

NEEDHAM PLANNING BOARD

Tuesday April 4, 2023

7:00 p.m.

Charles River Room

Public Services Administration Building, 500 Dedham Avenue

AND

Virtual Meeting using Zoom

Meeting ID: **880 4672 5264**

(Instructions for accessing below)

To view and participate in this virtual meeting on your phone, download the “Zoom Cloud Meetings” app in any app store or at www.zoom.us. At the above date and time, click on “Join a Meeting” and enter the following Meeting ID: **880 4672 5264**

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Or to Listen by Telephone: Dial (for higher quality, dial a number based on your current location):

US: +1 312 626 6799 or +1 646 558 8656 or +1 301 715 8592 or +1 346 248 7799 or +1 669 900 9128 or +1 253 215 8782 Then enter ID: **880 4672 5264**

Direct Link to meeting: <https://us02web.zoom.us/j/88046725264>

1. Request to extend the Action Deadline of Decision: Major Project Site Plan Special Permit No. 2021-01: WELL LCB Needham Landlord LLC, c/o LCB Senior Living, 3 Edgewater Drive, Suite 101, Norwood, MA, 02062, Petitioner. (Property located at 100-110 West Street, Needham, MA). Regarding redevelopment of the property to include an 83 unit Assisted Living and Alzheimer’s/Memory Care facility and 72 Independent Living Apartments.
2. Public Hearings:
 - 7:10 p.m. 920 South Street Definitive Subdivision: Brian Connaughton, 920 South Street, Needham, MA, Petitioner, (Property located at 920 South Street, Needham, MA). *Please note: this hearing has been continued from the December 19, 2022, February 7, 2023 and March 28, 2023 meetings.*

Scenic Road Act and Public Shade Tree Act: Brian Connaughton, 920 South Street, Needham, MA, Petitioner, (Property located at 920 South Street, Needham, MA). *Please note: this hearing has been continued from the December 19, 2022, February 7, 2023 and March 28, 2023 meetings.*
3. Discussion with CAPC Chair Stephen Frail on climate smart zoning reform.
4. Revise temporary outdoor seating/outdoor display policy to extend applicability date to April 1, 2024 or another later date deemed appropriate by the Board.
5. Minutes.
6. Report from Planning Director and Board members.
7. Correspondence.

(Items for which a specific time has not been assigned may be taken out of order.)

March 23, 2023

**BY OVERNIGHT DELIVERY
& ELECTRONIC MAIL**

Town of Needham Planning Board Members
Public Service Administration Building
500 Dedham Avenue
Needham, MA 02492
Attn: Lee Newman, Planning Director

Re: 100 West Street, Needham, Massachusetts (the "Property")

Dear Planning Board Members:

We are counsel to Welltower Inc., which owns the Property by and through HCRI Massachusetts Properties Trust II (the "Property Owner"), and its affiliate (the "Applicant"), which previously obtained the existing Major Project Site Plan Review Special Permit (SPMP No. 2021-01) dated May 18, 2021 and recorded in the Norfolk County Registry of Deeds at Book 39525, Page 70 (the "Existing Decision") in connection with a potential redevelopment of the Property.

As the Planning Board is aware, the Applicant has been working diligently since issuance of the Existing Decision to advance the redevelopment of the Property (the "Project"). During this time, the Project has faced a number of obstacles, including the COVID-19 pandemic, which has proven particularly challenging to the development of new senior living projects.

Despite these challenges and macro-economic considerations, the Applicant has continued to advance the Project. Most recently, an affiliate of the Property Owner requested the Planning Board's approval, pursuant to an application dated June 10, 2022 (the "Prior Application"), to develop the Property with a slightly different development program from what was approved in the Existing Decision. The proposed program represented a feasible alternative in light of current challenges. During an extensive public process consisting of multiple public hearings and other community outreach, the Town and members of the public offered many helpful comments. As a result, the Prior Application was withdrawn in order to evaluate the Project and develop a thoughtful response to the comments raised during this process. The Applicant is continuing its efforts to advance a responsive and feasible Project, including examining whether it can utilize the Existing Decision.

Pursuant to Section 4.7 of the Existing Decision, and as tolled by Chapter 53 of the Acts of 2020, the Existing Decision lapses on June 14, 2023. Section 4.7 of the Existing Decision and Section 7.5.2 of the Town of Needham Zoning By-Law (the "By-Law") allow the Applicant to

request, and the Planning Board to grant, an extension of time for lapse of the Existing Decision for good cause.

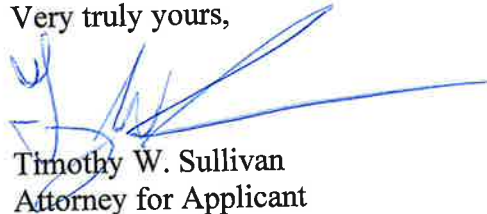
We hereby request that the Board grant a twelve (12) month extension of time for lapse of the Existing Decision, resulting in a new lapse date of June 14, 2024. Pursuant to the Existing Decision, the Planning Board may approve such extension request without the need for a public hearing.

As noted above, the Applicant has been and continues to diligently work to advance the Project. The requested extension of time is necessary for the Applicant to compile a complete and responsive new application to the Planning Board, while maintaining the existing entitlement for the Property.

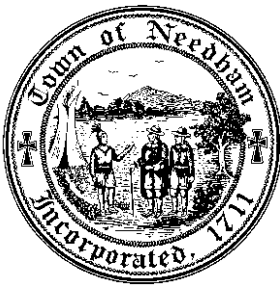
As set forth herein, good cause exists for the Planning Board to extend the expiration of the Existing Decision until June 14, 2024.

We respectfully request the opportunity to appear before the Planning Board for consideration of this request at its next meeting on April 4, 2023.

Very truly yours,



Timothy W. Sullivan
Attorney for Applicant



PLANNING & COMMUNITY DEVELOPMENT
PLANNING DIVISION

LEGAL NOTICE
Planning Board
TOWN OF NEEDHAM
NOTICE OF HEARING

Under the provisions of M.G.L., Ch. 41, S. 81-T, the Needham Planning Board will hold a public hearing on Monday, December 19, 2022, at 8:00 p.m. in the Charles River Room, first floor, Public Services Administration Building, 500 Dedham Avenue, Needham, Massachusetts, as well as by Zoom Web ID Number 880 4672 5264 (further instructions for accessing by zoom are below), regarding the application of Brian Connaughton, 920 South Street, Needham, MA for approval of a Definitive Subdivision Plan. Said Plan consists of nine (9) sheets and was submitted along with accompanying material. If approved, the Plan would create two (2) building lots; all would have frontage and access on the new road.

The land proposed to be subdivided is located at 920 South Street, Needham, Norfolk County, Massachusetts, and is shown on Assessors Plan No. 205 as Parcel 6, and bounded and described as follows:

Northerly by South Street on two courses, together measuring 177.66 feet; Northeasterly by land now or formerly of Erna Schwartz Place Family Trust, 331.24 feet; Southeasterly again by land now or formerly of Erna Schwartz Place Family Trust, 235.92; Easterly again by land now or formerly of Erna Schwartz Place Family Trust, 621 feet, more or less; Southerly by the Charles River, 264 feet, more or less, Easterly by land now or formerly of Mark Lichtenstein, Trustee and land now or formerly of Philip & Karen B. Silveira, on two courses, together measuring 1,092 feet, more or less.

Said parcel is shown as Lot numbered 16 on a plan drawn by Cheney Engineering Co., Inc., Surveyors, dated March 1987, as approved by the Land Court, filed in the Land Court Registration Office as No. 2417R, a copy of a portion of which is filed with the Norfolk County Registry District of the Land Court with Certificate No. 130654 in Book 654.

The above-described land is subject to the sewer easements as set forth in Document Nos. 6159, 8953, 146331 and shown on said plan as Sewer Easement (30.00 Wide).

The above-described land is also subject to Sewer Easement (20.00 Wide) shown on said plan.

Being the same premises conveyed to Brian Connaughton by deed of VNA Care Hospice, Inc., dated April 8, 2022, filed with the Norfolk County Registry District of the Land Court as Document No. 1501178 and noted on Certificate of Title No. 207299, to which deed reference is made for title.

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Direct Link to meeting: <https://us02web.zoom.us/j/88046725264>

The application may be viewed at this link:

<https://www.needhamma.gov/Archive.aspx?AMID=146&Type=&ADID=> . Interested persons are encouraged to attend the public hearing and make their views known to the Planning Board. This legal notice is also posted on the Massachusetts Newspaper Publishers Association's (MNPA) website at (<http://masspublicnotices.org/>).

NEEDHAM PLANNING BOARD

Needham Hometown Weekly: November 25, 2022 & December 1, 2022.

LEGAL NOTICE
Planning Board
TOWN OF NEEDHAM
NOTICE OF HEARING

In accordance with the provisions of the Scenic Road Act, M.G.L. Chapter 40A, S. 15C, the Needham Planning Board will hold a public hearing on Monday, December 19, 2022, at 8:00 p.m. in the Charles River Room, first floor, Public Services Administration Building, 500 Dedham Avenue, Needham, Massachusetts, as well as by Zoom Web ID Number 880 4672 5264 (further instructions for accessing by zoom are below), regarding the application of Brian Connaughton, 920 South Street, Needham, MA, for consent to remove approximately 26 feet of existing stone wall on South Street, a designated Scenic Road, for the purpose of creating a new subdivision road. In addition, two trees need to be removed that are partially within the layout of South Street. One is an 18-inch diameter tree that is situated 14 inches in the layout of South Street and 4 inches on the Premises, and the other is a 22-inch diameter tree, situated 6 inches in the layout of South Street and 16 inches on the Premises. The Needham Tree Warden will hold a concurrent hearing under M.G.L., Chapter 87, the Shade Tree Law. The affected property is located on the southerly side of South Street at 920 South Street and is shown on Assessor's Map 205 as Parcel 6. The stone wall section proposed to be removed is to accommodate a new roadway access to the site for a two-lot subdivision. The proposed activities are shown on a Definitive Subdivision Plan set consisting of 9 sheets, prepared by Verne T. Porter, 354 Elliot Street, Newton, MA: Sheet 1, Title Sheet, dated September 9, 2022; Sheet 2, entitled "Existing Conditions Site Plan," dated September 9, 2022; Sheet 3, entitled "By Right Subdivision Plan of Land," dated September 9, 2022; Sheet 4, entitled "Proposed Lotting Plan," dated September 9, 2022; Sheet 5, entitled "Proposed Grading Plan," dated September 9, 2022; Sheet 6, entitled "Proposed Utilities Plan," dated September 9, 2022; Sheet 7, entitled "Plan, Profile & Detail Sheet," dated September 9, 2022; Sheet 8, entitled "Detail Sheet," dated September 9, 2022; Sheet 9, entitled "Detail Sheet," dated September 9, 2022, as well as Plan prepared by Verne T. Porter, 354 Elliot Street, Newton, MA, entitled "Street Opening Sketch Plan, 920 South Street, Needham Massachusetts," dated November 14, 2022.

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NEEDHAM PLANNING BOARD

Needham Hometown Weekly: December 1, 2022 and December 8, 2022.

NOTICE

TOWN OF NEEDHAM PUBLIC WORKS DEPARTMENT

NOTICE is hereby given that Brian Connaughton, has petitioned for the removal of two (2)

PUBLIC SHADE TREES

As follows: At 920 South St., on the front edge of property

<u>SPECIES</u>	<u>DIAMETER</u>	<u>CONDITION</u>
<u>White Pine</u>	<u>22 inches</u>	<u>Poor</u>
<u>White Pine</u>	<u>18 inches</u>	<u>Poor</u>

Permission is respectfully requested to remove two (2) Public Shade Trees.

A PUBLIC HEARING will be held in the Charles River Room, first floor, Public Services Administration Building, 500 Dedham Avenue., Needham, Massachusetts at **8:00 P.M, Monday the 19th day of December, 2022,** at which time and place all interested persons may appear and be heard.

Needham Select Board



TOWN OF NEEDHAM
MASSACHUSETTS

RECEIVED TOWN CLERK
NEEDHAM, MA 02492
2022 NOV -8 PM 4:58

Room 20, Town Hall
Needham, MA 02492
781-455-7526

APPLICATION FOR APPROVAL
OF A DEFINITIVE SUBDIVISION PLAN

PLANNING DEPARTMENT

Date: September 30 20 22

The undersigned, on behalf of Brian Connaughton (owner's name or self) of
920 South Street, Needham, MA 02492 (address), owner of land in Needham, the description of
said land being submitted herewith, desiring to make a subdivision of said land hereby submits the following required plans
and documents:

- a) the original tracings and eight full sized copies and six reduced sized copies of each of the
following plans –
- a key location map
 - a lot plan
 - a profile plan
 - a municipal services and utility plan
 - a topographic plan
 - any detail plans required

Each plan bearing titles, endorsements and imprints required.

- b) a filing fee of \$500 plus \$250 per lot for each lot in the subdivision.
c) a description of the boundaries of the entire area to be subdivided; and
d) ~~a list of names and addresses of all abutters as they appear on the most recent Needham Assessors' records~~
e) Exhibit A - List of Waivers; Exhibit B - Legal Description; and Drainage Calculations
(specify any additional material or information submitted)

and petitions the Planning Board to consider and approve such subdivision plans under the provisions of the Subdivision
Control Law (M.G.L. Chapter 41, Sections 81-A through 81-G inclusive, as amended) and in accordance with the Rules and
Regulations of the Needham Planning Board and the applicable By-Laws of the Town of Needham.

The undersigned certifies that the applicant(s) is/are the sole owner(s) of the entire land proposed to be subdivided and that
the subdivision plans and the description submitted indicate the true boundaries of said land and ~~the correct names of all
abutters as shown on the most recent records of the Needham Assessors.~~

(If the applicant is not the owner, written authorization to act as agent must be attached)

Brian Connaughton (owners)

By  (agent)
George Giunta, Jr., Esq.

This application is accepted by the Needham Planning Board in accordance with Sections 81-Q and 81-T of the Subdivision Control Law.
Nov. 1 20 22 By 

EXHIBIT A

Definitive Subdivision Application
920 South Street
Needham, MA

RECEIVED TOWN CLERK
NEEDHAM, MA 02122
2022 NOV -8 PM 4: 58

LIST OF WAIVERS

The Applicants hereby request the following waivers with respect to the Town of Needham, Subdivision Regulations and Procedural Rules of the Planning Board:

1. Waiver of the requirements of Section 3.2, relative to submission of definitive plans, as follows:

- a. A waiver from the requirements of subsection (b) that plans be drawn on blue tracing cloth or mylar, and that the Title Block be located in the lower right-hand corner;
- b. A waiver from the requirements of subsection (e) that street line traverse closures be provided.

2. Waiver of the requirements of Section 3.3, relative to street and construction details, as follows:

- a. A waiver from the required width of roadway layout at Section 3.3.1 from 50 feet to 20 feet;
- b. A waiver from the required pavement width at Section 3.3.1 from twenty-four (24) to eighteen (18) feet;
- c. A waiver from the required pavement radius in the turnaround at Section 3.3.5 from sixty (60) feet to fifty (50) feet;
- e. A waiver from the curbing requirement at Section 3.3.6 in the in the cul-de-sac;
- f. A waiver from the requirement of sidewalks on both sides of the road layout at Section 3.3.16 to no sidewalk
- g. A general waiver of construction and such other unspecified waivers as may be necessary for the construction of the way and related improvements as shown on the revised plans submitted herewith.

3. Waiver of any and all other requirements as may be necessary and appropriate for the division / reconfiguration of the subject premises as depicted on the plan.

EXHIBIT B

Definitive Subdivision Application
920 South Street
Needham, MA

RECEIVED TOWN CLERK
NEEDHAM, MA 02452
2022 NOV -8 PM 4: 58

Description

That certain parcel of registered land, known and numbered 920 South Street, bounded and described as follows:

Northerly	by South Street on two courses, together measuring 177.66 feet;
Northeasterly	by land now or formerly of Erna Schwartz Place Family Trust, 331.24 feet;
Southeasterly	again by land now or formerly of Erna Schwartz Place Family Trust , 235.92;
Easterly	again by land now or formerly of Erna Schwartz Place Family Trust , 621 feet, more or less;
Southerly	by the Charles River, 264 feet, more or less,
Easterly	by land now or formerly of Mark Lichtenstein, Trustee and land now or formerly of Philip & Karen B. Silveira, on two courses, together measuring 1,092 feet, more or less.

Said parcel is shown as Lot numbered 16 on a plan drawn by Cheney Engineering Co., Inc., Surveyors, dated March 1987, as approved by the Land Court, filed in the Land Court Registration Office as No. 2417R, a copy of a portion of which is filed with the Norfolk County Registry District of the Land Court with Certificate No. 130654 in Book 654.

The above-described land is subject to the sewer easements as set forth in Document Nos. 6159, 8953, 146331 and shown on said plan as Sewer Easement (30.00 Wide).

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Being the same premises conveyed to Brian Connaughton by deed of VNA Care Hospice, Inc., dated April 8, 2022, filed with the Norfolk County Registry District of the Land Court as Document No. 1501178 and noted on Certificate of Title No. 207299, to which deed reference is made for title.

RECEIVED TOWN CLERK
NEEDHAM, MA 02454

Brain Connaughton
920 South Street
Needham, MA 02492

2022 NOV -8 PM 4: 58

September 30, 2022

Town of Needham
Planning Board
Needham, Massachusetts 02492

Attn: Lee Newman, Planning Director

Re: Brian Connaughton
Application for Approval of
Definitive Subdivision Plan and Scenic Road Act
920 South Street, Needham, MA

Dear Mrs. Newman,

Please accept this letter as confirmation that I, Brian Connaughton, current owner of the property known and numbered 920 South Street, Needham, MA, have authorized my attorney George Giunta, Jr., Esquire, to make application to the Planning Board for Approval of Definitive Subdivision Plan and Scenic Road Act, and other zoning and planning related relief that may be required or appropriate in connection with the division of the said premises into two lots with a new roadway. In connection therewith, Attorney Giunta is specifically authorized to execute, sign, deliver and receive all necessary documentation related thereto, including, without limitation, Application for Approval of a Definitive Subdivision Plan and Application for Hearing Under the Scenic Road Act.

Sincerely,



Brain Connaughton

RECEIVED TOWN CLERK
NEEDHAM, MA 02492
2022 NOV -8 PM 4:58

TOWN OF NEEDHAM

MASSACHUSETTS



500 Dedham Avenue
Needham, MA 02492
781-455-7550

PLANNING BOARD

**APPLICATION FOR PUBLIC HEARING UNDER
THE SCENIC ROAD ACT**

Name of Applicant: Brian Connaughton

Address of Applicant: 920 South Street, Needham, MA 02492

Location of Property Subject to Scenic Road Act:
Address: 920 South Street, Needham, MA 02492

Assessor's Map and Parcel Number: Map 205, Parcel 20

Description of Proposed Activity Subject to Scenic Roads Act:

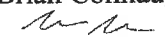
Removal and / or alteration of existing stone wall and possible removal of tress and vegetation along southerly side of South Street in connection with construction of proposed new subdivision roadway.

Purpose of Proposed Activity:

Accommodation of proposed new subdivision roadway.

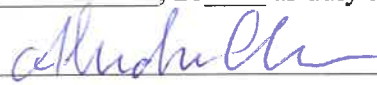
This application shall be accompanied by a filing fee of \$250.00 and a deposit in the amount determined by the Planning Board sufficient to cover advertising, notification and other costs for the public hearing.

Brian Connaughton

Applicant Signature:  Date: Sept. 30, 2022

By: George Giunta, Jr., Esq.

For Planning Department Use:

Application accepted this 1 day of NOV., 2022 as duly submitted under the rules and regulations of the Planning Board, by 

Brain Connaughton
920 South Street
Needham, MA 02492

RECEIVED TOWN CLERK
NEEDHAM, MA 02492
2022 NOV -8 PM 4:58

September 30, 2022

Town of Needham
Planning Board
Needham, Massachusetts 02492

Attn: Lee Newman, Planning Director

Re: Brian Connaughton
Application for Approval of
Definitive Subdivision Plan and Scenic Road Act
920 South Street, Needham, MA

Dear Mrs. Newman,

Please accept this letter as confirmation that I, Brian Connaughton, current owner of the property known and numbered 920 South Street, Needham, MA, have authorized my attorney George Giunta, Jr., Esquire, to make application to the Planning Board for Approval of Definitive Subdivision Plan and Scenic Road Act, and other zoning and planning related relief that may be required or appropriate in connection with the division of the said premises into two lots with a new roadway. In connection therewith, Attorney Giunta is specifically authorized to execute, sign, deliver and receive all necessary documentation related thereto, including, without limitation, Application for Approval of a Definitive Subdivision Plan and Application for Hearing Under the Scenic Road Act.

Sincerely,



Brain Connaughton

GEORGE GIUNTA, JR.
ATTORNEY AT LAW*
281 CHESTNUT STREET
NEEDHAM, MASSACHUSETTS 02492
*Also admitted in Maryland

TELEPHONE (781) 449-4520

FAX (781) 465-6095

September 30, 2022

Lee Newman
Planning Director
Town of Needham
1471 Highland Avenue
Needham, MA 02492

Re: 920 South Street - Definitive Subdivision Application
Brian Connaughton

Dear Lee,

Please be advised that I represent Brian Connaughton relative to his property at 920 South Street, Needham, MA 02492 (the "Premises") and his intent to subdivide same into two buildable lots. In connection therewith, submitted herewith please find the following:

1. Completed Application for Approval of a Definitive Subdivision Plan;
2. Exhibit A – List of Waivers;
3. Exhibit B - Description;
4. Definitive Subdivision Plan, 920 South Street, Needham, Massachusetts, prepared by Verne T. Porter, Jr., PLS, Land Surveyors – Civil Engineers, 354 Elliot Street, Newton, Massachusetts 02464, consisting of 9 sheets as follows: 1. Title Sheet, dated September 9, 2022, 2. Existing Conditions Site Plan, dated September 9, 2022, 3. By-Right Subdivision Plan of Land, dated September 9, 2022, 4. Proposed Lotting Plan of Land, dated September 9, 2022, 5. Proposed Grading Plan, dated September 9, 2022, 6. Proposed Utilities Plan, dated September 9, 2022, 7. Plan, Profile & Detail Sheet, dated September 9, 2022, 8. Detail Sheet, dated September 9, 2022, and 9. Detail Sheet, dated September 9, 2022 (hereinafter, collectively, the "Subdivision Plan");
5. Drainage Summary, Proposed Two-Lot Residential Subdivision, 920 South Street, Needham, Massachusetts, dated September 28, 2022, prepared by Verne T. Porter, Jr., PLS, Land Surveyors – Civil Engineers, 354 Elliot Street, Newton, Massachusetts 02464;
6. Check No. 107 in the amount of \$1,000 for the applicable filing fee; and
7. Application for Public Hearing Under the Scenic Road Act.

The Premises is located on the Southerly side of South Street in the Rural Residential Conservation (RRC) Zoning District. It is shown and identified as Parcel 70 on Assessor's Map No. 205 and is currently occupied by a three-story, twenty-two room structure, originally constructed in 1908.¹ While the structure was likely built initially as a single-family residential dwelling, it was used for commercial purposes as the Stanley Tippet Hospice Home from approximately 1993 until recently. In addition, the Premises is also occupied by a small, detached shed, driveways and parking areas.

As shown on the Subdivision Plan, the applicant is proposing to subdivide the Premises into two building lots, as well as a small non-buildable parcel along South Street. Both of the new lots will have frontage on and will be served by and accessed from the proposed new roadway.

As depicted on sheet 3 of the Subdivision Plan, a new roadway can be built with a 60 foot radius circle and 40 foot width road (with sidewalks on both sides).² However, whereas the proposed road will only serve two lots, will end in a turn-around, and is located in a scenic area of Town, the Applicant is of the opinion that a full roadway, 24 feet wide, with sidewalks and a full 120 foot diameter circle is not appropriate. Rather, the Applicant feels that something akin to a shared driveway is far more suitable for this location, would better preserve open space and the scenic nature of the area. Therefore, the Applicant is requesting a waiver of construction as well as several other waivers. Given the nature of the development, its location on South Street and past practice of the Board, The Applicant asserts that the requested waivers are appropriate for this development.

Finally, while the proposed new roadway is located in substantially the same place as the existing driveway, removal of a small portion of the existing stone wall and modification thereof is necessary to accommodate the proposed new roadway. Therefore, an Application for Public Hearing Under the Scenic Road Act is submitted herewith, and the Applicant requests that same be acted on simultaneous with his application for Definitive Subdivision Approval.

Kindly schedule this matter for consideration at the next available meeting of the Planning Board. Please also let me know if you require any further information or materials.

As always, your anticipated courtesy and cooperation and appreciated.

Sincerely,



George Giunta, Jr.

¹ According to Assessor's Department records

² This "by-right" condition assumes a single waiver; namely, reduction of roadway width from 50' to 40'. A waiver of roadway width has been granted for nearly all subdivisions approved in the last 50 years. Moreover, the standard width of public ways throughout the Town is 40 feet. Therefore, while a roadway width of 40 feet technically requires a waiver, by virtue of its near universal application, such width has become a de facto standard.

Definitive Subdivision Plan
~920 South Street~
Needham, Massachusetts

FOR REGISTRY USE ONLY



Locus Map
Scale 1"=400'

1. THIS PLAN WAS MADE FROM AN ACTUAL ON THE GROUND SURVEY BY THIS OFFICE
2. THE SUBJECT PROPERTY IS LOCATED IN THE RURAL RESIDENTIAL ZONE
3. ASSESSORS MAP 205 PARCEL 7
4. UTILITIES SHOWN WHERE COMPILED FROM BEST AVAILABLE INFORMATION AND ACTUAL FIELD LOCATIONS. THEY MAY OR MAY NOT BE COMPLETE OR CORRECT. CONTRACTOR TO FIELD VERIFY ALL LOCATIONS AND DEPTHS PRIOR TO ANY EXCAVATION.
5. 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.
6. WETLANDS DELINEATIONS PERFORMED BY ECOTEC INC.
7. LOCUS IS LOCATED IN THE FOLLOWING FLOOD ZONE PER FEMA FLOOD INSURANCE RATE MAP NUMBER 25021C0038E DATED 7-17-2012

Zone Rural Residence Conservation
43,560s.f. Minimum
150' Lot Frontage
50' Front Setback
25' Side Setback
25' Rear Setback
FAR Not Applicable
Max. Lot Coverage 15%
Max. Stories 2 1/2
Max. Height 35'

Owner/Applicant:
Brian Connaughton
920 South Street
Needham, Ma. 02492
Cert. #207299

DIRECTOR OF PUBLIC WORKS	
DATE APPROVED	
TOWN ENGINEER	
DATE APPROVED	
I, TOWN CLERK OF THE TOWN OF NEEDHAM, HEREBY CERTIFY THAT THE NOTICE OF THE PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE TWENTY DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SAID NOTICE	
DATE	TOWN CLERK

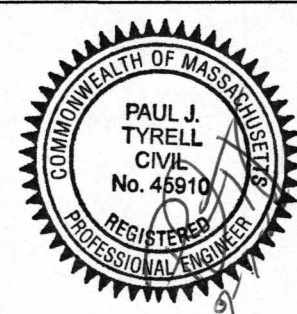
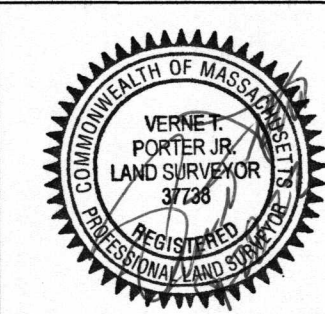
APPROVAL IN ACCORDANCE WITH SECTION 91-U OF CHAPTER 41 OF THE GENERAL LAWS AS AMENDED	
TOWN OF NEEDHAM PLANNING BOARD	
BY:	
APPROVED:	

I CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS PLAN IS TRUE AND CORRECT TO THE ACCURACY REQUIRED BY THE SUBDIVISION REGULATIONS AND PROCEDURAL RULES OF THE NEEDHAM PLANNING BOARD.

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

Brian Connaughton 9-28-27

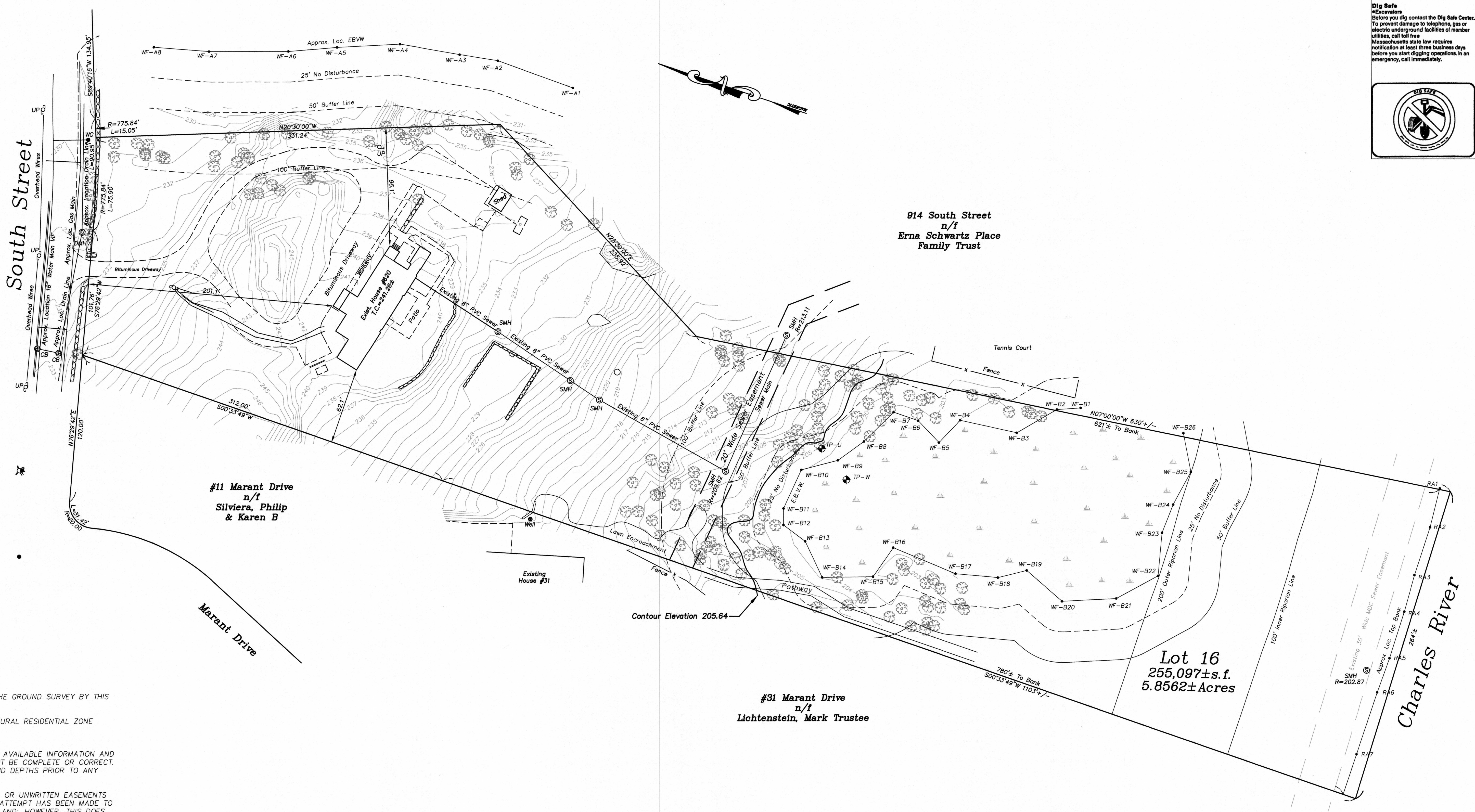
REVISIONS	
DATE	DESCRIPTION



~Title Sheet~	
920 South Street	
Needham, Massachusetts	
Scale: As Noted	September 9, 2022
VERNE T. PORTER Jr., PLS	
Land Surveyors - Civil Engineers	
354 Elliot Street Newton, Massachusetts 02464	
	Design By:
Cover Sheet	Checked By:
#22019	Drawn By:

Legend

- =Erosion Control
- =Trench Drain
- =Catch Basin
- =Drain Manhole
- =Sewer Manhole
- =Hydrant
- =Gas Gate
- =Water Gate
- =Gas Gate
- =Water Gate
- =Utility Pole
- =Light Pole
- =Test Pit
- =Wetland Flag
- WF-B18
- =Vegetated Wetland
- =Tree To Remain
- =Tree To Be Removed
- R=100.00 =Rim Elevation
- I=90.00 =Invert Elevation
- T.C.=103.00 =Top of Concrete Elevation
- =Proposed Spot Elevation
- =Proposed Contour Line
- =Existing Contour Line
- 6.3x3 =Existing Spot Elevation
- x =Existing Fence
- =Proposed D-Stone
- S85°19'54"E =Property Line W/Bearing & Distance
- 102.48'



1. THIS PLAN WAS MADE FROM AN ACTUAL ON THE GROUND SURVEY BY THIS OFFICE
2. THE SUBJECT PROPERTY IS LOCATED IN THE RURAL RESIDENTIAL ZONE
3. ASSESSORS MAP 205 PARCEL 7
4. UTILITIES SHOWN WERE COMPILED FROM BEST AVAILABLE INFORMATION AND ACTUAL FIELD LOCATIONS. THEY MAY OR MAY NOT BE COMPLETE OR CORRECT. CONTRACTOR TO FIELD VERIFY ALL LOCATIONS AND DEPTHS PRIOR TO ANY EXCAVATION.
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6. WETLANDS DELINEATIONS PERFORMED BY ECOTEC INC.
7. LOCUS IS LOCATED IN THE FOLLOWING FLOOD ZONE PER FEMA FLOOD INSURANCE RATE MAP NUMBER 25021C0038E DATED 7-17-2012

DIRECTOR OF PUBLIC WORKS	
DATE APPROVED	
TOWN ENGINEER	
DATE APPROVED	
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TOWN OF NEEDHAM PLANNING BOARD	
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APPROVED:	

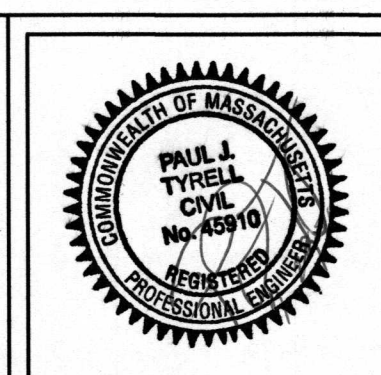
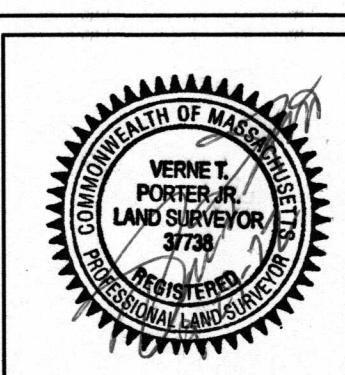
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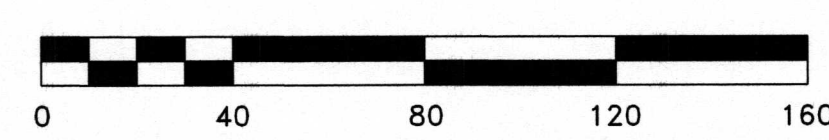
Brian Connaughton 9-29-22

Owner/Applicant:
Brian Connaughton
920 South Street
Needham, Ma. 02492
Cert. #207299

REVISIONS	
DATE	DESCRIPTION

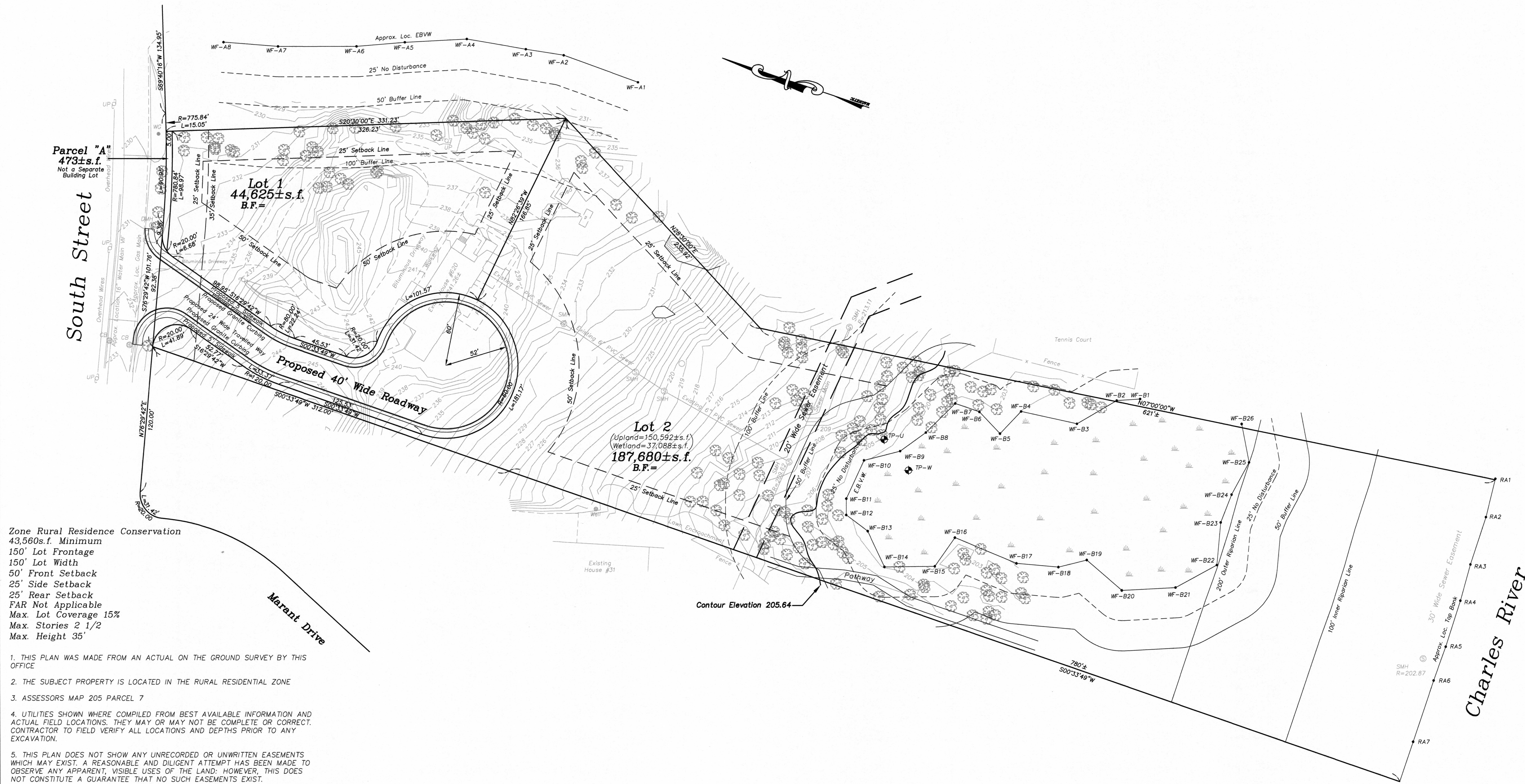


~Existing Conditions Site Plan~	
920 South Street	
Needham, Massachusetts	
Scale: 1"=40'	September 9, 2022
VERNE T. PORTER Jr, PLS	
Land Surveyors - Civil Engineers	
354 Elliot Street, Newton, Ma. 02464	
Project: 22019	
Designed By:	
Drawn By:	
Checked By:	



Sheet 1 of 8

Dig Safe
Excavators
Before you dig contact the Dig Safe Center.
To prevent damage to telephone, gas or
electric underground facilities of member
utilities, call toll free
Massachusetts state law requires
notification at least three business days
before you start digging operations. In an
emergency, call immediately.



Zone Rural Residence Conservation
43,560s.f. Minimum
150' Lot Frontage
150' Lot Width
50' Front Setback
25' Side Setback
25' Rear Setback
FAR Not Applicable
Max. Lot Coverage 15%
Max. Stories 2 1/2
Max. Height 35'

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DATE APPROVED	
TOWN ENGINEER	
DATE APPROVED	
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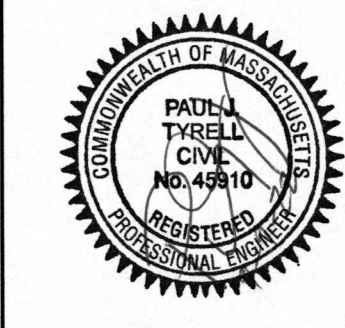
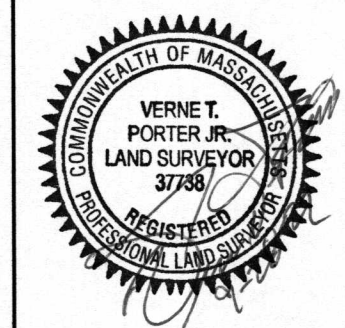
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Verne T. Porter Jr. 9-28-27

Owner/Applicant:
Brian Connaughton
920 South Street
Needham, Ma. 02492
Cert. #207299

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~By Right Subdivision Plan of Land~	
920 South Street	
Needham, Massachusetts	
Scale: 1"=40'	September 9, 2022
VERNE T. PORTER Jr, PLS	
Land Surveyors - Civil Engineers	
354 Elliot Street, Newton, Ma. 02464	
Project:22019	
Desinged By:	
Drawn By:	
Checked By:	

0 40 80 120 160

Sheet 2 of 8

South Street

Parcel "A"
517±s.f.
Not A Separate
Building Lot

Lot 1
43,617±s.f.
B.F.=19.08

Lot 2
Upland=157,803±s.f.
Wetland=37,089±s.f.
194,892±s.f.
4.4741 Acres
B.F.=9.08

Zone Rural Residence Conservation
43,560s.f. Minimum
150' Lot Frontage
50' Front Setback
25' Side Setback
25' Rear Setback
FAR Not Applicable
Max. Lot Coverage 15%
Max. Stories 2 1/2
Max. Height 35'

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Total Lot Area=255,097±s.f.
Roadway Area=16,071±s.f.

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TOWN OF NEEDHAM PLANNING BOARD	
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APPROVED:	

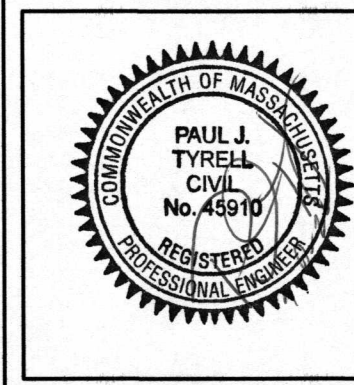
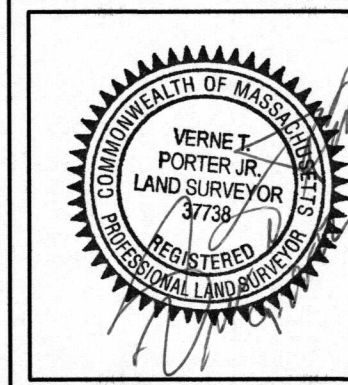
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Verne T. Porter Jr. 9-28-22

Owner/Applicant:
Brian Connaughton
920 South Street
Needham, Ma. 02492
Cert. #207299

REVISIONS	
DATE	DESCRIPTION



~Proposed Lotting Plan of Land~

920 South Street

Needham, Massachusetts

Scale: 1"=40' September 9, 2022

VERNE T. PORTER Jr, PLS

Land Surveyors - Civil Engineers

354 Elliot Street, Newton, Ma. 02464

0 40 80 120 160

Sheet 3 of 8

Project:22019

Desinged By:

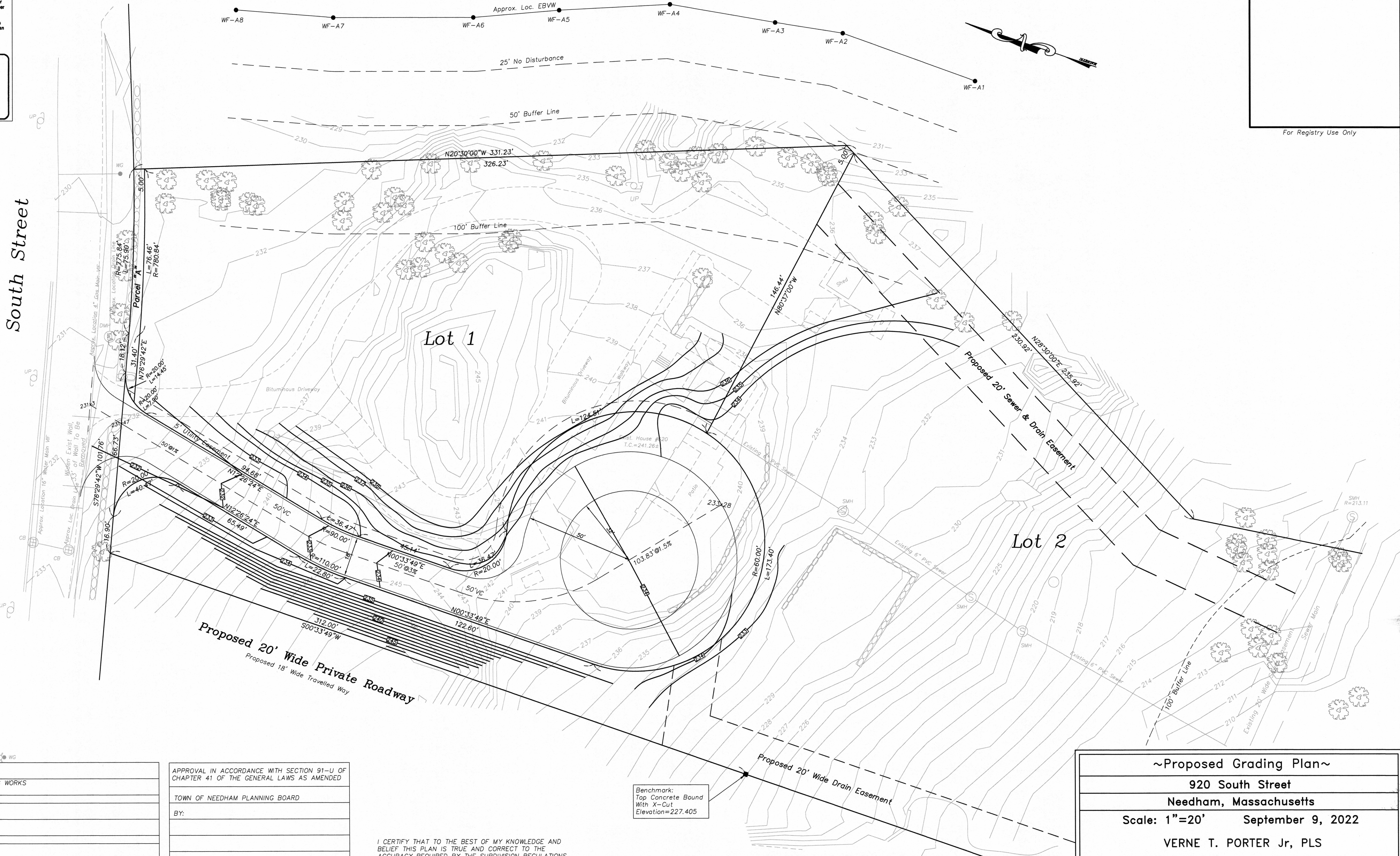
Drawn By:

Checked By:

Dig Safe
Excavators
Before you dig contact the Dig Safe Center.
To prevent damage to telephone gas or
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utilities, call toll free
Massachusetts state law requires
notification at least three business days
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emergency, call immediately.



South Street



For Registry Use Only

DIRECTOR OF PUBLIC WORKS	
DATE APPROVED	
TOWN ENGINEER	
DATE APPROVED	
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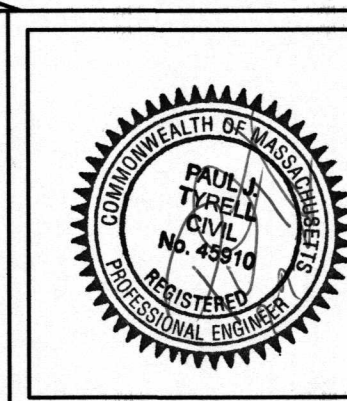
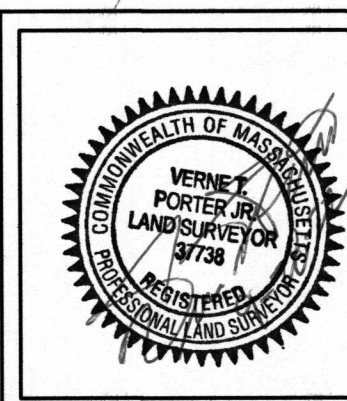
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[Signature]

Owner/Applicant:
Brian Connaughton
920 South Street
Needham, Ma. 02492
Cert. #207299

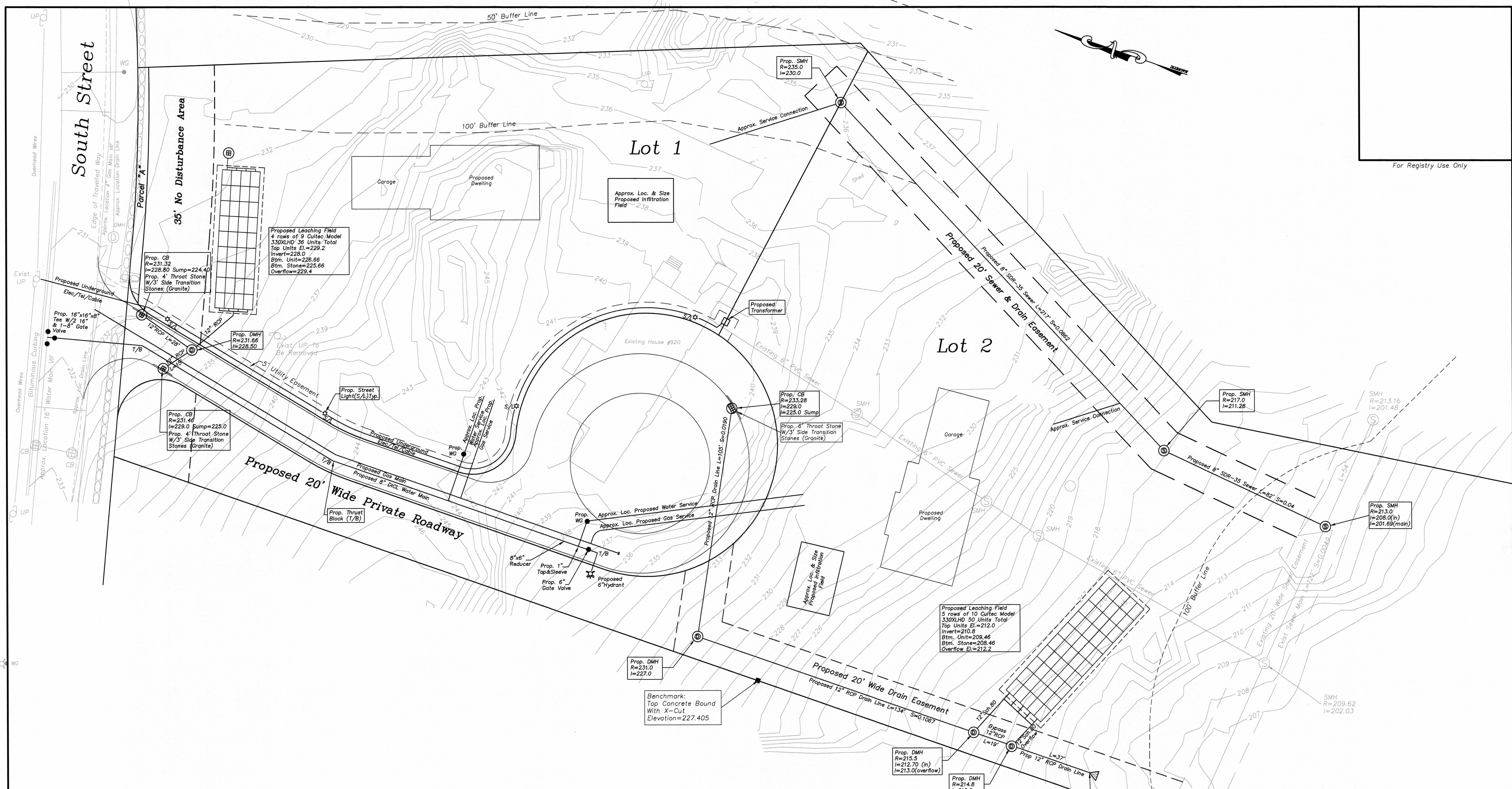
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~Proposed Grading Plan~	
920 South Street	
Needham, Massachusetts	
Scale: 1"=20'	September 9, 2022
VERNE T. PORTER Jr, PLS	
Land Surveyors - Civil Engineers	
354 Elliot Street, Newton, Ma. 02464	
Project: 22019	
Designed By:	
Drawn By:	
Checked By:	

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Sheet 4 of 8



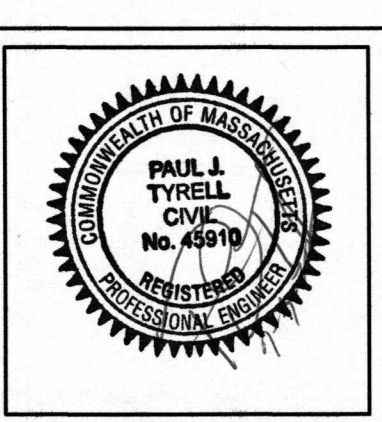
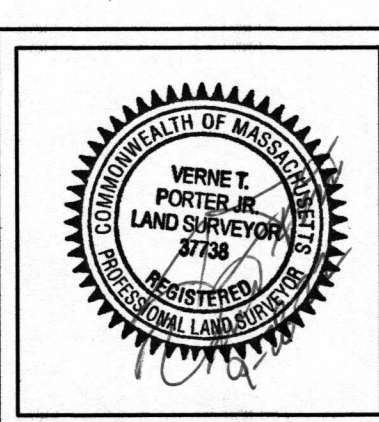
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Verne T. Porter Jr.

REVISIONS	
DATE	DESCRIPTION



~Proposed Utilities Plan~

920 South Street

Needham, Massachusetts

Scale: 1"=20' September 9, 2022

VERNE T. PORTER Jr, PLS

Land Surveyors - Civil Engineers

354 Elliot Street, Newton, Ma. 02464

Project:22019

Desinged By:

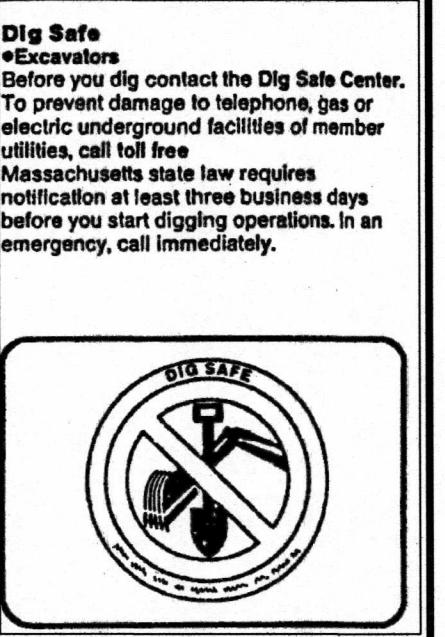
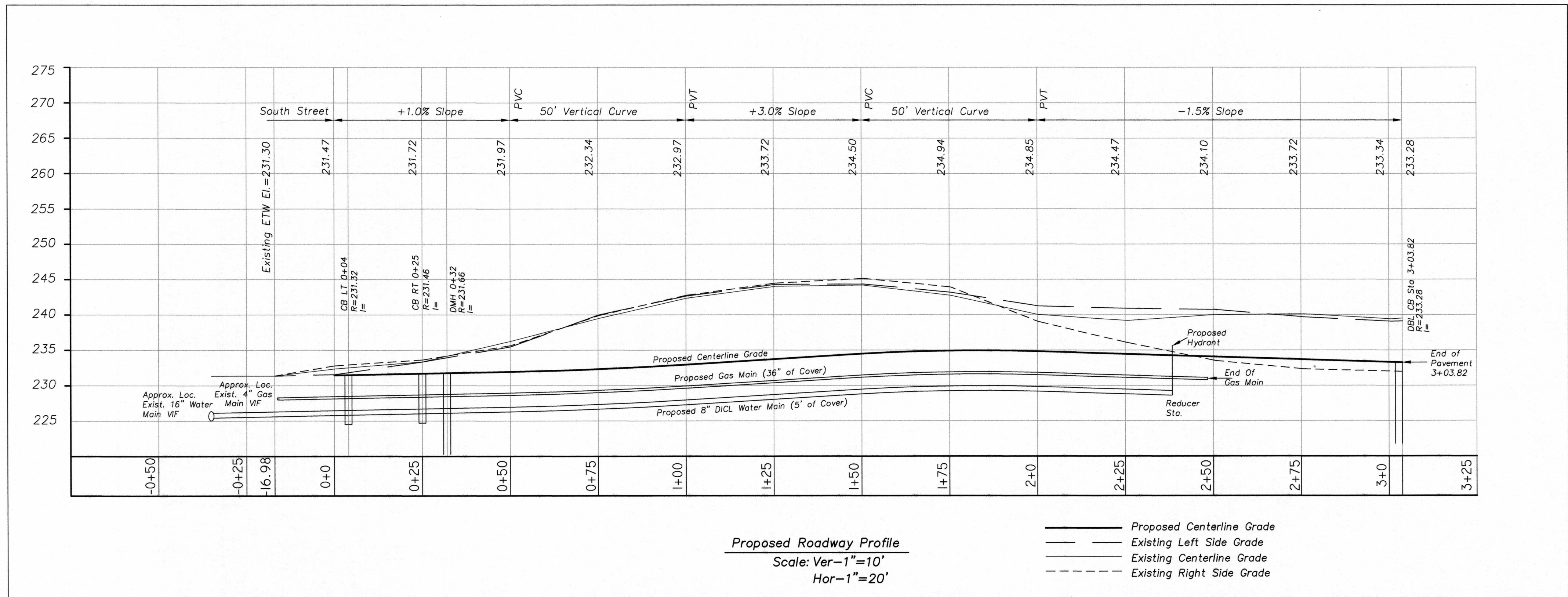
Drawn By:

Checked By:

0 20 40 60 80

Sheet 5 of 8

Owner/Applicant:
Brian Connaughton
920 South Street
Needham, Ma. 02492
Cert. #207299



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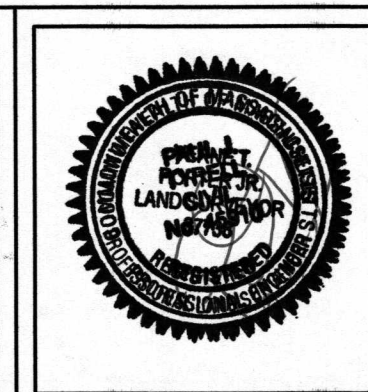
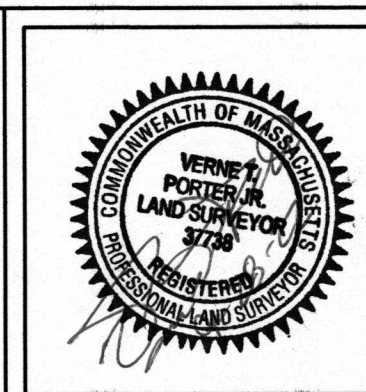
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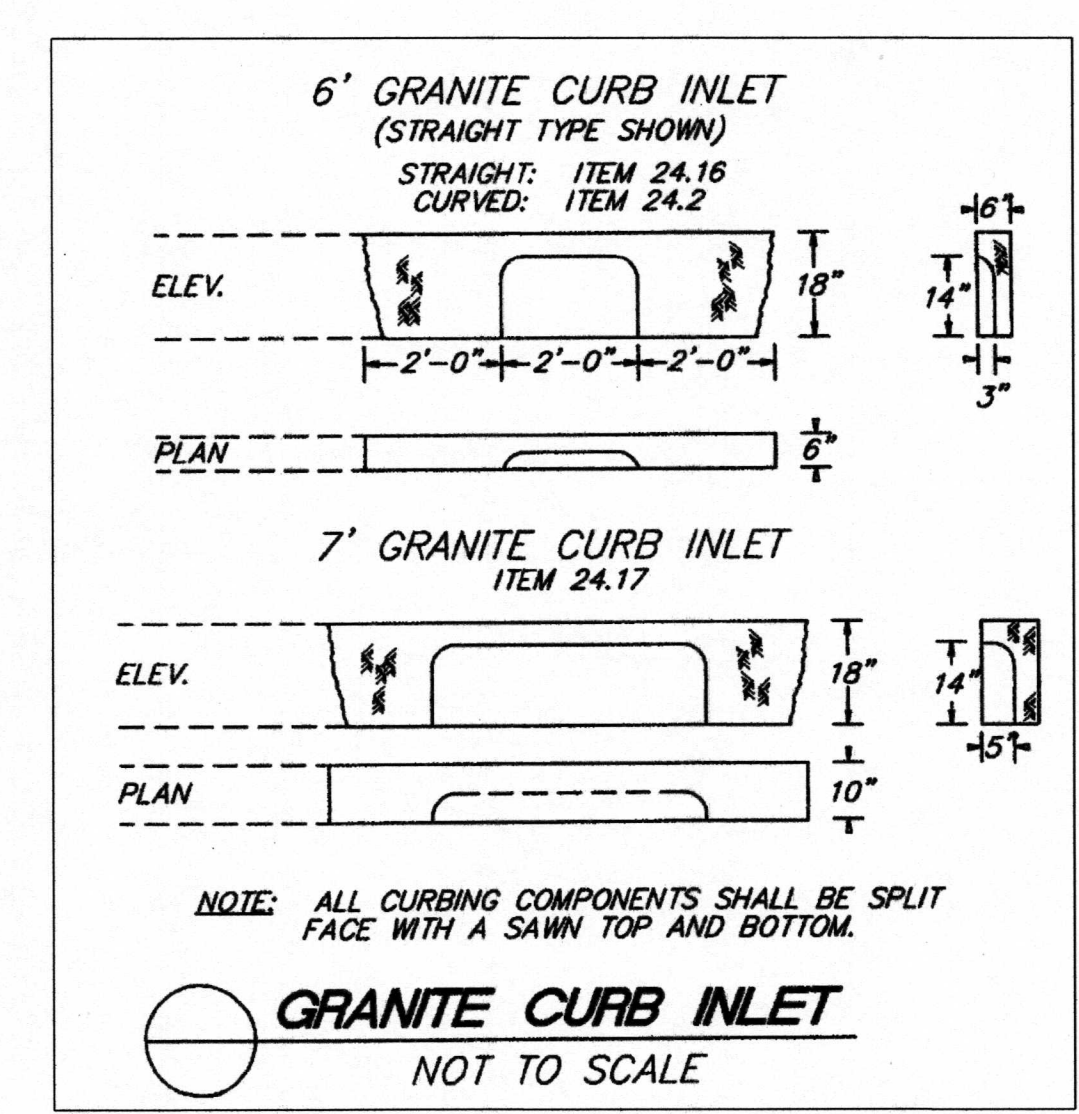
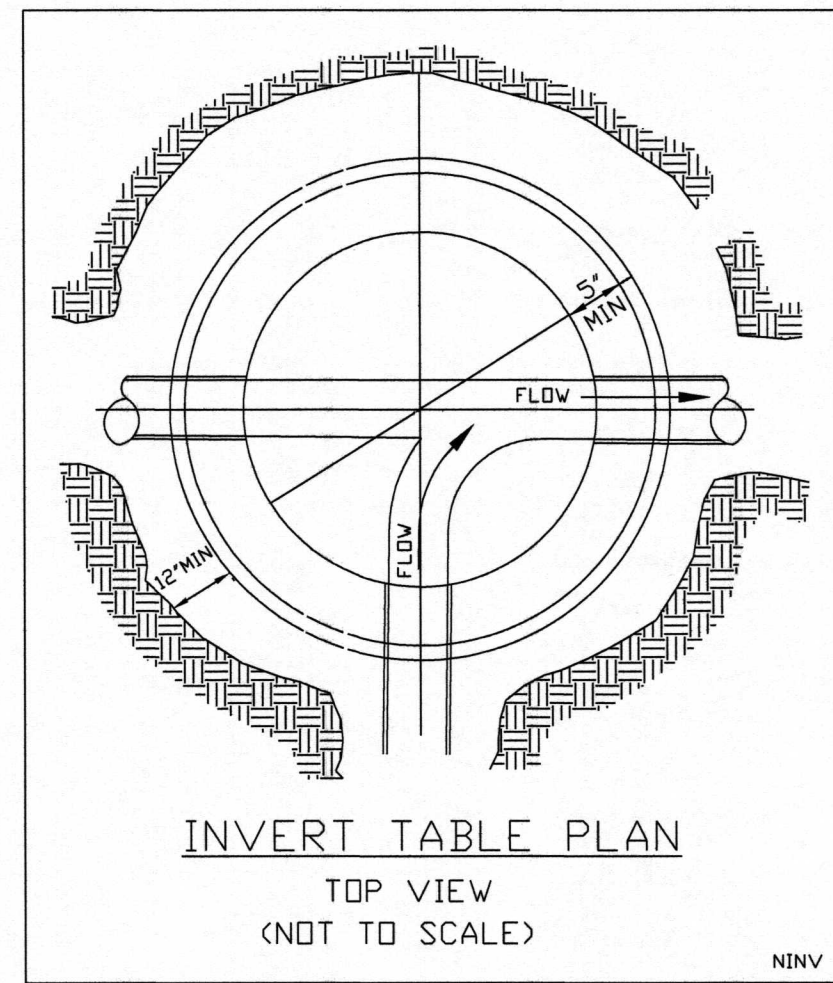
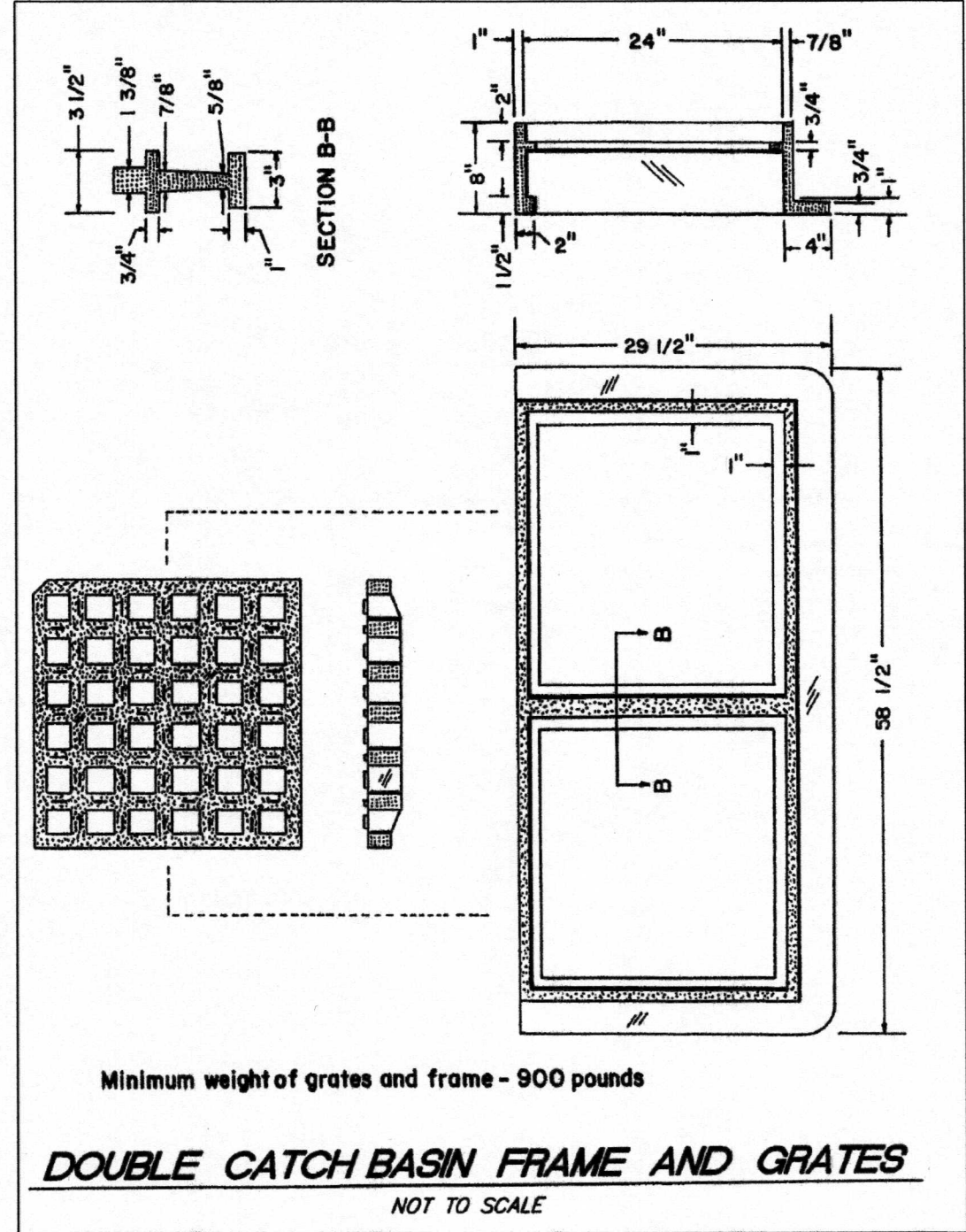
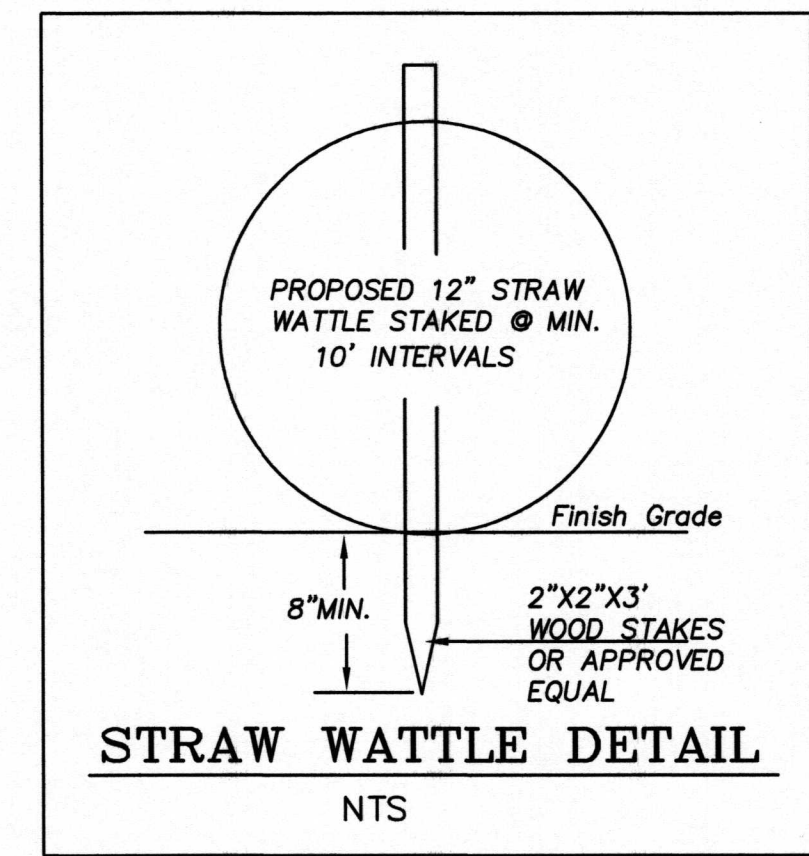
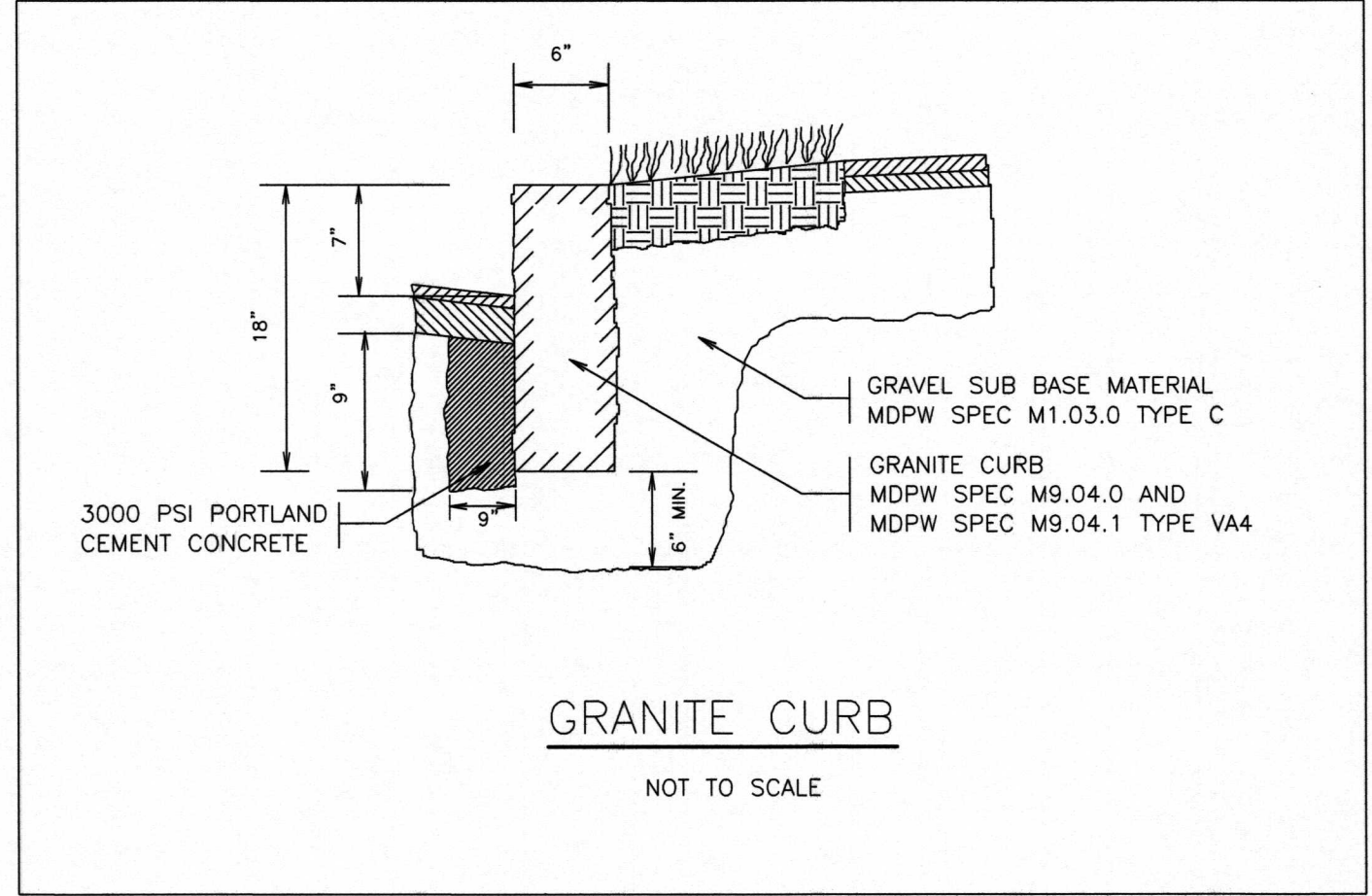
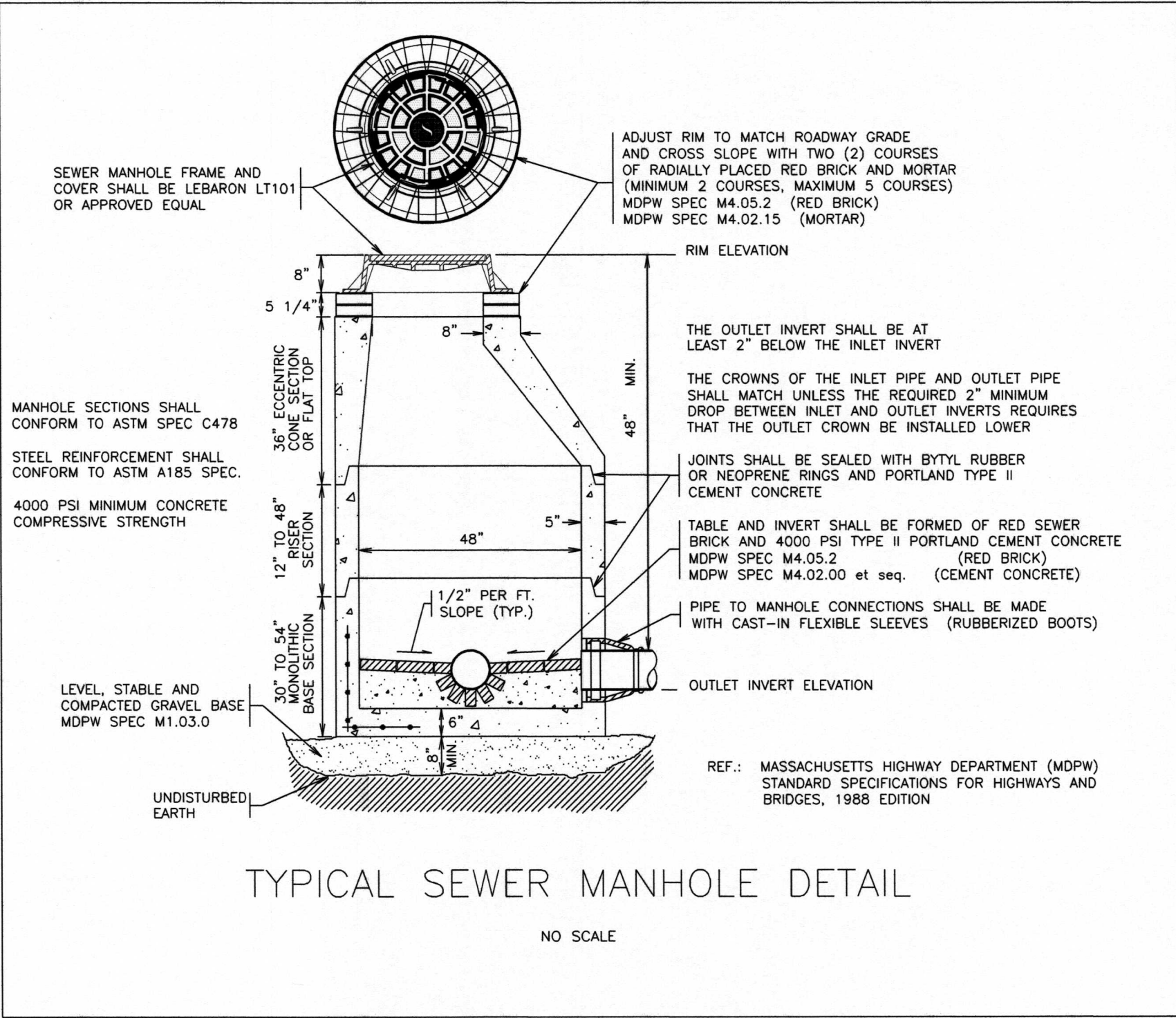
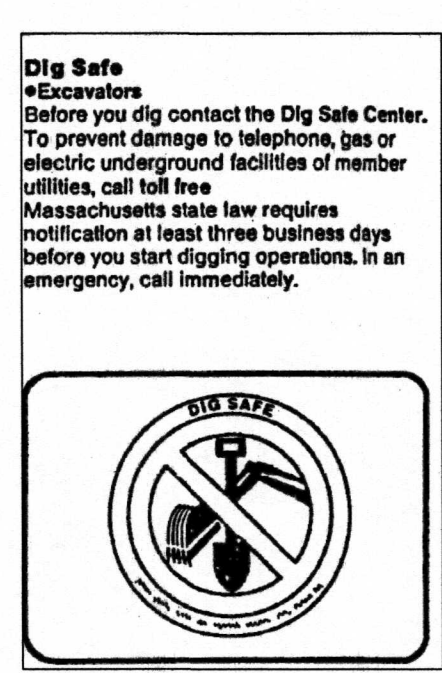
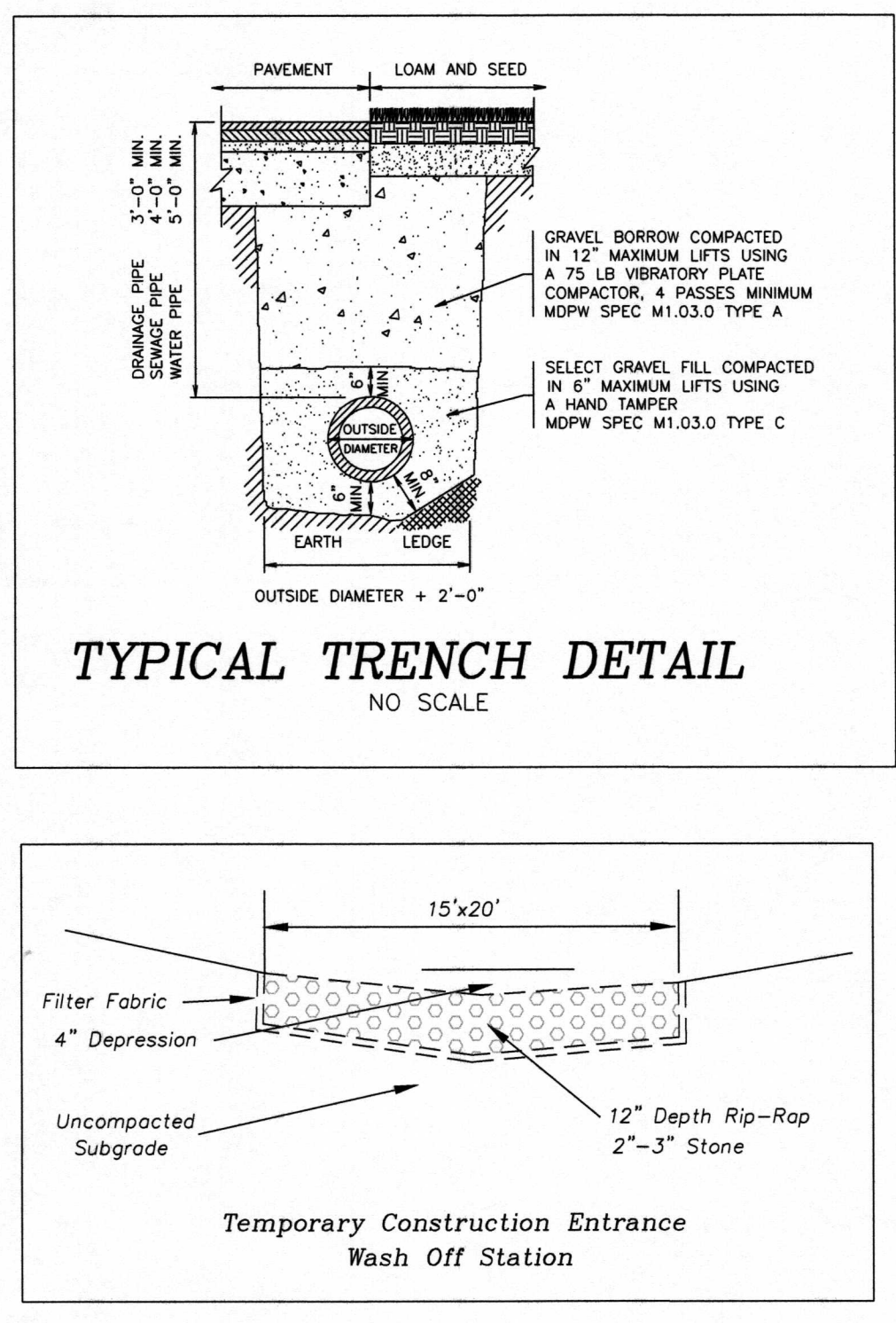
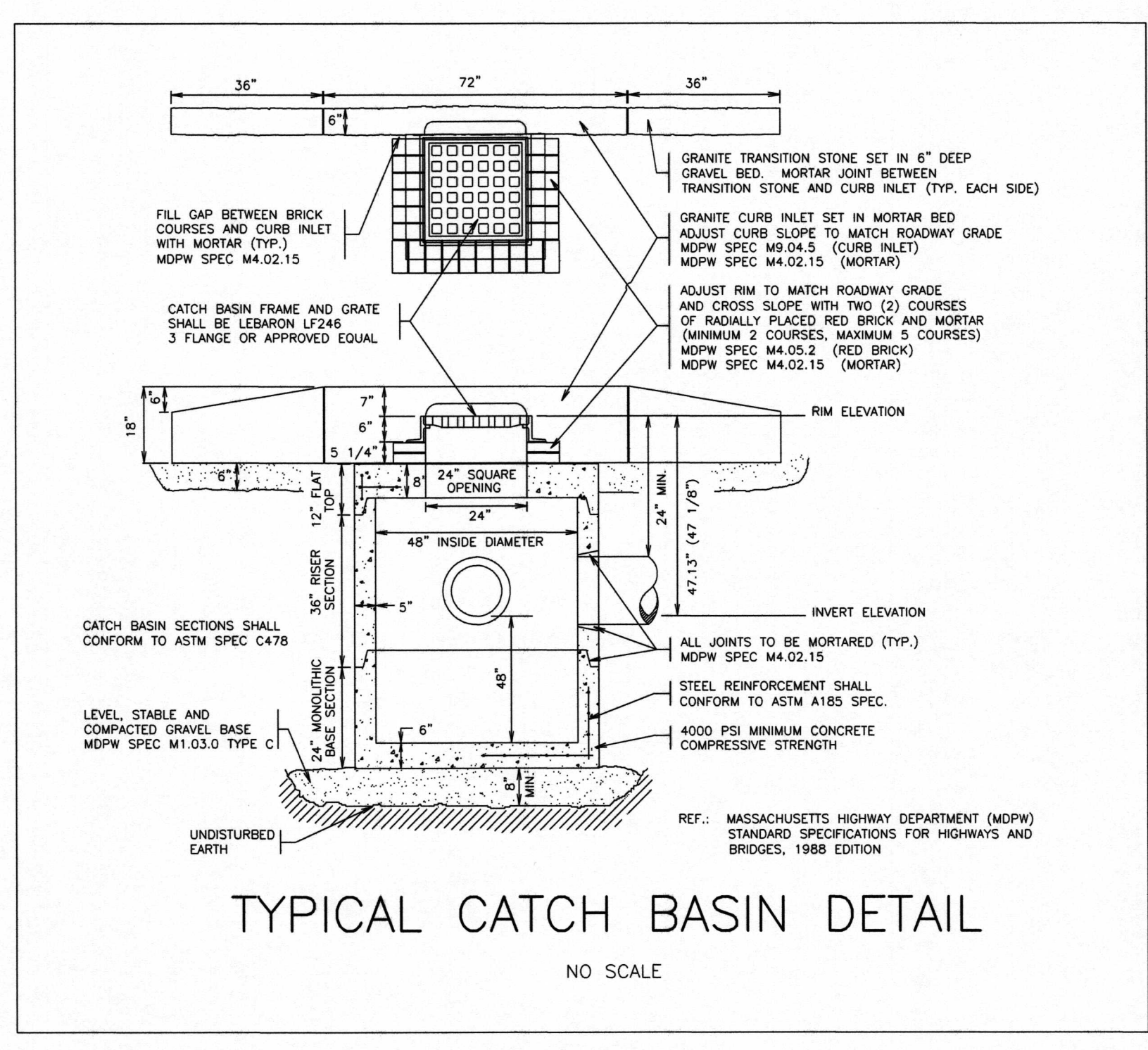
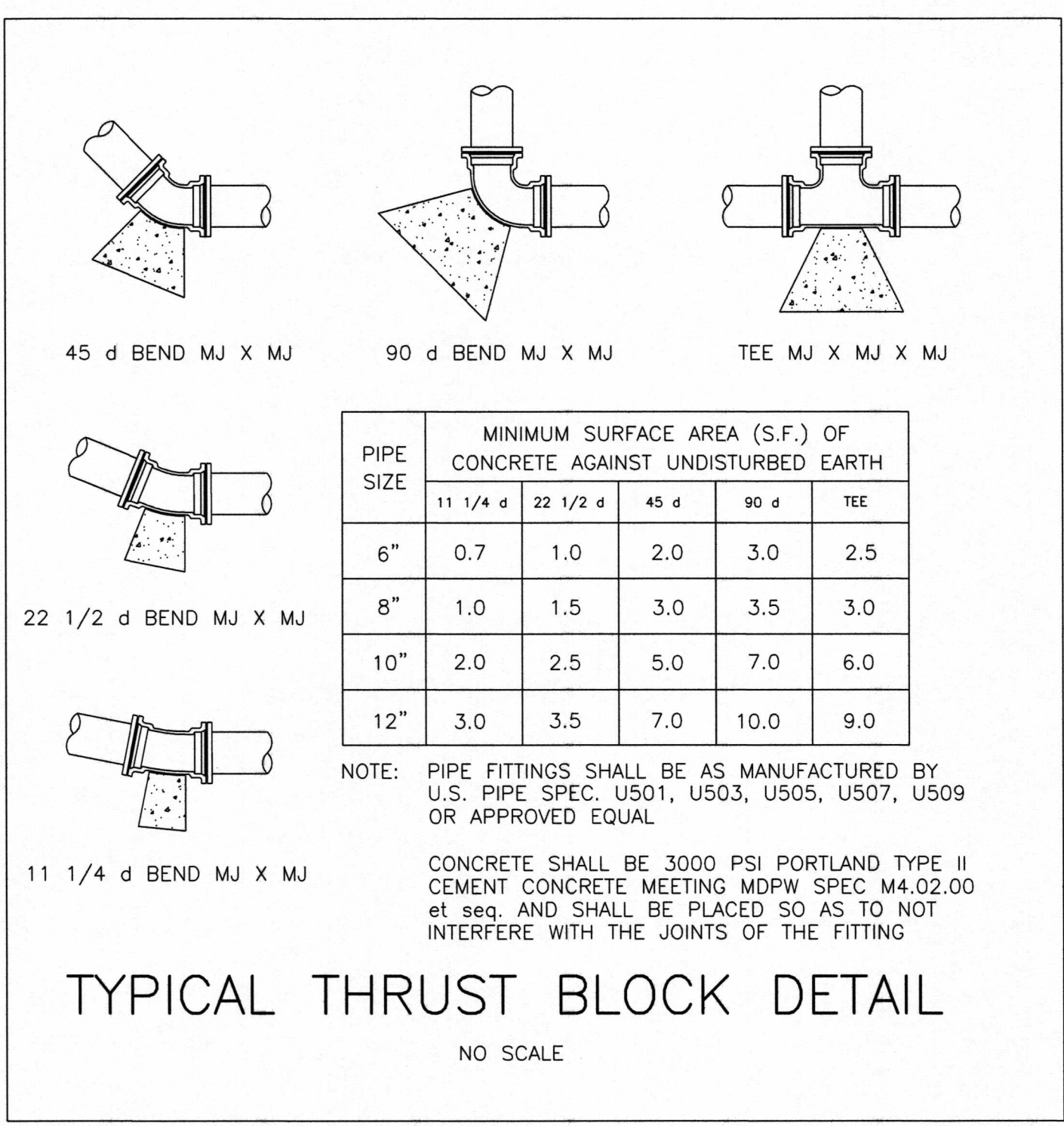
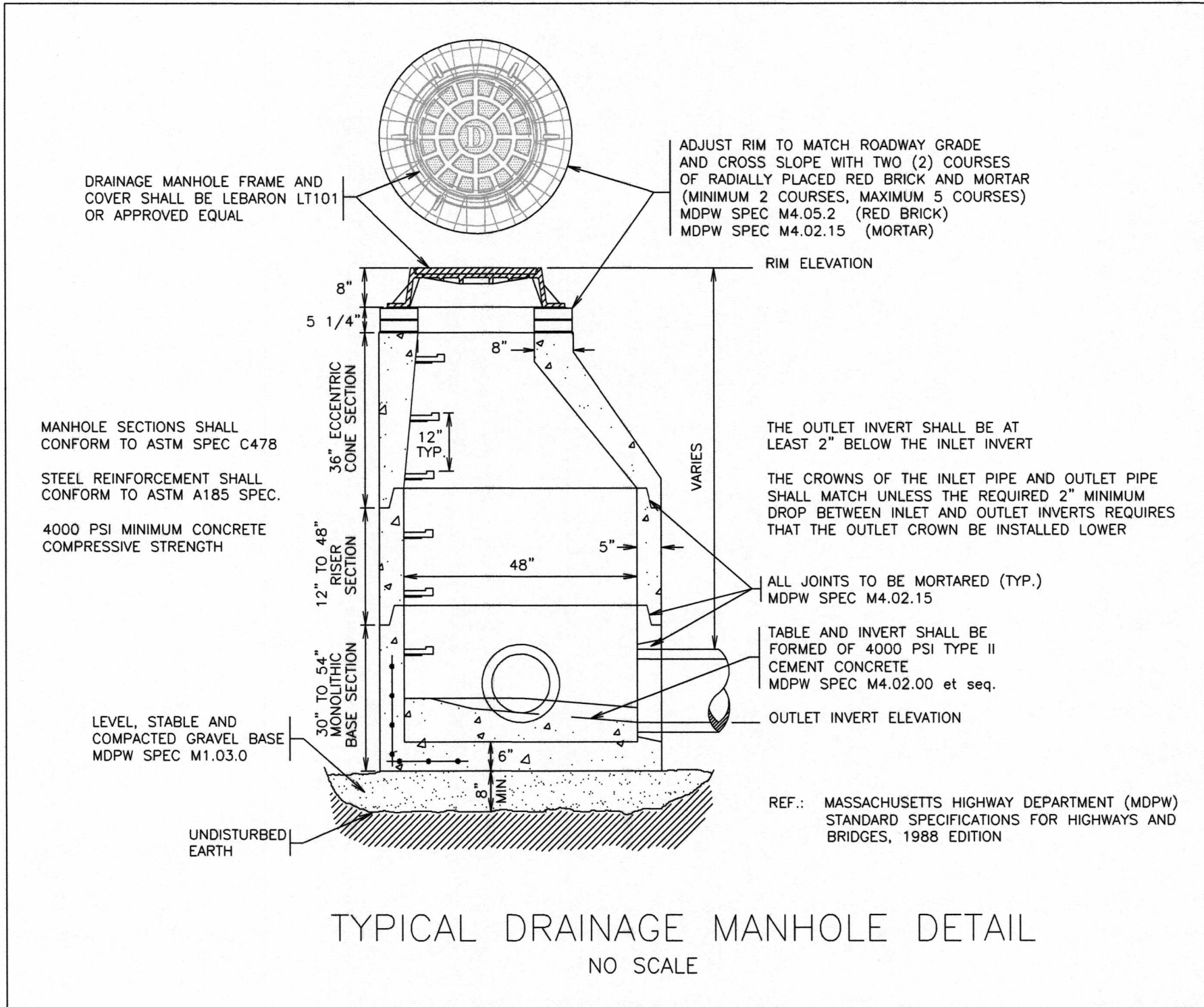
Brian Connaughton

Owner/Applicant:
Brian Connaughton
920 South Street
Needham, Ma. 02492
Cert. #207299

REVISIONS	
DATE	DESCRIPTION



~Plan, Profile & Detail Sheet~	
920 South Street	
Needham, Massachusetts	
Scale: As Noted	September 9, 2022
VERNE T. PORTER Jr, PLS	
Land Surveyors - Civil Engineers	
354 Elliot Street, Newton, Ma. 02464	
Sheet 6 of 8	
Project:22019	Desinged By:
Drawn By:	Checked By:



DIRECTOR OF PUBLIC WORKS	
DATE APPROVED	
TOWN ENGINEER	
DATE APPROVED	
I, TOWN CLERK OF THE TOWN OF NEEDHAM, HEREBY CERTIFY THAT THE NOTICE OF THE PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE TWENTY DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SAID NOTICE	
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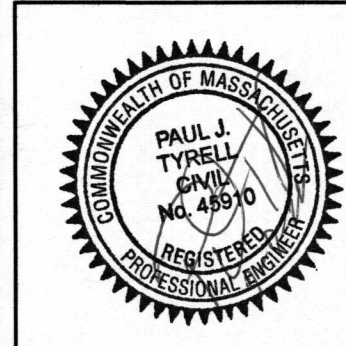
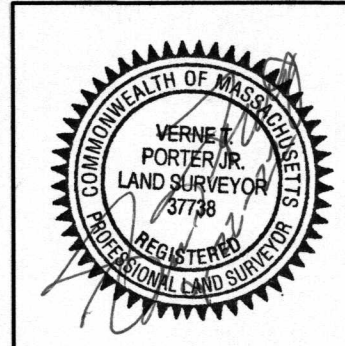
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David D. Kelly 9-28-22

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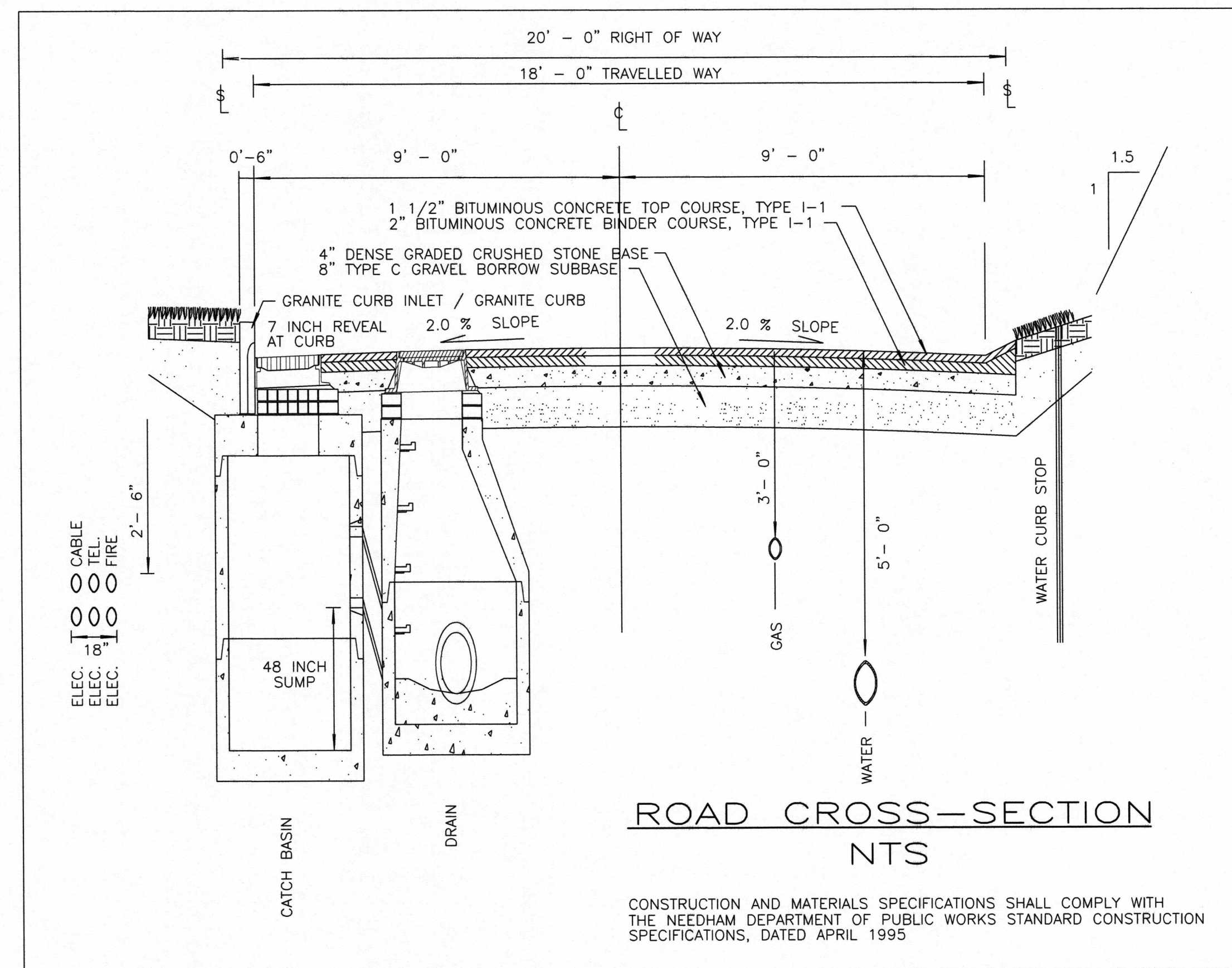
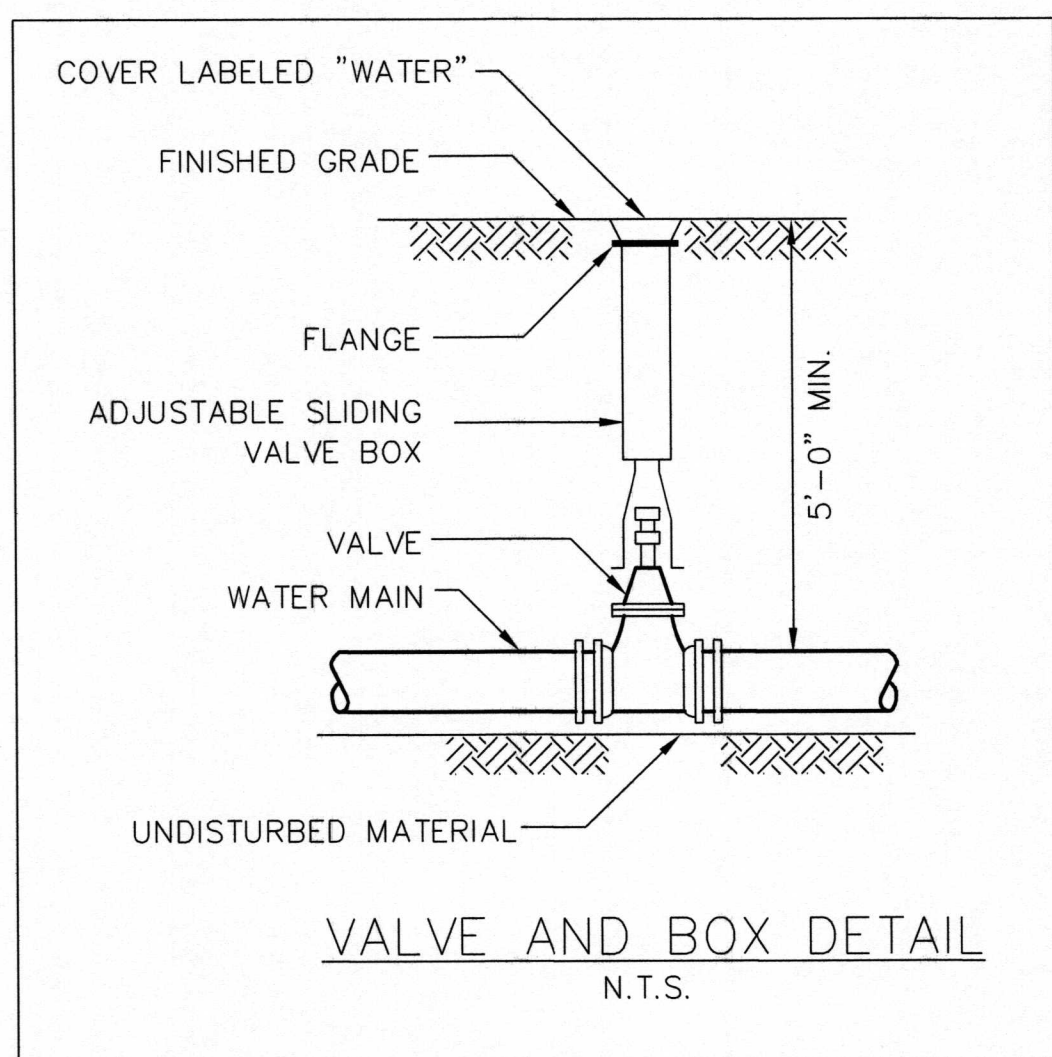
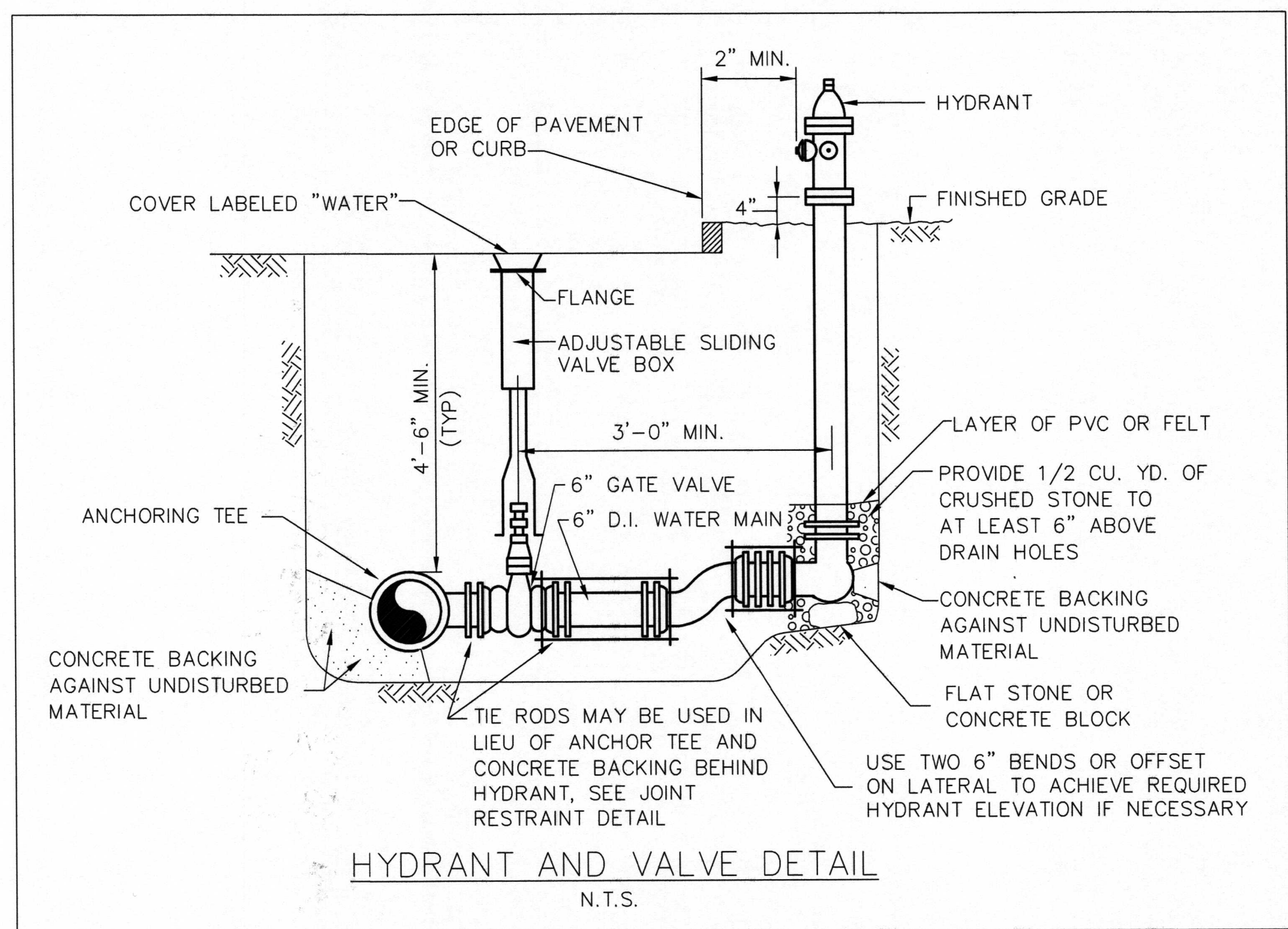
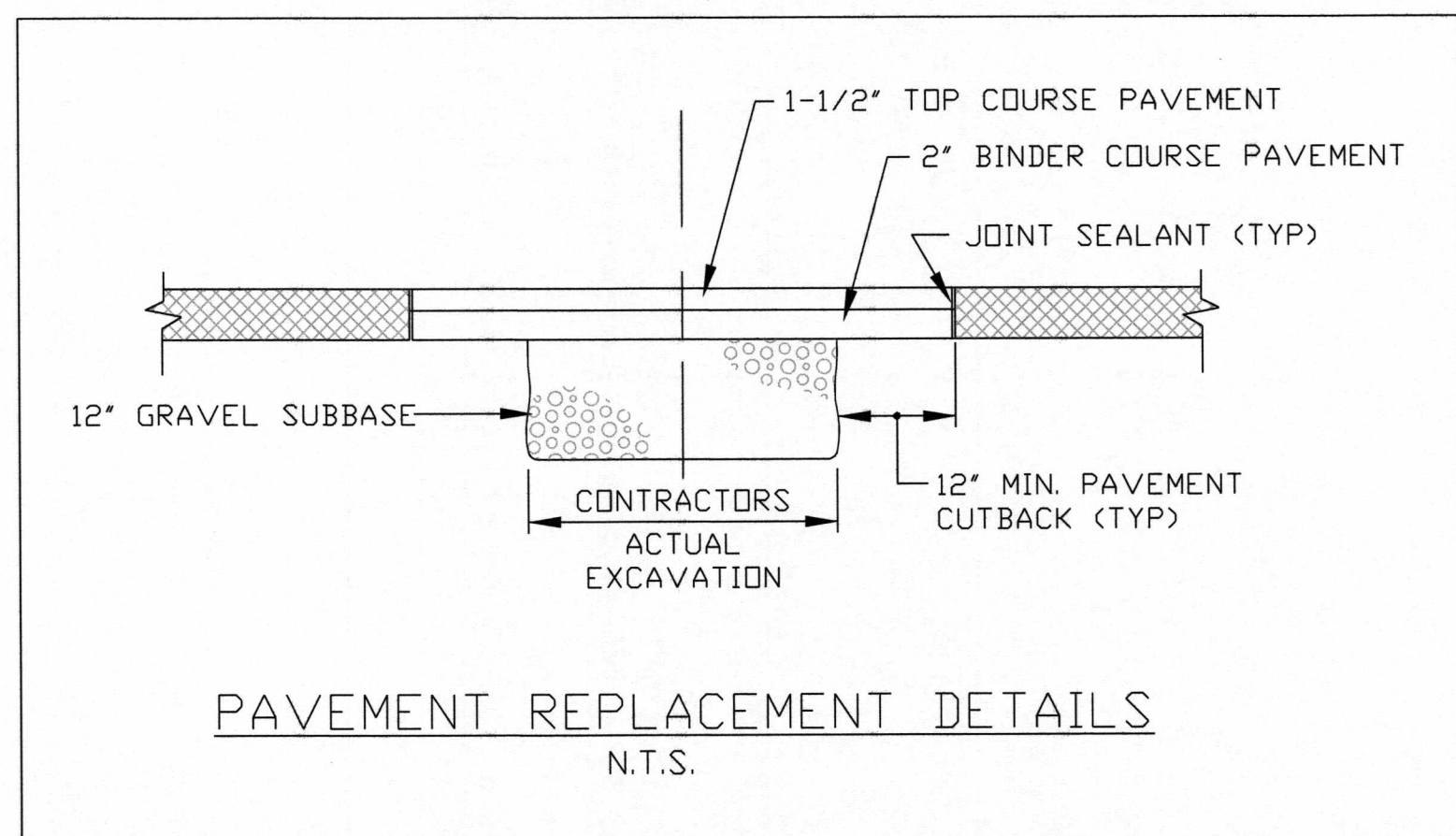
David D. Kelly 9-28-22

Owner/Applicant:
Brian Connaughton
920 South Street
Needham, Ma. 02492
Cert. #207299



~Detail Sheet~	
920 South Street	
Needham, Massachusetts	
Scale: As Noted	September 9, 2022
VERNE T. PORTER Jr, PLS	
Land Surveyors - Civil Engineers	
354 Elliot Street, Newton, Ma. 02464	
Project:22019	Desinged By:
Drawn By:	Checked By:
Sheet 7 of 8	

Dig Safe
Excavators
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DATE APPROVED	
TOWN ENGINEER	
DATE APPROVED	
I, TOWN CLERK OF THE TOWN OF NEEDHAM, HEREBY CERTIFY THAT THE NOTICE OF THE PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE TWENTY DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SAID NOTICE	
DATE	TOWN CLERK

APPROVAL IN ACCORDANCE WITH SECTION 91-U OF CHAPTER 41 OF THE GENERAL LAWS AS AMENDED	
TOWN OF NEEDHAM PLANNING BOARD	
BY:	
APPROVED:	

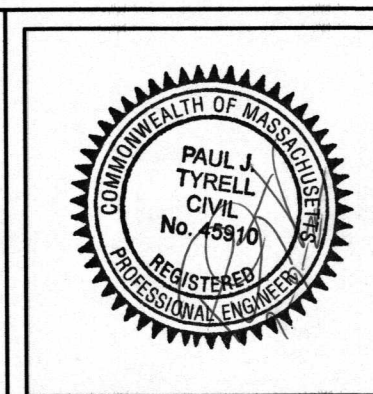
I CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS PLAN IS TRUE AND CORRECT TO THE ACCURACY REQUIRED BY THE SUBDIVISION REGULATIONS AND PROCEDURAL RULES OF THE NEEDHAM PLANNING BOARD.

Ben T. Porter Jr.

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

Ben T. Porter Jr. 9-24-22

REVISIONS	
DATE	DESCRIPTION



~Detail Sheet~	
920 South Street	
Needham, Massachusetts	
Scale: As Noted	September 9, 2022
VERNE T. PORTER Jr, PLS	
Land Surveyors - Civil Engineers	
354 Elliot Street, Newton, Ma. 02464	
Project: 22019	
Designed By:	
Drawn By:	
Checked By:	

0 1 2 3 4 5 6 7 8 9 10

Sheet 8 of 8

DRAINAGE SUMMARY

**PROPOSED TWO-LOT
RESIDENTIAL SUBDIVISION
920 SOUTH STREET
NEEDHAM, MASSACHUSETTS**



September 28, 2022

**VERNE T. PORTER JR., PLS
LAND SURVEYORS – CIVIL ENGINEERS
354 ELLIOT STREET
NEWTON, MA 02464**

DRAINAGE SUMMARY
PROPOSED TWO-LOT
RESIDENTIAL SUBDIVISION
920 SOUTH STREET
NEEDHAM, MASSACHUSETTS

The proposed project consists of the demolition of an existing single-family dwelling, subdivision of the land and the construction of a two-lot subdivision, including two (2) single-family residential dwellings and a new roadway at 920 South St in Needham, MA, under the requirements of the City of Needham Stormwater By-Law.

The on-site soils in the area are shown as “103C – Charlton-Hollis-rock outcrop complex, 8 to 15 percent slopes” soils on the NRCS Soils Survey map of the area, which are areas that fall within the Hydrological Soil Groups B & D. For purposes of our design, we made a conservative assumption and assumed a C soil with an infiltration rate of 0.27 in/hr. in accordance with Table 2.3.3 Rawles Rates as found in the Massachusetts Stormwater Handbook. VTP will perform soil test pits in the area of the proposed infiltration systems to verify assumptions and provide revised drainage calculations if material differs.

Ground cover on the site is an existing single-family dwelling, bituminous concrete driveway and a shed. The majority of the site is wooded. The existing drainage on the site flows overland from a high point in the middle of the property towards South St and portions flowings towards the rear of the property. Overall, the site will maintain the current flow pattern, however new collection systems for the proposed roadway have been provided to collect the runoff and attenuate offsite flows.

There are bordering vegetated wetland Resource Areas within 100-feet of the lot, to both the east and south of the parcel. The proposed drainage controls are designed to capture & contain the runoff from the proposed building and proposed site improvements. This system will store the runoff from the roadway and allow the stored water to slowly infiltrate after the storm event and overflow offsite.

Under the proposed conditions, with the new buildings and new roadway, the rate of site runoff from the re-developed lot area will be greater than the existing conditions for the 2, 10, 25 & 100-year storm events. The proposed controls have been designed to store this increase to maintain the pre and post runoff rates.

COMPLIANCE WITH STORMWATER STANDARDS

Untreated Stormwater (Standard 1)

The project is designed so that new stormwater conveyances (outfalls/discharges) do not discharge untreated stormwater into, or cause erosion to, existing wetlands.

Post-Development Peak Rates (Standard 2)

A hydrologic study was performed to determine the rate of runoff for the 2, 10, 25 and 100-year storm events under pre-development (existing) conditions. Unmitigated post-development rates were then computed in a similar manner. The study point where the peak rates were compared were taken at two (2) locations at the existing offsite flow areas. From these analyses, it was determined that the proposed project and its stormwater management system would not increase the peak runoff rates above existing levels. It is the intent of the stormwater management system to minimize impacts to drainage patterns, and downstream property prior to its release from the site or discharge to wetlands.

The *United States Department of Agriculture (U.S.D.A)*. Soil Conservation Service (SCS) Technical Release 55 (TR-55), 1986, was used as the procedure for estimating runoff. A SCS TR-20-based computer program was used for estimating peak discharges. TR-55 is a generally accepted model for use on small sites that begin with a rainfall amount uniformly imposed on the watershed over a specified time distribution. Mass rainfall is converted to mass runoff by using a runoff curve number (CN). CN is based on soils, plant cover, impervious areas, interception, and surface storage. Runoff is then transformed into a hydrograph that depends on runoff travel time through segments of the watershed.

Development in a watershed changes the watershed's response to precipitation. The most common effects are reduced infiltration and decreased travel time, which can result in significantly higher peak rates of runoff. The volume of runoff is determined primarily by the amount of precipitation and by infiltration characteristics related to soil type, antecedent rainfall, type of vegetal cover, impervious surfaces, and surface retention. Travel time is determined primarily by slope, flow length, depth of flow, and roughness of flow surfaces. Peak rates of discharge are based on the relationship of the above parameters, as well as the total drainage area of the watershed, the location of the development in relation to the total drainage area, and the effect of any flood control works or other manmade storage. Peak rates of discharge are also influenced by the distribution of rainfall within a given storm event.

Stormwater management computations for the full-build were performed using a SCS-based *HYDROCAD* for existing and proposed conditions, curve numbers, time of concentrations and unit hydrograph computations.

Existing Conditions

Table 1. Shows the curve numbers, areas and times of concentration used to develop the pre-development hydrologic model of the site.

Table 1. – Existing Conditions					
Sub-Areas	Surface Cover	Curve Number (CN)	Area (SF)	Tc (Mins.)	Remarks
Area #1				6.0	
	Exist Bldgs.	98	3,365		Incls. Shed
	Exist. Imp.	98	14,690		Incls. Walks & patios
	Lawn/Woods	76	42,006		
Area #2					
	Lawn/Woods	76	64,724		
		Total Area	124,785		
*CN based on Class C soils.					

Proposed Conditions

The proposed conditions will result in a new collection system that will collect the site run-off from the proposed roadway and proposed dwellings and direct it to underground leaching systems prior to overflowing off-site. For purposes of this report, we have assumed

Table 2. Shows the curve numbers, areas and times of concentration used to develop the post-development hydrologic model of the site.

Table 2. – Proposed Conditions					
Sub-Areas	Surface Cover	Curve Number (CN)	Area (SF)	Tc (Mins.)	Remarks
Area #1				6.0	
	1-Acre Lot	79	43,609		20% Impervious
Area #2				6.0	
	2-Acre Lot	77	61,320		12% Impervious
Area #3				6.0	
	Bit. Conc. Road	98	5,728		
	Lawn Area	77	6,076		Road shoulder
Area #4				6.0	
	Bit. Conc. Road	98	3,052		
	Lawn Area	77	5,000		Road shoulder
		Total Area	124,785		
*CN based on Class C soils.					

Peak Rate Summary

Table 3. Shows the peak runoff for the existing, as well as for the developed site at 100-year design storms.

Areas	Design Storm	Existing Runoff* (CFS)	Existing Volume* (Ac-Ft)	Proposed Runoff* (CFS)	Proposed Volume* (Ac-Ft)
Offsite Flow					
South St	2-yr.	2.57	0.187	1.54	0.113
	10-yr.	4.81	0.350	3.09	0.224
	25-yr.	6.61	0.486	4.37	0.318
	100-yr.	10.31	0.774	7.06	0.555
Wetland					
	2-yr.	1.93	0.144	1.93	0.143
	10-yr.	4.13	0.299	4.05	0.293
	25-yr.	5.99	0.434	5.83	0.423
	100-yr.	9.95	0.729	9.58	0.754

Recharge to Groundwater (Standard 3)

The change in groundcover for the new development will change by increasing the impervious areas by approximately 6,533 sf. Groundwater infiltration will be achieved through the individual underground storage areas.

Required Recharge Volume for the entire site was calculated in accordance with the Massachusetts Stormwater Management Standards:

$$R_v = F * \text{impervious area (in acres)}$$

$$R_v = (0.25/12) * 0.564 = 0.012 \text{ Ac-ft.} = 512.25 \text{ CF}$$

R_v = Required Recharge Volume;

F = Target Depth Factor (0.25 in. for soils of Hydrologic Soil Group C);

Impervious area = building, pavement on site in post development condition (0.546 Ac).

The proposed onsite leaching systems will store and infiltrate over 512.25 cf in just the 2-year storm event.

In addition to MA Stormwater Standards for recharge, the Town of Needham has a requirement of 1" of the total proposed impervious area to be recharged.

The total SF of the impervious area in the proposed development is 24,588 sf (based on Lot 1 and Lot 2 percentages). This results in 2,049 cf of runoff. The proposed infiltration systems provide 3,746.16 cf of available storage.

Removal of TSS (Standard 4)

To handle the TSS removal of the proposed roadway, a 4' deep sump has been provided in the proposed catchbasins..

Land Uses with Higher Potential Pollutant Loads (Standard 5)

The use proposed does not differ from the current use of the space and has no higher potential for pollution.

Critical Areas (Standard 6 – Water Quality Treatments)

This site does not lie within a critical area. One-half inch (1/2") of runoff is the standard for treatment relative to water quality, but as stated prior, the proposed use will not create pollutants in excess of what exists today, and per the Town of Needham standards we are storing an infiltration over 1" of run-off.

Redevelopment (Standard 7)

Redevelopment projects are those that involve development, rehabilitation or expansion on previously developed sites provided the redevelopment results in no net increase in impervious area. Furthermore, components of redevelopment project, which include development of previously undeveloped sites, do not fall under Standard 7. In addition, redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable. However, if it is not practicable to meet all the Standards, new (retrofitted or expanded) stormwater management systems must be designed to improve existing conditions.

The project, as proposed, is new two-lot residential subdivision building on an existing developed site, with an increase in impervious areas. VTP has considered this project a development and we have met all the applicable standards of the Massachusetts Stormwater Policy.

Erosion and Sedimentation Controls (Standard 8)

Erosion Control measures have been provided on the plans that accompany this application.

Operation and Maintenance Plan (Standard 9)

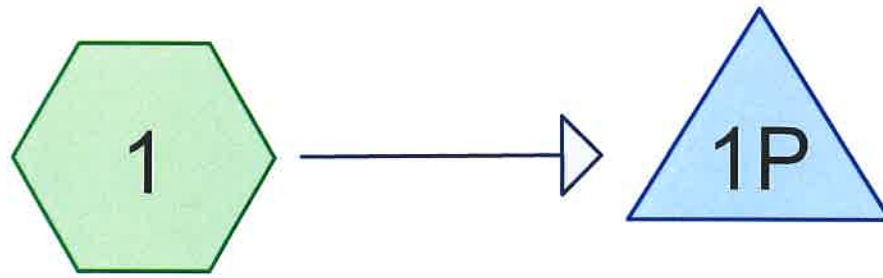
An Operation and Maintenance (O&M) Plan is provided as part of the application.

Prohibition of Illicit Discharges

The Owner and Users of the facility, assures that there will not be illicit discharges to the nearby wetlands from the proposed facility.

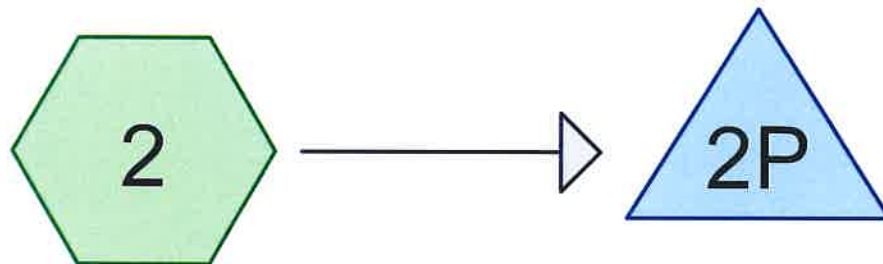
Floodplain (310 CMR 10.57)

The project site does not fall with a floodplain district.



Front of Site

South St



Rear of Site

Wetland



Subcat



Reach



Pond



Link

Routing Diagram for South St - Pre Development

Prepared by HP, Printed 9/28/2022

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South St - Pre Development

Prepared by HP

Printed 9/28/2022

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Page 2**Area Listing (selected nodes)**

Area (acres)	CN	Description (subcatchment-numbers)
0.337	98	Existing Drives and Walks (1)
0.077	98	Existing Dwelling & Shed (1)
2.450	76	Woods/grass comb., Fair, HSG C (1, 2)
2.865	79	TOTAL AREA

South St - Pre Development

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920 South St - Pre Development
Type III 24-hr 2-Year Rainfall=3.22"

Printed 9/28/2022

Page 3

Summary for Subcatchment 1: Front of Site

Runoff = 2.57 cfs @ 12.09 hrs, Volume= 0.187 af, Depth> 1.62"

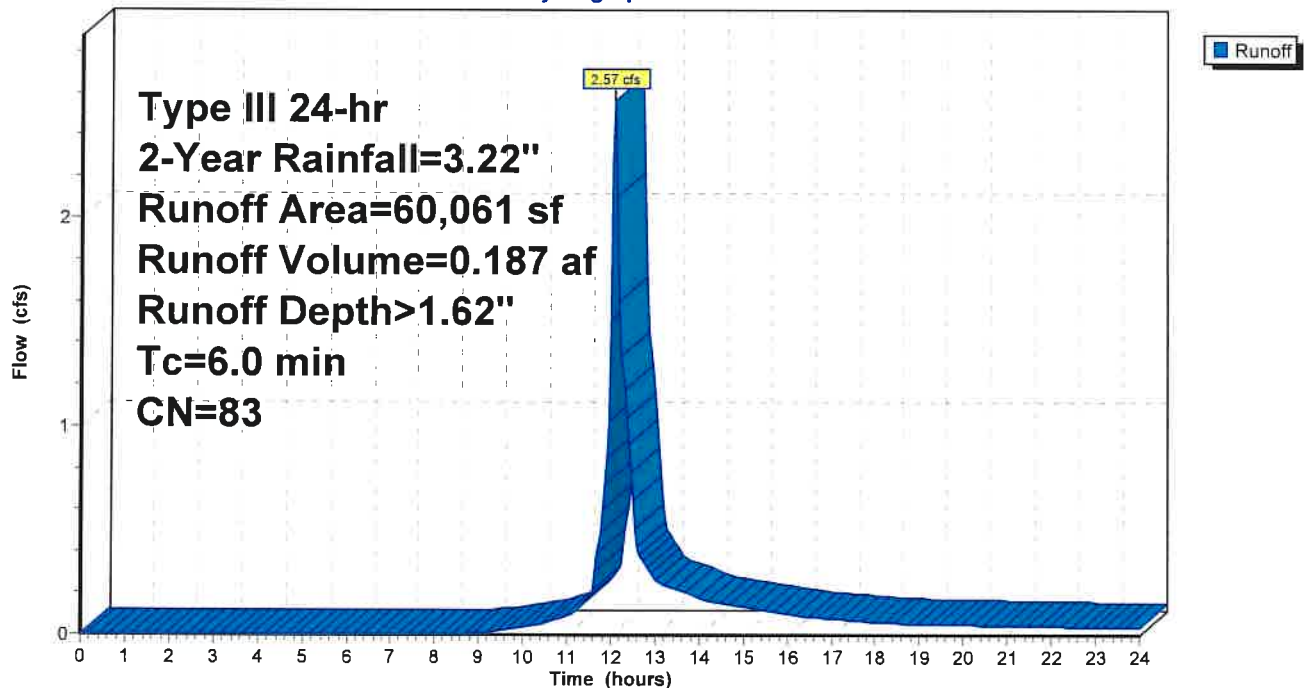
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.22"

	Area (sf)	CN	Description
	42,006	76	Woods/grass comb., Fair, HSG C
*	3,365	98	Existing Dwelling & Shed
*	14,690	98	Existing Drives and Walks
	60,061	83	Weighted Average
	42,006		69.94% Pervious Area
	18,055		30.06% Impervious Area

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

Subcatchment 1: Front of Site

Hydrograph



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920 South St - Pre Development
Type III 24-hr 2-Year Rainfall=3.22"

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Summary for Subcatchment 2: Rear of Site

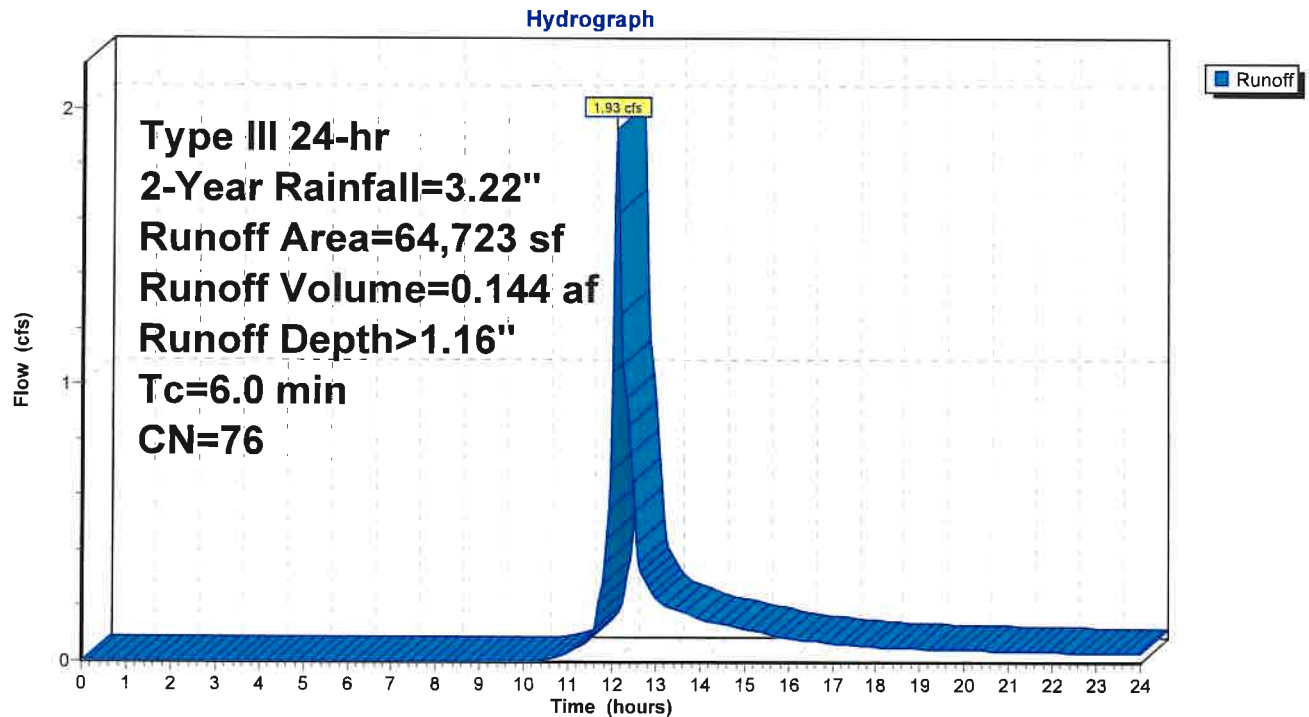
Runoff = 1.93 cfs @ 12.10 hrs, Volume= 0.144 af, Depth> 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.22"

Area (sf)	CN	Description
64,723	76	Woods/grass comb., Fair, HSG C
64,723		100.00% Pervious Area

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

Subcatchment 2: Rear of Site



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920 South St - Pre Development
Type III 24-hr 2-Year Rainfall=3.22"

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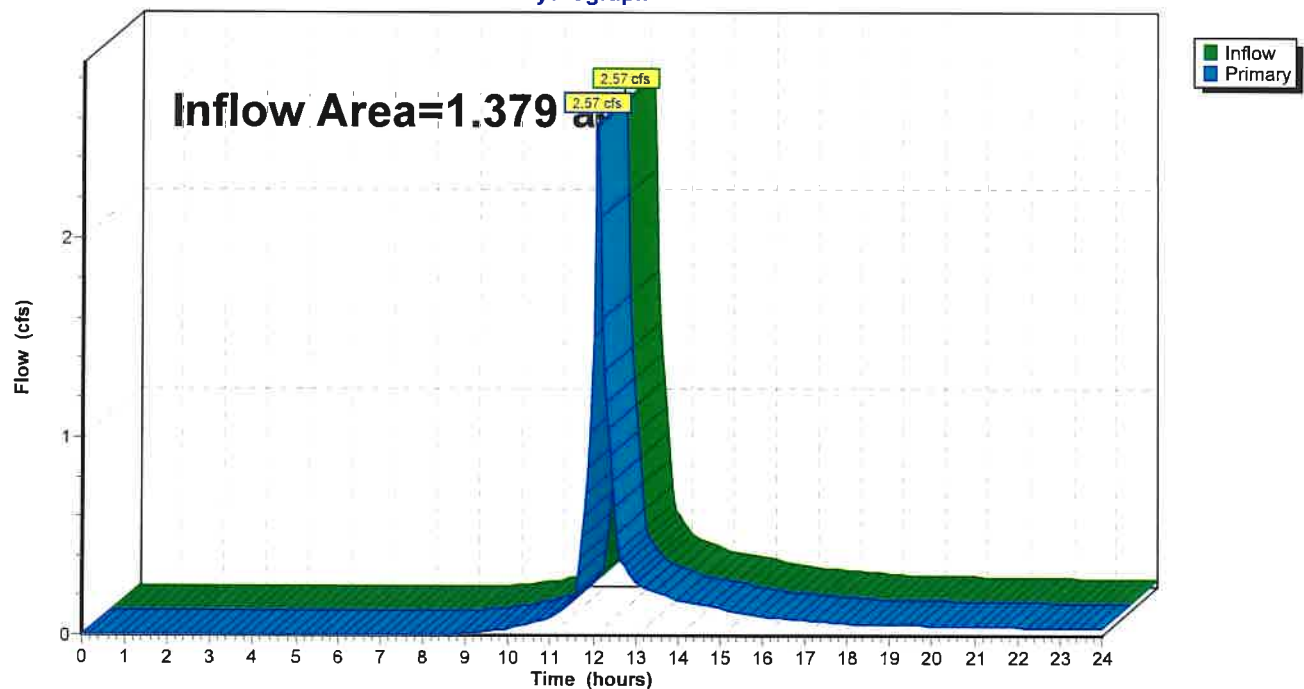
Summary for Pond 1P: South St

Inflow Area = 1.379 ac, 30.06% Impervious, Inflow Depth > 1.62" for 2-Year event
Inflow = 2.57 cfs @ 12.09 hrs, Volume= 0.187 af
Primary = 2.57 cfs @ 12.09 hrs, Volume= 0.187 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: South St

Hydrograph



South St - Pre Development

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920 South St - Pre Development
Type III 24-hr 2-Year Rainfall=3.22"

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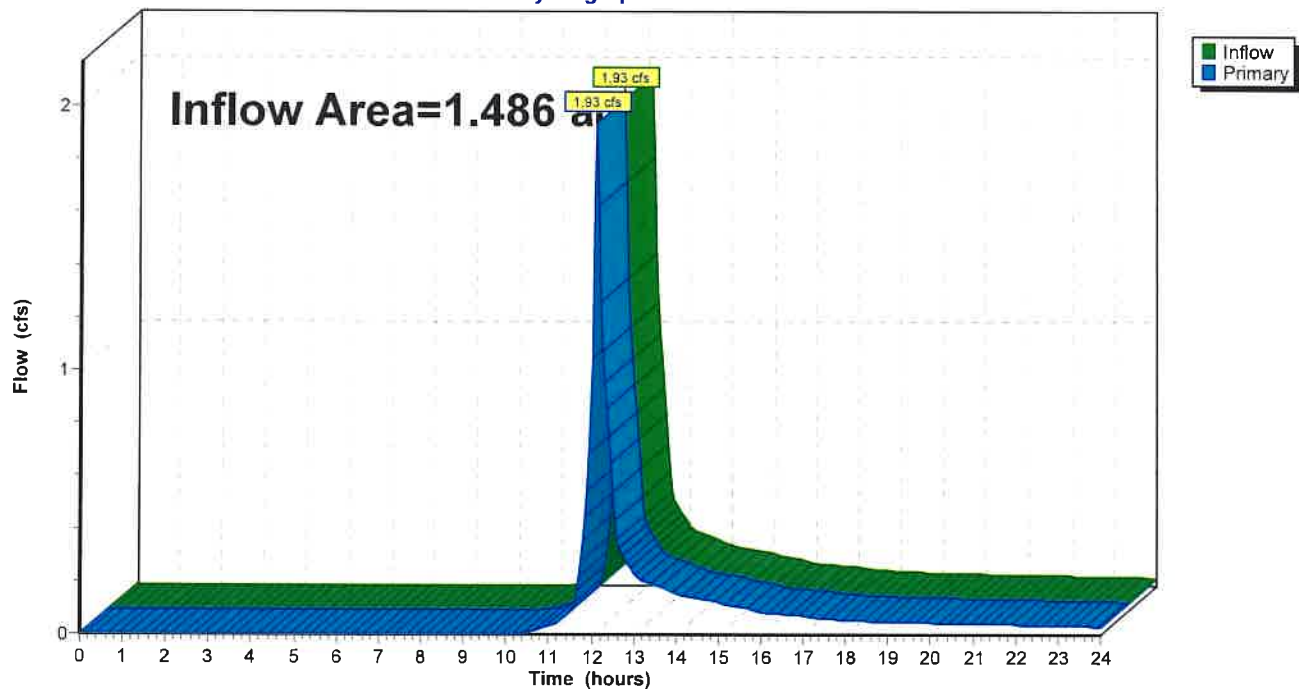
Summary for Pond 2P: Wetland

Inflow Area = 1.486 ac, 0.00% Impervious, Inflow Depth > 1.16" for 2-Year event
Inflow = 1.93 cfs @ 12.10 hrs, Volume= 0.144 af
Primary = 1.93 cfs @ 12.10 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Wetland

Hydrograph



South St - Pre Development

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920 South St - Pre Development
Type III 24-hr 10-Year Rainfall=4.86"

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Summary for Subcatchment 1: Front of Site

Runoff = 4.81 cfs @ 12.09 hrs, Volume= 0.350 af, Depth> 3.05"

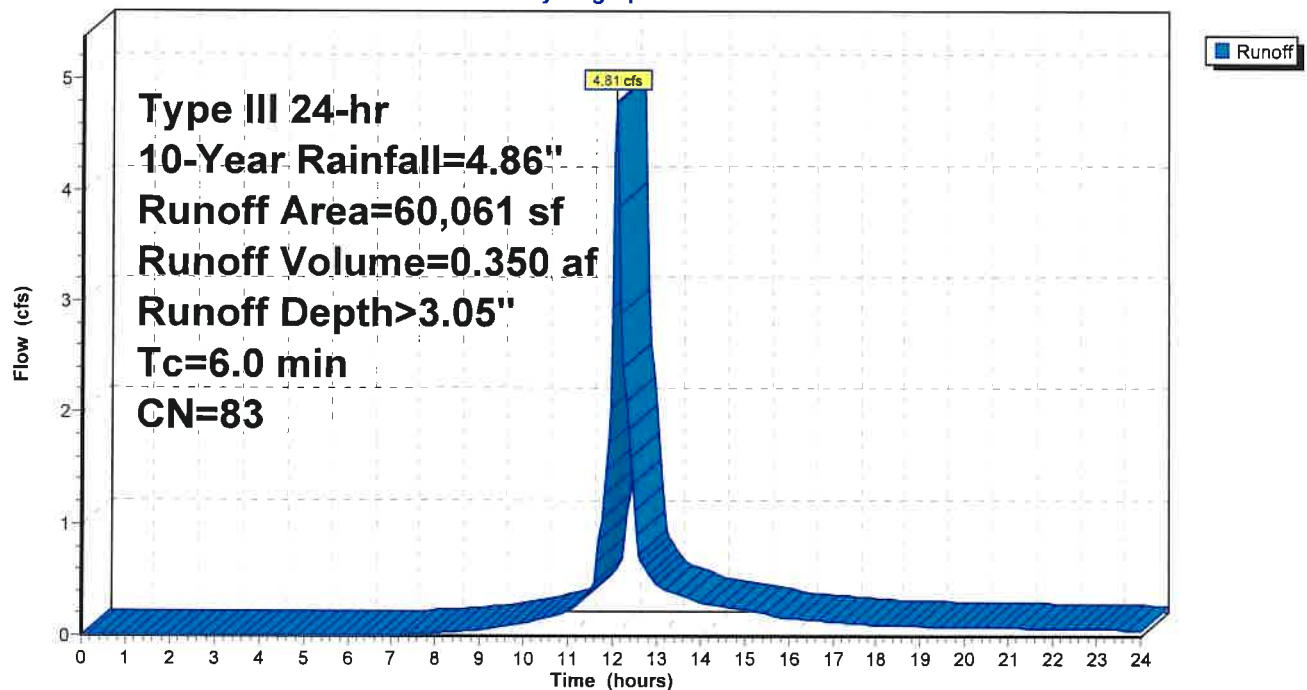
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.86"

	Area (sf)	CN	Description
	42,006	76	Woods/grass comb., Fair, HSG C
*	3,365	98	Existing Dwelling & Shed
*	14,690	98	Existing Drives and Walks
	60,061	83	Weighted Average
	42,006		69.94% Pervious Area
	18,055		30.06% Impervious Area

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

Subcatchment 1: Front of Site

Hydrograph



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920 South St - Pre Development
Type III 24-hr 10-Year Rainfall=4.86"

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Summary for Subcatchment 2: Rear of Site

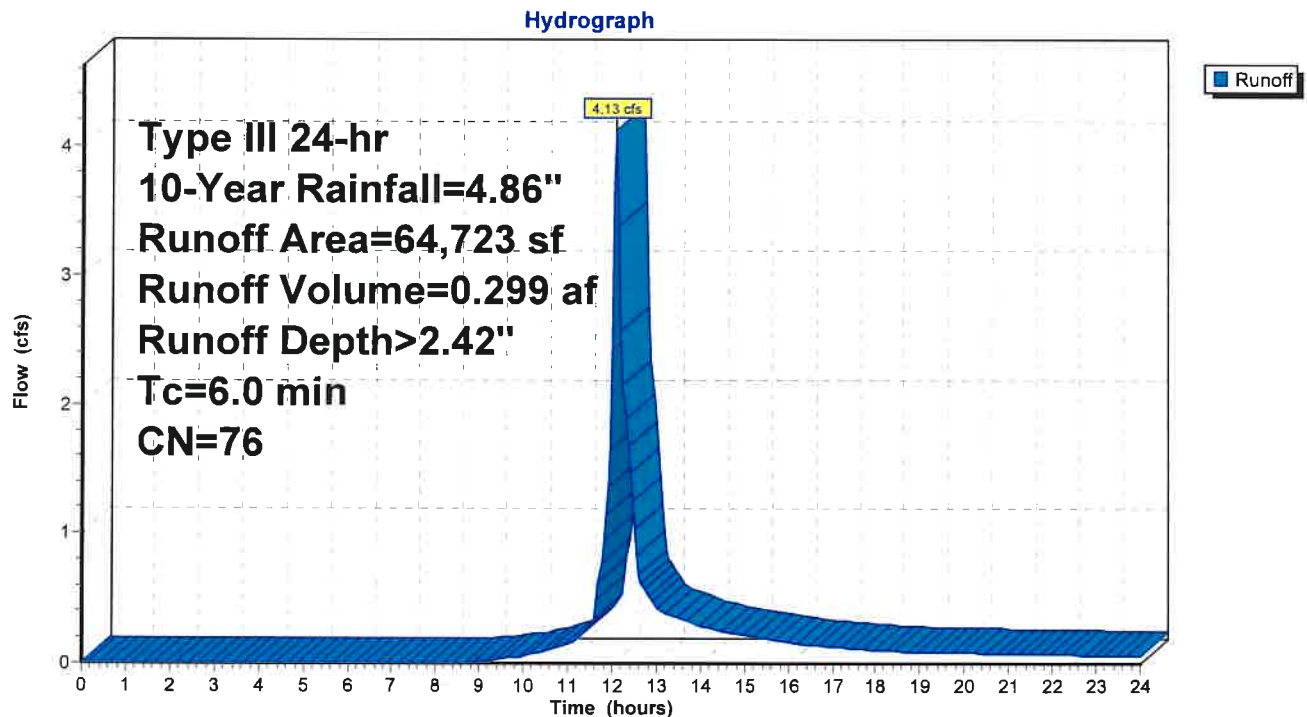
Runoff = 4.13 cfs @ 12.09 hrs, Volume= 0.299 af, Depth> 2.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.86"

Area (sf)	CN	Description
64,723	76	Woods/grass comb., Fair, HSG C
64,723		100.00% Pervious Area

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

Subcatchment 2: Rear of Site



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920 South St - Pre Development
Type III 24-hr 10-Year Rainfall=4.86"

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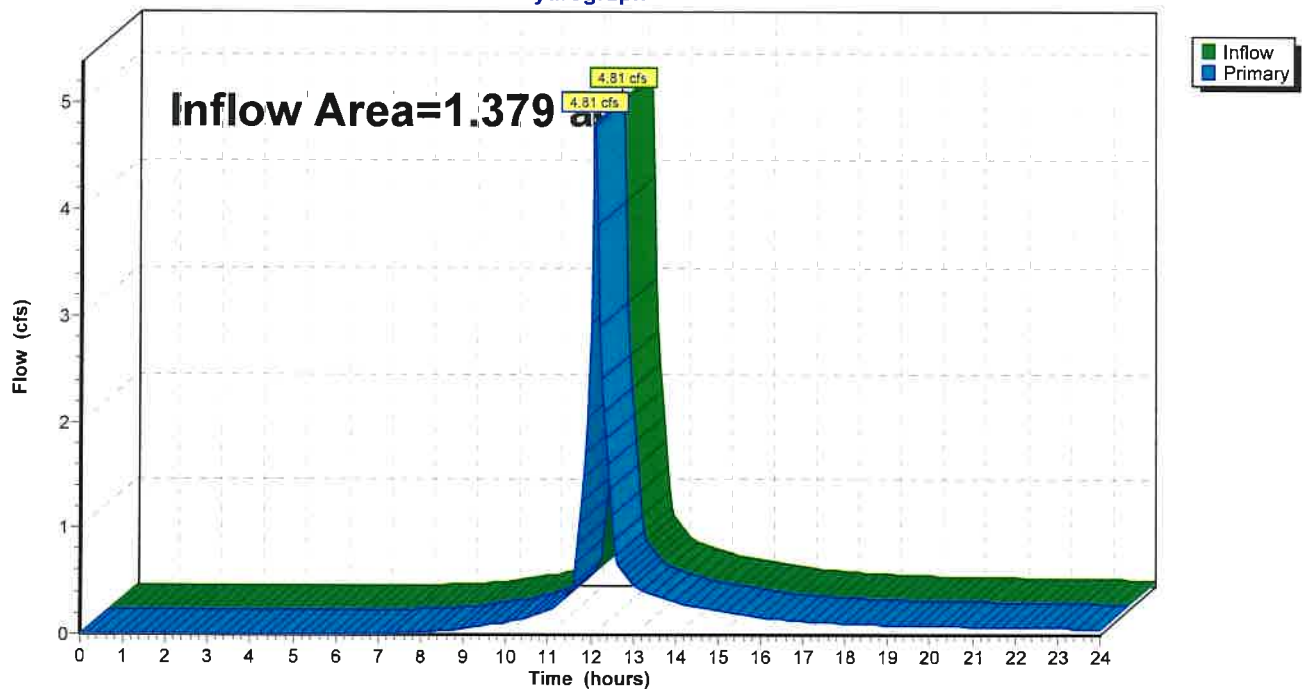
Summary for Pond 1P: South St

Inflow Area = 1.379 ac, 30.06% Impervious, Inflow Depth > 3.05" for 10-Year event
Inflow = 4.81 cfs @ 12.09 hrs, Volume= 0.350 af
Primary = 4.81 cfs @ 12.09 hrs, Volume= 0.350 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: South St

Hydrograph



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920 South St - Pre Development
Type III 24-hr 10-Year Rainfall=4.86"

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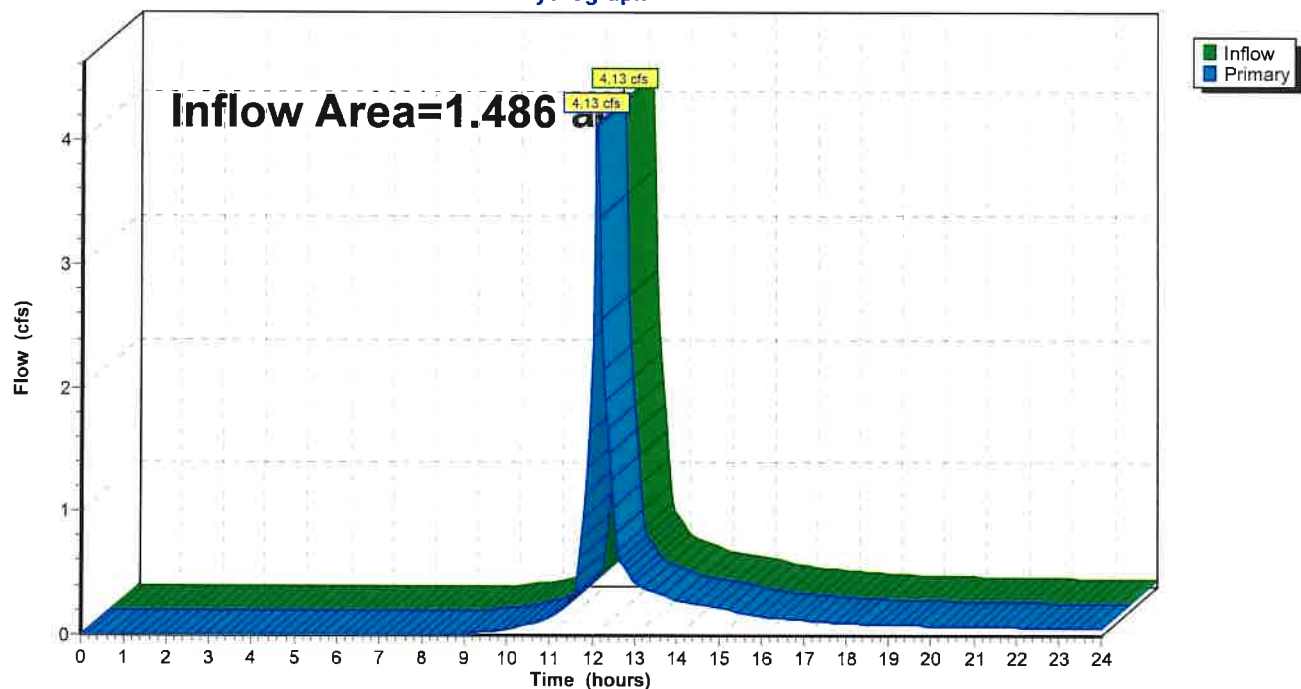
Summary for Pond 2P: Wetland

Inflow Area = 1.486 ac, 0.00% Impervious, Inflow Depth > 2.42" for 10-Year event
Inflow = 4.13 cfs @ 12.09 hrs, Volume= 0.299 af
Primary = 4.13 cfs @ 12.09 hrs, Volume= 0.299 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Wetland

Hydrograph



South St - Pre Development

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920 South St - Pre Development
Type III 24-hr 25-Year Rainfall=6.15"

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Summary for Subcatchment 1: Front of Site

Runoff = 6.61 cfs @ 12.09 hrs, Volume= 0.486 af, Depth> 4.23"

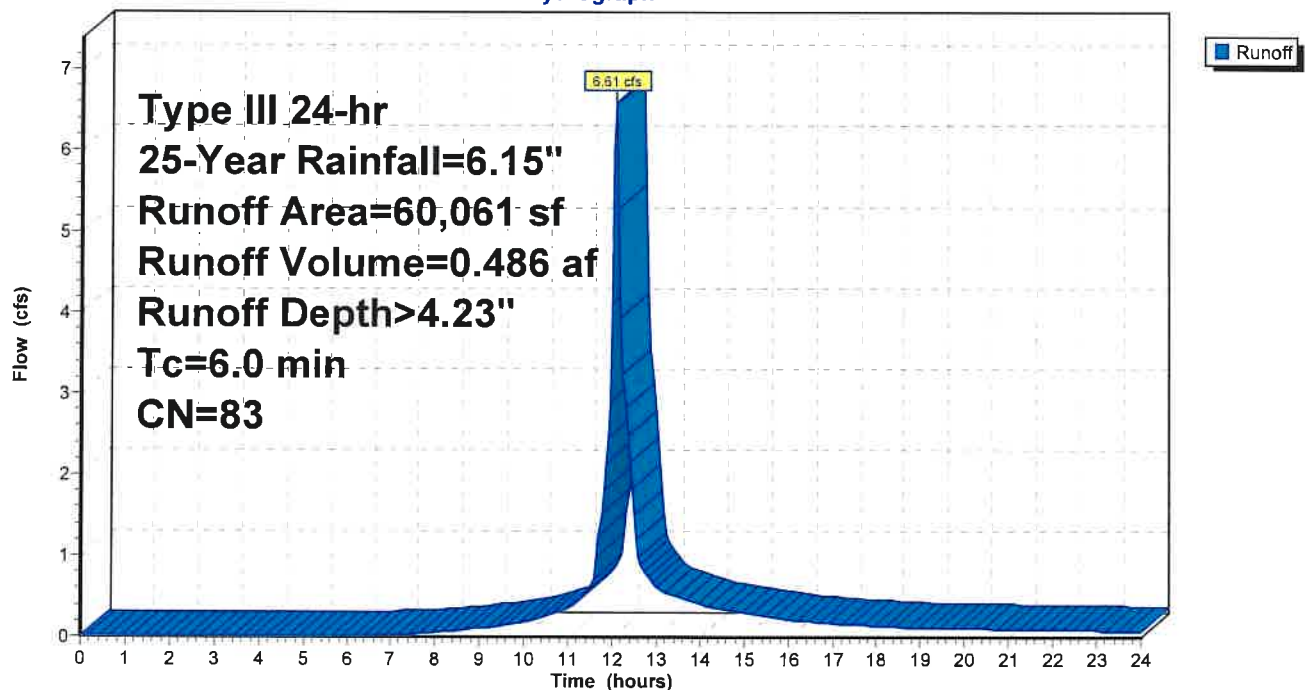
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.15"

	Area (sf)	CN	Description
	42,006	76	Woods/grass comb., Fair, HSG C
*	3,365	98	Existing Dwelling & Shed
*	14,690	98	Existing Drives and Walks
	60,061	83	Weighted Average
	42,006		69.94% Pervious Area
	18,055		30.06% Impervious Area

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

Subcatchment 1: Front of Site

Hydrograph



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920 South St - Pre Development
Type III 24-hr 25-Year Rainfall=6.15"

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Summary for Subcatchment 2: Rear of Site

Runoff = 5.99 cfs @ 12.09 hrs, Volume= 0.434 af, Depth> 3.51"

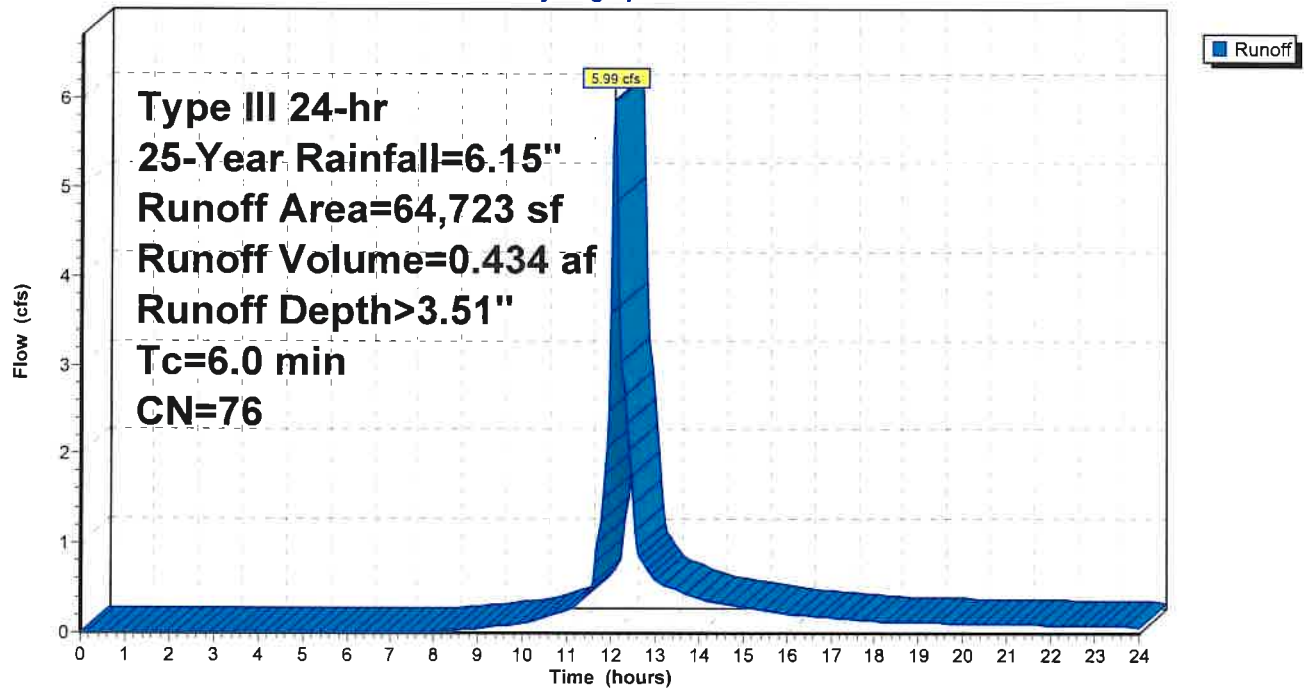
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.15"

Area (sf)	CN	Description
64,723	76	Woods/grass comb., Fair, HSG C
64,723		100.00% Pervious Area

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

Subcatchment 2: Rear of Site

Hydrograph



South St - Pre Development

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920 South St - Pre Development
Type III 24-hr 25-Year Rainfall=6.15"

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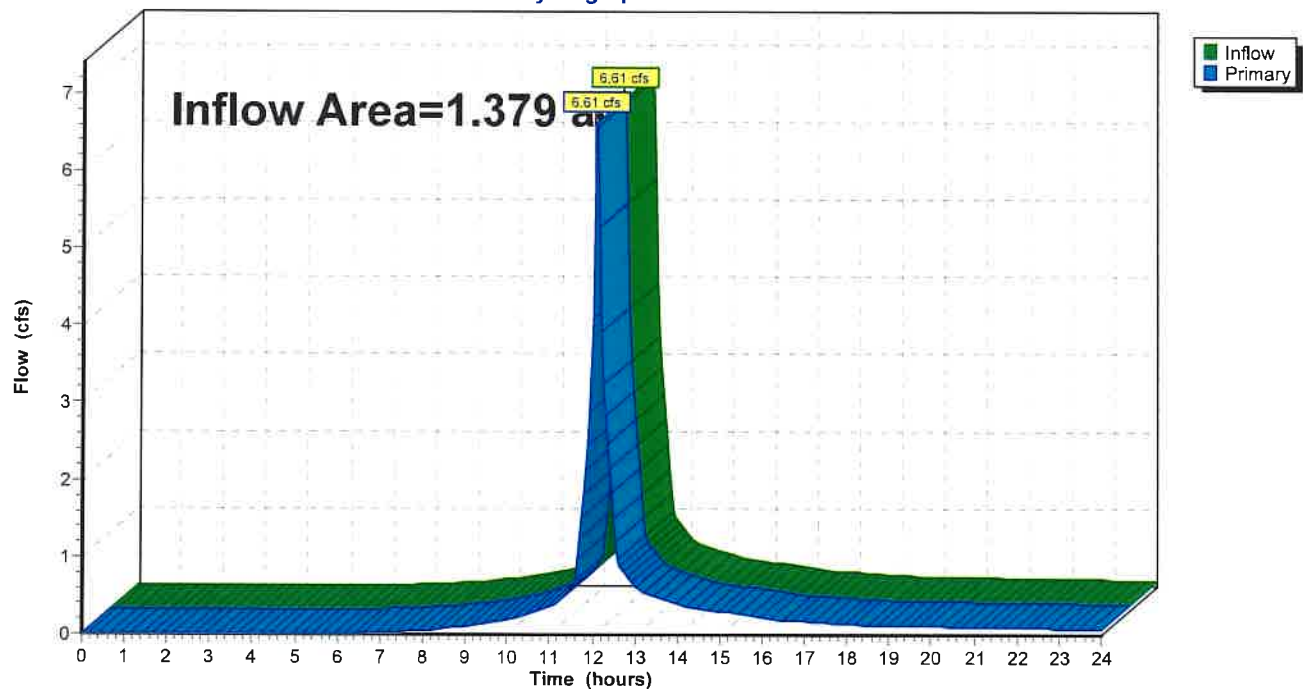
Summary for Pond 1P: South St

Inflow Area = 1.379 ac, 30.06% Impervious, Inflow Depth > 4.23" for 25-Year event
Inflow = 6.61 cfs @ 12.09 hrs, Volume= 0.486 af
Primary = 6.61 cfs @ 12.09 hrs, Volume= 0.486 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: South St

Hydrograph



South St - Pre Development

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920 South St - Pre Development
Type III 24-hr 25-Year Rainfall=6.15"

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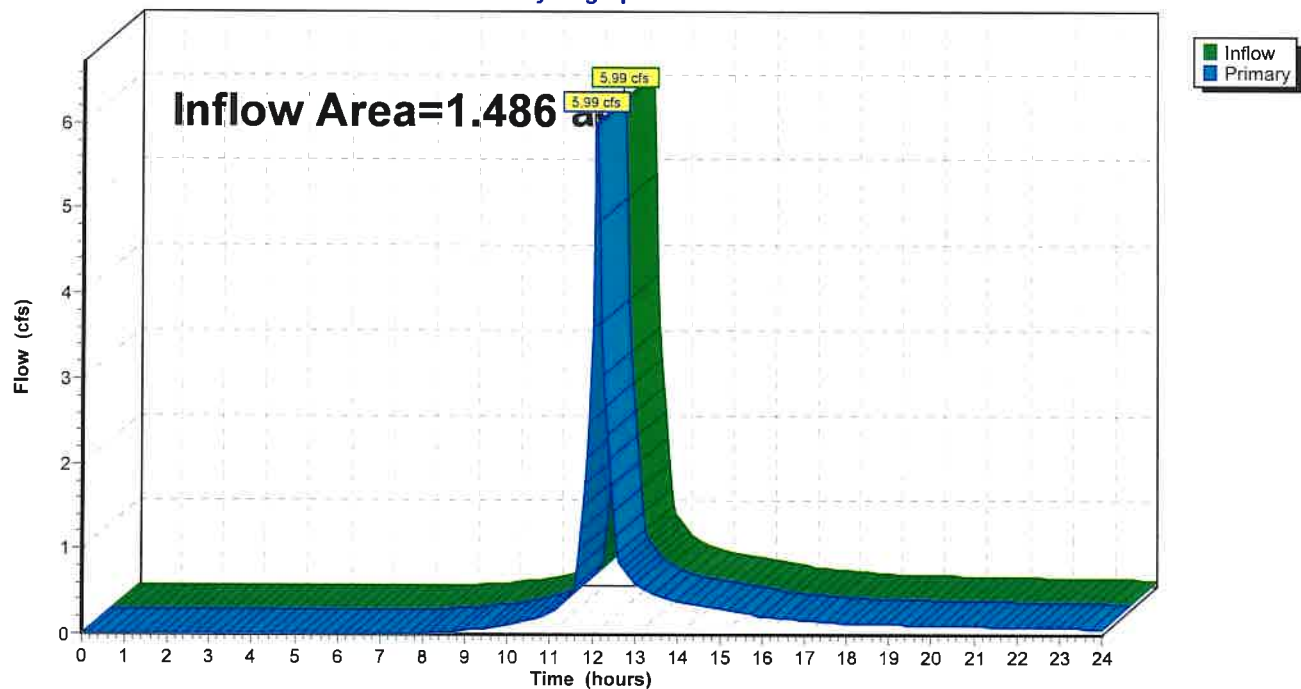
Summary for Pond 2P: Wetland

Inflow Area = 1.486 ac, 0.00% Impervious, Inflow Depth > 3.51" for 25-Year event
Inflow = 5.99 cfs @ 12.09 hrs, Volume= 0.434 af
Primary = 5.99 cfs @ 12.09 hrs, Volume= 0.434 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Wetland

Hydrograph



South St - Pre Development

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920 South St - Pre Development
Type III 24-hr 100-Year Rainfall=8.80"

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Summary for Subcatchment 1: Front of Site

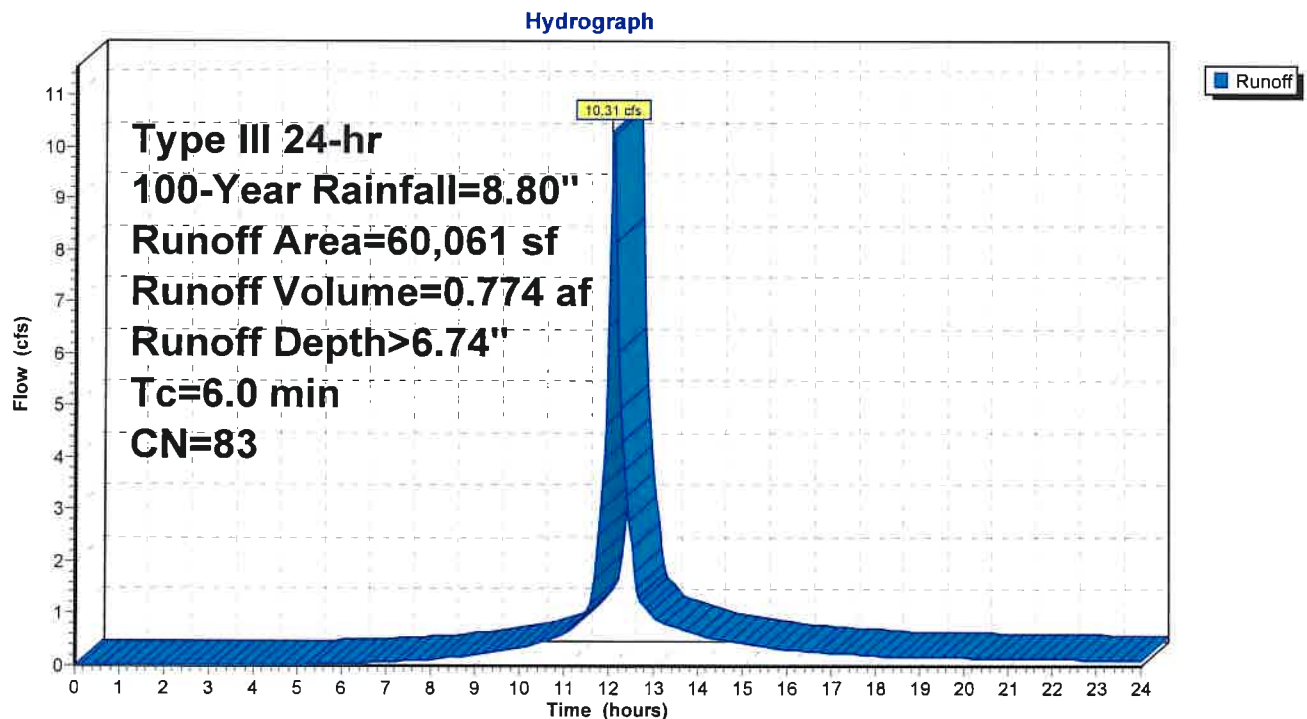
Runoff = 10.31 cfs @ 12.09 hrs, Volume= 0.774 af, Depth> 6.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.80"

	Area (sf)	CN	Description
	42,006	76	Woods/grass comb., Fair, HSG C
*	3,365	98	Existing Dwelling & Shed
*	14,690	98	Existing Drives and Walks
	60,061	83	Weighted Average
	42,006		69.94% Pervious Area
	18,055		30.06% Impervious Area

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

Subcatchment 1: Front of Site



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920 South St - Pre Development
Type III 24-hr 100-Year Rainfall=8.80"

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Summary for Subcatchment 2: Rear of Site

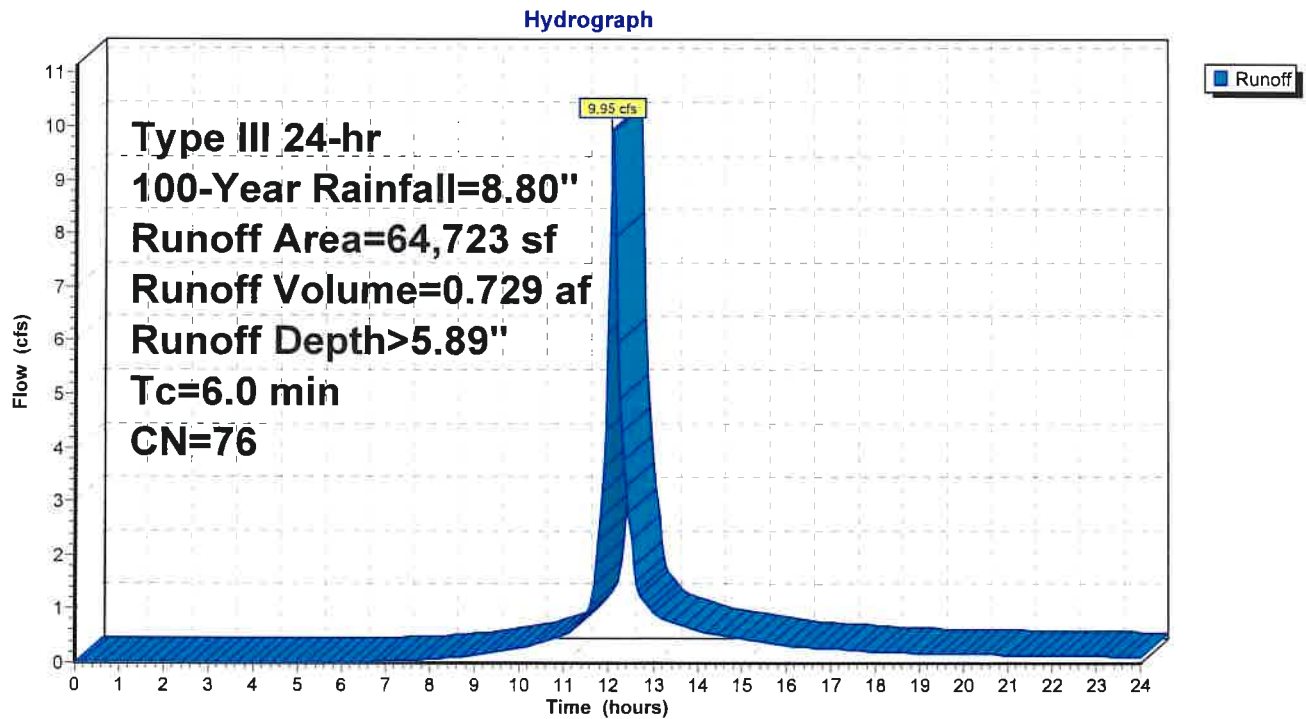
Runoff = 9.95 cfs @ 12.09 hrs, Volume= 0.729 af, Depth> 5.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.80"

Area (sf)	CN	Description
64,723	76	Woods/grass comb., Fair, HSG C
64,723		100.00% Pervious Area

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

Subcatchment 2: Rear of Site



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920 South St - Pre Development
Type III 24-hr 100-Year Rainfall=8.80"

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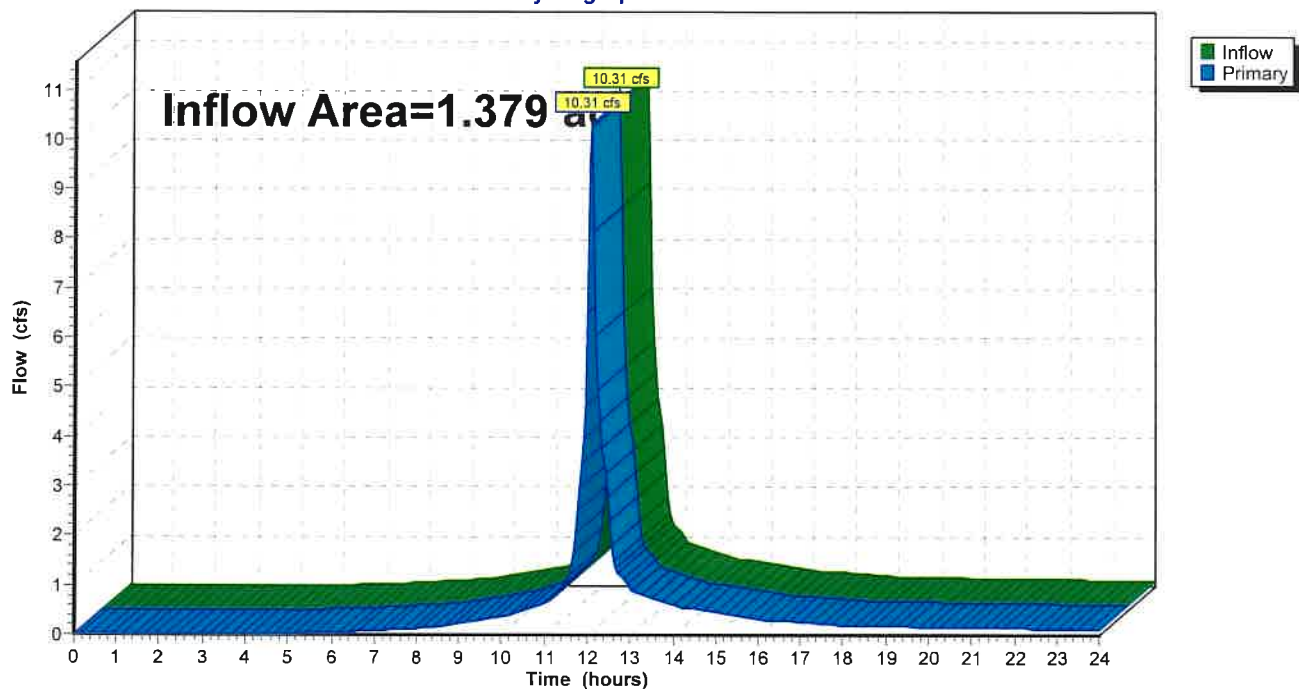
Summary for Pond 1P: South St

Inflow Area = 1.379 ac, 30.06% Impervious, Inflow Depth > 6.74" for 100-Year event
Inflow = 10.31 cfs @ 12.09 hrs, Volume= 0.774 af
Primary = 10.31 cfs @ 12.09 hrs, Volume= 0.774 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: South St

Hydrograph



South St - Pre Development

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920 South St - Pre Development
Type III 24-hr 100-Year Rainfall=8.80"

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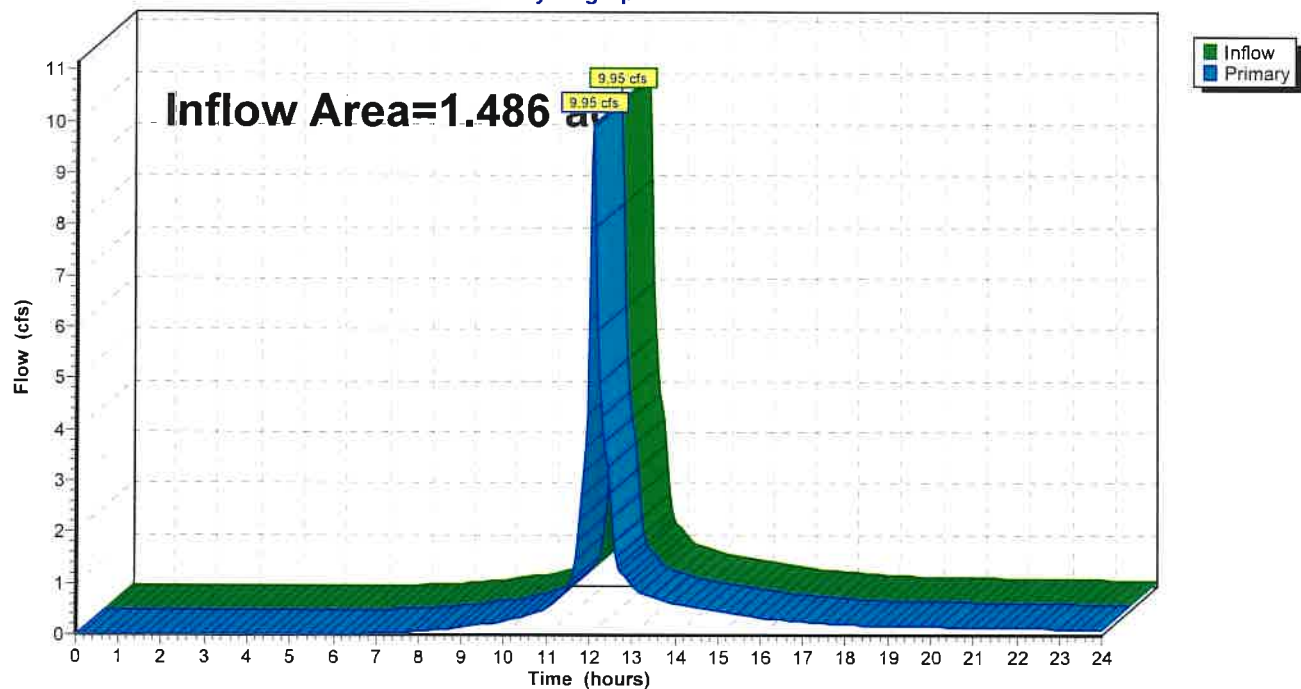
Summary for Pond 2P: Wetland

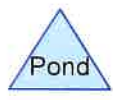
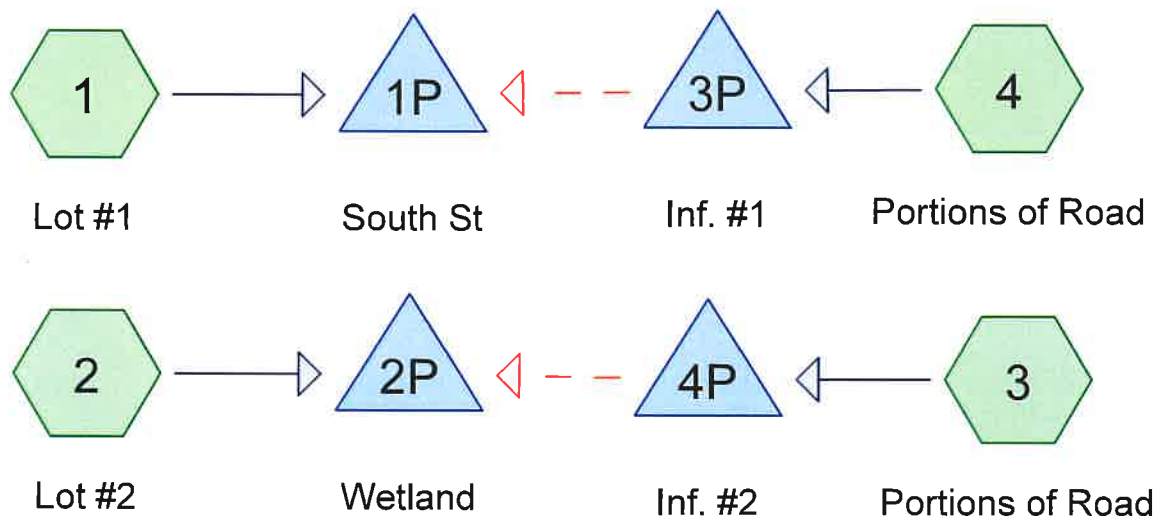
Inflow Area = 1.486 ac, 0.00% Impervious, Inflow Depth > 5.89" for 100-Year event
Inflow = 9.95 cfs @ 12.09 hrs, Volume= 0.729 af
Primary = 9.95 cfs @ 12.09 hrs, Volume= 0.729 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Wetland

Hydrograph





South St - Post Development

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.001	79	1 acre lots, 20% imp, HSG C (1)
1.406	77	2 acre lots, 12% imp, HSG C (2)
0.254	74	>75% Grass cover, Good, HSG C (3, 4)
0.131	98	Portions of Road (3)
0.070	98	Prop. Roadway (4)
2.863	79	TOTAL AREA

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Type III 24-hr 2-Year Rainfall=3.22"

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Summary for Subcatchment 1: Lot #1

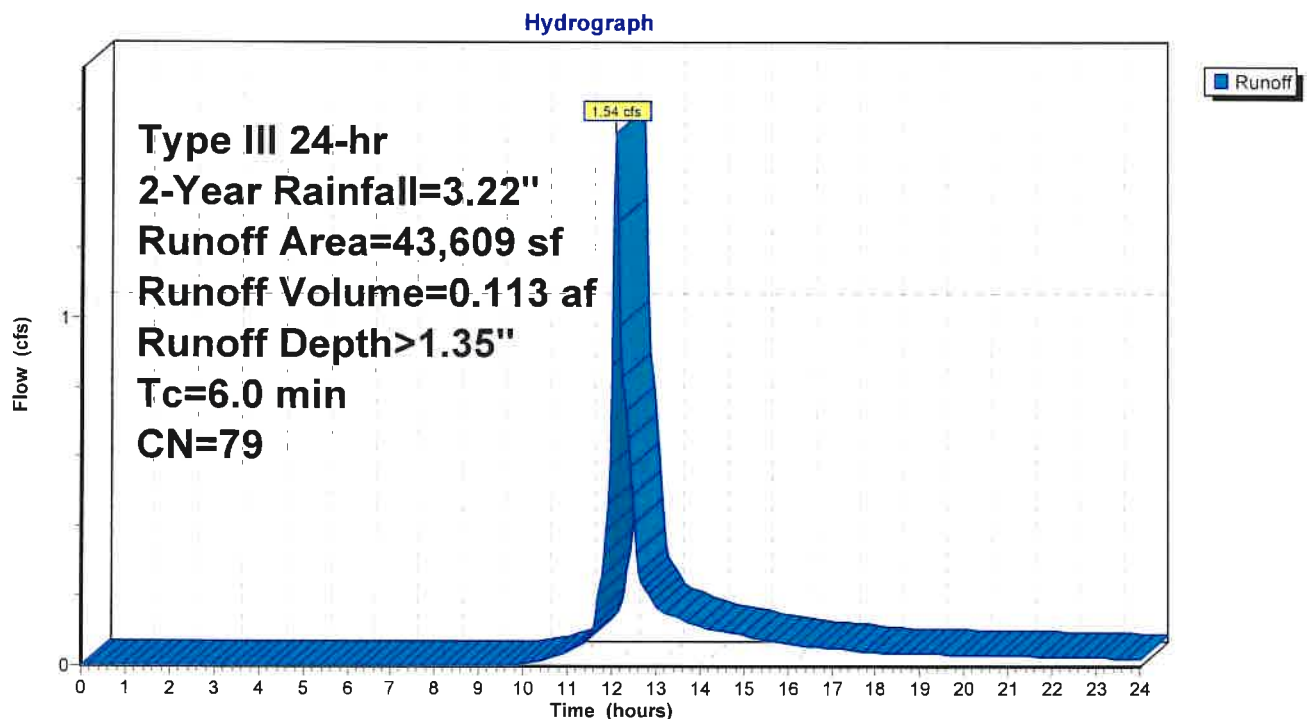
Runoff = 1.54 cfs @ 12.10 hrs, Volume= 0.113 af, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.22"

Area (sf)	CN	Description
43,609	79	1 acre lots, 20% imp, HSG C
34,887		80.00% Pervious Area
8,722		20.00% Impervious Area

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

Subcatchment 1: Lot #1



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Type III 24-hr 2-Year Rainfall=3.22"

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Summary for Subcatchment 2: Lot #2

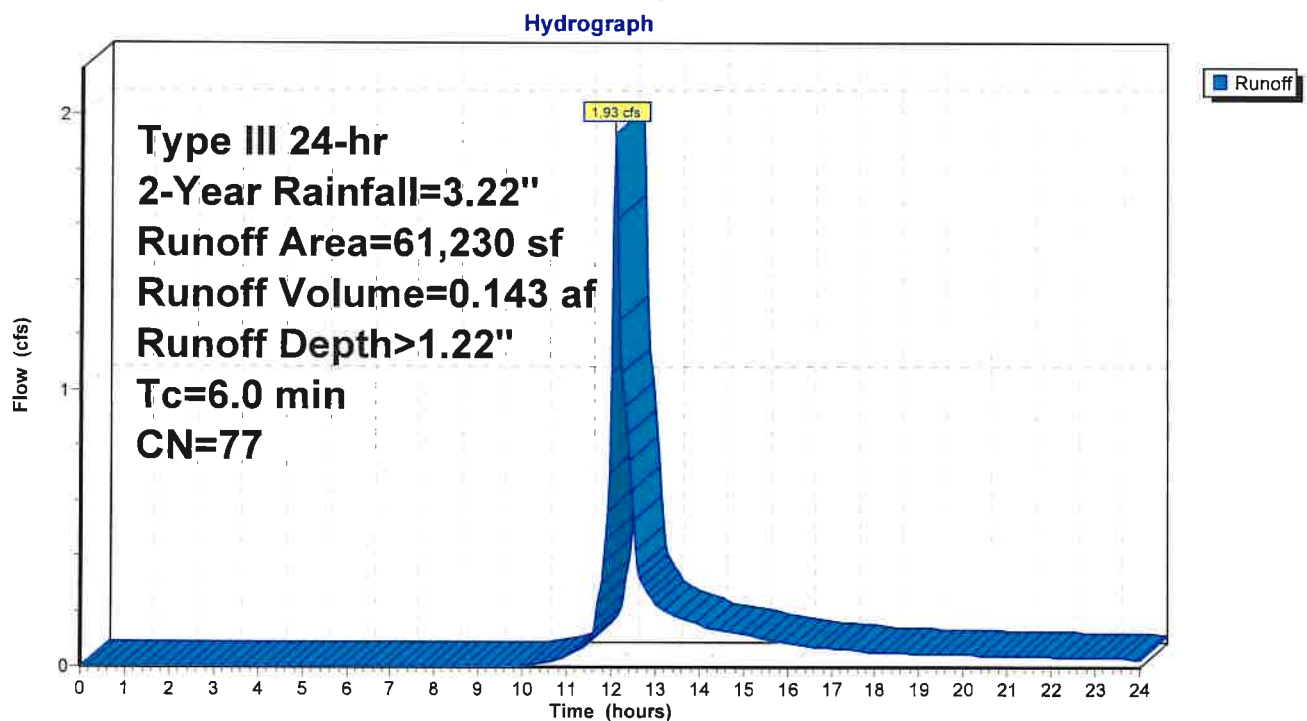
Runoff = 1.93 cfs @ 12.10 hrs, Volume= 0.143 af, Depth> 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.22"

Area (sf)	CN	Description
61,230	77	2 acre lots, 12% imp, HSG C
53,882		88.00% Pervious Area
7,348		12.00% Impervious Area

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

Subcatchment 2: Lot #2



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Type III 24-hr 2-Year Rainfall=3.22"

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Summary for Subcatchment 3: Portions of Road

Runoff = 0.58 cfs @ 12.09 hrs, Volume= 0.042 af, Depth> 1.85"

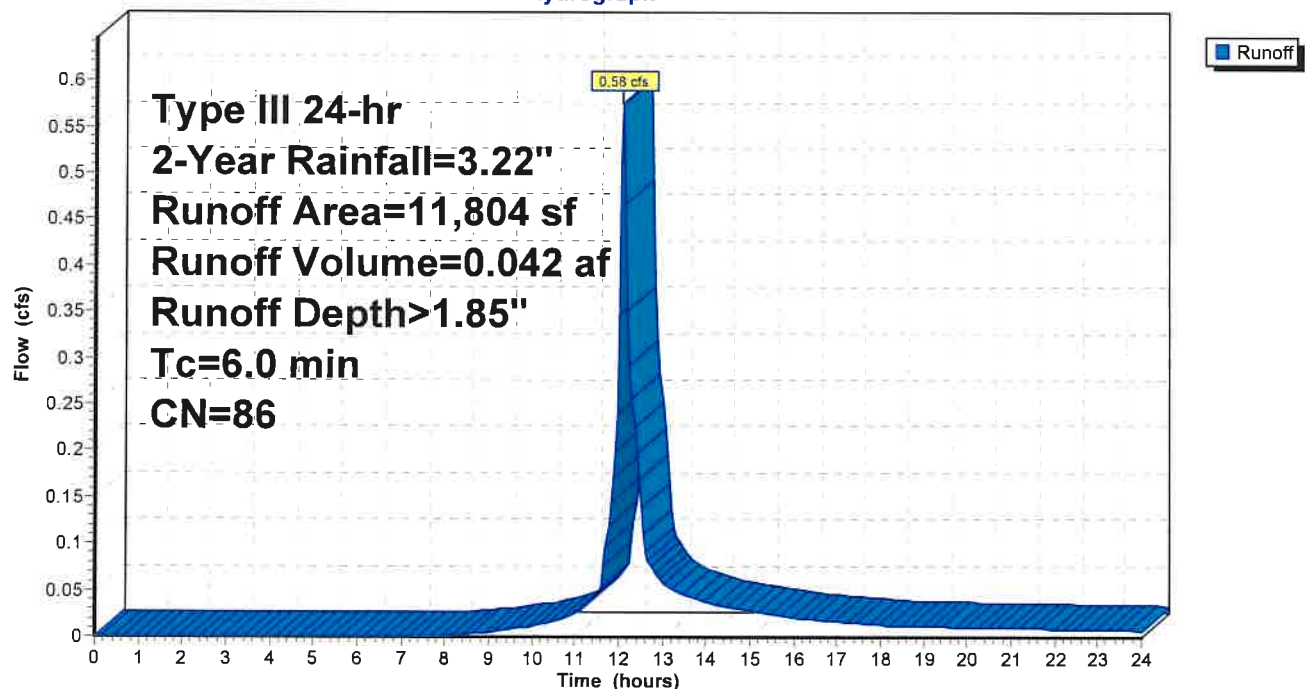
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.22"

	Area (sf)	CN	Description
*	5,728	98	Portions of Road
	6,076	74	>75% Grass cover, Good, HSG C
	11,804	86	Weighted Average
	6,076		51.47% Pervious Area
	5,728		48.53% Impervious Area

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

Subcatchment 3: Portions of Road

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.22"

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Summary for Subcatchment 4: Portions of Road

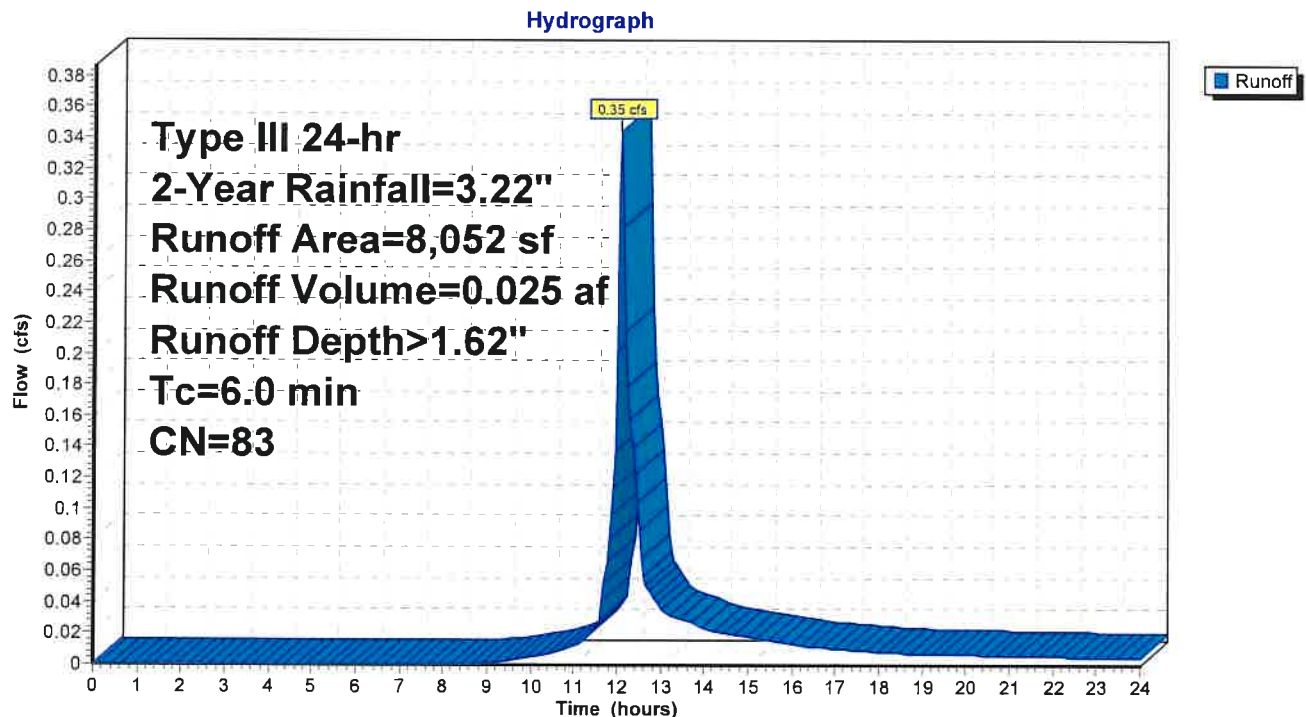
Runoff = 0.35 cfs @ 12.09 hrs, Volume= 0.025 af, Depth> 1.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.22"

	Area (sf)	CN	Description
*	3,052	98	Prop. Roadway
	5,000	74	>75% Grass cover, Good, HSG C
	8,052	83	Weighted Average
	5,000		62.10% Pervious Area
	3,052		37.90% Impervious Area

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

Subcatchment 4: Portions of Road



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Type III 24-hr 2-Year Rainfall=3.22"

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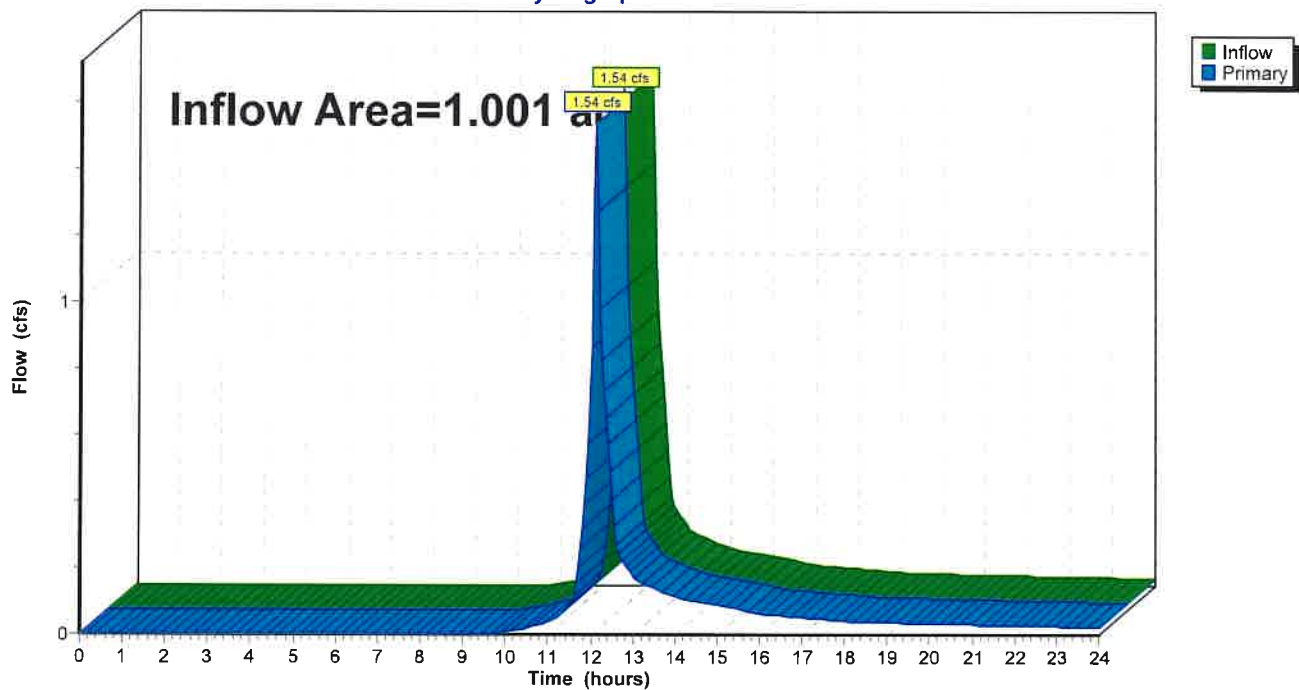
Summary for Pond 1P: South St

Inflow Area = 1.001 ac, 20.00% Impervious, Inflow Depth > 1.35" for 2-Year event
Inflow = 1.54 cfs @ 12.10 hrs, Volume= 0.113 af
Primary = 1.54 cfs @ 12.10 hrs, Volume= 0.113 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: South St

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.22"

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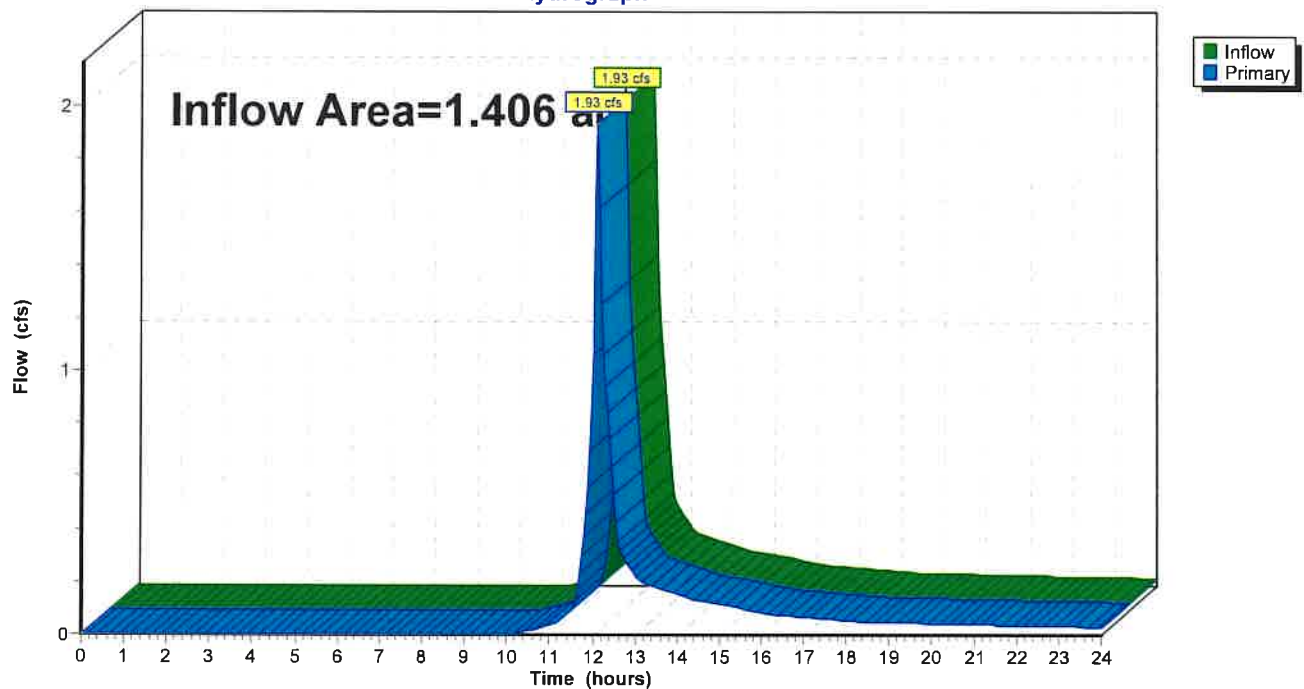
Summary for Pond 2P: Wetland

Inflow Area = 1.406 ac, 12.00% Impervious, Inflow Depth > 1.22" for 2-Year event
Inflow = 1.93 cfs @ 12.10 hrs, Volume= 0.143 af
Primary = 1.93 cfs @ 12.10 hrs, Volume= 0.143 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Wetland

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.22"

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Summary for Pond 3P: Inf. #1

Inflow Area = 0.185 ac, 37.90% Impervious, Inflow Depth > 1.62" for 2-Year event
Inflow = 0.35 cfs @ 12.09 hrs, Volume= 0.025 af
Outflow = 0.01 cfs @ 11.15 hrs, Volume= 0.010 af, Atten= 97%, Lag= 0.0 min
Discarded = 0.01 cfs @ 11.15 hrs, Volume= 0.010 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 224.34' @ 17.70 hrs Surf.Area= 0.032 ac Storage= 0.017 af

Plug-Flow detention time= 320.8 min calculated for 0.010 af (39% of inflow)
Center-of-Mass det. time= 197.4 min (1,029.4 - 832.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	223.46'	0.027 af	20.83'W x 66.50'L x 3.54'H Field A 0.113 af Overall - 0.044 af Embedded = 0.069 af x 40.0% Voids
#2A	223.96'	0.044 af	Cultec R-330XLHD x 36 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
		0.072 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	223.46'	0.270 in/hr Exfiltration over Surface area
#2	Secondary	226.00'	12.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.01 cfs @ 11.15 hrs HW=223.50' (Free Discharge)
↑ **1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=223.46' (Free Discharge)
↑ **2=Orifice/Grate** (Controls 0.00 cfs)

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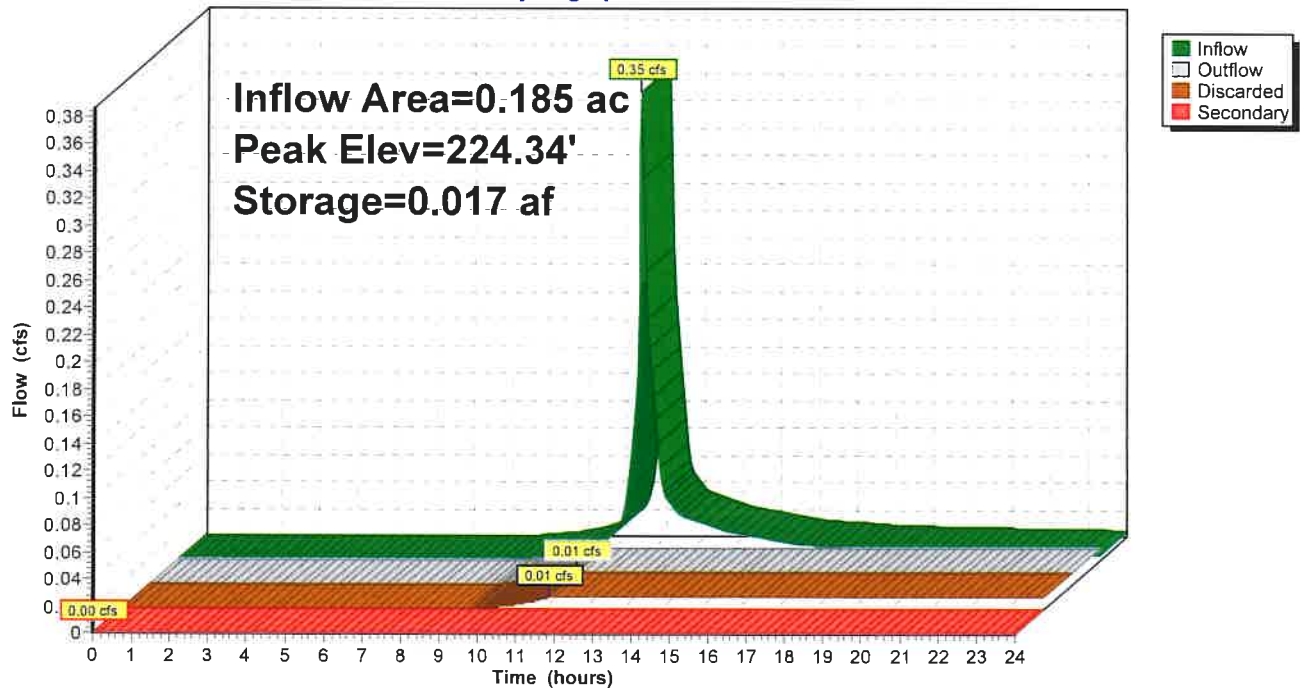
920 South St - Post Development
Type III 24-hr 2-Year Rainfall=3.22"

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Pond 3P: Inf. #1

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.22"

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Summary for Pond 4P: Inf. #2

Inflow Area = 0.271 ac, 48.53% Impervious, Inflow Depth > 1.85" for 2-Year event
Inflow = 0.58 cfs @ 12.09 hrs, Volume= 0.042 af
Outflow = 0.01 cfs @ 10.70 hrs, Volume= 0.014 af, Atten= 98%, Lag= 0.0 min
Discarded = 0.01 cfs @ 10.70 hrs, Volume= 0.014 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 226.06' @ 18.33 hrs Surf.Area= 0.043 ac Storage= 0.029 af

Plug-Flow detention time= 315.4 min calculated for 0.014 af (33% of inflow)
Center-of-Mass det. time= 188.7 min (1,010.4 - 821.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	225.00'	0.037 af	25.67'W x 73.50'L x 3.54'H Field A 0.153 af Overall - 0.061 af Embedded = 0.092 af x 40.0% Voids
#2A	225.50'	0.061 af	Cultec R-330XLHD x 50 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 5 rows
		0.098 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	225.00'	0.270 in/hr Exfiltration over Surface area
#2	Secondary	228.14'	12.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.01 cfs @ 10.70 hrs HW=225.04' (Free Discharge)
↑ **1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=225.00' (Free Discharge)
↑ **2=Orifice/Grate** (Controls 0.00 cfs)

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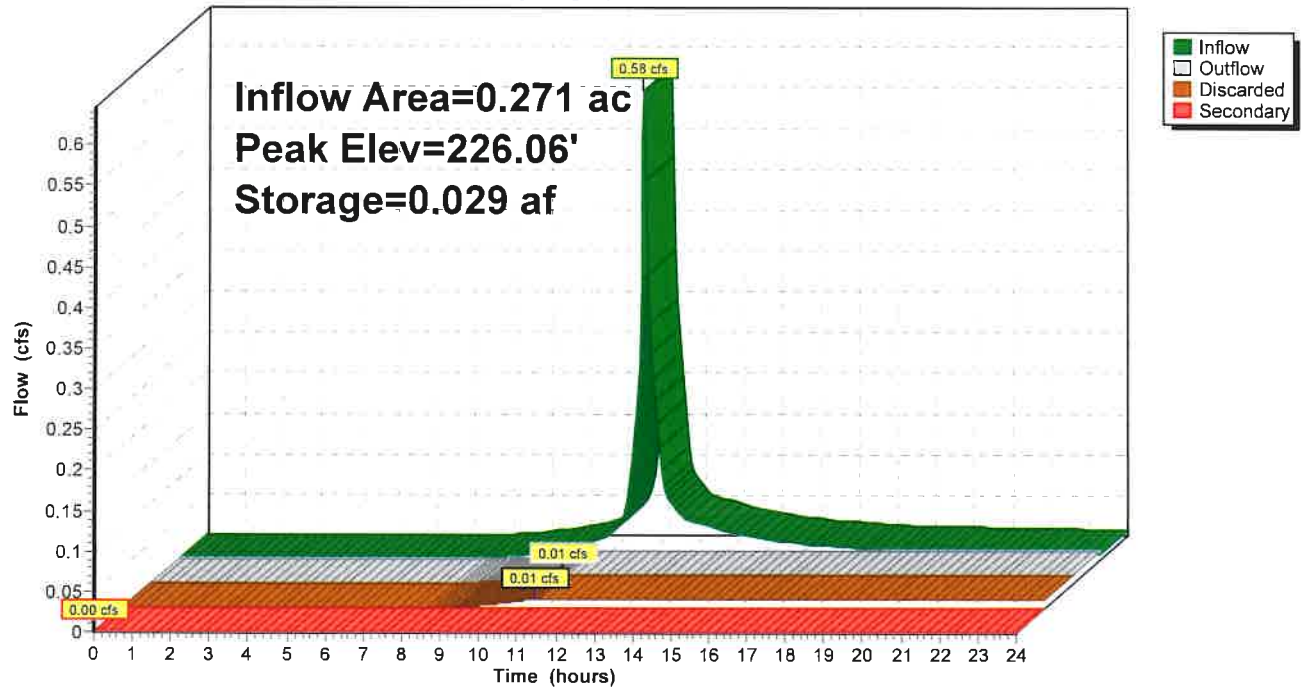
920 South St - Post Development
Type III 24-hr 2-Year Rainfall=3.22"

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Pond 4P: Inf. #2

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.86"

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Summary for Subcatchment 1: Lot #1

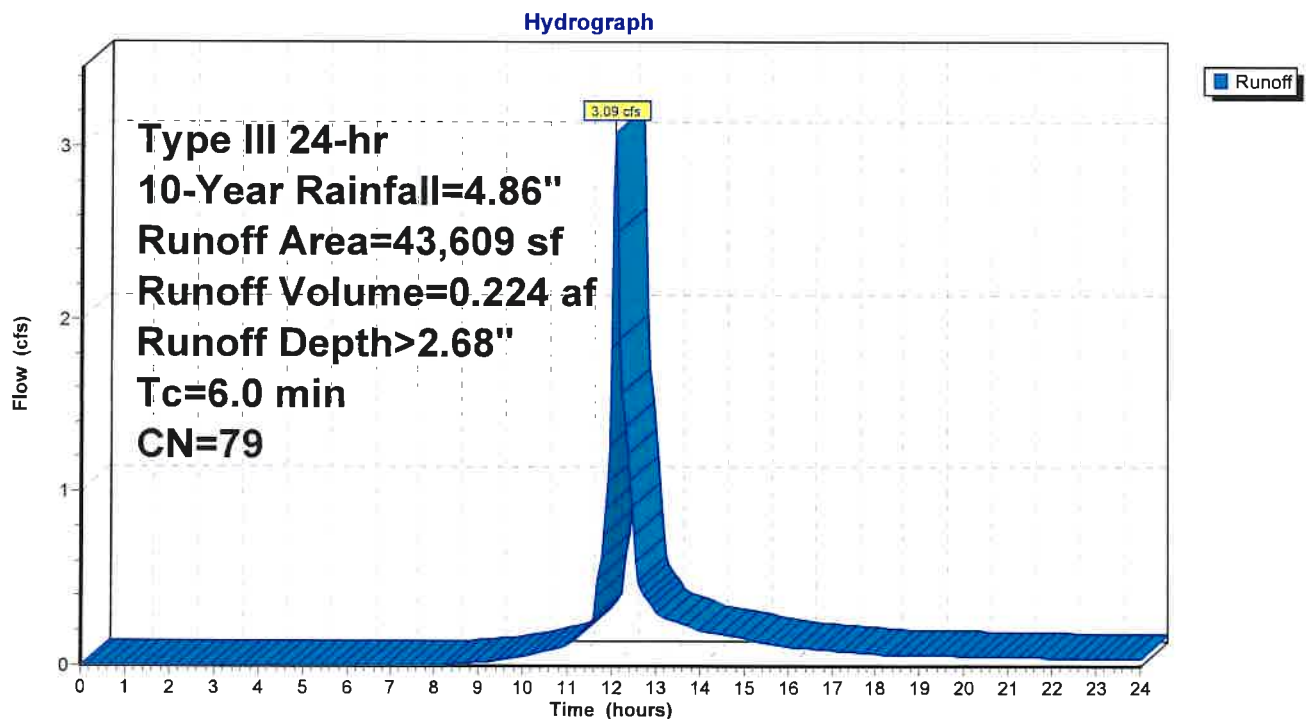
Runoff = 3.09 cfs @ 12.09 hrs, Volume= 0.224 af, Depth> 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.86"

Area (sf)	CN	Description
43,609	79	1 acre lots, 20% imp, HSG C
34,887		80.00% Pervious Area
8,722		20.00% Impervious Area

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

Subcatchment 1: Lot #1



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Type III 24-hr 10-Year Rainfall=4.86"

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Summary for Subcatchment 2: Lot #2

Runoff = 4.05 cfs @ 12.09 hrs, Volume= 0.293 af, Depth> 2.50"

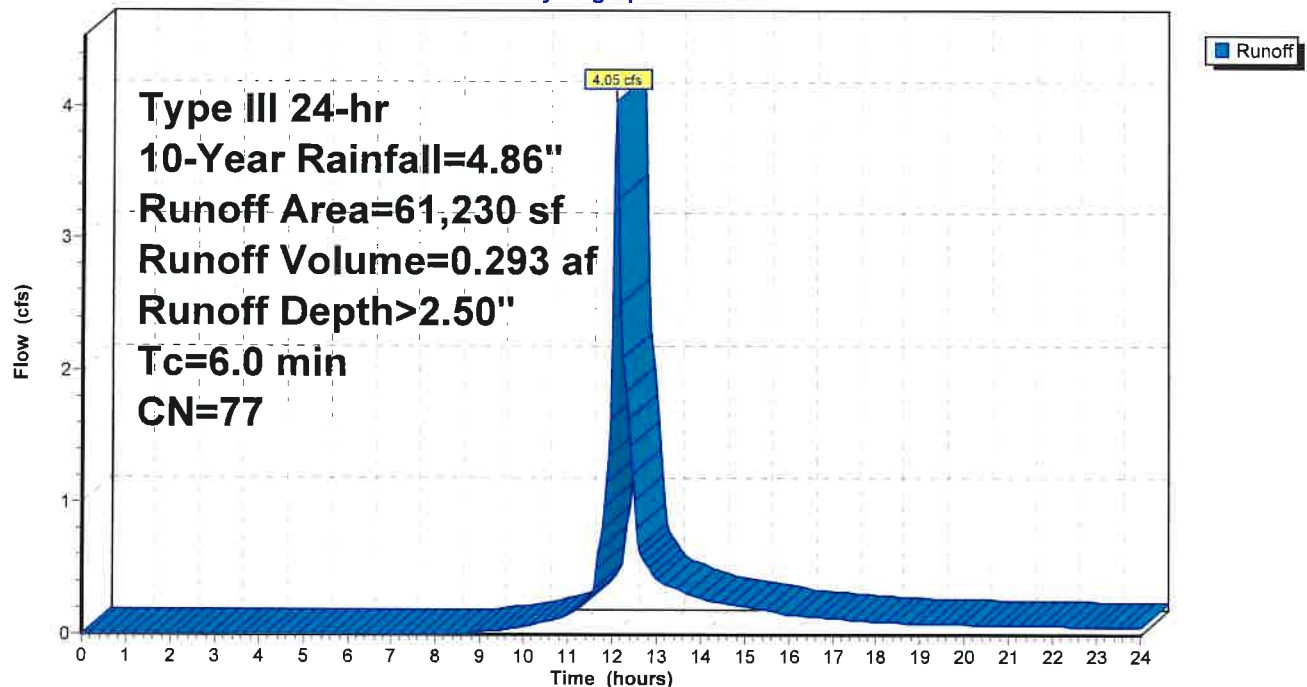
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.86"

Area (sf)	CN	Description
61,230	77	2 acre lots, 12% imp, HSG C
53,882		88.00% Pervious Area
7,348		12.00% Impervious Area

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

Subcatchment 2: Lot #2

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.86"

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Summary for Subcatchment 3: Portions of Road

Runoff = 1.02 cfs @ 12.09 hrs, Volume= 0.075 af, Depth> 3.33"

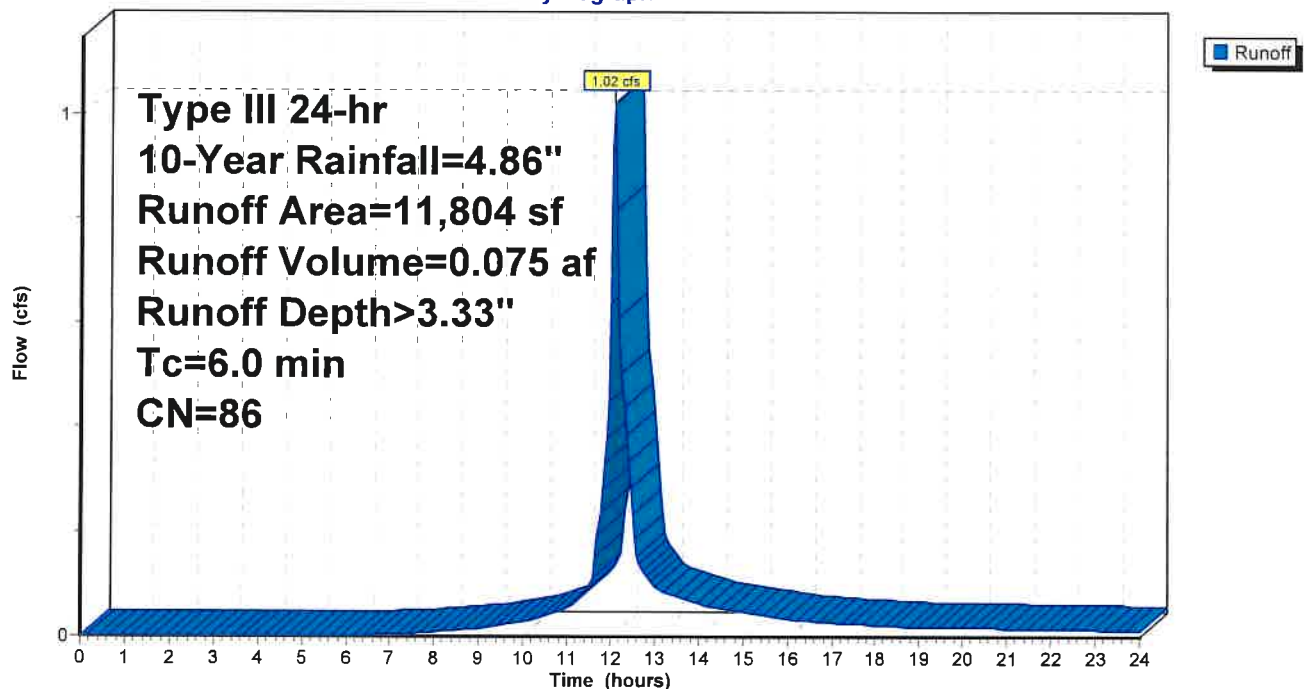
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.86"

Area (sf)	CN	Description
* 5,728	98	Portions of Road
6,076	74	>75% Grass cover, Good, HSG C
11,804	86	Weighted Average
6,076		51.47% Pervious Area
5,728		48.53% Impervious Area

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

Subcatchment 3: Portions of Road

Hydrograph



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Type III 24-hr 10-Year Rainfall=4.86"

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Summary for Subcatchment 4: Portions of Road

Runoff = 0.64 cfs @ 12.09 hrs, Volume= 0.047 af, Depth> 3.05"

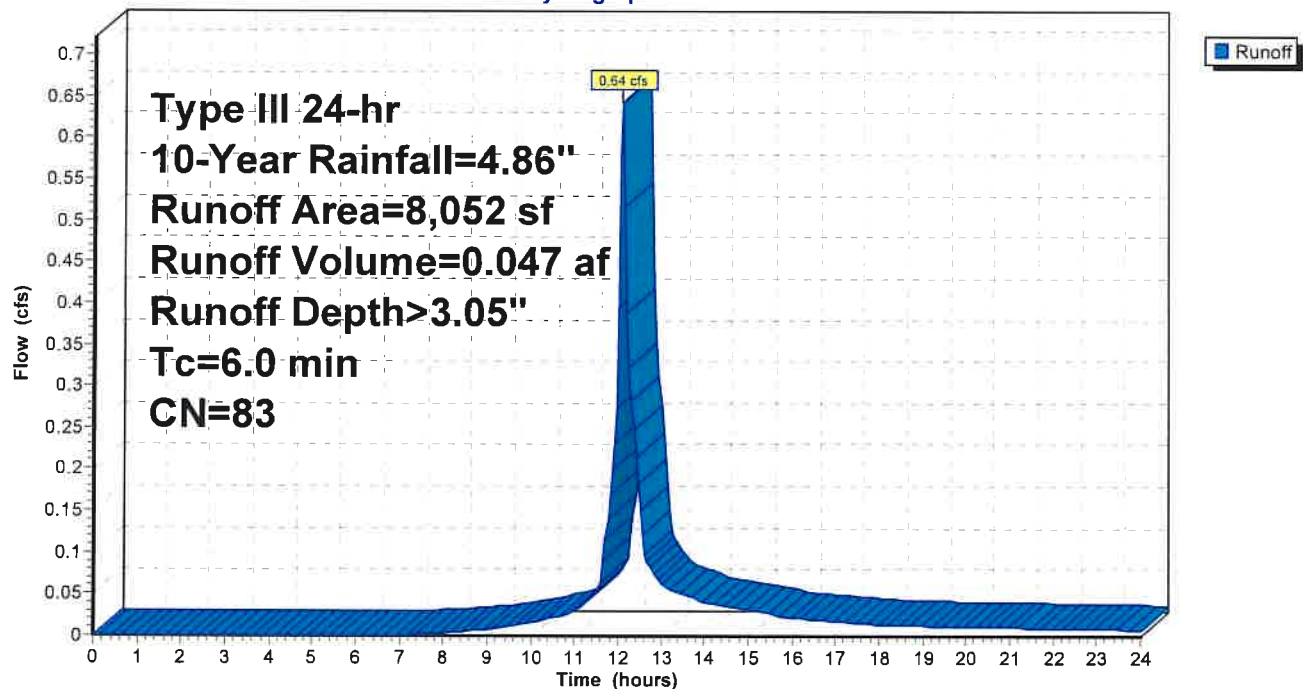
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.86"

	Area (sf)	CN	Description
*	3,052	98	Prop. Roadway
	5,000	74	>75% Grass cover, Good, HSG C
	8,052	83	Weighted Average
	5,000		62.10% Pervious Area
	3,052		37.90% Impervious Area

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

Subcatchment 4: Portions of Road

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Type III 24-hr 10-Year Rainfall=4.86"

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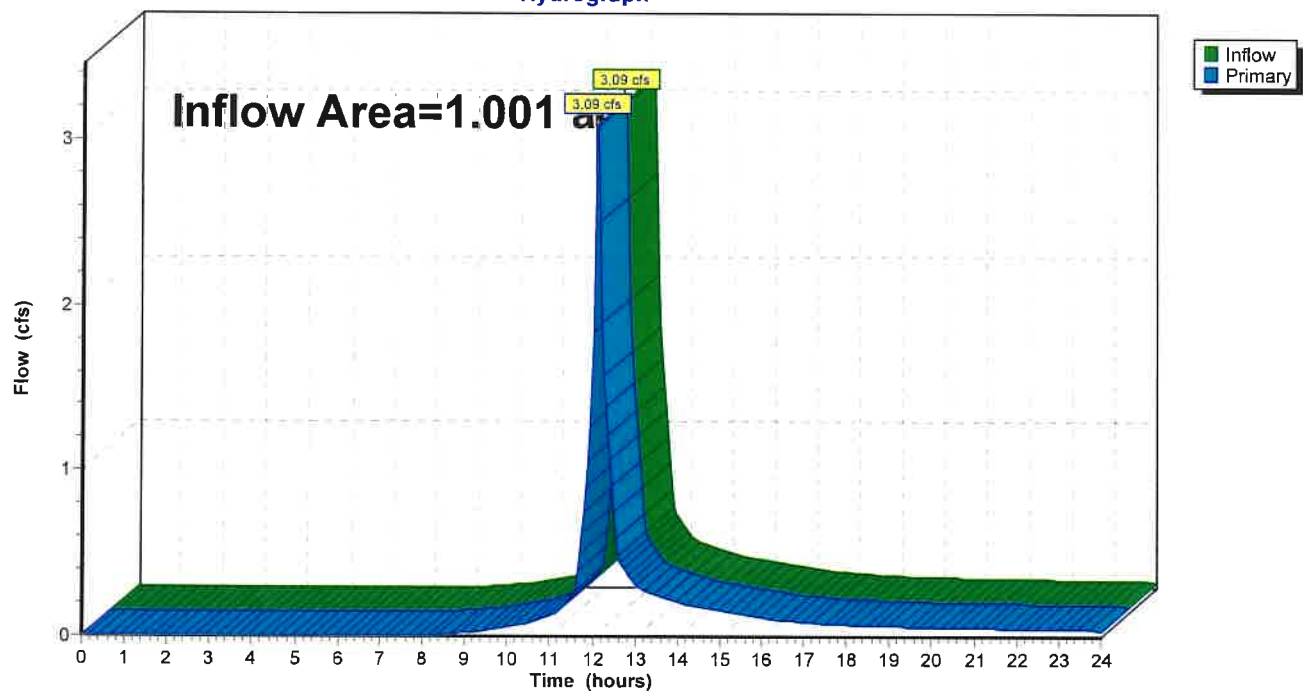
Summary for Pond 1P: South St

Inflow Area = 1.001 ac, 20.00% Impervious, Inflow Depth > 2.68" for 10-Year event
Inflow = 3.09 cfs @ 12.09 hrs, Volume= 0.224 af
Primary = 3.09 cfs @ 12.09 hrs, Volume= 0.224 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: South St

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Type III 24-hr 10-Year Rainfall=4.86"

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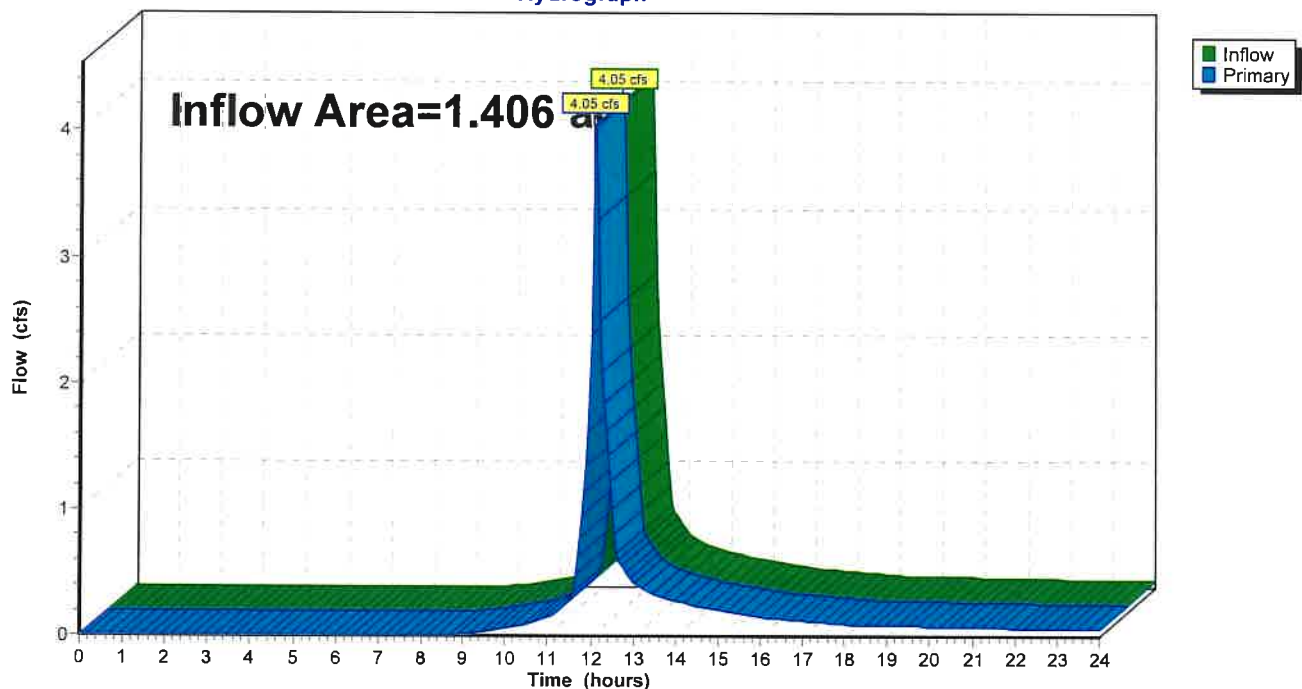
Summary for Pond 2P: Wetland

Inflow Area = 1.406 ac, 12.00% Impervious, Inflow Depth > 2.50" for 10-Year event
Inflow = 4.05 cfs @ 12.09 hrs, Volume= 0.293 af
Primary = 4.05 cfs @ 12.09 hrs, Volume= 0.293 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Wetland

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Type III 24-hr 10-Year Rainfall=4.86"

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Summary for Pond 3P: Inf. #1

Inflow Area = 0.185 ac, 37.90% Impervious, Inflow Depth > 3.05" for 10-Year event
Inflow = 0.64 cfs @ 12.09 hrs, Volume= 0.047 af
Outflow = 0.01 cfs @ 9.75 hrs, Volume= 0.011 af, Atten= 99%, Lag= 0.0 min
Discarded = 0.01 cfs @ 9.75 hrs, Volume= 0.011 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 225.10' @ 22.19 hrs Surf.Area= 0.032 ac Storage= 0.036 af

Plug-Flow detention time= 313.3 min calculated for 0.011 af (23% of inflow)
Center-of-Mass det. time= 169.1 min (983.2 - 814.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	223.46'	0.027 af	20.83'W x 66.50'L x 3.54'H Field A 0.113 af Overall - 0.044 af Embedded = 0.069 af x 40.0% Voids
#2A	223.96'	0.044 af	Cultec R-330XLHD x 36 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
		0.072 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	223.46'	0.270 in/hr Exfiltration over Surface area
#2	Secondary	226.00'	12.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.01 cfs @ 9.75 hrs HW=223.50' (Free Discharge)
↑ **1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=223.46' (Free Discharge)
↑ **2=Orifice/Grate** (Controls 0.00 cfs)

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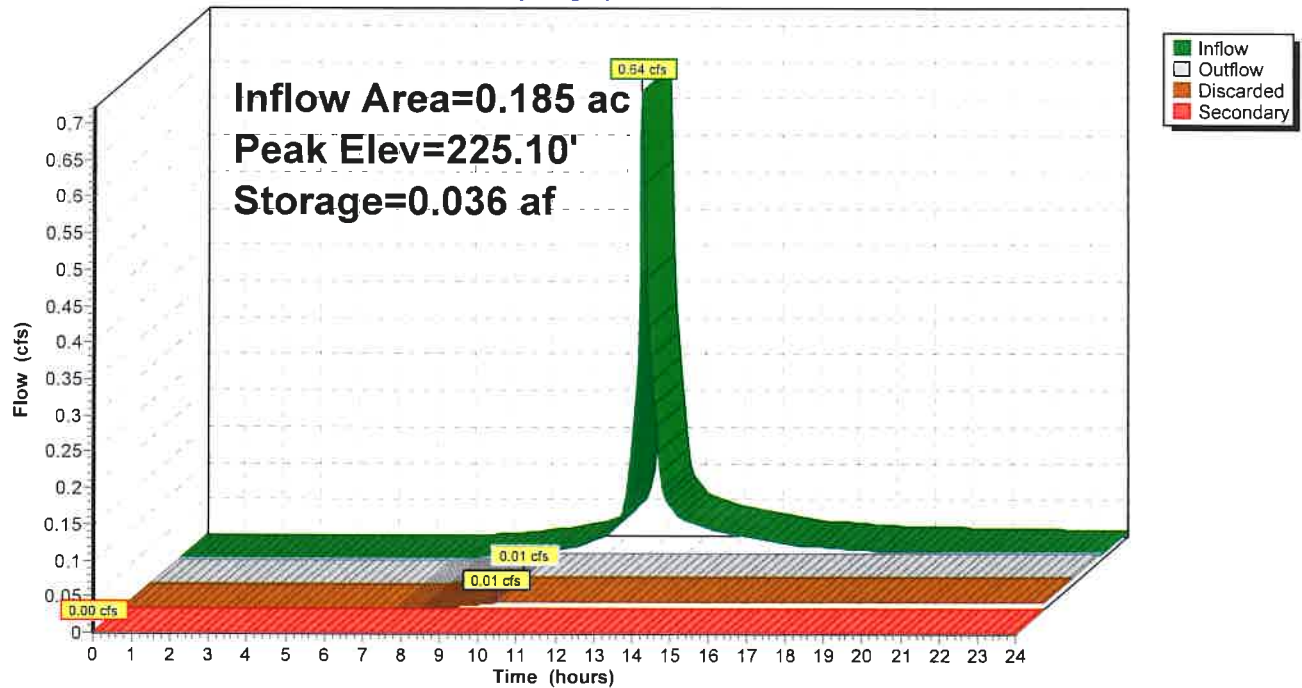
920 South St - Post Development
Type III 24-hr 10-Year Rainfall=4.86"

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Pond 3P: Inf. #1

Hydrograph



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920 South St - Post Development
Type III 24-hr 10-Year Rainfall=4.86"

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Summary for Pond 4P: Inf. #2

Inflow Area = 0.271 ac, 48.53% Impervious, Inflow Depth > 3.33" for 10-Year event
Inflow = 1.02 cfs @ 12.09 hrs, Volume= 0.075 af
Outflow = 0.01 cfs @ 9.20 hrs, Volume= 0.016 af, Atten= 99%, Lag= 0.0 min
Discarded = 0.01 cfs @ 9.20 hrs, Volume= 0.016 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 226.94' @ 23.16 hrs Surf.Area= 0.043 ac Storage= 0.060 af

Plug-Flow detention time= 315.8 min calculated for 0.016 af (21% of inflow)
Center-of-Mass det. time= 157.5 min (962.5 - 805.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	225.00'	0.037 af	25.67'W x 73.50'L x 3.54'H Field A 0.153 af Overall - 0.061 af Embedded = 0.092 af x 40.0% Voids
#2A	225.50'	0.061 af	Cultec R-330XLHD x 50 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 5 rows
		0.098 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	225.00'	0.270 in/hr Exfiltration over Surface area
#2	Secondary	228.14'	12.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.01 cfs @ 9.20 hrs HW=225.04' (Free Discharge)
↑ **1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=225.00' (Free Discharge)
↑ **2=Orifice/Grate** (Controls 0.00 cfs)

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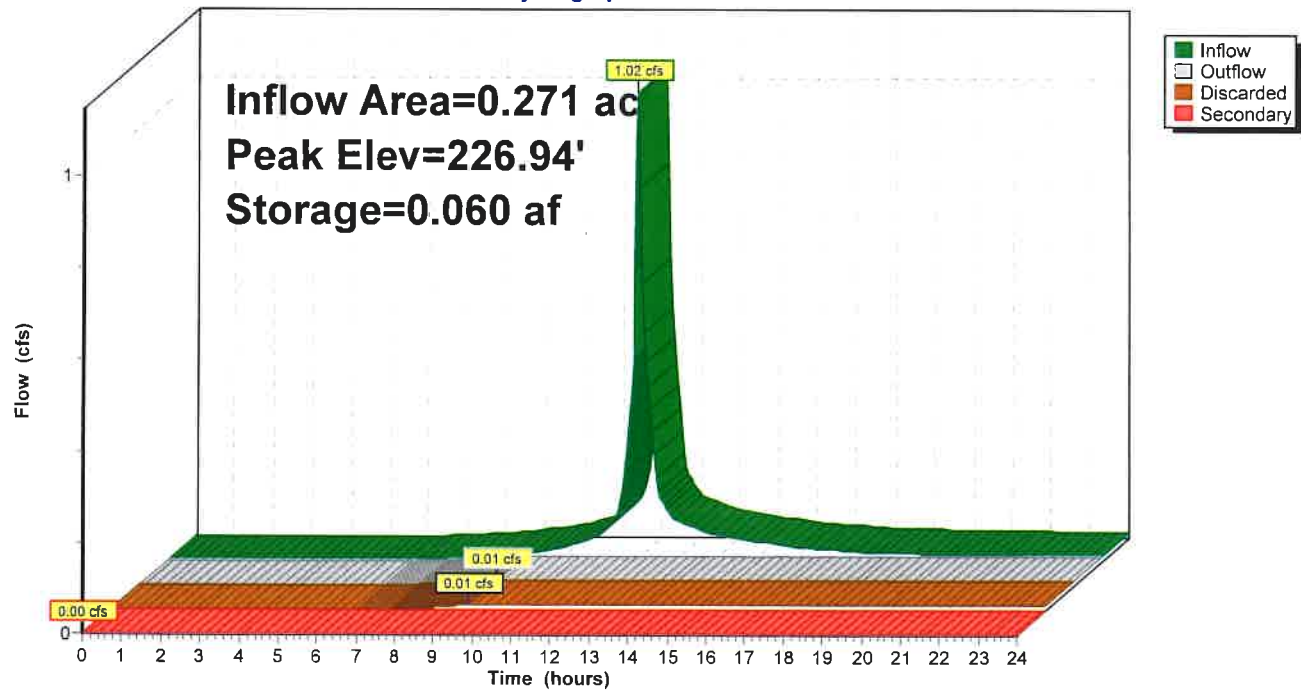
920 South St - Post Development
Type III 24-hr 10-Year Rainfall=4.86"

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Pond 4P: Inf. #2

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.15"

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Summary for Subcatchment 1: Lot #1

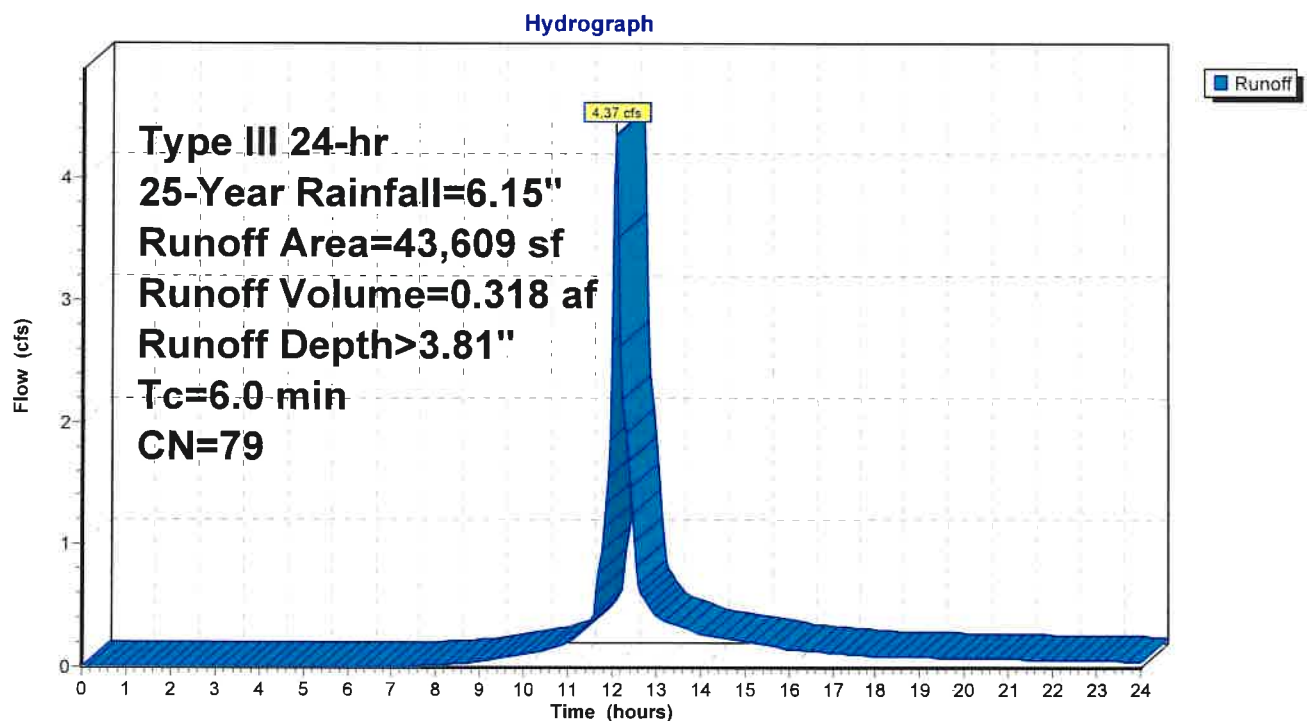
Runoff = 4.37 cfs @ 12.09 hrs, Volume= 0.318 af, Depth> 3.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.15"

Area (sf)	CN	Description
43,609	79	1 acre lots, 20% imp, HSG C
34,887		80.00% Pervious Area
8,722		20.00% Impervious Area

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

Subcatchment 1: Lot #1



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Type III 24-hr 25-Year Rainfall=6.15"

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Summary for Subcatchment 2: Lot #2

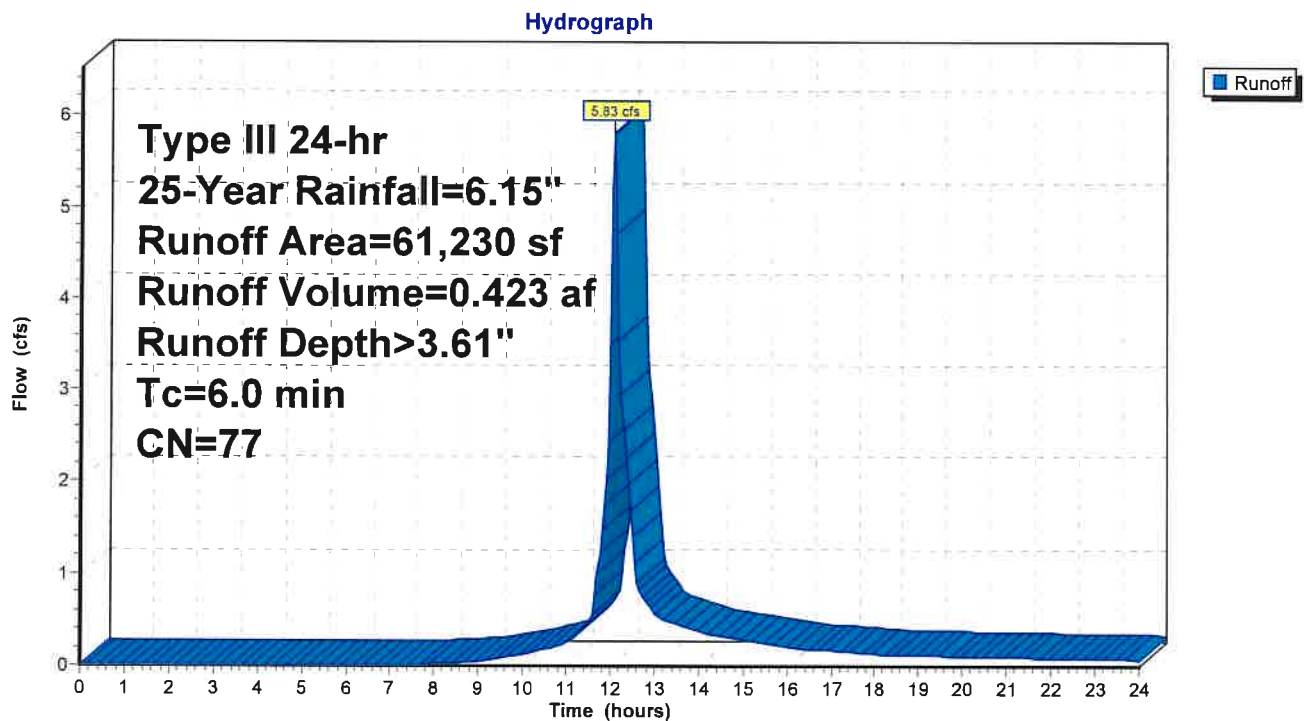
Runoff = 5.83 cfs @ 12.09 hrs, Volume= 0.423 af, Depth> 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.15"

Area (sf)	CN	Description
61,230	77	2 acre lots, 12% imp, HSG C
53,882		88.00% Pervious Area
7,348		12.00% Impervious Area

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

Subcatchment 2: Lot #2



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Type III 24-hr 25-Year Rainfall=6.15"

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Summary for Subcatchment 3: Portions of Road

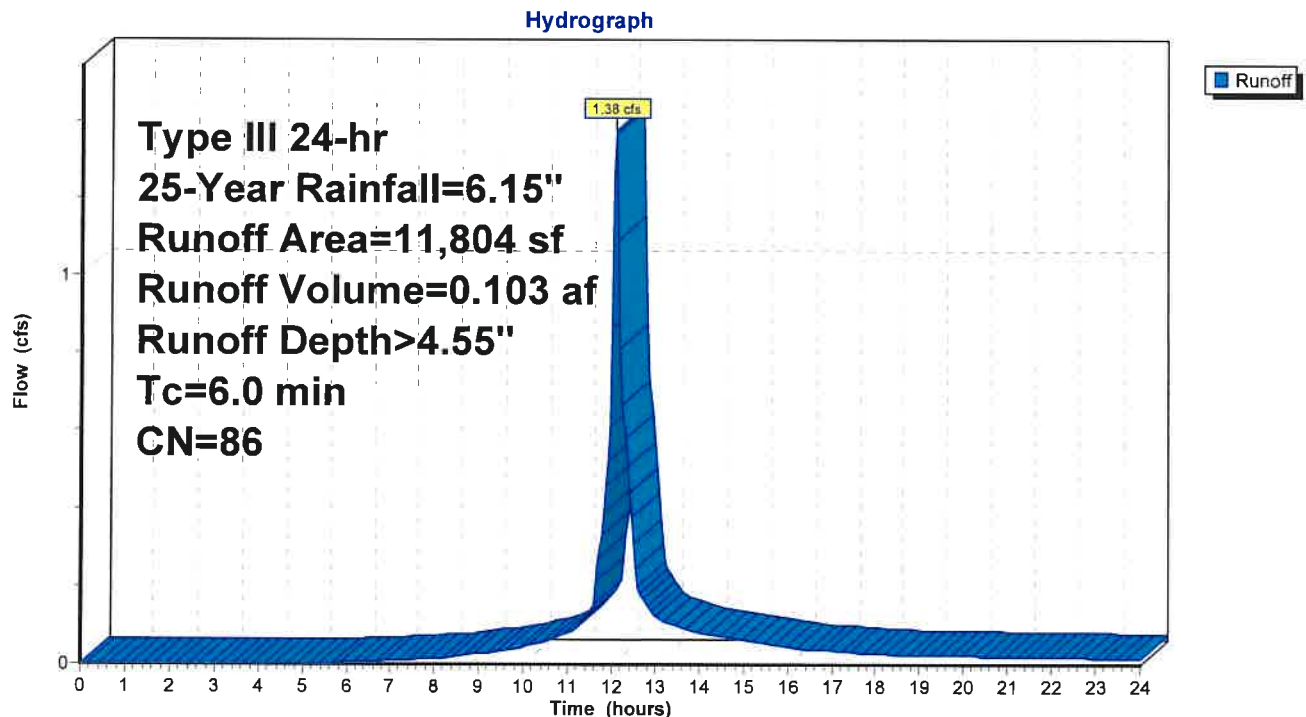
Runoff = 1.38 cfs @ 12.09 hrs, Volume= 0.103 af, Depth> 4.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.15"

	Area (sf)	CN	Description
*	5,728	98	Portions of Road
	6,076	74	>75% Grass cover, Good, HSG C
	11,804	86	Weighted Average
	6,076		51.47% Pervious Area
	5,728		48.53% Impervious Area

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

Subcatchment 3: Portions of Road



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Type III 24-hr 25-Year Rainfall=6.15"

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Summary for Subcatchment 4: Portions of Road

Runoff = 0.89 cfs @ 12.09 hrs, Volume= 0.065 af, Depth> 4.23"

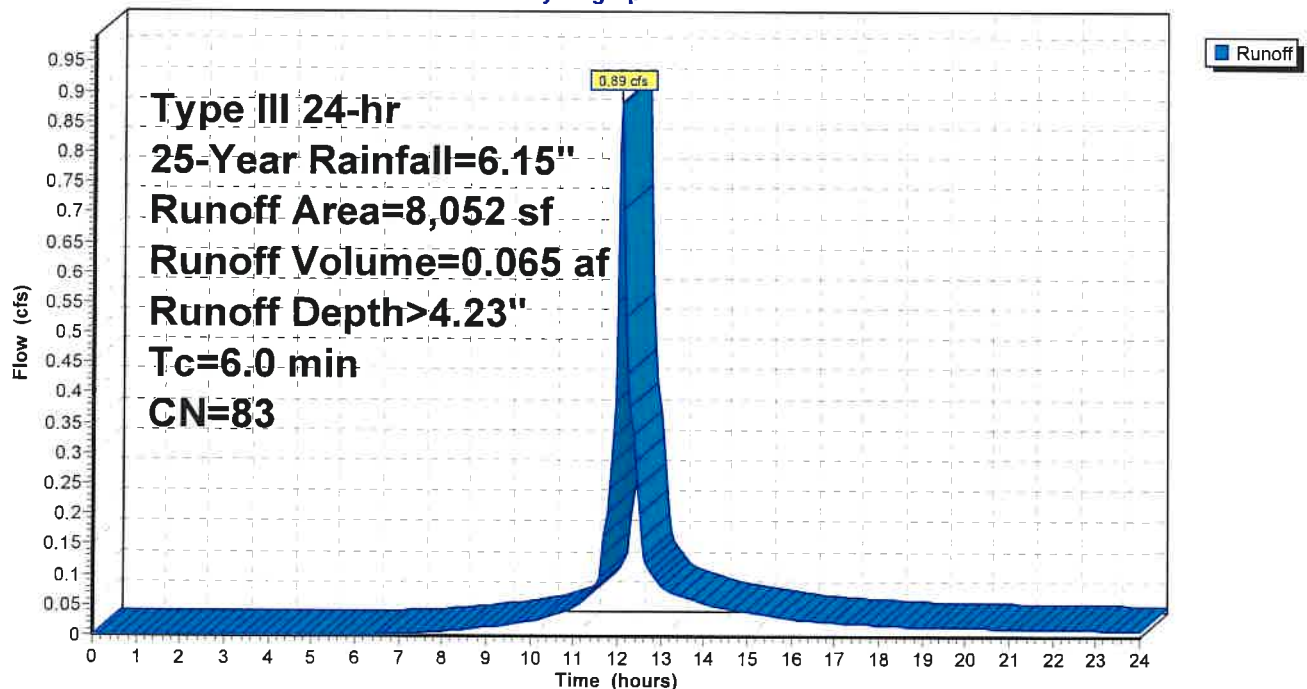
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.15"

	Area (sf)	CN	Description
*	3,052	98	Prop. Roadway
	5,000	74	>75% Grass cover, Good, HSG C
	8,052	83	Weighted Average
	5,000		62.10% Pervious Area
	3,052		37.90% Impervious Area

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

Subcatchment 4: Portions of Road

Hydrograph



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920 South St - Post Development
Type III 24-hr 25-Year Rainfall=6.15"

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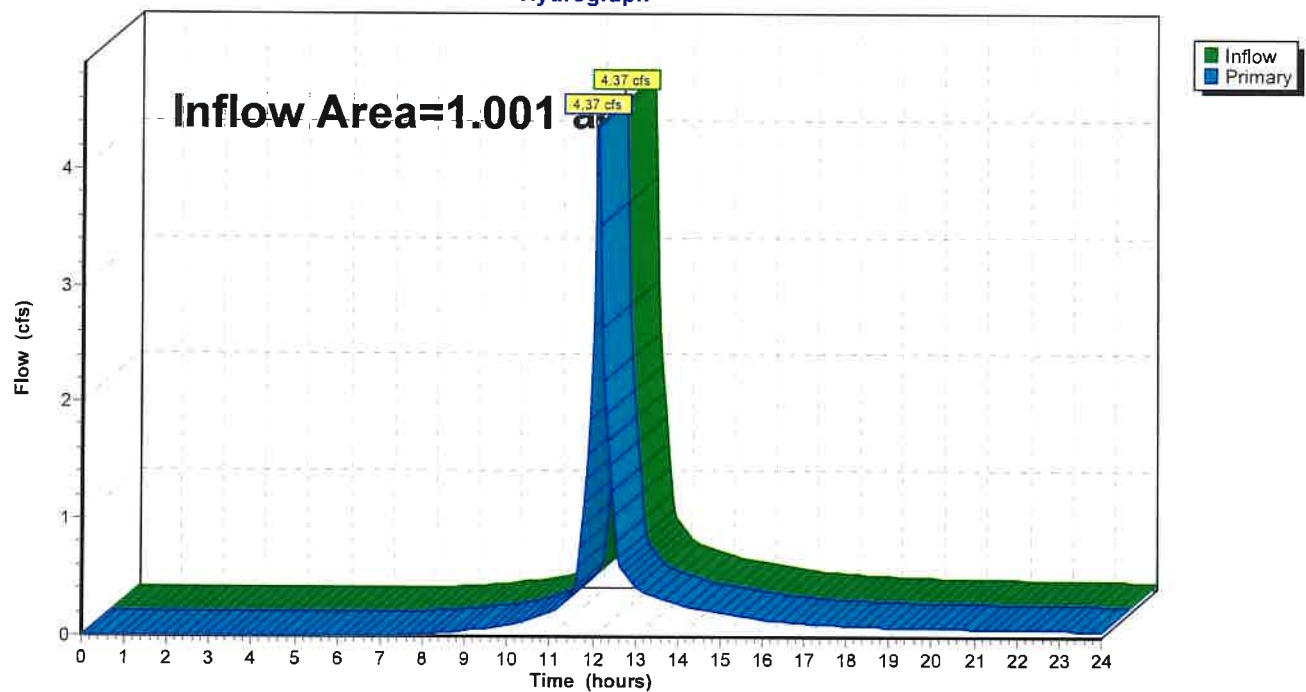
Summary for Pond 1P: South St

Inflow Area = 1.001 ac, 20.00% Impervious, Inflow Depth > 3.81" for 25-Year event
Inflow = 4.37 cfs @ 12.09 hrs, Volume= 0.318 af
Primary = 4.37 cfs @ 12.09 hrs, Volume= 0.318 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: South St

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.15"

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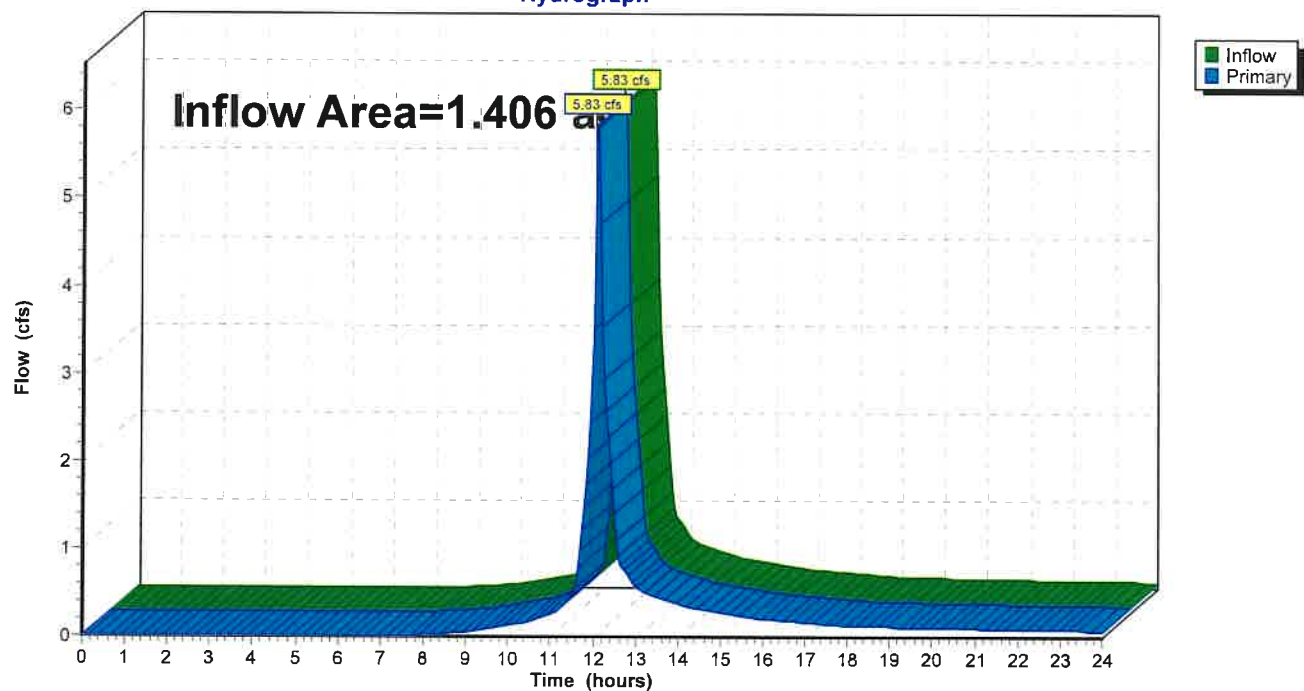
Summary for Pond 2P: Wetland

Inflow Area = 1.406 ac, 12.00% Impervious, Inflow Depth > 3.61" for 25-Year event
Inflow = 5.83 cfs @ 12.09 hrs, Volume= 0.423 af
Primary = 5.83 cfs @ 12.09 hrs, Volume= 0.423 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Wetland

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.15"

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Summary for Pond 3P: Inf. #1

Inflow Area = 0.185 ac, 37.90% Impervious, Inflow Depth > 4.23" for 25-Year event
Inflow = 0.89 cfs @ 12.09 hrs, Volume= 0.065 af
Outflow = 0.01 cfs @ 8.90 hrs, Volume= 0.012 af, Atten= 99%, Lag= 0.0 min
Discarded = 0.01 cfs @ 8.90 hrs, Volume= 0.012 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 225.84' @ 24.00 hrs Surf.Area= 0.032 ac Storage= 0.054 af

Plug-Flow detention time= 318.9 min calculated for 0.012 af (18% of inflow)
Center-of-Mass det. time= 150.2 min (955.0 - 804.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	223.46'	0.027 af	20.83'W x 66.50'L x 3.54'H Field A 0.113 af Overall - 0.044 af Embedded = 0.069 af x 40.0% Voids
#2A	223.96'	0.044 af	Cultec R-330XLHD x 36 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
		0.072 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	223.46'	0.270 in/hr Exfiltration over Surface area
#2	Secondary	226.00'	12.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.01 cfs @ 8.90 hrs HW=223.50' (Free Discharge)
↑ **1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=223.46' (Free Discharge)
↑ **2=Orifice/Grate** (Controls 0.00 cfs)

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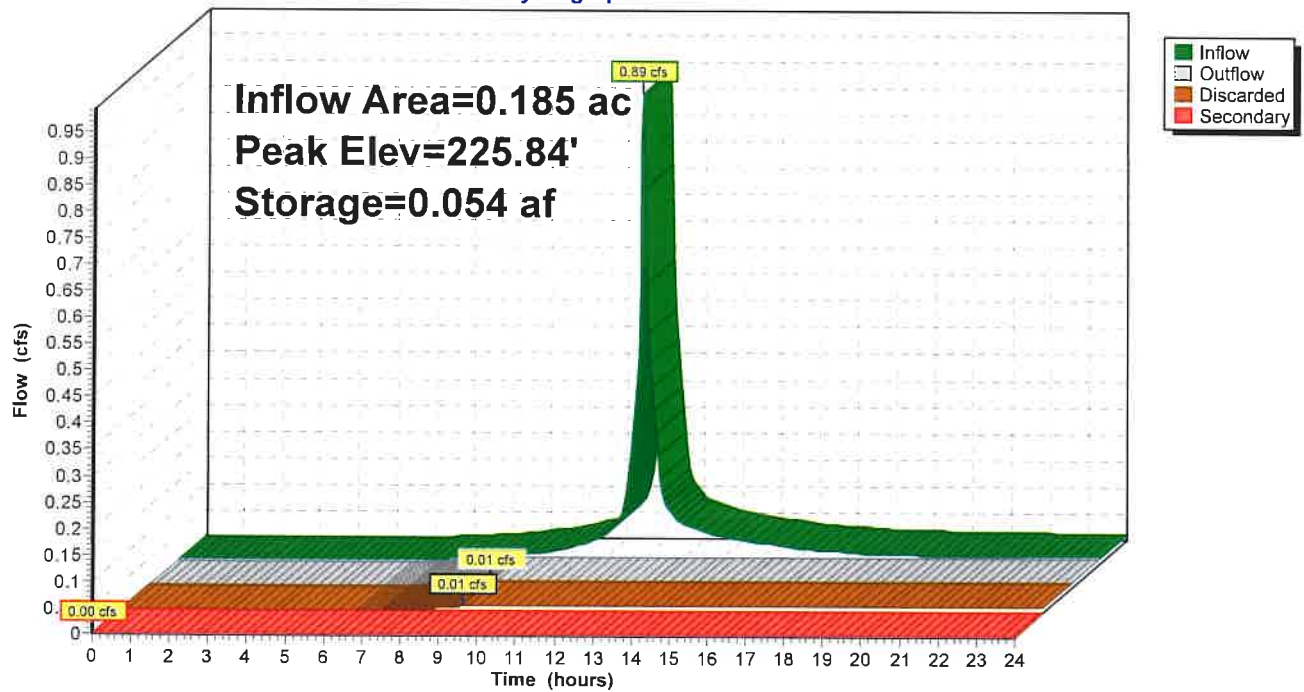
920 South St - Post Development
Type III 24-hr 25-Year Rainfall=6.15"

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Pond 3P: Inf. #1

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Type III 24-hr 25-Year Rainfall=6.15"

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Summary for Pond 4P: Inf. #2

Inflow Area = 0.271 ac, 48.53% Impervious, Inflow Depth > 4.55" for 25-Year event
Inflow = 1.38 cfs @ 12.09 hrs, Volume= 0.103 af
Outflow = 0.01 cfs @ 8.35 hrs, Volume= 0.016 af, Atten= 99%, Lag= 0.0 min
Discarded = 0.01 cfs @ 8.35 hrs, Volume= 0.016 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 227.87' @ 24.00 hrs Surf.Area= 0.043 ac Storage= 0.086 af

Plug-Flow detention time= 326.2 min calculated for 0.016 af (16% of inflow)
Center-of-Mass det. time= 136.7 min (933.0 - 796.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	225.00'	0.037 af	25.67'W x 73.50'L x 3.54'H Field A 0.153 af Overall - 0.061 af Embedded = 0.092 af x 40.0% Voids
#2A	225.50'	0.061 af	Cultec R-330XLHD x 50 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 5 rows
		0.098 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	225.00'	0.270 in/hr Exfiltration over Surface area
#2	Secondary	228.14'	12.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.01 cfs @ 8.35 hrs HW=225.04' (Free Discharge)
↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=225.00' (Free Discharge)
↑2=Orifice/Grate (Controls 0.00 cfs)

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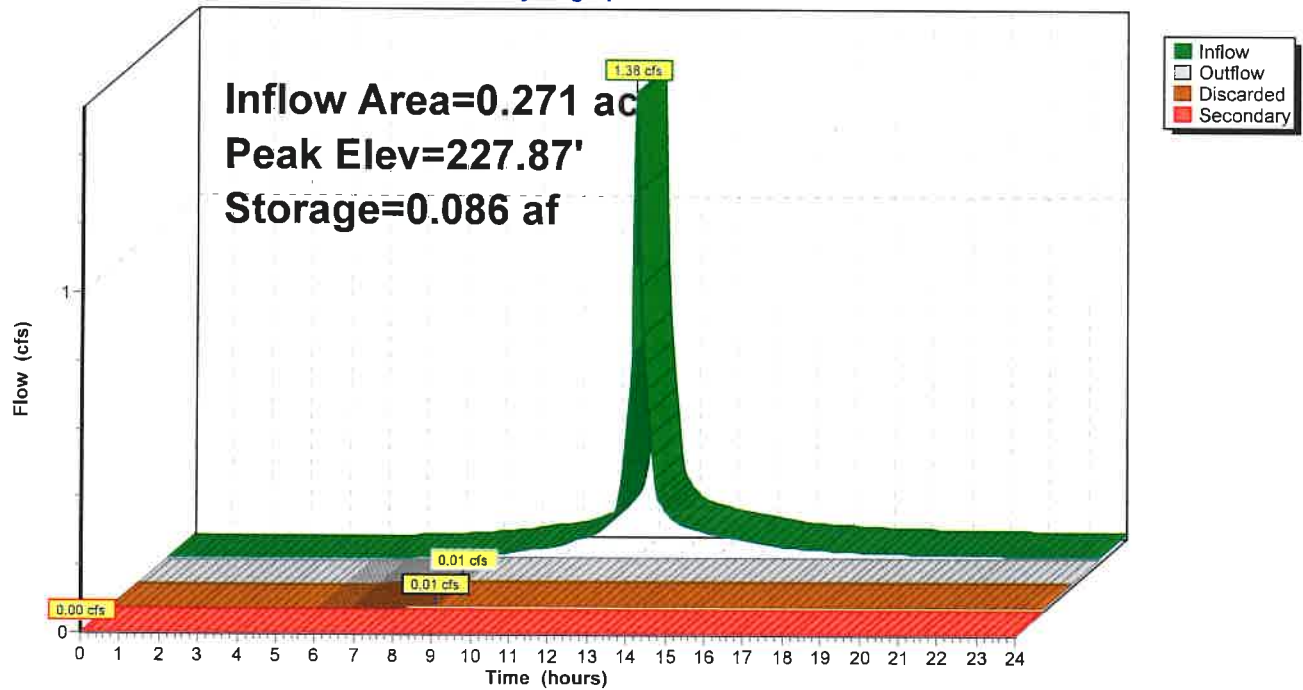
920 South St - Post Development
Type III 24-hr 25-Year Rainfall=6.15"

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Pond 4P: Inf. #2

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.80"

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Summary for Subcatchment 1: Lot #1

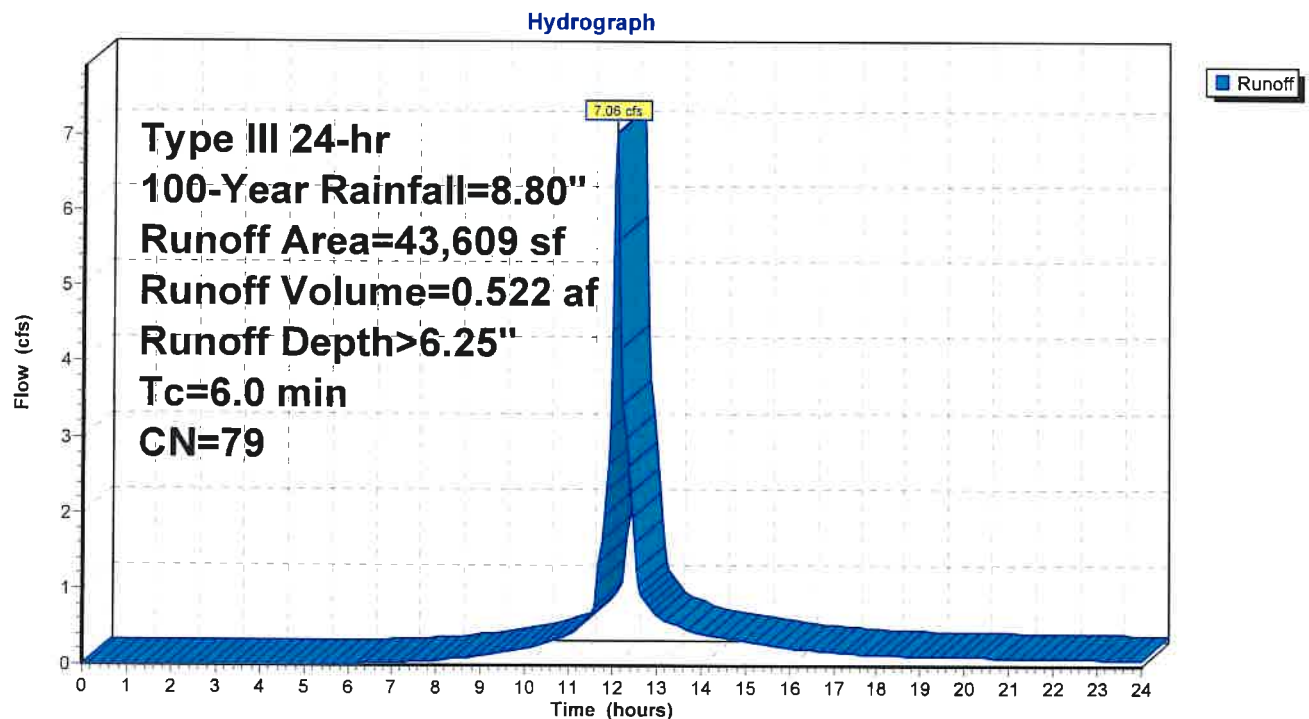
Runoff = 7.06 cfs @ 12.09 hrs, Volume= 0.522 af, Depth> 6.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.80"

Area (sf)	CN	Description
43,609	79	1 acre lots, 20% imp, HSG C
34,887		80.00% Pervious Area
8,722		20.00% Impervious Area

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

Subcatchment 1: Lot #1



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Type III 24-hr 100-Year Rainfall=8.80"

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Summary for Subcatchment 2: Lot #2

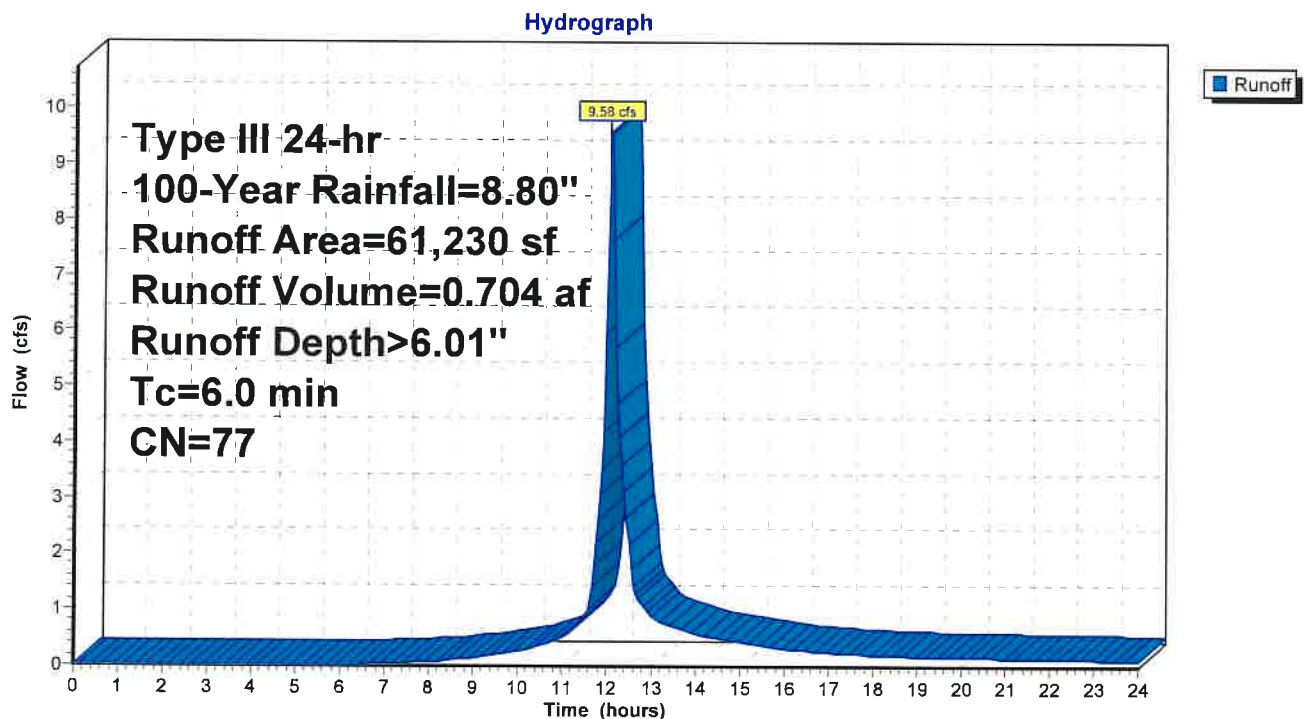
Runoff = 9.58 cfs @ 12.09 hrs, Volume= 0.704 af, Depth> 6.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.80"

Area (sf)	CN	Description
61,230	77	2 acre lots, 12% imp, HSG C
53,882		88.00% Pervious Area
7,348		12.00% Impervious Area

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

Subcatchment 2: Lot #2



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Type III 24-hr 100-Year Rainfall=8.80"

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Summary for Subcatchment 3: Portions of Road

Runoff = 2.10 cfs @ 12.09 hrs, Volume= 0.160 af, Depth> 7.10"

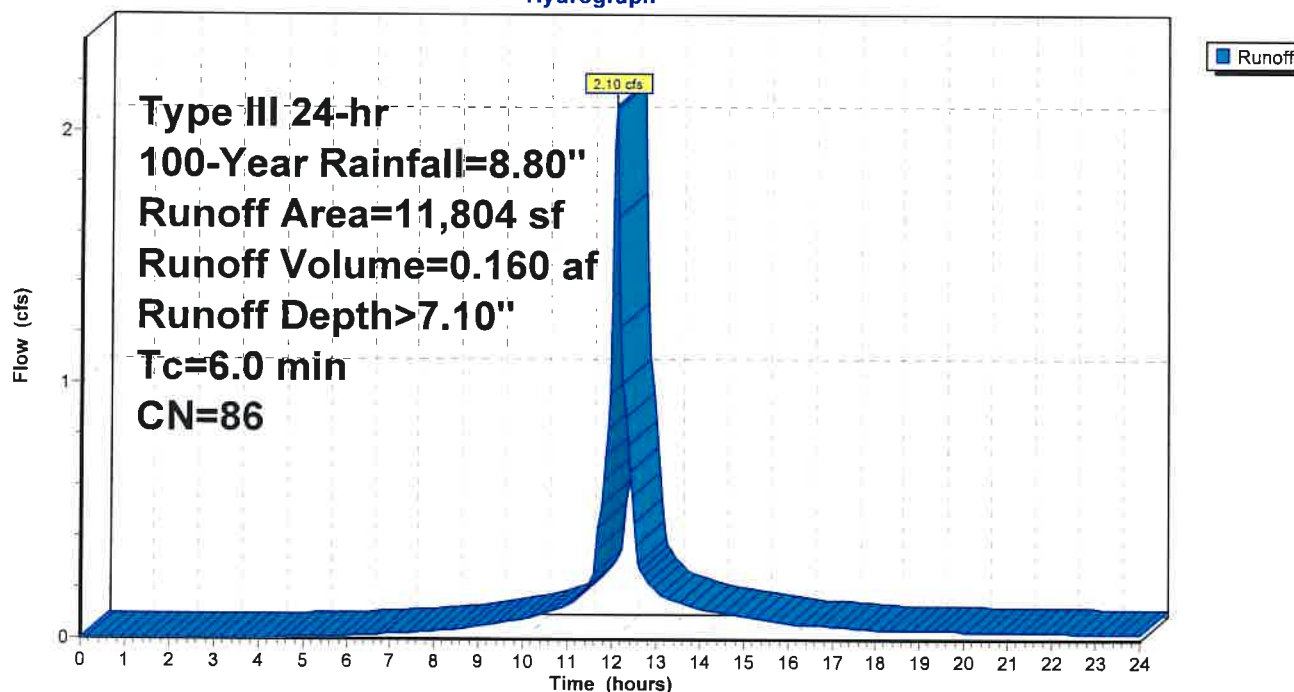
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.80"

Area (sf)	CN	Description
* 5,728	98	Portions of Road
6,076	74	>75% Grass cover, Good, HSG C
11,804	86	Weighted Average
6,076		51.47% Pervious Area
5,728		48.53% Impervious Area

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

Subcatchment 3: Portions of Road

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Type III 24-hr 100-Year Rainfall=8.80"

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Summary for Subcatchment 4: Portions of Road

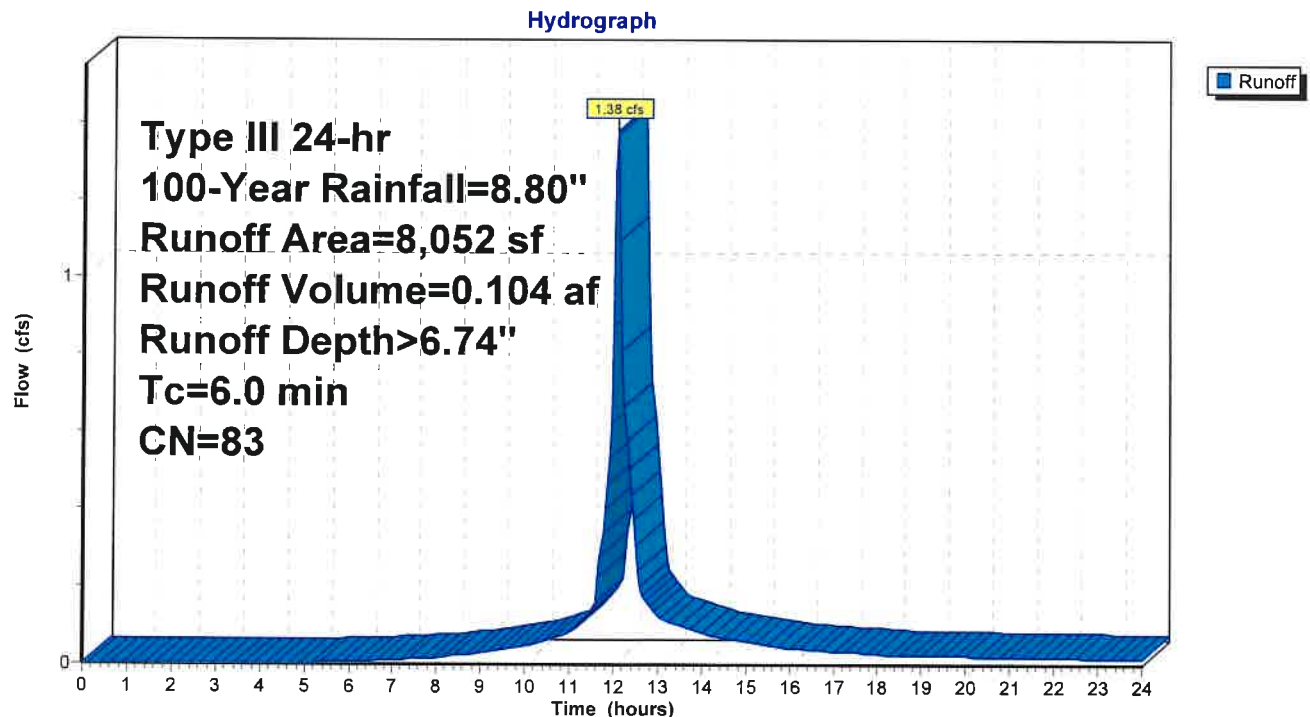
Runoff = 1.38 cfs @ 12.09 hrs, Volume= 0.104 af, Depth> 6.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.80"

	Area (sf)	CN	Description
*	3,052	98	Prop. Roadway
	5,000	74	>75% Grass cover, Good, HSG C
	8,052	83	Weighted Average
	5,000		62.10% Pervious Area
	3,052		37.90% Impervious Area

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

Subcatchment 4: Portions of Road



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Type III 24-hr 100-Year Rainfall=8.80"

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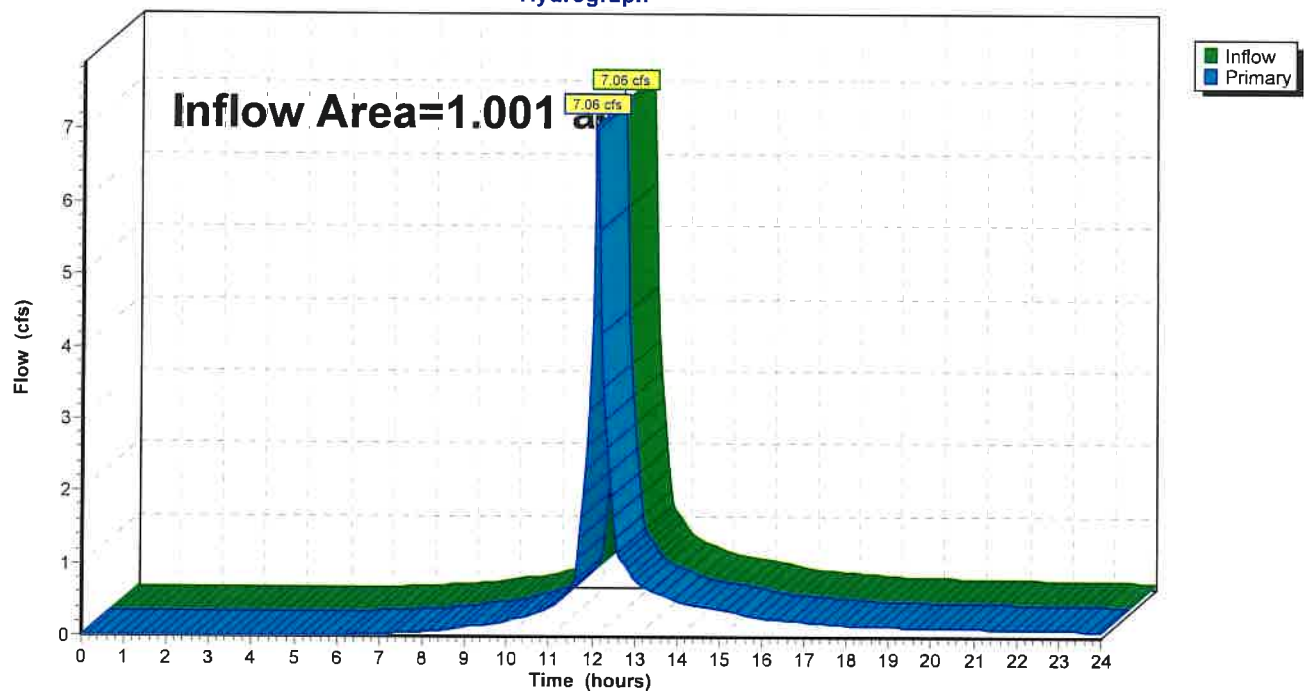
Summary for Pond 1P: South St

Inflow Area = 1.001 ac, 20.00% Impervious, Inflow Depth > 6.65" for 100-Year event
Inflow = 7.06 cfs @ 12.09 hrs, Volume= 0.555 af
Primary = 7.06 cfs @ 12.09 hrs, Volume= 0.555 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 1P: South St

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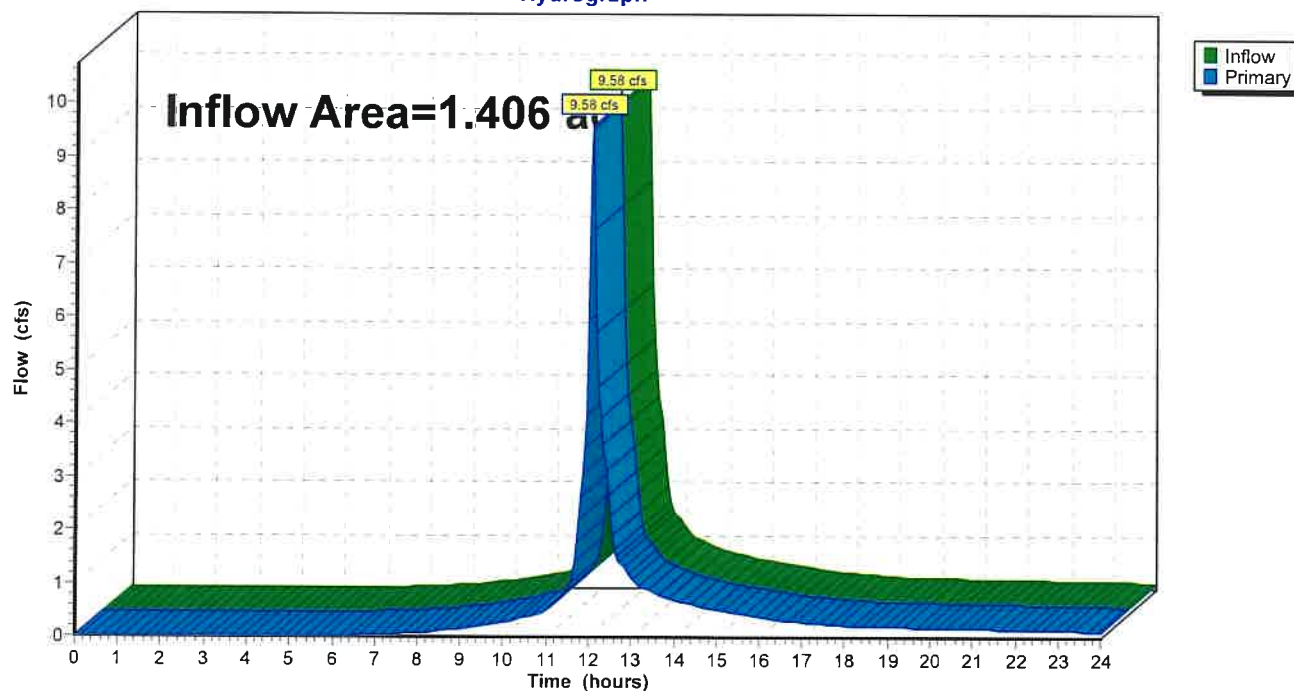
Summary for Pond 2P: Wetland

Inflow Area = 1.406 ac, 12.00% Impervious, Inflow Depth > 6.44" for 100-Year event
Inflow = 9.58 cfs @ 12.09 hrs, Volume= 0.754 af
Primary = 9.58 cfs @ 12.09 hrs, Volume= 0.754 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Pond 2P: Wetland

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Type III 24-hr 100-Year Rainfall=8.80"

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Summary for Pond 3P: Inf. #1

Inflow Area = 0.185 ac, 37.90% Impervious, Inflow Depth > 6.74" for 100-Year event
Inflow = 1.38 cfs @ 12.09 hrs, Volume= 0.104 af
Outflow = 0.16 cfs @ 12.76 hrs, Volume= 0.046 af, Atten= 88%, Lag= 40.5 min
Discarded = 0.01 cfs @ 7.45 hrs, Volume= 0.013 af
Secondary = 0.15 cfs @ 12.76 hrs, Volume= 0.033 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 226.19' @ 12.76 hrs Surf.Area= 0.032 ac Storage= 0.061 af

Plug-Flow detention time= 248.4 min calculated for 0.046 af (44% of inflow)
Center-of-Mass det. time= 129.1 min (921.0 - 791.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	223.46'	0.027 af	20.83'W x 66.50'L x 3.54'H Field A 0.113 af Overall - 0.044 af Embedded = 0.069 af x 40.0% Voids
#2A	223.96'	0.044 af	Cultec R-330XLHD x 36 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
		0.072 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	223.46'	0.270 in/hr Exfiltration over Surface area
#2	Secondary	226.00'	12.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.01 cfs @ 7.45 hrs HW=223.50' (Free Discharge)
↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.15 cfs @ 12.76 hrs HW=226.19' (Free Discharge)
↑2=Orifice/Grate (Orifice Controls 0.15 cfs @ 1.47 fps)

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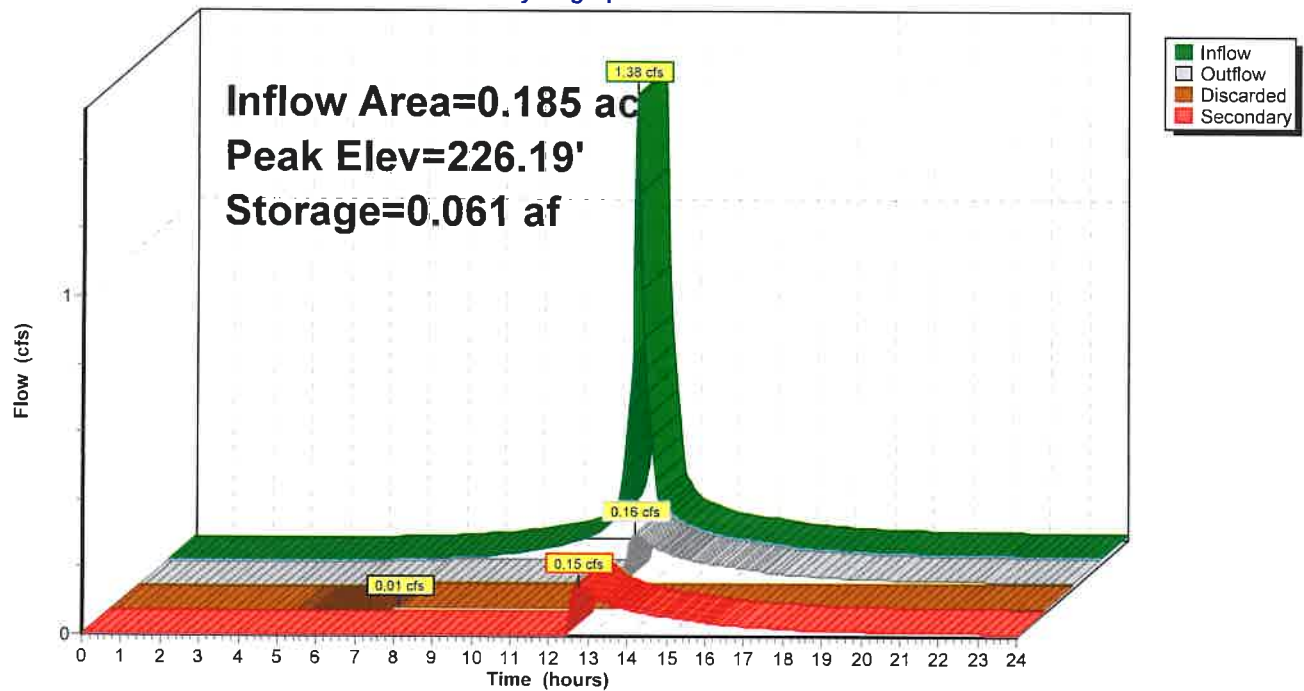
920 South St - Post Development
Type III 24-hr 100-Year Rainfall=8.80"

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Pond 3P: Inf. #1

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.80"

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Summary for Pond 4P: Inf. #2

Inflow Area = 0.271 ac, 48.53% Impervious, Inflow Depth > 7.10" for 100-Year event
Inflow = 2.10 cfs @ 12.09 hrs, Volume= 0.160 af
Outflow = 0.26 cfs @ 12.70 hrs, Volume= 0.069 af, Atten= 88%, Lag= 36.6 min
Discarded = 0.01 cfs @ 6.80 hrs, Volume= 0.018 af
Secondary = 0.24 cfs @ 12.70 hrs, Volume= 0.051 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 228.38' @ 12.70 hrs Surf.Area= 0.043 ac Storage= 0.095 af

Plug-Flow detention time= 253.8 min calculated for 0.068 af (43% of inflow)
Center-of-Mass det. time= 130.7 min (915.0 - 784.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	225.00'	0.037 af	25.67'W x 73.50'L x 3.54'H Field A 0.153 af Overall - 0.061 af Embedded = 0.092 af x 40.0% Voids
#2A	225.50'	0.061 af	Cultec R-330XLHD x 50 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 5 rows
		0.098 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	225.00'	0.270 in/hr Exfiltration over Surface area
#2	Secondary	228.14'	12.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.01 cfs @ 6.80 hrs HW=225.04' (Free Discharge)
↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.24 cfs @ 12.70 hrs HW=228.38' (Free Discharge)
↑2=Orifice/Grate (Orifice Controls 0.24 cfs @ 1.67 fps)

South St - Post Development

Prepared by HP

HydroCAD® 10.00-24 s/n 08768 © 2018 HydroCAD Software Solutions LLC

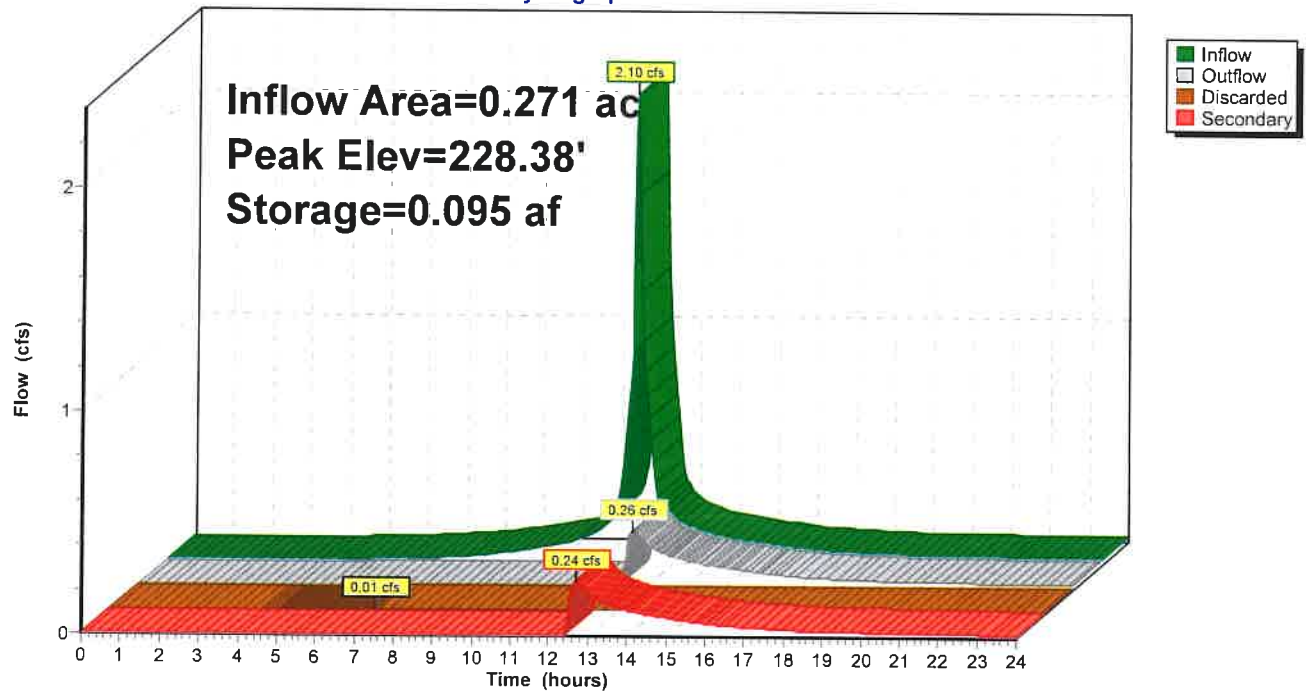
920 South St - Post Development
Type III 24-hr 100-Year Rainfall=8.80"

Printed 9/28/2022

Page 42

Pond 4P: Inf. #2

Hydrograph



Norfolk and Suffolk Counties, Massachusetts

103C—Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2wzp1

Elevation: 0 to 1,390 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Not prime farmland

Map Unit Composition

Charlton, extremely stony, and similar soils: 50 percent

Hollis, extremely stony, and similar soils: 20 percent

Rock outcrop: 10 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton, Extremely Stony

Setting

Landform: Ridges, hills

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex, linear

Across-slope shape: Convex

Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material

A - 2 to 4 inches: fine sandy loam

Bw - 4 to 27 inches: gravelly fine sandy loam

C - 27 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent

Surface area covered with cobbles, stones or boulders: 9.0 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water

(Ksat): Moderately low to high (0.14 to 14.17 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: B

Ecological site: F144AY034CT - Well Drained Till Uplands

Hydric soil rating: No

Description of Hollis, Extremely Stony

Setting

Landform: Ridges, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Nose slope, side slope, crest

Down-slope shape: Convex

Across-slope shape: Linear, convex

Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

A - 2 to 7 inches: gravelly fine sandy loam

Bw - 7 to 16 inches: gravelly fine sandy loam

2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent

Surface area covered with cobbles, stones or boulders: 9.0 percent

Depth to restrictive feature: 8 to 23 inches to lithic bedrock

Drainage class: Somewhat excessively drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low
(0.00 to 0.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D

Ecological site: F144AY033MA - Shallow Dry Till Uplands

Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Ridges, hills

Parent material: Igneous and metamorphic rock

Typical profile

R - 0 to 79 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: 0 inches to lithic bedrock

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low
(0.00 to 0.00 in/hr)

Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydrologic Soil Group: D

Hydric soil rating: No

Minor Components

Woodbridge, extremely stony

Percent of map unit: 8 percent

Landform: Ground moraines, hills, drumlins

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Canton, extremely stony

Percent of map unit: 5 percent

Landform: Moraines, hills, ridges

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex, linear

Across-slope shape: Convex

Hydric soil rating: No

Chatfield, extremely stony

Percent of map unit: 5 percent

Landform: Ridges, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Nose slope, side slope,
crest

Down-slope shape: Convex

Across-slope shape: Linear, convex

Hydric soil rating: No

Ridgebury, extremely stony

Percent of map unit: 2 percent

Landform: Hills, drainageways, drumlins, depressions, ground
moraines

Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Head slope, base slope

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts

Survey Area Data: Version 17, Sep 3, 2021

Soil Map—Norfolk and Suffolk Counties, Massachusetts



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

9/28/2022
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFO

The soil surveys that comprise your map are at a scale of 1:25,000.

Warning: Soil Map may not be valid

Enlargement of maps beyond the scale may lead to a misunderstanding of the detail of map line placement. The maps do not show contrasting soils that could have been shown at a larger scale.

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

Source of Map: Natural Resource
Web Soil Survey URL:

Coordinate System: Web Mercator

Maps from the Web Soil Survey are in the Web Mercator projection, which preserves directional distance and area. A projection that uses the Albers equal-area conic projection, for more accurate calculations of distance or area.

This product is generated from the data of the version date(s) listed below.

Soil Survey Area: Norfolk and Suffolk Counties
Survey Area Data: Version 17, September 2017

Soil map units are labeled (as space permits) at a scale of 1:50,000 or larger.

Date(s) aerial images were photographed: 2017, 2022

The orthophoto or other base map is a composite of aerial imagery compiled and digitized probably during different years. Shifting of map unit boundaries may occur.

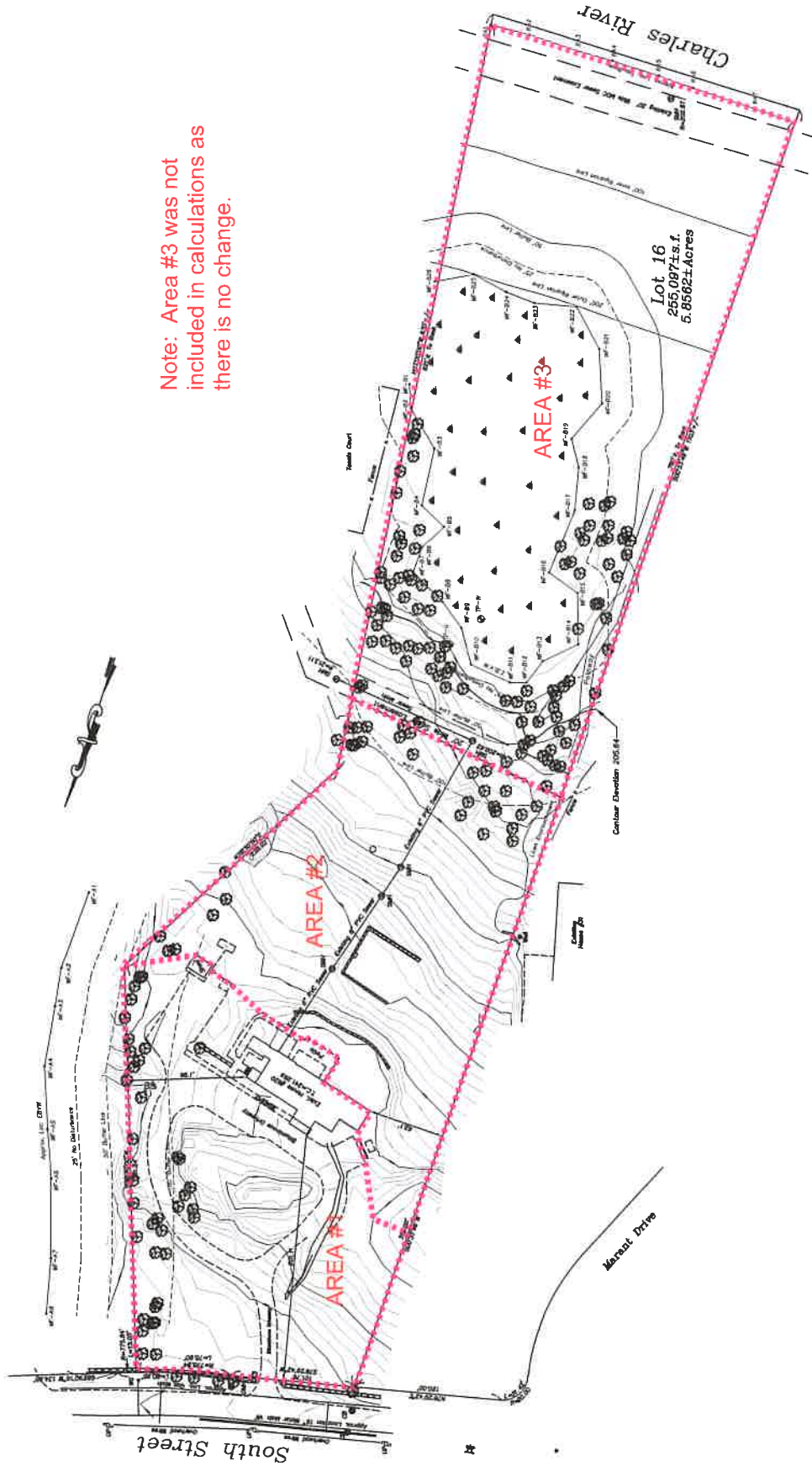


Natural Resources
Conservation Service

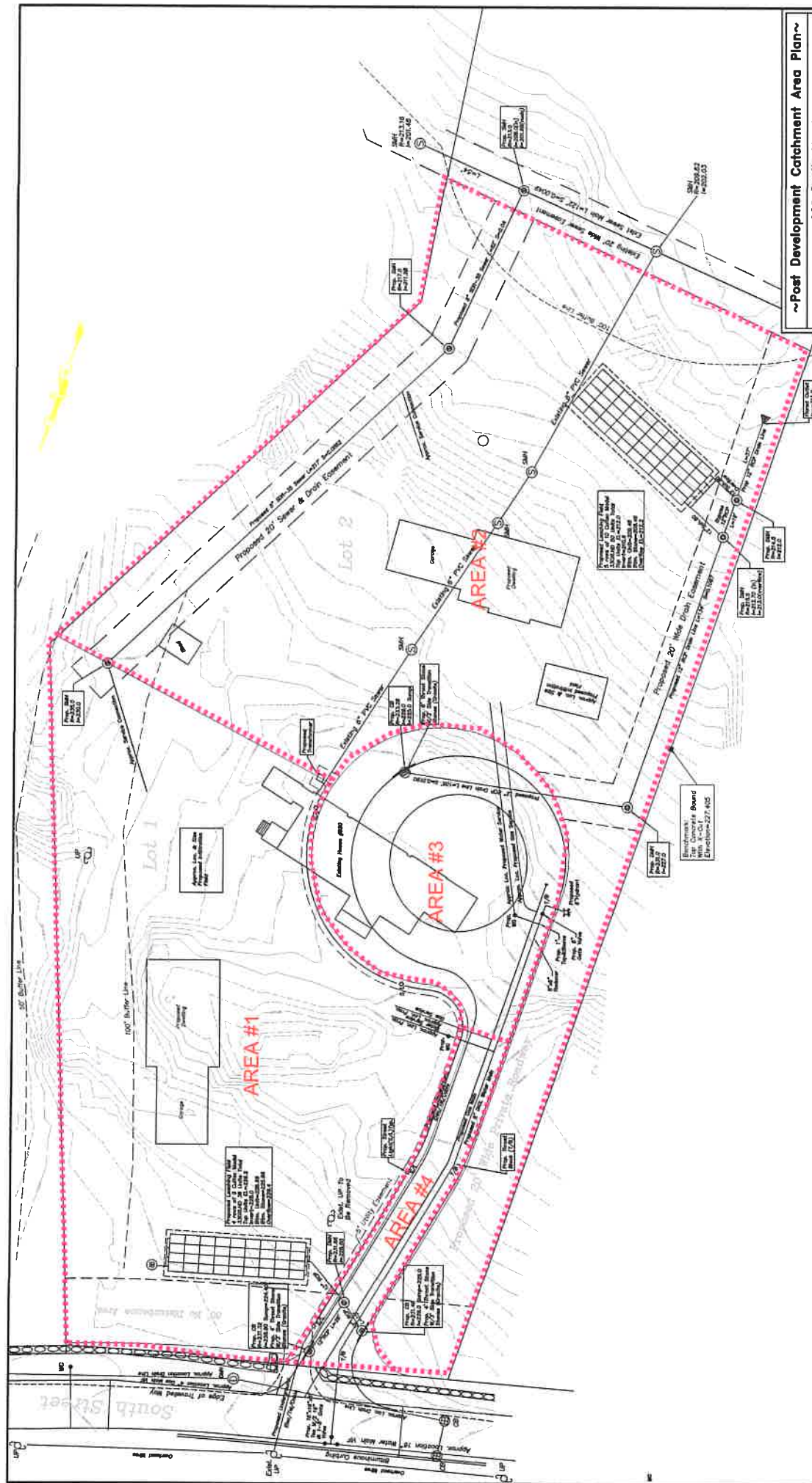
Web Soil Survey
National Cooperative Soil Survey

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
103C	Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes	2.1	100.0%
Totals for Area of Interest		2.1	100.0%



~Pre Development Catchment Area Plan~	
920 South Street	Needham, Massachusetts
Scale: n.f.s.	September 28, 2022
VERNE T. PORTER Jr, PLS	
Land Surveyors - Civil Engineers	
354 Elliot Street, Newton, Ma. 02464	
Project: 22018	Designed By:
Drawn By:	Checked By:
Sheet 1 of 2	



~Post Development Catchment Area Plan~	
920 South Street	
Needham, Massachusetts	
Scale: n.t.s.,	September 28, 2022
VERNE T. PORTER JR, PLS	
Land Surveyors - Civil Engineers	
354 Elliot Street, Newton, Ma. 02464	
Project: 2019	
Designed By:	Drawn By:
Checked By:	
Sheet 2 of 2	

Owner/Applicant:
 Brian Corrigan
 1000 North Main Street
 Needham, MA 02462
 Cell: 617-779-7799

GEORGE GIUNTA, JR.
ATTORNEY AT LAW*
281 CHESTNUT STREET
NEEDHAM, MASSACHUSETTS 02492
*Also admitted in Maryland

TELEPHONE (781) 449-4520

FAX (781) 465-6095

November 16, 2022

Lee Newman
Planning Director
Town of Needham
1471 Highland Avenue
Needham, MA 02492

Re: 920 South Street
Application for Public Hearing Under the Scenic Road Act
Brian Connaughton

Dear Lee,

In connection with the above referenced Application for Public Hearing Under the Scenic Road Act relative to the property at 920 South Street, Needham, MA 02492 (the "Premises"), provided herewith please find a "Street Opening Sketch Plan", dated November 14, 2022, prepared by Verne T. Porter, Jr., PLS (hereinafter the "Sketch Plan"). Same is provided to supplement the previously submitted Definitive Subdivision materials and Application for Public Hearing Under the Scenic Road Act.

As shown on the Sketch Plan, there is approximately 26 feet of existing stone wall that needs to be removed to make way for the proposed new subdivision roadway. In addition, a short return, at the new end of the wall is proposed, to match the existing stone wall return on the opposite side.

In addition, two trees need to be removed that are partially within the layout of South Street. One is an 18 inch diameter tree that is situated 14 inches in the layout of South Street and 4 inches on the Premises, and the other is a 22 inch diameter tree, situated 6 inches in the layout of South Street and 16 inches on the Premises. Whereas M.G.L. c.87, Section 1 defines a public shade tree to include "all trees within a public way *or on the boundaries thereof*" (emphasis added), the two trees appear to qualify as public shade trees. Therefore same will need to be addressed through a public hearing held simultaneous with the Scenic Road Act hearing. A separate written request for removal of the two trees and the necessary hearing is being provided to you and to the Tree Warden simultaneous herewith.

Please do not hesitate to let me know if you have any questions or require anything further. As always, your courtesy and assistance are appreciated.

Sincerely,

A handwritten signature in black ink, appearing to read "G. Giunta, Jr.", with a stylized, cursive script.

George Giunta, Jr.

CC Edward Olsen, Parks and Forestry Superintendent

GEORGE GIUNTA, JR.
ATTORNEY AT LAW*
281 CHESTNUT STREET
NEEDHAM, MASSACHUSETTS 02492
*Also admitted in Maryland

TELEPHONE (781) 449-4520

FAX (781) 465-6095

November 16, 2022

Edward Olsen
Parks and Forestry Superintendent
Town of Needham
500 Dedham Avenue
Needham, MA 02492

Re: 920 South Street
Request for removal of Public Shade Trees
Brian Connaughton

Greetings Superintendent Olsen,

Please be advised that I represent Brian Connaughton relative to his property at 920 South Street, Needham, MA 02492 (the "Premises") and his intent to subdivide same into two buildable lots. In connection therewith, two trees need to be removed that are partially within the layout of South Street, as shown on "Street Opening Sketch Plan", dated November 14, 2022, prepared by Verne T. Porter, Jr., PLS (hereinafter the "Sketch Plan"), provided herewith. One is an 18 inch diameter tree that is situated 14 inches in the layout of South Street and 4 inches on the Premises, and the other is a 22 inch diameter tree, situated 6 inches in the layout of South Street and 16 inches on the Premises. Whereas M.G.L. c.87, Section 1 defines a public shade tree to include "all trees within a public way *or on the boundaries thereof*" (emphasis added), the two trees appear to qualify as public shade trees.

Therefore, please accept this letter as a formal request to remove the said two trees, as well as the necessary hearing relative thereto, to be held simultaneous with the pending Scenic Road hearing with the Planning Board.

Please do not hesitate to let me know if you have any questions or require anything further. Your courtesy and cooperation are appreciated.

Sincerely,



George Giunta, Jr.

CC Lee Newman, Planning Director

South Street

Driveway Ent.
Existing 18'

26' of Wall To Be
Removed

5" Town Tree
To Remain

29" Town Tree
To Remain

Existing Stone Wall—To Remain

19" Town Tree
To Remain

32" Town Tree
To Remain

20" Town Tree
To Remain

Existing Stone Wall
To Remain

Parcel "A"

Street Line

22" To Be
Removed 6"
In Street/16"
on Locus

19" To Be
Removed

20" To Be
Removed

18" To Be
Removed 14"
In Street/4"
on Locus

Proposed Wall
Return Match
Existing Easterly
Return

6" To Be
Removed

36" = Tree Diameter



Lot 1

Existing Bituminous Driveway

5' Utility Easement

Proposed 20' Wide Private Roadway

Lot 2

STREET OPENING SKETCH PLAN
920 SOUTH STREET
NEEDHAM, MASSACHUSETTS
SCALE: 1"=10' NOVEMBER 14, 2022
VERNE T. PORTER JR., PLS
354 ELLIOT STREET, NEWTON, MA. 02464

GEORGE GIUNTA, JR.
ATTORNEY AT LAW*
281 CHESTNUT STREET
NEEDHAM, MASSACHUSETTS 02492
*Also admitted in Maryland

TELEPHONE (781) 449-4520

FAX (781) 465-6095

March 7, 2023

Lee Newman, Planning Director
Town of Needham
1471 Highland Avenue
Needham, MA 02492

Re: 920 South Street
Definitive Subdivision Application
Scenic Road and Public Shade Tree

Dear Lee,

In connection with the pending applications for Definitive Subdivision, Scenic Road Act and Public Shade Tree relative to the property at 920 South Street, Needham, MA 02492 (the "Premises"), provided herewith please find a revised set of plans. Significant changes from the original set include the following:

1. The elevation of the road has been lowered, which in turn has resulted in changes to the grading design;
2. A 10 foot buffer planting strip and a 5 foot drainage swale have been added along a portion of the westerly sideline;
3. The drain line has been relocated from the west side to the east side of the property;
4. Prospective house footprints have been added to better refine the anticipated interior grading, especially as relates to proposed Lot 2; and
5. Additional detail has been added to the plan relative to the interior grading.

Please let me know if you have any questions or require anything further prior to the next hearing. As always, your courtesy and assistance are appreciated.

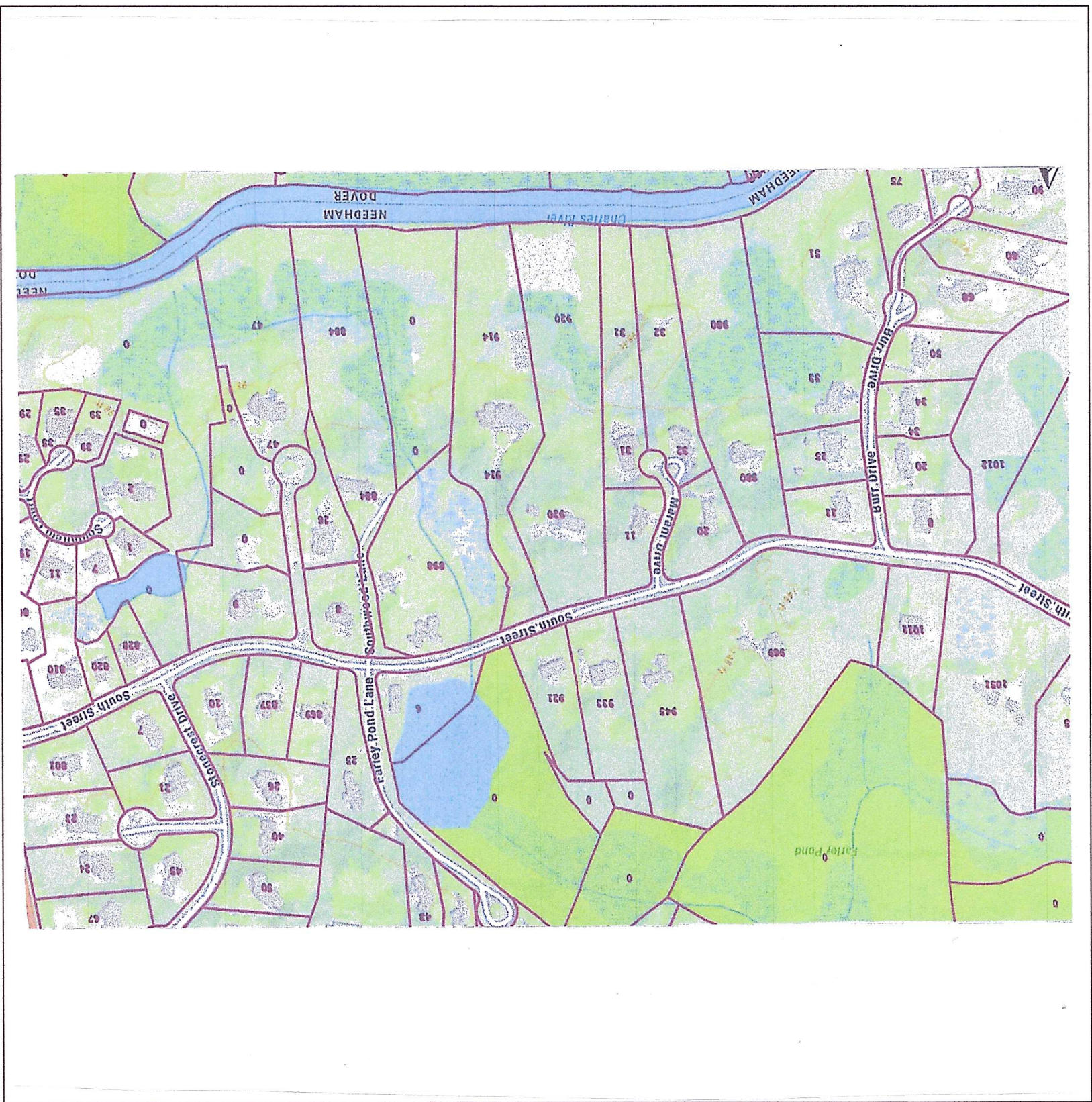
Sincerely,



George Giunta, Jr.

Definitive Subdivision Plan
~920 South Street~
Needham, Massachusetts

FOR REGISTRY USE ONLY



Locus Map

Scale 1"=400'

1. THIS PLAN WAS MADE FROM AN ACTUAL ON THE GROUND SURVEY BY THIS OFFICE
2. THE SUBJECT PROPERTY IS LOCATED IN THE RURAL RESIDENTIAL ZONE
3. ASSESSORS MAP 205 PARCEL 7
4. UTILITIES SHOWN WERE COMPILED FROM BEST AVAILABLE INFORMATION AND ACTUAL FIELD LOCATIONS. THEY MAY OR MAY NOT BE COMPLETE OR CORRECT. CONTRACTOR TO FIELD VERIFY ALL LOCATIONS AND DEPTHS PRIOR TO ANY EXCAVATION.
5. 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.
6. WETLANDS DELINEATIONS PERFORMED BY ECOTEC INC.
7. LOCUS IS LOCATED IN THE FOLLOWING FLOOD ZONE PER FEMA FLOOD INSURANCE RATE MAP NUMBER 25021C0038E DATED 7-17-2012

Zone Rural Residence Conservation
43,560s.f. Minimum
150' Lot Frontage
50' Front Setback
25' Side Setback
25' Rear Setback
FAR Not Applicable
Max. Lot Coverage 15%
Max. Stories 2 1/2
Max. Height 35'

Owner/Applicant:
Brian Connaughton
920 South Street
Needham, Ma. 02492
Cert. #207299

DIRECTOR OF PUBLIC WORKS	
DATE APPROVED	
TOWN ENGINEER	
DATE APPROVED	
I, TOWN CLERK OF THE TOWN OF NEEDHAM, HEREBY CERTIFY THAT THE NOTICE OF THE PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE TWENTY DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SAID NOTICE	
DATE	TOWN CLERK

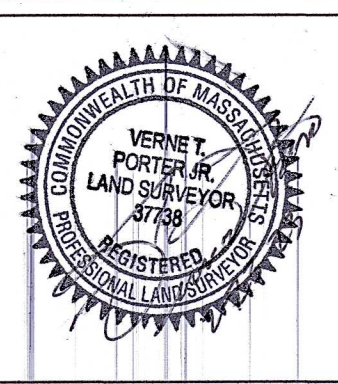
APPROVAL IN ACCORDANCE WITH SECTION 91-U OF CHAPTER 41 OF THE GENERAL LAWS AS AMENDED	
TOWN OF NEEDHAM PLANNING BOARD	
BY:	
APPROVED:	

I CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS PLAN IS TRUE AND CORRECT TO THE ACCURACY REQUIRED BY THE SUBDIVISION REGULATIONS AND PROCEDURAL RULES OF THE NEEDHAM PLANNING BOARD.

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

Verne T. Porter Jr. 2-23-23

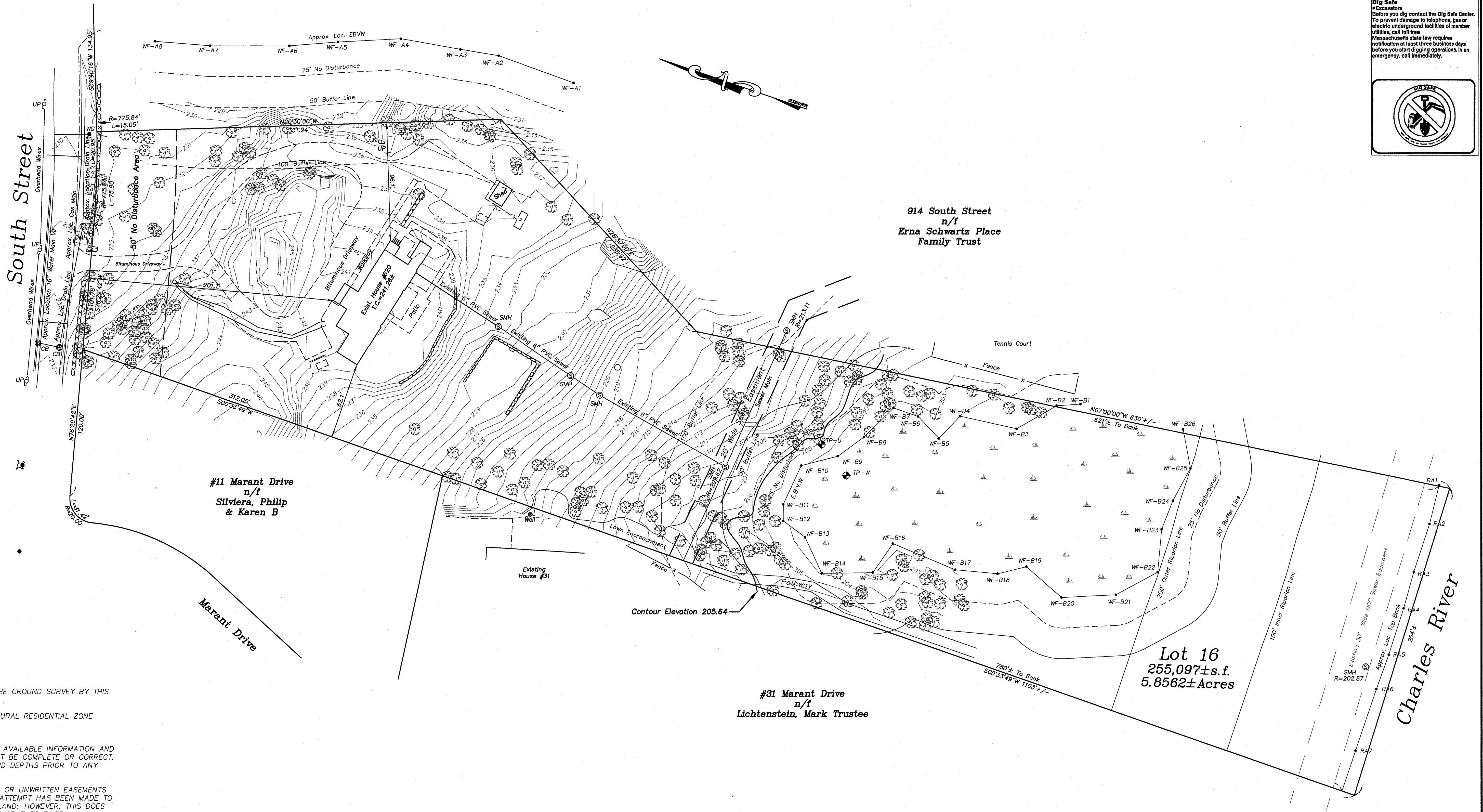
REVISIONS	
DATE	DESCRIPTION
1-19-23	ADDED HOUSE FOOTPRINTS & GRADING
2-23-23	GRADING, EASEMENTS, BUFFER STRIP, ETC.



~Title Sheet~	
920 South Street	
Needham, Massachusetts	
Scale: As Noted	September 9, 2022
VERNE T. PORTER Jr., PLS	
Land Surveyors - Civil Engineers	
354 Elliot Street Newton, Massachusetts 02464	
	Design By:
Cover Sheet	Checked By:
#22019	Drawn By:

Legend

- =Erosion Control
- =Trench Drain
- ⊕ =Catch Basin
- ⊕ =Drain ManHole
- ⊕ =Sewer ManHole
- ⊕ =Hydrant
- =Gas Gate
- =Water Gate
- ⊕ =Gas Gate
- ⊕ =Water Gate
- ⊕ =Utility Pole
- ⊕ =Light Pole
- ⊕ =Test Pit
- ⊕ =Wetland Flag
- WF-B16
- ⊕ =Vegetated Wetland
- ⊕ =Tree To Remain
- ⊕ =Tree To Be Removed
- R=100.00 =Rim Elevation
- I=90.00 =Invert Elevation
- T.C.=103.00 =Top of Concrete Elevation
- 63x3 =Proposed Spot Elevation
- 63x3 =Proposed Contour Line
- 64 =Existing Contour Line
- 63x3 =Existing Spot Elevation
- x =Existing Fence
- ⊕ =Proposed D-Stone
- S8519°54'E
102.45' =Property Line W/Bearing & Distance



Dig Safe
 Before you dig contact the Dig Safe Center.
 To prevent damage to telephone, gas or electric underground facilities of member utilities, call toll free
 Massachusetts state law requires notification at least three business days before you start digging operations. In an emergency, call immediately.



1. THIS PLAN WAS MADE FROM AN ACTUAL ON THE GROUND SURVEY BY THIS OFFICE
2. THE SUBJECT PROPERTY IS LOCATED IN THE RURAL RESIDENTIAL ZONE
3. ASSESSORS MAP 205 PARCEL 7
4. UTILITIES SHOWN WHERE COMPILED FROM BEST AVAILABLE INFORMATION AND ACTUAL FIELD LOCATIONS. THEY MAY OR MAY NOT BE COMPLETE OR CORRECT. CONTRACTOR TO FIELD VERIFY ALL LOCATIONS AND DEPTHS PRIOR TO ANY EXCAVATION.
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6. WETLANDS DELINEATIONS PERFORMED BY ECOTEC INC.
7. LOCUS IS LOCATED IN THE FOLLOWING FLOOD ZONE PER FEMA FLOOD INSURANCE RATE MAP NUMBER 25021C0038E DATED 7-17-2012

DIRECTOR OF PUBLIC WORKS	
DATE APPROVED	
TOWN ENGINEER	
DATE APPROVED	
I, TOWN CLERK OF THE TOWN OF NEEDHAM, HEREBY CERTIFY THAT THE NOTICE OF THE PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE TWENTY DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SAID NOTICE	
DATE	TOWN CLERK

APPROVAL IN ACCORDANCE WITH SECTION 91-U OF CHAPTER 41 OF THE GENERAL LAWS AS AMENDED	
TOWN OF NEEDHAM PLANNING BOARD	
BY:	
APPROVED:	

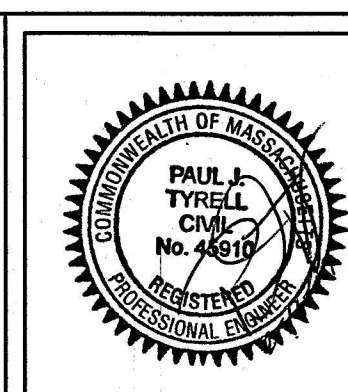
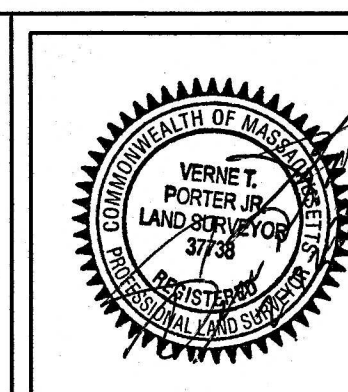
I CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS PLAN IS TRUE AND CORRECT TO THE ACCURACY REQUIRED BY THE SUBDIVISION REGULATIONS AND PROCEDURAL RULES OF THE NEEDHAM PLANNING BOARD.

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

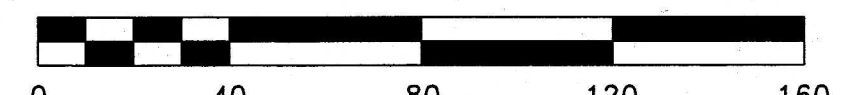
Verne T. Porter Jr. 2-23-23

Owner/Applicant:
 Brian Connaughton
 920 South Street
 Needham, Ma. 02492
 Cert. #207299

REVISIONS	
DATE	DESCRIPTION
1-19-23	NO REVISIONS MADE
2-23-23	NO REVISIONS MADE

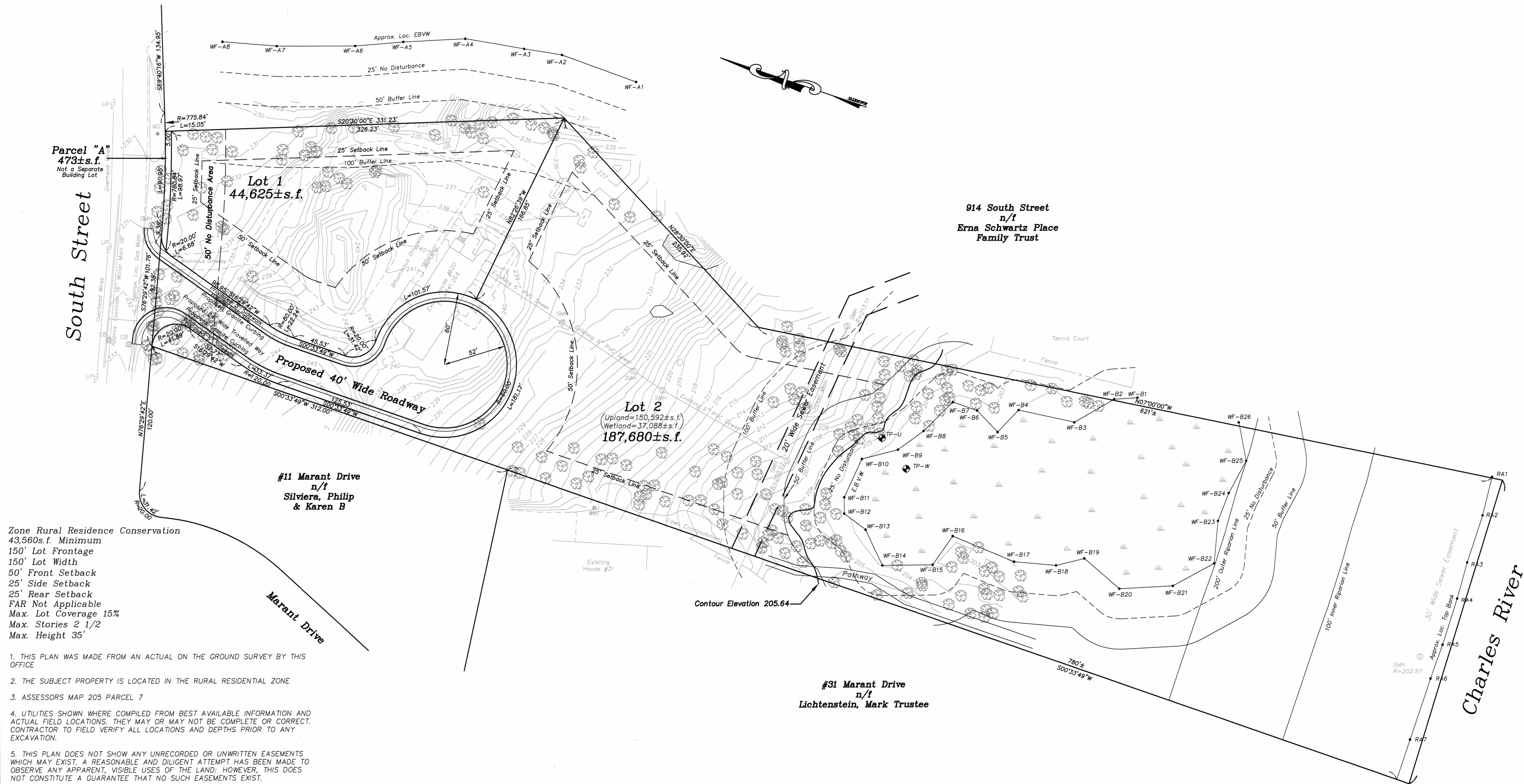


~Existing Conditions Site Plan~	
920 South Street	
Needham, Massachusetts	
Scale: 1"=40'	September 9, 2022
VERNE T. PORTER Jr, PLS	
Land Surveyors - Civil Engineers	
354 Elliot Street, Newton, Ma. 02464	
Project:22019	
Desinged By:	
Drawn By:	
Checked By:	



Sheet 1 of 8

Dig Safe
Excavators
Before you dig, contact the Dig Safe Center.
To prevent damage to telephone, gas or
electric underground facilities of member
utilities, call toll free
Massachusetts state law requires
notification at least three business days
before you start digging operations. In an
emergency, call immediately.



Zone Rural Residence Conservation
43,560s.f. Minimum
150' Lot Frontage
150' Lot Width
50' Front Setback
25' Side Setback
25' Rear Setback
FAR Not Applicable
Max. Lot Coverage 15%
Max. Stories 2 1/2
Max. Height 35'

1. THIS PLAN WAS MADE FROM AN ACTUAL ON THE GROUND SURVEY BY THIS OFFICE
2. THE SUBJECT PROPERTY IS LOCATED IN THE RURAL RESIDENTIAL ZONE
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6. WETLANDS DELINEATIONS PERFORMED BY ECOTEC INC.
7. LOCUS IS LOCATED IN THE FOLLOWING FLOOD ZONE PER FEMA FLOOD INSURANCE RATE MAP NUMBER 25021C0038E DATED 7-17-2012

DIRECTOR OF PUBLIC WORKS	
DATE APPROVED	
TOWN ENGINEER	
DATE APPROVED	
I, TOWN CLERK OF THE TOWN OF NEEDHAM, HEREBY CERTIFY THAT THE NOTICE OF THE PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE TWENTY DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SAID NOTICE	
DATE	TOWN CLERK

APPROVAL IN ACCORDANCE WITH SECTION 91-U OF CHAPTER 41 OF THE GENERAL LAWS AS AMENDED	
TOWN OF NEEDHAM PLANNING BOARD	
BY:	
APPROVED:	

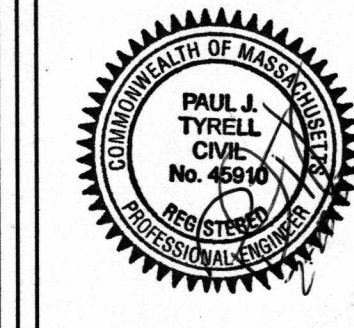
I CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS PLAN IS TRUE AND CORRECT TO THE ACCURACY REQUIRED BY THE SUBDIVISION REGULATIONS AND PROCEDURAL RULES OF THE NEEDHAM PLANNING BOARD.

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

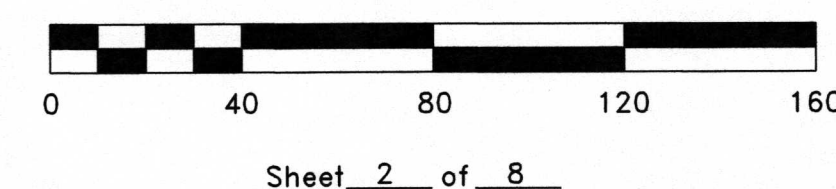
Verne T. Porter Jr.
2-23-23

Owner/Applicant:
Brian Connaughton
920 South Street
Needham, Ma. 02492
Cert. #207299

REVISIONS	
DATE	DESCRIPTION
1-19-23	NO REVISIONS MADE
2-23-23	NO REVISIONS MADE



~By Right Subdivision Plan of Land~	
920 South Street	
Needham, Massachusetts	
Scale: 1"=40'	September 9, 2022
VERNE T. PORTER Jr, PLS	
Land Surveyors - Civil Engineers	
354 Elliot Street, Newton, Ma. 02464	
Project:22019	
Desinged By:	
Drawn By:	
Checked By:	



Sheet 2 of 8

South Street

Parcel "A"
517±s.f.
Not A Separate
Building Lot

Lot 1
43,617±s.f.
B.F.=19.08

914 South Street
n/f
Erna Schwartz Place
Family Trust

Lot 2
(Upland=157,803±s.f.
Wetland=37,089±s.f.)
194,892±s.f.
4.4741 Acres
B.F.=9.08

#11 Marant Drive
n/f
Silviera, Philip
& Karen B

#31 Marant Drive
n/f
Lichtenstein, Mark Trustee

Charles River

Zone Rural Residence Conservation
43,560s.f. Minimum
150' Lot Frontage
50' Front Setback
25' Side Setback
25' Rear Setback
FAR Not Applicable
Max. Lot Coverage 15%
Max. Stories 2 1/2
Max. Height 35'

1. THIS PLAN WAS MADE FROM AN ACTUAL ON THE GROUND SURVEY BY THIS OFFICE
2. THE SUBJECT PROPERTY IS LOCATED IN THE RURAL RESIDENTIAL ZONE
3. ASSESSORS MAP 205 PARCEL 7
4. UTILITIES SHOWN WERE COMPILED FROM BEST AVAILABLE INFORMATION AND ACTUAL FIELD LOCATIONS. THEY MAY OR MAY NOT BE COMPLETE OR CORRECT. CONTRACTOR TO FIELD VERIFY ALL LOCATIONS AND DEPTHS PRIOR TO ANY EXCAVATION.
5. 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.
6. WETLANDS DELINEATIONS PERFORMED BY ECOTEC INC.
7. LOCUS IS LOCATED IN THE FOLLOWING FLOOD ZONE PER FEMA FLOOD INSURANCE RATE MAP NUMBER 25021C0038E DATED 7-17-2012

Total Lot Area=255,097±s.f.
Roadway Area=16,071±s.f.

DIRECTOR OF PUBLIC WORKS	
DATE APPROVED	
TOWN ENGINEER	
DATE APPROVED	
I, TOWN CLERK OF THE TOWN OF NEEDHAM, HEREBY CERTIFY THAT THE NOTICE OF THE PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE TWENTY DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SAID NOTICE	
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APPROVED:	

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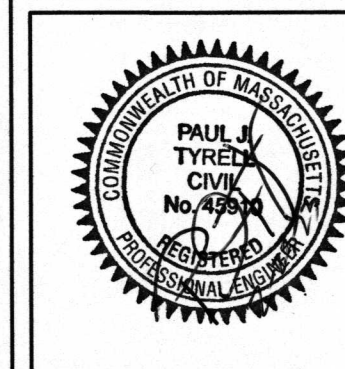
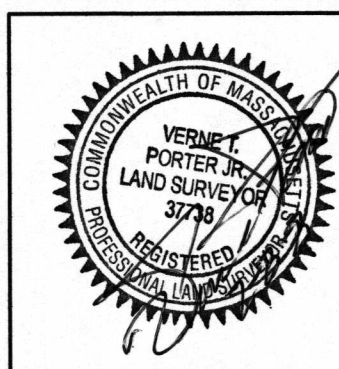
I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

Verne T. Porter Jr.

2-23-23

Owner/Applicant:
Brian Connaughton
920 South Street
Needham, Ma. 02492
Cert. #207299

REVISIONS	
DATE	DESCRIPTION
10-5-22	LOT WIDTHS ADDED
1-19-23	NO REVISIONS MADE
2-23-23	REVISED DRAIN EASEMENTS



~Proposed Lotting Plan of Land~

920 South Street

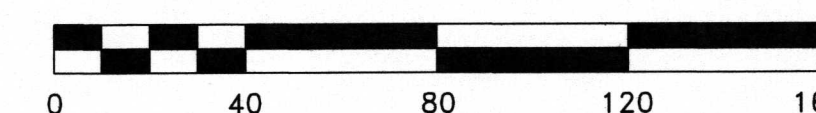
Needham, Massachusetts

Scale: 1"=40' September 9, 2022

VERNE T. PORTER Jr, PLS

Land Surveyors - Civil Engineers

354 Elliot Street, Newton, Ma. 02464



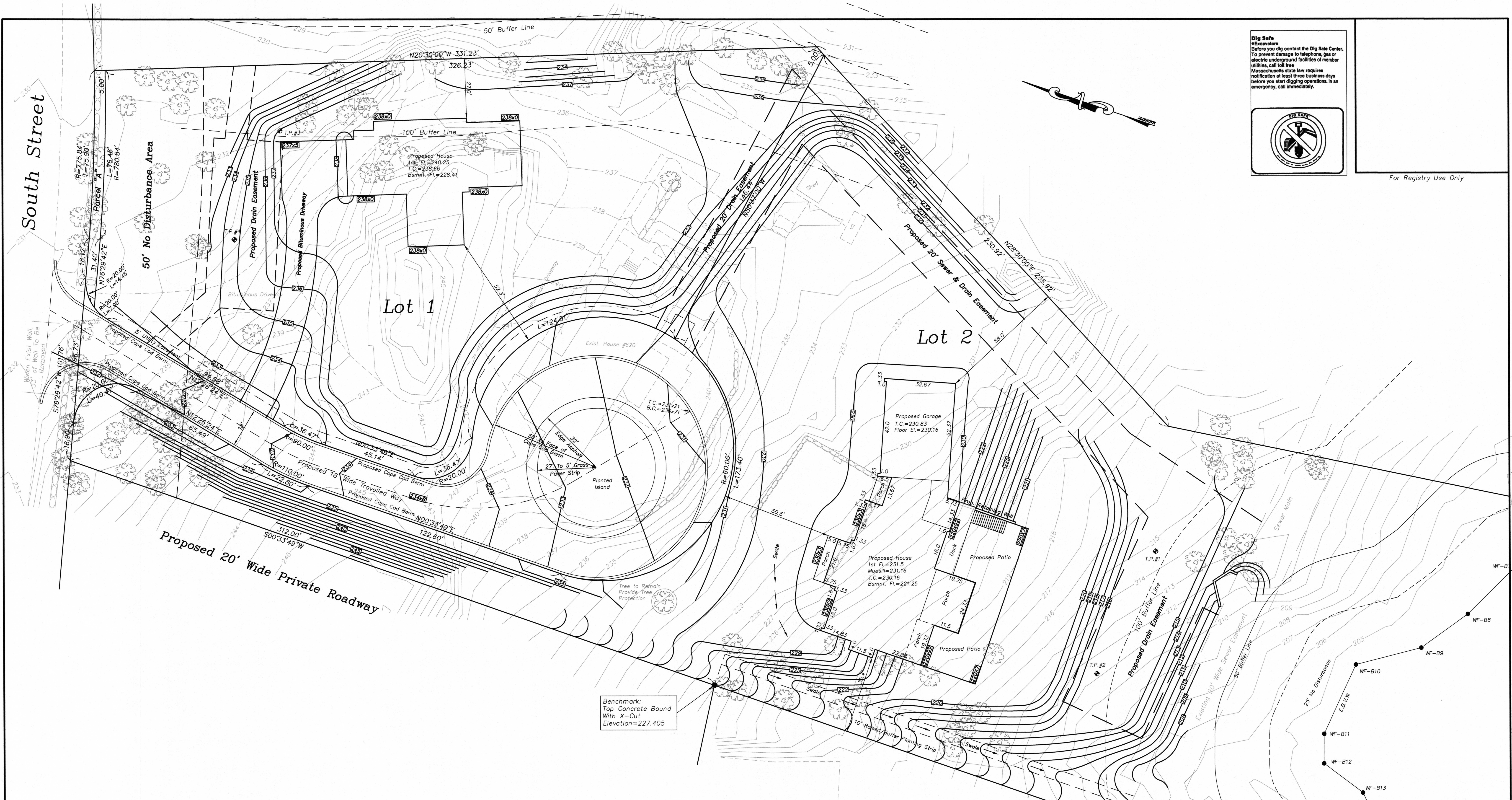
Sheet 3 of 8

Project:22019

Desinged By:

Drawn By:

Checked By:



Dig Safe
Excavators
Before you dig contact the Dig Safe Center.
To prevent damage to telephone, gas or
electric underground facilities of member
utilities, call toll free
Massachusetts state law requires
notification at least three business days
before you start digging operations. In an
emergency, call immediately.



For Registry Use Only

DIRECTOR OF PUBLIC WORKS	
DATE APPROVED	
TOWN ENGINEER	
DATE APPROVED	
I, TOWN CLERK OF THE TOWN OF NEEDHAM, HEREBY CERTIFY THAT THE NOTICE OF THE PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE TWENTY DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SAID NOTICE	
DATE	TOWN CLERK

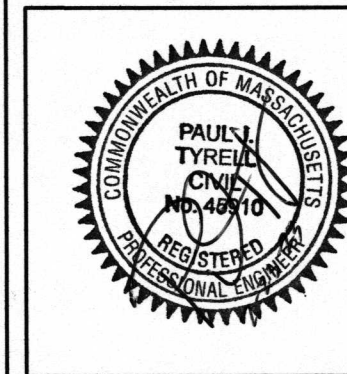
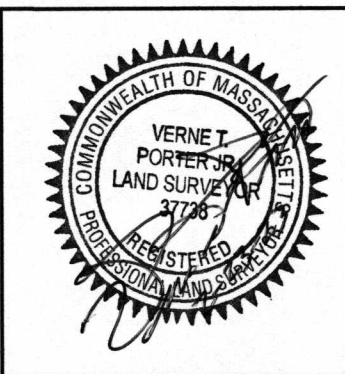
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BY:	
APPROVED:	

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Brian Connaughton 2-23-23

Owner/Applicant:
Brian Connaughton
920 South Street
Needham, Ma. 02492
Cert. #207299

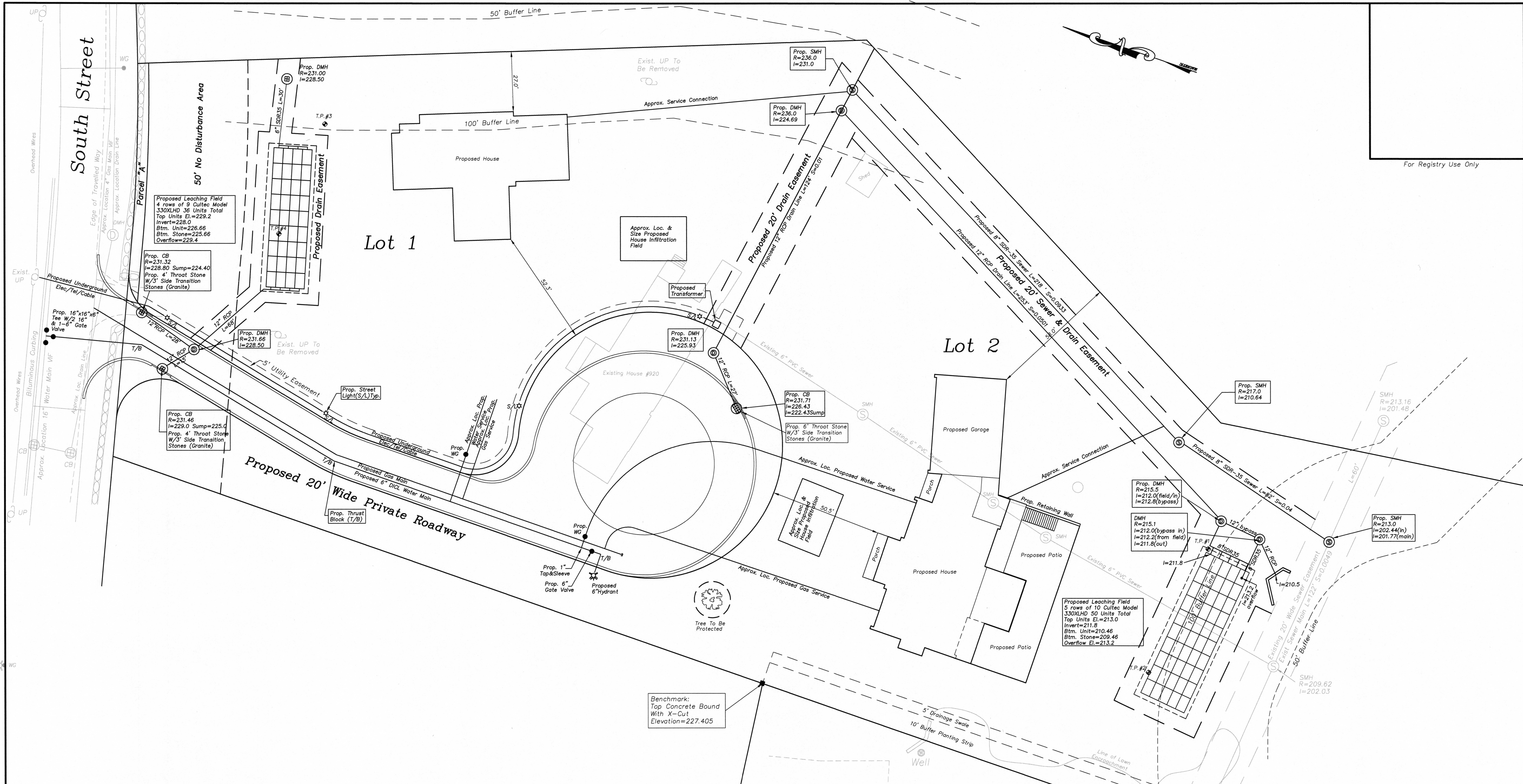
REVISIONS	
DATE	DESCRIPTION
1-19-23	ADDED HOUSE FOOTPRINTS & GRADING
2-23-23	LOT & ROAD GRADING, ELEVATIONS, SWALE



~Proposed Grading Plan~	
920 South Street	
Needham, Massachusetts	
Scale: 1"=20'	September 9, 2022
VERNE T. PORTER Jr, PLS	
Land Surveyors - Civil Engineers	
354 Elliot Street, Newton, Ma. 02464	
Project:22019	
Desinged By:	
Drawn By:	
Checked By:	

0 20 40 60 80

Sheet 4 of 8



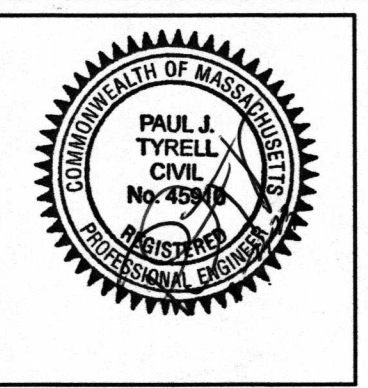
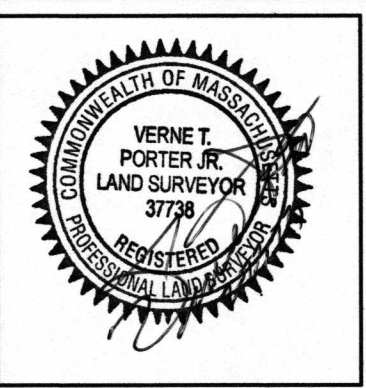
DIRECTOR OF PUBLIC WORKS	
DATE APPROVED	
TOWN ENGINEER	
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Verne T. Porter Jr. 2-23-23

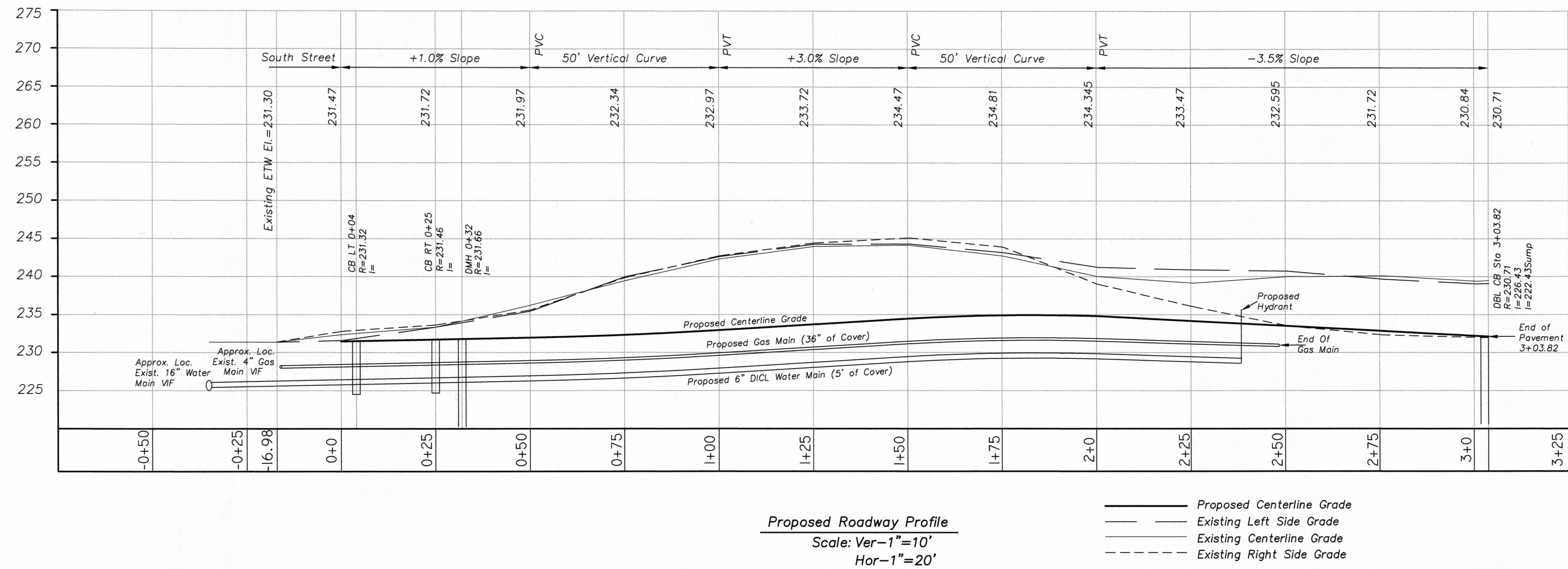
REVISIONS	
DATE	DESCRIPTION
1-19-23	ADDED HOUSE FOOTPRINTS & GRADING
2-23-23	EASEMENTS, BUFFER STRIP, SWALE



~Proposed Utilities Plan~	
920 South Street	
Needham, Massachusetts	
Scale: 1"=20'	September 9, 2022
VERNE T. PORTER Jr, PLS	
Land Surveyors - Civil Engineers	
354 Elliot Street, Newton, Ma. 02464	
Project:22019	
Designed By:	
Drawn By:	
Checked By:	

Sheet 5 of 8

Dig Safe
Excavators
Before you dig contact the Dig Safe Center.
To prevent damage to telephone, gas or electric underground facilities of member utilities, call toll free
Massachusetts state law requires notification at least three business days before you start digging operations. In an emergency, call immediately.



DIRECTOR OF PUBLIC WORKS	
DATE APPROVED	
TOWN ENGINEER	
DATE APPROVED	
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DATE	TOWN CLERK

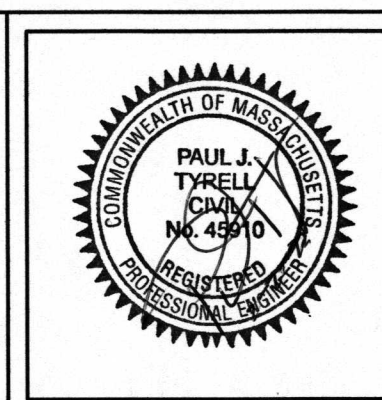
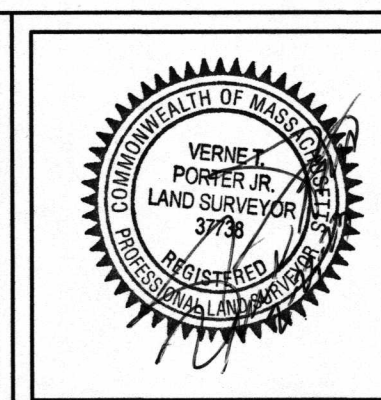
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TOWN OF NEEDHAM PLANNING BOARD	
BY:	
APPROVED:	

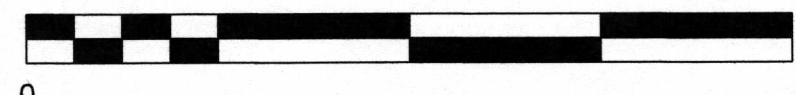
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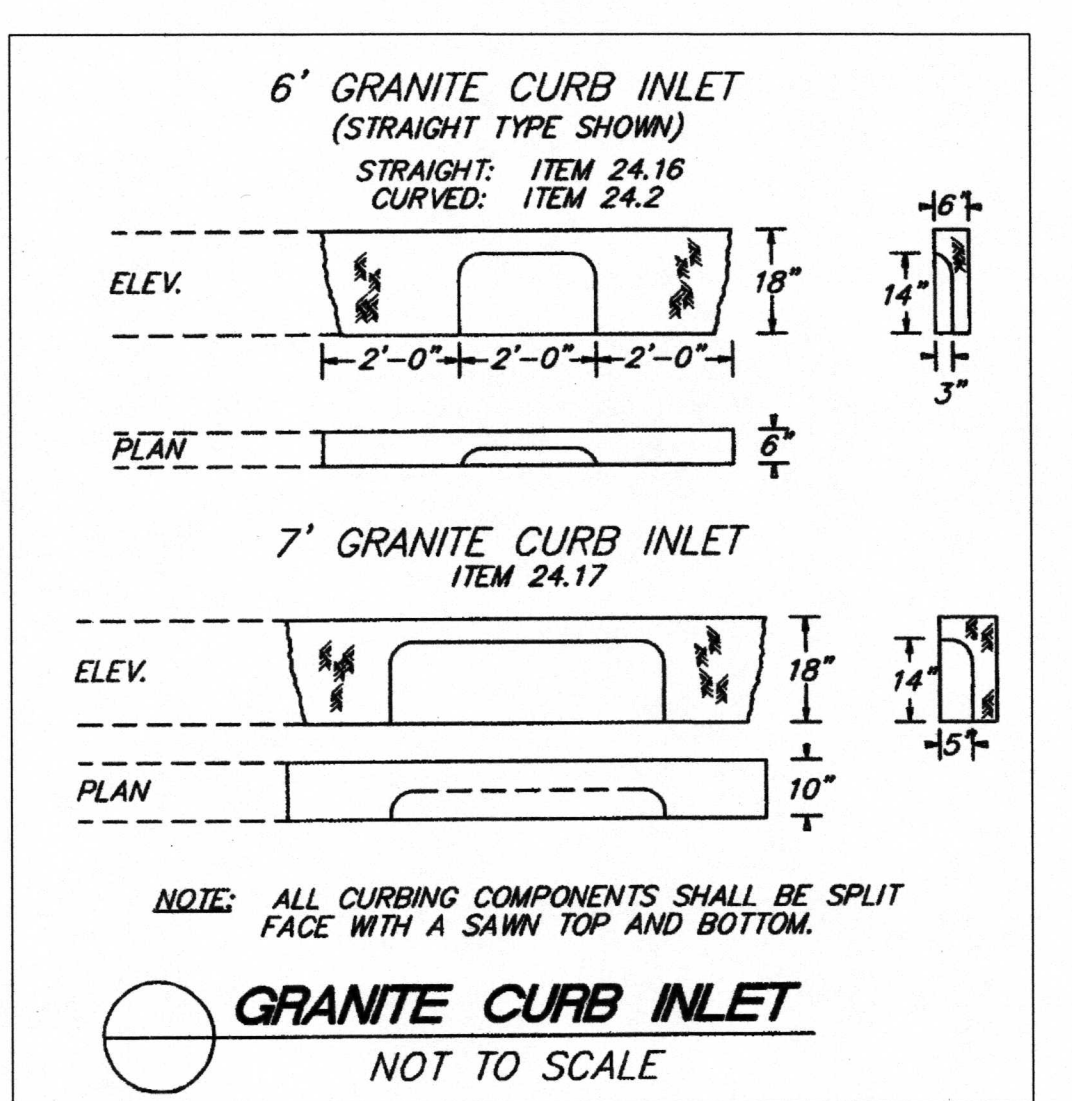
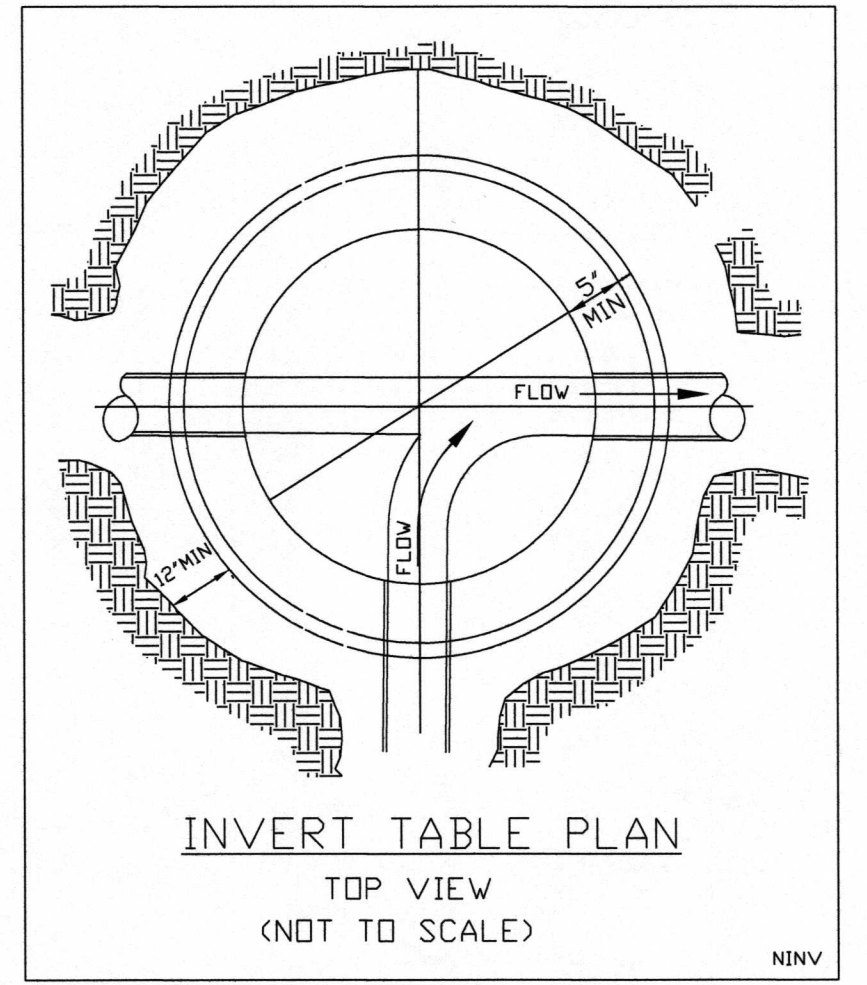
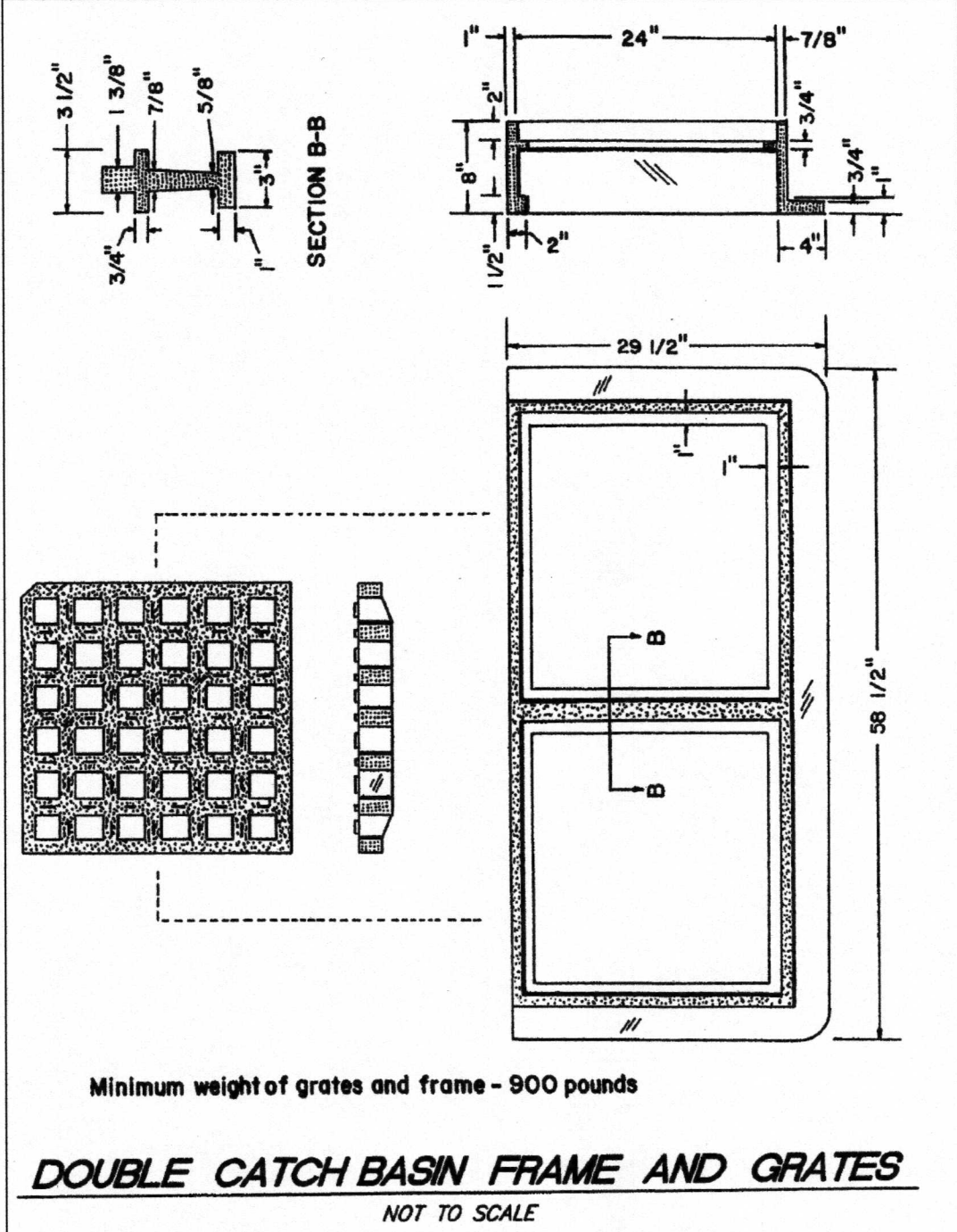
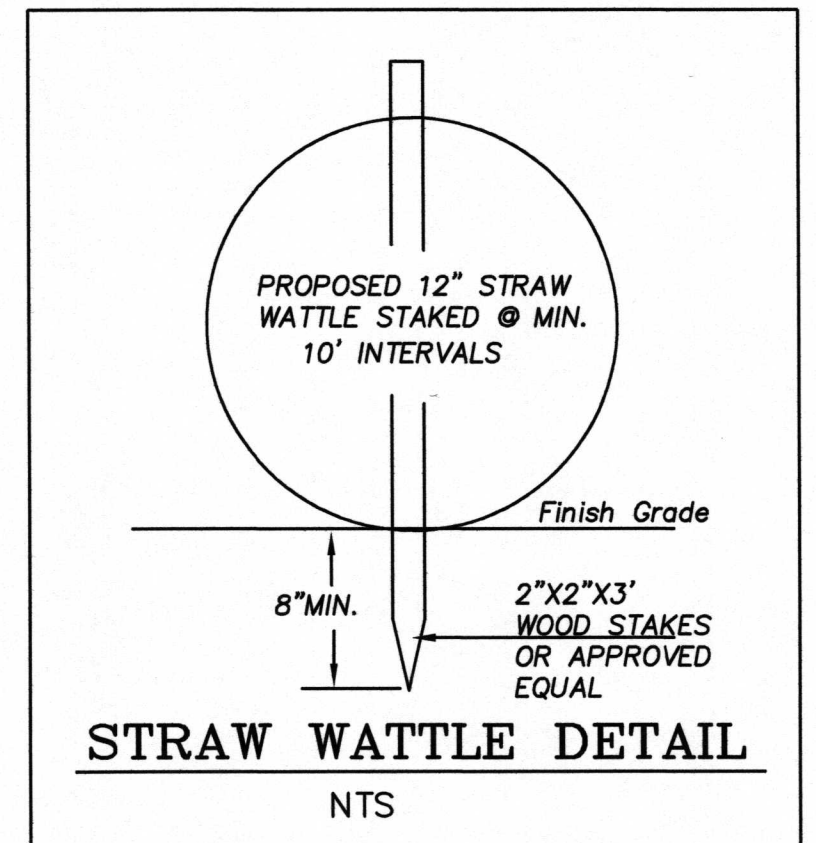
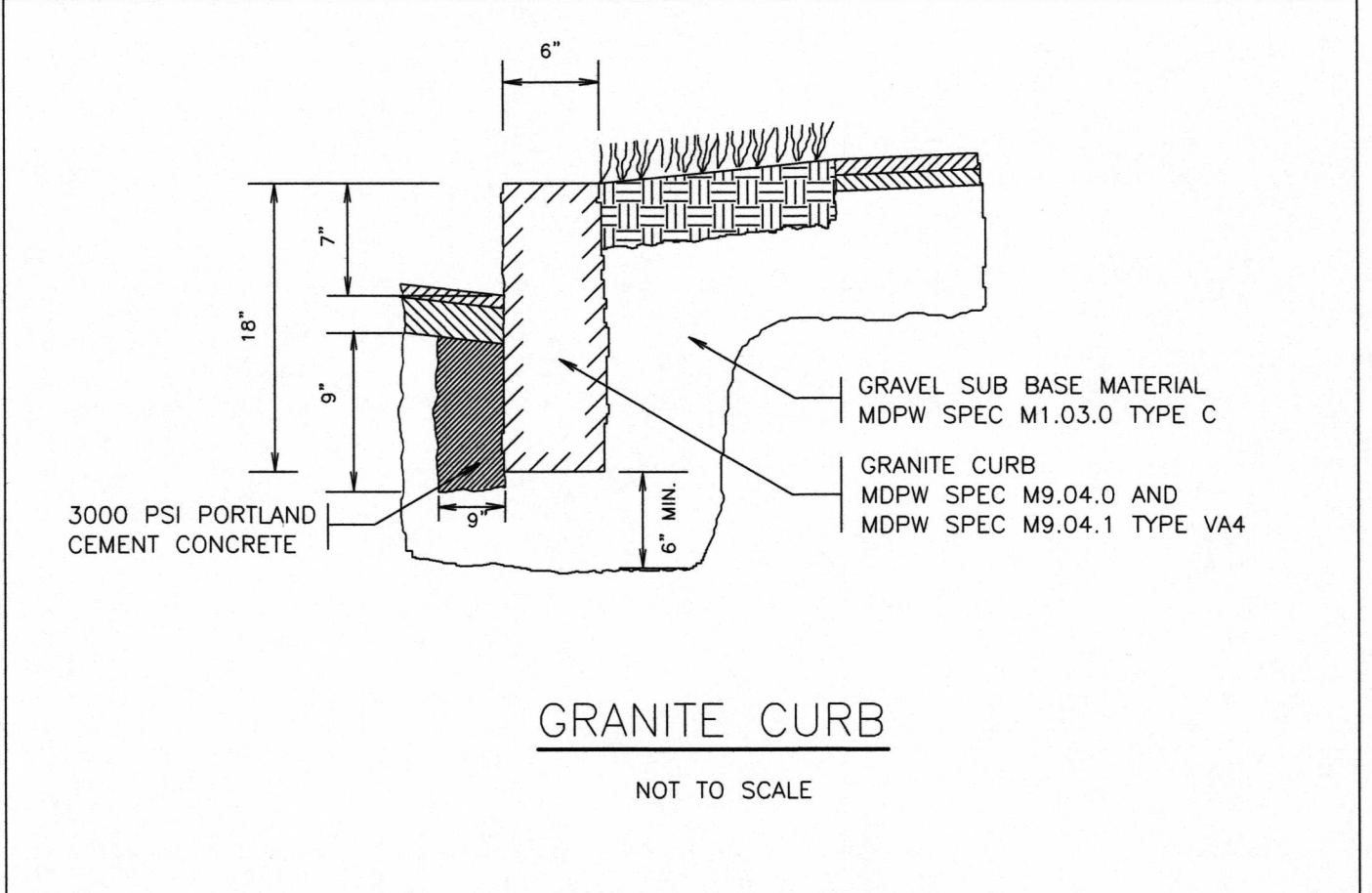
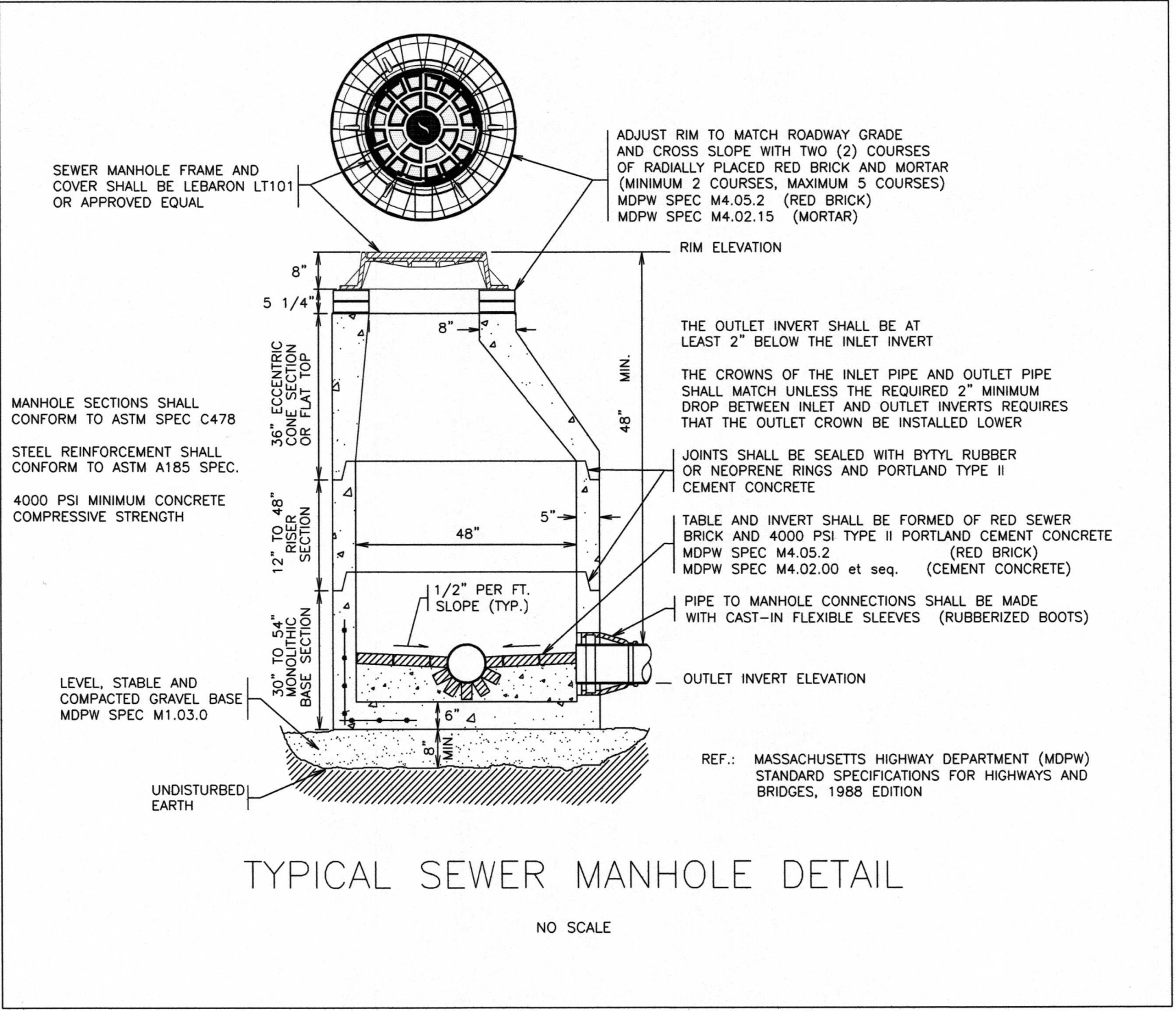
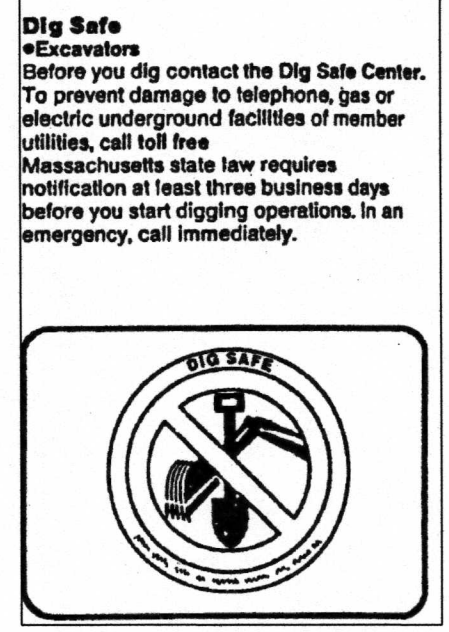
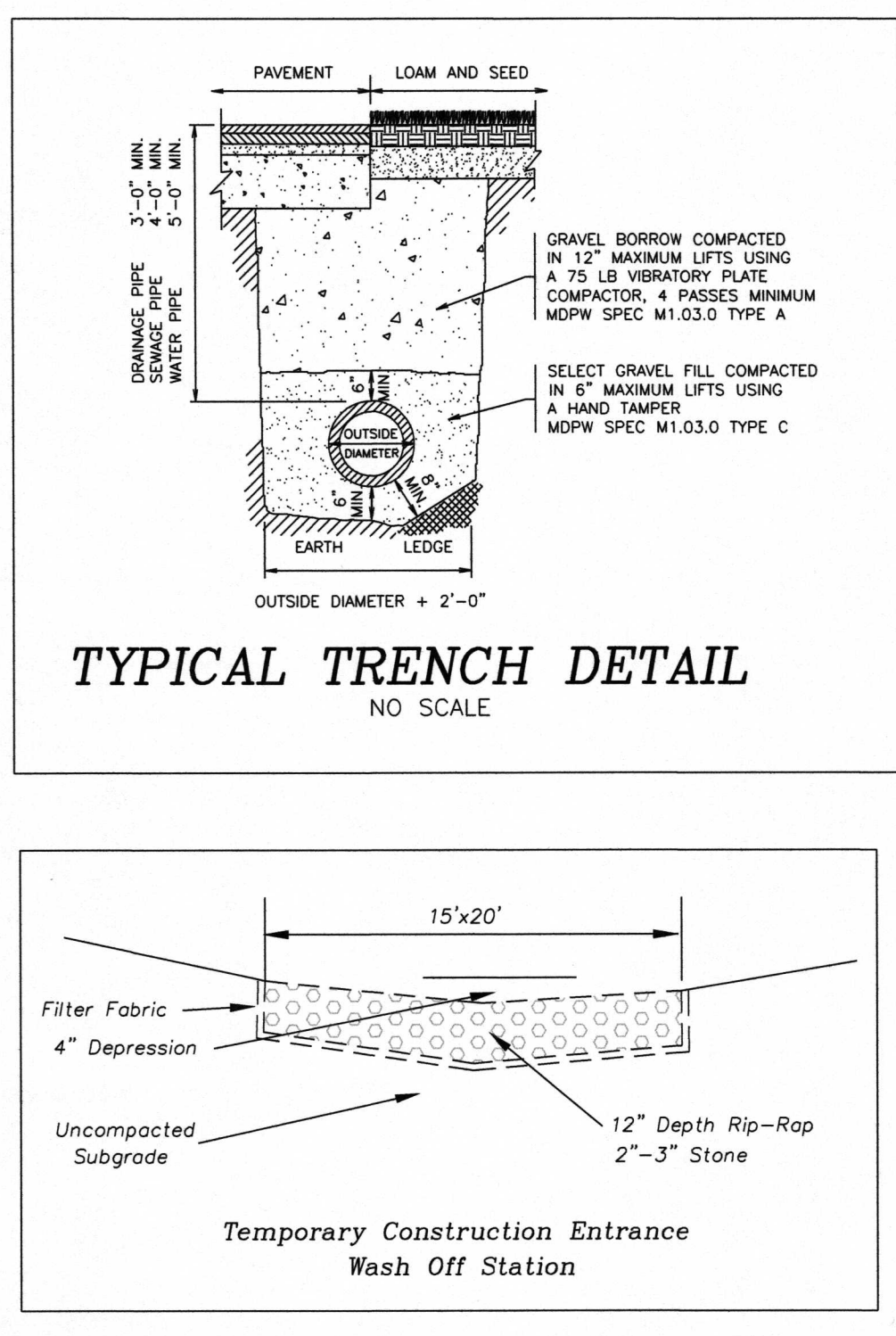
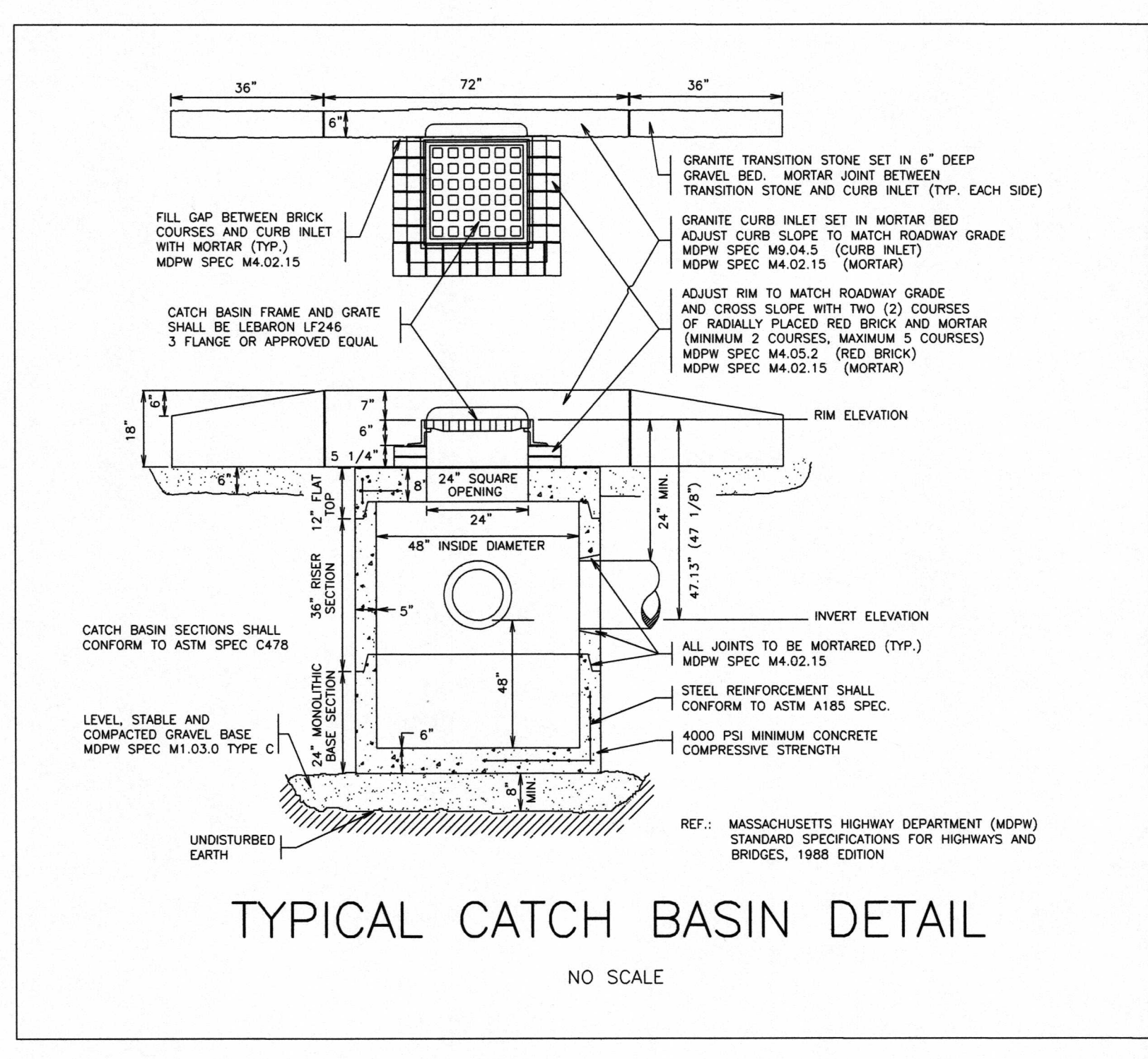
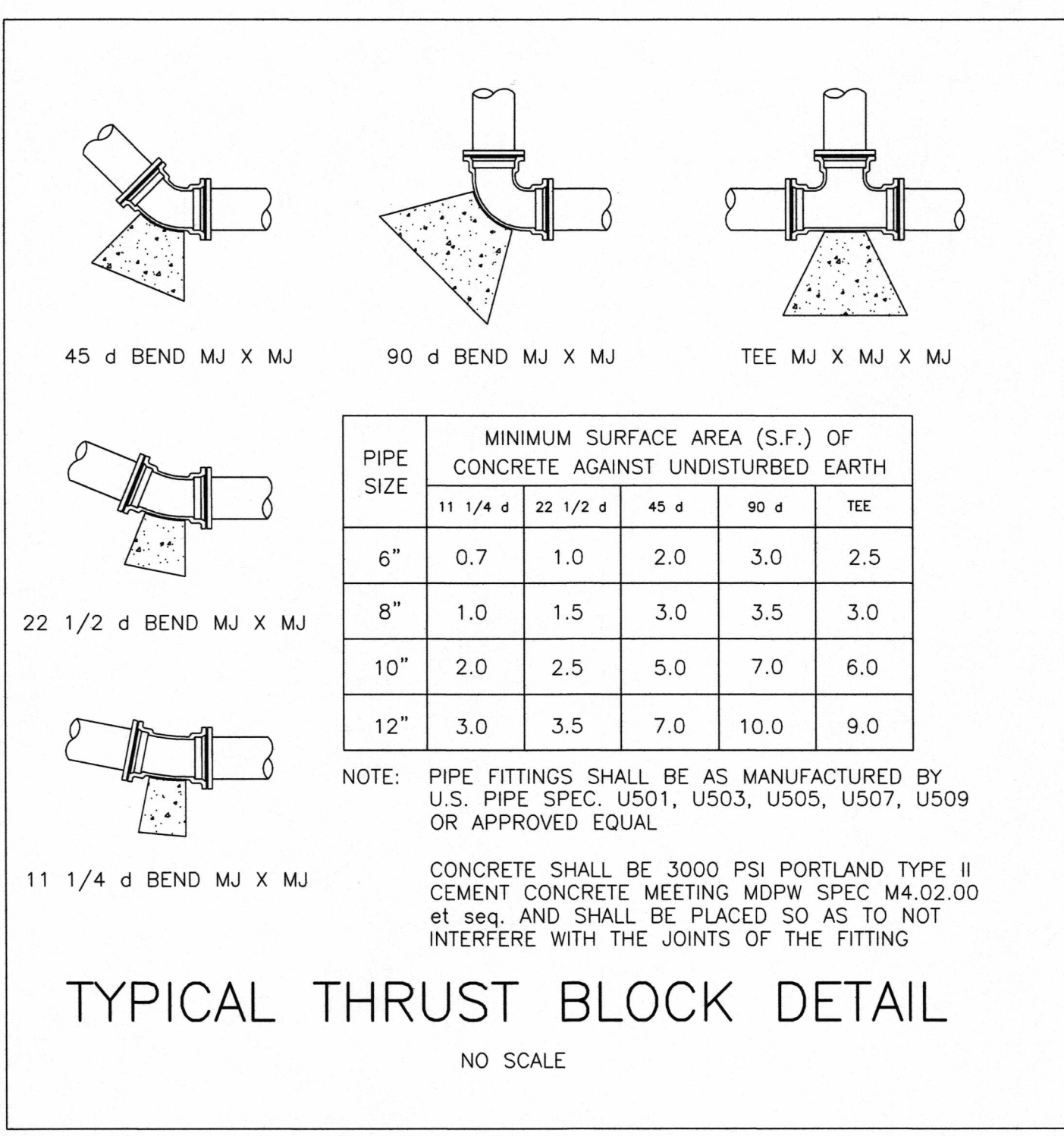
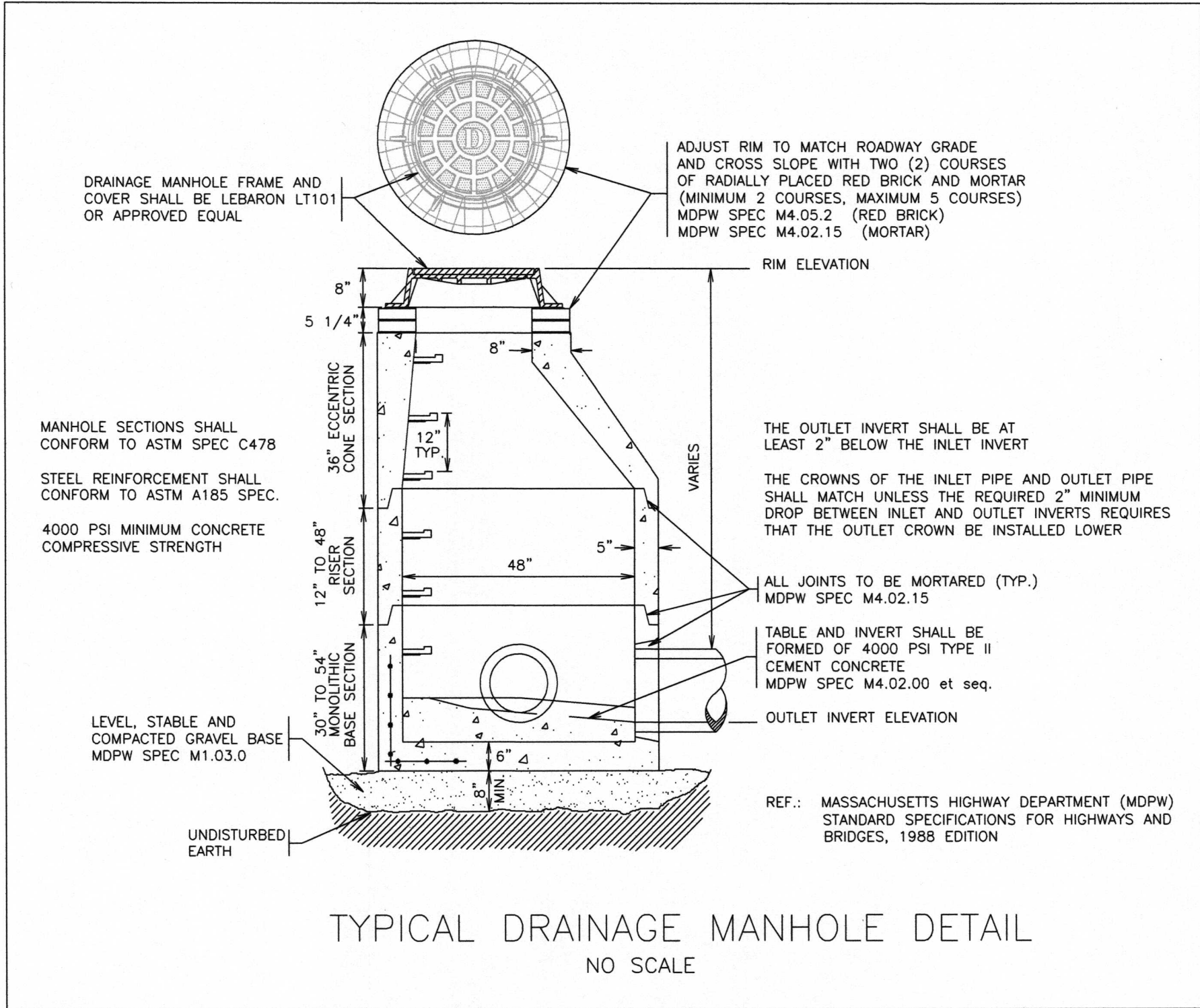
Verne T. Porter Jr. 2-23-23

Owner/Applicant:
Brian Connaughton
920 South Street
Needham, Ma. 02492
Cert. #207299

REVISIONS	
DATE	DESCRIPTION
1-19-23	NO REVISIONS MADE
2-23-23	ROAD GRADING



~Plan, Profile & Detail Sheet~	
920 South Street	
Needham, Massachusetts	
Scale: As Noted	September 9, 2022
VERNE T. PORTER Jr, PLS	
Land Surveyors - Civil Engineers	
354 Elliot Street, Newton, Ma. 02464	
	
Sheet 6 of 8	
Project:22019	Desinged By:
Drawn By:	Checked By:



DIRECTOR OF PUBLIC WORKS

DATE APPROVED

TOWN ENGINEER

DATE APPROVED

I, TOWN CLERK OF THE TOWN OF NEEDHAM, HEREBY CERTIFY THAT THE NOTICE OF THE PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE TWENTY DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SAID NOTICE

DATE

TOWN CLERK

APPROVAL IN ACCORDANCE WITH SECTION 91-U OF CHAPTER 41 OF THE GENERAL LAWS AS AMENDED

TOWN OF NEEDHAM PLANNING BOARD

BY:

APPROVED:

I CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS PLAN IS TRUE AND CORRECT TO THE ACCURACY REQUIRED BY THE SUBDIVISION REGULATIONS AND PROCEDURAL RULES OF THE NEEDHAM PLANNING BOARD.

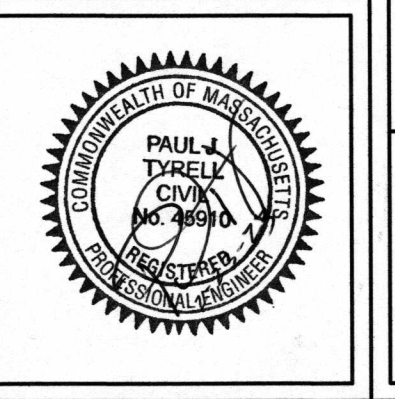
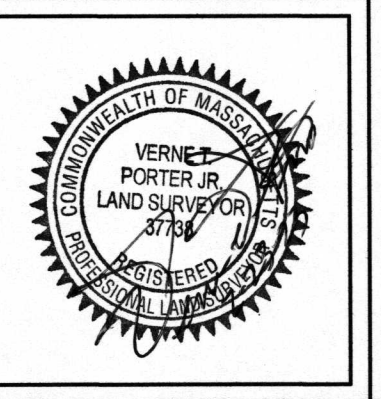
Brian Connaughton 2-23-23

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

Brian Connaughton 2-23-23

Owner/Applicant:
Brian Connaughton
920 South Street
Needham, Ma. 02492
Crt. #207299

REVISIONS	
DATE	DESCRIPTION
1-19-23	NO REVISIONS MADE
2-23-23	NO REVISIONS MADE



~Detail Sheet~

920 South Street

Needham, Massachusetts

Scale: As Noted September 9, 2022

VERNE T. PORTER Jr, PLS

Land Surveyors - Civil Engineers

354 Elliot Street, Newton, Ma. 02464

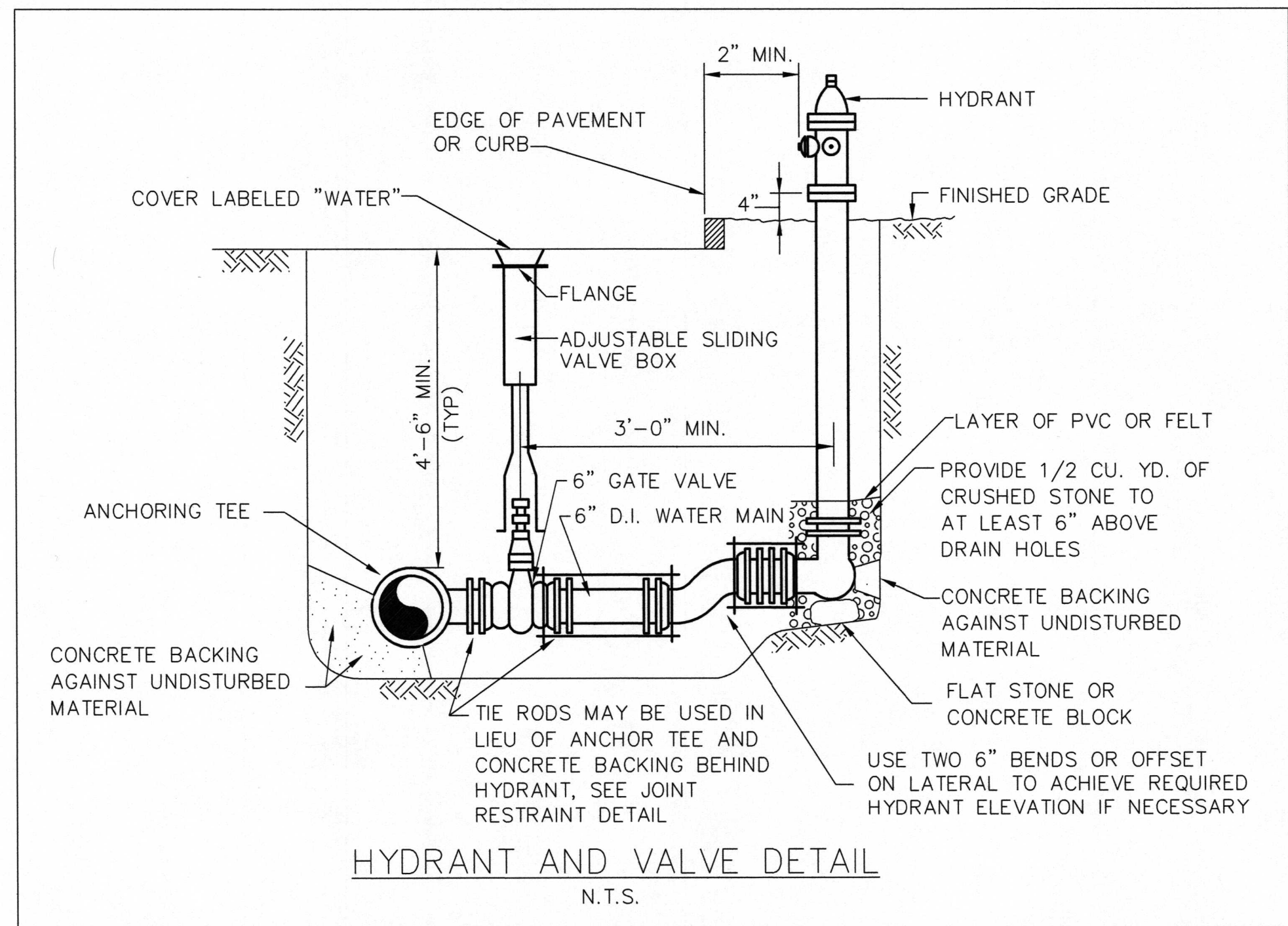
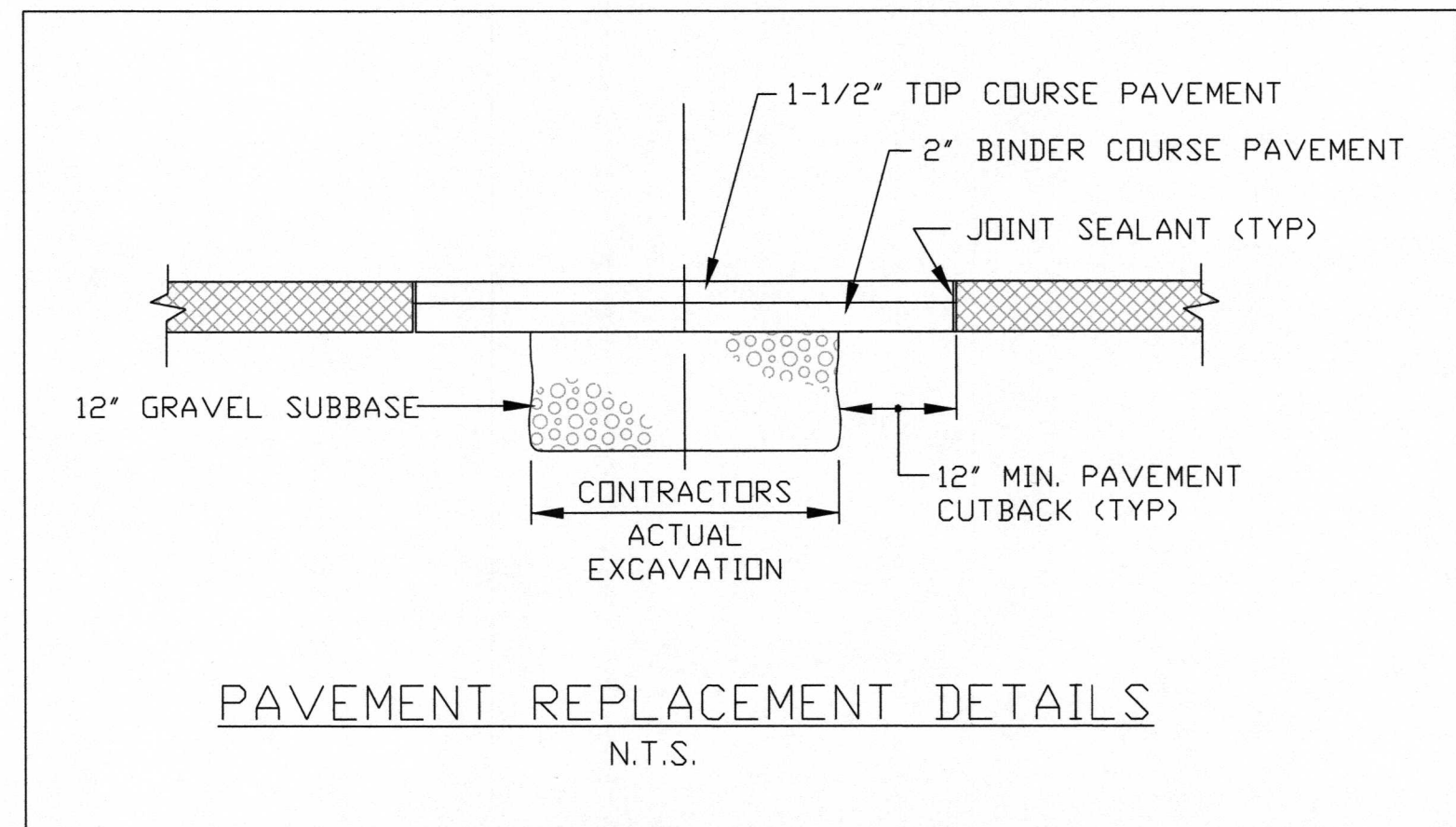
Project:22019

Desinged By:

Drawn By:

Checked By:

Sheet 7 of 8



DIRECTOR OF PUBLIC WORKS	
DATE APPROVED	
TOWN ENGINEER	
DATE APPROVED	
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DATE	TOWN CLERK

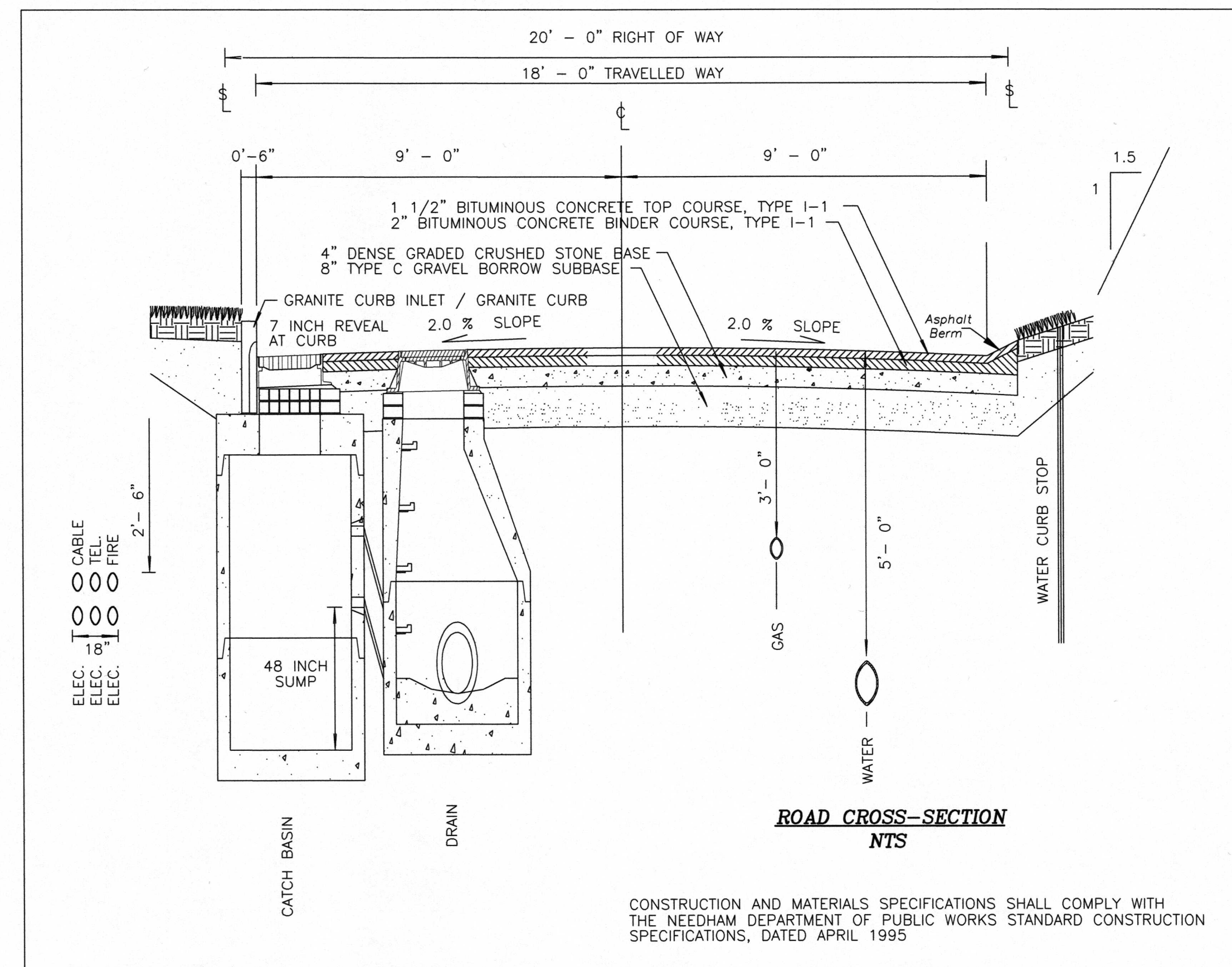
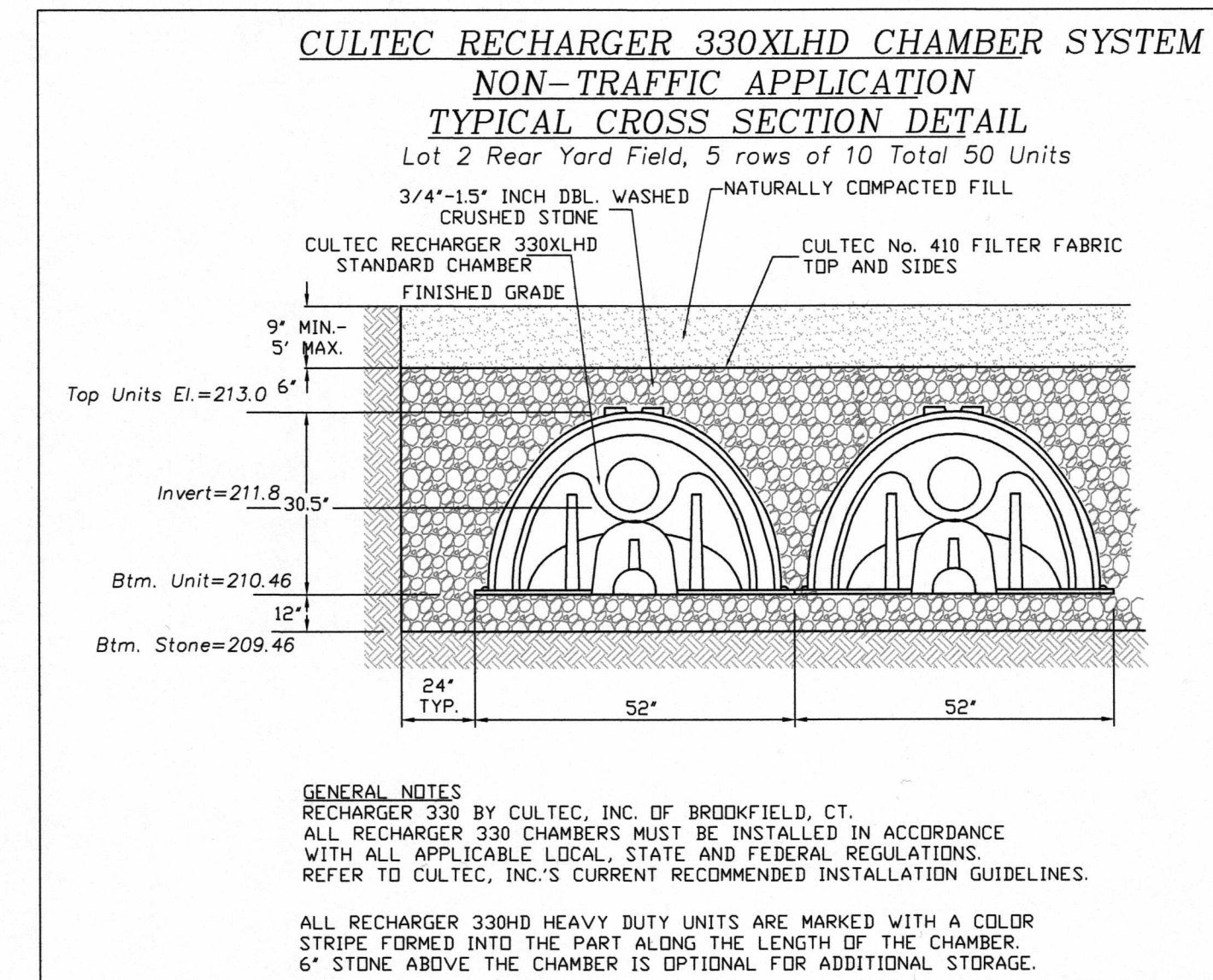
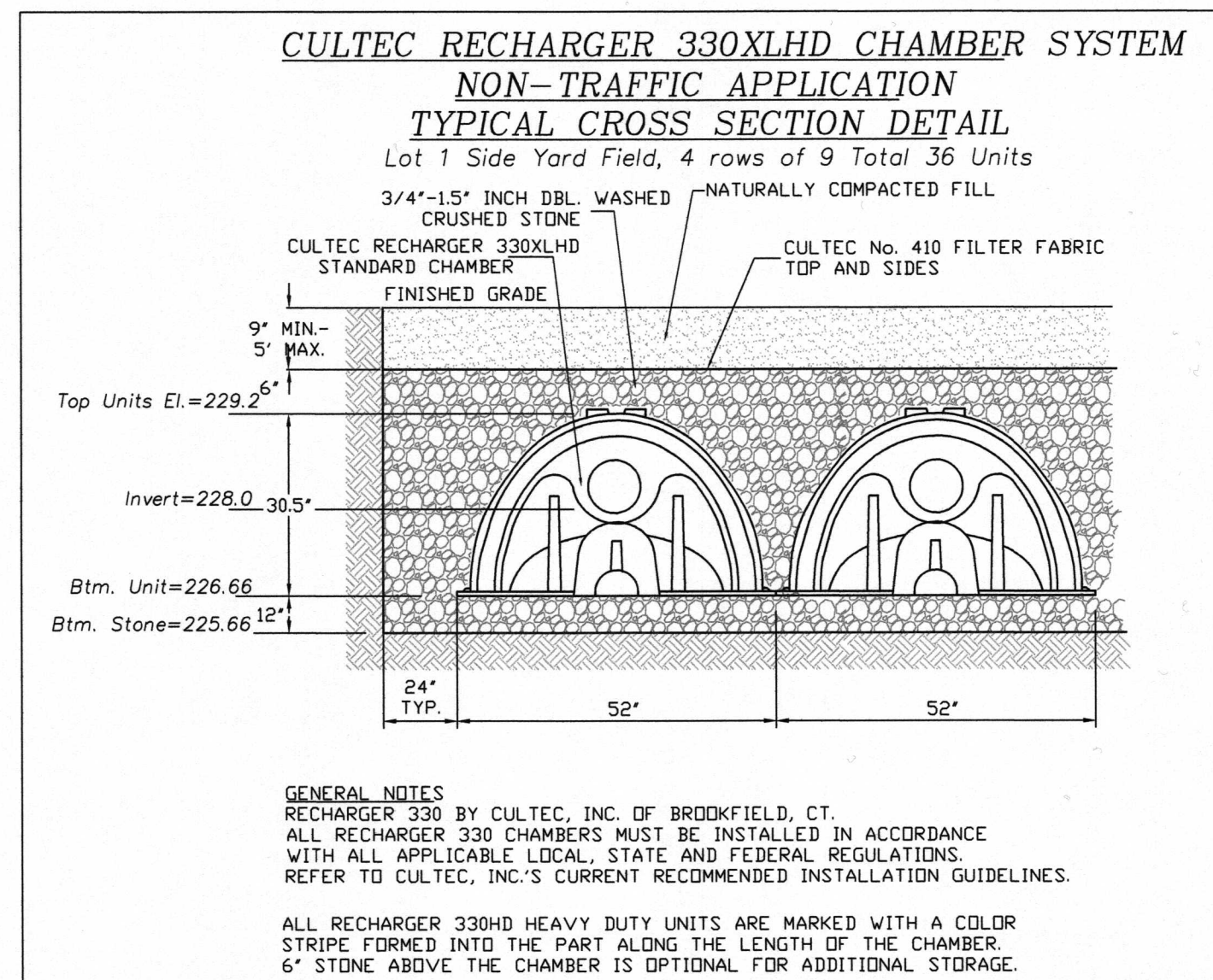
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TOWN OF NEEDHAM PLANNING BOARD	
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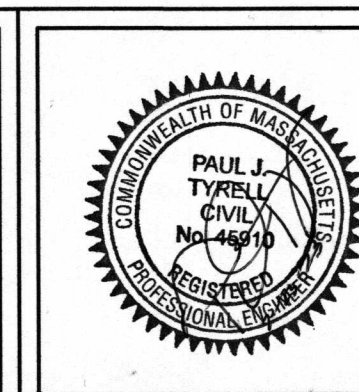
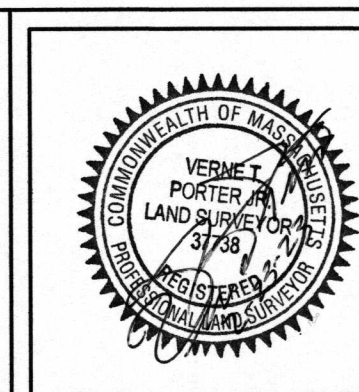
Verne T. Porter Jr. 2-23-23

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS

Verne T. Porter Jr. 2-23-23



REVISIONS	
DATE	DESCRIPTION
1-19-23	NO REVISIONS MADE
2-23-23	DRAINAGE DETAILS ADDED



~Detail Sheet~	
920 South Street	
Needham, Massachusetts	
Scale: As Noted	September 9, 2022
VERNE T. PORTER Jr, PLS	
Land Surveyors - Civil Engineers	
354 Elliot Street, Newton, Ma. 02464	
Project: 22019	
Designed By:	
Drawn By:	
Checked By:	

Dig Safe
 •Excavators
 Before you dig contact the Dig Safe Center. To prevent damage to telephone, gas or electric underground facilities of member utilities, call toll free Massachusetts state law requires notification at least three business days before you start digging operations. In an emergency, call immediately.





Needham Public Health Division

178 Rosemary St., Needham, MA 02494
www.needhamma.gov/health

781-455-7940 ext. 504
781-455-7922 (fax)



MEMO

To: Lee Newman, Planning Department
Alex Clee, Planning Department

From: Tara Gurge, Public Health Division

Date: 10/20/2022

Re: Definitive Subdivision Plan Comments for 920 South Street

This memo is in reference to the Public Health Division comments on the proposed Definitive Subdivision for 920 South Street. This proposed development, once approved, will comprise of two lots. The existing building and shed are to be raised, and two new homes are proposed to be built, one on each lot.

This proposed subdivision would create two (2) individual house lots, with both lots serviced by a newly proposed shared driveway. These lots would be serviced by municipal water and sewer.

The following is a list of Public Health Division comments regarding this proposal:

- Need to ensure that owners/builders fill out the Health Divisions online Notification of Demolition form, for the demolition of the existing main building and shed, along with uploading the required supplemental documents which must be submitted for our review and approval prior to the issuance of the Building Dept. demolition permit(s).

The following additional off-street drainage requirements are indicated:

- 1) All lots should be graded to the limits of construction as to have no standing water or otherwise create a public health nuisance.
- 2) Grading shall not improperly shed or illegally increase drainage onto adjacent properties.
- 3) All subsequent developers or builders should be notified of the off-street drainage requirements.
- 4) If there are difficult or unusual conditions as determined in the field from the approved grading plan, or other circumstances or objections received from abutters, the Board of Health may require an as-built grading plan for further evaluation.
- 5) Following the Board of Health off-street drainage guidelines for a subdivision, a drainage surety of \$3,500.00 will be required for each lot, or \$7,000.00 for the two-lot subdivision.

Please feel free to contact the Public Health Division office if you have any additional questions on those requirements.

From: [Deb Anderson](#)
To: [Alexandra Clee](#); [Clayton Hutchinson](#)
Cc: [Elisa Litchman](#); [Lee Newman](#)
Subject: Re: Request for comment - 920 South Street Subdivision & scenic rd app
Date: Thursday, December 15, 2022 3:37:43 PM

Due to the extensive wetland resource areas located on this site, the applicant will be required to contact Conservation for any proposed work or disturbance on the property including but not limited to tree removal, excavation, construction, etc...to determine whether a filing with the Conservation Commission is required.

Debbie Anderson
Director of Conservation
Town of Needham
500 Dedham Avenue
Needham, MA 02492
781-455-7550 x 248

From: Alexandra Clee <aclee@needhamma.gov>
Sent: Thursday, December 15, 2022 3:30:14 PM
To: Deb Anderson <andersond@needhamma.gov>; Clayton Hutchinson <chutchinson@needhamma.gov>
Cc: Elisa Litchman <elitchman@needhamma.gov>; Lee Newman <LNewman@needhamma.gov>
Subject: RE: Request for comment - 920 South Street Subdivision & scenic rd app

Will you be able to get me comments by today or first thing in the morning?

If not, it's okay, then I would ask for before Monday evening.

Alexandra Clee
Assistant Town Planner
Needham, MA
www.needhamma.gov

From: Alexandra Clee
Sent: Tuesday, November 29, 2022 1:17 PM
To: Deb Anderson <andersond@needhamma.gov>; Clayton Hutchinson <chutchinson@needhamma.gov>
Cc: Elisa Litchman <elitchman@needhamma.gov>; Lee Newman <LNewman@needhamma.gov>
Subject: FW: Request for comment - 920 South Street Subdivision & scenic rd app

Sorry, should have sent to Conservation too

Alexandra Clee
Assistant Town Planner

Needham, MA
www.needhamma.gov

From: Alexandra Clee

Sent: Tuesday, November 8, 2022 11:29 PM

To: David Roche <droche@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Tom Conroy <TConroy@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; Justin Savignano <jsavignano@needhamma.gov>; Carys Lustig <clustig@needhamma.gov>

Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>

Subject: Request for comment - 920 South Street Subdivision & scenic rd app

Dear all,

We have received an application materials for a proposed subdivision and scenic road proposal at 920 South Street. The proposal is to subdivide the Premises into two building lots, as well as a small non-buildable parcel along South Street. Both of the new lots will have frontage on and will be served by and accessed from the proposed new roadway.

More information can be found in the application, which is attached.

The Planning Board has scheduled this matter for December 19, 2022. Please send your comments by Wednesday December 14, 2022 at the latest.

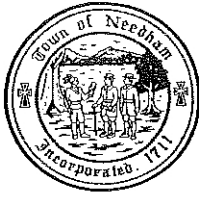
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1. Application for a Definitive Subdivision, with Exhibit A (List of Waivers) and Exhibit B (Description).
2. Letter from Brian Connaughton, dated September 30, 2022.
3. Application for Scenic Road permit.
4. Letter from George Giunta Jr., Attorney, dated September 30, 2022.
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6. Drainage Summary, Proposed Two Lot Residential Subdivision, 920 South Street, Needham,

MA, prepared by Verne T. Porter, 354 Elliot Street, Newton, MA, dated September 28, 2022.

Thank you, alex.

Alexandra Clee
Assistant Town Planner
Needham, MA
781-455-7550 ext. 271
www.needhamma.gov



**TOWN OF NEEDHAM, MASSACHUSETTS
PUBLIC WORKS DEPARTMENT
500 Dedham Avenue, Needham, MA 02492
Telephone (781) 455-7550 FAX (781) 449-9023**

March 23, 2023

Needham Planning Board
Public Service Administration Building
Needham, MA 02492

RE: Definitive Subdivision Application
920 South Street

Dear Members of the Board,

The Department of Public Works completed its review of a request from the applicant to construct a two-lot subdivision off South Street.

The documents submitted for review are as follows:

1. Letter from George Giunta Jr., Attorney, dated March 7, 2023.
2. Plan set consisting of 9 sheets, prepared by Verne T. Porter, 354 Elliot Street, Newton, MA: Sheet 1, Title Sheet, dated September 9, 2022, revised January 19, 2023 and February 23, 2023; Sheet 2, entitled "Existing Conditions Site Plan," dated September 9, 2022, revised January 19, 2023 and February 23, 2023; Sheet 3, entitled "By Right Subdivision Plan of Land," dated September 9, 2022, revised January 19, 2023 and February 23, 2023; Sheet 4, entitled "Proposed Lotting Plan," dated September 9, 2022, revised October 5, 2022, January 19, 2023 and February 23, 2023; Sheet 5, entitled "Proposed Grading Plan," dated September 9, 2022, revised January 19, 2023 and February 23, 2023; Sheet 6, entitled "Proposed Utilities Plan," dated September 9, 2022, revised January 19, 2023 and February 23, 2023; Sheet 7, entitled "Plan, Profile & Detail Sheet," dated September 9, 2022, revised January 19, 2023 and February 23, 2023; Sheet 8, entitled "Detail Sheet," dated September 9, 2022, revised January 19, 2023 and February 23, 2023; Sheet 9, entitled "Detail Sheet," dated September 9, 2022, revised January 19, 2023 and February 23, 2023.
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7. Drainage Summary, Proposed Two Lot Residential Subdivision, 920 South Street, Needham, MA, prepared by Verne T. Porter, 354 Elliot Street, Newton, MA, dated September 28, 2022.

Our comments and recommendations are as follows:

- As part of the NPDES requirements, the applicant will need to comply with the Public Outreach & Education and Public Participation & Involvement control measures. The applicant shall submit a letter to the DPW identifying the measures selected and dates by which the measures will be completed. We have no objections that this requirement be incorporate it into the Planning Board's decision.

If you have any questions regarding the above, please contact our office at 781-455-7550.

Truly yours,

Sincerely,

Thomas Ryder
Town Engineer

From: [Tom Conroy](#)
To: [Alexandra Clee](#); [John Schlittler](#)
Cc: [Lee Newman](#); [Donald Anastasi](#); [Jay Steeves](#); [Ronnie Gavel](#)
Subject: RE: Request for comment - *revised* 920 South Street Subdivision & scenic rd app
Date: Wednesday, March 29, 2023 9:55:39 AM
Attachments: [image001.png](#)

Hi Alexandra,

Fire dept. is board.

Thank you



Thomas M. Conroy

Fire Chief - Needham Fire Department

tconroy@needhamma.gov

Ph (781) 455-7580

From: Alexandra Clee <aclee@needhamma.gov>
Sent: Tuesday, March 28, 2023 8:36 PM
To: Tom Conroy <TConroy@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>
Cc: Lee Newman <LNewman@needhamma.gov>; Donald Anastasi <DAnastasi@needhamma.gov>; Jay Steeves <steevesj@needhamma.gov>; Ronnie Gavel <rgavel@needhamma.gov>
Subject: Request for comment - *revised* 920 South Street Subdivision & scenic rd app

Dear Fire and Police,

We have received the attached revised plans with respect to the proposed subdivision at 920 South Street. Please review and send us any comments you may have as soon as possible so that they can be included in the Planning Board packets. The Planning Board will be discussing this on April 4 and would very much appreciate your comments by Thursday this week if possible.

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Thanks, alex.

Alexandra Clee
Assistant Town Planner
Needham, MA
www.needhamma.gov

From: Alexandra Clee

Sent: Tuesday, November 8, 2022 11:29 PM

To: David Roche <droche@needhamma.gov>; Thomas Ryder <tryder@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>; Tom Conroy <TConroy@needhamma.gov>; Tara Gurge <TGurge@needhamma.gov>; Timothy McDonald <tmcdonald@needhamma.gov>; Justin Savignano <jsavignano@needhamma.gov>; Carys Lustig <clustig@needhamma.gov>

Cc: Lee Newman <LNewman@needhamma.gov>; Elisa Litchman <elitchman@needhamma.gov>

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From: [John Schlittler](#)
To: [Alexandra Clee](#); [Tom Conroy](#)
Cc: [Lee Newman](#); [Donald Anastasi](#); [Jay Steeves](#); [Ronnie Gavel](#)
Subject: RE: Request for comment - *revised* 920 South Street Subdivision & scenic rd app
Date: Wednesday, March 29, 2023 12:44:07 PM

Police are ok with this

From: Alexandra Clee <aclee@needhamma.gov>
Sent: Tuesday, March 28, 2023 8:36 PM
To: Tom Conroy <TConroy@needhamma.gov>; John Schlittler <JSchlittler@needhamma.gov>
Cc: Lee Newman <LNewman@needhamma.gov>; Donald Anastasi <DAnastasi@needhamma.gov>; Jay Steeves <steevesj@needhamma.gov>; Ronnie Gavel <rgavel@needhamma.gov>
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**Select Board
TOWN OF NEEDHAM
AGENDA FACT SHEET**

MEETING DATE: 12 /19 /2022

Agenda Item	Public Hearing for the removal of two (2) Public Shade trees at 920 South St.
Presenter(s)	Edward Olsen, Tree Warden, Parks & Forestry Superintendent

1.	BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED
	Brian Connaughton has respectfully requested to remove two Public Shade Trees. He is looking to develop a new driveway at this address. He is formally seeking approval from the Town to remove and replace these trees with more suitable species. Currently these White Pine trees are misshapen, missing a large portion of their crown canopy. These trees will be negatively impacted by the proposed new construction work. The Tree Warden does not object to the removal of these trees based on these reasons. I would also recommend a donation to the Town of Needham Tree Gift fund for future tree plantings in Town in the amount of \$400.
2.	VOTE REQUIRED BY SELECT BOARD
	Under M.G.L. Chapter 87, Requires a Vote by the Select Board & Under the Scenic Road Act, requiring a Vote by the Planning Board Suggested Motions: 1. "That the Board vote to approve and sign the Public Shade Tree Hearing form for the removal of two, White Pine trees along the front road frontage of 920 South St.
3.	BACK UP INFORMATION ATTACHED
	1. Tree hearing request letter from George Giunta, Jr. dated 11/16/22 2. Legal Ad published in Needham Times, issues 12//22, 12//22 3. List of notified abutters 4. Aerial Maps/Plot plans 5. Public Shade Tree Hearing Notice



**Select Board
TOWN OF NEEDHAM
AGENDA FACT SHEET**

6. Photos of tree under consideration
7. Approval letter from Tree Warden, E. Olsen to Select Board 12/14/22
8. Public Shade Tree Approval form

NEEDHAM PLANNING BOARD MINUTES

December 19, 2022

The Needham Planning Board hybrid meeting, held in person at the Charles River Room of the Public Services Administration Building and Virtual using Zoom, was called to order by Adam Block, Chairman, on Monday, December 19, 2022, at 7:30 p.m. with Messrs. Alpert and Crocker and Ms. McKnight, as well as Assistant Planner, Ms. Clee.

Mr. Block took a roll call attendance of the Board members and staff. He noted this is an open meeting that is being held in public and remotely per state guidelines. He reviewed the rules of conduct for all meetings. He noted Ms. Espada will not be at the meeting and will watch the video of this meeting so she can participate. This meeting does include public hearings and public comment will be allowed. If any votes are taken at the meeting the vote will be conducted by roll call. All supporting materials, including the agenda, are posted on the town's website.

Public Hearing:

7:30 p.m. -- Major Project Site Plan Special Permit No. 2002-03: WELL Balfour Needham Landlord LLC, 4500 Dorr Street, Toledo, Ohio 43615, Petitioner. (Property located at 100-110 West Street, Needham, MA). Regarding proposal to redevelop the property to include 155 units of senior housing, consisting of 127 Assisted Living apartments and 28 Alzheimer's/Memory Care units. Please note: this hearing has been continued from the August 16, 2022, September 20, 2022, October 18, 2022 and November 15, 2022 meetings of the Planning Board.

Mr. Block noted this is a continued hearing. Additional materials have been submitted. He will take a motion to continue the hearing, but people will have an opportunity to speak tonight. He noted the public can email comments or questions to the Board. He noted the following correspondence for the record: an email from Colleen Schaller, Chair of the Council on Aging, dated 10/17/22, noting the Council on Aging passed a vote opposing a special permit for the current proposal as it does not include independent living; an email from Kim Marie Nicols, of 12 Crescent Road, dated 9/21/22, with comments and questions; an email from Glenn Mulno, of 40 Morton Street, dated 12/19/22, opposing the plan; and an email from Attorney Evans Huber, representative for the applicant, dated 12/15/22, with comments.

Mr. Huber noted the applicant will revise the application to include 9 independent living units in the southeast corner of the building on the first floor. The reason for this location is it is physically segregated in one corner and the area has its own entrance. The residents are free to use the main entrance and amenities. Each unit has its own patio. He noted the affordable unit requirements are for 10 or more units. There are no affordable units with this project. The applicant will contribute \$1.9 million to the Town. He noted there will be some updated filings such as revised floor plans, first floor changes to some elevations and updated parking and traffic analysis. Chris Yetman, Development Manager from HYM Investments, showed the plan. He has tried to address all comments to date. The ground floor will have walk out patios with an entrance/exit directly to the vehicles and Highland Avenue. This is a great area for independent living and the applicant is committed to making a financial mitigation payment.

Mr. Yetman noted there will be one 2-bedroom unit, 2 one-bedroom-plus-den units and the rest are one-bedroom units. Mr. Crocker asked the square footage of the units. Mr. Yetman noted the one-bedroom units will be 760 square feet, one bedroom plus den will be 950 square feet and the 2-bedroom units will be 975 square feet. Mr. Block asked if the independent living units would have access to all amenities and was informed, they would. Mr. Block asked if there would be an additional fee basis for the amenities. Mr. Yetman noted there would be a base rent pay rate and residents could have an additional amenities package. Trip Regg, of Balfour Senior Living, stated there was a desire for a lower price point. Balfour would need to charge for things with a direct expense like food and beverage. There is no need to charge for the pool and fitness center as long as the model stays operationally efficient. That could change in the future if it starts costing a lot. Mr. Block asked what the amenities are on the second and third floors for the residents. Mr. Yetman stated the main dining is on the third floor.

Mr. Block noted his understanding that the food package is an added expense but for the amenities on the first floor there is either no fee or a minimal fee depending on the model and may have a cost in the future. Mr. Regg stated it is not intended to have an expense in the future. Ms. McKnight asked what circumstances may change in the future that would incur a fee.

Mr. Regg would not expect this to change for the pool. As part of the program, residents may buy tickets to outside experiences like movies and the cost will be passed along to the residents without a markup. There is no plan to charge for the fitness center or pool but there will be a charge for 3 meals a day. There will be no charge for use of the community room. Ms. McKnight noted, at North Hill, she can go have lunch with a friend and pay. Can the independent living residents invite friends to have lunch with them and pay for the lunch? Mr. Regg stated the program has the ability to take outside payments for meals. The meal could be charged to the room, or it could be paid for with a credit card.

Mr. Crocker asked if all the amenities on the first floor are for the whole building but the memory care units and was informed this was correct. He asked if the independent living residents can use the same facilities as the assisted living residents and was informed, they could. Mr. Crocker asked if there were different plans for the assisted living. Mr. Huber noted, by law, they were required to provide at least one meal per day for the assisted living residents. Other meals above that would be part of a fee package. There is no such meals requirement for independent living. Mr. Crocker asked what amenities are on the upper floor. Mr. Regg noted the theater and dining room, and both are available to all independent living residents. Mr. Crocker asked what was not available to independent living residents. Mr. Yetman noted a personal care package was not available. There is a difference between a licensed unit and an unlicensed unit. Independent living is unlicensed, and care would not be provided. If care is needed, the resident would need to move into a licensed unit or get outside care.

Ms. McKnight appreciates the cooperation of coming up with independent living units. An important aspect of this project is affordability. She wants to see one unit be affordable and feels it would be reasonable for a proportionate reduction paid to the town of approximately \$211,000. Mr. Alpert asked where the Select Board is regarding this agreement. He heard the Select Board had tabled it. He noted the agreement is on the Select Board's plate and not the Planning Board's. He is not sure how much influence the Planning Board has. He asked if there has been any further discussion with the Select Board. Mr. Huber noted it is on hold as some aspects are in flux at the moment. Mr. Block asked if Mr. Huber intends to enter into an agreement with the Select Board. Mr. Huber stated that is the intent. He commented there is a desire by Ms. McKnight to have affordable units on site but that is not Balfour's intention. Balfour does not intend to renege on the \$1.9 million to the town.

Daniel Goldberg, of 199 Tudor Road, noted the only issue talked about is meals. The Council on Aging was unanimously opposed to the project if it had no independent living units. He is concerned the applicant came back with only 9 units. The Planning Board did not ask why only 9 units. He feels that is the minimal number to sneak their proposal through.

Josh Levy, of 1668 Great Plain Avenue, questioned the process. He asked if this is under the jurisdiction of the Planning Board. Mr. Block noted the application is only before the Planning Board. The Board will vote on the relief being sought and decide on the proposal as revised. The municipal benefits agreement is with the Petitioner and the Select Board, and the Planning Board does not have a role with that. Mr. Levy asked if the Planning Board would consider the Municipal Benefits Agreement and was informed, they would. It may possibly be made a condition or that it be signed and executed may be a finding.

Colleen Schaller, Board Chair of the Council on Aging, noted the Board has not met to discuss the new proposal. The proposal will have been discussed by the next public hearing and comments will be sent. Mr. Block suggested comments be sent by the Thursday before the meeting by 1/12. Ms. Schaller noted her meeting is not until 1/12. Mr. Alpert stated he has been on the Board for 7 or 8 years. It had been a rule to require comments be sent by the Thursday before the meeting. Comments arriving on Friday generally gives the Board members time. This is a volunteer position. It is frustrating to get comments and letters the day of the hearing. He appreciates the Council on Aging will meet on the 12th, but he would like to get the comments by Monday if possible. Ms. Schaller stated comments will be given the next day and she will be at the next Planning Board meeting.

Maggie Abuzzese, of 30 Bridle Trail, wants to comment on the discussion of when comments should be to the Board. The Board should require applicants to have all in the week before. She noted she received this packet late Friday. The Board should back up the applicant's deadline. This is a new proposal with 9 independent units. This does not meet the purpose of the Overlay District Amendment. The proposal should meet the purposes. Nine people do not revive the neighborhood and there are no affordable units. She noted Town Meeting was promised 9 affordable units which is why this was passed. Mr. Block recognized the frustration through the correspondence from the community. His understanding of the scope of

the authority for the Planning Board is they can only reject the applicant if there is 1) a violation of the dimensional requirements, 2) if built in violation of other parts of the By-Law or 3) if the impacts of the proposal were too great and they could not be reasonably mitigated. The By-Law talks about vibrancy but not a certain amount. There will still be employees, friends and relatives contributing to the vibrancy of the neighborhood. The Board needs to think carefully about the scope of its legal authority under the Zoning By-Law and state Zoning Act. If the Board is demanding independent living, he is not sure of its legal authority. It could be discriminating against people with disabilities. There is a great need in town for all levels of housing, but they need to be mindful of the limit of their authority.

Mr. Crocker noted the proposal was ushered through Town Meeting talking about vibrancy and affordable units all packaged together. People in memory care are an important part of the community. The town needs these types of programs and options for seniors and multi-generational living. There are varying degrees of vibrancy. He does not believe this is within the window of acceptance. He understands why only 9 units but feels the applicant can do better. The town needs independent living. He noted the original plan did not have memory care and now this plan does. The applicant needs to find a way to make them both work. This part of town needs this. He wants something toward what the town voted for. He appreciates it but is disappointed with only this, but he thinks they can get there.

Mr. Alpert stated when the Overlay District was proposed the Board insisted the use be by special permit. The Board should consider if the application is consistent with the general purpose of the By-Law and the more specific purposes and objectives of this By-Law. He looks forward to discussing this with Town Counsel. He noted the Avery Square District Overlay District, Section 3.15.1. He wants the members to be mindful of 7.5.2.1 and consider if the application is consistent with the By-Law. He believes this is where the Board has the authority to decide if this meets the criteria. He has not made up his mind yet and wants further input. He feels the Planning Board should have the authority to accept or reject the application.

Jill Kahn, of 44 Brookline Street, has been a Town Meeting member for 25 years. She does not appreciate that what went to Town Meeting is not what they are looking at. She would not have voted in favor of this proposal. She asked why they are presenting something new without affordable units. Mr. Huber stated the number of 9 was chosen because there is a good place in the building for the segregation of units and because it does not require an affordable unit. If there are over 10 units, there would need to be 12.5% affordable units. Projects like this are very expensive and at some point, it does not become financially feasible. Ms. Kahn noted another concern is there was an article in the Boston Globe regarding staffing shortages in nursing and assisted living homes. She is concerned with no affordability and having so many assisted living and memory care units there will be staffing shortages. She would like to see something back to what was voted on at Town Meeting.

Ms. McKnight noted the Board could not reduce the financial amount in proportion to the value of an affordable unit without speaking with the Select Board. Mr. Crocker is concerned with the Planning Board getting into payment talks with the Town. Ms. McKnight stated she could go along but say “if the Select Board agrees.” Ms. Newman will speak with Town Manager Kate Fitzpatrick. A motion was made to continue the hearing to 2/7/23 at 7:00 p.m. Mr. Alpert prefers the hearing be at 7:15 p.m. The amendment to the motion was accepted.

Upon a motion made by Mr. Crocker, and seconded by Ms. McKnight, it was by a roll call vote of the four members present unanimously:

VOTED: to continue the hearing to 2/7/23 at 7:15 p.m.

8:00 p.m. – 920 South Street Definitive Subdivision: Brian Connaughton, 920 South Street, Needham, MA, Petitioner (Property located at 920 South Street, Needham, MA).

8:00 p.m. – Scenic Road Act and Public Shade Tree Act: Brian Connaughton, 920 South Street, Needham, MA, Petitioner (Property located at 920 South Street, Needham, MA).

Upon a motion made by Mr. Crocker, and seconded by Ms. McKnight, it was by a roll call vote of the four members present unanimously:

VOTED: to waive the reading of all three public hearing notices and hear all 3 matters simultaneously.

Mr. Block noted the following correspondence for the record: a memo from Assistant Public Health Director Tara Gurge, dated 10/20/22, with comments; an email from Justin Savignano, dated 12/16/22, with no comments or objections, and a letter from Attorney Barry Fogel, dated 12/19/22, representative for an abutter, with a request for more information. George Giunta Jr., representative for the applicant, noted this is the former Stanley Tippet Hospice House and is in the Rural Residential Conservation District. There is 177 feet of frontage on South Street with 5.68 acres down to the Charles River. The property could be divided into 3 lots but will be divided into 2 lots. Mr. Connaughton will live on one lot. The Tippet House was there from 1993 to last year and was a 3-story house with 22 rooms built in 1908. The location of the house was in the middle of the property and has been taken down. The applicant tried to preserve the house, but it could not be done.

Mr. Giunta Jr. noted 2 lots are proposed and the by-right plan shows a 40-foot-wide road with a 60-foot radius circle, sidewalks and a full building out. There is room to make it all fit. The Subdivision Rules and Regulations calls for a 50-foot road, but all roads have been 40 feet or less for many years. Two lots can be done with no waivers but a 40-foot waiver. It does not make sense to do 24 feet of pavement and sidewalks for 2 houses. There will be a 20-foot-wide layout road and 18 feet paved with a circle. A hammerhead was explored but it did not work well. He noted a chunk of property has visible ledge there will be issues with. Mr. Crocker asked if the Fire Department had any comments on the radius. Mr. Giunta Jr. stated the Fire Department is fine with a 20-foot layout. Ms. Clee clarified she did not get comments from the Fire or Police and will need to get something. Mr. Giunta Jr. stated he will be asking for a continuance. He noted this would be a private way for 2 houses and is basically a common driveway. He feels the smaller pavement looks better and is environmentally better. No sidewalks are proposed.

Ms. McKnight asked the diameter of the turn around and was informed 52 feet. Mr. Crocker asked if there will be an 18-foot width going around the circle. Mr. Giunta Jr. stated there will be. They will bring revised plans and get them to members before the next meeting. Ms. McKnight noted she drove that way and drove down the small streets. It is hard to turn around with grass in the middle of the circle. She asked if there would be grass. Mr. Giunta Jr. stated there would be grass and a landscaped circle. It will be the standard design. The applicant is making use of the existing drive and will revise as much as they can. The drive has been shifted a bit. There is a large wetland area in back down to the Charles River. The project has tried to minimize and stay away from the wetlands and the wetland buffer zone. They may need to dip into the buffer for some utilities. The applicant will deal with the Conservation Commission in some form. Ms. McKnight asked what utilities and was informed a drain/sewer easement is proposed. The existing sewer line will be connected to. Parcel A is an unbuildable strip on South Street and provides the vegetative buffer along the street. The project will need an Association for the 2 lots and both lots will include an ownership interest in Parcel A.

Mr. Alpert asked why show 40 feet and not 50 feet when the Rules say the Petitioner has to show 50 feet. He will talk to Ms. Newman to see if the requirement can be waived. He is not sure why it is there. He is in favor of the concept but if it cannot be waived the applicant would need to show 50 feet. Mr. Giunta Jr. encouraged him to speak with the Planning Director. He submitted the plan based on discussions with the staff. The standard for public ways is 40 feet. Mr. Alpert has no problem with reducing it, but they need to show an as-of-right plan. He feels the regulations should be amended.

Mr. Giunta Jr. showed the Utilities and Roadway Plan. The project has minimized the impact and pavement. Two infiltration systems have been proposed – one up front in the scrub area with mature trees in front. The other system is in back. The plans will be revised to flip it with the other side as the sewer drain line is already on that side. The grading is minimal for the road. He will add more information.

Ms. McKnight stated the width of the right of way seems narrow. She has no issue with 18 feet of pavement but is concerned with snow storage. There is only 2 feet beyond the 18 feet of pavement. People can put up fences. She feels the right of way should be 22 or 24 feet. Mr. Crocker would like to see vegetation. It would help mitigate run off. Mr. Giunta Jr. stated there may be a sketch that shows some of it but there will be more information coming. There will be continuing dialogues with the neighbor. He noted in the front of the property there is an existing wall and driveway opening. They need to get rid of a section of the existing wall. The stones will be reused to make a return to have the 2 sides match. He noted permission is needed from the Planning Board to change the wall. They are trying to keep the wall as much as they can. He noted the prior driveway was not compliant and 2 existing trees will need to be removed. The Tree Warden has been involved.

Mr. Block asked if other trees will be removed where the houses are to be constructed. Mr. Giunta Jr. stated a number of trees will be removed. Ed Olsen, Tree Warden, met with the applicant and, if granted permission, he has no objection to the removal of the 2 white pines. Mr. Giunta Jr. will have the materials to the Board on 1/9 or 1/10.

Dr. Serguei Aliev, of 31 Marant Drive, is a direct abutter. He does not oppose the subdivision and hopes for better for the area. Before the property was not maintained. He has had good communication with Brian Connaughton. His question regards the drainage. This area gets flooded due to the lowest point. He asked the applicant to compromise and discuss the buffer zone. He would like to see how the grading will be done. He is satisfied with the project and the applicant. James Jakobeak, of 50 Burr Drive, noted it sounds like this is away from the Burr Drive side. He has questions about run off. There is ponding on the other side of the road. He wants to comment about the run off. Mr. Block noted correspondence from Debbie Anderson, of the Conservation Commission, dated 9/15/22, with comments.

Upon a motion made by Mr. Alpert, and seconded by Mr. Crocker, it was by a roll call vote of the four members present unanimously:

VOTED: to continue the 3 hearings to 2/7/23 at 8:15 p.m.

The Board took a 5-minute recess.

Transfer of Permit: Major Project Site Plan Special Permit No. 1991-01: TDRG Inc., Paul Turano, President, d/b/a Cook Needham, 63 Kings Road, Canton, MA 02021, to Ceed Corp, d/b/a Cook Restaurant, 15 Nell Road, Revere, MA 02151, Petitioner (Property located at 101-105 Chapel Street, Needham, MA).

Mr. Block stated this special permit will be transferred from TDRG, Inc. to Ceed Corp and will continue the name Cook at 101-105 Chapel Street. Edison Gutierrez, managing partner, stated the same floor plan is being kept. The only changes are the daily specials, the food menu and the bar menu. Mr. Crocker asked if the décor would be changing. Mr. Gutierrez stated some has already been improved. He did some Christmas décor but nothing major. Mr. Alpert noted the letter signed by Mr. Gutierrez. He asked if he had read the special permit and is only requesting one change. He wants on the record Mr. Gutierrez abides by all conditions in the special permit. Mr. Gutierrez has read the special permit and agrees to all conditions. Mr. Alpert noted he has requested extended hours. Mr. Gutierrez noted he would like 10:00 a.m. Saturday and Sunday rather than 11:00 a.m. for a brunch menu.

Upon a motion made by Mr. Alpert, and seconded by Mr. Crocker, it was by a roll call vote of the four members present unanimously:

VOTED: to treat the change in the site plan special permit as a minor modification.

Upon a motion made by Mr. Alpert, and seconded by Ms. McKnight, it was by a roll call vote of the four members present unanimously:

VOTED: to accept the transfer with the minor modification requested.

Upon a motion made by Ms. McKnight, and seconded by Mr. Alpert, it was by a roll call vote of the four members present unanimously:

VOTED: to approve the decision as written.

Decision: Amendment to Major Project Site Plan Special Permit No. 94-5: Coca-Cola Beverages Northeast, Inc., 1 Executive Park Drive, Bedford, NH, 03110, Petitioner (Property located at 9 B Street, Needham, Massachusetts). Regarding proposal to renovate the existing building by removing the existing 14,500 sf office wing, removal of 44, 985 sf of the existing Fleet Services wing, associated storage and former railroad bay to be replaced by 14, 610 sf attached new single-story Fleet Services wing and addition of 14 loading docks (see legal notice and application for more details).

Attorney Evans Huber noted there was an inconsistency or error in the documents. In the parking analysis, the building was classified as warehouse, but the parking requirement was 1:400 square feet. That is for light industrial or manufacturing. Warehouse is 1:850 square feet. If the correct classification is warehouse, the project would need less parking. He feels this was incorrectly classified as warehouse and should be light industrial per the ITE parking generation manual. It should not

be classified as warehouse. Another issue this raises was the way the existing parking supply was counted. In the total parking count truck spaces were included. The By-Law says automobiles and does not mention trucks. They looked at the site from that perspective – auto parking and truck parking or storage. If classified as warehouse, auto parking on site is still short but not by as much. The project will still need a waiver. He will submit revised documents. This was triggered by error on their part but is easily fixable. They are not proposing to change any parking, just the calculation.

Ms. McKnight does not see manufacturing and she is not sure why it is a warehouse. Mr. Huber stated the category is light industrial or manufacturing. He feels it is light industrial rather than warehouse. This is more than just storage of product. Ms. McKnight asked if the Building Commissioner and Planning Director agreed with that. Mr. Huber noted the Building Commissioner acknowledged the ambiguity there. Mr. Block would like the Building Commissioner to concur with whatever classification they resolve it to. Mr. Alpert asked if, procedurally, the hearing would need to be reopened. He will check with Ms. Newman. Mr. Block noted this will be continued to 1/17/23.

Deliberation: Major Project Site Plan Special Permit No. 2022-02: 557 Highland, LLC, an affiliate of The Bulfinch Companies, Inc., 116 Huntington Avenue, Suite 600, Boston, MA, Petitioner (Property located at 557 Highland Avenue, Needham Massachusetts). Regarding proposal to redevelop the Property with approximately 496,694 square feet of office, laboratory and research and development uses. The proposal also includes construction of one-level of below grade parking under each building and a separate stand-alone parking garage, as well as approximately 10,000 square feet of retail and restaurant uses. (See legal notice and application for more details).

Mr. Block noted there was a redlined version of the decision and comments from the developer's attorney. Ms. Espada will have to listen to the recording so she can participate at the next meeting on Thursday at 2:00 p.m. Mr. Block noted the solar-ready status and asked Mr. Crocker if he had reviewed the final version. Mr. Crocker stated the applicant had specifically talked about solar on the 2 main roof buildings and had agreed to do it. Mr. Block stated the petitioner has proposed, in Section 3.12, to install one or more solar arrays as part of the North and/or the South buildings. Mr. Crocker stated he understands what they are saying but the petitioner said at meetings they would do solar, but circumstances may create a hindrance. This is unnecessarily convoluted. In the future there may be an allowance for solar to go over mechanicals. He does not see a need to give an easy out and is not happy with the revised language. The petitioner said they were going to install solar, and it should be in the decision.

Mr. Alpert agreed with Mr. Crocker. He wants the decision left as the Planning Director drafted it. The petitioner can come back if they have an issue. The hearing is closed. He feels the Board should go forward with the decision as drafted and the petitioner can come back with modifications if needed. Ms. McKnight concurs with her colleagues on the solar. Attorney Timothy Sullivan, representative for the applicant, noted his client submitted a letter this afternoon. Mr. Alpert stated he resents getting a letter at 5:30 p.m. on the night of a meeting and be expected to read it and consider it. Mr. Sullivan stated the substance does not change from the draft and the letter. The petitioner said there were opportunities but did not show solar. The project will be solar ready with solar arrays implemented. Mr. Crocker reiterated the applicant stated it would be done. Mr. Sullivan noted solar ready and solar arrays are being committed to the same as was presented. He stated the applicant is committed to LEED standard and will have the project solar ready and have solar arrays.

Mr. Block suggested saying "the applicant shall not be required to fulfill this requirement if it is out of compliance with the rest of the By-Law." Mr. Alpert noted, in Section 3.12, Mr. Sullivan's language, remove (i) "the petitioner determines, based on an analysis from a qualified professional" and the word "desired." Subsection (ii) and (iii) are ok. Mr. Sullivan is fine with the changes. Mr. Crocker accepts the change. Mr. Block noted it had never been said the applicant intends to phase the project. There is no phasing plan. Mr. Sullivan stated this was in the initial application. The applicant asked for a Certificate of Occupancy for one building before the next building was done. This is consistent with what was presented. It is not intended to be phased if there are no material alterations of the plan, but they need the flexibility to build one building and get a Certificate of Occupancy.

Mr. Block asked, if phased, what other changes will there be. Will the track still be in the same place? Mr. Sullivan stated all conditions apply and all are in the same location. The applicant will come back to the Board if modifications are necessary. Mr. Alpert has an issue with the concept not being discussed at the public meeting. Mr. Block stated Town Counsel does not have a problem with the changes. Mr. Alpert stated he has no issue with issuing a Certificate of Occupancy for one building and no problem with the concept issue of each building being owned separately and financed. The financing

is not within the Planning Board purview and should not be in the decision. Mr. Sullivan suggested saying each can have its own Certificate of Occupancy and strike “separately owned and financed” on the first page of his redlined version.

Ms. Clee informed the Board the Planning Director stated it would be prudent to require a phasing plan if the applicant decided to phase it. Mr. Sullivan noted “any changes shall be shown on a phasing plan and submitted to the Planning Board.” Mr. Alpert suggested taking out Mr. Sullivan’s language about a separate phase and include a proviso that sufficient parking be constructed. Mr. Crocker is ok with that. In Section 1.23, Mr. Sullivan put in words to make it clear and noted a grant of easement is in another area. Section 3.4 was made clear for lenders and others. If one building is in violation not all are in violation. Ms. McKnight asked who would be responsible if the common areas are not maintained. Mr. Block stated it will be maintained by a condo association. Mr. Crocker noted the language says, “one or more solar arrays on the north and/or south buildings.” He wants “/or” taken out and keep “and.” In Section 3.38 (g), Mr. Sullivan wants to clarify all traffic mitigation measures are subject to obtaining approvals.” Ms. McKnight stated it should be added that the applicant shall diligently pursue getting approvals. Mr. Sullivan would like to add the ability to bond over something in (p). Mr. Block stated the Board will finalize the language on Thursday when the Board meets.

Mr. Alpert left the meeting at 11:30 p.m.

Minutes

Mr. Block stated in the minutes of 9/20/22, page 2, he is not sure if the 7 spaces are on site or off. It was decided to delete “with the 7 spaces shown.” On page 3, Mr. Fernandes is a participant for the business owner. In the 10/3/22 minutes, page 3, remove “it” and clarify he would like “the south building” pushed back. Ms. McKnight suggested deleting the sentence “Mr. Crocker likes the yews” and all agreed. On the top of page 5, delete “they are proposing nothing more in the way of hazardous waste...”

Upon a motion made by Mr. Crocker, and seconded by Ms. McKnight, it was by a roll call vote of the four members present unanimously:

VOTED: to approve the minutes of 9/20/22 and 10/3/22 as revised tonight.

Report from Planning Director and Board members.

Mr. Block noted there is a revision to the red brick on the Town Common in front of Town Hall. He noted this seems fine to him. All agreed.

Correspondence

Mr. Block noted correspondence from Jon Schneider, Chairman of the Zoning Board of Appeals, suggesting revisions to ADUs by right and eliminating the requirement for a special permit for 3 car garages in the Single Residence B District - he would like them allowed by right. Mr. Block hopes to take up ADUs for the May Town Meeting. He will speak with Mr. Schneider.

Upon a motion made by Mr. Crocker, and seconded by Ms. McKnight, it was by a roll call vote of the four members present unanimously:

VOTED: to adjourn the meeting at 11:35 p.m.

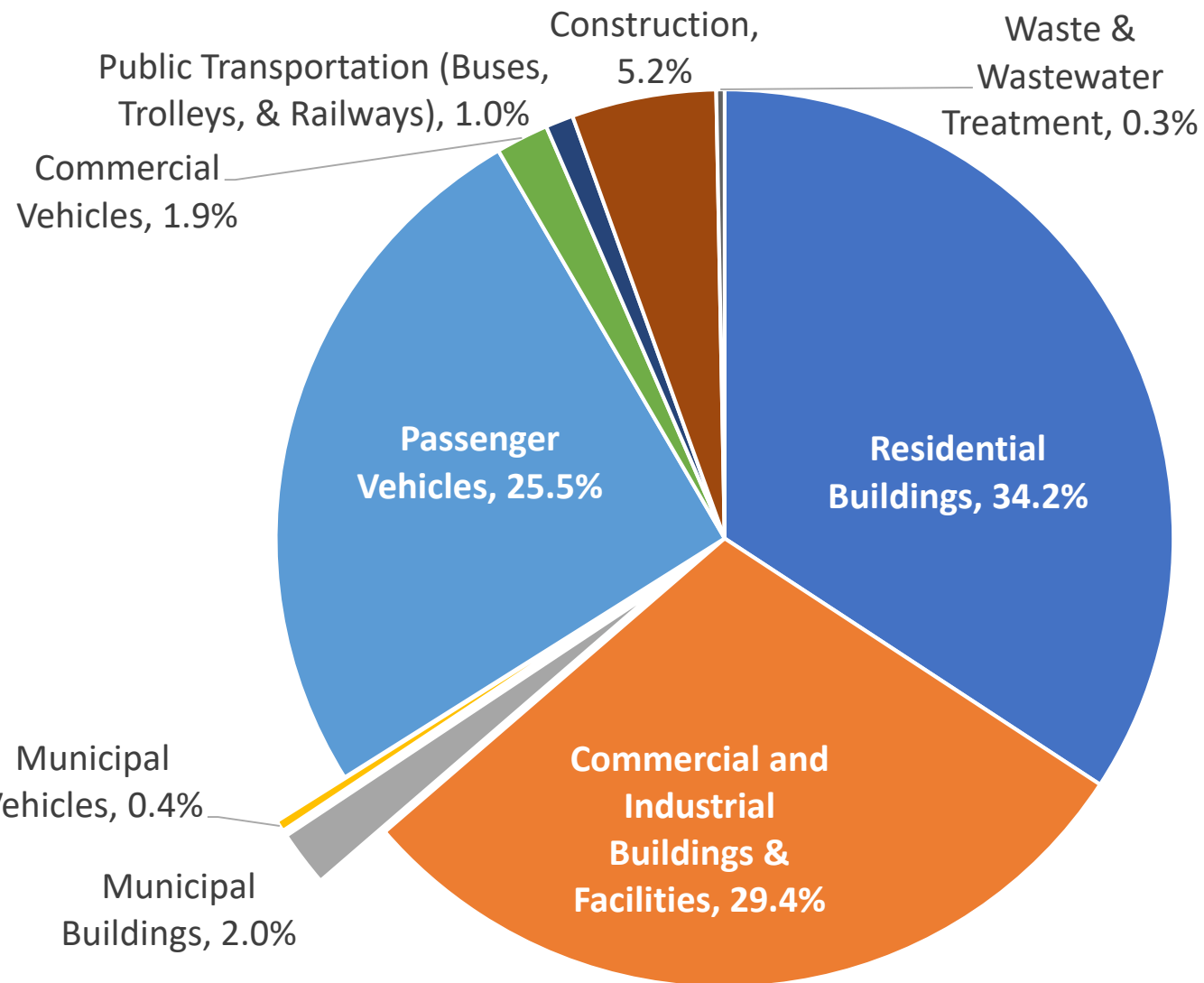
Respectfully submitted,
Donna J. Kalinowski, Notetaker

Jeanne S. McKnight, Vice-Chairman and Clerk

CAPC Presentation to Select Board

April 4, 2023

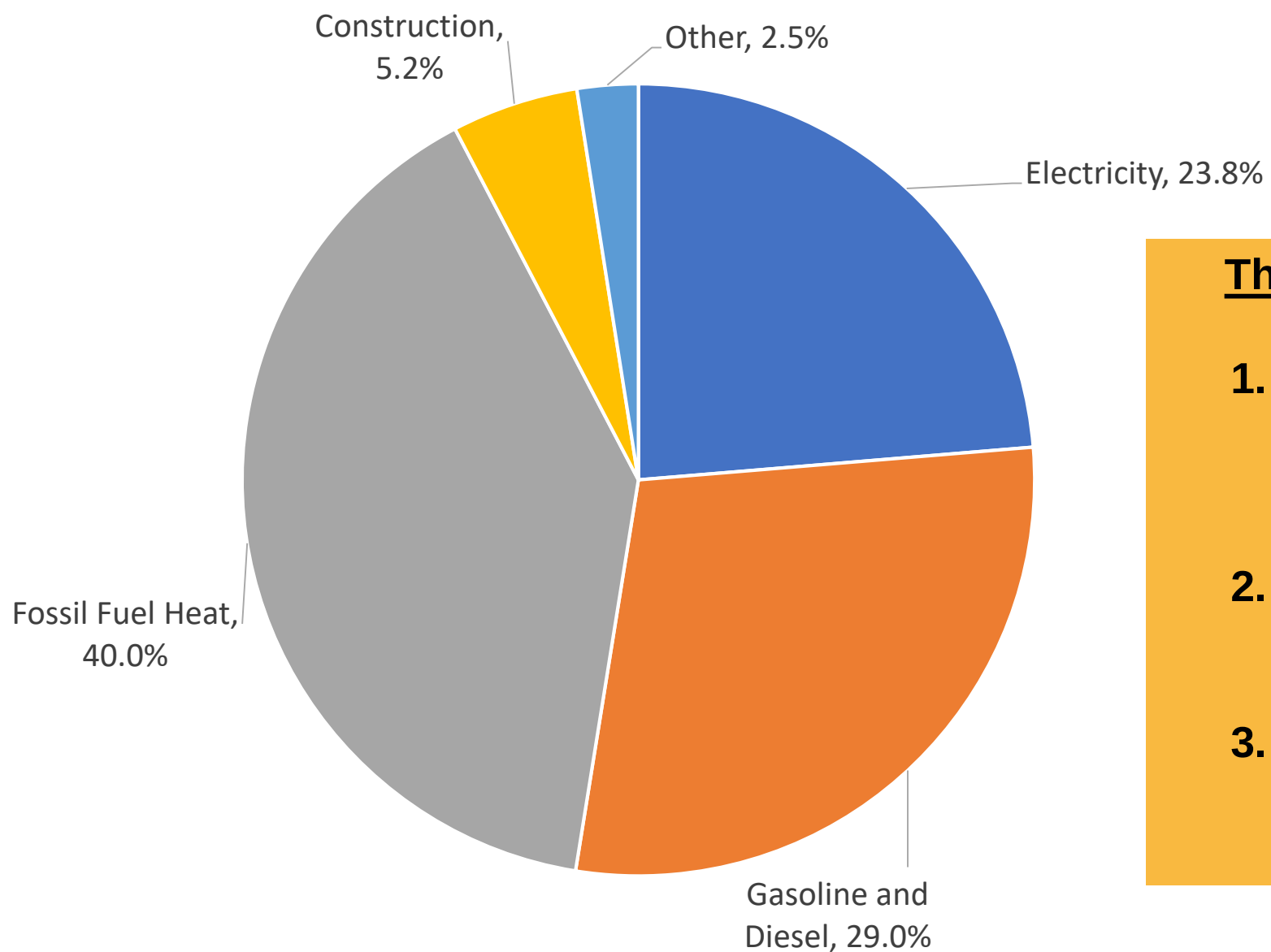
Climate Smart Zoning and Permitting
Updated Stretch Code and Opt-In Specialized Energy Code



Town of
Needham's Share
of GHG is only
2.4%

Reducing GHG Emissions
will require a collective
effort by Town residents,
businesses, and other
organizations

NEEDHAM'S GREENHOUSE GAS EMISSIONS BY SECTOR



The Basic Formula to Net Zero

- 1. Make buildings as efficient as possible**
(insulation, windows, doors)
- 2. Electrify everything**
(heat pumps, EVs)
- 3. Green the electricity grid**
(solar, wind, geothermal, etc.)

NEEDHAM'S GREENHOUSE GAS EMISSIONS BY SOURCE

How do we accelerate decarbonization of buildings?

Zoning and Permitting

- Remove barriers to adoption of solar, heat pumps, energy storage, and other GHG reduction technologies in residential and commercial buildings

Building Codes

- Improve the energy performance of all buildings

How do we accelerate decarbonization of buildings?

Smart Zoning and Permitting Working Group	Action 1 Remove zoning barriers to installing solar, heat pumps, geothermal, and energy efficiency measures for commercial/municipal/multi-family/single family residential buildings.
Net Zero Buildings	Action 2 Adopt Specialized Code (“Net-Zero”) for all new construction including municipal buildings, residential and commercial developments

Smart Zoning and Permitting

Key questions

- What should be by right, by right with site plan review, and what should be by special permit?
- What should we include in our definitions: rooftop solar, ground-based solar, solar canopies, how to define size, energy storage, heat pumps, wind turbines, etc?
- How should setbacks be decided upon for each type of solar?
- What should a site plan review process be?
- How much emphasis on pollinator protection, canopy preservation, vegetation management, stormwater runoff, mitigation for loss of carbon sequestration and forest habitat?

Existing Solar Zoning in Needham

- Large-Scale Ground-Mounted Solar Photovoltaic Installation Overlay District
 - >250 kW DC
 - Allowed by right in Overlay District
 - Requires Major Project Site Plan Review by Planning Board
 - Minimum lot area: 20 Acres
 - Setbacks 50 feet
 - Maximum lot coverage 50%
 - Height restricted to 25 feet
 - Sections similar to what is provided in DOER model language

Existing Solar Zoning in Needham

- Commercial district rooftop solar
 - Solar and HVAC may exceed height restrictions of building by up to 15 feet
 - Total horizontal coverage of all structures does not exceed 25 percent
 - All structures must be set back from roof edge by distance no less than their height
 - Planning Board may require screening of equipment

“As a reminder, while regulating aesthetics can arguably be considered a matter of protecting public welfare, attempting to place restrictions on dimensional standards, such as setbacks or height, as they relate to aesthetics can create roadblocks to actual installation. It is therefore not recommended that communities regulate aesthetics of solar energy systems due to the strong statutory protections in Chapter 40A Section 3, or that they do so very carefully.”

Metropolitan Area Planning Council sample recommendations for zoning/permitting

- Focusing on expediting solar installations
- Provide permitting checklists to make process easier to follow
- Utilize narrow inspection time windows to lower costs
- Develop a solar permitting website
- Offer online permitting
- Reduce or eliminate permitting fees for solar projects

Source: <https://www.mapc.org/wp-content/uploads/2017/10/Solar-Permitting-and-Zoning-Bylaw-Guidance.pdf>

Summary of CAPC Discussion

- Consensus was that the following items are not blocked by current zoning:
 - Residential heat pumps
 - Residential roof top solar
 - Large-Scale Ground-Mounted Solar PV Installations (covered in 3.13)

Summary of CAPC Discussion

- Consensus was that the following items are not blocked by current zoning by laws:
 - Residential roof top solar (over 500 installations in Needham)
 - Residential heat pumps (treated like bay windows or accessory structure)
 - Small residential ground-based solar systems (a couple of been approved)

Summary of CAPC Discussion

- Highest priority items to address
 - Solar canopies over parking lots / structures
 - Commercial rooftop solar
 - Small and medium sized ground-based solar

Summary of CAPC Discussion

- Recommend zoning for solar canopies “as-a-right” – with site plan approval
 - Why as-a-right?
Remove barriers to the quickest way to add local green energy production
 - Why a site plan approval?
Need to handle stormwater, minimum height to allow planes and emergency vehicles, impact on parking, impact on paving
 - Allow canopies on parking garage roofs
Helps with snowmelt, safety, and protects cars parked on roof

Summary of CAPC Discussion

- Add zoning for small- and medium ground-based solar
 - Small- and medium ground-based solar not defined in our bylaw
 - Clarify for permitting process for ground-based solar arrays based upon size
 - Recommend Small systems be as-a-right (subject to lot coverage limits and setbacks) and Medium systems be as-a-right with site plan review (with additional requirements spelled out in site plan review process)

Summary of CAPC Discussion

- Recommend that the Town separate out height and set back restrictions for commercial rooftop solar installations
 - Why?

Current zoning unnecessarily restricts solar arrays on commercial structures because it includes solar panels in the limits the total horizontal coverage of a structure

- Example: 4.5 (3) (See also in 4.8 (1), 4.9 (1), 4.11 (1))

...Structures erected on a building and not used for human occupancy, such as chimneys, heating ventilating or air-conditioning equipment, solar or photovoltaic panels, elevator housings, skylights, cupolas, spires and the like may exceed the maximum building height provided that no part of such structure shall project more than 15 feet above the maximum allowable building height, the total horizontal coverage of all of such structures on the building does not exceed 25 percent, and all of such structures are set back from the roof edge by a distance no less than their height. The Planning Board may require screening for such structures as it deems necessary. Notwithstanding the above height limitations, cornices and parapets may exceed the maximum building height provided they do not extend more than 5 feet above the highest point of the roof.

Resources for Climate Smart Zoning

- Model Zoning for the Regulation of Solar Energy Systems
(DOER, 2014)
<https://www.mass.gov/doc/model-solar-zoning-0/download>
- MAPC Climate Smart Zoning and Permitting
https://www.mapc.org/wp-content/uploads/2021/11/FINAL-Playbook_Climate-Smart-Zoning-Permitting-Chapter.pdf
 - Action A: Allow by-right the installation and operation of net zero enabling technologies.
 - Action B: Include net zero enabling technologies and related terms in zoning definitions.
 - Action C: Exempt net zero enabling technologies from height and setback requirements.
- Solar Best Practices Guide
(Pioneer Valley Planning Commission)
<https://www.pvpc.org/sites/default/files/doc-solar-best-practices-guide4180.pdf>
- Community Planning for Solar Toolkit
(UMASS Clean Energy Extension)
<https://ag.umass.edu/clean-energy/research-new-initiatives/solarplanning>

Resources for Climate Smart Zoning

[Draft Climate Smart Zoning language for Needham](#)

Needham Climate Action Planning Committee

Updated Stretch Code and
Opt-In Specialized Code

Needham has already adopted the Stretch Code

- The Stretch Code is an above-code appendix designed “to result in cost-effective construction that is more energy-efficient than what is built under the base code” – Massachusetts Municipal Association
- Needham adopted the Stretch Code at May 2019 Town Meeting
- >300 Massachusetts cities and towns have adopted the stretch code
- In 2022, Massachusetts updated the Stretch Code

Key Changes to Stretch Code

- Stricter efficiency standards (HERS ratings or Passive House) for both new construction and alterations
 - Some types of renovations must meet HERS ratings
- New construction requires ventilation and heat capture
- Requirements for homes to include EV wiring
- High ventilation buildings such as labs and hospitals get exemptions

Updated Stretch Code

Needham has already opted in, so these will take effect without the need of Town Meeting taking an affirmative vote

On-site Clean Energy Application	Maximum HERS Index score (before renewable energy credit)				
	New construction			Alterations, Additions and Change of use	
	Current Stretch Code	Updated Stretch Code Through 6/30/2024	Updated Stretch Code Effective 7/1/2024	Current Stretch Code	Updated Stretch Code
None (Fossil fuels)	55	52	42	65	52
Solar	60	55		70	55
All-Electric	60	55	45	70	55
Solar & All-Electric	65	58		75	58

New Opt-in Specialized Code

- Written to encourage Net Zero building construction
- Requires an affirmative vote by Town Meeting
- Goes into effect at least 6 months after an affirmative vote, on a Jan 1 or July 1 date
- Applicable for new construction only

Net Zero pathways for Single-Family New Construction under the Opt-in Specialized code

Building Size	Fuel Type	Minimum Efficiency	Electrification	Min. EV wiring	Renewable Generation
Dwelling units up to 4,000 sf	All Electric	HERS 45 or Phius CORE or PHI	Full	1 parking space	Optional
Dwelling units up to 4,000 sf	Mixed-fuel	HERS 42 or Phius CORE or PHI	Pre-wiring	1 parking space	Solar PV (except shaded sites)
Dwelling units > 4,000 sf	All Electric	HERS 45 or Phius CORE or PHI	Full	1 parking space	Optional
Dwelling units > 4,000 sf	Mixed-fuel	HERS 0 or Phius ZERO	Pre-wiring	1 parking space	Solar PV or other renewables

Net Zero pathways for Multi-Family New Construction under the Opt-in Specialized code

Building Size	Fuel Type	Minimum Efficiency	Electrification	Min. EV wiring	Renewable Generation
Multi-family >12,0000 sf	All Electric	Phius CORE or PHI	Full	20% of parking spaces	Optional
Multi-family >12,0000 sf	Mixed-fuel	Phius CORE or PHI	Pre-wiring	20% of parking spaces	Optional

Net Zero pathways for Commercial New Construction under the Opt-in Specialized code

Pathway	Energy Efficiency Requirements	Performance Standard
All-electric Building Performance Standard	Same energy efficiency requirements as the Updated Stretch Code for all building types except multi-family	All space heating, water heating, cooking equipment and drying equipment is powered by electricity and meets minimum efficiency standards.
Mixed-Fuel Building Performance Standard	Multi-family buildings built to the Commercial Specialized Code must achieve precertification to Passive House standards (either from PHI or Phius)	Allows fossil fuels Onsite solar required Pre-wiring for electrical service required
Zero Energy Building Performance Standard		Net Zero on annual basis On-site renewable generation can offset energy use HERS 0 available for multi-family

SOLAR BEST PRACTICES GUIDE

A GUIDE TO ASSIST
MUNICIPALITIES WITH SOLAR
LAND USE REGULATIONS

Prepared by Pioneer Valley Planning Commission with assistance from towns and cities in the Pioneer Valley:
Belchertown, Blandford, Easthampton, East Longmeadow, Hadley, Northampton, Pelham, Ware, Westhampton, Wilbraham, and Williamsburg, with Support from the Massachusetts District Local Technical Assistance Fund

COMMUNITIES & PARTNER ORGANIZATIONS

Town of Belchertown
Town of Blandford
City of Easthampton
Town of East Longmeadow
Town of Hadley
City of Northampton
Town of Pelham
Town of Ware
Town of Westhampton
Town of Wilbraham
Town of Williamsburg

University of Massachusetts Clean Energy Extension
State Representative Lindsay Sabadosa

SPECIAL THANKS TO

Gerry Bingham, MA Department of Energy Resources
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Patty Gambarini, Pioneer Valley Planning Commission
Mike Petrin, VHB
Gerry Palano, MA Department of Agricultural Resources
Tim Roughan, National Grid
Mark Stinson, MA Department of Environmental Protection

Some content within this guide has been adapted from resources developed by the Massachusetts Department of Energy Resources, UMass Clean Energy Extension, the Massachusetts Citizen Planner Training Collaborative, and the Cape Cod Commission

Prepared by:

Pioneer Valley Planning Commission

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Eric Weiss, Municipal Services Manager

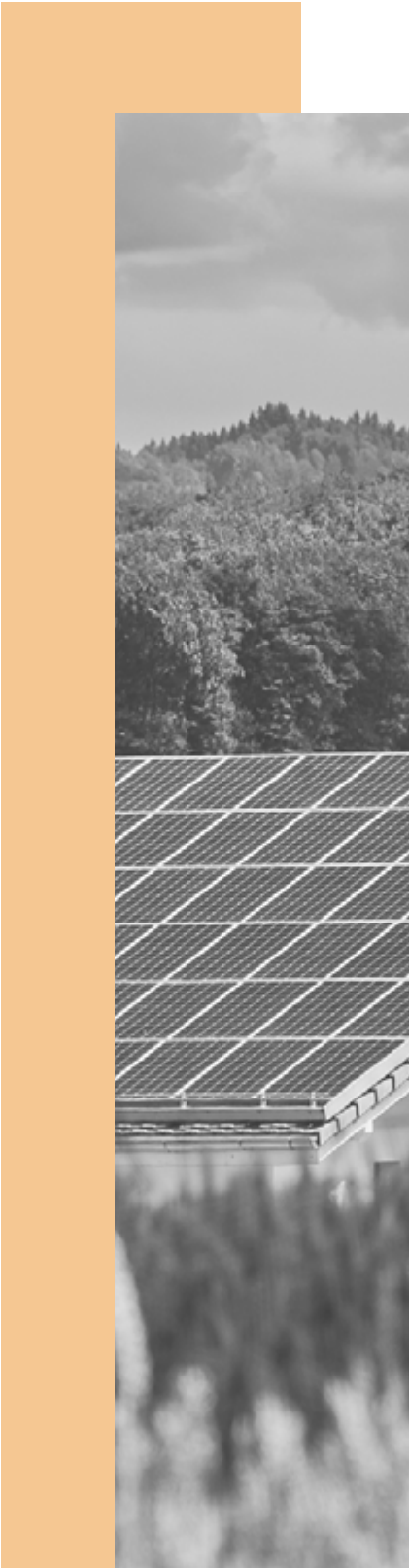


**Pioneer Valley
Planning Commission**

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1 INTENT OF GUIDE



Installation of large-scale solar energy arrays has been increasing rapidly across the Commonwealth of Massachusetts; many communities with limited capacity are having to address proposals for solar installations on forest and prime farm lands, and other lands that are identified as resource-rich.

The intent of this guide is to assist communities with the regulation and development of Solar Photovoltaic Installations by providing standards for their placement, design, construction, operation, monitoring, modifications, and removal; to protect public health, safety or welfare in accordance with M.G.L. c. 40A, § 3; to protect and preserve farmland, forests, and open space as promoted by the Commonwealth of Massachusetts; to protect the scenic, natural, and historic resources; and to provide adequate financial assurance for the eventual decommissioning of such installations.

Throughout, this document provides helpful resources and examples that communities can use to develop effective solar energy zoning regulations and policies.

SOLAR PV IN MASSACHUSETTS 2

SOLAR PV BASICS

Solar photovoltaic systems, commonly abbreviated as solar PV, are the primary technology used to harness solar energy for electricity production. Solar PV cells, made primarily from silicon, convert sunlight directly into electricity. Multiple cells are connected in a solar panel or module, in which the cells are encased in protective glass, metal, and/or plastic. Panels can be used individually or connected to form an array. Solar PV panels are a different technology from solar thermal panels, which are used to produce domestic hot water, or the concentrated solar power systems of the southwestern United States, which use mirrors to concentrate sunlight and heat water into steam to generate electricity.

In addition to solar PV panels, a solar PV system includes an inverter, which converts the direct current (DC) electricity generated by the panels into the alternating current (AC) electricity used for local transmission within the electric grid, and fed into homes and businesses. Other components include mounting structures, wiring to connect system components, meters, and additional electrical accessories. Some solar arrays, especially larger systems, may also include an energy storage system, typically in the form of a set of batteries. Because the amount of sunlight available to generate energy varies depending on the time of day, season of the year, and weather conditions, solar PV is a variable source of energy. Battery storage systems are therefore useful for moderating the flow of electricity into the grid, and allowing solar-generated electricity to be used even at night when the sun is not shining.

Due to their modularity, solar PV systems can vary greatly in size. The size of a solar array is typically described in terms of its capacity, which is a measure of the instantaneous power output of the array at top production (i.e., in full sun). It is usually measured in kilowatts (kW) or megawatts (MW), where 1 MW equals 1000 kW. In our region, small-scale systems used to power an individual home, business, or municipal facility tend to be less than 25 kW. Commercial-scale solar arrays, which sell power directly to the grid, are often 1 MW or greater in size. An average 1 MW array would cover approximately 4-5 acres of land.

In Massachusetts, most solar PV systems are distributed energy resources – small or medium-sized power sources that are connected to the lower-voltage distribution lines which provide power to residential and business customers. The current state solar incentive program limits the size of solar PV arrays eligible for incentives to 5 MW AC, and so, at present, that is the largest size project many municipalities may see proposed. However, in some cases, electricity utilities or other entities may find it economical to propose much larger, “utility-scale” projects, which are greater than 5 MW AC, and which may be connected directly to transmission lines rather than distribution lines.

It is important to note that the capacity of a solar PV system is different when measured in units AC versus units DC. The DC capacity of a solar array is a good indication of its size, and footprint on the landscape. The AC capacity of a solar array is an indication of the maximum amount of energy flowing from the array into the grid, after it has gone through the inverter. In the absence of energy storage, a typical DC to AC ratio for solar array capacity is about 1.25:1. However, with energy storage, that ratio can be significantly higher (close to 2:1), since excess electricity can be stored in batteries during the day, and released into the grid during the night, when the panels are not generating electricity. This means that a solar array with a capacity of 5 MW AC might be as large as 10 MW DC.

The annual generation of a solar array is a measure of the yearly energy output produced by the panels. It is typically measured in kilowatt-hours (kWh) or megawatt-hours (MWh). In New England, annual generation is approximately equal to the array's capacity (in DC) * 14% * 8760 hours per year.



STATE INCENTIVES FOR SOLAR PV DEVELOPMENT

The state of Massachusetts has implemented three successive programs to provide incentives for solar development, which have been overseen by the state Department of Energy Resources (DOER).

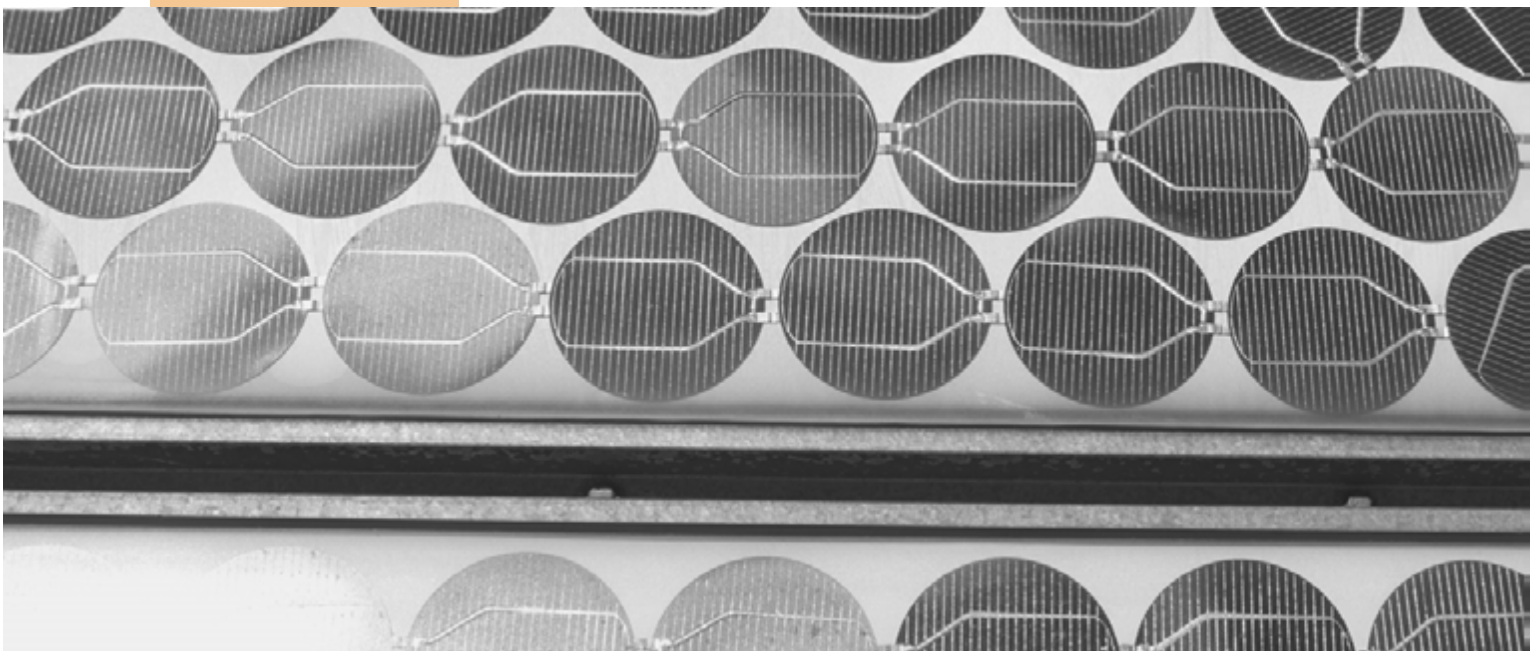
Under the **Solar Carve-Out** (2010-2013) and **Solar Carve-Out II** (2014-2018) programs, new solar PV systems within the state were eligible to qualify for Solar Renewable Energy Credits (SRECs). SRECs were issued to system owners based on how much electricity their solar panels generated; depending on the size and type of PV system, the system owner would earn up to 1 SREC for each MWh of power generated by the solar array. Systems that qualified under these programs could earn SRECs for a period of 10 years from the date they are first interconnected and operational. Utility companies which supply electricity to Massachusetts are required to purchase a certain number of SRECs every year, which they tend to do in bulk at auction. DOER sets a floor and ceiling on the auction price for SRECs, with prices that decline by a small percentage each cycle. After 10 years of operation, solar systems built under these programs no longer earn SRECs, but continue to be eligible for renewable energy credits (RECs), as well as generating saleable electricity for the system owner. RECs are worth less than SRECs, but can still be aggregated and sold at auction to utility companies. **About 2,100 MW of solar PV capacity were installed in the state under these two programs.**

In November 2018, the Solar Carve-out II program was replaced by the **Solar Massachusetts Renewable Target Program**, or **SMART**. The SMART regulation provides incentives in the form of direct “tariff” payments to the system owner for each kWh of power generated, with credit for the renewable content of the electricity going directly to the utility company in the form of RECs. SMART provides a base compensation incentive rate for solar arrays, based on system size, utility service area, and timing of entrance into the program. Additional incentives are available for projects located on buildings, parking lot canopies, landfills, brownfields, and “dual-use” solar and agriculture projects, as well as certain types of projects that benefit public entities, like municipalities, or that provide lower-cost electricity to multiple customers (“community-shared”). The SMART program initially was designed to provide incentives for 1,600 MW of solar development. The program was subject to an emergency regulation in April 2020, which further expanded the program to a total of **3,200 MW**.

The updated regulation places restrictions on what types of large, ground-mounted projects can receive incentives when they are sited on undeveloped land designated as BioMap2 Critical Natural Landscapes or Core Habitat by the state MassWildlife Natural Heritage and Endangered Species Program.

FUTURE SOLAR DEVELOPMENT IN MASSACHUSETTS

As part of the 2008 Global Warming Solutions Act, Massachusetts set mandated greenhouse gas emission reduction targets, including an 80% reduction in emissions relative to 1990 levels by 2050. In order to reach these goals, large amounts of renewable electricity-generating capacity will have to be added to the New England grid, with solar photovoltaic (PV) systems representing a significant portion of that added capacity. But how much solar PV capacity will ultimately be needed? The state of Massachusetts has set short-term targets for solar PV development, such as the 3,200 MW cap established for the SMART solar incentives program. However, the state currently has no long-term vision of how much solar will ultimately need to be developed. Of course, future electricity needs are impossible to predict exactly, and the changing economics of other types of technologies – particularly offshore wind – will play an important role in the mix of renewable sources that will power the electric grid in the future.



Nevertheless, a number of organizations have conducted economic and energy modeling to estimate how much solar PV capacity may ultimately be needed to help power a clean grid in Massachusetts.

- The **Stanford Solutions Project**¹ estimates **38.4 GW** of solar PV will be needed state-wide to achieve 100% renewable fuel use across Massachusetts, including electrified heating and transportation sectors. Under this scenario, 29.5% of Massachusetts electricity comes from solar.
- The **Brattle Group**² estimates about 107 GW of solar PV must be built across New England to achieve an 80% reduction in greenhouse gas emissions for the region. Massachusetts represents about 46% of New England electricity use, so could be considered responsible for up to **50 GW** of solar PV development – although wind development off the coast of Massachusetts will also represent an important portion of the state's contribution to the New England electricity supply. Under this scenario, solar would provide 37% of electricity generation.
- The **National Renewable Energy Laboratory**³ estimates 715 GW of solar PV are needed nationwide by 2050 to achieve 27% of electricity generation from this source. Massachusetts is envisioned to contribute **10-30 GW** to this total.

The state of Massachusetts currently has about 2.5 GW of solar installed. In order to reach the capacity levels described above, solar capacity would need to expand to 4-20 times what it is currently. Therefore, we can expect to see continued pressure for solar development in coming decades..

¹Delucchi, M.A., M.Z. Jacobson, G. Bazouin, and Z.A.F. Bauer, 2015. Spreadsheets for 50-state 100% wind, water, and solar roadmaps, <http://web.stanford.edu/group/efmh/jacobson/Articles/I/WWS-50-USState-plans.html>

²Weiss, J. and J.M. Hagerty, 2019. Achieving 80% GHG reduction in New England by 2050, https://brattlefiles.blob.core.windows.net/files/17233_achieving_80_percent_ghg_reduction_in_new_england_by_20150_september_2019.pdf

³SunShot, E.E., US Department of Energy, 2012. SunShot Vision Study: February 2012. NREL Report No. BK5200-47927. DOE/GO-102012-3037.

3 DEVELOPING OR UPDATING A SOLAR BYLAW OR ORDINANCE

DEFINING A CLEAR PROCESS

A municipal solar bylaw or ordinance should proscribe the process for solar array development and operation within the community, from initial permitting, to site clearing and construction, to annual maintenance, management, and reporting, and through eventual decommissioning. The bylaw or ordinance should be thorough and lay out a clear process, so as to provide clarity to both the solar developer and solar PV system owner (if the facility changes hands), as well as to board members reviewing the project.

However, because any amendments to a zoning bylaw or ordinance require approval at Town Meeting or by Town or City Council, it may also be wise to allow sufficient flexibility in the bylaw or ordinance to permit updates to minor components of the permitting process without amending the bylaw.

After reviewing several proposed projects, the Site Review Approval Authority (typically the Planning Board or Zoning Board of Appeals) may recognize that there are additional types of documents or specific information which would be of use in reviewing future applications. A municipality's Site Plan Review Rules and Regulations can lay out the requirements that could be provided in a typical application. Keep in mind that requirements for construction, maintenance, or reporting relevant to a specific site could be put into the final conditions associated with the permit for that project, rather than included in a bylaw, ordinance governing all projects. See *Appendix A* for an example. Rules and regulations can be adopted by the Site Plan Authority with a majority vote during an appropriately advertised Public Hearing.

PLANNING FOR SOLAR DEVELOPMENT IN YOUR COMMUNITY

Solar development is coming to represent a large source of new development in many Massachusetts communities. Mass Audubon's 2020 *Losing Ground* report estimated that solar development has represented as much as a quarter of all new land development in the state in recent years. As noted in *Section 2* of this guide, significant additional solar development is necessary in Massachusetts over the coming decades, if the state is to meet its mandated greenhouse gas emission reduction goals. With this in mind, communities may wish to conduct specific planning for solar development, and to develop solar zoning bylaws that are compatible with these plans. As detailed below, municipalities cannot "unreasonably" regulate or restrict solar development, but bylaws can be designed to guide development towards certain locations or certain types of projects. For example, many municipalities allow as-of-right siting of solar PV development on former landfill properties; others streamline development of building-mounted and parking lot canopy arrays by requiring only a building permit for their construction.

There is not currently a template to guide municipal-level solar development planning in Massachusetts, but the UMass Clean Energy Extension is working with a diverse team to create just such a document, which will be completed in mid-2021. In the meantime, existing municipal planning documents - such as a Master Plan or Open Space & Recreation Plan - can help identify where a community prefers to see, and prefers not to see, solar development. Hazard Mitigation Plans can also help to identify where a community could benefit from solar development paired with energy storage, potentially allowing for electrical power at an emergency shelter during a black-out. Where there are appropriate sites for solar development on public land or with willing private landowners, communities can consider taking a proactive approach, actively soliciting proposals for development of a site, rather than solely responding to permitting applications from developers.



STATE REQUIREMENTS REGARDING SOLAR BYLAWS AND ORDINANCES

PROTECTION FROM "UNREASONABLE" REGULATION

Massachusetts General Laws (MGL) Chapter 40A, Section 3, protects solar energy systems and the building of structures that facilitate the collection of solar energy as follows:

No zoning ordinance or by-law shall prohibit or unreasonably regulate the installation of solar energy systems or the building of structures that facilitate the collection of solar energy, except where necessary to protect the public health, safety or welfare.

The challenge in interpreting this statement lies in defining what constitutes "unreasonable" regulation of solar, and what requirements are necessary to protect the public welfare. In the review of new solar bylaws performed by the Massachusetts Attorney General's Office, the office frequently comments:

There are no court decisions to guide the Municipality and this Office in determining what qualifies as an unreasonable regulation of solar uses in contravention of G.L. c. 40A, § 3. However, the Municipality should be mindful of this requirement in applying the amendments adopted and consult closely with Town Counsel during the process.

The Massachusetts Department of Energy Resources (DOER) model solar bylaw/ordinance also addresses this statute, and notes the lack of court precedent in defining "unreasonable" regulation:

Although these systems must be allowed within the community, they may be regulated where necessary to protect public health, safety or welfare through other provisions of the Zoning Bylaw/Ordinance. For example, these systems will still need to meet dimensional regulations and other performance standards necessary to protect public health, safety or welfare. In addition, a Site Plan Review process may be used to collect information that will ensure compliance with the performance standards in the Zoning Bylaw/Ordinance. Where some communities include Design Review in their permit processes, these communities will need to balance their desire for certain design objectives with the Commonwealth's protection of solar energy systems. Finally, this suggested bylaw/ordinance document requires a special permit for a large-scale ground-mounted facility in a residential district and prohibits such systems in another residential district. While a special permit is discretionary, and language expressing uncertainty and cautioning communities about the lack of case law regarding Chapter 40A Section 3 has been included, the Attorney General's Office has approved local zoning using this permitting mechanism.

While DOER cannot offer a definitive interpretation, limited use of special permits when applied to the largest of solar systems, especially when these systems are allowed elsewhere by right, may well be reasonable regulation. In DOER's view, given the plain language of the statute, it is prudent to allow opportunity to site all scales of solar energy systems somewhere in the community.

This guide and the model bylaw/ordinance language provided herein have been constructed based on existing solar bylaws that were reviewed by the respective municipal counsels of the municipalities that implemented them. Approved bylaws and ordinances have placed constraints on where and how solar arrays can be built, including limits on forest clearing, maximum grades of slope where solar can be developed, and property line setbacks. However, it is important to recognize that there remains little clear guidance on what constitutes “unreasonable” regulation. Further, it is possible that reasonable regulation could be context-dependent. For example, barring forest clearing from more than 2 acres of land may eliminate the potential for most solar development on 90% of potential sites in a town that is heavily forested, while not doing so in another municipality with more unforested land. The constrictions imposed by specific siting requirements are worth considering carefully in development of a municipal solar zoning bylaw or ordinance.

PROTECTION OF AGRICULTURAL ENERGY SYSTEMS

Massachusetts General Laws (MGL) Chapter 40A, Section 3, provides further protection of certain solar photovoltaic systems that are built for the exclusive purpose of providing electricity for agricultural activities on a property that is primarily in agricultural use (where solar is accessory to the agricultural use). In this case, the system may not be prohibited, unreasonably regulated, or require a special permit.

*No zoning ordinance or by-law shall ... prohibit, unreasonably regulate, or require a special permit for the use of land for the primary purpose of commercial agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture, **nor prohibit, unreasonably regulate or require a special permit for the use, expansion, reconstruction or construction of structures thereon for the primary purpose of commercial agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture...***

Note that this law does not exempt a proposed solar PV system from regulation, but indicates it must not require a special permit to build– that is, that it must be allowed as-of-right, but can be subject to site plan review to ensure it meets relevant laws and is eligible for issuance of a building permit. In order to be eligible for this protection, the property on which the project is sited must meet specific requirements in terms of commercial agricultural sales and parcel size, which are further detailed in Section 3. See additional resources in the appendix for questions on the applicability of agricultural exemption to specific solar energy systems. (See Appendix B)

GREEN COMMUNITIES STATUS

Many towns and cities across the Commonwealth participate in the Green Communities program, which assists municipalities in setting and achieving goals for energy efficiency. One of the five criteria to earn designation as a Green Community is passage of a zoning bylaw related to renewable energy which provides for as-of-right siting of at least one type of renewable energy manufacturing or generation facility in at least one zoning district or designated location, as follows:

To qualify as a green community, a municipality or other local governmental body shall...provide for the as-of-right siting of renewable or alternative energy generating facilities, renewable or alternative energy research and development facilities, or renewable or alternative energy manufacturing facilities in designated locations.

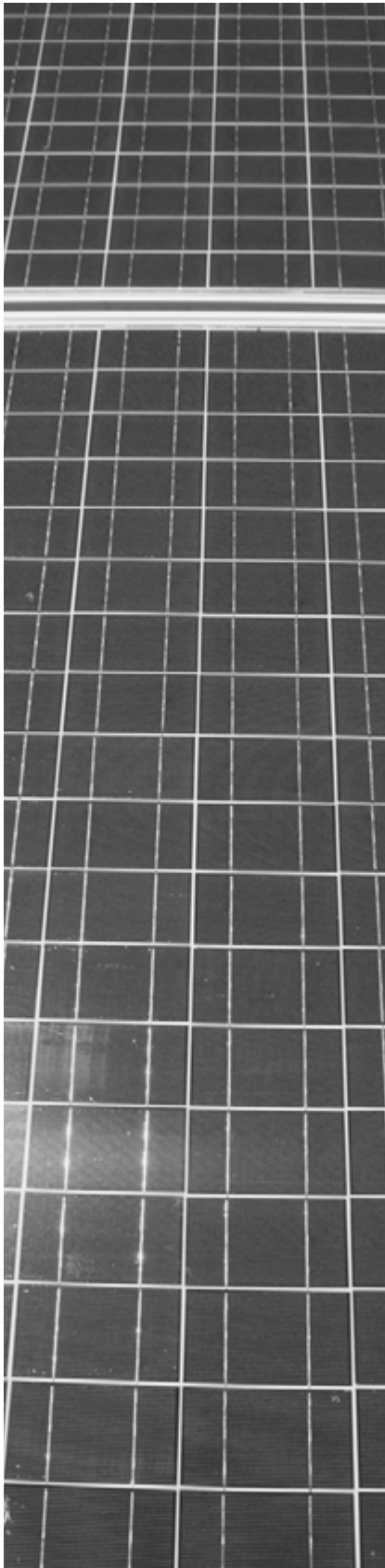
This criterion is relatively straightforward to fulfill and maintain. For example, it could be met by allowing as-of-right siting of residential-scale solar arrays in a zoning district, or establishing a solar overlay district which allows for siting of commercial-scale solar development on one or more parcels in town. It does not prohibit inclusion of site plan review in the as-of-right process.

IMPOSING A TEMPORARY SOLAR MORATORIUM

In some communities, the municipality need may arise to pass a temporary moratorium on the development of large-scale solar systems, to allow the municipality time to update and modernize its existing solar bylaw. This can be done by putting into place a temporary moratorium for a period of up to 12 months.

It is important to present to the community and the Attorney General's Office if you have Town Meeting, that there is a reasoning behind adopting a temporary solar moratorium. For example, understanding the impacts of solar development on prime farmland, especially if the community had just approved multiple solar projects.

See Appendix C for Example Moratorium Bylaw/Ordinance



4 COMPONENTS OF A MUNICIPAL SOLAR BYLAW OR ORDINANCE

This section and the following sections (5-12) describe nine components that we recommend be included in any municipal solar bylaw or ordinance: ***Purpose; Applicability; Definitions; Standards for Small-Scale Solar Arrays; Site Plan Approval; Site Plan Review Standards; Construction, Maintenance, Monitoring, and Modifications; Discontinuance and Removal; Financial Surety.***

Each section provides a basic overview of the importance of that bylaw or ordinance component, followed by example language. In some cases, we provide language that we recommend be included in any solar regulation. In other cases, municipalities have taken different approaches, and we provide alternative language to address the issue at hand. Finally, we also include language regarding optional provisions that a municipality may wish to consider including. Depending on the format of the municipality's existing zoning bylaws or ordinance, the language provided herein may be incorporated as a stand-alone section, or included piecemeal in the appropriate sections of the zoning regulations.



SAMPLE BYLAW/ ORDINANCE LANGUAGE

COMPONENTS OF BYLAW/ORDINANCE TYPICALLY IN THE ***PURPOSE*** SECTION AND SAMPLE LANGUAGE

A. Purpose. The purpose of this bylaw (or ordinance) is to provide for the construction and operation of solar energy facilities and to provide standards for the placement, design, construction, monitoring, modification and removal of solar facilities that address public safety, minimize impacts on scenic, natural and historic resources of the town (or city) and provide adequate financial assurance for decommissioning.

Additionally, the solar energy facilities shall be consistent with community planning documents including but not limited to the Town's (or City's) Open Space and Recreation Plan or Master Plan

The provisions set forth in this section shall take precedence over all other sections when considering applications related to the construction, operation, and/or repair of solar energy facilities.

5

APPLICABILITY

Solar projects range in size, from residential-scale arrays sited on top of a home roof or in the backyard, to large commercial solar array installations covering multiple acres of land.

Under the State Zoning Act, solar PV arrays can be allowed As-of-Right (with a building permit only), allowed As-of-Right (with Site Plan Review), or approved through a Special Permit (with Site Plan Review). Because the size of these systems can vary so greatly, municipalities often choose to regulate different sizes or types of systems differently. Examples include allowing roof-mounted units As-of-Right (with a building permit only), while requiring a Special Permit for the construction of commercial-scale arrays in certain zones. As described above in Section 3, the State Zoning Act also protects developers from “unreasonable regulation” of solar development in your city or town.

The contents of this section can apply to a primary use of property or an accessory use, whether the solar array is providing energy for on-site use, or selling power directly to the grid.

AS-OF-RIGHT VS. SPECIAL PERMIT

As-of-Right and Special Permit zoning are applicable to many kinds of development, not just solar PV systems. Both permitting processes can incorporate Site Plan Review (SPR), but the outcomes of that review differ.

As-of-Right Siting means that development may proceed without the need for a special permit, variance, amendment, or other discretionary approval. As-of-right development may be subject to non-discretionary Site Plan Review to determine conformance with local zoning bylaws as well as state and federal law. As-of-right zoning bylaws or ordinances can apply appropriate standards that protect public health and safety. Reasonable environmental performance standards per the developed bylaw or ordinance may be incorporated into the Site Plan Review process (e.g. height, setback, etc.), but cannot be so stringent as to make the use infeasible. The key is that Site Plan Review must be truly non-discretionary – *i.e., if the standards and zoning requirements are met, the project can be built*. In this context, Site Plan Review can only be used to shape a project; it cannot be used to deny a project, except in rare circumstances. As-of-right development projects that are consistent with zoning bylaws and ordinances and with state and federal law cannot be prohibited.

This is distinct from the **Special Permit (SP)**. In the special permit process, the full range of discretion is available to the special permit granting authority:

Neither the Zoning Enabling Act nor the town zoning bylaw gives...an absolute right to the special permit...The board is not compelled to grant the permit. It has discretionary power in acting thereon. MacGibbon v. Board of Appeals of Duxbury, 356 Mass. 635, 638-639 (1970).

The Special Permit may be denied if the Planning Board or other permit granting authority is not satisfied with the project.

DEFINING SOLAR ARRAY SIZE AND TYPE

As noted above, many municipalities choose to regulate solar PV arrays of different sizes differently, typically differentiating between “small,” “medium,” and “large” projects. Municipalities have taken different approaches to defining the size of solar installations. Options for defining project size include:

1. Project Capacity: The total wattage of the solar installation in kW or MW DC. (See *Section 2*, Solar PV Basics for a definition of project capacity).
2. Solar Panel Area: The total area of solar panels, typically in square feet.
3. Project Footprint: The total footprint of the project, typically in square feet for small and roof-mounted installations, and in acres for larger projects.

Of course, these three definitions of solar array size are related, but may vary with project type and over time. For example, as solar PV panels become more efficient, less space will be required to provide a project with the same capacity.

As a rough rule of thumb for roof-mounted projects, 100 square feet of roof space is required per 1.6 kW of solar. For smaller projects, there may not be a great discrepancy between the solar panel area and project footprint. However, large ground-mounted projects require multiple components, including, but not limited to: the solar PV system, spaces between rows of panels, cleared buffers, access and maintenance roads, and a utility interconnection site. Traditional ground-mounted arrays provide roughly 200-250 kW per acre, equivalent to roughly 18,000 square feet of panels. Parking lot canopies provide roughly 263 kW per acre, equivalent to roughly 18,936 square feet of panels.

In addition to distinguishing between projects of different sizes, some municipalities choose to differentiate among projects based on type – such as roof-mounted systems, ground-mounted systems, or parking lot canopies.

However defined, these categories should be included in the **Definitions** section of the zoning bylaw or ordinance (see next section, *Section 6*).

RECOMMENDATIONS

- As-of-Right (building permit) – Allowing rooftop installations and small, residential-scale ground-mounted projects as-of-right in all zoning districts will streamline the permitting process, encouraging local solar projects and minimizing staff or Board review time. Defining what constitutes a small-sized solar energy project will clarify which systems may proceed straight to obtaining a building permit.
- As-of-Right (with Site Plan Review) – Allowing large rooftop installations and medium-scale, ground-mounted projects as-of-right, but subject to site plan review, will lay out the requirements for a straightforward and streamlined permitting process, while allowing Board review to ensure projects are meeting state and local standards.
- Special Permit (with Site Plan Review) – Municipalities may choose to allow large-scale projects to proceed either through an As-of-Right or Special Permit process with Site Plan Review, depending on degree of flexibility and control desired within the municipality.
- Project Size – Solar array project sizes should be defined relevant to the manner in which they are regulated, and these definitions should be included in the Definitions section of the bylaw (*see Section 6 of this document*). We recommend including a definition for projects that require Site Plan Review. In this guide, we refer to these systems as Commercial Solar Photovoltaic Installations (CSPIs), and define them as solar installations with a minimum rated nameplate capacity of 250 kW DC – equivalent to about 1 acre in project footprint.



SAMPLE BYLAW/ORDINANCE LANGUAGE

COMPONENTS OF BYLAW/ORDINANCE TYPICALLY IN THE APPLICABILITY SECTION AND SAMPLE LANGUAGE

The bylaw or ordinance should define which types of projects are allowed as-of-right (with issuance of a building permit), as-of-right (with site plan approval), and by special permit. Example language is provided below.

A. As-of-Right: The following solar photovoltaic installations, as defined herein, are allowed as of right with issuance of a valid building permit from the building inspector in all zoning districts:

1. Any such roof-mounted installation on an existing structure. *[Note that a maximum capacity could be listed to limit the size of roof-mounted project requiring only a building permit.]*
2. Any such ground-mounted installation less than or equal to 25 kW DC in capacity.

B. As-of-Right: The following solar photovoltaic installations, as defined herein, are allowed as of right with site plan approval in all zoning districts:

1. Any ground-mounted installation greater than 25 kW DC over an existing parking surface, pedestrian walkway, or other paved area in a manner that maintains the function of the area beneath the canopy. *[Note that some municipalities allow parking lot canopies as of right with issuance of a building permit in order to streamline development.]*
2. Any other ground-mounted installation greater than 25 kW DC but less than 250 kW DC in capacity.

C. Special Permit: Any solar photovoltaic installation not specified in (A) or (B) requires a special permit in all zoning districts from the Special Permit Granting Authority. For all special permit applications, site plan approval as described below is required, but shall not require a second public hearing, per bylaw or ordinance addressing site plan approval.

The municipality may also choose to limit solar PV projects based on size or location. Additionally, a community may also choose *Special Permit* versus *Site Plan Approval* thresholds based on their own values since impacts tend to increase on sites of more than one acre. Example language is in *Section 6 Definitions*. Note that the number values provided (maximum acreage for array, maximum forest clearing, maximum slope) are provided as examples only, and should be determined based on the community values, land use, and topography of your municipality.

D. Not Permitted: No commercial solar photovoltaic installation may be permitted as follows:

1. Any solar photovoltaic installation of greater than 20 acres of previously undeveloped land in a fenced array area.
2. Any solar photovoltaic installation requiring forest clearing greater than ten acres.
3. Any solar photovoltaic installation on slopes of 15% or greater as averaged over fifty horizontal feet; the Special Permitting Granting Authority may consider waiving this up to 18% based on site-specific parameters. No cutting or filling may be done to reduce natural slopes.

DEFINITIONS 6

Zoning codes can sometimes fail to identify and define specific terms and types of solar energy systems. The lack of clear definitions can lead to future misinterpretation and create uncertainty about the legality of solar use.

Typical definitions related to solar development are provided on the next page; these can be adopted into a solar bylaw or ordinance.

These definitions should be placed in a general definitions section of the municipal bylaw or ordinance.



GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION: A solar photovoltaic installation that is directly mounted to structural supports on the ground and not mounted on a roof or other previously existing structure.

RATED NAMEPLATE CAPACITY: The maximum rated output of electric power production of the commercial solar photovoltaic installation in Direct Current (DC).

SITE PLAN APPROVAL AUTHORITY: The site plan approval authority as designated by the Zoning Guide.

SOLAR ENERGY: Radiant energy received from the sun that can be collected in the form of heat or light by a solar energy system.

SOLAR PHOTOVOLTAIC INSTALLATION: A solar energy system that converts solar energy directly into electricity through an arrangement of solar photovoltaic panels.

As noted in Section 5, it is often appropriate to include definitions of solar PV array system sizes in the bylaw/ordinance, as they relate to how different systems are regulated (e.g. as-of-right or by special permit). Also as described in Section 5, project size can be defined by solar PV system capacity (kW DC), the area occupied by solar PV panels, or the project footprint. Examples of these different ways of defining project size are provided below and on the following page. Note that the number values provided (maximum nameplate rated capacity, maximum surface area of panels, maximum project footprint) are provided as examples only, and should be determined based on the different regulatory pathways for different project sizes, and your community's values and vision for the land.

Capacity

SMALL-SCALE GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION: A Ground-Mounted Solar Photovoltaic Installation with a rated nameplate capacity of 25 kW DC or less.

MEDIUM-SCALE GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION: A Ground-Mounted Solar Photovoltaic Installation with a rated nameplate capacity greater than 25 kW DC but less than or equal to 250 kW DC.

COMMERCIAL SOLAR PHOTOVOLTAIC INSTALLATION (CSPI): A Ground-Mounted Solar Photovoltaic Installation with a rated nameplate capacity greater than 250 kW DC.

Solar Panel Area

SMALL-SCALE GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION: A Ground-Mounted Solar Photovoltaic Installation that occupies 2,100 square feet or less of surface area of solar panels.

MEDIUM-SCALE GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION: A Ground-Mounted Solar Photovoltaic Installation that occupies more than 2,100 but less than 32,000 square feet of surface area of solar panels.

LARGE-SCALE GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION: A Ground-Mounted Solar Photovoltaic Installation that occupies 32,000 square feet or more of surface area of solar panels.

Project Footprint

Size requirements regarding project footprints are often provided as alternatives to the nameplate capacity definition. For example:

MEDIUM-SCALE GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION: A Ground-Mounted Solar Photovoltaic Installation with a rated nameplate capacity greater than 25 kW but no more than 250 kW and that occupies no more than 40,000 square feet of surface area.

-OR-

MEDIUM-SCALE GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION: A Ground-Mounted Solar Photovoltaic Installation with a rated nameplate capacity greater than 25 kW but no more than 250 kW and does not occupy more than one (1) acre of land.

LARGE-SCALE GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION: A Ground-Mounted Solar Photovoltaic Installation with a rated nameplate capacity greater than 250 kW or that occupies more than one (1) acre of land.

7 STANDARDS FOR SMALL-SCALE SOLAR ARRAYS

The majority of this guide addresses commercial-scale solar photovoltaic systems. For roof-mounted and small-scale ground-mounted solar PV system, the the DOER model bylaw does provide the following recommendations regarding standards.

A. All Small and Medium-Scale Solar Photovoltaic Installations shall adhere to the following Design and Operation Standards.

1. Utility Notification. No grid-intertie photovoltaic system shall be installed until evidence has been given to the Site Plan Review Authority that the owner has submitted notification to the utility company of the customer's intent to install an interconnected customer-owned generator. Off-grid systems are exempt from this requirement.
2. Emergency Access. Solar energy systems shall be located in such a manner as to ensure emergency access to the roof, provide pathways to specific areas of the roof, provide for smoke ventilation opportunities, and provide emergency egress from the roof.
 - a. For buildings with pitched roofs, solar collectors shall be located in a manner that provides a minimum of one three-foot wide clear access pathway from the eave to the ridge on each roof slope where solar energy systems are located as well as one three-foot smoke ventilation buffer along the ridge.
 - b. Residential rooftops that are flat shall have a minimum three-foot wide clear perimeter and commercial buildings that are flat shall have a minimum four-foot wide clear perimeter between a solar energy system and the roofline, as well as a three-foot wide clear perimeter around roof-mounted equipment such as HVAC units.
 - c. To the extent practicable, the access pathway shall be located at a structurally strong location on the building (such as a bearing wall).

Building and Fire Department personnel should be involved in the development of emergency access standards, and any zoning standards that are adopted should be consistent with local building and fire codes.

3. Safety. No roof-mounted solar energy system shall be located in a manner that would cause the shedding of ice or snow from the roof into a porch, stairwell or pedestrian travel area.

SITE PLAN APPROVAL 8

This section presents regulations that the municipality may choose to include in a bylaw or ordinance in a site plan review setting, either in coordination with as-of-right siting or a special permit, as described in Section 5.

The contents of this section are intended to apply to large-scale solar photovoltaic installations, however they may be defined in your municipality. For the purposes of this guide, we refer to these installations as Commercial-Scale Solar Photovoltaic Installations, or CSPIs, defined as solar photovoltaic installations with a minimum capacity of 250 kW DC, equivalent to about 1 acre in project footprint for a ground-mounted installation. The contents of this section also apply to modifications that materially alter the type, configuration, or size of these installations or related equipment. **If the Applicability portion of your bylaw requires Site Plan Review for Medium-Scale Solar PV Installations (e.g. less than 250 kW DC), you may wish to identify an abbreviated list of requirements for these smaller-scale projects.**



THE PERMITTING TIMELINE & INTERCONNECTION

Local permitting is one of many administrative steps that solar developers must go through in order to develop and build a commercial-scale solar facility. Where municipal permitting falls in the administrative process is dependent to an extent on utility and state requirements, but can also be influenced by what documentation municipal boards require in the permit application, and what steps in the process are required to be completed before the project proponent comes before the municipal board.

Municipalities that require numerous documents may receive applications for projects that are later in the process and have already received approvals from other entities. The advantage here is that the developers are serious in their intent to move forward with project development. The disadvantage is that the project is later in the design phase, it may be more constrained by approvals that have already been received, and developers may be less open to local concerns that could modify the project plan. In addition, the project proponents will have sunk significant funds into development of the project, and be more adamant (and potentially litigious) in ensuring the project moves forward.

The alternative is to allow projects to come before municipal boards before they have received approvals from other entities. The advantage here is that the project developers may be more open to modifications that address local concerns. One disadvantage is that many solar projects that go through the initial stages of development are never built; hence, significant volunteer and staff time may be wasted reviewing projects that never progress. In addition, projects that do progress may have to come back before a municipal board for approval of modifications made based on review by other entities.

Some municipalities require documentation that a commercial-scale project is at a specific stage in the interconnection process before it may come before a municipal board for review. Interconnection is the process via which a solar PV facility receives permission from the utility and connects to the electric grid. As a first step, the system developer must submit an application to obtain formal written approval from the local utility. For commercial-scale systems, once the utility has determined that an application is complete, the utility typically requires that the developer pay for a study to establish the impacts of interconnection of the facility to the grid system, and to determine if upgrades are required before interconnection can occur. The utility and developer then commit to an *Interconnection Service Agreement* (ISA) for the project, which includes a requirement for the developer to cover the cost of system upgrades. After the project has been built, the developer then submits to receive an *Authorization to Connect*.



SAMPLE BYLAW/ORDINANCE LANGUAGE

COMPONENTS OF BYLAW/ORDINANCE TYPICALLY IN THE *SITE PLAN APPROVAL* SECTION AND SAMPLE LANGUAGE

Municipalities may want to identify specific standards or criteria for the site plan approval of solar photovoltaic installations and its related application requirements. Suggestions below may or may not be appropriate for your community.

A. Site Plan Approval. The construction, installation or modification of a ground-mounted solar photovoltaic installation, whether as-of-right or by special permit, shall be subject to site plan approval by the Site Plan Approval Authority in accordance with the Applicability Section of the zoning bylaw.

1. General. All plans and maps shall be prepared, stamped and signed by a Professional Engineer licensed to practice in Massachusetts.

2. Required Documents. The project proponent shall provide the following documents:

a. A site plan showing:

i. An existing conditions plan with property lines and physical features, including topography and roads, characteristics of vegetation (trees-mature, old growth, shrubs, open field, etc), wetlands, streams, ledge, for the project site;

ii. Proposed changes to the landscape of the site, including grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures, driveways, snow storage, and storm water management systems; including total acreage of disturbed area, total vegetation cleared, not including mowed fields;

- iii. Trees with a DBH of 20" or greater within project parcel(s) shall be identified to determine tree loss, along with inventorying of diseased or hazard trees slated to be removed due to proposed development;
- iv. Drawings of the solar photovoltaic installation signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts showing the proposed layout of the system and any potential shading from nearby structures;
- v. Three line electrical diagram detailing the solar photovoltaic installation, associated components, and electrical interconnection methods, with all National Electrical Code compliant disconnects and overcurrent devices;
- vi. Documentation of the major system components to be used, including the PV panels, mounting system, and inverter;
- vii. Name, address, and contact information for proposed system installer;
- viii. Name, address, phone number and signature of the project proponent, as well as all co-proponents or property owners, if any;
- ix. The name, contact information and signature of any agents representing the project proponent.

If the following are not addressed in general site plan review regulations for all types of development, then the community may wish to include them for CSPIs specifically:

- x. Locations of active farmland and prime farmland soils, wetlands, permanently protected open space, Priority Habitat Areas and BioMap 2 Critical Natural Landscape Core Habitat mapped by the Natural Heritage & Endangered Species Program (NHESP) and "Important Wildlife Habitat" mapped by the DEP.
- xi. Locations of floodplains or inundation areas for moderate or high hazard dams;
- xii. Locations of local or National Historic Districts.
- xiii. Stormwater management and erosion and sediment control (*See discussion under Chapter 10*)

Further recommended language regarding Required Documents continues, as follows:

- b. Documentation of actual or committed prospective access and control of the project site sufficient to allow for construction and operation of the proposed solar photovoltaic installation.
- c. A plan for the operation and maintenance of the solar photovoltaic installation as detailed in A(3): Operation and Maintenance Plan.
- d. Proof of liability insurance.
- e. Description of financial surety that satisfies Financial Surety.
- f. Pre-construction photos from the right-of-way and nearest abutters. These photos should include tree coverage.
- g. Zoning district designation for the parcel(s) of land comprising the project site.
- h. Visualization of post-construction solar development, including perspectives from right-of-way(s), nearest abutting properties or residential structures, and tree coverage. The Site Plan Approval Authority may determine additional visualizations to be submitted for review.
- i. Proof that the project proponent will meet the required Site Plan Review notification procedures.

Required Document (i) above should reference the municipality's existing Site Plan Review public and/or abutter notification procedures, if applicable. For example, a community may require projects that are subject to Site Plan Review to notify all property owners within 100 feet of the project site.

See Figures 8-1, 8-2 and 8-3 for an example of what site plan approval authorities may ask for applicants to submit to ensure minimal visual impact to abutters and protected corridors.

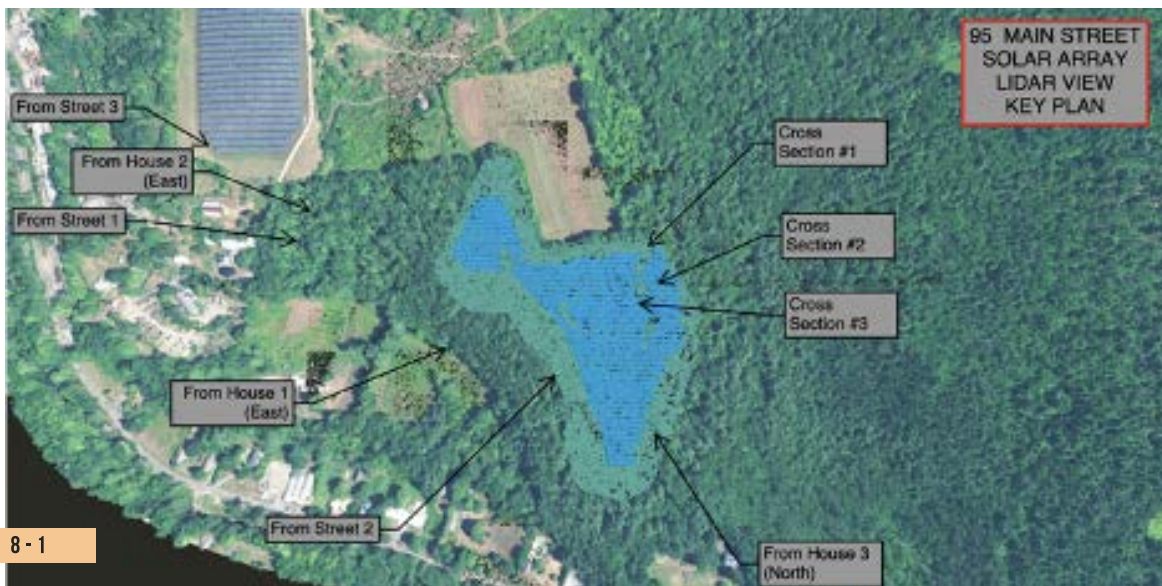


FIG. 8-1

Summary of Visualizations (Courtesy of Williamsburg Zoning Board of Appeals)

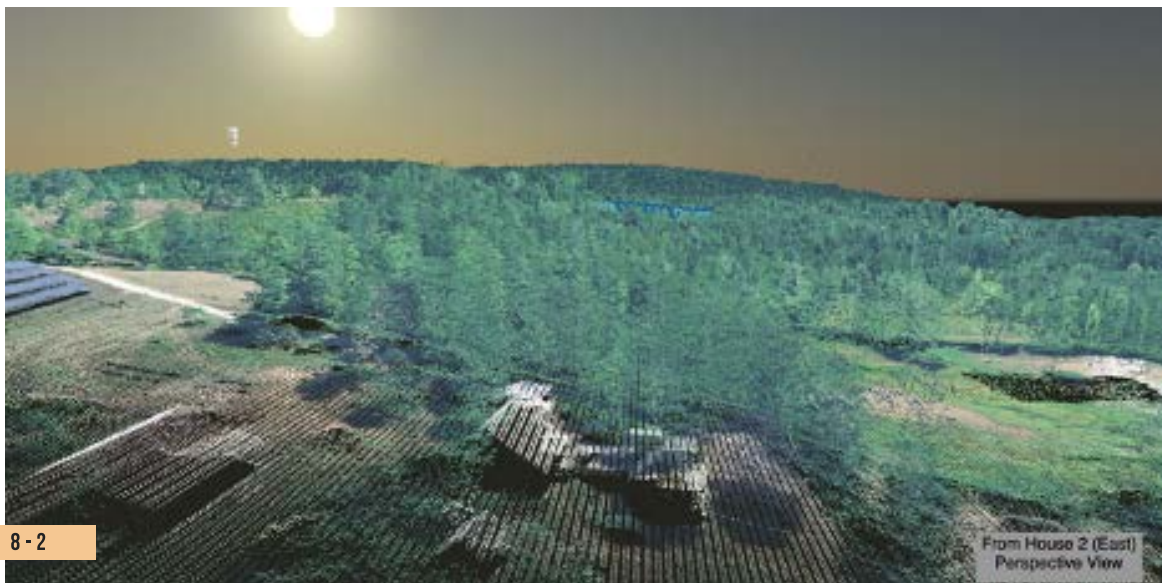


FIG. 8-2

Visualization from Abutter's Perspective (Courtesy of Williamsburg Zoning Board of Appeals)

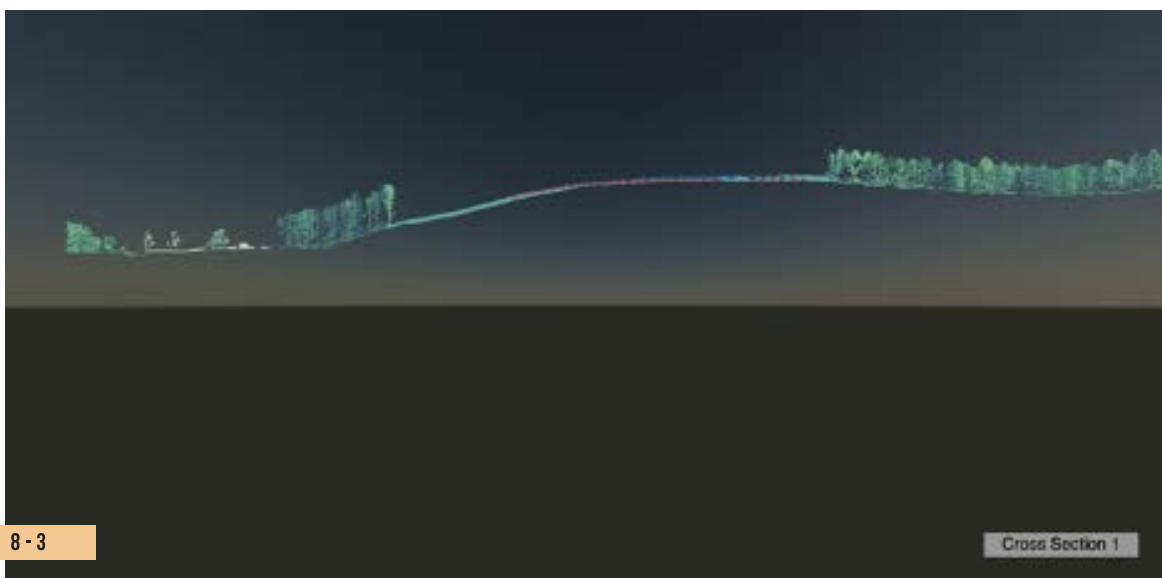


FIG. 8-3

Cross Section (Courtesy of Williamsburg Zoning Board of Appeals)

Further recommended Site Plan Approval language continues, as follows:

3. Operation & Maintenance Plan. This plan shall include measures to maintain safe access to the installation, stormwater controls, and general procedures for operational maintenance of the installation. The Operation & Maintenance Plan should include a training component and schedule for emergency services staff along with any designees the Site Plan Approval Authority deems necessary.

4. Waiver Requests. The Site Plan Approval Authority may waive documentation requirements as it deems appropriate upon written request of the applicant submitted with an application for approval.

The language below is one way to ensure coordination among all necessary boards, commissions, and departments, and avoid discrepancies in the approval process across separate municipal entities.

5. Consultation with Other Departments and Entities. No building permit shall be issued and no application for such permits shall be accepted for construction, exterior alteration, relocation, or change in use except where noted in Section X, unless a site plan has been endorsed by the Site Plan Approval Authority, after consultation with other boards, including but not limited to the following: Building Inspector, Board of Health, Select Board or Town/City Council, Historical Commission, Conservation Commission, Highway Department or DPW, Fire Department and Police Department. The Site Plan Approval Authority may waive any or all requirements of site plan review for external enlargements of less than 10% of the existing occupied area.

Further example language continues, as follows:

B. Utility Notification. No solar photovoltaic installation shall be constructed until evidence has been given to the Site Plan Approval Authority that the utility company operating the electric grid the installation is to be connected to has been informed of the solar photovoltaic installation owner or operator's intent to install an interconnected customer-owned generator. Off-grid systems shall be exempt from this requirement.

OPTIONAL - Pollinator Friendly Certification

Municipalities may wish to consider a requirement for pollinator-friendly certification of CSPIs. This ensures the CSPI is planted and maintained as a native wildflower meadow, without requiring additional, continued oversight by the Site Plan Approval Authority. The Pollinator-Friendly Certification Program for Solar PV Arrays, administered by UMass Clean Energy Extension, is a program that promotes the planting of native vegetation under and around solar arrays, and maintenance of vegetation, fencing, nesting habitat, and other features to support continued use of land under and around solar arrays by native pollinators and other wildlife. The criteria for each level of certification are available on the UMass Clean Energy Extension website at (<https://ag.umass.edu/clean-energy/services/pollinator-friendly-solar-pv-for-massachusetts>). These criteria are updated periodically as new information and scientific research become available.

Example language:

C. Pollinator-Friendly Certification. No Commercial-Scale Solar Photovoltaic Installation shall be constructed until proof has been given to the Site Plan Approval Authority that the project proponent has obtained Pollinator-Friendly Certification for the solar photovoltaic installation through the UMass Clean Energy Extension Pollinator-Friendly Certification Program at a minimum of the [choose Certified, Silver, or Gold] Certification Level, or other equivalent certification as determined by the Site Plan Approval Authority. This certification must be maintained throughout the life of the installation.



PROTECT THE WATER SUPPLY!

Municipalities should protect the water supply through requirements and standards that should be addressed during the site plan review process. Some of the suggestions to protect the water supply are covered elsewhere in this document through standards of development and decommissioning.

Additional considerations to protect the water supply in your zoning regulations:

- Require planting of low growing grasses or regular mowing of other types of grasses to ensure minimal fuel for wildfires in areas around panels.
- Ensure that there is no oil, hazardous materials or other potential contaminants stored on-site
- Require only non-toxic materials to be used in transformers.

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9 SITE PLAN REVIEW STANDARDS

Many zoning bylaws already include general language regarding dimensional requirements (such as height or setbacks), as well as lighting and signage standards. The standards identified in this section of the guide may be used in addition to existing special use permit and site plan review standards, or they may be used to create a stand-alone set of review standards specific to solar photovoltaic installations. These standards are often included under sections identified as Local Site Requirements, Dimensional Regulations, or Site Plan Review Design and Operations Standards. Standards may be written so as to differ across projects based on size, type, or permitting pathway (as-of-right vs. special permit).





SAMPLE BYLAW/ORDINANCE LANGUAGE

COMPONENTS OF BYLAW/ORDINANCE TYPICALLY IN THE *SITE PLAN REVIEW STANDARDS* SECTION AND SAMPLE LANGUAGE

Municipalities may want to identify specific standards or criteria for the site plan approval of solar photovoltaic installations and its related application requirements. Suggestions below may or may not be appropriate for your community.

The following language addresses large-scale PV installations.

All commercial-scale solar photovoltaic installations requiring Site Plan Review shall adhere to the following Design and Operation Standards.

Height

In general, height standards should be consistent with requirement for other types of structures. Separate height requirements may be imposed if there is a compelling reason to do so. For example:

A. Height. The height of any structure associated with a Commercial-Scale Ground Mounted Solar Photovoltaic Installation shall not exceed 35 feet.

Building Height Standards

Standards within the zoning bylaw may need to be adjusted to include an exemption for the small increase in height created by roof-mounted solar PV installations. For example:

B. Building Height Regulations Exemptions. Mechanical equipment and appurtenances necessary to the operation or maintenance of the building or structure itself, including chimneys, ventilators, plumbing vent stacks, cooling towers, water tanks, broadcasting and television antennae and roof-mounted solar energy systems.

Setbacks

Minimum setbacks can be established to meet standards already required by the individual municipality, based on their desire to preserve viewsheds and character, as outlined in planning documents (e.g. Master Plan, Open Space and Recreation Plan), or along any designated scenic roads within municipal limits. Some municipalities require buffering from adjacent residential properties that exist at the time of permitting, along with larger setbacks from the right-of-way or other zoning district.

In general, these setbacks should be consistent with other use types. For example:

C. Setbacks. All Medium and Large Ground-Mounted Solar Photovoltaic Installations shall meet the front setback of 50 feet, side setbacks of 20 feet, and rear setback of 20 feet.

Smaller setbacks may be considered for small-scale, residential projects:

Small Ground-Mounted Solar Photovoltaic Installations accessory to principal use may be located no closer than [1/2 of the setback that would otherwise apply] from the front, side or rear lot line. All ground-mounted solar energy systems in residential districts shall be installed either in the side yard or rear yard to the extent practicable.

Larger setbacks may be considered for Commercial Solar Photovoltaic Installations, if there is a compelling reason to do so. For example:

For all Commercial-Scale Ground-Mounted Solar Photoelectric Installations, minimum setbacks shall be as follows:

FRONT SETBACK (feet) 100

REAR YARD (feet) 100

SIDE YARD (feet) 100

PERIMETER SETBACK (feet) 100

Acreage and generating capacity thresholds apply in the aggregate to new facilities and expansions of existing facilities. For expansions, the acreage and output generation of the existing facility would be added to those of the proposed expansion to determine the overall size and generating capacity. Required setback areas shall not be counted toward a facility's total acreage.

Appurtenant Structures

In general, all appurtenant structures should be subject to the same requirements as other types of structures. This can be specifically called out within the bylaw or ordinance language.

D. Appurtenant Structures. All appurtenant structures to a solar photovoltaic installation shall be subject to the requirements of the Zoning Guide concerning the bulk and height of structures, lot area, setbacks, open space, parking and building coverage requirements. All such appurtenant structures, including but not limited to, equipment shelters, storage facilities, transformers, and substations, shall be architecturally compatible with each other. Whenever reasonable, structures should be screened from view by vegetation.

Lighting

Dark Sky standards for lighting are often included and defined elsewhere in the zoning code, particularly as a consideration in Site Plan Review. The intent of the lighting/dark sky regulations is to manage and/or limit outdoor lighting in order to preserve and recover the visibility of the night sky; prevent light pollution, light trespass, and glare; to conserve energy and protect natural resources; and to facilitate safety and security of persons and property.

E. Lighting. Lighting shall be consistent with local, state and federal law. Lighting of all parts of the installation, such as appurtenant structures, shall be limited to that required for safety and operational purposes, and shall be reasonably shielded from abutting properties. Where feasible, lighting of the solar energy system shall be directed downward and shall incorporate full cutoff fixtures to reduce light pollution. Lighting of CSPI shall be limited to night-time maintenance and inspections by authorized personnel, and shall comply with Dark Sky standards. There should be no illumination when personnel are not on the site.

Signage

Sign standards are often defined elsewhere in the zoning code, and can be referenced here.

F. Signage. A sign shall be erected identifying the owner and providing a 24-hour emergency contact phone number of the CSPI owner or operator. CSPIs shall not display any advertising. Signs must comply with sign standards as identified in the community's sign regulations.

Day-time Visual Distraction

If restrictions on visual distractions are not included elsewhere in the bylaw or ordinance, they may be defined here. For example:

G. Day-time Visual Distraction. The Commercial-Scale Ground-Mounted Photovoltaic Installation shall be positioned to minimize glare on any residence or public way, and shall not create a visual obstruction on a public roadway, such as blocking intersections or creating blind curves. The applicant should submit a ratings and technical specifications for the solar panels to ensure minimal reflectivity.

Utility Connections

H. Utility Connections. All utility connections from the solar photovoltaic installation must be placed underground, unless it can be demonstrated to the Site Plan Approval Authority that soil conditions, shape, and topography of the site or requirements of the utility provider make it infeasible. Electrical transformers for utility interconnections may be above ground if required by the utility provider.

Fencing

I. Fencing. There shall be a fence built surrounding the solar array and ancillary equipment. The fence shall be knuckled selvage chain link fence unless determined otherwise by the Site Plan Approval Authority. The fence shall be at least six inches above the ground to allow for wildlife crossing under fence.

If Pollinator-Friendly Certification is required (see Section 7), that may be referenced in the bylaw language. For example:

I. Fencing. There shall be a fence built surrounding the solar array and ancillary equipment. The fence shall be knuckled selvage chain link fence unless determined otherwise by the Site Plan Approval Authority. There shall be a gap along the bottom of the fence that complies with UMass Clean Energy Extension Pollinator-Friendly Certification Program standards, in order to allow for wildlife crossing under fence.

Access Roads

J. Access Roads. Access roads shall be planned and constructed in consultation with the Department of Public Works in order to minimize grading, stormwater/run-off control, removal of stone walls or trees and to minimize impacts to environmental, wetlands, or historic resources.

Emergency Access

K. Emergency Access. The CSPI owner or operator shall provide a copy of the project summary, electrical schematic, and an approved site plan, to the local fire department and the Building Inspector. Upon request the owner or operator shall cooperate with local emergency services in developing an emergency response plan, which may include ensuring that emergency personnel have immediate, 24-hour access to the facility. All means of shutting down the CSPI shall be clearly marked. The owner or operator shall identify a responsible person for public inquiries throughout the life of the installation and shall provide a mailing address and 24-hour telephone number for such person(s). **These components shall be included in the Operation & Maintenance Plan.**

OTHER CONSIDERATIONS

ENERGY STORAGE

As battery technology improves, energy storage has recently made its way into solar PV site plans as an additional component of larger CSPIs. As of April 2020, energy storage will now be required for new solar projects larger than 500 kW seeking incentives under the SMART program. Because this is a relatively new technology, there are not yet clear standards and criteria for development of these systems. The DOER Model Solar Bylaw does not address them.

Current energy storage systems are most often composed of large banks of lithium ion batteries, although new technologies are being developed and beginning to enter the market. Energy storage systems are beneficial to the electricity grid, because they allow for a more regulated flow of electricity into the grid, and also allow intermittent renewable energy sources to provide electricity during times when it is not being directly generated, for example, allowing for the use of solar-generated electricity at night. Of course, energy storage systems add additional complexity to a proposed solar PV project, and additional considerations with regards to safety, environmental hazards, noise, aesthetics, operations and maintenance, and decommissioning must be addressed.

Local boards and planning departments are beginning to gain experience in reviewing battery storage systems, and examining the extent to which they fit into existing local zoning regulations. Unfortunately, because they are a relatively new technology, there are not yet clear standards and criteria for development of these

systems. This gap has been recognized at both the state and federal level. The U.S. Department of Energy (DOE) has established an Energy Storage Safety Collaborative, which is currently working on updates to the various safety codes, regulations, and standards (collectively known as CSR) applicable to energy storage systems. The Massachusetts Clean Energy Center reports it is supporting the development and implementation of appropriate CSRs, as well exploring outreach and education opportunities for emergency personnel and other relevant authorities. Because energy storage systems are evolving quickly, the guidance provided below is relatively general and preliminary. We encourage you to check the resources identified at the end of this guide for any updates on the regulation of energy storage systems.

Safety

Energy storage systems are regulated by a variety of safety codes, standards, and regulations – the “CSRs” noted above. The US DOE has identified over 40 codes and standards that may require updates to address energy storage systems - including building codes, electrical codes, and fire safety codes – but not all of these codes require enforcement by local officials.

Safety codes in a given municipality are enforced by Authorities Having Jurisdiction (AHJs), which is a collective term for the organizations, agencies, or individuals responsible for enforcing the requirements of a specific code or standard. The AHJ in a given community may vary, depending on the municipality and the code being enforced. According to the Massachusetts Department of Fire Services, *the phrase “authority having jurisdiction,” or its acronym AHJ, is used in ... a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the AHJ may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority.*

Your municipal fire chief, building inspector, and electrical inspector should be able to identify areas in which they qualify as an AHJ, and which safety codes they are responsible for enforcing. When an energy storage project comes forward, it is important to ensure these officials are staying abreast of any new additions to national safety codes applicable to energy storage systems, and any modifications of these rules specific to Massachusetts. For example, the National Fire Prevention Association (NFPA) issued an updated *NFPA 1 Fire Code* in 2018, which addresses energy storage systems specifically. The State Fire Marshall announced Massachusetts amendments to that code in October 2019, including provisions relevant to energy storage systems.

In the absence of additional guidance regarding safety planning, the Safety Subgroup of the national Energy Storage Integration Council has the following recommendations regarding incident preparedness and training of emergency response personnel. These recommendations can inform the portion of the Operations and Maintenance Plan composed by the facility developer in consultation with emergency response personnel.

For those personnel called on during emergency situations an important consideration is appropriate training to recognize and respond to all reasonably foreseeable incidents that may occur at the site of an energy storage installation, whether the incident source is the system itself or something external (e.g. wildfire or flood). It is recommended that ... the energy storage supplier make available all necessary emergency action information related to their system. This information could also be included in the operations and maintenance manual. This emergency action information will contain salient information for preparing for incidents and could be used by the utility and other stakeholders, such as local responders, to prepare a site specific, emergency action plan.

The action plan could address possible incident scenarios starting during construction and commissioning and continuing through operation and decommissioning. This could include a call/email list for all those who need to be informed of a situation potentially including: emergency personnel, operators, owners, regulators, and many others. Actions for these parties may include urgent responses, such as responding to a medical emergency, or non-urgent responses, such as performing an incident investigation. This plan could account for all reasonable accidents that could occur at the project site possibly including but not limited to medical emergencies and incidents associated with fires, chemical spills, explosions, shocks and mishandling of the system or materials related to the installation.

The incident training manual could allow utility personnel and their contractors, as well as first and second responders, to understand the likely incident scenarios associated with the energy storage installation and appropriate actions to take to for each scenario. It could include, at a minimum, emergency shutdown procedures, a Materials Safety Data Sheet (MSDS) or Safety Data Sheet (SDS) along with any first-aid requirements. Steps and actions listed in the incident training manual could be consistent with the Occupational Safety and Health Administration (OSHA) hazard communications standard (HCS).

Several technical recommendations regarding design for safety are included in Appendix D.

Responding to emergencies at a solar facility may require special training and equipment. Lithium ion battery fires, for example, cannot be treated like common fires; they have different burn characteristics and toxic byproducts. The relevant permitting authority for a commercial-scale solar PV facility – be it the Site Plan Review Authority in As-of-Right zones, or the Special Permit Approval Authority – should be prepared to include conditions on the permit necessary to ensure that emergency personnel have access to the appropriate training and equipment in order to respond to any emergencies that may occur on-site. It is not inappropriate for the municipality to request or require that the solar developer cover the costs of necessary training or equipment. NFPA currently has an on-line training available for fire personnel (see Resources).

In many cases, both the solar PV facility owner and local emergency personnel may prefer that specialized emergency response personnel employed by the facility owner respond to directly address certain kinds of incidents specific to solar sites, including electrical and chemical fires. Local emergency personnel may not have the expertise or equipment necessary to respond appropriately to these situations, nor a comfort level working in close proximity to high voltages.

Where this is the case, emergency personnel's main role may be to contain any fires to the facility property, while ensuring that appropriate personnel employed by the facility are alerted and responding to the scene. Solar PV arrays and energy storage systems typically include remote monitoring systems which alert the facility owner to any problems or unusual conditions occurring on-site.

However, ensuring that emergency contact information for the facility is readily accessible and up-to-date is imperative, especially since solar PV facilities often change hands multiple times over their operational life.

Environmental Considerations

Large battery systems are an evolving technology, but many batteries contain heavy metals, which could cause damage if leached into the environment. In addition, fire suppression systems may include release of a chemical agent to suppress the fire. Material Safety Data Sheets (MSDS) for fire suppression chemicals should be reviewed carefully, and the potential for any leaking, leaching, or chemical spills reviewed with the solar developer. The Site Plan Review Authority, and Conservation Commission where applicable, should take special care in reviewing plans for energy storage systems placed in environmentally-sensitive areas.

Environmental Considerations

Because batteries require climate-controlled conditions, these systems must be actively heated and cooled over the course of the year, to prevent freezing or

overheating. The fans associated with these units do produce noise, which in some conditions may be audible to nearby abutters. It is important to ensure that these systems meet any noise regulations or bylaws applicable in the municipality.

In addition to this long-term noise consideration, there are also noise issues to consider during construction. Depending on the order of workflow at the site, energy storage systems may be installed at the site before the solar PV facility is in full operation. These energy systems may sit idle for multiple weeks before the utility finishes its approval process and the facility goes into operation. During this time, battery systems need to be kept from freezing or overheating; in the absence of an operational solar array, the solar developer may expect to power climate control systems through a diesel generator, which can disturb abutters.

Don't forget to ask the solar developer about the timing of installation of the energy storage system, and their plans for keeping the batteries climate-controlled until the system is fully operational.

Aesthetics

Batteries for energy storage are often packaged into large metal shipping containers, installed over a concrete pad. These units are not always the most attractive, and some permitting authorities have requested that these units be painted such that they blend in with the surrounding scenery. However, these systems may need to be painted white or another light color, to reduce heat load on the unit. Vegetation screens, situated at a safe distance from the unit, may provide an alternative method to screen these systems from view, as well as offer cooling value. One innovative approach in more developed areas could be to have a mural painted on the side of the unit.

Operations and Maintenance

The municipality may wish to include requirements to ensure the energy storage component of the Operations and Maintenance Plan is complete. According to the Energy Storage Integration Committee Safety Subgroup, the plan the solar developer provides to the utility could be designed to include:

- Plans for inspecting, servicing, repair and renovation as well as any addition to the system (e.g. installation of additional storage capacity).
- A complete operation and maintenance manual. This manual could provide instructions for all required operating and maintenance activities, the timing for these activities, and who will perform them. Ideally the manual could be in electronic form and automatically prompt utility personnel and/or their agents

to initiate, perform, and document required actions after the system is commissioned and placed in operation. This manual could also include conditions under which the system will have met end of warranty, service life, and operational life.

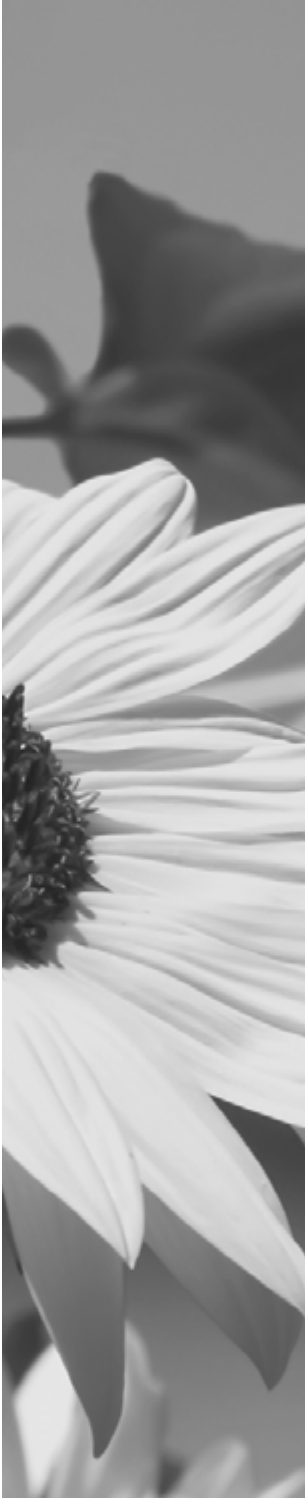
A municipality may choose to require all or a subset of these components.

Decommissioning

Decommissioning costs and protocol for the energy storage system should also be considered. The Energy Storage Integration Committee Safety Subgroup provides the following guidance regarding decommissioning, which may be already addressed by the utility, but is worth noting here: *It is recommended that the energy storage supplier be required to develop a decommissioning and disposal plan for utility approval. This plan could explain the procedure for decommissioning, including any hazards this may present, as well as the steps to disconnect the system from external automated control systems. It could elaborate who is responsible for disposal and recycling, what costs this will incur, how articles could be packaged for disposal, and who is responsible for shipping the materials to the disposal or recycling site.*

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10 ENVIRONMENTAL STANDARDS



Municipal planners and Site Plan Approval Authorities (whether Planning Boards or Zoning Board of Appeals members) should carefully consider impacts of proposed projects on abutters and neighbors, safety concerns, and short- and long-term environmental impacts.

“While solar energy is a renewable, green resource, its generation is not without environmental impacts. Though solar facilities do not generate the air or water pollution typical of other large-scale fossil-fuel power production facilities, impacts on wildlife habitat and stormwater management can be significant due to the large scale of these uses and the resulting extent of land disturbance. The location of sites, the arrangement of panels within the site, and the ongoing management of the site are important in the mitigation of such impacts.”

- Darren K. Coffey, AICP

American Planning Association Planning Advisory Service, 2019



SAMPLE BYLAW/ORDINANCE LANGUAGE

ENVIRONMENTAL COMPONENTS OF BYLAW/ORDINANCE TYPICALLY IN THE *SITE PLAN REVIEW STANDARDS* SECTION AND SAMPLE LANGUAGE

Municipalities may choose to adopt specific environmental standards as part of Site Plan Review Design and Operation Standards, along with the basic standards addressed in *Section 9*. The examples provided below may be adapted for your community.

Vegetation Clearing

A. Vegetation Clearing. Clearing of natural vegetation shall be limited to what is necessary for the construction, operation, and maintenance of the Commercial Solar Photovoltaic Installation or otherwise prescribed by applicable laws, regulations, and guides. Existing root structures and topsoil shall be maintained to the maximum extent possible. Where removal of naturally occurring vegetation such as trees and shrubs is planned, the owner of the CSPI must demonstrate that the removal of this vegetation is necessary and its presence adversely affects the performance and operation of the solar installation.

Project Visibility

B. Project Visibility. The CSPI shall be designed to minimize its visibility, including preserving natural vegetation to the maximum extent possible, blending in equipment with the surroundings, adding vegetative buffers to provide an effective visual barrier from adjacent roads and driveways, and from abutting dwellings.

Topsoil is critical to supporting healthy vegetation and reducing stormwater flows post construction. Topsoil, the uppermost soil layer, also known as “A horizon,” is typically higher in organic matter and darker in color than underlying soils. It also often has a granular and more porous structure and has lower clay content. Permanent removal of topsoil often ends in poor vegetation growth and survival and greatly diminished capacity for soaking up and mitigating stormflows.

See page 48 for some suggestions on how to ensure preservation and management of topsoil.

Site Vegetation Planting and Vegetation Maintenance

As noted in Section 7, municipalities may wish to consider a requirement for pollinator-friendly certification of CSPIs. This ensures the CSPI is planted and maintained as a native wildflower meadow, without requiring additional, continued oversight by the Site Plan Approval Authority. The Pollinator-Friendly Certification Program for Solar PV Arrays, administered by UMass Clean Energy Extension, is a program which promotes the planting of native vegetation under and around solar arrays, and maintenance of vegetation, fencing, nesting habitat, and other features to support continued use of land under and around solar arrays by native pollinators and other wildlife.

For municipalities that wish to include this requirement, the following language can be used:

C*. Vegetation Planting and Maintenance. The project proponent must obtain Pollinator-Friendly Certification for the solar photovoltaic installation through the UMass Clean Energy Extension Pollinator-Friendly Certification Program at a minimum of the [choose Certified, Silver, or Gold] Certification Level, or other equivalent certification as determined by the Site Plan Approval Authority. This certification must be actively maintained throughout the lifetime of the installation. **A copy of the final Establishment and Maintenance plan approved by the UMass Clean Energy Extension Pollinator-Friendly Certification Program must be included in the final Operations & Maintenance Plan for the installation.**

Alternatively, or in addition, municipalities can choose to include the following language regarding vegetation plantings.

C. Vegetation Planting. A diversity of plant species native to New England shall be used for any visual screens and vegetative erosion controls. Use of invasive plants, as identified by the most recent version of the "Massachusetts Prohibited Plant List" maintained by the Massachusetts Department of Agricultural Resources, is prohibited. If deemed necessary by the Site Plan Approval Authority, the depth of the vegetative screen shall be 30 feet and will be composed of native trees and shrubs staggered for height and density that shall be properly maintained.

The following language may also be used to regulate vegetation management on-site.

D. Vegetation Management. The open area of the site shall be seeded with a pollinator mix and maintained as bird and insect habitat. Mowing may only be done to retain a natural functioning of the landscape. Plants shall be maintained and replaced as necessary by the owner of the CSPI for the life of the CSPI. **The plan for vegetation control, and if applicable, animal control, shall be included in the Operation & Maintenance Plan.**

E. Animal and Plant Management. Herbicides, rodenticides, or any other pesticides may not be used to control vegetation or animals at a CSPI, except where herbicide use has been approved by the Site Plan Approval Authority for control of invasive species. In a dual-use CSPI, the agricultural operator, but not the CSPI operator, is exempt from this restriction. **The plan for vegetation control, and if applicable, animal control, shall be included in the Operation & Maintenance Plan.**

STORMWATER MANAGEMENT, EROSION & SEDIMENT CONTROL

Site disturbance for large solar facilities can be significant due to the large area taken up by the solar PV panels themselves, as well as inter-row spacing, trim zones to limit shading of panels, and associated electrical infrastructure. Depending on the site orientation and the panels to be used, significant grading may be required for panel placement, roads, and other support infrastructure.

Solar PV installations that impact areas identified in Chapter 131, Section 40 are subject to the state Wetlands Protection Act 310 CMR, and the requirements within the Massachusetts Stormwater Handbook and Standards. Local wetlands and stormwater regulations may also apply to the installation.

The project proponent will need to submit a Stormwater Management Plan, detailing how the site will meet state and local regulations. Depending on the project siting relative to wetlands and other water bodies, the Stormwater Management Plan may need to be reviewed solely by the Site Plan Approval Authority, or by both the Authority and the Conservation Commission.

The Massachusetts Stormwater Handbook and Stormwater Standards can be found at: <https://www.mass.gov/guides/massachusetts-stormwater-handbook-and-stormwater-standards>

Considerations for phasing the construction could minimize sedimentation.

A municipality may have stormwater management and erosion and sediment control standards and requirements in a number of possible places within local municipal code.

- A community regulated by EPA's MS4 permit (Municipal Separate Storm Sewer System) will likely have these standards specifically in a general bylaw or ordinance and possibly accompanying regulations. Any part of the zoning relative to drainage and solar photovoltaic installations ought to reference specifically that stormwater management and erosion and sediment control part of the local municipal code.
- Non-MS4 permit communities may have drainage and erosion and sediment control standards in subdivision regulations and in the zoning bylaw. Given the scale of CSPI projects, all such development proposals should include provisions for erosion and sediment control and stormwater management. This is critical to avoiding impacts to properties and resources that are located downgradient from the solar field. Substandard development projects have the effect of often passing on costs to others. If no such section exists in the zoning bylaw, following is some example language:

F. Stormwater Management. A Stormwater Management Plan must be submitted with the stamp and signature of a Registered Professional Engineer (PE) who is licensed in the Commonwealth of Massachusetts. The Stormwater Management Plan shall fully describe the project in drawings, narrative, and calculations. It shall include:

- a. The site's existing and proposed topography;
- b. All areas of the site designated as open space;
- c. A description and delineation of existing stormwater conveyances, impoundments, environmental resources on or adjacent to the site into which stormwater flows;
- d. A delineation of 100-year flood plains, if applicable;
- e. Estimated seasonal high groundwater elevation in areas to be used for stormwater retention, detention, or infiltration;
- f. Existing and proposed vegetation and ground surfaces with runoff coefficients for each;
- g. A drainage area map showing pre- and post-construction watershed boundaries, drainage area and stormwater flow paths, including municipal drainage system flows, at a scale that enables verification of supporting calculations;
- h. A recharge analysis that calculates pre- and post-construction annual groundwater recharge rates on the parcel;
- i. A description and drawings of all components of the proposed stormwater management system;
- j. Soils information from test pits performed at the location of proposed Stormwater Management facilities, including soil descriptions, depth to seasonal high groundwater and depth to bedrock. Soils information will be based on site test pits logged by a Massachusetts Certified Soil Evaluator.

Preserve and Manage Topsoil and Soil Porosity

If there are not explicit and strong provisions for preservation of topsoil in the local Earth Removal bylaw/ordinance, it is important to consider adding requirements for project proposals to fully describe control measures that will be used to preserve the existing topsoil on the construction site.

At a minimum, site owners and operators must preserve existing topsoil on the construction site to the maximum extent feasible. For low-density developments, the common measure of topsoil stripping might be unnecessary and should be minimized, if not avoided. If it is determined that preserving native topsoil is infeasible, the reasons why this was determined must be addressed in the project proposal.

Further, proper management of the topsoil stockpile should include measures that minimize or eliminate the discharge of material from entering drainage systems or surface waters. For any stockpile or land clearing debris composed, in whole or in part, of sediment or soil, the following requirements apply:

- Locate the piles within the designated limits of disturbance.
- Protect from contact with stormwater (including run-on) using a temporary perimeter sediment barrier.
- Where practicable, provide cover or appropriate temporary vegetative or structural stabilization to avoid direct contact with precipitation or to minimize sediment discharge.
- Never hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or surface water.
- To the maximum extent practicable, contain and securely protect from wind.
- For final stabilization, all areas within the limits of disturbance to be seeded or planted must be de-compacted and topsoiled, and then seeded or planted with perennial vegetative cover.
- Immediately after seeding or planting the area to be stabilized, select, design, and install non-vegetative erosion controls that provide cover (e.g., mulch, rolled erosion control products), to the extent necessary to prevent erosion while vegetation is becoming established.

Where construction activity does require grading and filling and where compaction of soil can be expected, this disturbance should be limited. Soil treatments/amendments should be considered for such disturbed areas to restore permeability. If the bulk density is not reduced following fill, these areas will be considered semi-impervious after development and runoff volumes should be calculated accordingly.

MITIGATION CONSIDERATIONS

MITIGATION COMPONENTS OF BYLAWS/ORDINANCES AND SAMPLE LANGUAGE

Tree clearing is a major concern when it comes to solar development. Solar developers require clearing of wooded areas within and surrounding the solar array to avoid shading of solar panels by surrounding vegetation. Meanwhile, local community residents and abutters may be concerned about the loss of forest, and associated habitat and ecosystem services. Communities can reduce potential conflicts between solar development and forest preservation by requiring mitigation for large-scale forest clearing.

Mitigation for Loss of Wildlife Habitat within the Installation

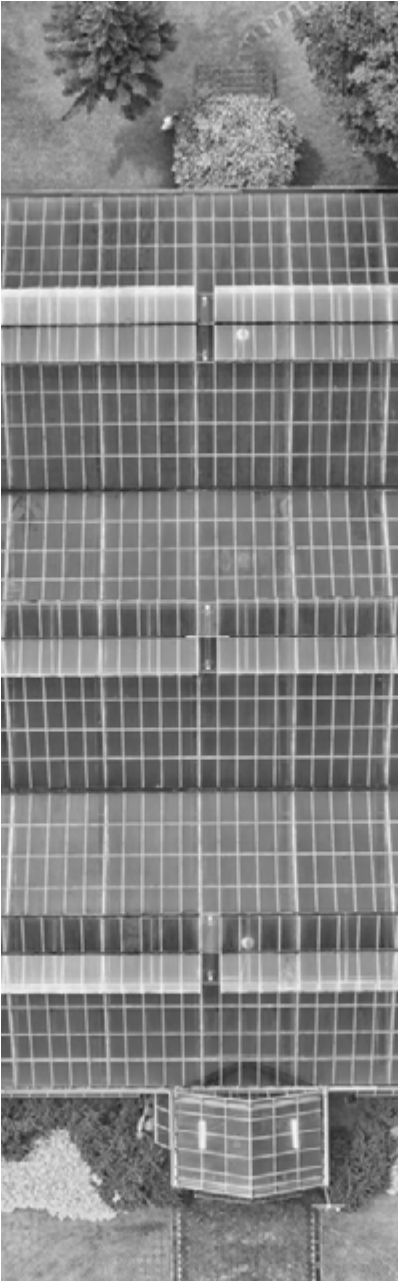
If natural forest, shrubland, or grassland is proposed to be converted to a CSPI, the municipality may require that the project proponent create a wildflower meadow habitat within and immediately around the CSPI, and a successional forest habitat in the surrounding areas managed to prevent shading until the installation is decommissioned and the site restored to forest. This can be accomplished through Pollinator-Friendly Certification, which requires establishment and maintenance of a native wildflower meadow. Alternatively, the Site Plan Approval Authority can provide direct oversight of the establishment and maintenance of such habitat. The special permit may be conditioned to effect and make enforceable this requirement. Keep in mind that replacement of a natural habitat with a managed wildflower meadow is likely to provide higher quality habitat than gravel or non-native turfgrass; however, such a substitution is unlikely to replace the wildlife habitat and other ecosystem services provided by the natural habitat.

G. Mitigation for Loss of Wildlife Habitat within the Installation. If undeveloped land is proposed to be converted to a CSPI, the plans shall show mitigation measures that create a wildflower meadow habitat within and immediately around the CSPI and a successional forest habitat in the surrounding areas managed to prevent shading until the installation is decommissioned and the site restored to forest.

The special permit may be conditioned to effect and make enforceable this requirement.

Mitigation for Loss of Carbon Sequestration and Forest Habitat

If forestland is proposed to be converted to a CSPI, the municipality may require that the developer designate an area of unprotected forestland (that is, land that could otherwise be developed under current zoning) within the municipality for permanent protection. The location of the designated forest may be limited to the parcel under development or contiguous parcels, or allowable anywhere within the municipality. The designated area may be required to be equal in size to the project footprint of the proposed for development, or of a size equal to multiple times the total area of such forest conversion (e.g two or four times). Such designated land shall remain in substantially its natural condition without alteration except for routine forestry practices until such time as the CSPI is decommissioned and the CSPI project footprint is restored to forest. The special permit may be conditioned to effect and make enforceable this requirement.



H. Mitigation for Loss of Carbon Sequestration and Forest Habitat. If undeveloped land is proposed to be converted to a CSPI, the plans shall designate an area of unprotected land (that is, land that could otherwise be developed under current zoning) contiguous parcels or nearby, or location within the municipality agreed upon by the the Site Plan Authority in consultation with the Conservation Commission, under common ownership that comprise the project site, and of a size equal to four times the total area of such forest conversion. Such designated land shall remain in substantially its natural condition without alteration except for routine forestry practices until such time as the CSPI is decommissioned and the site restored to forest. The special permit may be conditioned to effect and make enforceable this requirement.

As an alternative to forest protection, municipalities can also consider a tree replacement bylaw or ordinance for solar development that clears large acreages of trees. This can be applied to all types of development that are regulated by the zoning code. See Appendix E for example.



11 CONSTRUCTION, MAINTENANCE, MONITORING & MODIFICATIONS

The intent of this section is to provide assurance that the facility will be built and operated in accordance with the approved agreement and maintained within accepted standards for its lifespan of operation. This section covers **Construction, Maintenance, Annual Reporting and Modification** requirements. By signing an agreement with the municipality, the operator is assuming responsibility and assuring the municipality it will meet all of its short and long term obligations under the signed agreement.





SAMPLE BYLAW/ORDINANCE LANGUAGE

COMPONENTS OF BYLAW/ORDINANCE TYPICALLY IN THE *CONSTRUCTION, MAINTENANCE, MONITORING & MODIFICATIONS* SECTION AND SAMPLE LANGUAGE

Municipalities may want to identify specific standards or criteria for the approval of solar photovoltaic installations and its related application requirements. Suggestions below may or may not be appropriate for your community.

Construction Monitoring

It is important that municipal boards are assured that the operator is constructing the solar array in accordance with the approved plan. Once the plan has been approved, the appropriate municipal board(s) or municipal staff will need to monitor construction to assure it is being done to in accordance with the approved plan, as overseen by the Building Inspector, the Site Plan Approval Authority, the Special Permit Granting Authority, and/or the Conservation Commission. The construction monitoring costs may be required to be covered by the developer as one of the conditions in the approved agreement. Alternatively, approval may be conditioned upon having an engineer provide weekly reports to the supervising authority, indicating the work completed and stamping it as being in substantial compliance with the approved plans.

A. Construction Monitoring. The Site Plan Approval Authority may require a third-party inspector, selected by and acting under the direction of the Building Commissioner, to be employed to monitor compliance with all approvals and conditions during the CSPI's construction at the applicant's expense.

Maintenance

It is important for safety, visual appearance, and environmental compliance that the operator perform agreed upon regular maintenance of the facility. If there is the need for additional maintenance need, the operator must address it in accordance with the conditions agreed to in the permit, and in accordance with state law and the municipal bylaw or ordinance.

B. Maintenance. The CSPI owner or operator shall maintain the facility in good condition. Maintenance shall include, but not be limited to, painting, structural repairs, and integrity of security measures. Site access shall be maintained to a level acceptable to the local emergency services. The owner or operator shall be responsible for the cost of maintaining the solar photovoltaic installation and all access roads that are not public ways.

Annual Reporting

The community should be kept up-to-date through the identified proper municipal authorities informed and in accordance with the signed agreement. The operator must complete and submit any required annual reports to appropriate Town or City authorities. These authorities can be established via the bylaw or ordinance or as a condition of approval. Appropriate authorities may include the Health Agent, Town/City Clerk, Fire Chief, Police Chief, Planning Department (and/or Planning Board or ZBA), Highway Superintendent or DPW Director, Town/City Engineer, Conservation Commission, or others.

C. Annual Reporting. The owner or operator of a CSPI shall submit an annual report demonstrating and certifying compliance with the Operation and Maintenance Plan, the requirements of this guide, and approvals granted hereunder, including but not limited to continued management and maintenance of vegetation, compliance with the approved plans and any permit conditions, continuation of liability insurance, and adequacy of road access. The annual report shall also provide information on the maintenance completed during the course of the year and the amount of electricity generated by the facility. The report shall be submitted to the Board of Selectmen or Town/City Council, Planning Board, Fire Chief, Building Commissioner, Board of Health, and Conservation Commission (if a wetlands permit was issued) no later than 45 days after the end of the calendar year.

If the municipality has required Pollinator Friendly Certification of the CSPI through the UMass Clean Energy Extension program, it may request a copy of the Annual Maintenance Log, which is submitted annually to UMass.

E. The owner or operator of a CSPI shall submit a copy of the Annual Maintenance Log submitted to UMass Clean Energy Extension as proof of continued participation in the Pollinator Friendly Certification Program. The log shall be submitted to the [list appropriate authorities] no later than 45 days after the end of the calendar year.

Modifications

There are two types of modifications municipal authorities commonly face. The first is a modification during construction based on the existing site conditions, forcing the developer to alter the installation and configuration of the site. The second are modifications put in place by the developer after site plan approval (additional panels, etc). The operator must inform the Site Plan Review Authority of any type of proposed modification to allow for proper review and approval.

D. Modifications. All modifications to a CSPI made after issuance of the required building permit shall require approval by the Site Plan Approval Authority before implementation.

Transfer of Ownership

In the current solar market, commercial-scale facilities change ownership frequently – in many cases, even before the project is fully constructed and operational. It is important to include language within the conditions set on a permit approval that detail the expectations associated with a transfer of ownership.

E. Transfer of Ownership. In the event that the solar facility is sold, all municipal permits, conditions, and associated documentation shall be provided in both digital and hard copy format to the new owner, including [add specific documents as needed]. The [Site Review Approval Authority/Special Permit Granting Authority] must be provided with updated contact information for the new owner, including name, address, telephone number, and e-mail address. Authorities Having Jurisdiction, including local emergency personnel, must be provided with updated emergency contact information, including an emergency contact number that is staffed 24 hours a day. The new owner must abide by all conditions as detailed in the final permit. Any proposed changes to the project shall require approval as described in the Modifications section of the municipality's solar zoning bylaw [list section of bylaw].

12

DISCONTINUANCE & REMOVAL

The intent of this section is to provide guidance on the discontinuation and removal of the Commercial Solar Photovoltaic Installations. All actions and requests in this section should be at the expense of the owner or operator, upon written request of the Building Inspector Select Board, Town or City Council. If in accordance with the existing agreement there is an indication of lack of operation, maintenance or the discontinuance of the operation of the array, the municipality must take enforceable action. The terms of the agreement must also be transferrable and transmissible to any assigned future owners of the array. The removal of the CSPI should include returning to the original conditions in accordance with the approved building permit and any other permits or conditions. The challenge with solar PV installations is that they will likely be in place for at least 20 years; agreements, permits, and conditions must therefore be accessible to future local officials, as well as future owners of the solar PV installation, should the project change hands. Therefore, all language and requirements must be in clear and enforceable terms.



SAMPLE BYLAW/ORDINANCE LANGUAGE

COMPONENTS OF BYLAW/ORDINANCE TYPICALLY IN THE *DISCONTINUANCE AND REMOVAL* SECTION AND SAMPLE LANGUAGE

Municipalities may want to identify specific standards or criteria for approval of solar photovoltaic installations and its related application requirements. Suggestions below may or may not be appropriate for your community.

A. Removal Requirements. Any CSPI, or any substantial part thereof, not used for a period of one continuous year or more without written permission from the Site Plan Approval Authority, or that has reached the end of its useful life, shall be considered discontinued and shall be removed. Upon written request from the Building Inspector, addressed to the contact address provided and maintained by the owner or operator as required above, the owner or operator shall provide evidence to the Building Inspector demonstrating continued use of the CSPI. Failure to provide such evidence within thirty days of such written request shall be conclusive evidence that the installation has been discontinued. Anyone intending to decommission and/or remove such an installation shall notify the Site Plan Approval Authority and Building Inspector by certified mail of the proposed date of discontinued operations and plans for removal.

1. Physical removal of all parts of and appurtenances to the CSPI, including structures, equipment, security barriers and transmission lines;
2. Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations;
3. Stabilization or re-vegetation of the site as necessary to minimize erosion. The Site Plan Approval Authority may allow the owner or operator to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.
4. Any site that was deforested for the CSPI, per Section 5(B) or (C), shall be restored to encourage native tree growth, including the planting of seedlings, if necessary, to establish growth. The cost of plant replacement shall be incorporated into the financial surety stipulated in Section 13.

B. Right to Remove. If the owner or operator of the CSPI fails to remove the installation in accordance with the requirements of this section, the town shall have the right, to the extent it is otherwise duly authorized by law, to enter the property and physically remove the installation at the expense of the owner of the installation and the owner(s) of the site on which the facility is located. The Town/City may use the financial surety as stipulated in §13(D), below for this purpose.

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13 FINANCIAL SURETY

The intent of financial surety is to protect the municipality by making make sure that the funds identified for decommissioning and site stabilization are available throughout the lifetime of the project. In this section, we provide sample language to ensure a clear disposition of cash bonds or other financial surety, and annual confirmation of the existence of the financial surety for the lifetime of the project.



SAMPLE BYLAW/ ORDINANCE LANGUAGE

COMPONENTS OF BYLAW/ORDINANCE TYPICALLY IN THE *FINANCIAL SURETY* SECTION AND SAMPLE LANGUAGE

A. Financial Surety. Prior to commencing operation, the applicant shall provide a form of financial surety, through a cash deposit, in an amount determined to be adequate by the Site Plan Review Authority to cover cost of CSPI removal and site restoration.

B. Decommissioning Cost Estimation. The applicant shall submit a fully inclusive estimate of the costs associated with removal, prepared by a qualified engineer. The amount shall include an escalator for calculating increased removal costs due to inflation. Salvage for solar panels may be included for other components of the installation at the discretion of the Site Plan Review Authority.

See *Appendix E* for an example of estimating decommissioning costs.

C. The financial surety shall be maintained by the developer for the lifespan of the facility, with annual certification notices from the surety company or bank for surety bonds submitted to the Site Plan Review Authority. Such surety is not required for municipal facilities.

D. A cash deposit [of a minimum amount of \$100,000 per MW (DC) of installed system capacity] shall be held by the Town Treasurer pursuant to M.G.L. Chapter 44, Section 53 ½.

SOME ADDITIONAL CONSIDERATIONS ON THE TRANSACTION OF FINANCIAL SURETY

1. Cash deposit amount shall be identified in the conditions of the Special Permit
2. Interest earned on cash deposit shall be deposited into the General Fund and shall be returned to the developer with cash deposit at time of decommissioning.
3. Performance required and standards for determining satisfactory completion or default: by-law, ordinance, rule, regulation or contract stating that Building Inspector/Zoning Enforcement Officer shall inspect the project and provide written documentation of completion or default to the applicant and the Town.
4. The procedures the applicant must follow to obtain a return of the monies or other security: by-law, ordinance, rule, regulation or contract stating the applicant shall request in writing to the Building Inspector/Zoning Enforcement Officer (BI/ZEO) who shall in turn inspect the project for full completion (regarding a construction bond) or full decommissioning at the time it is requested. BI/ZEO shall inspect and provide in writing to the applicant and the Town of the condition of the project and inform the Town/City Treasurer and/or Accountant to release the funds to the applicant or to be used to restore the site to its original condition.
5. The project shall be deemed in default if it has been abandoned (as previously described in this bylaw), if applicant has notified the Town of default, or if the project is inactive for 180 days and deemed in default after inspection by the BI/ZEO and notice of default is sent to the Town/City, Treasurer and/or Accountant in writing.

14 PAYMENT IN LIEU OF TAXES (PILOT) LOCAL TAX PAYMENTS

We strongly recommend that towns and cities utilize Payments in Lieu of Taxes (PILOTs), rather than traditional property taxes in assessing Commercial-Scale Solar Photovoltaic Installations. PILOT agreements are made between the project proponent and the municipality to modify the schedule for the payment of taxes; these agreements ideally result in better cash management for the operator and a greater total tax receipt for the municipality. PILOTs also avoid questions of legality surrounding municipal property tax payments on certain types of solar photovoltaic installations.

PILOT Agreements must be ratified by Town Meeting or Town/City Council, and submitted to the Department of Revenue for approval. (For more information, contact the Massachusetts Department of Revenue). The municipality will account for PILOT payment revenue under the "New Growth" section of its total tax levy.

The Legal Status of PILOTs

PILOT Tax payments. Under Massachusetts G.L. c. 59, §38H(b): "agreement for payment in lieu of taxes" (PILOT), municipalities are permitted to negotiate a fair value PILOT applicable to the developer and/or successor entities, which will be in place for the agreed upon lifespan of the proposed solar array.

Negotiating a PILOT Agreement

PILOT agreements should be negotiated between the project proponent and the municipality in an open, equitable fashion. PILOT agreements should be negotiated with the assistance and involvement of the assessors. Before negotiating a PILOT, the eligibility of the project for a PILOT should be reviewed by Town Counsel or the City Solicitor.

Exemptions to Property Taxes for Solar PV Arrays

Your community should be aware that in accordance with MGL Chapter 59 Section 5 (Clause 45), this MGL has negatively impacted the property taxes collected in other communities and provides for a tax exemption for solar and wind energy systems. It applies only to projects which are being utilized as primary or auxilliary source (i.e., if the energy is used on the site may be considered tax exempt).

15 THE PERMITTING PROCESS

TIPS TO REMEMBER

SITE PLAN REVIEW AUTHORITY/SPECIAL PERMIT GRANTING AUTHORITY

- **Follow Open Meeting Laws and Required Timelines** – This is ALWAYS legally required, but because development of CPSIs may be controversial, with a good deal of money wrapped up in their development, it is especially important to ‘dot every i and cross every t’ to avoid possible litigation.
- **As-of-Right vs. Special Permit Site Plan Review** – Recognize the difference between as-of-right non-discretionary site plan review, and special permit discretionary site plan review, and act accordingly.
- **Consult with other relevant municipal boards and departments.**
- **Third Party Consultation** – Third-party review of stormwater management plans is allowable under Massachusetts law, and should be paid for by the project proponent.
- **Negotiate PILOT payments in consultation with assessors and other relevant municipal representatives.**
- **Bonds for Decommissioning**
- **Consider site-specific aesthetic, environmental, and safety specifications, to be included in conditions set on the permit.**
- **Remember large solar PV facilities change ownership frequently.** Write permit conditions such that they are clear and enforceable. Require the transfer of all permitting documents to any new owners as a condition of the permit.

TIPS TO REMEMBER

CONSERVATION COMMISSION

- **MA DEP Guidance** – Review guidance on permitting of solar PV arrays provided by the Massachusetts Department of Environmental Protection: <https://www.mass.gov/guides/massdep-wetlands-program-policy-17-1-photovoltaic-system-solar-array-review#-siting-photovoltaic-systems->
- **Don't be afraid to contact your MassDEP circuit rider with questions.**
- **Follow Open Meeting Laws and Required Timelines** – This is ALWAYS legally required, but because development of CPSIs may be controversial, with a good deal of money wrapped up in their development, it is especially important to 'dot every i and cross every t' to avoid possible litigation.
- **Coordinate with the Site Plan Approval Authority and Special Permit Granting Authority** - (often the Planning Board of Zoning Board of Appeals)
- **Third Party Consultation** – Third-party review of wetland boundaries and stormwater management plans is allowable under Massachusetts law, and should be paid for by the project proponent.
- **The Commission can require regular site checks** during construction and following storm events– weekly, if necessary.
- **The Commission can use its discretion in the wetland buffer zone**, and apply appropriate Special Conditions in the Order of Conditions.
- **The Commission can require limited vegetation clearing in the trim zone**, and apply appropriate Special Conditions in the Order of Conditions.

Consultation with other Agencies and Municipal Boards

In cases where a Site Plan Review is required, the permitting process will be overseen by the Site Plan Review Authority, in consultation with other boards and departments as needed. For projects which require a Special Permit, this Special Permit Approval Authority will then need to determine whether a Special Permit can be granted, and to set appropriate conditions. The Site Plan Review Authority and Special Permit Approval Authority may or may not be the same entity, depending on the permitting structure laid out in the municipality's bylaws.

In most cases, the Conservation Commission only becomes directly involved in the permitting process if work activities associated with development of the solar array are to occur in jurisdictional areas defined under the Massachusetts Wetland Protection Act (WPA). These areas are defined in detail in the WPA, but typically include areas within 100 feet of a wetland or water body, or 200 feet of most rivers and streams.

Because commercial-scale solar projects often involve clearing of large tracts of land, they have the potential to affect wetlands and water bodies, even if those areas are greater than 100 feet away. However, the Conservation Commission has no authority outside its jurisdictional area based on the potential for a project to affect a wetland – it can only come in after the fact, if a jurisdictional area is negatively affected in a way that violates the WPA. For any project that has the potential for run-off or erosion into a wetland or water body, members of the Conservation Commission should be included in meetings of the Site Plan Approval Authority in an advisory role. Even in cases where the Conservation Commission has direct jurisdictional authority, it is important for town boards to coordinate closely, to ensure that the requirements laid out for permitting are consistent and do not work at cross-purposes.

Other entities that may be involved in environmental permitting relating to proposed solar PV projects include the Massachusetts Department of Environmental Protection (as above, under the Wetland Protection Act), the Massachusetts Natural Heritage and Endangered Species Program (within rare species habitat, under the Massachusetts Endangered Species Act), the Department of Conservation and Recreation (in public water supply zones, under the Watershed Protection Act), and the federal Army Corps of Engineers (under the Clean Water Act). The Massachusetts Department of Agricultural Resources (MDAR) may specifically be involved in projects related to agriculture.

Third-Party Review of Stormwater Management Plans

Due to the complexity of large, land-altering solar developments, it is recommended that an independent third party review all stormwater and erosion control and sedimentation controls and plans as part of the Site Plan Approval process. The applicant's engineering and site plans should be reviewed by a licensed third-party engineering review. Usually, municipalities have engineering firms on call who can perform this review in advance of a hearing by the boards on these applications. If the municipality has adopted MGL Chapter 44, Section 53G, the municipality may require that the third-party review be paid for by the applicant.

If approved, it will be important for the municipality to ensure successful implementation of the stormwater management plan and ongoing maintenance of mitigation measures. These measures can be addressed in an approval upon conditions, through sufficient performance security requirements and long-term maintenance provisions.

MGL Chapter 44, Section 53G authorizes the establishment of a special account by certain local boards including the Planning Board or Conservation Commission, for the employment of outside consultants (i.e., peer review of technical issues like peer civil engineering review or traffic peer review) using funds supplied by an applicant for a permit.

Pursuant to section 53G, a board must adopt regulations, through a simple vote of the board to adopt, in order to establish an account.

The account is established by the treasurer with funds segregated from other municipal accounts. The funds, plus interest earned, in such account can be expended by the board without appropriation. Usually, a contract is entered into with the consultant only upon receipt by the board of the funds necessary to pay the consultant. Upon completion of review of a project, any excess funds plus interest shall be repaid to the applicant. The treasurer of the municipality must submit annual reports on such special accounts to the Select Board, Town or City Council, Mayor, or City Manager. All contracts awarded under the provisions of section 53G must comply with the bidding laws of MGL Ch 30B.

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APPENDIX

- A - INSTRUCTIONS AND COMPLETE APPLICATION CHECKLIST
- B - RESOURCES REGARDING AGRICULTURAL EXEMPTION
- C - EXAMPLE SOLAR MORATORIUM BYLAW/ORDINANCE
- D - SAFETY IN ENERGY STORAGE
- E - EXAMPLE TREE REPLACEMENT BYLAW/ORDINANCE
- F - SAMPLE MUNICIPAL BYLAWS/ORDINANCES
- G - SAMPLE PILOT AGREEMENT
- H - ADDITIONAL RESOURCES

A

INSTRUCTIONS AND COMPLETE APPLICATION CHECKLIST

- Town of East Longmeadow



Town of East Longmeadow
Department of Planning and Community Development
60 Center Square
East Longmeadow, Massachusetts 01028
(413) 525-5400 - ext. 1700

**INSTRUCTIONS FOR FILING
SPECIAL PERMIT, SITE PLAN REVIEW, and SUBDIVISION PLAN APPLICATIONS**

COMPLETE APPLICATION PACKETS

For Special Permits, Site Plan Review, and Subdivision Plans, prior to filing application packets with the Planning Board, the applicant shall review the contents of the packet with Planning & Community Development staff for completeness. After the applicant receives approval from Planning & Community Development staff, the applicant shall bring the packets to the Town Clerk to have the submittals date/time stamped and certified by the Town Clerk. Submittals shall be returned to the Planning and Community Development Department on the same date as part of the COMPLETE APPLICATION PACKET.

The Planning and Community Development Department will only accept a COMPLETE APPLICATION PACKET. All submitted materials should be typed or legibly printed. Fillable forms are available on the Town's website at:

<https://www.eastlongmeadowma.gov/286/Planning>

A COMPLETE APPLICATION PACKET must include all of the following:

1. A ZONING DETERMINATION, with original signatures, signed by the Building Commissioner.
2. Eight (8) hard copies of the executed Zoning Determination (submit this request at least 10 days prior to your anticipated application submittal).
3. A fully completed APPLICATION FORM with original signatures and with the date and time of the filing certified by the Town Clerk.
4. Eight (8) hard copies of the executed APPLICATION FORM.
5. Eight (8) complete sets of all Supporting Materials, as applicable (Plan review application check list, Narrative, Deed of Ownership, Waiver Request Form, Photos, Drainage Report, Traffic Impact Study, Maps, Development Impact Statement).
6. Determination of Applicability submitted to the Conservation Commission (If applicable)
7. Five (5) Storm water Drainage Reports (if applicable)

8. Site Plans and Architectural Elevations (plans should bear the seal of an architect, landscape architect or professional engineer of appropriate discipline licensed in Massachusetts).
 - a. Two separate site plans showing: 1) Existing Conditions 2) Proposed Conditions
 - b. Three (3) sets of the plans shall be full sized (24"x36")
 - c. Six (6) sets shall be 11"x17"

PLEASE NOTE: If filing an Application Not Required (ANR) the following is required:

- Two (2) Mylar Plans
- One (1) full sized (24"x36")

9. Required Filing Fee.
10. **Two sets** of pre-stamped, BLANK envelopes for mailing out required "parties of interest" notifications.
11. Twelve (12) additional pre-stamped, blank envelopes for notice to surrounding municipalities.
12. A TAX COLLECTOR AFFIDAVIT signed by the East Longmeadow Tax Collector (or designee).
13. A CERTIFIED LIST OF ABUTTERS from the Assessor's Office (submit this request at least 10 days prior to your anticipated application submittal).
14. Digital PDF files on a USB device containing the items listed above.

STEPS:

1. Depending on the scale and complexity of the project, it is suggested that the Planning and Community Development Director be consulted early in the project planning process.
2. FILE A ZONING DETERMINATION APPLICATION WITH THE BUILDING DEPARTMENT (submit this request at least 10 days prior to your anticipated application submittal).

This will formally determine what zoning approvals are needed and, if so, by which permit granting authority (Planning Board, Board of Appeals, or Town Council).

3. COMPILE APPLICATION MATERIALS (see COMPLETE APPLICATION PACKET)

4. Before submitting the packet to the TOWN CLERK, submit the COMPLETE APPLICATION PACKET (see COMPLETE APPLICATION PACKET) to the Planning and Community Development Department staff for final review.
5. Submit application with original signatures and one application copy with the Town Clerk to be date/time stamped. This constitutes the official filing date of the application. Leave one date/time stamped packet with Town Clerk.
6. The Planning and Community Development Department will schedule the required meeting date for the application for which the applicant and “parties of Interest” will be mailed notifications.
7. For larger or complicated projects an informal project review/pre permitting meeting may be held with relevant departments to which the applicant will be invited to attend to informally present and discuss the project with various town departments and solicit input. This will likely be conducted prior to the Public Hearing meeting.
8. The Planning Board will conduct the Public Hearing at which the applicant will be given the opportunity to present the project. “Parties in interest” will also have the opportunity participate. The Public Hearing may be continued to a future meeting(s) by the Planning Board to request additional materials and information.
9. Once the Planning Board has determined that they have received all of the relevant information that they require to render a Decision, they will close the Public Hearing and render a Decision.
10. Within fourteen (14) days of the close of hearing, the Planning Board will file its Decision with the Town Clerk, which will be date/time stamped. This will constitute the date on which the Appeal period starts.

The Applicant and any “parties in interest” have 20 days from this date to file an appeal of the Planning Board’s Decision in Court.

11. The applicant will be mailed a copy of the Decision.
12. At the expiration of the 20 day Appeal period the applicant shall go to the Town Clerk’s Office and receive the Planning Board’s Decision endorsed by the Town Clerk that the 20 Day Appeal period has expired with no appeals being filed.
13. The Applicant must record the Special Permit Decision, Site Plan Approval and Plans, and/or Subdivision Certificate of Approval Decision at the Hampden County Registry of Deeds in order for it to become effective. A copy of the recorded document shall be returned to the Planning and Community Development Department.



Case Number:

Plan Review Application Checklist

In order for the town of East Longmeadow Planning Board to accurately review your project in a timely manner, plan sets submitted with applications must be complete and thorough. A comprehensive understanding of this handout and submittal of all required documents and plans ensures an efficient review of your project.

Unless otherwise noted or determined by Planning and Community Development Department Staff to not be required, the following information and drawings must be included in the submittal package for your application. For an application to be accepted, each and every item is required at the time of application submittal.

In certain instances, plans, or portions of plans, may be waived when not applicable for the review of a particular type of development, at the discretion of the Planning and Community Development Director. Requests for any such waiver(s) must be submitted, in writing, to the Planning and Community Development Department for consideration prior to application submittal.

All submitted materials must be legible, organized & bound (where appropriate) in a manner that allows for distribution of all proposal materials as one (1) package. Please utilize double-sided printing for submitted reports, studies and statements when possible.

Initials Indicate Items Submitted

Staff	Applicant
	1. Completed Application Form (with all required signatures; 8 Copies)
	2. Completed Plan Review Application Checklist (1 original & 7 copies)
	3. Plans
	☐ Three (3) stapled and folded sets of full-sized plans (24" x 36") and six (6) sets of reduced plans (11" x 17") are required for all applications. Staff reserves the right to require additional copies.
	☐ One (1) electronic copy (PDF) of all proposed activity plans (See Section 10 of checklist for requirements)
	☐ All plans oriented so that north arrow points to top of sheet
	☐ Plans shall be drawn at a minimum scale of 1"= 40' or less
	☐ All plans shall be stamped by Commonwealth of Massachusetts Registered Professional Engineer, Professional Land Surveyor, Professional Landscape Architect, and/or Architect, as appropriate
	☐ Plan sets shall be comprised of separate sheets as listed below unless otherwise approved by the Planning and Community Development Director
	☐ All plans shall have a title block comprised of the following: Project Title, Sheet Title, Sheet Number; Registrant Stamp (i.e., PE, PLS, LA, RA); Registrant's name and address; Street addresses of the project area parcels; Scale at which the plan is drawn; Plan Issue Date; and all plan revision dates (with corresponding revision descriptions).

3a. Cover Sheet, to include the following information:

- ☐ **Title Block**
 - Project name/title
 - Assessor's map and parcel number(s)
 - Name and address of property owner(s)
 - Name and address of developer
 - Name and address of Engineer / Architect/ Landscape Architect
 - Revision Date Block
 - Street Number and/or Lot Number
 - HCRD Registry Book and Page (to include previous land plans and recorded deed book and page numbers)
- ☐ **Zoning Requirements Table** (Indicate Required vs. Provided)
 - Zoning District
 - Lot Area
 - Lot Frontage
 - Front, Side & Rear Setbacks of Buildings and Parking Areas
 - Building Height
 - Lot Coverage Percentage
 - Green Space
 - Off-Street Parking Spaces
 - Compact Parking Spaces
 - Accessible Parking Spaces
 - Van Accessible Parking Spaces
 - Screening Buffers
 - Percentage of Lot that is Upland
 - Total Square Footage of Upland
- ☐ **Locus Map** (At a scale of 1 inch = 100 feet, showing the entire project and its relation to existing areas, buildings, and roads within a distance of 1,000 feet from the project boundaries, or such other distances as may be approved or required by the Planning Board.)
- ☐ **Plan Index** with latest revision date of each individual plan
- ☐ **Flood Insurance Rate Map (FIRM) with effective date**
- ☐ **Soils Map**

3b. Existing Conditions Plan

- ☐ Name of Surveyor or Surveyor Firm
- ☐ Date of survey
- ☐ Property lines with bearings and distances

Staff	Applicant
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| <ul style="list-style-type: none">☐ Monuments set/found at all lot corners☐ Easements with bearings and distances suitable for registry filing☐ Names of all abutters and zoning district☐ Street names☐ Benchmark locations (Based on USGS NGVD 88. Datum may not be assumed)☐ NHESP mapped areas (Areas of Estimated and Priority Habitats)☐ Existing 21E Contaminated Site Information☐ Existing Buildings and Structures<ul style="list-style-type: none">☐ Area of building☐ Number of stories | |
|---|--|

- ☐ Principal use
- ☐ Setbacks from property lines
- ☐ Floor elevations
- ☐ Existing Topography:
 - ☐ Contours at 2' intervals (1' contours or additional spot grades if site is flat)
 - ☐ Overhead and underground utilities including but not limited to water, sewer, drainage, electric, telephone, cable TV, gas, septic systems, detention structures, wells
 - ☐ Existing parking/paved areas including pavement type (parking, walkways, etc.)
 - ☐ All existing curbcuts
 - ☐ Listing of all existing utility owners and contact info located within the project limits
 - ☐ Adequate utility information outside the site to verify proposed utility connections
 - ☐ All utility pipe types, sizes, lengths, and slopes
 - ☐ All utility structure information including rim and invert elevations
 - ☐ All existing easements within 50 feet of property line-Identify any utility within the easement
 - ☐ All existing utility easements with bearings and distances
 - ☐ Existing pavement markings within site and on connecting roads
 - ☐ Existing features such as walls, curbing, landscaping, trees, walks, fences, trees 18 inches DBH (diameter at breast height), lighting, poles, guys, signs, loading areas, fire hydrants, dumpster locations, known buried slabs, etc.
 - ☐ Wetlands, floodplain, water protection district delineation including offsets and buffer zones
 - ☐ Streams, water courses, swales, and all flood hazard areas
 - ☐ Rock outcroppings
 - ☐ Test pit locations including groundwater depths when encountered
 - ☐ Historic buildings within 250 feet of the subject property
- ☐ Door locations with sill elevation

3c. Demolition Plan

- ☐ **Existing Conditions Plan plus:**
 - ☐ Existing Buildings and Structures to be removed/demolished

Staff	Applicant
	☐ Existing parking/paved areas to be removed/demolished ☐ Existing utilities to be removed/demolished ☐ Existing hydrants to be removed ☐ Existing features to be removed/ demolished such as walls, curbing, landscaping trees, walks, fences, trees 18" DBH or greater, lighting, poles, guys, signs, etc. ☐ Dust Control Measures

- ☐ Proposed construction phase drainage infrastructure plan including (but not limited to) piping and natural watercourse profiles & cross-sections, retention/detention structures, drain manholes, catch basins, gutter inlets, headwalls, water quality BMPs, and erosion & sedimentation control features, etc.

3d. Construction/Layout Plan/Site Plan

- ☐ Proposed Buildings and Structures
 - ☐ Area of building or additions
 - ☐ Number of stories
 - ☐ Principal use of structure
 - ☐ Floor elevations
- ☐ Door locations with sill elevations
- ☐ Setback dimensions from property lines
- ☐ Out-buildings, detached garages, temp. construction trailers, etc.
- ☐ Proposed Topography, including but not limited to:
 - ☐ Proposed contours at 2' intervals
 - ☐ Parking lot setbacks to property line
 - ☐ Parking lot grades (not to exceed 5% or be less than 0.5%)
 - ☐ Walls
 - ☐ Parking spaces (delineated and dimensioned)
 - ☐ Accessible parking spaces & aisles
 - ☐ Wheelchair ramps
 - ☐ Sidewalks
 - ☐ Pavement type(s)
 - ☐ Curb type(s) and limits
 - ☐ Lighting / Poles / Guys
 - ☐ Signs (include sign schedule)
 - ☐ Pavement markings
 - ☐ Loading areas / Loading Docks / Platforms
 - ☐ Fences
 - ☐ Landscape areas
 - ☐ Dumpster(s), Compactor(s) & Pads
 - ☐ Spot Grades at four (4) Building Corners
 - ☐ Overall Plan Showing Areas of Cut & Fill

Staff	Applicant
	☐ Critical dimensions including aisle widths, parking stall dimensions, curb radius, driveway openings, etc.

- ☐ Grading at entrance-show spot grades, if required
- ☐ Emergency Vehicle Access
- ☐ Truck Access (WB-50 unless otherwise approved by Department of Public Works)
- ☐ Snow Storage Areas
- ☐ Construction notes (including the following notes):
 - ☐ Any minor modifications (as determined by the Department of Public Works and Planning and Community Development Director) to the information shown on the approved site plans shall be submitted to the Department of Public Works as a Minor Plan Revision for approval prior to the work being performed.
 - ☐ Any work and material within the Town right-of-way shall conform to the Town of East Longmeadow requirements
 - ☐ All handicap parking, ramps, and access shall conform to AAB & MAAB requirements
 - ☐ All erosion control measures shall be in place prior to construction. Erosion Control shall conform to the East Longmeadow Conservation Commission requirements as stated in the Order of Conditions. (Refer to Erosion Control Plan if part of submission)
 - ☐ All pavement markings and signs shall conform to MUTCD requirements

3e. Grading and Drainage Plan

- ☐ **Existing Conditions Plan and Construction/ Layout/ Site Plan plus:**
- ☐ Existing and proposed site grading/ topography-Contours at 2' intervals (1' contours or additional spot grades, if slight is flat)
- ☐ Proposed parking lots, sidewalks, islands, etc.
 - ☐ Parking lot grades shall not exceed 5% or be less than 0.5 %
- ☐ Floor elevations & door locations
- ☐ Proposed drainage infrastructure plan including but not limited to piping and natural watercourse profiles & cross-sections, infiltration/ retention / detention structures, drain manholes, headwalls, roof recharge systems, flow direction, water quality BMPs, etc.
- ☐ Adequate information off site to verify proposed drain connections
- ☐ Drainage system profiles including rim and invert elevations, material, types, sizes, lengths, utility crossings and slopes
- ☐ Utility easements with bearings and distances suitable for Hampden County Registry of Deeds filing
- ☐ Delineation of all stockpile areas
- ☐ Provide safety fencing around stockpiles over 10' in height or otherwise restrict site access
- ☐ For applications associated with residential or commercial/industrial subdivisions, include an overall development plan showing all construction activity and proposed grading for all project phases, and

Staff	Applicant

show the proposed building envelope within each house lot and the proposed grading, drainage, and storm water disposal for each lot.

- ☐ A design for the stormwater drainage systems prepared by a Registered Professional Engineer demonstrating that proposed development rates of runoff do not exceed pre-development rates, as required under Massachusetts Stormwater Management Standards.

3f. Utility and Grading Plan (Show appropriate info from Existing Conditions & Construction/Layout/Site Plans)

- ☐ Include all proposed utilities, including, but not limited to, Water, Sewer, Drainage, Electric, Telephone, Cable TV, Gas, Lighting, Title V Septic Systems & Detention and Retention Structures
 - ☐ Adequate utility information outside the site to verify proposed utility connections
 - ☐ All utility pipe types, sizes, lengths, and slopes
 - ☐ All utility structure information including rim and invert elevations
 - ☐ Any utility access vaults
 - ☐ All utility access handholes
 - ☐ All water services, hydrants, gates, shutoffs, tees
 - ☐ Utilities shall be underground
 - ☐ All transformer locations
 - ☐ Required utility easements with dimensional bearings and distances
- ☐ Force main, if required, conforming to Town of East Longmeadow requirements
- ☐ Water main loop
- ☐ Sewer profile showing all utility crossings
- ☐ Sections through detention basin(s)
- ☐ Detention basin, retention basin or other stormwater mechanisms (such as infiltration devices), if proposed (All storm water plans must adhere to the new NPDES MS4 permit which have taken effect July 1, 2018).
- ☐ Include the following notes:
 - ☐ The contractor shall obtain a letter of approval from DPW prior to any construction within the right-of-way
 - ☐ All water and sewer material and construction shall conform to the Town of East Longmeadow requirements
 - ☐ All water and sewer construction shall be inspected by the Town of East Longmeadow before being backfilled
 - ☐ The Town shall be notified at least 24 hours prior to the required inspections

3g. Landscape Plan

- ☐ Location, species, and size of all proposed plantings
- ☐ All existing landscaping to be removed or retained
- ☐ Plant and tree legend

Staff	Applicant
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| | <ul style="list-style-type: none">☐ Delineate & label all existing and proposed groundcovers, lawn areas, driveways, walkways, patios and other surface treatments☐ Snow storage areas☐ Proposed irrigation methods (on-site wells to be used unless otherwise approved)☐ Verify sight distances at entrances☐ Include the following notes:<ul style="list-style-type: none">• Planting period shall be noted as March 15 - May 15 and September 15 – November 15, weather permitting• Owner is responsible for maintaining live vegetation, and the maintenance, removal and replacing of all dead trees, shrubs, ground cover and plants |
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	3h. Erosion Control Plan (show appropriate information from Existing Conditions and Construction/Layout/Site Plans)
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| | <ul style="list-style-type: none">☐ Straw bales or straw bale/silt fence combination and compost filter tubes☐ Anti-tracking BMP area at all construction entrances☐ Dust Control (Methods of)☐ Protection of existing and proposed drainage structures with straw bales and/or silt sacks☐ Delineation of all temporary stockpile areas☐ Safety fencing around stockpiles over 10' in height or otherwise restricted site access☐ Straw bales or straw bale/silt fence combination around all stockpiles☐ Include the following notes:<ul style="list-style-type: none">• All BMP erosion control measures shall be in place prior to demolition or any site work.• Erosion Control BMPs shall conform to US EPA, NPDES, MA DEP and Massachusetts Erosion and Sedimentation Control Guidelines for Urban and Suburban Areas.• Maintenance specifications for all proposed erosion and sedimentation controls. |
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	3i. Building Elevations
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| | <ul style="list-style-type: none">☐ Show all structural building elevations (front, sides and rear facades)☐ For additions/alterations: label existing and new construction, as well as items to be removed☐ Identify all existing and proposed exterior materials, treatments and colors - including roofing, roof eaves, eave brackets, siding, doors, trim, sills, windows, fences, and railings, etc.☐ Show details of proposed new exterior elements☐ Show any exterior mechanical, duct work, utility boxes, satellite dish, etc.☐ Include dimensions for building height and wall length and identify existing and proposed floor elevations☐ Provide Sample Boards of proposed finish materials☐ For alterations to any existing or new business/commercial/industrial uses, show a table containing the following: |
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- Maximum area of building to be used for retail/sales, office, business, industrial or other use
- Maximum number of employees, where applicable

Staff	Applicant
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- Maximum seating capacity, where applicable
- Hours of operation
- Number of parking spaces existing or required for the intended use

3j. Sign Plan

- ☐ Fully-dimensioned color elevations for all proposed signs
- ☐ Total square footage of existing signs and total square footage of proposed signs
- ☐ Existing and proposed sign locations on site plan, to include directional signs
- ☐ Existing and proposed materials and methods of lighting for all signs

3k. Lighting Plan

- ☐ Location and orientation of all existing and proposed exterior lighting, including building and ground lighting and emergency spot lighting (if any)
- ☐ Height and initial foot-candle readings on the ground and the types of fixtures to be used
- ☐ Plan must show illumination patterns on-site and areas off-site
- ☐ Provide Cut Sheet for all lighting fixtures

3l. Detail Sheets (Typical Details)

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| ☐ Pavement Section Detail | ☐ Sewer Manhole Detail (26" cover) |
| ☐ Sidewalk Detail | ☐ Detention/Retention Basin Sections (from plan) |
| ☐ Curb Detail | ☐ Detention Basin Outlet Structure Detail |
| ☐ Driveway Detail | ☐ Miscellaneous Detention/Retention Basin Details |
| ☐ Wheel Chair Ramp Detail | ☐ Infiltration Device Details |
| ☐ Concrete Pad Detail | ☐ Stormwater BMPs (Water Quality Structure Details, etc.) |
| ☐ Catch Basin Detail | ☐ Bollards |
| ☐ Drainage Manhole Detail | ☐ Tree/Shrub Planting Detail |
| ☐ Silt Sac Detail | ☐ Sign Detail |
| ☐ Water and Sewer Trench Sections | ☐ Fence Detail |
| ☐ Anti-Seepage Collar Detail | ☐ Flowable Fill Trench |
| ☐ Flared End Detail | ☐ Pavement Marking Details |
| ☐ Rip Rap Detail | ☐ Handicap Parking/Compact Parking Signs |
| ☐ Straw Bales/Silt Fence Detail | ☐ Hydrant Detail: American-Darling B-62-B Open Right) or Mueller Super Centurion Silt Sac Detail Hydrant (Open Right) |
| ☐ Compost Filter Tube Detail | ☐ Thrust Block Detail |
| ☐ Light Pole Foundation Detail | ☐ Retaining Wall Details |

4. Project Narrative (15 Copies), to include adequate summary & description of the proposed project and indicating, where appropriate:

Staff	Applicant
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| | ☐ The number of dwelling units to be built and the acreage in residential use
☐ Evidence of compliance with parking and off-street loading requirements
☐ The forms of ownership contemplated for the property and a summary of the provisions of any ownership or maintenance thereof
☐ Identification of all land that will become common or public land
☐ Any other evidence necessary to indicate compliance with the zoning ordinance
☐ A written statement indicating the estimated time required to complete the proposed project and any and all phases thereof
☐ A written estimate showing, in detail, the projected costs of all site improvements (and off-site improvement) planned
☐ Drainage calculations by a registered professional engineer, with storm drainage design conforming to Town of East Longmeadow stormwater regulations, as well as wetland delineations determined by a certified wetland scientist, if applicable, for 1, 10, 25 & 100 year storm events |
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5. Certified Abutters List (15 copies)

6. Proof of Ownership (Copy of Deed(s) for All Involved Parcels; 15 Copies)

7. Development Impact Statement (DIS) (15 Copies), if required by the Planning Board

8. Traffic Impact & Access Study (TIAS) (15 Copies), if required by the Planning Board

9. Stormwater Management Report (15 Copies), if required, comprised of the following:

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| | ☐ MADEP Stormwater Standards Compliance Checklist (signed & stamped)
☐ Overall Project Description
☐ Existing Conditions
☐ Proposed Improvements
☐ Proposed Conditions
☐ Hydrologic Analysis for Existing & Proposed Conditions for Milestone Storm Event Intensities
☐ Stormwater Management Regulations
☐ Summary
☐ Appendix - Existing/Proposed Conditions Plans showing the following: <ul style="list-style-type: none"> ▪ Overall Existing Subcatchment Area Table <ul style="list-style-type: none"> ▪ Subcatchment Labeled, Design Point, Area, Curve number, Tc (min.) ▪ Soil Classifications Table (Existing Soils) <ul style="list-style-type: none"> ▪ Map Unit Symbol, Map Unit Name, Hydrologic Soil Code ▪ Overall Proposed Subcatchment Area Table <ul style="list-style-type: none"> ▪ Subcatchment Labeled, Design Point, Area, Curve number, Tc (min.) ▪ Soil Classifications Table (Including Proposed Boron Soils, Etc., if applicable) |
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- Map Unit Symbol, Map Unit Name, Hydrologic Soil Code
- ☐ Appendix - Hydrologic Analyses

Staff	Applicant
	▪ HydroCAD Software Analyses (or equivalent software) Analyses (Existing & Proposed Conditions) ☐ Appendix - Illicit Discharge Certification (signed & dated)
	10. <u>Electronic PDF and AutoCAD Files</u> ☐ Shall consist of a CD with a printed CD Label in a CD case or USB Drive in PDF Format ☐ PDF files shall be created from within the AutoCAD environment and contain Layer information.
	11. <u>Application Fee</u> (All fees are due at time of application submission)

Official Use Only:

For the Planning Board, this application has been received by the Planning and Community Development Department on the date specified below:

Review date: _____ All materials submitted: Yes No

Signature: _____ Fee: _____

B

**RESOURCES REGARDING
AGRICULTURAL EXEMPTION**

Part I ADMINISTRATION OF THE GOVERNMENT**Title VII** CITIES, TOWNS AND DISTRICTS**Chapter 40A** ZONING**Section 3** SUBJECTS WHICH ZONING MAY NOT REGULATE;
EXEMPTIONS; PUBLIC HEARINGS; TEMPORARY
MANUFACTURED HOME RESIDENCES

Section 3. No zoning ordinance or by-law shall regulate or restrict the use of materials, or methods of construction of structures regulated by the state building code, nor shall any such ordinance or by-law prohibit, unreasonably regulate, or require a special permit for the use of land for the primary purpose of commercial agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture, nor prohibit, unreasonably regulate or require a special permit for the use, expansion, reconstruction or construction of structures thereon for the primary purpose of commercial agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture, including those facilities for the sale of produce, wine and dairy products, provided that either during the months of June, July, August and September of each year or during the harvest season of the primary crop raised on land of the owner or lessee, 25 per cent of such products for sale, based on either gross sales dollars or volume, have been produced by the owner or lessee of the land on which the facility is located, or at least 25 per cent of such products for sale,

based on either gross annual sales or annual volume, have been produced by the owner or lessee of the land on which the facility is located and at least an additional 50 per cent of such products for sale, based upon either gross annual sales or annual volume, have been produced in Massachusetts on land other than that on which the facility is located, used for the primary purpose of commercial agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture, whether by the owner or lessee of the land on which the facility is located or by another, except that all such activities may be limited to parcels of 5 acres or more or to parcels 2 acres or more if the sale of products produced from the agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture use on the parcel annually generates at least \$1,000 per acre based on gross sales dollars in area not zoned for agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture. For such purposes, land divided by a public or private way or a waterway shall be construed as 1 parcel. No zoning ordinance or by-law shall exempt land or structures from flood plain or wetlands regulations established pursuant to the General Laws. For the purposes of this section, the term "agriculture" shall be as defined in section 1A of chapter 128, and the term horticulture shall include the growing and keeping of nursery stock and the sale thereof; provided, however, that the terms agriculture, aquaculture, floriculture and horticulture shall not include the growing, cultivation, distribution or dispensation of marijuana as defined in section 2 of chapter 369 of the acts of 2012, marihuana as defined in section 1 of chapter 94C or marijuana or marihuana as defined in section 1 of chapter 94G; and provided further, that nothing in this section shall preclude a municipality from establishing zoning by-laws or ordinances which allow commercial marijuana growing and cultivation on land used for

commercial agriculture, aquaculture, floriculture, or horticulture. Said nursery stock shall be considered to be produced by the owner or lessee of the land if it is nourished, maintained and managed while on the premises.

No zoning ordinance or by-law shall regulate or restrict the interior area of a single family residential building nor shall any such ordinance or by-law prohibit, regulate or restrict the use of land or structures for religious purposes or for educational purposes on land owned or leased by the commonwealth or any of its agencies, subdivisions or bodies politic or by a religious sect or denomination, or by a nonprofit educational corporation; provided, however, that such land or structures may be subject to reasonable regulations concerning the bulk and height of structures and determining yard sizes, lot area, setbacks, open space, parking and building coverage requirements. Lands or structures used, or to be used by a public service corporation may be exempted in particular respects from the operation of a zoning ordinance or by-law if, upon petition of the corporation, the department of telecommunications and cable or the department of public utilities shall, after notice given pursuant to section eleven and public hearing in the town or city, determine the exemptions required and find that the present or proposed use of the land or structure is reasonably necessary for the convenience or welfare of the public; provided however, that if lands or structures used or to be used by a public service corporation are located in more than one municipality such lands or structures may be exempted in particular respects from the operation of any zoning ordinance or by-law if, upon petition of the corporation, the department of telecommunications and cable or the department of public utilities shall after notice to all affected communities and public hearing in one of said municipalities, determine

the exemptions required and find that the present or proposed use of the land or structure is reasonably necessary for the convenience or welfare of the public. For the purpose of this section, the petition of a public service corporation relating to siting of a communications or cable television facility shall be filed with the department of telecommunications and cable. All other petitions shall be filed with the department of public utilities.

No zoning ordinance or bylaw in any city or town shall prohibit, or require a special permit for, the use of land or structures, or the expansion of existing structures, for the primary, accessory or incidental purpose of operating a child care facility; provided, however, that such land or structures may be subject to reasonable regulations concerning the bulk and height of structures and determining yard sizes, lot area, setbacks, open space, parking and building coverage requirements. As used in this paragraph, the term "child care facility" shall mean a child care center or a school-aged child care program, as defined in section 1A of chapter 15D.

Notwithstanding any general or special law to the contrary, local land use and health and safety laws, regulations, practices, ordinances, by-laws and decisions of a city or town shall not discriminate against a disabled person. Imposition of health and safety laws or land-use requirements on congregate living arrangements among non-related persons with disabilities that are not imposed on families and groups of similar size or other unrelated persons shall constitute discrimination. The provisions of this paragraph shall apply to every city or town, including, but not limited to the city of Boston and the city of Cambridge.

Family child care home and large family child care home, as defined in section 1A of chapter 15D, shall be an allowable use unless a city or town prohibits or specifically regulates such use in its zoning ordinances or by-laws.

No provision of a zoning ordinance or by-law shall be valid which sets apart districts by any boundary line which may be changed without adoption of an amendment to the zoning ordinance or by-law.

No zoning ordinance or by-law shall prohibit the owner and occupier of a residence which has been destroyed by fire or other natural holocaust from placing a manufactured home on the site of such residence and residing in such home for a period not to exceed twelve months while the residence is being rebuilt. Any such manufactured home shall be subject to the provisions of the state sanitary code.

No dimensional lot requirement of a zoning ordinance or by-law, including but not limited to, set back, front yard, side yard, rear yard and open space shall apply to handicapped access ramps on private property used solely for the purpose of facilitating ingress or egress of a physically handicapped person, as defined in section thirteen A of chapter twenty-two.

No zoning ordinance or by-law shall prohibit or unreasonably regulate the installation of solar energy systems or the building of structures that facilitate the collection of solar energy, except where necessary to protect the public health, safety or welfare.

No zoning ordinance or by-law shall prohibit the construction or use of an antenna structure by a federally licensed amateur radio operator.

Zoning ordinances and by-laws may reasonably regulate the location and height of such antenna structures for the purposes of health, safety, or

aesthetics; provided, however, that such ordinances and by-laws reasonably allow for sufficient height of such antenna structures so as to effectively accommodate amateur radio communications by federally licensed amateur radio operators and constitute the minimum practicable regulation necessary to accomplish the legitimate purposes of the city or town enacting such ordinance or by-law.

EMERGENCY ALERTS

Coronavirus Updates and Information

Get notified by text, email, or phone in your preferred language. Sign-up for COVID-19 alerts. *Nov. 29th, 2020, 5:00 pm*

[Read more](#) ♦

For the latest information on COVID-19 Cases, Travel, & Reopening. *Dec. 2nd, 2020, 5:00 pm* [Read more](#) ♦

HIDE ALERTS ▲

≡ Mass.gov

Smart Growth / Smart Energy Toolkit Modules - Agricultural Preservation

Learn about the Smart Growth/Smart Energy Agricultural Preservation module.

Overview

Preserving agricultural land and farming in Massachusetts has been a high priority of state and local officials for several decades. Through a variety of state and local initiatives, opportunities have emerged to help ensure a viable agricultural economy and farmland preservation. Many communities have successfully protected agricultural land using an array of financial and legal tools.

The Problem

We are losing agricultural lands and farming opportunities at an alarming rate. These losses create issues such as:

- dramatic alteration of the traditional New England landscape
- A growing dependence on imported food products, and
- A commitment to spending an ever-increasing portion of our food costs on transportation of these products.

Over 16,000 acres of open space is developed and lost in Massachusetts each year, much of it existing or retired farmland. These lands represent a tremendous cultural and historic resource for rural and suburban communities throughout the Commonwealth.

High real estate values in Massachusetts, along with the steady decrease in buildable areas, have increased pressure to develop what remains of agricultural open spaces in many communities. Lands that have been

used historically for farming or pasture, but lie in residential or commercial zones, are often considered "prime real estate" to the development community. These areas are generally clear of forest and have topography well-suited to a variety of land use developments.

High land values has made it very attractive for existing farmers, orchard owners or other agricultural enterprises to sell these lands to private developers. Most communities don't have the funds to "match" a developer's offer resulting in farmlands being converted into residential subdivisions at the expense of viewsheds, open space, local agricultural production and community character.



Pressure to develop residentially zoned agricultural land in Massachusetts is enormous. Despite the existence of several state programs designed to maintain or preserve existing farmland, thousands of acres of these lands are vulnerable to prospective sprawl development. Communities should use the Open Space and Recreation Plan process to identify existing agricultural lands that should be preserved and the tools that would be most effective toward that goal.

Image taken from *Above and Beyond, Visualizing Change in Small Towns and Rural Areas*. Campoli et, al. APA Planners Press, 2001

Introduction to Agricultural Preservation

The goals of agricultural preservation in Massachusetts vary depending on the unique situations of each community.

- In some rural communities, the goal of agricultural preservation is to enable existing farmlands to remain viable through the use of restrictions programs and marketing projects or tax breaks.
- Other more suburban communities may want to see existing agricultural lands developed in ways that decrease the impacts from conventional subdivision activity and preserve significant amounts of the open areas.
- In urban areas, the focus may be less on preservation and more on providing access to agricultural opportunities not often found in densely developed areas.

There are a variety of ways to protect or promote agricultural opportunities in Massachusetts. The tools that are used will depend on the opportunities faced by a community and their goals for preserving or creating agricultural spaces:

Chapter 61A - The Chapter 61 Program provides a tax break to owners of recreational, forest or agricultural lands as long as the land remains in the specified use. It is important to note that Chapter 61 is an incentive program not a permanent protection of open space or farmland. Local planners should assume that all of these lands in their community have development potential. [Changes were made to this law in 2006](https://malegislature.gov/Laws/SessionLaws/Acts/2006/Chapter394) (<https://malegislature.gov/Laws/SessionLaws/Acts/2006/Chapter394>).

Agricultural Commissions - These Commissions are formed by passing a local bylaw or ordinance and serve as advocates for local farms. Responsibilities can include protecting farmland, providing assistance for natural resource management, affording visibility to local farmers, and assisting local boards with community development decisions. [Ninety-one cities and towns have established Agricultural Commissions.](/files/documents/2017/11/13/Agricultural%20Preservation%20towns.pdf) (</files/documents/2017/11/13/Agricultural%20Preservation%20towns.pdf>)

Right to Farm - The Right to Farm is vested in all residents of the Commonwealth under Article 97 of the state Constitution. Communities interested in formally re-asserting that right within the community may pass a Right to Farm Bylaw that clearly states the priorities of the community relative to fostering agricultural activities and allowing farms to operate "with minimal conflict with abutters and Town agencies". The bylaw/ordinance also establishes the notification procedure for informing all residents of the Town of the community's status as a Right to Farm entity. You can [view a list of communities with a Right-to-Farm Bylaw](/files/documents/2017/11/13/Agricultural%20Preservation%20towns.pdf) (</files/documents/2017/11/13/Agricultural%20Preservation%20towns.pdf>).

Agricultural Preservation Restrictions (APRs) - This program is designed to protect the most productive agricultural lands in the Commonwealth and establishes permanent deed restrictions on agricultural lands, protecting them from any use that might diminish the area's agricultural potential. These deed restrictions are purchased with state funds that can be matched to some extent by municipal and in some cases federal funding as well.

Community Gardens - Community Garden programs have been successfully developed in cities such as Somerville and Lowell and provide residents with an opportunity to grow food or horticultural varieties in heavily urbanized settings. Gardens are often managed by community groups who allocate specific plots of land to citizens on an annual basis. These areas also provide community gathering for cultural and educational events.

Farm Viability Enhancement Program (FVEP) - The purpose of the FVEP is to improve the economic bottom line and environmental integrity of participating farms through the implementation of Farm Viability Plans. These farm plans, which are developed by teams comprised of farmers and other agricultural, economic and environmental consultants, suggest ways for farmers to increase their on-farm income through such methods as improved management practices, diversification, direct marketing, value-added initiatives and agritourism. In addition, Farm Viability Plans make recommendations concerning environmental and resource conservation concerns on participating farms

Zoning Protections - Communities concerned with the development potential of existing agricultural lands can adopt zoning bylaw amendments specifically designed to protect these open tracts of land. Perhaps the most straight forward approach is to implement true large lot zoning. Minimum lot sizes in these provisions generally range from 10 to 25 acres per unit and, as a result, are best suited to communities with vast areas of farmland. Densities should not go below these levels in order to achieve the desired end result of preserving wide open undeveloped areas. Other protections can include mandatory cluster or Open Space Residential

Design (OSRD) provisions for existing farmland. These provisions ensure that the protection of open space will be maximized as lands transition from farmland to residential development.

Transfer of Development Rights (TDR) - This technique is better suited to Massachusetts communities where individual farms are considerably smaller than in other areas of the country where true large lot zoning has been used to preserve open space in agricultural areas.

TDR provides an excellent opportunity to blend down-zoning with incentives for increased density. In agricultural communities, undeveloped agricultural lands can be designated as "sending areas" where the amount of development that would ordinarily be allowed on the parcel is transferred to a pre-designated "receiving area". In other words, the development potential of one area is added on to the development potential of another.



Existing Village vs. Conventional Development vs. Development with TDR

Characteristics that Support Agricultural Preservation

Communities that have success in preserving farmland and agricultural preservation will generally have the following characteristics:

- **Well Organized Parcel Information.** Having access to a well organized Assessor's database that identifies preservation and development opportunities is a critical first step to planning for agricultural preservation. Communities that have implemented a GIS Assessor's database have a clear advantage when prioritizing lands for preservation. Other local initiatives, such as Open Space and Recreation Plans, can serve as an excellent source of information relative to Chapter 61A lands and other farmlands in a community.
- **Committed Core Citizens Group.** Institutionalizing preservation efforts in the form of Agricultural Commissions, Agricultural Preservation Restrictions or Community Gardens often hinges on a reliable group of citizens with administrative skills and a solid understanding of the local tools and state-level programs that apply to these situations.
- **Open Lines of Communication.** Regular outreach efforts are a required component of a successful Right-to-Farm initiative and local Commissions must develop a consistent forum for individuals to raise issues, resolve conflicts and plan for the future of agricultural lands.

- **Local Commitment in the General Population.** Agricultural Preservation efforts often require community-wide support. It is therefore essential for communities involved in these efforts to continually reach beyond the primary stakeholders in the agricultural community and into the overall population to support local initiatives.

Benefits

Over ninety Agricultural Commissions have been created in Massachusetts to help preserve agricultural lands and farming operations in their community. In these communities and many others, local officials have leveraged funding to help finance more than 500 APRs statewide, which span thousands of acres of active or retired farmland. Targeted production efforts have also successfully decreased local commitments to imported products. The work of local Commissions, in collaboration with state agencies, has helped to maintain a \$6 billion revenue stream for an industry that pays \$77 million each year in wages.

These types of agricultural preservation measures directly or indirectly satisfy several of the Massachusetts Sustainable Development Principles including:

- **Plan Regionally:** Preserving farmland and agricultural opportunities has obvious economic significance to the state as a whole and is consistent with long standing Massachusetts policies.
- **Concentrate Development and Mix Uses:** Preservation techniques that mandate cluster development in agricultural areas concentrate development in a way that preserves land while expanding housing opportunities in a municipality.
- **Use Natural Resources Wisely:** The preservation of agricultural lands conserves existing natural resources by maintaining recharge to groundwater and maintaining open space.
- **Protect Land and Ecosystems:** Conservation restrictions that may be placed on existing agricultural lands can provide permanent protection for wildlife habitat and significant cultural or historic landscapes.
- **Increase Job and Business Opportunities:** Efforts to preserve and enhance the viability of existing agricultural operations foster local economies and strengthen sustainable resource-based businesses.

Financial Considerations

Agricultural preservation can provide several financial benefits to municipalities and to the development community:

- Limiting development in outlying agricultural areas will reduce municipal infrastructure and service costs that would result from large scale subdivision development.
- If development rights are transferred as part of a preservation technique, private developers can realize significant financial gains through an increase in the development potential in "receiving areas" such as village centers or established residential neighborhoods.

Other financial considerations include:

- the amount of money that may be needed by a community to purchase lands that are withdrawing from the Chapter 61A program.
- the likelihood of success of any proposed APR will be increased if a municipality can provide a portion of the funding required to purchase the deed restriction.

Another direct economic benefit of agricultural preservation comes from maintaining a viable local agricultural economy. Producing more local agricultural products reduces dependence on foreign and out-of-state operations, reduces shipping expenses and oil consumption, and strengthens local economies. Locally grown products employ Massachusetts farmers and substantially reduce the costs and impacts of large scale interstate transport.

RELATED

Case Studies - Agricultural Preservation (</service-details/case-studies-agricultural-preservation>)

C

EXAMPLE SOLAR MORATORIUM BYLAW / ORDINANCE

- Pioneer Valley Planning Commission

Example Language for a Temporary Moratorium on the Construction of Large-Scale Ground-Mounted Solar Photovoltaic Installations

Italic text highlighted in GRAY represents instructions, and not text to be included in the Moratorium. Text highlighted in YELLOW should be updated to match the circumstances of the Town.

Article I: Temporary Moratorium on the Construction of Large Ground Mounted Photovoltaic Installations

1.1 Authority and Purpose

The Town of _____ (“Town”) currently has _____ approved **ground mounted photovoltaic installations**, commonly referred to “solar farms”, completed or under construction and another _____ that have been approved and are in the permitting process. **Many of these projects have involved large-scale clear cutting of trees and ground vegetation and several have been located in close proximity to abutting residential neighborhoods.**

For towns with an existing solar zoning bylaw:

Although the Zoning Bylaw adopted pursuant to the vote on _____ and amended at a(n) _____ Town Meeting as Article # _____ on DATE addresses ground-mounted photovoltaic installations, **the Town needs to adopt further changes to the Zoning Bylaw to protect environmental resources and provide more efficiency for those property owners who seek to develop solar facilities as an accessory use. It is crucial that the Town act to establish a temporary moratorium on the use of land and the construction related to large ground mount photovoltaic installations and the issuance of building permits in connection with the same.**

For towns with no existing solar zoning bylaw:

The Town of _____ has yet to develop specific requirements with regard to large ground mounted solar photovoltaic installations. There is an immediate identified need to protect the interests of the Town and its citizens by establishing long term zoning bylaw standards and provisions to ensure that such uses and development will be consistent with the Town’s long term planning interests and **Master Plan.**

1.2 Temporary Moratorium

The purpose of this moratorium is to allow the Town sufficient time to engage in a planning process to address the effects of such structures and uses in the Town and to enact bylaws in a matter consistent with sound land use planning goals and objectives. Because the regulation of **ground mounted photovoltaic installations** raises novel legal, planning and public safety issues, the Town needs time to undertake a planning process to make appropriate amendments to the Zoning Bylaw regarding regulation of **Ground Mounted Photovoltaic Installations**. Accordingly, the Town intends to adopt a temporary moratorium on the use of land and structures in the Town

Comment [KC1]: Use defined term (in zoning bylaw) related to ground mounted solar. Use throughout bylaw text.

Comment [ZD2]: Provide local context regarding need for amendment.

Comment [ZD3]: Some dates/context as to the amendments to your ground mounted solar zoning bylaw could be helpful, if adopted per this process.

Comment [ZD4]: ...or other identifiable community planning document.

for Ground Mounted Photovoltaic Installations [provide size limitation – e.g. “over X kW DC in capacity” or “with a project footprint over X acres in size] until Future date to allow the sufficient time to address the effects of such structures and uses in the Town and to enact appropriate Zoning Bylaws in a consistent manner. Notwithstanding any other provision in the Town of _____ Zoning Bylaw to the contrary, no building permit may be issued for the construction of any Ground Mounted Photovoltaic Installation over X in size and to the extent legally permissible, the Planning Board shall not accept any further application for any Ground Mounted Photovoltaic Installation over X in size during the aforementioned moratorium period. This moratorium shall not apply to any Ground Mounted Photovoltaic Installation for which a Site Plan Review or Special Permit application was received by the Planning Board prior to 1st posting date of public notice for bylaw amendment. Any Ground Mounted Photovoltaic Installation proposed in an application submitted to the Planning Board prior to 1st posting date of public notice for bylaw amendment, shall be governed by the provisions of the _____ Town Zoning Bylaw in effect prior to the first publication of notice of the public hearing on this by-law required by MGL Chapter 40A, Section 5.

Comment [KC5]: Reasonable time frame to achieve a new solar bylaw – AG’s office approved 10 months for this example.

Comment [KC6]: Or ZBA – dependent on which authority permits solar

Comment [KC7]: Consider permitting for these types of developments and list applications required for approvals.

Comment [KC8]: Or ZBA – dependent on which authority permits solar

D

TECHNICAL RECOMMENDATIONS FOR SAFE ENERGY STORAGE SYSTEMS

The recommendations below are pulled directly from Energy Storage Safety Guidelines compiled by the Energy Storage Integration Council for Distribution-Connected Systems in 2016. These guidelines are directed towards energy storage system suppliers, but may serve as a starting point for electrical inspectors or other safety personnel making inquiries about the safety of the system. The complete report is available at: <https://www.epri.com/research/products/000000003002008308>

- While it is often beneficial to design a closed system for heating and cooling efficiency, pressure relief valves could be considered to prevent a hazardous buildup of pressure. Closed systems can lead to oxygen starvation which can cause a backdraft if sufficient heat builds up for a fire. In systems where an explosion hazard may exist, deflagration venting could be considered as well.
- Fire suppression systems may be an effective control for component fire potential. Claims on effectiveness could be supported with some combination of testing, analysis, and/or simulation. However, it is important to consider the material that may experience a fire when selecting the type of system to be used. In the case of lithium-ion batteries, sufficient heat can be generated internally to sustain or reignite a fire if extinguished by an oxygen starvation system. In these cases a water suppression system may be considered if properly designed to remove enough heat from the cells that the exothermic chemical reaction can be slowed or stopped.
- It is important to consider both normal and unexpected operating conditions in the design of the contactors. Inverter based systems often require large capacitive filters on their DC bus to reduce the magnitude of the AC current (noise) component. These capacitors draw significant current when first connected to a battery or other DC source; thus, all inverters come with a pre-charge circuit. This circuit allows the input capacitors to be resistively coupled to battery voltage thereby reducing the in-rush current. Abnormal conditions during pre-charge include voltage spikes, incorrect contactor switching, and battery short circuit. If the contactors in this circuit open unexpectedly while pre-charging the capacitors, they can fuse and cause an inverter fault requiring extensive repair or, in rare cases, an inverter fire.

Impressed current systems or sacrificial anodes may be used in environments where corrosion could affect system operation or safety. Essentially, they work by holding the system at a somewhat positive potential to slow the rate of chemical reaction with this environment. Impressed current systems accomplish this through the use of a DC power supply or rectifier. Sacrificial anodes accomplish this by providing an anode of an appropriate chemical to produce a negative potential as it reacts with the air or soil.

- When an energy storage system contains large volumes of liquid, it is important to consider secondary containment. Recommendations can be adapted from stationary battery standards for flooded lead acid batteries which stipulate that secondary containment be sufficient to contain and allow for the safe disposal of either 30% of the total volume or 100% of the largest single container, whichever is greater.
- Cyber security may be considered as a safety issue for internet connected systems, SCADA connected systems, and even stand-alone systems. This involves an analysis of what access to system information and system control could produce a hazard. For example, changing BMS parameters could lead to reduced system life or fire through the improper enforcement of safety constraints. The National Institute of Standards and Technology publishes a general cyber security framework which may be applied to energy storage systems and installations.
- Energy storage technologies that contain or produce hydrogen gas are subject to the appropriate controls for this hazard. Examples of these controls can be found in section 500 of the National Electrical Code (NEC), and NFPA 2: Hydrogen Technologies Code those other standards may be more appropriate for specific technologies.

E

EXAMPLE TREE REPLACEMENT BYLAW / ORDINANCE

- City of Northampton

§ 350-12.3. Significant trees.

- A. Legislative findings and intent. The City of Northampton finds that significant trees enhance air quality, reduce noise, reduce energy costs, create habitat, enhance aesthetics and property values, and benefit City neighborhoods. The intent of this section is to encourage the preservation and protection of significant trees during development and redevelopment projects that require a site plan approval, special permit, comprehensive permit, finding, or variance (collectively "zoning relief").
- B. No person shall remove any significant tree associated with any site plan approval or any other zoning relief without a site plan approval from the Planning Board (if a site plan approval is otherwise required), or an administrative site plan approval from the Office of Planning and Sustainability if no site plan is otherwise required.
- C. The removal of any significant tree after July 1, 2015, or within 12 months immediately prior to such a site plan or zoning relief, whichever is later, shall be subject to this section.
- D. The requirements of this section shall not apply to:
 - (1) Trees located on property under the jurisdiction of the Conservation Commission.
 - (2) City-owned public shade trees pursuant to MGL Chapter 87.
 - (3) Trees associated with emergency projects necessary for public safety, health and welfare as determined by the Building Commissioner, Director of Planning and Sustainability, or Director of Public Works.
 - (4) Trees that are hazardous due to disease, age, or shallow roots, as determined and confirmed in writing by a certified arborist and reviewed by the City's Tree Warden.
 - (5) Trees affected by work performed by a utility company in maintenance of its rights-of-way or in its maintenance, repair or replacement of infrastructure that is unrelated to a development project requiring zoning relief.
 - (6) Trees that are approved for removal through special permit by the Planning Board.
 - (a) The Board may grant a special permit if, after weighing the benefits of significant trees against other community benefits created as part of the project, it determines a

waiver of tree replacement to be appropriate and if at least the following standards have been met:

[1] Trees are removed in order to create net zero energy buildings (for electric and thermal use) of up to 10,000 square feet and/or to install 10,000 square feet of ground-mounted PV panels; in addition to providing one or more community benefits, which may include:

[a] Affordable housing units where 50% or more of the units are deed-restricted for affordable housing as defined in this Chapter 350.

[b] A project that results in permanently protected open space.

(b) Building square footage shall apply to a single building footprint or to the aggregate of two or more buildings. In order to exercise a special permit granted under this section, applicants must present a building permit that has been issued for specific plans showing compliance with the net-zero standard and must construct in accordance with the special permit within one year of the issuance of a building permit. Planning Board special permit to grant a waiver from replacement within this provision is allowed only for the trees necessary to be removed in order to provide the solar access to the building(s) and/or panel array.

E. Any person removing a significant tree that is subject to this section shall satisfy either of the following conditions:

(1) Provide for replacement trees according to the following standards:

(a) Replacement trees shall be noninvasive deciduous or coniferous trees (as defined by the City's Tree List and Planting Guidelines) planted on or off site, as approved as part of a site plan or administrative site plan, or on any City-owned property with approval by the Office of Planning and Sustainability, in consultation with the City Tree Warden, unless such trees are public shade trees as per MGL c. 87, § 1,. Replacements shall be calculated so that for each inch of diameter at breast height of the removed trees there shall be no less than 1/2 inch of caliper diameter of replacement trees.

- (b) Replacement trees shall have a minimum of one-inch caliper diameter.
- (c) Replacement trees shall be maintained in good health a minimum of 24 months after they are planted as confirmed by the City's Tree Warden. If replacement trees are not found to be in "good health" as determined by the Tree Warden, the trees shall be replaced as directed by the Warden.
- (d) Replacement trees shall either be approved street tree species as defined in the rules and regulations regarding subdivision of land or other trees that are hardy in all of the following USDA Plant Hardiness Zones: 6a, 6b, 7a, and 7b.
- (2) Pay funds to the City for a tree replacement fund account that, in the Planning Board's estimate, will allow the City to plant new public shade trees on City property in accordance with the above formula.

F. Protection of significant trees during construction.

- (1) Any significant trees to be retained and any replacement trees on property where demolition and/or construction activity is planned shall be protected in an area shown on the approved site plan and should follow American National Standards Institute (ANSI) A300 standards for tree care practices.
- (2) The protected area shall exceed both the critical root zone and drip-line of each significant tree unless the Planning Board approves an alternate maintenance and tree protection plan submitted by a certified arborist.
- (3) A certified arborist shall submit a written letter to the Building Commissioner, Tree Warden and Office of Planning and Sustainability certifying that such area has been so protected in accordance with the site plan.

G. Recordkeeping. The Department of Planning and Sustainability shall collect annual totals of the number and diameter at breast height measurements of significant trees preserved and replaced.

F

SAMPLE MUNICIPAL BYLAWS/ ORDINANCES

- Town of Belchertown
- City of Northampton
- Town of Shutesbury
- Town of Athol

Belchertown Solar Bylaw

§145-28. Commercial Solar Photovoltaic Installations

A. Purpose. This bylaw is to regulate the development of Commercial Solar Photovoltaic Installations by providing standards for their placement, design, construction, operation, monitoring, modifications, and removal; to protect public health, safety or welfare in accordance with M.G.L. c. 40A, § 3; to protect and preserve farmland, forests, and open space as promoted by the Commonwealth of Massachusetts; to protect the scenic, natural, and historic resources of Belchertown; and to provide adequate financial assurance for the eventual decommissioning of such installations.

A solar photovoltaic system that is for the exclusive purpose of providing electricity for a property that is primarily in agricultural use as defined under M.G.L. c. 40A, §3, and that produces electricity to be used solely for the benefit of the agricultural property is exempt.

B. Applicability. This bylaw applies to large-scale (minimum 250 kW rated nameplate capacity) solar photovoltaic installations constructed after the effective date of this bylaw. This bylaw also pertains to physical modifications that materially alter the type, configuration, or size of these installations or related equipment. The requirements of this bylaw shall apply to a commercial solar photovoltaic installation regardless of whether it is the primary use of property or an accessory use.

(1) As-of-Right: The following commercial solar photovoltaic installations, as defined herein, are allowed as of right with site plan approval in all zoning districts:

- (a) Any such installation over parking lots;
- (b) Any such installation on existing structures.

(2) Special Permit: Any CSPI not specified in (1) requires a special permit in all zoning districts from the Planning Board. For all special permit applications, site plan approval as described below is required, but shall not require a second public hearing, per §145-27D(3)(a).

(3) Not Permitted: No commercial solar photovoltaic installation may be permitted as follows:

- (a) Any CSPI of greater than 20 acres in fenced array area.
- (b) Any CSPI requiring forest clearing greater than ten acres.
- (c) Any CSPI on slopes of 8% or greater as averaged over 50 horizontal feet; the Planning Board may consider waiving this up to 12% based on site-specific parameters.
- (d) Any CSPI on a parcel with inadequate frontage as defined in §145-2.

C. Definitions.

Commercial Solar Photovoltaic Installation (CSPI): Any solar photovoltaic installation with 250 kW or greater rated nameplate capacity, even if its primary generation is not intended for supplying the grid.

Rated Nameplate Capacity: The maximum rated output of electric power production of the commercial solar photovoltaic installation in Direct Current (DC).

Site Plan Approval Authority: The site plan approval authority as designated by the Zoning Bylaw.

Solar Photovoltaic Array: an arrangement of solar photovoltaic panels.

D. Requirements.

(1) Site Plan Approval. The construction, installation or modification of a CSPI, whether as-of-right or by special permit, shall be subject to site plan approval in accordance with the Zoning Bylaw. Together with the requirements of §145-27, the Site Plan Approval Authority shall consider and apply the requirements set forth in this bylaw in reviewing and deciding an application for site plan approval.

(a) General. All plans and maps shall be prepared, stamped and signed by a Professional Engineer licensed to practice in Massachusetts.

(b) Required Documents. The project proponent shall provide the following documents:

[1] A site plan showing:

- i. An existing conditions plan with property lines and physical features, including topography and roads, for the project site;
- ii. Proposed changes to the landscape of the site, including grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures, driveways, snow storage, and storm water management systems;
- iii. Blueprints or drawings of the solar photovoltaic installation signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts showing the proposed layout of the system and any potential shading from nearby structures;
- iv. One or three line electrical diagram detailing the solar photovoltaic installation, associated components, and electrical interconnection methods, with all National Electrical Code compliant disconnects and overcurrent devices;
- v. Documentation of the major system components to be used, including the PV panels, mounting system, and inverter;
- vi. Name, address, and contact information for proposed system installer;
- vii. Name, address, phone number and signature of the project proponent, as well as all co-proponents or property owners, if any;

- viii. The name, contact information and signature of any agents representing the project proponent; and
- [2] Documentation of actual or prospective access and control of the project site (item (2) below);
- [3] An operation and maintenance plan (item (3) below);
- [4] Proof of liability insurance; and
- [5] Description of financial surety that satisfies Section 10(b);
- [6] There shall be a fence surrounding the solar array and ancillary equipment.

The Site Plan Approval Authority may waive documentary requirements as it deems appropriate upon the written request of the applicant submitted with an application for approval.

(2) Site Control. The project proponent shall submit documentation of actual or committed prospective access and control of the project site sufficient to allow for construction and operation of the proposed CSPI.

(3) Operation & Maintenance Plan. The project proponent shall submit a plan for the operation and maintenance of the CSPI. This plan shall include measures to maintain safe access to the installation, storm water controls, and general procedures for operational maintenance of the installation. The development is subject to the Belchertown Stormwater bylaw and regulations.

(4) Utility Notification. No CSPI shall be constructed until evidence has been given to the Site Plan Approval Authority that the utility company operating the electrical grid the installation is to be connected to has been informed of the CSPI owner or operator's intent to install an interconnected customer-owned generator. Off-grid systems shall be exempt from this requirement.

(5) Dimension and Density Requirements.

(a) Setbacks

For all CSPI, front, side and rear yard setbacks shall be as follows:

- [1] The front setback depth shall be at least 150 feet;
- [2] The side setback depth shall be at least 75 feet;
- [3] The rear setback depth shall be at least 75 feet;
- [4] The setback from any developed residential property shall be at least 200 feet.

(b) Appurtenant Structures. All appurtenant structures to a CSPI shall be subject to the requirements of the Zoning Bylaw concerning the bulk and height of structures, lot area, setbacks, open space, parking and building coverage requirements. All such appurtenant structures, including but not limited to, equipment shelters, storage

facilities, transformers, and substations, shall be architecturally compatible with each other. Whenever reasonable, structures should be shaded from view by vegetation.

(6) Design Standards.

(a) Lighting. Lighting of CSPI shall be limited to night-time maintenance and inspections by authorized personnel, and shall comply with Dark Sky standards. There shall be no illumination without personnel on the site.

(b) Signage. A sign shall be erected identifying the owner and providing a 24-hour emergency contact phone number of the CSPI owner or operator. CSPIs shall not display any advertising. Any sign must comply with §145-22.

(c) Day-time Visual Distraction. The panel array shall be positioned to minimize glare on any residence or public way, and shall not create a visual obstruction on a public roadway, such as blocking intersections or creating blind curves.

(d) Utility Connections. Reasonable efforts shall be made to place all utility connections from the CSPI underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider. Electrical transformers for utility interconnections may be above ground if required by the utility provider.

(7) Safety and Environmental Standards.

(a) Emergency Services. The CSPI owner or operator shall provide a copy of the project summary, electrical schematic, and an approved site plan, to the local fire department and the Building Inspector. Upon request the owner or operator shall cooperate with local emergency services in developing an emergency response plan, which may include ensuring that emergency personnel have immediate, 24-hour access to the facility. All means of shutting down the CSPI shall be clearly marked. The owner or operator shall identify a responsible person for public inquiries throughout the life of the installation, and shall provide a mailing address and 24-hour telephone number for such person(s).

(b) Control of Vegetation and Animals, Including Insects. Herbicides, rodenticides, or any other pesticides may not be used to control vegetation or animals at a CSPI. In a dual-use CSPI, the agricultural operator, but not the CSPI operator, is exempt from this restriction.

(c) Project Visibility and Landscape Planting. A CSPI shall be designed to minimize its visibility, including preserving natural vegetation to the maximum extent possible, blending in equipment with the surroundings, adding vegetative buffers to provide an effective visual barrier from adjacent roads and driveways, and to screen abutting dwellings. The owner of the CSPI shall not remove any naturally occurring vegetation

such as trees and shrubs unless it adversely affects the performance and operation of the solar installation. A diversity of plant species native to New England shall be used for any screens and vegetative erosion controls. Use of exotic plants, as identified by the most recent version of the "Massachusetts Prohibited Plant List" maintained by the Massachusetts Department of Agricultural Resources, is prohibited. If deemed necessary by the Planning Board, the depth of the vegetative screen shall be 30 feet and will be composed of native trees and shrubs staggered for height and density that shall be properly maintained. Cultivars of native plants are acceptable. The open area of the site shall be seeded with a pollinator mix and maintained as bird and insect habitat. Mowing is to be done as little as possible to retain a natural functioning of the landscape. Plants shall be maintained and replaced as necessary by the owner of the CSPI for the life of the CSPI.

(d) Land Clearing, Soil Erosion, and Wildlife Habitat. Clearing of natural vegetation shall be limited to what is necessary for the construction, operation, and maintenance of the CSPI or otherwise prescribed by applicable laws, regulations, and bylaws. A CSPI may not be constructed on slopes exceeding 8% except as expressly authorized pursuant to §145-28B(3)(c), nor may cutting and filling be done to reduce natural slopes. Existing root structures and topsoil shall be maintained to the maximum extent practicable and provide for a minimum of 6" of topsoil on all exposed areas.

(8) Mitigation Measures.

(a) Mitigation for Loss of Carbon Sequestration and Forest Habitat. If forestland is proposed to be converted to a CSPI, the plans shall designate an area of unprotected land (that is, land that could otherwise be developed under current zoning) on the parcel or block of contiguous parcels under common ownership that comprise the project site, and of a size equal to four times the total area of such forest conversion. Such designated land shall remain in substantially its natural condition without alteration except for routine forestry practices until such time as the CSPI is decommissioned and the site restored to forest. The special permit may be conditioned to effect and make enforceable this requirement.

(b) Mitigation for Loss of Forest Habitat within the Installation. If forestland is proposed to be converted to a CSPI, the plans shall show mitigation measures that create a wildflower meadow habitat within and immediately around the CSPI and a successional forest habitat in the surrounding areas managed to prevent shading until the installation is decommissioned and the site restored to forest. The special permit may be conditioned to effect and make enforceable this requirement.

(9) Monitoring and Maintenance.

(a) Construction Monitoring. The Site Plan Approval Authority may require a third-party inspector, selected by and acting under the direction of the Building

Commissioner, to be employed to monitor compliance with all approvals and conditions during the CSPI's construction at the applicant's expense.

(b) Maintenance. The CSPI owner or operator shall maintain the facility in good condition. Maintenance shall include, but not be limited to, painting, structural repairs, and integrity of security measures. Site access shall be maintained to a level acceptable to the local emergency services. The owner or operator shall be responsible for the cost of maintaining the solar photovoltaic installation and all access roads that are not public ways.

(c) Annual Reporting. The owner or operator of a CSPI shall submit an annual report demonstrating and certifying compliance with the Operation and Maintenance Plan, the requirements of this bylaw, and approvals granted hereunder, including but not limited to continued management and maintenance of vegetation, compliance with the approved plans and any permit conditions, continuation of liability insurance, and adequacy of road access. The annual report shall also provide information on the maintenance completed during the course of the year and the amount of electricity generated by the facility. The report shall be submitted to the Board of Selectmen, Planning Board, Fire Chief, Building Commissioner, Board of Health, and Conservation Commission (if a wetlands permit was issued) no later than 45 days after the end of the calendar year.

(d) Modifications. All material modifications to a CSPI made after issuance of the required building permit shall require approval by the Site Plan Approval Authority.

(10) Discontinuance and Removal.

(a) Removal Requirements. Any CSPI, or any substantial part thereof, not used for a period of one continuous year or more without written permission from the Site Plan Approval Authority, or that has reached the end of its useful life, shall be considered discontinued and shall be removed. Upon written request from the Building Inspector, addressed to the contact address provided and maintained by the owner or operator as required above, the owner or operator shall provide evidence to the Building Inspector demonstrating continued use of the CSPI. Failure to provide such evidence within thirty days of such written request shall be conclusive evidence that the installation has been discontinued. Anyone intending to decommission and/or remove such an installation shall notify the Site Plan Approval Authority and Building Inspector by certified mail of the proposed date of discontinued operations and plans for removal.

The owner or operator shall physically remove the installation no more than 150 days after the date of discontinued operations. Removal shall consist of:

- [1] Physical removal of all parts of and appurtenances to the CSPI, including structures, equipment, security barriers and transmission lines;

[2] Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations;

[3] Stabilization or re-vegetation of the site as necessary to minimize erosion. The Site Plan Approval Authority may allow the owner or operator to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.

[4] Any site that was deforested for the CSPI, per §145-28B(3)(b), shall be restored to encourage native tree growth, including the planting of seedlings, if necessary, to establish growth. The cost of plant replacement shall be incorporated into the financial surety stipulated in §145-28D(10)(b) below.

If the owner or operator of the CSPI fails to remove the installation in accordance with the requirements of this section, the town shall have the right, to the extent it is otherwise duly authorized by law, to enter the property and physically remove the installation at the expense of the owner of the installation and the owner(s) of the site on which the facility is located. The Town may use the financial surety as stipulated in §145-28D(10) (b), below for this purpose.

(b) Financial Surety. Proponents seeking to construct and operate a CSPI shall provide to the Town, in a form determined by the Site Plan Approval Authority and prior to construction, a surety, through cash, an escrow account, bond or otherwise, to cover the cost of removal in the event the town must remove the CSPI and remediate the landscape, including reforestation. The amount and form of such surety shall be determined by the Site Plan Approval Authority. This surety will not be required for municipally- or state-owned facilities. The project proponent shall submit a fully inclusive estimate of the costs associated with removal, prepared by a qualified engineer. The amount shall include a mechanism for calculating increased removal costs due to inflation.

NORTHAMPTON CODE

WATER SUPPLY PROTECTION (WSP)						
Uses Allowed: (by-right unless otherwise noted) any mix or their accessory uses/structures (home office, tag sales § 350-2.1, fences § 350-6.8, horses and animals § 350-5.3)	Site Plan Approval Required by Planning Board (if checked) Any nonresidential construction greater than 2,000 square feet triggers site plan	Use By Special Permit Approval Required by Designated Board (if checked)	Dimensions	Landscaping	Minimum Parking	Building Design
Solar photovoltaic of any size, ground-mounted: 1. Over any legal parking lot or driveway; 2. At any landfill site not separate from the site-assigned property by any road; and 3. At an airport not separated from the runways by any road.	√		Same setbacks as setbacks for other accessory buildings in the district	Sufficient landscaping within the setbacks to provide effective visual separation	0	None. Installations must be maintained in good condition with painting, structural repairs and security maintained and facilities no longer being used dismantled within 90 days.
Accessory solar photovoltaic ground-mounted on a parcel with any building or use, provided that the PV is sized to generate no more than 100% or 8 KW of the annual projected electric use of the non-PV building or use			Setbacks: Front = 15 feet Side = 4 feet Rear = 4 feet And such open space as applies to the principal building			
Accessory solar photovoltaic ground-mounted on a parcel with any building or use, between 8 KW or over 100% up to but no more than 200% of the annual projected electric use of the non-PV building or use	√	√ Planning Board	Setbacks: Front = 15 feet Side = 4 feet Rear = 4 feet And such open space as applies to the principal building			

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WATER SUPPLY PROTECTION (WSP)						
Uses Allowed: (by-right unless otherwise noted) any mix or their accessory uses/structures (home office, tag sales § 350-2.1, fences § 350-6.8, horses and animals § 350-5.3)	Site Plan Approval Required by Planning Board (if checked) Any nonresidential construction greater than 2,000 square feet triggers site plan	Use By Special Permit Approval Required by Designated Board (if checked)	Dimensions	Landscaping	Minimum Parking	Building Design
Solar photovoltaic (PV), large-scale ground-mounted with less than two acres of tree removal: Any other solar photovoltaic (PV), large-scale ground-mounted not listed above, where less than two acres of tree removal is planned. The removal of significant trees on the subject parcel(s) must be replaced in accordance with § 350-12. 3 and includes tree removal that occurs within 12 months immediately prior to an application for installation of such a system. ¹	√		Lot size = 0 Frontage/Width/Depth = 0 Setbacks: Front: 50 feet Side: 50 feet Rear: 50 feet Maximum height = 30 feet Open space = 20%	A planted buffer to abutting residential property shall be at least 15 feet in width along the property boundary. It shall contain a screen of plantings of vertical habit in the center of the strip not less than three feet in width and six feet in height at the time of occupancy of such lot. Individual shrubs shall be planted not more than five feet on center, and individual trees thereafter shall be maintained by the owner or occupants so as to maintain a dense screen year-round. At least 50% of the plantings shall be evenly spaced. Whenever possible, existing trees and ground cover should be preserved in this strip, reducing the need to plant additional trees. Trees may not be cut down in this strip without site plan approval.	0	See also §§ 350-8.2 through 350-8.11 for location, construction, layout requirements for parking lots Installation must be maintained in good condition with painting, structural repairs and security maintained and facilities no longer being used dismantled within 90 days.

NORTHAMPTON CODE

WATER SUPPLY PROTECTION (WSP)						
Uses Allowed: (by-right unless otherwise noted) any mix or their accessory uses/structures (home office, tag sales § 350-2.1, fences § 350-6.8, horses and animals § 350-5.3)	Site Plan Approval Required by Planning Board (if checked) Any nonresidential construction greater than 2,000 square feet triggers site plan	Use By Special Permit Approval Required by Designated Board (if checked)	Dimensions	Landscaping	Minimum Parking	Building Design
Solar photovoltaic (PV), large-scale ground-mounted with more than two acres of tree removal ^{1,2}	√	√ Planning Board	Lot size = 0 Frontage/Width/Depth = 0 Setbacks: Front: 50 feet Side: 50 feet Rear: 50 feet Maximum height = 30 feet Open space = 20%	A planted buffer to abutting residential property shall be at least 15 feet in width along the property boundary. It shall contain a screen of plantings of vertical habit in the center of the strip not less than three feet in width and six feet in height at the time of occupancy of such lot. Individual shrubs shall be planted not more than five feet on center, and individual trees thereafter shall be maintained by the owner or occupants so as to maintain a dense screen year-round. At least 50% of the plantings shall be evenly spaced. Whenever possible, existing trees and ground cover should be preserved in this strip, reducing the need to plant additional trees. Trees may not be cut down in this strip without site plan approval.	0 See also §§ 350-8.2 through 350-8.11 for location, construction, layout requirements for parking lots	Installation must be maintained in good condition with painting, structural repairs and security maintained and facilities no longer being used dismantled within 90 days.

NORTHAMPTON CODE

WATER SUPPLY PROTECTION (WSP)						
Uses Allowed: (by-right unless otherwise noted) any mix or their accessory uses/structures (home office, tag sales § 350-2.1, fences § 350-6.8, horses and animals § 350-5.3)	Site Plan Approval Required by Planning Board (if checked) Any nonresidential construction greater than 2,000 square feet triggers site plan	Use By Special Permit Approval Required by Designated Board (if checked)	Dimensions	Landscaping	Minimum Parking	Building Design
Short-term rental: allowed only upon annual registration with the City. Use as a registered rental is only valid for the year in which registration is completed and expires December 31 each year.						

NOTES:

- ¹ The owner or operator shall remove the installation no more than 150 days after the date of discontinued operations. Removal shall consist of:
- Removal of all structures, equipment, security barriers, transmission lines, conduits, poles.
 - Disposal of all waste in accordance with local, state, and federal waste disposal regulations.
 - Stabilization or re-vegetation of the site as necessary to minimize erosion.

If the owner/operator fails to remove the installation in accordance with the requirements of this section, the City shall have the right, exercise or call the bond/performance guarantee in order to cover the cost of removal.

Performance guarantee: Applicants shall submit an itemized cost estimate for complete decommissioning of the array as specified above. Prior to beginning construction the applicant shall post a performance guarantee in the form of a bond or escrow or other guarantee approved by the Planning Board for the amount to cover decommissioning, including a 20% contingency and calculated with twenty-year inflation factor.

- ² The Board must find that the removal of trees will not negatively impact the health, safety and welfare of the residents of Northampton by maintaining a robust and diverse ecosystem for the residents while also creating renewable energy systems. In order for the Board to make such finding, the applicant shall submit an analysis of the proposed project's impact relative to the benefit of the solar installation as follows:
- Analysis showing that tree removal which occurs on more than one acre of slopes greater than 20% will not cause erosion of topsoil and will not increase siltation of any streams present on the site or within 200 feet of the property boundary.
 - Analysis of the forest type and relevant habitat that will be lost. This analysis must include the structure and diversity of the canopy, midstory and understory of the forested area to be cleared. Analysis must be performed by an individual with a master's degree in wildlife biology or ecological science from an accredited college/university or other competent professional with at least two years of experience in wildlife habitat evaluation.
 - Any forested area within which certifiable vernal pools are found must be identified and a permit from the Conservation Commission must be granted prior to review by the Planning Board.
 - Any forested area containing clusters of five or more healthy trees of 20 inches diameter breast height or greater that are not in decline shall be preserved in order to continue to provide high value ecological benefit to the community. Connection of these larger trees to surrounding stands of trees shall be maintained.
 - As part of the forest type analysis, the report shall contain information regarding the abundance and distribution of habitats within the region and of the specific site and any historical information on the extent and quality of these habitats and impact of clearing on these habitats. The applicant must show through analysis that habitat is not fragmented and that connectivity remains in the proposed conditions.
 - Analysis by a qualified third party showing that the project will be carbon-neutral over the first 10 years of operation. The applicant shall provide the following calculations:
 - The total volume of trees to be removed (provided by an independent certified forester) and the projected volume of trees over a ten-year period of additional growth.
 - Subtracting the estimated live-wood in replacement trees provided under the significant tree section of this zoning ordinance 10 years after planting.
 - Conversion of the net live-wood to be removed to short tons of carbon (using research from the Northern Institute of Applied Climate Science or other methodology after approval by the permit granting authority).
 - Subtraction of the carbon offsets (short tons of carbon) provided by the solar photovoltaic project over 10 years of operation, including the calculation of potential carbon stored had the trees continued to thrive in that same ten-year window.

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- e. If there is any net release of carbon with the above calculations, the applicant shall assign renewable energy credits (REC) to the City to match or exceed said release of carbon. However, RECs may not be used to fund biomass projects.
- 4. At least 50% of the property shall be protected from tree clearing and future development for the duration of the operation of the solar array installation and until such time as the system is decommissioned and removed.
- 5. Within the area beyond the first two acres of canopy removed, stumps for removed trees must remain in place and no excavation/soil disturbance is allowed other than what would be required to bore support posts for the PV panels.
- 6. Electrical transformers for utility interconnections may be aboveground only if required by the utility provider. Power and telecommunications poles and equipment shall not be visible from the public way.

Town of Shutesbury



8.10-1 Purpose

The purpose of this bylaw is to facilitate and appropriately regulate the creation of Ground-Mounted Solar Electric Installations (a) by providing standards for the placement, design, construction, operation, monitoring, modification and removal of such installations that address public safety, minimize impacts on environmental, scenic, natural, and historic resources and (b) to provide adequate financial assurance for the eventual decommissioning of such installations.

8.10-2 Applicability

A.! This Section 8.10 applies to Large- Scale and Small-Scale Ground-Mounted Solar Electric Installations, as noted. Small-Scale Ground-Mounted Solar Electric Installations which are accessory to an existing residential or non-residential use which generate electricity principally used by such residential or non-residential use are permitted as of right, do not need to comply with this Section, but require a Site Plan Review from the Zoning Board of Appeals, as well as a building permit, and must comply with all other applicable

provisions of the Town of Shutesbury Zoning Bylaw.

- B. This Section 8.10 also pertains to physical modifications that materially alter the type, configuration, or size of Ground-Mounted Solar Electric Installations or related equipment.
- C. This Section 8.10 shall not apply to any special permit duly applied for and in process prior to its effective date.
- D. Upon written request by the applicant, the Planning Board may waive or reduce any requirement of this Section 8.10 by the same majority vote required for the permit itself upon written findings included in the permit of:
 - 1. special circumstances of the site, its surroundings, or the proposal that negate the need for imposition of the requirement; or the objectives of this section may be met in an alternative manner; and
 - 2. that such a waiver or reduction will not derogate from the public purposes and intent of this zoning bylaw.

In the case of a special permit, such requests must be made by the applicant no later than the close of the public hearing. An affirmative or negative vote under this paragraph shall not be construed as an approval or disapproval of the permit sought.

8.10-3 General Requirements

- A. Compliance with Laws, Bylaws, and Regulations
The construction and operation of all Ground-Mounted Solar Electric Installations shall be consistent with all applicable local, state and federal requirements, including but not limited to all applicable safety, construction, electrical, and communications requirements. All buildings and fixtures forming part thereof shall be constructed in accordance with the Massachusetts State Building Code.
- B. Mitigation for Loss of Carbon Sequestration and Forest Habitat
If forestland is proposed to be converted to a Ground-Mounted Solar Installation the plans shall designate thereon an area of unprotected (meaning, not subject to MGL. Ch. 184, §§ 31-33 at time of application) land on the same lot and of a size equal to four times (4X) the total area of such installation. Such designated land shall remain in substantially its natural condition without alteration, including unauthorized (by SPGA) forestry/tree cutting, until such time as the installation is decommissioned. The Special Permit may be conditioned to effectuate and make enforceable this requirement.
- C. Mitigation for Loss of Forest Habitat within the Installation
If forestland is proposed to be converted to a Ground-Mounted Solar Electric Installation the plans shall show mitigation measures that create a wildflower meadow habitat within and immediately around the Solar Electric System and a successional forest habitat in the surrounding areas managed to prevent shading until such time as the installation is decommissioned. The Special Permit may be conditioned to effectuate and make enforceable this requirement.
- D. Mitigation for Installation of Perimeter Fencing
Any perimeter fencing within winter sight of a public roadway, driveway, or dwelling existing at the time of the special permit application shall be entirely black in color. The Special Permit may be conditioned to effectuate and make enforceable this requirement.

E. Mitigation for Disruption of Trail Networks

If existing trail networks or woods roads are disrupted by the location of the Ground-Mounted Solar Electric Installation, the plans shall show alternative trail alignments to be constructed by the applicant. The Special Permit may be conditioned to effectuate and make enforceable this requirement, although no rights of public access may be established hereunder.

F. All plans and maps shall be prepared, stamped and signed by a Professional Civil Engineer licensed to practice in the Commonwealth of Massachusetts.

8.10-4 Required Documents

The project applicant shall provide the following documents in addition to or in coordination with those required under Article IX below.

A. Site Plan. A Site Plan additionally showing:

1. Locations of wetlands and Priority Habitat Areas as defined by the Natural Heritage & Endangered Species Program (NHESP).
2. Locations of local or National Historic Districts.
3. Locations of all known, mapped or suspected Native American archaeological sites or sites of Native American ceremonial activity. Identification of such sites shall be based on responses, if any, to written inquiries with a requirement to respond within 35 days, to the following parties: all federally or state recognized Tribal Historic Preservation Officers with any cultural or land affiliation to the Shutesbury area; the Massachusetts State Historical Preservation Officer; tribes or associations of tribes not recognized by the federal or state government with any cultural or land affiliation to the Shutesbury area; and the Shutesbury Historical Commission. Such inquiries shall serve as a notice to the aforesaid parties and shall contain a plan of the project, specific identification of the location of the project, and a statement that permitting for the project is forthcoming. Accompanying the site plan shall be a report documenting such inquiries, the responses from the parties, a description of the characteristics, including photographs, of any Native American sites located, and the outcomes of any additional inquiries made based on information obtained from or recommendations made by the aforesaid parties. A failure of parties to respond within 35 days shall allow the applicant to submit the site plans.
4. The project proponent must submit a full report of all materials to be used, including but not limited to the use of cleaning products, paints or coatings, hydro-seeding, fertilizers, and soil additives. When available, Material Safety Data Sheets will be provided.

B. Blueprints. Blueprints or drawings of the installation signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts, showing:

1. The proposed layout of the system and any potential shading from nearby structures.
2. One- or three-line electrical diagram detailing the Ground-Mounted Solar Electric Installation, associated components, and electrical interconnection methods, with all Massachusetts and National Electrical Code compliant disconnects and overcurrent devices.

C. General Documentation. The following information shall also be provided:

1. A list of any hazardous materials proposed to be located on the site in excess of

- household quantities and a plan to prevent their release to the environment as appropriate.
2. Name, address, and contact information for proposed system installer.
 3. The name, contact information and signature of any agents representing the project applicant.
- D. Site Control
- The project applicant shall submit documentation of actual or prospective access and control of the project site sufficient to allow for construction and operation of the proposed Ground-Mounted Solar Electric Installation.
- E. Operation and Maintenance Plan
- The project applicant shall submit a plan for the operation and maintenance of the Ground-Mounted Solar Electric Installation, which shall include measures for maintaining safe access to the installation, stormwater management (consistent with DEP's and, where appropriate, Shutesbury's stormwater regulations and vegetation controls), as well as general procedures for operational maintenance of the installation.
- F. Financial Surety
- Applicants for Ground-Mounted Solar Electric Installations shall provide a form of surety, either through an escrow account, bond or otherwise, accessible to the Town of Shutesbury, to cover the cost of removal in the event the Town must remove the installation and remediate the site to its natural preexisting condition, in an amount and form determined to be reasonable by the SPGA, but in no event to exceed more than 125 percent of the cost of removal and compliance with the additional requirements set forth herein. The project applicant shall submit a fully inclusive estimate of the costs associated with removal, prepared by a qualified engineer. The amount shall include a mechanism for calculating increased removal costs due to inflation.
- G. Utility Notification
- No Ground-Mounted Solar Electric Installation shall be constructed until evidence has been provided to the Planning Board that the utility company that operates the electrical grid where the installation is to be located has approved the solar electric installation owner or operator's intent to install an interconnected customer-owned generator and that the utility can and will connect the proposed generator into their power grid. Off-grid systems shall be exempt from this requirement.
- H. Proof of Liability Insurance

8.10-5 Dimensional Requirements

- A. Minimum setbacks for all Large-Scale Ground-Mounted Solar Electric Installations:
- Front street setback: 500 feet (as required for Forest Conservation District)
 - Property line setback: 100 feet
- B. Minimum setbacks for all Small-Scale Ground-Mounted Solar Electric Installations:
- Front street setback: 100 feet
 - Property line setback: 50 feet
- C. Required setback areas shall not be counted toward a facility's total acreage.

8.10-6 Design and Performance Standards

- A. Lighting

Large- and Small-Scale Solar Electric Installations shall have no permanently-affixed exterior lighting.

B. Signage

1. Sufficient signage shall be provided to identify the owner of the facility and provide a 24-hour emergency contact phone number.
2. Signage at the perimeter warning pedestrians is allowable.
3. Ground-Mounted Solar Electric Installations shall not be used for displaying any advertising except for reasonable identification of the manufacturer or operator of such installation.

C. Control of Vegetation

Herbicides or pesticides may not be used to control vegetation or animals at a Ground-Mounted Solar Electric Installation.

D. Visual Impacts

1. Ground-Mounted Solar Electric Installation shall be designed to minimize visual impacts including preserving natural vegetation to the maximum extent possible, blending in equipment with the surroundings, and adding vegetative buffers to provide an effective visual barrier from adjacent roads and driveways, and to screen abutting residential dwellings.
2. When possible, a diversity of plant species shall be used, with a preference for species native to New England.
3. Use of exotic plants, as identified by the most recent copy of the "Massachusetts Prohibited Plant List" maintained by the Massachusetts Department of Agricultural Resources, is prohibited.
4. If deemed necessary by the Planning Board, the depth of the vegetative screen shall be 30 feet and will be composed of native trees and shrubs staggered for height and density that shall be properly maintained.
5. The owner/operator shall not remove any naturally occurring vegetation such as trees and shrubs unless it adversely affects the performance and operation of the solar installation.
6. Landscaping shall be maintained and replaced as necessary by the owner/operator of the Ground-Mounted Solar Electric Installation.

E. Utility Connections.

Electrical transformers, wires, or other utility interconnections shall be constructed as required by the utility provider and may be above ground if necessary; provided, however, that every reasonable effort shall be made to place all utility connections underground, depending on appropriate soil conditions and topography of the site and any requirements of the utility provider.

F. All electric power generated at a Ground-Mounted Solar Electric Installation shall be from Solar Energy.

G. Access Driveways shall be constructed to minimize grading, removal of stone walls or roadside trees, and minimize impacts to environmental or historic resources.

8.10-7 Safety and Environmental Standards

A. Emergency Services

1. Ground-Mounted Solar Electric Installations owner or operator shall provide a copy of

- the project summary, electrical schematic, and site plan to the Shutesbury Fire Chief.
- 2. The owner or operator shall cooperate with local emergency services to develop an emergency response plan.
- 3. All means of shutting down the solar electric installation shall be clearly marked.
- 4. The owner or operator shall identify a responsible person for public inquiries throughout the life of the installation.
- B. Land Clearing, Soil Erosion and Land Impacts
 - 1. The facility shall be designed to minimize impacts to open agricultural land and fields, even if not in production. Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of the Ground-Mounted Solar Electric Installation. In no event shall tree stocking on the parcel to be developed for the installation be reduced to below Level-C as defined in 304 CMR 11.03 and as measured at the time of application. Grading that substantially disturbs the existing soil profile and structure is prohibited; sites shall be selected where construction may be accomplished without such earth work.
 - 2. Prior to any site disturbance and construction, the limits of the work shown on the approved site plan shall be surveyed and clearly marked by a Professional Land Surveyor. Upon completion of the survey, the Professional Land Surveyor shall verify to the Planning Board, in writing, that the limit of work, as shown on the approved site plans, has been established on site.
 - 3. The design shall minimize the use of concrete and other impervious materials to the maximum extent possible. Ground-Mounted Solar Electric Installation shall be installed on water permeable surfaces.
 - 4. Locating Ground-Mounted Solar Electric Installations, including access driveways and any associated drainage infrastructure on original grades in excess of 15% is prohibited.
- C. Habitat Impacts

Large-Scale Ground-Mounted Solar Electric Installations shall not be located on permanently protected land subject to MGL. Ch. 184, §§ 31-33 Priority Habitat and Bio Map 2 Critical Natural Landscape Core Habitat mapped by the Natural Heritage and Endangered Species Program (NHESP) and "Important Wildlife Habitat" mapped by the DEP.
- D. Wetlands
 - 1. Where wetland delineation is in doubt or dispute, the Planning Board may require the applicant to submit a request for determination of wetlands to the Conservation Commission.
 - 2. The Planning Board may impose conditions to contain and control stormwater runoff that might negatively impact identified wetlands or other hydrologic features even if the proposed work area is outside the jurisdiction of the Conservation Commission.

8.10-8 Monitoring, Maintenance and Reporting

- A. Solar Electric Installation Conditions
 - 1. The Ground-Mounted Solar Electric Installation owner or operator shall maintain the facility in good condition.
 - 2. Maintenance shall include, but not be limited to, painting, structural repairs, and

- integrity of security measures.
3. Site access shall be maintained to a level acceptable to the Shutesbury Fire Chief and Emergency Management Director.
 4. The owner or operator shall be responsible for the cost of maintaining the Solar Electric Installation and any access driveways.
- B. Annual Reporting
1. The owner or operator of a Ground-Mounted Solar Electric Installation shall submit an annual report demonstrating and certifying compliance with the Operation and Maintenance Plan, the requirements of this Section 8.9 and the approved special permit, including but not limited to continued management and maintenance of vegetation, compliance with the approved plans and any special permit conditions, continuation of liability insurance, and adequacy of road access.
 2. The annual report shall also provide information on the maintenance completed during the course of the year and the amount of electricity generated by the facility.
 3. The report shall be submitted to the Select Board, Planning Board, Fire Chief, Emergency Management Director, Building Commissioner, Board of Health and Conservation Commission (if a wetlands permit was issued) no later than 45 days after the end of the calendar year.

8.10-9 Abandonment or Decommissioning

- A. Removal Requirements
1. Any Ground-Mounted Solar Electric Installation which has reached the end of its useful life or has been abandoned shall be removed.
 2. The owner or operator shall physically remove the installation no later than 150 days after the date of discontinued operations.
 3. The owner or operator shall notify the Special Permit Granting Authority by certified mail, of the proposed date of discontinued operations and plans for removal.
- B. Decommissioning shall consist of:
1. Physical removal of all components of the Ground-Mounted Solar Electric Installation, including but not limited to structures, foundations, equipment, security barriers, and on-site above-ground transmission lines. Associated off-site utility interconnections shall also be removed if no longer needed.
 2. Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations.
 3. Restoration of the site to its natural preexisting condition, including stabilization or re-vegetation of the site as necessary to minimize erosion. The Special Permit Granting Authority may allow the owner or operator to leave landscaping or designated below-grade foundations and electric lines in order to minimize erosion and disruption to vegetation.
- C. Decommissioning by the Town
- If the owner or operator of a Ground-Mounted Solar Electric Installation fails to remove such installation in accordance with the requirements of this Section 8.9 within 150 days of discontinued operations or abandonment, the Town may enter the property and physically remove the installation at the owner's expense, drawing from the escrow account or upon the bond or other financial surety provided by the applicant.

8.10-10 Lapse of Approval

Any special permit shall automatically lapse if the Large-or Small-Scale Ground-Mounted Solar Electric Installation is not installed and functioning within two (2) years of the grant of the special permit or if the installation shall be considered abandoned.

MAP: LARGE GROUND MOUNTED SOLAR ELECTRIC INSTALLATION DISTRICTS

As referenced in Shutesbury Zoning Bylaws, Section 8.10



Article ____ To see if the Town of Athol will vote to amend the Athol Zoning Bylaws, Article III, by deleting the existing Section 3.24, Ground-Mounted Solar Photovoltaic Installations, in its entirety and replacing with the following new text in its place.

The purpose and intent of this bylaw is to provide standards for the placement, design, construction, operation, monitoring, modification and removal of ground-mounted solar photovoltaic installations which address public safety, minimize impacts on scenic, natural and historic resources and to provide adequate financial assurance for the eventual decommissioning of such installations. The provisions set forth in this section shall apply to the placement, design, construction, operation, maintenance and/or repair, and environmental effects of ground-mounted solar photovoltaic installations.

3.24.2 Applicability

This bylaw applies to commercial and residential ground-mounted solar photovoltaic installations greater than 10,000 square feet proposed to be constructed after the effective date of this bylaw. This bylaw also pertains to physical modifications that materially alter the type, configuration or size of the installation. Square footage shall be calculated as follows:

- i. The area within the security fence if a fence is provided, or
- ii. All land area within a polygon (a plane shape-two dimensional-with straight sides) around the entire installation including all solar panels, all appurtenances including but not limited to buildings, storage areas, construction staging and lay-down areas, and transformers and poles, and parking along with a 15 foot perimeter area around all of the above or
- iii. All areas of disturbed land, whichever is greater.

As defined in 3.24.2:

- a) This bylaw does not pertain to ground-mounted solar photovoltaic installations installed on residential, commercial or industrial buildings. Those installations are subject to the State Building Code.
- b) Ground-mounted solar photovoltaic installations less than or equal to 10,000 square feet shall only need a building permit and meet property setback requirements.
- c) This bylaw does not pertain to solar carport canopies over existing rows of parking spaces. Such installations are considered Accessory Uses under Section 2.3 and are subject to the State Building Code.
- d) This bylaw shall not apply to any ground-mounted solar photovoltaic installation being developed with the direct involvement of the Town of Athol at the former municipal landfill on West Royalston Road in Athol, MA.

3.24.3 Special Permit Granting Authority

Subject to the requirements of this bylaw, ground-mounted solar photovoltaic installations may be permitted in the R-C Zoning District subject to a Special Permit from the Athol Board of Planning and Community Development, pursuant to meeting the Special Permit Criteria and Requirements below. The Board of Planning and Community Development shall be the Special Permit Granting Authority for ground-mounted solar photovoltaic installations. In addition to the findings required in Section 1.2.6.2, the Special Permit Granting Authority must also find that the proposal does not contravene the purposes of this section. Ground-mounted solar photovoltaic installation Special Permit applications shall be filed in accordance with the Board of Planning and Community Development Filing Requirements & Fees.

3.24.4 Requirements for Ground-Mounted Solar Photovoltaic installations

The following requirements shall apply to ground mounted solar photovoltaic installations greater than 10,000 square feet.

1. Compliance with Laws, Bylaws and Regulations

The construction and operation of ground-mounted solar photovoltaic installations shall comply with all applicable local, state and federal requirements, including but not limited to all applicable safety, construction, electrical, and communications requirements. All buildings, fixtures and other appurtenance structures forming part of a ground-mounted solar photovoltaic installation shall be constructed in accordance with the State Building Code.

2. Building Permit

No ground-mounted solar photovoltaic installation shall be constructed, installed or modified as provided in this section without first obtaining a building permit

3. Pre-application Conference and Public Outreach

The applicant shall participate in a pre-application conference with the Board of Planning and Community Development prior to the submittal of a formal application. A public outreach plan, including project development timeline, which indicates how the applicant will meet the required site plan review notification procedures and otherwise inform the abutters and the town residents, shall be provided as part of the pre-application conference process. The applicant shall be required to erect a 4-foot by 4-foot double-sided sign perpendicular to the road at the proposed entrance to the project site prior to the pre-application conference.

The sign shall be headed with the following: Notice: This property is the site of a proposed commercial ground-mounted solar photovoltaic installation in accordance with Section 3.24 of the Athol Zoning Bylaw. The sign shall also indicate the name of the applicant, the name of the owner of the installation, the size of the proposed facility in both acreage and MW, a contact person for additional information including phone and email address, and assessors plot number for the property.

4. Site Plan Review

Ground-mounted solar photovoltaic installations greater than 10,000 square feet shall undergo site plan review by the Board of Planning and Community Development (BPCD) prior to construction, installation or modification as provided in this section as well as section 3.18, Site Plan Review, as

applicable. The BPCD shall act as the Special Permit Granting Authority for such site plans with the entirety of the Town of Athol, including the Major Commercial Overlay District.

3.24.4.5 Professional Engineer

All plans and maps shall be prepared, stamped, and signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts.

3.24.4.6 Required Documents to be deemed a complete application.

Pursuant to the site plan review process, the applicant shall also provide the following documents:

(a) A site plan showing:

- i. Property lines and physical features, including both existing and proposed roads, for the project site at a scale of 1 inch equals 40 feet or such scale as may be approved by the Special Permit Granting Authority on standard 24" by 36" sheets and continuation on 8.5 " by 11" sheets as necessary for narrative;
- ii. Blueprints or drawings of the solar photovoltaic installation showing the proposed layout of the system;
- iii. One or three line electrical diagram detailing the solar photovoltaic installation, associated components, and electrical interconnection methods, with all National Electrical Code compliant disconnects and overcurrent devices;
- iv. Proposed wattage of the solar photovoltaic installation solar power generation indicated in both dc (direct current) and ac (alternating current); a notation shall be included explaining the difference, e.g. loss in conversion from dc to ac;
- v. Technical specification of the major system components to be used, including the PV panels, mounting system, and inverter and battery storage;
- vi. Name, address, and contact information for proposed system installer (owner);
- vii. Name, address, phone number and signature of the applicant, as well as all co-proponents or property owners;
- viii. Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures;
- ix. All existing lot lines, with size of each existing lot in acres or square feet, abutting land uses and location of structures [REDACTED]
- x. Names and addresses of all record owners within 500 hundred feet of all property lines along with a map showing the same;
- xi. Locations and details of all security measures for the site;
- xii. [REDACTED] as identified on the United States Natural Resources Conservation Service soils survey, on all land involved with the project;
- xiii. [REDACTED]
- xiv. [REDACTED]
- xv. All storm water plans as required in Section 3.24.5.11;
- xvi. A [REDACTED]
- xvii. A buffer, screening and landscape plan as required in Section 3.24.3;
- xviii. [REDACTED] at the time of application filing.
- xix. [REDACTED] as well as documentation of Dark Sky Standards in accordance with Section 3.24.5.7;

xx. Location of equipment and construction staging area, and

- (b) The name, contact information and signature of any agents representing the applicant;
- (c) [REDACTED] and proposed mitigation, if any, to minimize the impact on affected properties and roads, as well as the Orange airport in regards to the proposed solar panels as required in Section 3.24.5.5;
- (d) [REDACTED]
- (e) Documentation by an acoustical engineer of the noise levels projected to be generated by both the installation and operation of the facilities as required in Section 3.24.5.13;
- (f) Documentation of all soils types, as identified on the United States Natural Resources Conservation Service soils survey, on all land involved with the project;
- (g) Documentation of actual or prospective access and control of the project site as required in Section 3.24.7;
- (h) Visual impact analysis as required in Section 3.24.5.5;
- (i) [REDACTED]
- (j) [REDACTED]
- (k) Mitigation Plan as required in Section 3.24.5.4;
- (l) A list identifying all off-site electrical system improvements necessary to the electrical grid to accommodate the power from the proposed installation and identification of what entity is paying for such improvements.

3.24.4.7 Waiver of Submittal Requirements: Upon the written request of the applicant with justification, the Special Permit Granting Authority may waive any of its submission requirements under unique site conditions. In addition, the Special Permit Granting Authority may request any additional data needed to render its decision.

3.24.5 Design Standards

1. Lot and Siting Requirements

- i. Ground-mounted commercial solar photovoltaic array installations shall be permitted on parcels larger than 10 acres located within the RC zoning district and shall have a minimum lot frontage of 160 feet.
- ii. Project generation size shall not exceed 5MW AC, nor shall the installation exceed 20 acres of fenced area, if fenced. If not fenced, the 20 acre area shall be calculated as the area within a polygon around the entire installation including all solar arrays, all appurtenances including but not limited to buildings, storage areas, construction staging and lay-down areas, transformers and poles along with a 15 foot perimeter area around all of the above

a. [REDACTED] (measured over 100-foot intervals.) Cutting and filling to reduce natural slopes shall be prohibited except on short hollows, depressions or high spots. A waiver to increase the slope from 10% to 12% may be requested.

b. Shall be located on any parcel that contains 50% of Priority Habitat, Core Habitat or Critical Natural Landscape as defined in 225 CMR 20.00 Solar Massachusetts Renewable Target (SMART) Program, nor shall any trees be removed, or construction of structures, access roads or transmission lines may be placed in these designated areas.

iv. [REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

v. Location of the entrance road and all utility poles shall be located within the lot's frontage taking into consideration site lines for vehicular traffic and to lessen any visual impacts on abutters.

2. [REDACTED]

i. For all zoning districts except for the Rural Single-Family Residential (RC) zoning district, ground-mounted solar photovoltaic installations must observe all yard requirements applicable to the principal structure as defined in Section 2.6, Intensity of Use Schedule. The Special Permit Granting Authority may increase these setbacks in these districts if they determine it to be appropriate.

ii. For the RC zone, setbacks shall be:

- 200 feet for front yard*
- 200 feet for side and rear yard*
- 200 feet from any perennial stream**
- 200 feet from any water body greater than 1 acre and less than 5 acres**
- 400 feet from the shoreline of any water body greater than 5 acres**

* The Special Permit Granting Authority may reduce the minimum setback distance for front, side and rear yards only in the RC District to a minimum of 75 feet as authorized per Section 3.24.17. In addition to the specifics of Section 3.24.17, the applicant shall also be required to submit written consent from all affected abutter(s) for any reduction in setbacks.

However, reduction of the setback on any frontage with a public road is not permitted whether the yard is a front, side or rear yard. The setback between properties of a single owner subdivided per Section 3.24.5.4.4 may be waived to no less than the minimum for existing setback requirements of the RC District per Section 2.6.

**The setbacks for perennial streams and water bodies between 1 and 5 acres are not subject to any waiver of distances under Section 3.24.13. Setbacks for water bodies greater than 5 acres are only allowed to be reduced through a waiver to a minimum distance of 300 feet as long as a natural wooded buffer is maintained, detailed stormwater plans show no further impact to abutting properties versus the 400-foot setback distance, water quality of runoff is not reduced and wildlife and fauna movement is not restricted with the reduced setback. No access roads or transmission lines may be constructed in the setbacks to any water body greater than 1 acre.

- All ground mounted photovoltaic panels in a residential zone shall be limited to a height of 10 feet. For any other zone, the height shall be limited to 15 feet. Other appurtenance structures shall be limited to a height of 15 feet in all zones.

- 1. Ground-mounted solar photovoltaic installations shall be effectively screened year-round:
 - i. from all abutting properties in all residential zones;
 - ii. from all abutting properties in residential use in all non-residential zones;
 - iii. and from public and private ways in all residential districts.

Except for vehicular and pedestrian passageways and permitted signs, setback areas shall be modified only for additional screening. Where existing vegetation in the setbacks is insufficient to achieve year-round screening, additional screening shall be provided including, but not limited to, planting of dense vegetative screening, fencing, berms, natural ground elevations, land contouring, and/or placement of the solar panels and appurtenant structures on the site, all depending on site specific conditions.

Tree cutting within the required setback area shall not be permitted if it would reduce to any degree the effectiveness of the year-round screening.

- 2. If additional plantings are required for screening, a planting plan shall be submitted:

- i. Showing the types, sizes and locations of material to be used which shall be subject to the approval of the Special Permit Granting Authority.
 - ii. Plantings shall be a minimum of six (6) feet in height at planting and staggered so as to fill the setback area and keep the arrays from view year round.
 - iii. Using a diversity of plant species native to New England for any screens and vegetative erosion controls. Use of exotic plants, as identified by the most recent version of the “Massachusetts Prohibited Plant List” maintained by the Massachusetts Department of Agricultural Resources, is prohibited. Cultivars of native plants are acceptable.
 - iv. At least 75% of the plantings shall consist of evergreens and shall be evenly spaced throughout the area of the setback area.
3. Planting of the vegetative screening shall be completed prior to connection of the installation. Plants shall be maintained and replaced if unhealthy by the owner/operator of the installation for the life of the installation.
4. The open area of the site shall be seeded with a pollinator mix and maintained as bird and insect habitat. Mowing is to be done as little as possible to retain a natural functioning of the landscape. Alternative vegetation or cover options may be proposed by the applicant in consideration of soil type and quality, subject to the approval of the Special Permit Granting Authority. Gravel areas that are well drained and stable do not require the addition of topsoil. Topsoil shall not be imported into any project sites unless there is a demonstrated engineering need and must be approved by the Special Permit Granting Authority prior to any introduction. The need to introduce topsoil may be grounds for permit denial.
5. Clearing of natural vegetation shall be limited to what is necessary for the construction, operation, and maintenance of the installation. Existing root structures, flat gravel areas, and topsoil shall be maintained to the maximum extent practicable.
6. Vegetation Management: Herbicides, pesticides, or chemical fertilizers shall not be used to manage vegetation at the ground mounted solar photovoltaic installation.
7. Ground surface areas beneath solar arrays and setback areas shall be pervious to maximize on-site infiltration of stormwater.
4. 
 1. The Special Permit Granting Authority shall discuss construction phasing with the designer of the installation as a means of mitigating erosion and sedimentation.
 2. Habitat Fragmentation. A ground-mounted solar photovoltaic installation shall, to the greatest extent practicable, be clustered and located in or adjacent to areas of the site where the land has already been cleared of vegetation to avoid habitat fragmentation.

3. Invasive Species. The introduction of invasive species shall be prevented to the greatest extent practicable, during any construction or removal of a solar photovoltaic installation, through the use of current best practices.

4. A ground-mounted solar photovoltaic installation shall be considered the principal use of the parcel. Any parcel with an existing residence or other building may be approved for a solar installation with the provision that the residence or building be subdivided from the larger parcel prior to any construction

of the solar installation. The parcel with the ground-mounted solar photovoltaic installation may not be subdivided for the purpose of development of the divided land until such time as the installation is decommissioned.

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1. The design of the ground-mounted solar photovoltaic installations shall prevent reflected solar radiation or glare from becoming a public nuisance or hazard to adjacent buildings, roadways, or properties. Design efforts may include, but not be limited to, deliberate placement and arrangement on the site, anti-reflective materials, solar glare modeling, and screening in addition to required landscaping.
 2. Any ground-mounted solar photovoltaic array installation proposed within a 5-mile radius of the Orange Airport shall be analyzed for glare utilizing any glare analysis compatible with FAA glare guidelines. [One such software package is Forge Solar, PV Planning and Glare Analysis.]
 3. Ground-mounted solar photovoltaic installations shall not be approved unless the system design provides screening and buffers to protect scenic vistas and view sheds from residential uses, public streets and any waterways or water bodies.
 4. A visual impact assessment shall be conducted that follows the protocols of the “Guidelines for Landscape and Visual Impact Assessment (Third Addition). Such assessment shall produce a map showing all areas within a 5-mile radius of the installation where the installation can be seen and where it cannot be seen.

With input from the Planning Director, the applicant shall utilize additional tools to assess the visual impacts in critical areas of concern such as renderings, line-of-sight studies and/or two or three dimensional visualizations i.e. Photomontage, video montage, animation produced through Spatial Information Systems (SIS) and Geographic Information Systems (GIS).

5. All results of the visual impact assessment shall be taken into account in the design of the installation. When reviewing for compliance with section 3.24.3 Vegetated Buffer, Screening and Landscaping and scenic vistas in Section 3.24.5.3, the Special Permit Authority shall make a definitive judgment that the intent has been achieved.

3.24.5.6 Appurtenant Structures:

All appurtenant structures to ground-mounted solar photovoltaic installations shall be subject to reasonable regulations concerning the bulk and height of structures, lot area, setbacks, and open space, parking and building coverage requirements.

All such appurtenant structures, including but not limited to, equipment shelters, storage facilities, transformers, and substations, shall be architecturally compatible with each other. Whenever reasonable, structures shall be shielded from view by vegetation approved by the Special Permit Granting Authority and/or joined or clustered to avoid adverse visual impacts.

3.24.5.7 Lighting:

Lighting of ground-mounted solar photovoltaic installations shall be consistent with local, state and federal law.

Lighting of other parts of the installation, such as appurtenant structures, shall be limited to that required for safety and operational purposes, and shall be reasonably shielded from abutting properties. All lighting shall comply with International Dark Sky Standards FSA Certification Requirements. There shall be no illumination without personnel on site.

3.24.5.8 Signs:

The following signs shall be required:

- i. one that identifies the owner, the street address, provides a 24-hour emergency contact phone
- ii. educational signs providing information about solar photovoltaic panels and the benefits of renewable energy.

Signs shall comply with Section 3.9, Sign Regulations.

Ground-mounted solar photovoltaic installations shall not be used for displaying any advertising except for reasonable identification of the manufacturer or operator of the solar photovoltaic installation.

3.24.5.9 Utility Connections:

Utility connections, as determined by the Special Permit Granting Authority, shall be underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider.

3.24.5.10

The need for fencing shall be determined by the applicant unless such fencing is needed to comply with Section 3.24.3 Vegetated Buffer, Screening and Landscaping, and/or as required per the National Electrical Code. If installed, all, shall be placed 6 inches off the ground to allow migration of wildlife, and shall have an Emergency Access System padlock or box at each gate.

3.24.5.11

1. Proposed stormwater management plans detailed below shall conform to the more stringent of any conditions or standards of this subsection and the Department of Environmental Protection's Massachusetts Stormwater Handbook, as amended.

2. All stormwater infrastructure shall be owned and maintained by the owner of the installation and shall be located on the same parcel as the solar installation.
3. All post-development stormwater, up to and including a 50-year return frequency 24-hour storm, shall be retained on the parcel site and infiltrated into the soil thru low impact development, retention and infiltration basins. At no time may stormwater be carried off site.

Emergency overflows for storms in excess of the 50-year return frequency may be permitted provided it is demonstrated that no flooding or damage would be caused by the overflow. Attenuation of the discharge may be required as needed as determined by the Special Permit Granting Authority.

4. All pipes, catch basins and other materials utilized in the stormwater facilities shall be approved by the Athol Superintendent of Public Works, or his designee.

5. Stormwater Management Plan

- i. The Stormwater Management Plan (four paper copies and one electronic copy in PDF format required) with the permit application shall contain sufficient information for the Special Permitting Granting Authority to evaluate the environmental impact and effectiveness of the measures proposed for retaining stormwater on the parcel site.
 - ii. The Stormwater Management Plan shall fully describe the project in drawings, narrative and calculations. It shall include:
 - a. The site's existing and proposed topography [REDACTED]
 - b. A description and delineation of existing stormwater conveyances, impoundments, environmental resources on or adjacent to the site into which stormwater could flow;
 - c. A delineation of 100-year flood plains, if applicable;
 - d. Estimated seasonal high groundwater elevation in areas to be used for stormwater retention, detention, or infiltration;
 - e. The existing and proposed vegetation and ground surfaces with areas and runoff coefficients for each;
 - f. [REDACTED]
 - g. [REDACTED]
 - h. A drainage area map showing pre- and post-construction watershed boundaries, area and stormwater flow paths at a scale that enables verification of supporting calculations;
 - i. A recharge area analysis that calculates pre-and post-project annual groundwater recharge rates on the parcel;
 - j. A description and drawings of all components of the proposed stormwater management system;
 - k. [REDACTED]
 - l. Soils information from test pits performed at the location of proposed Stormwater Management facilities, including soil descriptions, depth to seasonal high groundwater and depth to bedrock. Soils information will be based on site test pits logged by a Massachusetts Certified Soil Evaluator.
6. To ensure proper containment and stabilization of the site during the construction phase, a [REDACTED] to control construction-related impacts, including erosion, sedimentation,

and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented. Such plan shall be developed to document compliance with Standard 8 of the Massachusetts Stormwater Handbook.

7. A Long -Term Stormwater Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed. Such plan shall be developed to document compliance with Standard 9 of the Massachusetts Stormwater Handbook.

- i. Stormwater management system(s) owners;
 - ii. The party or parties responsible for operation and maintenance of all aspects of the stormwater management system;
 - iii. The routine and non-routine maintenance tasks to be undertaken after construction is complete and a schedule for implementing those tasks;
 - iv. A plan that is drawn to scale and shows the location of all stormwater BMPs;
 - v. A schedule for routine inspections as well as a description of storms that would trigger immediate inspections following the storm;
 - vi. An inspection and maintenance log form
 - vii. An estimated stormwater operations and maintenance budget.
 - viii. Permission from the operator to allow agents of the Town of Athol to enter and inspect the premises to evaluate and ensure that the responsibility party complies with the Long-Term Stormwater Operation and Maintenance Plan requirements for each BMP.
8. During times of construction and post-construction where stormwater generated from the project area may inadvertently enter the public way, the developer (owner) shall be responsible for direct costs incurred by the town, including but not limited to stormwater related clean up, sanding, salting, street sweeping or other necessary management when required for the protection of public health and safety.

12.

Hazardous materials stored, used, or generated on site shall not exceed the amount for a Very Small Quantity Generator of Hazardous Waste as defined by the DEP pursuant to Mass DEP regulations 310 CMR 30.000 and shall meet all requirements of the DEP including storage of hazardous materials in a building with an impervious floor that is not adjacent to any floor drains to prevent discharge to the outdoor environment.

If any hazardous materials, including, but not limited to, lithium ion (storage batteries) are used within the solar electric equipment, then impervious containment areas capable of controlling and containing any release of hazardous materials to the environment and to prevent potential contamination of groundwater are required. A list of any hazardous materials proposed to be located on the site and a plan to prevent their release shall be provided to the Special Permit Granting Authority and Fire Chief.

13.

Noise generated by ground-mounted solar photovoltaic installations, cooling fans, inverters, associated equipment and machinery shall conform at a minimum to applicable state and local noise regulations,

including the DEP's Division of Air Quality noise regulations, 310 CMR 7.10 and 3.8.1.1 of the Athol Zoning Bylaw. Noise reduction shall be considered and incorporated as needed during the design phase of the installation including the location of the noise generator, shielding, noise cancellation, filtering, and noise suppression.

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1. The right of abutting and neighboring landowners to live without undue disturbance from noise, traffic, lighting, fumes, dust, odor, glare, or stormwater runoff;
 2. The adequacy of methods to store, handle, or dispose of wastes, including hazardous materials, to protect air, groundwater, and surface water pollution;
 3. The protection of historical and natural environmental features on the site under review and in adjacent areas;
 4. The adequacy of stormwater management systems to address non-point-source pollution.
 5. Minimization of erosion of soil both during and after construction.
 6. In the case of a residential zone location, the visual impact of the installation on its immediate abutters and the nearby neighborhood have been effectively neutralized through its location on the lot, appropriate design, landscaping and effective screening.
 7. The location of the site and the system design provides effective screening and buffers to protect scenic vistas and view sheds from residential uses, public streets, recreational areas and any waterways or water bodies, and
 8. The rural character of the general location has been maintained.

3.24.7 Site Control: The applicant shall submit documentation of actual or committed prospective access and control of the project site to allow for construction and the operation of the proposed ground-mounted solar photovoltaic installation.

3.24.8 Operation and Maintenance Plan: The installation owner or operator shall maintain the facility in good condition. The applicant shall submit a plan for the operation and maintenance of the ground-mounted solar photovoltaic installation along with a signed agreement with a maintenance company. This plan shall include measures for maintaining year-round safe access for emergency vehicle, snow plowing, storm water controls, and general procedures and a yearly schedule for the operation and maintenance of the facilities including fencing, and maintenance of landscaping.

3.24.9 Utility Notification: The applicant shall submit evidence satisfactory to the Special Permit Granting Authority that the utility company operating the electrical grid has been informed in writing of the intent to install a ground-mounted solar photovoltaic installation and intends to file an Interconnect Agreement in the future and that the utility company has responded in writing acknowledging the plan. Any off-grid system shall be exempt from this requirement.

3.24.10 Emergency Services: The applicant shall provide a copy of the project summary, operation and maintenance plan, electrical schematic, and site plan to the Athol Fire and Police Departments. The applicant and the installation operator shall cooperate with local and regional emergency services in developing an emergency response plan, which will ensure that emergency personnel have immediate, 24-hour access to the facility.

All means of shutting down the solar installation shall be clearly marked on the plan. The operator of the installation shall identify an official representative for public inquiries throughout the life of the installation.

The operation and maintenance plan required in Section 3.24.8 shall be periodically jointly reviewed and updated as necessary by the operator of the installation and the Athol Fire and Police Departments at a frequency to be determined by the Athol Fire Department. Safety personnel may request at any time that the operator provide onsite training in accessing and shutting down the operation of the installation.

The operator shall identify a qualified contact person who will provide assistance to local officials during an emergency. The operator shall update the contact information whenever there is a change in the contact person.

3.24.11 Annual Reporting: The owner or operator of a solar installation shall submit an annual report demonstrating and certifying compliance with the Operation and Maintenance Plan, the requirements of this bylaw, and approvals granted hereunder, including but not limited to continued management and maintenance of vegetation, compliance with the approved plans and any permit conditions, continuation of liability insurance, and adequacy of road access and functionality of stormwater management system. The annual report shall also provide information on the maintenance completed during the course of the year and the amount of electricity generated by the facility. The report shall be submitted to the Board of Selectmen, Special Permit Granting Authority, Fire Chief, and Conservation Commission (if a wetlands permit was issued) no later than 45 days after the end of the calendar year.

3.24.12 Modifications: All material modifications to the installation to be made after the issuance of the initial required building permit shall require approval of the Special Permit Granting Authority through a permit modification.

3.24.13 Discontinuance and Removal: Absent notice of a proposed date of decommissioning or written notice of extenuating circumstances, any ground-mounted solar photovoltaic installation not used for a period of one continuous year or more without written permission from the Special Permit Granting Authority, [REDACTED] shall be considered to be discontinued and shall be removed by the owner.

Upon written request from the Building Inspector addressed to the contact address provided and maintained by the owner or operator as required, the owner or operator shall provide evidence to the Building Inspector demonstrating continued use of the installation. Failure to provide such evidence within thirty days of such written request shall be conclusive evidence that the installation has been discontinued.

The owner or operator or landowner shall physically remove the installation no more than 180 days after the date of discontinued operation. The owner or operator or landowner shall notify the Special Permit Granting Authority by certified mail of the proposed date of discontinued operations and submit plans for removal. Removal shall consist of:

1. Physical removal of all parts of and appurtenances of the installation including solar arrays, structures, equipment, security barriers and transmission lines.
2. [REDACTED] and disposal of remaining solid and hazardous wastes in accordance with state and federal waste disposal regulations applicable at the time of disposal.
3. Stabilization and revegetation of the site as necessary to minimize erosion and prevent impacts to wetlands, water courses or water bodies. The Special Permit Granting Authority may allow the owner or operator or landowner to leave landscaping or designated below grade foundations (provided they are filled in) in order to minimize erosion and disruption of existing vegetation. This requirement may be waived if the landowner submits a plan for re-use of the site.
4. Any portion of a site that was deforested for the installation shall be restored so as to encourage native tree growth, including the planting of seedlings, if necessary to establish growth.

As a condition of the Special Permit approval, the applicant and the landowner shall agree to allow entry to remove an abandoned or decommissioned installation. If the owner or operator or landowner fails to remove the installation in accordance with the requirements of this section, the Town of Athol shall have the right, to the extent it is otherwise duly authorized by law, to enter the property and physically remove the installation at a rate of 1.3 times the actual costs incurred. The Town of Athol shall use the financial surety as stipulated in the Financial Surety Section 3.24.14.

3.24.14 Financial Surety: The applicant of ground-mounted solar photovoltaic installations shall provide surety in the form of cash, certified bank check, escrow account or bond held by and for the Town of Athol to cover the cost of removal and stabilization of the site in the event the town must remove the installation and remediate the landscape, in an amount and form determined to be reasonable by the Special Permit Granting Authority, but in no event to exceed more than 130 percent of the cost of removal and stabilization costs as well as any compliance with the additional requirements set forth herein.

This surety will be due and payable at the issuance of the building permit. Proof of payment in the form of a receipt from the Town Treasurer will be shown to the Building Inspector before the permits are issued. Such surety will not be required for municipally- or state-owned facilities. The project applicant shall submit a fully inclusive estimate of the costs associated with removal and stabilization prepared by a licensed professional engineer. Such estimate shall be reviewed by the Town of Athol and adjusted as needed to reflect the opinion of the Town as to fair costs. The amount shall include a mechanism for calculating increased removal costs due to inflation.

As a condition of approval, an applicant shall bind itself to grant the necessary license or easement to the Town to allow entry to remove the structures and stabilize the site. The Town shall have the right but not the obligation to remove the facility.

3.24.15 Taxes or Payment in Lieu of Taxes: If the project would otherwise be exempt from the payment of personal or real property taxes, the applicant shall enter into a tax agreement or a payment in lieu of taxes (PILOT) agreement with the Town of Athol that provides an equivalent amount of tax revenue to the town as determined by the Board of Assessors. Any tax-related agreement or PILOT shall be approved by the Board of Assessors prior to the issuance of the Building Permit.

3.24.16 [REDACTED] The Special Permit Granting Authority may hire, at the expense of the applicant, consultants to review the plans submitted if it determines that independent expert review is appropriate for the interest of the neighborhood and/or the town. The applicant shall pay the

estimated cost of said expert(s), including all legal fees and publication fees, to the Town prior to any review being undertaken. No Building Permit shall be approved until the total costs of said review(s) have been paid by the applicant.

3.24.17

1. The Special Permit Granting Authority may waive or reduce strict compliance with any requirement of the Design Standards of this bylaw (unless noted otherwise in the bylaw), or any rules and regulations promulgated hereunder, where:
 - a. such action is allowed by federal, state or local statutes and/or regulations;
 - b. it is fully within the public interest;
 - c. it is not inconsistent with the purpose and intent of this bylaw and the purposes and intent of the bylaw can still be met with the waiver or reduction due to special circumstances of the site
 - d. and the full objectives of the bylaws can be met in an alternative manner.
2. The applicant shall submit a written request for any requested waiver at the time of the initial application. Such request shall be accompanied by an explanation or documentation supporting the waiver request and demonstrating that:
 - a. strict application of the bylaws does not further the purposes or objectives of this bylaw,
 - b. due to special circumstances of the site that the objectives of the bylaws can be met in an alternative manner and,
 - c. such a waiver or reduction of the requirements will not derogate from the intent or purpose of the bylaw.
3. All waiver requests shall be discussed during a required a public hearing duly noted in a public agenda and shall require a two-thirds vote in favor to be approved. If the Special Permit Granting Authority deems additional time or information is required in the review of the waiver request, the Special Permit Granting Authority may continue the request for the waiver to a subsequent BPCD meeting.

3.24.18

The Special Permit Granting Authority may adopt, and from time to time amend, Rules and Regulations consistent with the provisions of this bylaw and G.L. c. 40A and other provisions of the General Laws, including the Subdivision Rules and Regulations of Town of Athol, Massachusetts, and shall file a copy of said Rules and Regulations with the Town Clerk. Said Rules and Regulations may provide for an application fee schedule for ground-mounted solar photovoltaic installation application submittals and methods for calculating the financial surety required under Section 3.24.14.

3.24.19

If the owner of the ground-mounted solar photovoltaic installation changes or the owner of the property changes, the special permit shall remain in effect, provided that the successor owner or operator assumes in writing all of the obligations of the special permit, site plan approval, and decommissioning plan. A new owner or operator of the ground-mounted solar photovoltaic installation shall notify the Special Permit Granting Authority and the Building Inspector/Zoning Enforcement Officer of such change in ownership or operator within thirty (30) days of the ownership change.

The special permit and all other local approvals for the ground-mounted solar array installation system would be void if a new owner or operator fails to provide written notification to Special Permit Granting Authority and the Building Inspector/Zoning Enforcement Officer in the required timeframe. Reinstatement of a void special permit, site plan approval and any other local approvals will be subject to the same review and approval processes for new applications under the Town of Athol Bylaws and Regulations.

3.24.20 Severability

If any provision of this bylaw is held invalid by a court of competent jurisdiction, the remainder of the bylaw shall not be affected thereby.

or act in relation thereto.

G

SAMPLE PILOT AGREEMENT

AGREEMENT FOR PAYMENT IN LIEU OF TAXES
FOR REAL PROPERTY AND PERSONAL PROPERTY

between

VH WEST BROOKFIELD, LLC (Developer)

and

THE TOWN OF WARE, MASSACHUSETTS (Town)

dated as of November 29, 2016

AGREEMENT FOR PAYMENT IN LIEU OF TAXES FOR
REAL PROPERTY AND PERSONAL PROPERTY

THIS AGREEMENT FOR PAYMENT IN LIEU OF TAXES FOR REAL PROPERTY AND PERSONAL PROPERTY ("Agreement") is made and entered into as of November [], 2016, by and between VH West Brookfield, LLC, a Delaware limited liability company ("Developer") and the Town of Ware, a municipal corporation duly established by law and located in Hampshire County, Massachusetts (the "Town"). Developer and the Town are collectively referred to in this Agreement as the "Parties," and individually referred to as a "Party."

WHEREAS, Developer is a "generation company" engaged in the business of producing, manufacturing or generating electricity or related services or products, including but not limited to, renewable energy generation attributes for retail sale to the public, or a "wholesale generation company" engaged in the business of producing, manufacturing or generating electricity for sale at wholesale only, as such terms are defined or used in the Massachusetts General Laws Chapter 59, §38H(b), and Chapter 164, §1;

WHEREAS, Developer has leased from Peter E. and Mary M. Dudula ("Property Owner") approximately 18.11 acres of land located at 38 Gilbertville Road in Ware, Massachusetts, more particularly described on the attached Exhibit A (the "Property"), under the terms of a Solar Facility Land Lease, dated July 21, 2016 (the "Lease"), with an initial term of twenty-five (25) years, and Developer plans to build, own and operate a solar photovoltaic energy facility with an expected nameplate capacity (the "Capacity") of approximately 1.39 MW (DC) (the "Project"), on said Property, as such Project is more particularly described in Exhibit B, and has entered into a Special Permit and Decommissioning Cash Surety Agreement with the Town in connection with Developer's obligation to decommission the Project within six (6) months following termination of the Lease;

WHEREAS, it is the intention of the Parties that Developer make annual payments to the Town for the full term of this Agreement in lieu of all real and personal property taxes for the Project, in accordance with M.G.L. c.59, §38H(b) and other applicable laws and regulations, including the regulations of the Massachusetts Department of Revenue adopted in connection therewith;

WHEREAS, because Developer and the Town desire an accurate projection of their respective expenses and revenues with respect to the real and personal property that is taxable under law as a result of the Project, the Parties believe that it is in their mutual best interests to enter into this Agreement fixing the payments that will be made with respect to all taxable real and personal property for the Project for the term of the Agreement;

WHEREAS, the Parties intend that, during the term of the Agreement, except as otherwise provided herein, Developer will not be assessed for any statutory real and personal property taxes attributable to the Project to which it might otherwise be subjected under

Massachusetts General Law for the Project, and that this Agreement will provide for the exclusive payments in lieu of such real and personal property taxes that Developer (or any successor owner of the Project) will be obligated to make to the Town with respect to the Project during the term hereof, provided, however, that this Agreement does not affect any other taxes and payments that may be charged to and owed by the Developer or Property Owner to the Town except for the real and personal property taxes attributable to the Project; nor does this Agreement affect any other payments that may be legally owed by Developer or Property Owner to the Town, including, but not limited to, real property taxes for the Property, taxes for personal property other than the taxes attributable to the Project, and payments for services provided by the Town to the Project and the Property, including, but not limited to, water and sewer services, betterment assessments, and other payment obligations;

WHEREAS, notwithstanding the foregoing, it is not the intention of the Parties to remove any obligation of the Property Owner to pay the real property taxes on the Property, including the land upon which the Project is sited;

WHEREAS, it has been determined that the Project equipment, machinery and components described in Exhibit D constitute real and/or personal property for tax purposes, and are not part of the real property upon which they are installed;

WHEREAS, this Agreement does not apply to real property taxes for the Property, and this Agreement shall not impact the Town's ability to raise or lower real property taxes in the ordinary course of its tax assessment practices;

WHEREAS, the Town is authorized to enter into this Agreement with the Developer, provided the payments in lieu of real and personal property taxes over the life of the Agreement are expected at inception to approximate the real and personal property tax payments that would otherwise be determined under M.G.L. c.59 based upon the full and fair cash valuation of the real and personal property attributable to the Project; and Developer, throughout the term hereof, qualifies as a "generation company" or "wholesale generation company";

WHEREAS, this Agreement is subject to approval by the Town's Board of Selectmen and Town Meeting; and

WHEREAS, the Parties have reached this Agreement after good faith negotiations.

NOW THEREFORE, in exchange for the mutual commitments and other good and valuable consideration, the receipt and sufficiency of which are acknowledged, the parties agree as follows:

1. Payment in Lieu of Real and Personal Property Taxes. Developer agrees to make annual payments to the Town ("Annual Payments") in lieu of all real and personal property taxes attributable to the Project for the period commencing on the Completion Date (as defined below) and continuing for twenty (20) years from such date (the "Term"). The amount of each Annual

Payment shall be the amount arrived at by multiplying the number of megawatts of the Project's installed Capacity on the Completion Date by the Factor, defined below, subject to adjustment as set forth herein. The "Factor" shall be \$14,000 per megawatt of the Project's installed Capacity on the Completion Date for the first year of the Term and shall increase by 2.0% annually thereafter, as reflected on the schedule attached hereto as Exhibit C. The "Completion Date" shall be the first date on which the Developer has received from the local electric utility written authorization to interconnect the Project to the utility's system and acceptance of the Project from the utility (to the extent required) and the Project has commenced commercial operation or when the Project is completed as determined by the building inspector. Each Annual Payment will be paid to the Town in four (4) equal quarterly installments (prorated for the first and last quarters of the term of this Agreement) on or before August 1, November 1, February 1 and May 1 of each fiscal tax year during the term of this Agreement and the Annual Payment amount and payment dates will be noted on quarterly bills issued by the Town to the Developer. Developer agrees that the Annual Payments in lieu of taxes under this Agreement will not be reduced on account of a depreciation factor or reduction in the Town's tax rate, or increased on account of an appreciation factor or increase in the Town's tax rate, which factors have been anticipated and are reflected in Exhibit C. The failure of the Town to deliver such a bill shall not relieve the Developer of its obligation to timely make payments required hereunder.

2. Changes In Capacity. To the extent that the Capacity of the Project is increased by Developer after the Completion Date, the remaining Annual Payments in lieu of taxes for real and personal property attributable to the Project will be increased as described in Paragraph 3 of this Agreement. Developer shall notify the Town of the Completion Date in writing within 30 days after the Completion Date has been achieved, and in such notification shall confirm the installed Capacity of the Project as of the Completion Date, which the Town may verify by visiting the Property or otherwise in accordance with paragraph 4 of this Agreement. Notwithstanding anything to the contrary in this Agreement, there shall be no reductions in annual payments for any reductions in capacity.

3. Calculation of Adjustment. To the extent that the installed Capacity of the Project exceeds 1.39 MW (DC) on the Completion Date or is increased by the Developer after the Completion Date, the remaining Annual Payments in lieu of taxes under this Agreement shall be increased by an amount equal to \$14.00 (MW payment divided by 1,000) for each kW of any such excess or increase, as applicable. The Parties agree that this adjustment is designed to ensure that the annual payments in lieu of taxes approximate the full and fair cash valuation of the Project. Notwithstanding anything to the contrary in this Agreement, in the event Developer reduces the Capacity of the Project to less than .2 MW DC, the Town may terminate this Agreement and assess any and all real and personal property taxes in accordance with the Massachusetts General Laws. No increase in installed Capacity of the Project shall increase payments hereunder until the Project equipment, improvements or other property causing the increase in Capacity have been interconnected to the local utility and have begun generating electrical power.

4. Inspection and Verifications. The Town, its officers, employees, consultants and attorneys will have the right to periodically inspect the Project and meters used to measure the

energy generated by the Project on reasonable prior notice to Developer for the purpose of confirming and verifying the Capacity of the Project and compliance with this Agreement.

Attached to this Agreement as Exhibit D is a preliminary, itemized inventory prepared by Developer (the "Inventory") of the improvements, equipment and other property anticipated to be incorporated into the Project. Only property necessary or incidental to the production of electricity shall be included in the Inventory or Project. Notwithstanding anything to the contrary in this Agreement, the Project, and thus the Annual Payments hereunder, shall not include buildings (except for a single equipment storage shed for use in the Project, subject to advance approval of the Town).

Within sixty (60) days after the Completion Date, Developer shall provide the Town with an as-built description of the solar photovoltaic panels and inverters and other equipment in the Project, to the same level of detail as provided on Exhibit D, which shall be considered the "Inventory." Within thirty (30) days after the Town's receipt of such notification, the Parties will agree on an updated Inventory; in the event the Town does not respond during such period, it shall be deemed to have accepted the Inventory as provided by the Developer. In the event the Parties are unable so to agree in such 30-day period, the Town shall, at its sole election, reasonably determine the updated Inventory, or assess taxes for such portions of the Project that are not included in the Inventory in Exhibit D as if this Agreement did not exist. Developer will update the Inventory annually as of January 1 of each year, and an updated written Inventory, referred to as an Annual Inventory Update, will be provided to the Town on or before February 1 of each year. The Town, its officers, employees, consultants, agents and attorneys will have the right periodically, during normal business hours and upon reasonable advance notice to Developer, to inspect the Project and review documents in possession of Developer that relate to the Project and the Inventory to verify the Inventory and Developer's compliance with this Agreement.

The Developer shall promptly provide such information as may be reasonably requested by the Town from time to time to determine and verify the existence, condition, cost and valuation of any and all equipment or personal property constituting the Project and any additions, replacements, improvements and upgrades thereto. In addition to any other rights of inspection hereunder, the Town, its officers, employees, consultants and attorneys will have the right to periodically inspect the Project on reasonable advance notice to the Developer for any reasonable purpose, including verification of Capacity of the Project. During any such inspection the Town shall comply with the reasonable safety guidelines of the Developer. The Town, its officers, employees, consultants and attorneys shall also have the right to review and audit those documents in the possession of the Developer relating to equipment and/or personal property installed relevant to Exhibit D of this Agreement and capacity data to verify the Capacity of the Project.

5. Town Expenses. Developer shall contribute \$3,500.00 to the Town for the legal costs associated with this Agreement. Such payment shall be made ten (10) days after execution of this Agreement.

6. Payment Collection. In addition to such rights and remedies available in this Agreement, all statutory rights and remedies available to the Town for the collection of taxes shall apply to the Annual Payments in lieu of taxes hereunder, including but not limited to, all rights and remedies provided in G.L. c.59 and G.L. c.60, and all such rights and remedies are hereby reserved notwithstanding anything to the contrary herein. The provisions of the General Laws, including but not limited to G.L. c.59 and G.L. c.60, will govern the establishment of liens and the collection of any payments in lieu of taxes provided for in this Agreement as though said payments were real or personal property taxes due and payable to the Town. Accordingly, for example, if and to the extent deemed necessary by the Town for assessment or collection of Annual Payments, the Project may, at the Town's election, be deemed personal property unintentionally omitted from annual assessment under G.L. c. 59, § 75, or "Real Property," as defined in G.L. c. 59, § 2A(a). All payments more than thirty (30) days past due shall accrue interest at 14 percent per annum until paid. Additionally, Developer shall pay reasonable attorneys' fees, court and other costs incurred by the Town in the collection of any unpaid amounts due under this agreement.

7. Tax Status. The Town agrees that during the term of this Agreement, the Town will not assess Developer or Property Owner for any real and personal property taxes attributable to the Project to which they might otherwise be subject under Massachusetts law in the absence of this Agreement, and the Town agrees that this Agreement will exclusively govern the payments of such taxes; provided, however, that this Agreement does not affect, and will under no circumstances preclude, the Town from assessing any other taxes, fees, charges, rates or assessments which Developer or Property Owner may be obligated to pay (except for the real and personal property taxes attributable to the Project), including, but not limited to, real estate and personal property taxes excluding those attributable to the Project, excise taxes on vehicles due pursuant to G.L. c.60A, betterments, fees, or charges for services provided by the Town to the Project or Property, including, but not limited to, water and sewer services.

8. Binding Effect; Assignment; Termination. This Agreement will be binding upon and inure to the benefit of the successors and assigns of the Developer as owner of the Project and tenant under the Lease and the provisions of this Agreement will run with the Project and the Property during the Term. This Agreement may not be assigned without the advance written approval of the Town, which approval shall not be unreasonably withheld or delayed. Notwithstanding the foregoing, Developer may assign this Agreement, without approval of the Town, for collateral purposes or to a new owner in the event the Project is sold or transferred, or to an entity who is also an owner of the Project, provided that it shall provide the Town with written notice of such assignment within 30 days of any such assignment, provided that Developer shall not sell or transfer the Project to a tax exempt entity without the advance written consent of the Town. Notwithstanding the foregoing or any other provision contained herein to the contrary, the Developer or its successors and assigns may terminate this Agreement in the event that (i) the Lease is terminated at any time for any reason or (ii) the Project ceases commercial operation and is decommissioned. Upon termination of this Agreement for any reason, the Project will thereafter be assessed and taxed as though this Agreement does not exist.

9. Statement of Good Faith. The Parties agree that the payment obligations established by this Agreement were negotiated in good faith in recognition of and with due consideration of the full and fair cash value of the Project, to the extent that such value is reasonably determinable as

of the date of this Agreement in accordance with G.L. c.59, §38H. Each Party was represented by counsel in the negotiation and preparation of this Agreement and has entered into this Agreement after full and due consideration and with the advice of its counsel and its independent consultants. The Parties further acknowledge that this Agreement is fair and mutually beneficial to them because it reduces the likelihood of future disputes over real and personal property taxes attributable to the Project, establishes tax and economic stability at a time of continuing transition and economic uncertainty in the electric utility industry in Massachusetts and the region, and fixes and maintains mutually acceptable, reasonable and accurate payments in lieu of taxes for the Project that are appropriate and serve their respective interests. The Town acknowledges that this Agreement is beneficial to it because it will result in mutually acceptable, steady, predictable, accurate and reasonable payments in lieu of taxes to the Town. Developer acknowledges that this Agreement is beneficial to it because it ensures that there will be mutually acceptable, steady, predictable, accurate and reasonable payments in lieu of taxes for the Project.

10. Notices. All notices, consents, requests, or other communications provided for or permitted to be given hereunder by a Party must be in writing and will be deemed to have been properly given or served upon the personal delivery thereof, via courier delivery service or otherwise. Such notices shall be addressed or delivered to the Parties at their respective addresses shown below. Developer shall be solely responsible to provide copies of any notices to Property Owner.

To: Developer:

VH West Brookfield, LLC
c/o Nautilus Solar Energy, LLC
396 Springfield Avenue
Summit, NJ 07901
Attn: James M. Rice

To: Town:

Board of Selectmen
Town of Ware
126 Main St # C
Ware, MA 01082

Any such addresses for the giving of notices may be changed by giving written notice as provided above to the other Parties. Notice given by counsel to a Party shall be effective as notice from such Party.

11. Applicable Law. This Agreement will be made and interpreted in accordance with the laws and regulations of the Commonwealth of Massachusetts, which are incorporated herein by reference. The Parties each consent to the jurisdiction of the Massachusetts courts or other applicable agencies of the Commonwealth of Massachusetts regarding any and all matters, including interpretation or enforcement of this Agreement or any of its provisions. The Parties each agree that service of process may be affected by certified mail, return receipt requested at

the addresses indicated in Paragraph 10 of this Agreement (Notices) (or such other address a Party may provide from time to time pursuant to Paragraph 10). Venue for all court actions brought hereunder shall be the state courts located in Hampshire or Worcester County Massachusetts.

12. Good Faith. The Parties shall act in good faith to carry out and implement this Agreement and to resolve any disputes between them.

13. Force Majeure. The Parties recognize that there is the possibility during the term of this Agreement that all or a portion of the Property or Project may be damaged or destroyed or otherwise rendered unusable due to unforeseeable events beyond the reasonable control of the Parties. These events are referred to as "Force Majeure." As used herein, Force Majeure includes, without limitation, the following events:

- a. Acts of God, including floods, winds, storms, earthquake, fire or other natural calamity;
- b. Acts of War or other civil insurrection or terrorism; or
- c. Taking by eminent domain by any governmental entity of all or a portion of the Property or the Project.

If an event of Force Majeure occurs during the Term and as a result of such event of Force Majeure the Project is partially or wholly damaged or destroyed or otherwise rendered inoperable or unusable ("Damaged") but the Lease is not terminated, then for the period of time following the event of Force Majeure during which the Project is so Damaged, the Annual Payments hereunder will be eliminated or reduced accordingly. In addition and without limiting the foregoing, if an event of Force Majeure occurs during the term of this Agreement with respect to any portion of the Project that renders the Project unusable for the customary purpose of the production of electricity for a period of more than sixty (60) consecutive calendar days, then Developer may, at its election, notify the Town of the existence of this condition as well as of its decision whether or not to rebuild that portion of the Project so damaged or destroyed or taken. If Developer elects not to rebuild, then it may notify the Town in writing of its termination of this Agreement and the Project and Property will thereafter be assessed and taxed by the Town as though this Agreement does not exist.

14. Covenants/Warranties of Developer.

- a. During the term of the Agreement, Developer will not voluntarily do any of the following:
 - 1) Convey by sale, lease, or otherwise any interest in the leasehold premises or Property to any tax exempt entity or organization, including without limitation a charitable organization pursuant to G.L. c.59, §5, Clause Third or to any person or entity that is not a

"generation company" or "wholesale generation company" under G.L. c. 59, § 38H(b) or assign this Agreement to any person or entity that is not a "generation company" or "wholesale generation company" under G.L. c. 59, § 38H(b), or in a manner where such assignment would otherwise disqualify this Agreement under G.L. c. 59, § 38H (b);

- 2) Fail to pay the Town all amounts due hereunder when due in accordance with the terms of this Agreement;
- 3) Seek, for any reason, an abatement or reduction of any of the amounts assessed in accordance with the terms of this Agreement and Developer hereby waives during the full term of this Agreement any rights it may have otherwise had to seek such an abatement or reduction; or
- 4) Seek to amend or terminate this Agreement on account of the enactment of any new law or regulation or a change in any existing law or regulation the intent or effect of which is to fix the method for calculating PILOT payments for renewable energy facilities.

b. Developer represents and warrants:

- 1) It is a corporation or other business entity duly organized, validly existing and in good standing under the laws of the state in which it was formed, and if a foreign corporation, is registered with the Massachusetts Secretary of State, and has full power and authority to carry on its business as it is now being conducted.
- 2) This Agreement constitutes a legal, valid and binding obligation of Developer enforceable in accordance with its terms, except to the extent that the enforceability may be limited by applicable bankruptcy, insolvency or other laws affecting other enforcement of creditors' rights generally or by general equitable principles.
- 3) It has taken all necessary action to authorize and approve the execution and delivery of this Agreement.
- 4) None of the documents or information furnished by or on behalf of Developer to the Town in connection with negotiation and execution of this Agreement contains any untrue statement of a material fact or omits to state any material fact required to be stated therein, or necessary to ensure that the statements contained herein or therein, in the light of the circumstances in which they were made, are not misleading.

- 5) The person executing this Agreement on behalf of Developer has the full power and authority to bind it to each and every provision of this Agreement.
- 6) Developer is a "generation company" or "wholesale generation company" as those terms are used and defined in G.L. c.59, §38H(b) and G.L. c.164, §1.
- 7) Developer does not qualify for a manufacturing classification exemption pursuant to G.L. c. 59 §5 (16)(3).

15. Invalidity. The Parties understand and agree that this Agreement shall be void and that no portion of this Agreement shall be enforceable, if (a) this Agreement, or any material portion of this Agreement, is determined or declared by a court or agency of competent jurisdiction to be illegal, void, or unenforceable; (b) Developer is determined or declared to not be a "generation company" or "wholesale generation company" as those terms are used and/or defined in G.L. c.59 §38H (b), and G.L. c.164, §1; and/or (c) this Agreement has not been approved by Ware Town Meeting.

16. Termination by Town. Notwithstanding anything to the contrary in this Agreement, the Town may terminate this Agreement upon and effective after ten (10) days written notice to Developer if:

- a. The Developer fails to make payments required under this Agreement and such failure is not cured within thirty (30) days, unless the past due payment is received prior to the effective date of the termination, as set forth above;
- b. The Developer has filed, or has had filed against it, a petition in Bankruptcy, or is otherwise insolvent;
- c. The Project is permanently abandoned for six (6) consecutive months or more or the Capacity of the Project is reduced to .2 MW (DC) or less; and/or
- d. The Developer otherwise materially breaches this Agreement and fails to cure such breach within sixty (60) days following notice of such failure received by Developer from Town.

17. Miscellaneous.

- a. Subject to applicable laws and regulations, each Party will, from time to time hereafter, execute and deliver, or cause to be executed and delivered, such reasonable additional documents or instruments as the Party reasonably requests for the purpose of implementing or effectuating the provisions of this Agreement, including, without limitation, lender consent documents on customary terms and conditions requested by Developer and approved by the Town through its Board of Selectmen. The reasonable

costs of executing and delivering such documents or instruments shall be borne by the requesting Party.

b. This Agreement may be executed in several counterparts, each of which shall be an original, and all of which shall constitute but one and the same instrument.

c. The Parties agree that this is the entire, fully integrated Agreement between them with respect to payments in lieu of taxes for the Project, and that there are no third party beneficiaries to this Agreement.

18. Certification of Tax Compliance. Pursuant to G.L. c. 62C, § 49A, Developer by its duly authorized representative, certifies that it has have complied with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting of child support.

19. Provisions Required by Law: Each and every provision of law and clause required by federal, state or local law to be inserted in this Agreement shall be deemed to be inserted herein and the Agreement shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision or clause is not inserted, or is not correctly inserted, then upon the request of any party the Agreement shall forthwith be amended to make such insertion or correction. In any event, this agreement shall be read and enforced as if it contains all provisions and clauses required by applicable federal, local and Massachusetts law.

20. Compliance with PILOT Statute. The Town and Developer shall timely comply with any recordkeeping, filing or other requirements mandated by the Massachusetts Department of Revenue in connection with the Department's implementation of the PILOT Statute.

21. Recording. This Agreement will be recorded by the Developer in the Hampshire County Registry of Deeds promptly following its execution.

[Signature Page to Follow]

Executed under seal by the undersigned as of the day and year first written above, each of whom represents that it is fully and duly authorized to act on behalf of and bind its principals.

TOWN OF WARE
BY ITS BOARD OF SELECTMEN:

John A. Desmond
Michael F. Fenton
Alan Phillips
Nancy Tabat

DEVELOPER:

VH WEST BROOKFIELD, LLC

By:

James M. Rice
James M. Rice [Office, Certificate of Vote]
Authorized Signatory

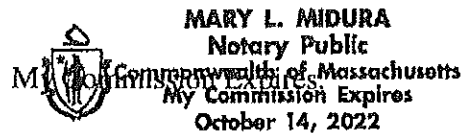
COMMONWEALTH OF MASSACHUSETTS

HAMPSHIRE, ss.

November 29, 2016

Then personally appeared the above-named [NANCY J. TALBOT], Selectman of the Town of Ware Board of Selectmen, who proved to me by satisfactory evidence of identification, being (check whichever applies): ☒ driver's license or other state or federal governmental document bearing a photographic image, ☐ oath or affirmation of a credible witness known to me who knows the above signatory, or ☐ my own personal knowledge of the identity of the signatory, to be the person whose name is signed above, and acknowledged the foregoing instrument to be his/her free act and deed for the purposes stated therein, before me.

Mary L. Midura
Notary Public



State of New Jersey
COMMONWEALTH OF MASSACHUSETTS ha

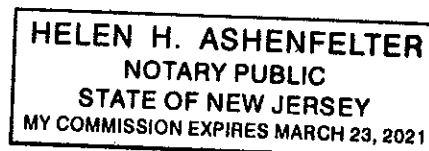
Morris, ss.

November 30, 2016

Then personally appeared the above-named [James M. Rice], Selectman of the Town of Ware Board of Selectmen, who proved to me by satisfactory evidence of identification, being (check whichever applies): ☐ driver's license or other state or federal governmental document bearing a photographic image, ☐ oath or affirmation of a credible witness known to me who knows the above signatory, or ☐ my own personal knowledge of the identity of the signatory, to be the person whose name is signed above, and acknowledged the foregoing instrument to be his/her free act and deed for the purposes stated therein, before me.

Helen H. Ashenfelter
Notary Public

My Commission Expires:



COMMONWEALTH OF MASSACHUSETTS

_____, ss.

November __, 2016

Then personally appeared the above-named [_____] , Selectman of the Town of Ware Board of Selectmen, who proved to me by satisfactory evidence of identification, being (check whichever applies): ☐ driver's license or other state or federal governmental document bearing a photographic image, ☐ oath or affirmation of a credible witness known to me who knows the above signatory, or ☐ my own personal knowledge of the identity of the signatory, to be the person whose name is signed above, and acknowledged the foregoing instrument to be his/her free act and deed for the purposes stated therein, before me.

Notary Public

NOTARY PUBLIC
STATE OF MASSACHUSETTS
My Commission Expires: 11/15/2017
0000 0000 0000

My Commission Expires:

STATE OF NEW JERSEY

_____, ss.

November __, 2016

Then personally appeared the above-named James M. Rice, Authorized Signatory for VH West Brookfield, LLC, who proved to me by satisfactory evidence of identification, being (check whichever applies): ☐ driver's license or other state or federal governmental document bearing a photographic image, ☐ oath or affirmation of a credible witness known to me who knows the above signatory, or ☐ my own personal knowledge of the identity of the signatory, to be the person whose name is signed above, and acknowledged the foregoing instrument to be his/her free act and deed for the purposes stated therein, before me.

Notary Public

My Commission Expires:

EXHIBIT A Description of

the Property

Approximately 18.11 acres of land shown on plan entitled "PLAN OF LAND Prepared For SEABOARD SOLAR HOLDINGS, LLC GILBERTVILLE ROAD WARE, MA.", prepared by Foresight Land Services, and filed in the Hampshire County Registry of Deeds in Plan Book 236, Page 84.

EXHIBIT B Description

of the Project

Solar Facility Size:	1.39 MW (DC)
Solar Facility Installation:	Ground mounted at a fixed tilt
Location:	Approximately 18.11 acres of land located at 38 Gilbertville Rd, Ware, MA 01082, which constitutes property owned by Landlord more particularly described on <u>Exhibit A</u> .
Solar Development Plan:	See map attached

EXHIBIT C

Schedule of Factors to Calculate Annual Payments in lieu of Taxes For Real and Personal Property Attributable to Project

<u>Contract Year</u>	<u>Factor</u>
1	\$ 14,000.00
2	\$ 14,280.00
3	\$ 14,565.60
4	\$ 14,856.91
5	\$ 15,154.05
6	\$ 15,457.13
7	\$ 15,766.27
8	\$ 16,081.60
9	\$ 16,403.23
10	\$ 16,731.30
11	\$ 17,065.92
12	\$ 15,542.18
13	\$ 17,407.24
14	\$ 18,110.49
15	\$ 18,472.70
16	\$ 18,842.16
17	\$ 19,219.00
18	\$ 19,603.38
19	\$ 19,995.45
20	\$ 20,395.36

EXHIBIT D

Preliminary Inventory

Item	Description	# Units
Photovoltaic Panels	Hanwha 330W	4,230
Inverters	Chint 1000V DC String Inverters for North America CPS-SC36-KTL	26
Transformers	1) 1MW Zig-Zag Grounding XFMR & 1) 1,000KVA Step Up XFMR	1 + 1
Racking	Magna Ground Mount Racking with Boysa.s Foundation	118 4x9 tables

H

ADDITIONAL RESOURCES

- SMART Regulation: <https://www.mass.gov/solar-massachusetts-renewable-target-smart>
- SMART Program Progress Updates: <http://masmartsolar.com/>
- Ineligible Lands under “SMART-ER” (for Category 2 & 3): <https://bit.ly/SMARTLanduse>
- Dual-Use Agriculture & Solar PV: Find more information on the UMass Clean Energy Extension website: <https://ag.umass.edu/clean-energy/current-initiatives/solar-pv-agriculture>
- Pollinator-Friendly Solar PV: Find more information about our certification program on our website: <https://ag.umass.edu/clean-energy/current-initiatives/pollinator-friendly-solar-pv-for-massachusetts>
- DOER Model Solar Zoning Bylaw: <https://www.mass.gov/files/documents/2016/08/nc/model-solar-zoning.pdf>
- MAPC Solar Permitting and Zoning Bylaw Guidance: <http://www.mapc.org/wp-content/uploads/2017/10/Solar-Permitting-and-Zoning-Bylaw-Guidance.pdf>
- Solar PV Information for Municipalities: UMass Clean Energy Extension is collecting links to resources for municipalities regarding solar PV siting and planning on its website: <https://ag.umass.edu/clean-energy/solar>
- Fire Safety Training for Battery Systems: <https://catalog.nfpa.org/Energy-Storage-and-Solar-Systems-Safety-Online-Training-P20882.aspx>

ENERGY STORAGE RESOURCES

National Fire Prevention Association - The 2018 NFPA 1 Fire Code is available for free viewing in read-only mode on the NFPA website. Unless already a NFPA member, you will need to create a free account and click on a URL received via e-mail to view the document. Energy storage systems are addressed in Chapter 52 of the code. <https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=1>

Fire Safety Training for Battery Systems - NFPA's self-paced online training teaches the fire service how to safely deal with emergency situations involving high voltage commercial and residential energy storage and solar PV systems. Students receive a certificate upon their successful completion of the program. <https://catalog.nfpa.org/Energy-Storage-and-Solar-Systems-Safety-Online-Training-P20882.aspx>

Massachusetts Comprehensive Fire Safety Code - State regulation 527 CMR 1.00 governs fire safety in Massachusetts, and addresses any state-specific modifications to the NFPA 1 Fire Code. <https://www.mass.gov/regulations/527-CMR-100-massachusetts-comprehensive-fire-safety-code>

Revisions to the Massachusetts Comprehensive Fire Safety Code - Revisions to 527 CMR 1.00 are posted on this website. An advisory from the State Fire Marshall details changes to the code effective October 18, 2019 which are relevant to energy storage systems. <https://www.mass.gov/service-details/massachusetts-fire-code>

Energy Storage Safety Collaborative - The website for the Energy Storage Safety Collaborative provides codes and standards, publications, and research updates regarding Department of Energy and National Laboratory work on energy storage safety. <https://www.sandia.gov/energystoragesafety-ssl>

Energy Storage Safety Guidelines - Guidelines developed in 2016 by the Energy Storage Integration Council for distribution-connected energy storage systems. Available from EPRI. <https://www.epri.com/research/products/000000003002008308>

Energy Storage System Guide for Compliance with Safety Codes and Standards - A report by two National Laboratories (Pacific Northwest and Sandia) providing a review of current gaps, and what should be included in energy storage system standards and safety codes. <https://www.sandia.gov/ess-ssl/publications/SAND2016-5977R.pdf>

Article ____ To see if the Town of Athol will vote to amend the Athol Zoning Bylaws, Article III, by deleting the existing Section 3.24, Ground-Mounted Solar Photovoltaic Installations, in its entirety and replacing with the following new text in its place.

3.24.1 Purpose

The purpose and intent of this bylaw is to provide standards for the placement, design, construction, operation, monitoring, modification and removal of ground-mounted solar photovoltaic installations which address public safety, minimize impacts on scenic, natural and historic resources and to provide adequate financial assurance for the eventual decommissioning of such installations. The provisions set forth in this section shall apply to the placement, design, construction, operation, maintenance and/or repair, and environmental effects of ground-mounted solar photovoltaic installations.

This bylaw aims to balance the rights of landowners to use their land with the corresponding right of abutting and neighboring landowners to live without undue disturbance from noise, traffic, lighting, signage, smoke, fumes, dust, odor, glare, or storm water runoff. To maintain the character of the Town of Athol as a small New England village, this bylaw aims to retain the natural beauty, aesthetic appeal, historic value and scenic attraction of the Town for both residents and tourists.

3.24.2 Applicability

This bylaw applies to commercial and residential ground-mounted solar photovoltaic installations greater than 10,000 square feet proposed to be constructed after the effective date of this bylaw. This bylaw also pertains to physical modifications that materially alter the type, configuration or size of the installation. Square footage shall be calculated as follows:

- i. The area within the security fence if a fence is provided, or
- ii. All land area within a polygon (a plane shape-two dimensional-with straight sides) around the entire installation including all solar panels, all appurtenances including but not limited to buildings, storage areas, construction staging and lay-down areas, and transformers and poles, and parking along with a 15 foot perimeter area around all of the above or
- iii. All areas of disturbed land, whichever is greater.

As defined in 3.24.2:

- a) This bylaw does not pertain to ground-mounted solar photovoltaic installations installed on residential, commercial or industrial buildings. Those installations are subject to the State Building Code.
- b) Ground-mounted solar photovoltaic installations less than or equal to 10,000 square feet shall only need a building permit and meet property setback requirements.
- c) This bylaw does not pertain to solar carport canopies over existing rows of parking spaces. Such installations are considered Accessory Uses under Section 2.3 and are subject to the State Building Code.
- d) This bylaw shall not apply to any ground-mounted solar photovoltaic installation being developed with the direct involvement of the Town of Athol at the former municipal landfill on West Royalston Road in Athol, MA.

3.24.3 Special Permit Granting Authority

applicable. The BPCD shall act as the Special Permit Granting Authority for such site plans with the entirety of the Town of Athol, including the Major Commercial Overlay District.

3.24.4.5 Professional Engineer

All plans and maps shall be prepared, stamped, and signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts.

3.24.4.6 Required Documents to be deemed a complete application.

Pursuant to the site plan review process, the applicant shall also provide the following documents:

(a) A site plan showing:

- i. Property lines and physical features, including both existing and proposed roads, for the project site at a scale of 1 inch equals 40 feet or such scale as may be approved by the Special Permit Granting Authority on standard 24" by 36" sheets and continuation on 8.5 " by 11" sheets as necessary for narrative;
- ii. Blueprints or drawings of the solar photovoltaic installation showing the proposed layout of the system;
- iii. One or three line electrical diagram detailing the solar photovoltaic installation, associated components, and electrical interconnection methods, with all National Electrical Code compliant disconnects and overcurrent devices;
- iv. Proposed wattage of the solar photovoltaic installation solar power generation indicated in both dc (direct current) and ac (alternating current); a notation shall be included explaining the difference, e.g. loss in conversion from dc to ac;
- v. Technical specification of the major system components to be used, including the PV panels, mounting system, and inverter and battery storage;
- vi. Name, address, and contact information for proposed system installer (owner);
- vii. Name, address, phone number and signature of the applicant, as well as all co-proponents or property owners;
- viii. Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures;
- ix. All existing lot lines, with size of each existing lot in acres or square feet, abutting land uses and location of structures within 500 feet of the site;
- x. Names and addresses of all record owners within 500 hundred feet of all property lines along with a map showing the same;
- xi. Locations and details of all security measures for the site;
- xii. Documentation of all soils types, as identified on the United States Natural Resources Conservation Service soils survey, on all land involved with the project;
- xiii. Provision of water including that needed for fire protection;
- xiv. Location of all existing trail networks and woods roads, stonewalls, and historic features;
- xv. All storm water plans as required in Section 3.24.5.11;
- xvi. A calculation of slopes throughout the site as a percentage over consecutive 100-foot distances;
- xvii. A buffer, screening and landscape plan as required in Section 3.24.3;
- xviii. Location and approximate height of tree cover on the site at the time of application filing.
- xix. Location, type of fixture, and height of any proposed lighting as well as documentation of Dark Sky Standards in accordance with Section 3.24.5.7;

xx. Location of equipment and construction staging area, and

- (b) The name, contact information and signature of any agents representing the applicant;
- (c) A glare analysis and proposed mitigation, if any, to minimize the impact on affected properties and roads, as well as the Orange airport in regards to the proposed solar panels as required in Section 3.24.5.5;
- (d) Names and addresses of all record owners within 500 hundred feet of all property lines along with a map showing the same;
- (e) Documentation by an acoustical engineer of the noise levels projected to be generated by both the installation and operation of the facilities as required in Section 3.24.5.13;
- (f) Documentation of all soils types, as identified on the United States Natural Resources Conservation Service soils survey, on all land involved with the project;
- (g) Documentation of actual or prospective access and control of the project site as required in Section 3.24.7;
- (h) Visual impact analysis as required in Section 3.24.5.5;
- (i) A complete list of chemicals, fuels, and any other hazardous materials to be used in both the construction and operation phase;
- (j) A calculation of earthwork operations listing the amount of soil and rock to be imported or exported from the site. If any material is to be imported, such material shall clean and without contamination by hazardous substances or invasive species and must be obtained from a source(s) approved by the Athol DPW.
- (k) Mitigation Plan as required in Section 3.24.5.4;
- (l) A list identifying all off-site electrical system improvements necessary to the electrical grid to accommodate the power from the proposed installation and identification of what entity is paying for such improvements.

3.24.4.7 Waiver of Submittal Requirements: Upon the written request of the applicant with justification, the Special Permit Granting Authority may waive any of its submission requirements under unique site conditions. In addition, the Special Permit Granting Authority may request any additional data needed to render its decision.

3.24.5 Design Standards

1. Lot and Siting Requirements

- i. Ground-mounted commercial solar photovoltaic array installations shall be permitted on parcels larger than 10 acres located within the RC zoning district and shall have a minimum lot frontage of 160 feet.
- ii. Project generation size shall not exceed 5MW AC, nor shall the installation exceed 20 acres of fenced area, if fenced. If not fenced, the 20 acre area shall be calculated as the area within a polygon around the entire installation including all solar arrays, all appurtenances including but not limited to buildings, storage areas, construction staging and lay-down areas, transformers and poles along with a 15 foot perimeter area around all of the above
- iii. No portion of a ground-mounted commercial solar photovoltaic array installation:

- a. Shall be constructed on slopes greater than 10%, (measured over 100-foot intervals.) Cutting and filling to reduce natural slopes shall be prohibited except on short hollows, depressions or high spots. A waiver to increase the slope from 10% to 12% may be requested.
- b. Shall be located on any parcel that contains 50% of Priority Habitat, Core Habitat or Critical Natural Landscape as defined in 225 CMR 20.00 Solar Massachusetts Renewable Target (SMART) Program, nor shall any trees be removed, or construction of structures, access roads or transmission lines may be placed in these designated areas.
- iv. Ground-mounted solar photovoltaic installations shall be permitted only on previously disturbed areas* with an option of adding additional area through land clearing.

If less than 20 acres of contiguous or nearly contiguous previously disturbed area is not present on the lot, then land clearing of up to 5 acres of non-previously disturbed area is allowed for the installation. The acreage for clearing of non-previously disturbed area may be increased to a maximum of 10 acres with a proper waiver request from the developer and with the approval of the waiver request by the Board as authorized under Section 3.24.17. At least 50% of the area of any such installation, with or without a waiver, shall be located on previously disturbed areas.

*Previously disturbed areas shall mean land that meets any one of the following conditions at the time of adoption of these bylaws:

1. Land where the original grade and native material has been altered and/or removed for previous development.
2. Land where ALL existing vegetation has been removed for previous development.
3. Land utilized for sand, gravel or rock excavation.
4. Land that has been utilized for agricultural purposes.

Land that has been utilized for Silviculture*, whether under the Massachusetts Forest Cutting Practices Act (FCPA) or not, or for any of the activities exempt under the FCPA, shall not be considered previously disturbed areas.

*Definition from the UD Forest Service: Silviculture is the art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society such as wildlife habitat, timber, water resources, restoration, and recreation on a sustainable basis

- v. Location of the entrance road and all utility poles shall be located within the lot's frontage taking into consideration site lines for vehicular traffic and to lessen any visual impacts on abutters.

2. Setbacks and Height

- i. For all zoning districts except for the Rural Single-Family Residential (RC) zoning district, ground-mounted solar photovoltaic installations must observe all yard requirements applicable to the principal structure as defined in Section 2.6, Intensity of Use Schedule. The Special Permit Granting Authority may increase these setbacks in these districts if they determine it to be appropriate.

- ii. For the RC zone, setbacks shall be:

- 200 feet for front yard*
- 200 feet for side and rear yard*
- 200 feet from any perennial stream**
- 200 feet from any water body greater than 1 acre and less than 5 acres**
- 400 feet from the shoreline of any water body greater than 5 acres**

* The Special Permit Granting Authority may reduce the minimum setback distance for front, side and rear yards only in the RC District to a minimum of 75 feet as authorized per Section 3.24.17. In addition to the specifics of Section 3.24.17, the applicant shall also be required to submit written consent from all affected abutter(s) for any reduction in setbacks.

However, reduction of the setback on any frontage with a public road is not permitted whether the yard is a front, side or rear yard. The setback between properties of a single owner subdivided per Section 3.24.5.4.4 may be waived to no less than the minimum for existing setback requirements of the RC District per Section 2.6.

**The setbacks for perennial streams and water bodies between 1 and 5 acres are not subject to any waiver of distances under Section 3.24.13. Setbacks for water bodies greater than 5 acres are only allowed to be reduced through a waiver to a minimum distance of 300 feet as long as a natural wooded buffer is maintained, detailed stormwater plans show no further impact to abutting properties versus the 400-foot setback distance, water quality of runoff is not reduced and wildlife and fauna movement is not restricted with the reduced setback. No access roads or transmission lines may be constructed in the setbacks to any water body greater than 1 acre.

- iii. All ground mounted photovoltaic panels in a residential zone shall be limited to a height of 10 feet. For any other zone, the height shall be limited to 15 feet. Other appurtenance structures shall be limited to a height of 15 feet in all zones.

3. Vegetated Buffer, Screening and Landscaping

- 1. Ground-mounted solar photovoltaic installations shall be effectively screened year-round:
 - i. from all abutting properties in all residential zones;
 - ii. from all abutting properties in residential use in all non-residential zones;
 - iii. and from public and private ways in all residential districts.

Except for vehicular and pedestrian passageways and permitted signs, setback areas shall be modified only for additional screening. Where existing vegetation in the setbacks is insufficient to achieve year-round screening, additional screening shall be provided including, but not limited to, planting of dense vegetative screening, fencing, berms, natural ground elevations, land contouring, and/or placement of the solar panels and appurtenant structures on the site, all depending on site specific conditions.

Tree cutting within the required setback area shall not be permitted if it would reduce to any degree the effectiveness of the year-round screening.

- 2. If additional plantings are required for screening, a planting plan shall be submitted:

- i. Showing the types, sizes and locations of material to be used which shall be subject to the approval of the Special Permit Granting Authority.
 - ii. Plantings shall be a minimum of six (6) feet in height at planting and staggered so as to fill the setback area and keep the arrays from view year round.
 - iii. Using a diversity of plant species native to New England for any screens and vegetative erosion controls. Use of exotic plants, as identified by the most recent version of the “Massachusetts Prohibited Plant List” maintained by the Massachusetts Department of Agricultural Resources, is prohibited. Cultivars of native plants are acceptable.
 - iv. At least 75% of the plantings shall consist of evergreens and shall be evenly spaced throughout the area of the setback area.
 3. Planting of the vegetative screening shall be completed prior to connection of the installation. Plants shall be maintained and replaced if unhealthy by the owner/operator of the installation for the life of the installation.
 4. The open area of the site shall be seeded with a pollinator mix and maintained as bird and insect habitat. Mowing is to be done as little as possible to retain a natural functioning of the landscape. Alternative vegetation or cover options may be proposed by the applicant in consideration of soil type and quality, subject to the approval of the Special Permit Granting Authority. Gravel areas that are well drained and stable do not require the addition of topsoil. Topsoil shall not be imported into any project sites unless there is a demonstrated engineering need and must be approved by the Special Permit Granting Authority prior to any introduction. The need to introduce topsoil may be grounds for permit denial.
 5. Clearing of natural vegetation shall be limited to what is necessary for the construction, operation, and maintenance of the installation. Existing root structures, flat gravel areas, and topsoil shall be maintained to the maximum extent practicable.
 6. Vegetation Management: Herbicides, pesticides, or chemical fertilizers shall not be used to manage vegetation at the ground mounted solar photovoltaic installation.
 7. Ground surface areas beneath solar arrays and setback areas shall be pervious to maximize on-site infiltration of stormwater.
4. Mitigation
1. The Special Permit Granting Authority shall discuss construction phasing with the designer of the installation as a means of mitigating erosion and sedimentation.
 2. Habitat Fragmentation. A ground-mounted solar photovoltaic installation shall, to the greatest extent practicable, be clustered and located in or adjacent to areas of the site where the land has already been cleared of vegetation to avoid habitat fragmentation.

3. Invasive Species. The introduction of invasive species shall be prevented to the greatest extent practicable, during any construction or removal of a solar photovoltaic installation, through the use of current best practices.

4. A ground-mounted solar photovoltaic installation shall be considered the principal use of the parcel. Any parcel with an existing residence or other building may be approved for a solar installation with the provision that the residence or building be subdivided from the larger parcel prior to any construction

of the solar installation. The parcel with the ground-mounted solar photovoltaic installation may not be subdivided for the purpose of development of the divided land until such time as the installation is decommissioned.

5. Visual Impacts and Glare

1. The design of the ground-mounted solar photovoltaic installations shall prevent reflected solar radiation or glare from becoming a public nuisance or hazard to adjacent buildings, roadways, or properties. Design efforts may include, but not be limited to, deliberate placement and arrangement on the site, anti-reflective materials, solar glare modeling, and screening in addition to required landscaping.

2. Any ground-mounted solar photovoltaic array installation proposed within a 5-mile radius of the Orange Airport shall be analyzed for glare utilizing any glare analysis compatible with FAA glare guidelines. [One such software package is Forge Solar, PV Planning and Glare Analysis.]

3. Ground-mounted solar photovoltaic installations shall not be approved unless the system design provides screening and buffers to protect scenic vistas and view sheds from residential uses, public streets and any waterways or water bodies.

4. A visual impact assessment shall be conducted that follows the protocols of the “Guidelines for Landscape and Visual Impact Assessment (Third Addition). Such assessment shall produce a map showing all areas within a 5-mile radius of the installation where the installation can be seen and where it cannot be seen.

With input from the Planning Director, the applicant shall utilize additional tools to assess the visual impacts in critical areas of concern such as renderings, line-of-sight studies and/or two or three dimensional visualizations i.e. Photomontage, video montage, animation produced through Spatial Information Systems (SIS) and Geographic Information Systems (GIS).

5. All results of the visual impact assessment shall be taken into account in the design of the installation. When reviewing for compliance with section 3.24.3 Vegetated Buffer, Screening and Landscaping and scenic vistas in Section 3.24.5.3, the Special Permit Authority shall make a definitive judgment that the intent has been achieved.

3.24.5.6 Appurtenant Structures:

All appurtenant structures to ground-mounted solar photovoltaic installations shall be subject to reasonable regulations concerning the bulk and height of structures, lot area, setbacks, and open space, parking and building coverage requirements.

All such appurtenant structures, including but not limited to, equipment shelters, storage facilities, transformers, and substations, shall be architecturally compatible with each other. Whenever reasonable, structures shall be shielded from view by vegetation approved by the Special Permit Granting Authority and/or joined or clustered to avoid adverse visual impacts.

3.24.5.7 Lighting:

Lighting of ground-mounted solar photovoltaic installations shall be consistent with local, state and federal law.

Lighting of other parts of the installation, such as appurtenant structures, shall be limited to that required for safety and operational purposes, and shall be reasonably shielded from abutting properties. All lighting shall comply with International Dark Sky Standards FSA Certification Requirements. There shall be no illumination without personnel on site.

3.24.5.8 Signs:

The following signs shall be required:

- i. one that identifies the owner, the street address, provides a 24-hour emergency contact phone
- ii. educational signs providing information about solar photovoltaic panels and the benefits of renewable energy.

Signs shall comply with Section 3.9, Sign Regulations.

Ground-mounted solar photovoltaic installations shall not be used for displaying any advertising except for reasonable identification of the manufacturer or operator of the solar photovoltaic installation.

3.24.5.9 Utility Connections:

Utility connections, as determined by the Special Permit Granting Authority, shall be underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider.

3.24.5.10 Fencing:

The need for fencing shall be determined by the applicant unless such fencing is needed to comply with Section 3.24.3 Vegetated Buffer, Screening and Landscaping, and/or as required per the National Electrical Code. If installed, such fencing shall be no more than 10 feet tall, shall be placed 6 inches off the ground to allow migration of wildlife, and shall have an Emergency Access System padlock or box at each gate.

3.24.5.11 Stormwater and Erosion Control

1. Proposed stormwater management plans detailed below shall conform to the more stringent of any conditions or standards of this subsection and the Department of Environmental Protection's Massachusetts Stormwater Handbook, as amended.

2. All stormwater infrastructure shall be owned and maintained by the owner of the installation and shall be located on the same parcel as the solar installation.
3. All post-development stormwater, up to and including a 50-year return frequency 24-hour storm, shall be retained on the parcel site and infiltrated into the soil thru low impact development, retention and infiltration basins. At no time may stormwater be carried off site.

Emergency overflows for storms in excess of the 50-year return frequency may be permitted provided it is demonstrated that no flooding or damage would be caused by the overflow. Attenuation of the discharge may be required as needed as determined by the Special Permit Granting Authority.

4. All pipes, catch basins and other materials utilized in the stormwater facilities shall be approved by the Athol Superintendent of Public Works, or his designee.

5. Stormwater Management Plan

- i. The Stormwater Management Plan (four paper copies and one electronic copy in PDF format required) with the permit application shall contain sufficient information for the Special Permitting Granting Authority to evaluate the environmental impact and effectiveness of the measures proposed for retaining stormwater on the parcel site.
- ii. The Stormwater Management Plan shall fully describe the project in drawings, narrative and calculations. It shall include:
 - a. The site's existing and proposed topography with contours at 2-foot intervals;
 - b. A description and delineation of existing stormwater conveyances, impoundments, environmental resources on or adjacent to the site into which stormwater could flow;
 - c. A delineation of 100-year flood plains, if applicable;
 - d. Estimated seasonal high groundwater elevation in areas to be used for stormwater retention, detention, or infiltration;
 - e. The existing and proposed vegetation and ground surfaces with areas and runoff coefficients for each;
 - f. Calculations for the 2-year, 10 year and 50 year return period utilizing NCRS TR 55 Handbook. Pipe sizes, depth of flow, capacities and velocities shall be included;
 - g. All pipes shall be a minimum 12-inch diameter.
 - h. A drainage area map showing pre- and post-construction watershed boundaries, area and stormwater flow paths at a scale that enables verification of supporting calculations;
 - i. A recharge area analysis that calculates pre-and post-project annual groundwater recharge rates on the parcel;
 - j. A description and drawings of all components of the proposed stormwater management system;
 - k. Hydrologic and hydraulic design calculations for the pre-development and post- development conditions for the design storms specified in the Massachusetts Stormwater Handbook;
 - l. Soils information from test pits performed at the location of proposed Stormwater Management facilities, including soil descriptions, depth to seasonal high groundwater and depth to bedrock. Soils information will be based on site test pits logged by a Massachusetts Certified Soil Evaluator.
6. To ensure proper containment and stabilization of the site during the construction phase, a Stormwater Pollution Plan to control construction-related impacts, including erosion, sedimentation,

and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented. Such plan shall be developed to document compliance with Standard 8 of the Massachusetts Stormwater Handbook.

7. A Long -Term Stormwater Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed. Such plan shall be developed to document compliance with Standard 9 of the Massachusetts Stormwater Handbook.

The Long-Term Stormwater Operation and Maintenance Plan shall at a minimum include:

- i. Stormwater management system(s) owners;
 - ii. The party or parties responsible for operation and maintenance of all aspects of the stormwater management system;
 - iii. The routine and non-routine maintenance tasks to be undertaken after construction is complete and a schedule for implementing those tasks;
 - iv. A plan that is drawn to scale and shows the location of all stormwater BMPs;
 - v. A schedule for routine inspections as well as a description of storms that would trigger immediate inspections following the storm;
 - vi. An inspection and maintenance log form
 - vii. An estimated stormwater operations and maintenance budget.
 - viii. Permission from the operator to allow agents of the Town of Athol to enter and inspect the premises to evaluate and ensure that the responsibility party complies with the Long-Term Stormwater Operation and Maintenance Plan requirements for each BMP.
8. During times of construction and post-construction where stormwater generated from the project area may inadvertently enter the public way, the developer (owner) shall be responsible for direct costs incurred by the town, including but not limited to stormwater related clean up, sanding, salting, street sweeping or other necessary management when required for the protection of public health and safety.

12. Hazardous Materials:

Hazardous materials stored, used, or generated on site shall not exceed the amount for a Very Small Quantity Generator of Hazardous Waste as defined by the DEP pursuant to Mass DEP regulations 310 CMR 30.000 and shall meet all requirements of the DEP including storage of hazardous materials in a building with an impervious floor that is not adjacent to any floor drains to prevent discharge to the outdoor environment.

If any hazardous materials, including, but not limited to, lithium ion (storage batteries) are used within the solar electric equipment, then impervious containment areas capable of controlling and containing any release of hazardous materials to the environment and to prevent potential contamination of groundwater are required. A list of any hazardous materials proposed to be located on the site and a plan to prevent their release shall be provided to the Special Permit Granting Authority and Fire Chief.

13. Noise

Noise generated by ground-mounted solar photovoltaic installations, cooling fans, inverters, associated equipment and machinery shall conform at a minimum to applicable state and local noise regulations,

including the DEP's Division of Air Quality noise regulations, 310 CMR 7.10 and 3.8.1.1 of the Athol Zoning Bylaw. Noise reduction shall be considered and incorporated as needed during the design phase of the installation including the location of the noise generator, shielding, noise cancellation, filtering, and noise suppression.

3.24.6. Site Plan Review Criteria: In addition to the criteria under Section 3.18.8, the Special Permit Granting Authority shall consider the following matters during Site Plan Review and shall either approve or deny a special permit upon its determination that such matters have or have not been satisfactorily addressed:

1. The right of abutting and neighboring landowners to live without undue disturbance from noise, traffic, lighting, fumes, dust, odor, glare, or stormwater runoff;
2. The adequacy of methods to store, handle, or dispose of wastes, including hazardous materials, to protect air, groundwater, and surface water pollution;
3. The protection of historical and natural environmental features on the site under review and in adjacent areas;
4. The adequacy of stormwater management systems to address non-point-source pollution.
5. Minimization of erosion of soil both during and after construction.
6. In the case of a residential zone location, the visual impact of the installation on its immediate abutters and the nearby neighborhood have been effectively neutralized through its location on the lot, appropriate design, landscaping and effective screening.
7. The location of the site and the system design provides effective screening and buffers to protect scenic vistas and view sheds from residential uses, public streets, recreational areas and any waterways or water bodies, and
8. The rural character of the general location has been maintained.

3.24.7 Site Control: The applicant shall submit documentation of actual or committed prospective access and control of the project site to allow for construction and the operation of the proposed ground-mounted solar photovoltaic installation.

3.24.8 Operation and Maintenance Plan: The installation owner or operator shall maintain the facility in good condition. The applicant shall submit a plan for the operation and maintenance of the ground-mounted solar photovoltaic installation along with a signed agreement with a maintenance company. This plan shall include measures for maintaining year-round safe access for emergency vehicle, snow plowing, storm water controls, and general procedures and a yearly schedule for the operation and maintenance of the facilities including fencing, and maintenance of landscaping.

3.24.9 Utility Notification: The applicant shall submit evidence satisfactory to the Special Permit Granting Authority that the utility company operating the electrical grid has been informed in writing of the intent to install a ground-mounted solar photovoltaic installation and intends to file an Interconnect Agreement in the future and that the utility company has responded in writing acknowledging the plan. Any off-grid system shall be exempt from this requirement.

3.24.10 Emergency Services: The applicant shall provide a copy of the project summary, operation and maintenance plan, electrical schematic, and site plan to the Athol Fire and Police Departments. The applicant and the installation operator shall cooperate with local and regional emergency services in developing an emergency response plan, which will ensure that emergency personnel have immediate, 24-hour access to the facility.

All means of shutting down the solar installation shall be clearly marked on the plan. The operator of the installation shall identify an official representative for public inquiries throughout the life of the installation.

The operation and maintenance plan required in Section 3.24.8 shall be periodically jointly reviewed and updated as necessary by the operator of the installation and the Athol Fire and Police Departments at a frequency to be determined by the Athol Fire Department. Safety personnel may request at any time that the operator provide onsite training in accessing and shutting down the operation of the installation.

The operator shall identify a qualified contact person who will provide assistance to local officials during an emergency. The operator shall update the contact information whenever there is a change in the contact person.

3.24.11 Annual Reporting: The owner or operator of a solar installation shall submit an annual report demonstrating and certifying compliance with the Operation and Maintenance Plan, the requirements of this bylaw, and approvals granted hereunder, including but not limited to continued management and maintenance of vegetation, compliance with the approved plans and any permit conditions, continuation of liability insurance, and adequacy of road access and functionality of stormwater management system. The annual report shall also provide information on the maintenance completed during the course of the year and the amount of electricity generated by the facility. The report shall be submitted to the Board of Selectmen, Special Permit Granting Authority, Fire Chief, and Conservation Commission (if a wetlands permit was issued) no later than 45 days after the end of the calendar year.

3.24.12 Modifications: All material modifications to the installation to be made after the issuance of the initial required building permit shall require approval of the Special Permit Granting Authority through a permit modification.

3.24.13 Discontinuance and Removal: Absent notice of a proposed date of decommissioning or written notice of extenuating circumstances, any ground-mounted solar photovoltaic installation not used for a period of one continuous year or more without written permission from the Special Permit Granting Authority, or is operating at less than 25% of its nameplate capacity shall be considered to be discontinued and shall be removed by the owner.

Upon written request from the Building Inspector addressed to the contact address provided and maintained by the owner or operator as required, the owner or operator shall provide evidence to the Building Inspector demonstrating continued use of the installation. Failure to provide such evidence within thirty days of such written request shall be conclusive evidence that the installation has been discontinued.

The owner or operator or landowner shall physically remove the installation no more than 180 days after the date of discontinued operation. The owner or operator or landowner shall notify the Special Permit Granting Authority by certified mail of the proposed date of discontinued operations and submit plans for removal. Removal shall consist of:

1. Physical removal of all parts of and appurtenances of the installation including solar arrays, structures, equipment, security barriers and transmission lines.
2. Recycling of all possible materials and disposal of remaining solid and hazardous wastes in accordance with state and federal waste disposal regulations applicable at the time of disposal.
3. Stabilization and revegetation of the site as necessary to minimize erosion and prevent impacts to wetlands, water courses or water bodies. The Special Permit Granting Authority may allow the owner or operator or landowner to leave landscaping or designated below grade foundations (provided they are filled in) in order to minimize erosion and disruption of existing vegetation. This requirement may be waived if the landowner submits a plan for re-use of the site.
4. Any portion of a site that was deforested for the installation shall be restored so as to encourage native tree growth, including the planting of seedlings, if necessary to establish growth.

As a condition of the Special Permit approval, the applicant and the landowner shall agree to allow entry to remove an abandoned or decommissioned installation. If the owner or operator or landowner fails to remove the installation in accordance with the requirements of this section, the Town of Athol shall have the right, to the extent it is otherwise duly authorized by law, to enter the property and physically remove the installation at a rate of 1.3 times the actual costs incurred. The Town of Athol shall use the financial surety as stipulated in the Financial Surety Section 3.24.14.

3.24.14 Financial Surety: The applicant of ground-mounted solar photovoltaic installations shall provide surety in the form of cash, certified bank check, escrow account or bond held by and for the Town of Athol to cover the cost of removal and stabilization of the site in the event the town must remove the installation and remediate the landscape, in an amount and form determined to be reasonable by the Special Permit Granting Authority, but in no event to exceed more than 130 percent of the cost of removal and stabilization costs as well as any compliance with the additional requirements set forth herein.

This surety will be due and payable at the issuance of the building permit. Proof of payment in the form of a receipt from the Town Treasurer will be shown to the Building Inspector before the permits are issued. Such surety will not be required for municipally- or state-owned facilities. The project applicant shall submit a fully inclusive estimate of the costs associated with removal and stabilization prepared by a licensed professional engineer. Such estimate shall be reviewed by the Town of Athol and adjusted as needed to reflect the opinion of the Town as to fair costs. The amount shall include a mechanism for calculating increased removal costs due to inflation.

As a condition of approval, an applicant shall bind itself to grant the necessary license or easement to the Town to allow entry to remove the structures and stabilize the site. The Town shall have the right but not the obligation to remove the facility.

3.24.15 Taxes or Payment in Lieu of Taxes: If the project would otherwise be exempt from the payment of personal or real property taxes, the applicant shall enter into a tax agreement or a payment in lieu of taxes (PILOT) agreement with the Town of Athol that provides an equivalent amount of tax revenue to the town as determined by the Board of Assessors. Any tax-related agreement or PILOT shall be approved by the Board of Assessors prior to the issuance of the Building Permit.

3.24.16 Costs of Outside Expertise: The Special Permit Granting Authority may hire, at the expense of the applicant, consultants to review the plans submitted if it determines that independent expert review is appropriate for the interest of the neighborhood and/or the town. The applicant shall pay the

estimated cost of said expert(s), including all legal fees and publication fees, to the Town prior to any review being undertaken. No Building Permit shall be approved until the total costs of said review(s) have been paid by the applicant.

3.24.17 Waiver of Design Standards

1. The Special Permit Granting Authority may waive or reduce strict compliance with any requirement of the Design Standards of this bylaw (unless noted otherwise in the bylaw), or any rules and regulations promulgated hereunder, where:
 - a. such action is allowed by federal, state or local statutes and/or regulations;
 - b. it is fully within the public interest;
 - c. it is not inconsistent with the purpose and intent of this bylaw and the purposes and intent of the bylaw can still be met with the waiver or reduction due to special circumstances of the site
 - d. and the full objectives of the bylaws can be met in an alternative manner.
2. The applicant shall submit a written request for any requested waiver at the time of the initial application. Such request shall be accompanied by an explanation or documentation supporting the waiver request and demonstrating that:
 - a. strict application of the bylaws does not further the purposes or objectives of this bylaw,
 - b. due to special circumstances of the site that the objectives of the bylaws can be met in an alternative manner and,
 - c. such a waiver or reduction of the requirements will not derogate from the intent or purpose of the bylaw.
3. All waiver requests shall be discussed during a required a public hearing duly noted in a public agenda and shall require a two-thirds vote in favor to be approved. If the Special Permit Granting Authority deems additional time or information is required in the review of the waiver request, the Special Permit Granting Authority may continue the request for the waiver to a subsequent BPCD meeting.

3.24.18 Rules and Regulations

The Special Permit Granting Authority may adopt, and from time to time amend, Rules and Regulations consistent with the provisions of this bylaw and G.L. c. 40A and other provisions of the General Laws, including the Subdivision Rules and Regulations of Town of Athol, Massachusetts, and shall file a copy of said Rules and Regulations with the Town Clerk. Said Rules and Regulations may provide for an application fee schedule for ground-mounted solar photovoltaic installation application submittals and methods for calculating the financial surety required under Section 3.24.14.

3.24.19 Ownership Changes

If the owner of the ground-mounted solar photovoltaic installation changes or the owner of the property changes, the special permit shall remain in effect, provided that the successor owner or operator assumes in writing all of the obligations of the special permit, site plan approval, and decommissioning plan. A new owner or operator of the ground-mounted solar photovoltaic installation shall notify the Special Permit Granting Authority and the Building Inspector/Zoning Enforcement Officer of such change in ownership or operator within thirty (30) days of the ownership change.

Model Zoning for the Regulation of Solar Energy Systems¹
Department of Energy Resources
Massachusetts Executive Office of Energy and Environmental Affairs
December 2014

This model zoning and accompanying Guidance were prepared to assist Massachusetts cities and towns in establishing reasonable standards to facilitate development of solar energy systems. These systems include small-, medium- and large-scale as well as both ground-mounted and roof-mounted installations.² The model zoning language provided here is not intended for adoption precisely as it is written. Communities will need to carefully consider how this language may be modified to suit local conditions and where it should be inserted into an existing Zoning Bylaw/Ordinance. Further, it is highly recommended that any language adapted from this model be reviewed by municipal counsel prior to adoption.

As small-, medium-, and large-scale ground-mounted and roof-mounted solar energy systems become more prevalent in Massachusetts, many communities are attempting to regulate the installation of these systems through their Zoning Bylaw/Ordinance. Developing these regulations has been particularly challenging for a number of reasons. Most notably, the Massachusetts General Laws contains several provisions that specifically address the ability of local governments to regulate solar energy systems and/or to protect solar access from development or vegetation (shading) on adjacent properties. While the language within Chapter 40A Section 3 states that a local government may not prohibit these uses, it does say they cannot be “unreasonably regulated” without providing guidance on what that particular phrase means. The Solar Energy Systems Policy Guidance, which accompanies this model zoning and succeeding sections of this document provide more explanation regarding the implications of the statutes on this issue and its significance to local zoning.

Unlike model bylaws/ordinances typically developed by the Commonwealth, the regulatory language provided here is not packaged as a “stand-alone” section of a Zoning Bylaw/Ordinance. With ground-mounted and roof-mounted solar energy systems, the statutory framework and “accessory” nature of some of these installations lend themselves to a different approach. This model zoning therefore assumes that municipalities will have many “typical” sections within their Zoning Bylaw/Ordinance and that several of these sections would be amended to address this issue. For the purposes of this model zoning, the Bylaw/Ordinance sections that are amended include:

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² This material was prepared by the Horsley Witten Group.

*The Definitions Section;
Allowable Uses;
Dimensional Requirements; and
Site Plan Review.*

There is also further discussion intended to help communities regulate these systems in the context of a Local Historic District.

Definitions

Commentary: Within a Zoning Bylaw/Ordinance, the Definitions Section usually stands alone. Definitions are also sometimes included as a sub-section within other sections of the Zoning Bylaw/Ordinance. For example, terms related to the protection of water resources may be included in a water resource protection overlay district section. We recommend that the following terms be added to the general Definitions Section of the Zoning Bylaw/Ordinance.

Photovoltaic System (also referred to as Photovoltaic Installation): An active solar energy system that converts solar energy directly into electricity.

Rated Nameplate Capacity: The maximum rated output of electric power production of the photovoltaic system in watts of Direct Current (DC).

Solar Access: The access of a solar energy system to direct sunlight.

Solar Collector: A device, structure or a part of a device or structure for which the primary purpose is to transform solar radiant energy into thermal, mechanical, chemical, or electrical energy.

Solar Energy: Radiant energy received from the sun that can be collected in the form of heat or light by a solar collector.

Commentary: While it is anticipated that installed solar energy systems will most frequently be photovoltaic, this model zoning uses the statutory definition of a solar energy system, which is broader and permits the installation of solar thermal systems as well.

Solar Energy System: A device or structural design feature, a substantial purpose of which is to provide daylight for interior lighting or provide for the collection, storage and distribution of solar energy for space heating or cooling, electricity generation, or water heating.

Solar Energy System, Active: A solar energy system whose primary purpose is to harvest energy by transforming solar energy into another form of energy or transferring heat from a collector to another medium using mechanical, electrical, or chemical means.

Solar Energy System, Grid-Intertie: A photovoltaic system that is connected to an electric circuit served by an electric utility.

Solar Energy System, Ground-Mounted: An Active Solar Energy System that is structurally mounted to the ground and is not roof-mounted; may be of any size (small-, medium- or large-scale).

Solar Energy System, Large-Scale: An Active Solar Energy System that occupies more than 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 250kW DC or greater).

Solar Energy System, Medium-Scale: An Active Solar Energy System that occupies more than 1,750 but less than 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 10 - 250 kW DC).

Solar Energy System, Off-Grid: A photovoltaic solar energy system in which the circuits energized by the solar energy system are not electrically connected in any way to electric circuits that are served by an electric utility.

Solar Energy System, Passive: A solar energy system that captures solar light or heat without transforming it to another form of energy or transferring the energy via a heat exchanger.

Solar Energy System, Roof-Mounted: An Active Solar Energy System that is structurally mounted to the roof of a building or structure; may be of any size (small-, medium- or large-scale).

Solar Energy System, Small-Scale: An Active Solar Energy System that occupies 1,750 square feet of surface area or less (equivalent to a rated nameplate capacity of about 10 kW DC or less).

Solar Thermal System: An Active Solar Energy System that uses collectors to convert the sun's rays into useful forms of energy for water heating, space heating, or space cooling.

Use Regulations

Commentary: Within a Zoning Bylaw/Ordinance, the Use Regulations describe which land uses are allowed within different zoning districts of the community, and which permits are required. The Use Regulations typically include a Use Table and/or a narrative description of the principal and accessory uses that are allowed, prohibited and/or allowed only through a Special Permit within each zoning district.

Pursuant to Chapter 40A Section 3, a Massachusetts municipality may not prohibit or unreasonably regulate solar energy systems except where necessary to protect public health, safety or welfare. Therefore, although these systems must be allowed within the community, they may be regulated where necessary to protect public health, safety or welfare through other provisions of the Zoning Bylaw/Ordinance. For example, these systems will still need to meet dimensional regulations and other performance standards necessary to protect public health, safety or welfare. In addition, a Site Plan Review process may be used to collect information that will ensure compliance with the performance standards in the Zoning Bylaw/Ordinance. Where some communities include Design Review in their permit processes, these communities will need to balance their desire for certain design objectives with the Commonwealth's protection of solar energy systems. Finally, as drafted this model zoning requires a special permit for a large-scale ground-mounted facility in a residential district and prohibits such systems in another residential district. While a special permit is discretionary, and language expressing uncertainty and cautioning communities about the lack of case law regarding Chapter 40A Section 3 has been included, the Attorney General's Office has approved local

zoning using this permitting mechanism. While DOER cannot offer a definitive interpretation, limited use of special permits when applied to the largest of solar systems, especially when these systems are allowed elsewhere by right, may well be reasonable regulation. In DOER's view, given the plain language of the statute, it is prudent to allow opportunity to site all scales of solar energy systems somewhere in the community. These provisions are described in more detail in the following sections. A more detailed discussion of DOER's understanding of Chapter 40A Section 3 is provided in the Policy Guidance for Regulating Solar Energy Systems that serves as a companion piece to this regulatory guidance.

As a cautionary note, while regulating aesthetics can arguably be considered a matter of protecting public welfare, attempting to place restrictions on materials, setbacks or height, and other similar items, as related to aesthetics, can create roadblocks to actual installation. It is therefore not recommended that communities regulate aesthetics of solar energy systems, or that they do so very cautiously, due to the strong statutory protections in Chapter 40A Section 3.

Two examples are provided in this section for how roof-mounted, small-scale ground-mounted, medium-scale ground-mounted, and large-scale ground-mounted solar energy systems can be incorporated into a municipality's Use Regulations. In these examples, roof-mounted solar energy systems, regardless of size, are allowed as-of-right throughout the community. As-of-right siting means that development may proceed without the need for a Special Permit, variance, amendment, waiver, or other discretionary approval. These projects cannot be prohibited, and can be built once a building permit has been issued by the inspector of buildings, building commissioner or local inspector.

For ground-mounted systems, there is a distinction between how small-scale, medium-scale and large-scale systems are treated and where each are allowed as-of-right, via site plan review, or by special permit. The model zoning allows small-scale ground-mounted systems as-of-right throughout the community. These are of a size that would service a house, small businesses, or small municipal building.

The model zoning allows medium-scale ground-mounted systems as-of-right in all districts except residential zoning districts; in these districts Site Plan Review is required. This means that medium-scale ground-mounted systems cannot be prohibited, and that DOER considers Site Plan Review reasonable regulation. Site Plan Review is discussed in more detail later in this document, but in general it establishes criteria for the layout, scale, appearance, safety, and environmental impacts of certain types and/or scales of development. Typically, site plan approval must be obtained before the building permit is issued. Since medium-scale ground-mounted systems can reach up to approximately an acre in size, DOER believes it is reasonable and appropriate to provide more regulatory scrutiny via Site Plan Review for these projects in residential districts to protect public health, safety, or welfare.

As drafted, the model zoning requires Site Plan Review for large-scale ground-mounted systems within most zoning districts, a special permit in one residential district, and prohibits such systems in another residential district. However, communities should remember that the language of the zoning exemption for solar energy systems is imprecise. While some communities already require a Special Permit to install a large-scale ground mounted solar facility, and/or

restrict them to certain districts, it is not clear whether these regulations are consistent with the Chapter 40A Section 3 mandate that they be reasonable and necessary to protect public health, safety, or welfare.

Connection to the Massachusetts Green Communities Designation and Grant Program

Recognizing the uncertainty around how regulations may or may not be interpreted as reasonable, DOER allows communities to meet Green Communities Criterion One by zoning for the as-of-right installation of a solar facility of at least an acre in size in a designated location. For more information on the Green Communities Designation and Grant Program, please visit: <http://www.mass.gov/eea/energy-utilities-clean-tech/green-communities/>.

Siting Preferences

Where a solar facility is sited, as well as placement on the site once selected, is an important consideration, particularly in regard to large-scale ground mounted facilities. DOER strongly discourages locations that result in significant loss of land and natural resources, including farm and forest land, and encourages rooftop siting, as well as locations in industrial and commercial districts, or on vacant, disturbed land. Significant tree cutting is problematic because of the important water management, cooling, and climate benefits trees provide.

In regard to farm properties, rooftops are preferable. If roof space is inadequate non-productive, non-arable agricultural land is the second choice. Should this also prove infeasible or inadequate a dual use of land design concept could preserve productive farmland by continuing crop production underneath high-mounted and well spaced panels. Finally, if none of these are feasible or they are inadequate the least productive land should be used first to minimize the loss of productive food/crop land.

Overlay Zoning Districts

Overlay zoning districts are one zoning approach that could be used to permit solar energy systems, and in ways not allowed under the base zoning districts. For example, the model zoning as drafted requires Site Plan Review for medium-scale ground mounted solar energy systems in residential districts. An overlay district could be used to permit such facilities without Site Plan Review in a portion of these residential districts where Site Plan Review is deemed unnecessary, while retaining the review for the balance of the districts.

In addition, some communities may wish to conduct a feasibility analysis to determine where large-scale solar energy systems are most appropriate within the municipality and use an overlay zoning district approach to encourage the siting of facilities in the most feasible locations. Once an area has been established through a thoughtful and analytical process, the municipality could enact overlay zoning legislation to prioritize these areas for large-scale solar energy systems. Many Massachusetts communities have already taken this approach through adoption of a large-scale ground-mounted solar overlay district, often based on DOER's [Model As-of-Right Zoning Bylaw: Allowing Use of Large-Scale Ground-Mounted Solar Photovoltaic Installations](#).

Agricultural Exemption:

In addition to the exemption pertaining to solar energy systems Section 3 of Chapter 40A also exempts agricultural uses from zoning regulations that would otherwise apply. Thus, when the majority of the power from a solar energy system (or a wind turbine) is integral to farm production construction and operation of the system would covered by the exemption. Questions on the applicability of the agricultural exemption to solar energy systems should be directed to Gerry Palano at the Dept. of Agricultural Resources (Gerald.Palano@state.ma.us or 617-626-1706).

Example 1 (Use Tables):

	Residential-1 (R1)	Residential-2 (R2)	Residential-3 (R3)	Commercial (C)	Industrial (I)	Public (P)
<u>PRINCIPAL USE</u>						
Medium-Scale Ground-Mounted Solar Energy System	SPR	SPR	SPR	Y	Y	Y
Large-Scale Ground-Mounted Solar Energy System	SP	N	SPR	SPR	SPR	SPR

Y = Allowed

SP = Special Permit

N = Prohibited

SPR = Site Plan Review

	Residential-1 (R1)	Residential-2 (R2)	Residential-3 (R3)	Commercial (C)	Industrial (I)	Public (P)
<u>ACCESSORY USE</u>						
Roof-Mounted Solar Energy System	Y	Y	Y	Y	Y	Y
Small-Scale Ground-Mounted Solar Energy System	Y	Y	Y	Y	Y	Y
Medium-Scale Ground-Mounted Solar Energy System	SPR	SPR	SPR	Y	Y	Y

Y = Allowed

SP = Special Permit

N = Prohibited

SPR = Site Plan Review

Example 2 (Uses listed):

1.0 Residential District Uses

1.1 Uses Permitted

1.1.1 Roof-Mounted Solar Energy Systems

1.1.2 Small-Scale Ground-Mounted Solar Energy Systems

1.2 Uses Allowed through Site Plan Review

- 1.2.1 Medium-Scale Ground-Mounted Solar Energy Systems
- 1.2.2 Large-Scale Ground-Mounted Solar Energy Systems in the R3 District

1.3 Uses Allowed via Special Permit

- 1.3.1 Large-Scale Ground-Mounted Solar Energy Systems in the R1 District

2.0 Non-Residential District Uses

2.1 Uses Permitted

- 2.1.1 Roof-Mounted Solar Energy Systems
- 2.1.2 Small-Scale Ground-Mounted Solar Energy Systems
- 2.1.3 Medium-Scale Ground-Mounted Solar Energy Systems

2.2 Uses Allowed through Site Plan Review

- 2.2.1 Large-Scale Ground-Mounted Solar Energy Systems

Dimensional Regulations

Commentary: In most cases, the existing dimensional standards in a Zoning Bylaw/Ordinance will allow for the development of small-, medium-, and large-scale solar energy systems. However, if a municipality finds alternate dimensional standards are necessary to allow solar energy systems while protecting public health, safety, or welfare, it may impose them. As a reminder, while regulating aesthetics can arguably be considered a matter of protecting public welfare, attempting to place restrictions on dimensional standards, such as setbacks or height, as they relate to aesthetics can create roadblocks to actual installation. It is therefore not recommended that communities regulate aesthetics of solar energy systems due to the strong statutory protections in Chapter 40A Section 3, or that they do so very carefully.

With regard to more basic dimensional requirements such as setbacks from the property line, municipalities may also find that adjustments can be made to encourage broader use of solar energy systems. Below is a series of dimensional regulation amendments that a municipality could adopt to further encourage small-, medium-, and large-scale ground-mounted and roof-mounted solar energy systems, or simply clarify requirements pertaining to them.

Height

Commentary: It is recommended that for purposes of height, roof-mounted solar energy systems should be considered similar to chimneys, television antennae, roof-top mechanical equipment and other appurtenances that are usually either allowed a much higher maximum height (e.g., 100 feet instead of 35 feet) or are exempted altogether from building height requirements. Such

an exemption can be stated in the definition of “Building Height” or through language similar to that provided in the following example.

It is recommended that existing zoning district height limitations apply for all ground-mounted solar energy systems. If the ground-mounted solar energy system is accessory to a principal building or structure on a lot, then the height restriction for accessory structures would apply. If the ground-mounted solar energy system is the principal structure on a lot, then the height restriction for principal structures would apply.

Example:

1.0 Building Height Regulations

1.1 Exemptions

1.1.1 Mechanical equipment and appurtenances necessary to the operation or maintenance of the building or structure itself, including chimneys, ventilators, plumbing vent stacks, cooling towers, water tanks, broadcasting and television antennae and roof-mounted solar energy systems.

Setbacks

Commentary: It is recommended that small- and medium-scale ground-mounted solar energy systems that are accessory to a primary building or structure on a lot be provided with more flexible setback requirements than those that would typically apply to a primary structure. Many communities already provide some flexibility for “accessory structures” like sheds, allowing these to be closer to the lot line than the primary structure. For example, where a front/side/rear yard setback for the primary structure may be 50 feet, setbacks of 20 feet may be allowed for accessory structures. When ground-mounted solar energy systems are developed as accessory structures to a home, business or other building or structure, they should be afforded at least the same flexibility.

If a community does not have this type of reduced setback already built into the Zoning Bylaw/ Ordinance, a provision could be added that effectively reduces the setback distance just for this use. For example, if the community has a dimensional table, a special footnote could be added to the dimensional table as indicated in the following examples. It should be noted that often times there is a distinction between how accessory structures are regulated in a residential zoning district and how they are regulated in a commercial or industrial district. Therefore, communities should ensure that provisions for flexible setbacks for small- and medium-scale ground-mounted solar energy systems are incorporated wherever appropriate.

The first example applies a reduction of 50% to the otherwise required setbacks for accessory uses. The value of 20 feet is used in the second example; however, this may be altered based on local conditions. For example, in some communities, particularly urban communities, the required side- and rear-yard setback distances may be shorter than 20 feet. In these

circumstances, the existing shorter setback distances should remain for small- and medium-scale ground-mounted solar energy systems.

As opposed to small- and medium-scale ground-mounted solar energy systems, which are typically sited as accessory to a principal building or structure on a lot, large-scale ground-mounted solar energy systems are usually sited as principal structures. Whenever a solar energy system is sited as a principal structure on a lot, it is recommended that the setback requirements for principal structures in that zoning district apply. Regardless of the scale of the system or the minimum setback required solar energy system installers often allow a sufficient setback to avoid the issue of shading by vegetation on neighboring properties.

Placement of solar energy systems in front yards should be avoided if at all possible. However, in DOER's view the statutory protections for solar energy systems create a situation where a ground-mounted array could not be prohibited outright in a front yard, so the language provided in the following example includes a standard for the front yard setback. DOER recognizes the concerns this may raise in residential neighborhoods and acknowledges that communities should work with property owners to find appropriate locations for ground-mounted systems in side or rear yards.

Example Dimensional Table Footnotes for Accessory Installations:

- (1) Small- and medium-scale ground-mounted solar energy systems accessory to principal use may be located no closer than [1/2 of the setback that would otherwise apply] from the front, side or rear lot line. All ground-mounted solar energy systems in residential districts shall be installed either in the side yard or rear yard to the extent practicable
- (2) Small- and medium-scale ground-mounted solar energy systems accessory to a principal use may be located no closer than [twenty (20) feet] from the front, side or rear lot line. All ground-mounted solar energy systems in residential districts shall be installed either in the side yard or rear yard to the extent practicable.

Lot Coverage

Commentary: A number of communities use "maximum lot coverage" or "maximum impervious surface" as one of their dimensional standards. While it is clear that such features as driveways or buildings would be included in any calculation of lot coverage, many other features may be more ambiguous depending on how clearly the definition in the Zoning Bylaw/Ordinance is written. Awnings, porches, decks and similar features can often become a matter of dispute. Regardless of the definition, it is recommended that solar energy systems with grass or another pervious surface under them be exempted from lot coverage or impervious surface calculations. If the area is to be paved or otherwise rendered impervious then this land area should in fact count toward any coverage or impervious surface limit. It is also important to note that this recommended exemption is not intended to apply to municipal stormwater regulations, as the panels could have the effect of altering the volume, velocity, and discharge pattern of stormwater runoff. The following provision could be included as a footnote to the Dimensional Table related

to maximum lot coverage and impervious cover requirements, or as a separate provision within the dimensional regulations.

Example:

Solar energy systems shall not be included in calculations for lot coverage or impervious cover as defined in [INSERT SECTION REFERENCE FOR ‘DEFINITIONS’].

Site Plan Review Requirements and Performance Standards

Commentary: Although not specifically addressed under Chapter 40A, Site Plan Review is included within the local Zoning Bylaws/Ordinances of many Massachusetts communities. Site Plan Review is meant to enforce clear and fair design standards for different types of development. This is typically done through a coordinated review process that circulates development applications among, and invites input from, all local boards and commissions that might permit a project, including Local Historic District Commissions as applicable. Site Plan Review is usually triggered by either specific types of uses (e.g., commercial or industrial development), or certain scales of uses (e.g., non-residential buildings over 5,000 square feet).

Typically, Site Plan Review procedures and requirements are provided within a separate section of the Zoning Bylaw/Ordinance. However, there are instances when communities provide separate Site Plan Review provisions and procedures within a section pertaining to a particular use or development type (e.g., Planned Business Development, etc.). Consistent with the Legislature’s intent to facilitate the siting of solar energy, communities should shape the Site Plan Review provisions of their Zoning Bylaws/Ordinances to enable large-, medium- and small-scale solar energy system projects to proceed without undue delay.

Model language for Site Plan Review for medium-scale ground-mounted solar energy systems is provided in the following Example 1. As discussed earlier in this document, Site Plan Review may be appropriate when medium-scale ground-mounted systems are sited within residential districts. The model language provided in Example 1 below is based on, but is less stringent than, the provisions in the Massachusetts DOER [Model As-of-Right Zoning Bylaw: Allowing Use of Large-Scale Ground-Mounted Solar Photovoltaic Installations](#).

Example 2 provides model language for Site Plan Review for large-scale ground-mounted solar energy systems when they are permitted as of right. As discussed earlier in this document, Site Plan Review may be appropriate for large-scale ground-mounted systems when they are sited anywhere within the community. The model language provided in Example 2 below is based on the provisions in the Massachusetts DOER [Model As-of-Right Zoning Bylaw: Allowing Use of Large-Scale Ground-Mounted Solar Photovoltaic Installations](#). Example 2 is also intended for use in concert with the special permit language in the next section of this model zoning.

Example 3 provides model language for roof-mounted and small-scale ground-mounted systems when they are part of a larger project where Site Plan Review is triggered through another threshold (e.g., commercial development, non-residential buildings over 5,000 square feet, etc.). It is important to note that the installation of roof-mounted or small-scale ground-mounted solar

energy systems does not trigger Site Plan Review on its own. However, when such systems are included as part of a larger development proposal that requires Site Plan Review, the municipality has the opportunity to review the roof-mounted or small-scale ground-mounted solar energy systems as part of the larger proposal.

As discussed earlier in this document, while regulating aesthetics can arguably be considered a matter of protecting public welfare, attempting to place restrictions on solar energy systems as they relate to aesthetics can create roadblocks to actual installation. It is therefore not recommended that communities regulate aesthetics of solar energy systems, or that they do so very cautiously, due to the strong statutory protections in Chapter 40A Section 3. However, where communities already have Site Plan Review standards that relate to aesthetics, such as screening requirements, these standards should also apply to solar energy systems. In other words, solar energy systems should not be singled out and regulated more stringently than other uses that require Site Plan Review; however, they can be held to the same level of restrictions that are in place for other uses.

Example 1 (Site Plan Review provisions for medium-scale ground-mounted solar energy systems in residential zoning districts):

1.0 Site Plan Review

1.1 Applicability

1.1.1 Medium-scale ground-mounted solar energy systems proposed within residential zoning districts shall undergo Site Plan Review prior to construction, installation or modification as provided in this section.

1.2 Site Plan Document Requirements

Pursuant to the Site Plan Review process, the project proponent shall provide the following documents, as deemed applicable by the Site Plan Review Authority:

1.2.1 A site plan showing:

- (a) Property lines and physical features, including roads, for the project site;
- (b) Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures;
- (c) Blueprints or drawings of the solar energy system showing the proposed layout of the system, any potential shading from nearby structures, the distance between the proposed solar collector and all property lines and existing on-site buildings and structures, and the tallest finished height of the solar collector;

- (d) Documentation of the major system components to be used, including the panels, mounting system, and inverter;
- (e) Name, address, and contact information for proposed system installer;
- (f) Name, address, phone number and signature of the project proponent, as well as all co-proponents or property owners, if any;
- (g) The name, contact information and signature of any agents representing the project proponent; and
- (h) Zoning district designation for the parcel(s) of land comprising the project site.

If the following are not addressed in existing site plan review regulations, then the community may wish to include them:

- (i) *Locations of active farmland and prime farmland soils, wetlands, permanently protected open space, Priority Habitat Areas and BioMap 2 Critical Natural Landscape Core Habitat mapped by the Natural Heritage & Endangered Species Program (NHESP) and “Important Wildlife Habitat” mapped by the DEP.*
- (j) *Locations of floodplains or inundation areas for moderate or high hazard dams;*
- (k) *Locations of local or National Historic Districts;*

- 1.2.2 Proof that the project proponent will meet the required Site Plan Review notification procedures.

Commentary: Provision 1.2.2 above should reference the municipality’s existing Site Plan Review public and/or abutter notification procedures if applicable. For example, a community may require projects that are subject to Site Plan Review to notify all property owners within 100 feet of the project site.

1.3 Site Plan Review Design Standards

- 1.3.1 Standards for medium-scale ground-mounted solar energy systems proposed within residential zoning districts

- 1.3.1.1 Utility Notification - No grid-intertie photovoltaic system shall be installed until evidence has been given to the Site Plan Review Authority that the owner has submitted notification to the utility company of the customer’s intent to install an interconnected customer-owned generator. Off-grid systems are exempt from this requirement.

1.3.1.2 Utility Connections - Reasonable efforts, as determined by the Site Plan Review Authority, shall be made to place all utility connections from the solar photovoltaic installation underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider. Electrical transformers for utility interconnections may be above ground if required by the utility provider.

1.3.1.3 Safety - The medium-scale ground-mounted solar energy system owner or operator shall provide a copy of the Site Plan Review application to the local fire chief. All means of shutting down the solar installation shall be clearly marked.

Commentary: With regard to issues of access and safety, communities looking to adopt zoning for medium-scale solar energy systems should be aware of any unique local requirements that could apply. For example, if the fire department will want an Emergency Response Plan as part of approval, this should be folded into the review process as seamlessly as possible.

1.3.1.4 Visual Impact – Reasonable efforts, as determined by the Site Plan Review Authority, shall be made to minimize visual impacts by preserving natural vegetation, screening abutting properties, or other appropriate measures.

1.3.1.5 Land Clearing, Soil Erosion and Habitat Impacts - Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of ground-mounted solar energy systems or as otherwise prescribed by applicable laws, regulations, and bylaws/ordinances.

Commentary: As drafted, this model zoning does not require medium-scale ground mounted solar energy systems to be fenced, but this is something communities will want to consider. Regardless, many project proponents will find fencing prudent.

Example 2 (Site Plan Review provisions for large-scale ground-mounted solar energy systems):

1.0 Site Plan Review

1.1 Applicability

1.1.1 Large-scale ground-mounted solar energy systems shall undergo Site Plan Review prior to construction, installation or modification as provided in this section.

1.2 Site Plan Document Requirements

Pursuant to the Site Plan Review process, the project proponent shall provide the following documents, as deemed applicable by the Site Plan Review Authority:

1.2.1 A site plan showing:

- (a) Property lines and physical features, including roads, for the project site;
- (b) Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures;
- (c) Blueprints or drawings of the solar energy system signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts showing the proposed layout of the system, any potential shading from nearby structures, the distance between the proposed solar collector and all property lines and existing on-site buildings and structures, and the tallest finished height of the solar collector;
- (d) One or three line electrical diagram detailing the solar photovoltaic installation, associated components, and electrical interconnection methods, with all Massachusetts Electric Code (527 CMR 12.00) compliant disconnects and overcurrent devices;
- (e) Documentation of the major system components to be used, including the panels, mounting system, and inverter;
- (f) Name, address, and contact information for proposed system installer;
- (g) Name, address, phone number and signature of the project proponent, as well as all co-proponents or property owners, if any;
- (h) The name, contact information and signature of any agents representing the project proponent; and
- (i) Zoning district designation for the parcel(s) of land comprising the project site.

If the following are not addressed in existing site plan review regulations, then the community may wish to include them:

- (j) *Locations of active farmland and prime farmland soils, wetlands, permanently protected open space, Priority Habitat Areas and BioMap 2 Critical Natural Landscape Core Habitat mapped by the Natural Heritage & Endangered Species Program (NHESP) and “Important Wildlife Habitat” mapped by the DEP.*
- (k) *Locations of floodplains or inundation areas for moderate or high hazard dams;*
- (l) *Locations of local or National Historic Districts;*

- 1.2.2 Documentation of actual or prospective access and control of the project site (see also Section 1.3.1.1);
- 1.2.3 An operation and maintenance plan (see also Section 1.3.1.2);
- 1.2.4 Proof of liability insurance; and
- 1.2.5 A public outreach plan, including a project development timeline, which indicates how the project proponent will meet the required Site Plan Review notification procedures and otherwise inform abutters and the community.

Commentary: Provision 1.2.6 above should reference the municipality's existing Site Plan Review public and/or abutter notification procedures if applicable. For example, a community may require projects that are subject to Site Plan Review to notify all property owners within 100 feet of the project site.

1.3 Site Plan Review Design and Operation Standards

1.3.1 Standards for large-scale ground-mounted solar energy systems

- 1.3.1.1 Site Control - The project proponent shall submit documentation of actual or prospective access and control of the project site sufficient to allow for construction and operation of the proposed solar energy system.
- 1.3.1.2 Operation & Maintenance Plan - The project proponent shall submit a plan for the operation and maintenance of the large-scale ground-mounted solar energy system, which shall include measures for maintaining safe access to the installation, stormwater controls, as well as general procedures for operational maintenance of the installation.
- 1.3.1.3 Utility Notification - No grid-intertie photovoltaic system shall be installed until evidence has been given to the Site Plan Review Authority that the owner has submitted notification to the utility company of the customer's intent to install an interconnected customer-owned generator. Off-grid systems are exempt from this requirement.
- 1.3.1.4 Lighting - Lighting of large-scale ground-mounted solar energy systems shall be consistent with local, state and federal law. Lighting of other parts of the installation, such as appurtenant structures, shall be limited to that required for safety and operational purposes, and shall be reasonably shielded from abutting properties. Where feasible, lighting of the solar energy system shall be directed downward and shall incorporate full cut-off fixtures to reduce light pollution.

- 1.3.1.5 Signage - Signs on large-scale ground-mounted solar energy systems shall comply with a municipality's sign bylaw/ordinance. A sign consistent with a municipality's sign bylaw/ordinance shall be required to identify the owner and provide a 24-hour emergency contact phone number. Solar energy systems shall not be used for displaying any advertising except for reasonable identification of the manufacturer or operator of the solar energy system.
- 1.3.1.6 Utility Connections - Reasonable efforts, as determined by the Site Plan Review Authority, shall be made to place all utility connections from the solar photovoltaic installation underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider. Electrical transformers for utility interconnections may be above ground if required by the utility provider.
- 1.3.1.7 Emergency Services – The large-scale ground-mounted solar energy system owner or operator shall provide a copy of the project summary, electrical schematic, and site plan to the local fire chief. Upon request the owner or operator shall cooperate with local emergency services in developing an emergency response plan. All means of shutting down the solar energy system shall be clearly marked. The owner or operator shall identify a responsible person for public inquiries throughout the life of the installation.

Commentary: With regard to issues of access and safety, communities looking to adopt zoning for large-scale solar energy facilities should be aware of any unique local requirements that could apply.

- 1.3.1.8 Land Clearing, Soil Erosion and Habitat Impacts - Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of solar energy system or otherwise prescribed by applicable laws, regulations, and bylaws/ordinances.

1.3.2 Monitoring and Maintenance

- 1.3.2.1 Solar Energy System Installation Conditions - The large-scale ground-mounted solar energy system owner or operator shall maintain the facility in good condition. Maintenance shall include, but not be limited to, painting, structural repairs, and integrity of security measures. Site access shall be maintained to a level acceptable to the local Fire Chief, Emergency Management Director, and Emergency Medical Services. The owner or operator

shall be responsible for the cost of maintaining the solar energy system and any access road(s), unless accepted as a public way.

1.3.2.2 Modifications - All material modifications to a large-scale ground-mounted solar energy system made after issuance of the required building permit shall require approval by the Site Plan Review Authority.

1.3.3 Abandonment or Decommissioning

1.3.3.1 Removal Requirements

Any large-scale ground-mounted solar energy system which has reached the end of its useful life or has been abandoned consistent with Section 1.3.3.2 of this bylaw/ordinance shall be removed. The owner or operator shall physically remove the installation no more than 150 days after the date of discontinued operations. The owner or operator shall notify the Site Plan Review Authority by certified mail of the proposed date of discontinued operations and plans for removal. Decommissioning shall consist of:

- (a) Physical removal of all solar energy systems, structures, equipment, security barriers and transmission lines from the site.
- (b) Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations.
- (c) Stabilization or re-vegetation of the site as necessary to minimize erosion. The Site Plan Review Authority may allow the owner or operator to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.

1.3.3.2 Abandonment

Absent notice of a proposed date of decommissioning or written notice of extenuating circumstances, the large-scale ground-mounted solar energy system shall be considered abandoned when it fails to operate for more than one year without the written consent of the Site Plan Review Authority. If the owner or operator of the solar energy system fails to remove the installation in accordance with the requirements of this section within 150 days of abandonment or the proposed date of decommissioning, the town retains the right, after the receipt of an appropriate court order, to enter and remove an abandoned, hazardous, or decommissioned large-scale ground-mounted solar energy system. As a condition of Site Plan approval, the applicant and landowner

shall agree to allow entry to remove an abandoned or decommissioned installation.

Commentary: Recognizing that other remedies, such as a tax lien, are available to communities in the event an abandoned facility is legitimately putting public safety at risk this model zoning does not require the provision of surety to cover the cost of removal in the event the municipality must remove the installation and remediate the landscape. Communities can, however, require surety in circumstances where a valid planning purpose for doing so exists.

Commentary: As drafted, this model zoning does not require large-scale ground mounted solar energy systems to be fenced, but this is something communities will want to consider. Regardless, many project proponents will find fencing prudent.

Example 3 (Site Plan Review provisions for roof-mounted and small-scale ground-mounted solar energy systems as part of a larger project that triggers Site Plan Review):

1.0 Site Plan Review

1.1 Site Plan Document Requirements

1.1.1 Requirements for Roof-Mounted and Small-Scale Ground-Mounted Solar Energy Systems - Where these solar energy systems may be accessory to a use allowed through Site Plan Review, the Site Plan Review shall include review of their adequacy, location, arrangement, size, design, and general site compatibility.

1.1.1.1 Roof-Mounted Solar Energy Systems – For all roof-mounted systems, the applicant shall provide:

- (a) The shortest distance between the solar collector and all edges of the roof.
- (b) The distance between the solar collector and any other existing rooftop features such as chimneys, spires, access points, etc.
- (c) The height of the solar collector both from finished grade and, where applicable, from the finished surface of the roof.

1.1.1.2 Small-Scale Ground-Mounted Solar Energy Systems – For all ground-mounted systems, the applicant shall provide:

- (a) The distance between the proposed solar collector and all property lines and existing on-site buildings and structures.
- (b) The tallest finished height of the solar collector.
- (c) Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures.

1.1.1.3 System Components – The Plan must include documentation of the major system components to be used, for example the panels, mounting system, and inverter.

1.1.1.4 Installer Details – The Plan must include the name, address, and contact information for proposed system installer.

1.2 Site Plan Review Design Standards

1.2.1 Standards for roof-mounted and small-scale ground-mounted solar energy systems

1.2.1.1 Utility Notification - No grid-intertie photovoltaic system shall be installed until evidence has been given to the Site Plan Review Authority that the owner has submitted notification to the utility company of the customer's intent to install an interconnected customer-owned generator. Off-grid systems are exempt from this requirement.

1.2.1.2 Emergency Access - Solar energy systems shall be located in such a manner as to ensure emergency access to the roof, provide pathways to specific areas of the roof, provide for smoke ventilation opportunities, and provide emergency egress from the roof.

(a) For buildings with pitched roofs, solar collectors shall be located in a manner that provides a minimum of one three-foot wide clear access pathway from the eave to the ridge on each roof slope where solar energy systems are located as well as one three-foot smoke ventilation buffer along the ridge.

(b) Residential rooftops that are flat shall have a minimum three-foot wide clear perimeter and commercial buildings that are flat shall have a minimum four-foot wide clear perimeter between a solar energy system and the roofline, as well as a three-foot wide clear perimeter around roof-mounted equipment such as HVAC units.

(c) To the extent practicable, the access pathway shall be located at a structurally strong location on the building (such as a bearing wall).

Commentary: Building and Fire Department personnel should be involved in the development of emergency access standards, and any zoning standards that are adopted should be consistent with local building and fire codes.

1.2.1.3 Safety – No roof-mounted solar energy system shall be located in a manner that would cause the shedding of ice or snow from the roof into a porch, stairwell or pedestrian travel area.

Special Permits

Commentary: Special Permits are addressed in Chapter 9 of the Zoning Act, and most Massachusetts communities have regulations pertaining to them within their zoning bylaw or ordinance. Below is model language for municipalities requiring special permits for large-scale ground-mounted solar energy systems. It is intended to be adopted and implemented alongside Site Plan Review language for large-scale ground-mounted systems included as Example 2 in this model zoning. Rather than include separate special permit standards applicable specifically to large-scale ground-mounted solar energy systems, this language simply directs that a permit be issued pursuant to the already established special permit bylaw/ordinance of the community.

Municipalities will, however, want to audit their special permit language, especially the approval standards, for compatibility with the siting of large-scale ground-mounted solar energy systems. Such systems should have far lower impacts than commercial or industrial uses that often require issuance of special permit, and communities should keep in mind the requirement in Chapter 40A Section 3 that any regulations pertaining to solar energy systems be reasonable.

1.0 Special Permit with Site Plan Review

1.1 Special Permit Requirements

- 1.1.1 Where required a special permit shall be issued prior to construction, installation or modification of any large-scale ground-mounted solar energy system. The special permit granting authority shall include as part of its special permit review and proceedings all the provisions and requirements of the Site Plan Review standards applicable to large-scale ground-mounted solar energy systems.

Pre-Existing Non-Conforming Uses and Structures

Commentary: Alterations, extensions and structural changes to pre-existing non-conforming uses and structures (e.g., existing buildings that do not meet the dimensional requirements of the Zoning Bylaw/Ordinance) that intensify non-conformities or result in additional non-conformities may not be allowed beyond a certain threshold or may require a Special Permit pursuant to the local Zoning Bylaw/Ordinance. It is recommended that the installation of roof-mounted or small-scale ground-mounted solar energy systems associated with pre-existing non-conforming uses or structures be exempt from this requirement. An example provision is provided below. Communities not comfortable with providing this exemption to small-scale ground mounted systems due to their potential to be located on very small lots may wish to apply Site Plan Review or continue to require a Special Permit where this can be justified to protect public health, safety, or welfare. As to roof mounted systems on non-conforming properties, given the exemption afforded solar energy systems, DOER believes it would be unreasonable to disallow them or require a Special Permit even when installation would exacerbate a pre-existing building height non-conformity.

Example:

1.0 Pre-Existing Non-Conforming Uses and Structures

1.1 Improvements that do not change the use or the basic exterior characteristics or appearance of the building or structure are allowed. Such improvements include but are not limited to the following:

1.1.1 Installation or replacement of solar energy systems.

Historic Districts

Commentary: Many communities in the Commonwealth have adopted Local Historic Districts to protect and preserve buildings, landscapes and neighborhoods of historic significance. In recent years, conflict has occasionally arisen about the installation of solar energy systems within these districts on historic buildings and structures, since some argue that they have adverse impacts on the visual appearance and integrity of the buildings and structures.

As described in the DOER Policy Guidance for Regulating Solar Energy Systems, Local Historic District Commissions must consider the policy of the Commonwealth to encourage the use of solar energy systems and to protect solar access when considering issuance of a certificate of appropriateness for a solar energy system. However, thoughtful design guidelines can help ensure that solar energy systems are sited while the goals of historic preservation continue to be achieved.

Design guidelines can require that solar energy systems not be visible from public areas, to the greatest extent practicable. When it is not feasible (either physically or economically) to locate solar energy systems out of the public eye, solar energy systems can be required to be designed to certain architectural standards (e.g., building-integrated, use of solar shingles) to the greatest extent practicable. However, these options may be infeasible as well due to the high cost and low performance of many of these technologies. To meet these challenges, Local Historic District Commissions are encouraged to write design guidelines that support the development of solar energy systems and are sensitive to the historic preservation goals of the Commission.



Climate-Smart Zoning and Permitting

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MAPC's Municipal Net Zero Playbook

MAPC's **Municipal Net Zero Playbook** ("the Playbook") provides guidance and tools to equip cities and towns with the resources to tackle their climate goals in an efficient and equitable manner. The Playbook is an interdisciplinary tool for municipal planners, energy/sustainability staff, and community members that seeks to empower cities and towns to implement net zero actions within their communities. These resources will help local net zero action implementers understand their role in advancing greenhouse gas (GHG) emissions reductions, adopting local policies, and accelerating state-level policy changes.

Explore all of MAPC's resources on Net Zero Planning: <https://www.mapc.org/net-zero/>

How to Use the Playbook

START HERE

MAPC developed two guiding frameworks to help communities navigate the Net Zero approach as they start on, or ramp up, their Net Zero journeys. Cities and towns can use these frameworks to inform community engagement, plan development, and strategy prioritization as they seek to customize their local Net Zero Action Plans.

Framework for Action

Learn how to navigate the Net Zero planning process and evaluate priority actions for a local net zero plan.

Framework for Equity

Learn how to develop Net Zero Plans that assess and acknowledge existing inequities and work to uplift and provide direct benefits to underserved communities.

Zero Emissions Mobility

Tackle GHG emissions reductions from how people get around a community.



Net Zero Buildings

Make buildings highly efficient and optimize clean energy for electricity, heating, and cooling.

Clean Energy Supply

Transition to 100 percent renewable sources of energy across a community.



Climate-Smart Zoning and Permitting

Take a strategic approach to local zoning and permitting updates.



WHAT'S NEXT?

As our work with communities expands, we plan to continue to add and update chapters to the Playbook that touch on emerging best practices.

CHOOSE YOUR OWN ADVENTURE

Drawing on our years of experience working with cities and towns on clean energy and climate, MAPC has compiled information on the best practices and actions municipalities can implement in their plans to advance toward Net Zero. You can start with the Chapter you are most interesting in tackling, or review each in depth.

The Playbook provides a starting point for each priority action, with links to resources, at MAPC and beyond, that offer more detailed guidance on implementation.

In order to guide our communities to net zero emissions by 2050, we must adjust zoning and permitting policies and practices to require and encourage the necessary changes to our building stock today and into the future.

This chapter outlines opportunities for municipalities to demonstrate leadership in zoning and permitting. The buildings sector comprises a large percentage of greenhouse gas emissions, and buildings constructed or renovated today will last for decades to come. Municipal zoning and permitting processes can help leverage a shift to low-carbon buildings and make a huge impact on current and future emissions. The recommendations in this chapter include best practices that have been utilized for some time, as well as emerging innovative practices.

The following strategies for **Climate-Smart Zoning and Permitting** provide your community with recommended actions that draw on best practices and innovations from across the Commonwealth of Massachusetts and country to:



Allow net zero enabling technologies by-right



Establish climate zoning overlays



Mandate energy efficiency and renewable energy as appropriate



Streamline and expedite permitting for net zero buildings

The Playbook provides a selection of priority actions to advance each of these strategies in your community. Each action's urgency factor of 2025, 2030, or 2050 provides a recommended timeframe by which to fully implement the action. For each action, the Playbook outlines the **action type, urgency, timeframe, local and national examples, scale of impact, type of expense, lead implementer and key partners,** and **performance indicators**. Where available, we have also identified funding opportunities and tools to measure action impacts.

Playbook Indicators

Timeframe to Implement

-  Short-term (Less than one year)
-  Intermediate (1 to 5 years)
-  Long-term (5 years or more)
-  Ongoing

Type of Expense

-  Staff
-  Capital
-  Operations

Benefits and Impacts

The listed benefits and impacts are in addition to reductions in greenhouse gas emissions.

- | | | | |
|---|----------|---|------------------|
|  | Equity |  | Environmental |
|  | Economic |  | Energy |
|  | Health |  | Calculating Tool |

Playbook Terms

Type Actions are sorted into the categories of advocacy, financing, plan, policy, program, or outreach.

Urgency Each action is assigned an urgency factor of 2025, 2030, or 2050, providing a recommended year by which to fully implement the action.

Feasibility A sampling of local, national, or international examples is provided to illustrate on-the-ground implementation. Some actions we have assessed to be impactful have not yet been demonstrated in other communities – these actions are identified as leadership opportunities.

Lead Implementer Each action includes a suggested municipal staff person or department responsible for leading the execution of the action and any decision-making involved. This will differ from community to community.

Key Partner(s) We identified partners within the municipality and the broader community who will be critical to successful implementation of the action.

Scale of Impact Actions have been identified as either an enabling action, hard to measure and high impact, or measurable and high impact. A high impact action is based on whether or not there is a direct connection with emissions reductions within a priority sector. Enabling actions may not have a direct connection to emissions reductions, but they are essential to put in place early on to support greater emissions reductions over time.

Performance Indicators Each action includes suggested metrics to track success and impact during implementation of the action.

How to use this chapter

Since developing, refining, and approving zoning language can take some time (at least a year or more), we recommend that municipalities consider pursuing multiple zoning actions at the same time, and begin as early as possible. It may make sense to plan for an initial round of zoning language changes, and then a second or third round as the community progresses onto other net zero targets.

For instance, a municipality may approve net zero definitions (**Action B**) and establish a climate overlay (**Action D or E**) in an initial article, and then later broaden some of the changes in the overlay to apply community-wide or adopt a Green Factor (**Action H**). Adopting multiple actions together into zoning allows for the city or town to carefully consider how each portion of the zoning code or the bylaws will interact with one another. A municipality may also consider adopting climate zoning changes as part of a larger zoning overhaul if the community has one planned in upcoming years.

Throughout these actions, it is beneficial to engage stakeholders within municipal government and across the community, including [equity stakeholders](#),¹ to create a holistic process for zoning and permitting. The process should be

clear to all departments involved in permitting and plan approval and should align with municipal goals. Once a municipality has successfully adopted net zero zoning language and streamlined permitting, consider developing a net zero zoning guide and permitting checklist to make it easy for developers to follow new policies and to create consistency.

Throughout this chapter, we highlight zoning actions that Massachusetts municipalities can take to advance net zero in their communities. Since zoning language legally cannot conflict with the [State Building Code](#),² Massachusetts municipalities may want to pair the adoption of these zoning and permitting actions with advocacy for a highly efficient building code to complement them. Communities can provide testimony and written comments on the State Building Code through the [Board of Building Regulations and Standards \(BBRS\)](#)³ or propose changes and vote on national codes through the [International Code Council \(ICC\)](#).⁴ Municipalities should consider pursuing Action H from the Net Zero Buildings Chapter to engage in this advocacy. MAPC's [Codes for Climate](#)⁵ webpage has more information on these actions and other ways municipalities can engage on building codes.



Strategy:

Allow net zero enabling technologies by-right

Action A

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Action B

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Action C

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Net Zero Enabling Technologies

In this chapter, **net zero enabling technologies** are defined as those technologies that either 1) significantly increase energy efficiency, 2) allow for a structure to avoid onsite combustion of fossil fuels or to source renewable energy, or 3) store energy generated from renewable sources onsite.

There is a lot of innovation within this field, as new technologies are being developed, tested, scaled up, and improved upon. Many of these technologies are decreasing in costs, as technology improves and supply chains grow, making them more financially attractive solutions for developers.

Category	Example Technologies
Energy Efficiency	• Triple-glazed windows • Ground-, air-, and water-source heat pumps • High R value insulation • Cool or green roof
Renewable Energy	• Solar photovoltaic (PV) • Solar hot water • Solar space heating • Ground-, air-, and water-source heat pumps • Onsite wind turbines
Energy Storage and Management	• Battery storage • Thermal energy storage • Electric vehicle (EV) charging infrastructure



Action A:

Allow by-right the installation and operation of net zero enabling technologies.

Type
Policy

Timeframe

Short-term

(Less than one year)

Urgency

By 2025



Type of Expense
Staff time

Scale of Impact
Hard to measure/
high impact

Performance Indicators

- Number of permits for enabling technology
- Number of clean energy systems installed

Feasibility

Leadership opportunity – look to DOER's [Massachusetts Model Solar Zoning](#)⁶

Key Partners

Planning Department, Energy Manager,
Zoning Board, Planning Board,
Inspectional Services Department

Lead Implementer

Select Board / City Council

Benefits and Impacts

Energy - Reduced energy load through use of energy efficient technologies. Reduced fossil fuel consumption

Environmental - Reduced indoor and outdoor air pollution

Economic - Lower electric and heating energy costs



Allow by-right the installation and operation of net zero enabling technologies.

Some net zero enabling technologies may require local zoning permits for installation. This typically includes solar PV, solar hot water, eco-roofs, and other mechanical equipment that is installed outside the building envelope (such as on the rooftop or within setbacks). This type of equipment will likely be subject to local zoning restrictions and may require additional permits or special permits to be installed.

- Streamline and expedite local permitting processes by allowing net zero enabling technologies to be installed by-right in the majority of zones, rather than requiring additional permits.
- Create a process by which the Inspectional Services Department, the Zoning Board, and developers have a shared understanding of what makes these technologies safe and suitable within the municipality.
- Provide additional training, checklists, and other process documentation to clearly outline what is allowed for which zones (see **Actions L** and **K**).





Equity Considerations

Municipalities should engage with populations identified in the community's Equity Assessment (see [MAPC's Framework for Equity](#)⁷) to plan for which technologies this action will include. Like other zoning actions, the locations in the municipality where this action is implemented will have an impact on equity. Municipalities implementing this action in phases or only in certain zones should consider choosing areas where the action will benefit renters, people of color, low-income residents, and other identified populations.



Immediate Next Step

Municipalities will need to determine which technologies to include and what language is appropriate for their local zoning code. The Massachusetts [Department of Energy Resources' \(DOER's\) Model Solar Zoning](#)⁸ is a good starting point for model language. DOER's model language establishes by-right zoning for solar energy, which could be adapted to define and include additional technologies.

Explore MAPC's resources on climate zoning:
<https://www.mapc.org/resource-library/climate-zoning/>



Action B:

Include net zero enabling technology and related terms in zoning definitions.

Type
Policy

Timeframe
Short-term
(Less than one year)

Urgency

By 2025

Feasibility

Local examples – [Natick Solar Zoning Definitions Section⁹](#); [Massachusetts Model Solar Zoning¹⁰](#)

Lead Implementer
Select Board /
City Council

Key Partners

Planning Department, Energy
Manager, Zoning Board,
Planning Board, Inspectional
Services Department

Benefits and Impacts

Energy – Reduced energy load
through use of energy efficient
technologies

Environmental – Reduced
indoor and outdoor air pollution

Economic – Lower electric and
heating energy costs



Type of Expense
Staff time



Scale of Impact
Enabling action

Performance Indicators

- Number of permits for net zero enabling technologies
- Number of clean energy systems installed



Include net zero enabling technology and related terms in zoning definitions.

Municipalities can take a foundational first step to adopting climate-smart zoning by defining net zero terms, such as “net zero” and “solar energy system”, in the Definitions section of the Zoning Ordinance. Defining terms provides clarity in the interpretation of the zoning ordinance, both for developers and building inspectors.

- Include definitions for any technology with a specified use in the zoning code, including those allowed by-right (**see Action A**) or by special permit.
- For some technologies, like solar or storage, it may be appropriate to designate different definitions based on size or capacity of the system, which could influence their impact on land use.
- Consider including definitions for technologies that the community may want to encourage in the future, such as microgrids, water-based district heating and cooling, or vehicle-to-grid technology.

Definitions can either be integrated into the zoning code in the current Definitions section, or as a separate net zero enabling technologies ordinance. As with any zoning change, zoning and planning staff should make sure to consult municipal counsel throughout the process.



Equity Considerations:

Municipalities should include definitions for community shared solar and other equity-focused clean energy structures that can ensure benefits for low-income residents and other vulnerable groups. The exercise of determining which technologies and actions should be included can be combined with an [Equity Assessment](#).¹¹

Immediate Next Step:

Municipalities should determine which zoning actions from this chapter align with the community's net zero target and other goals. From this list of zoning actions, the additions to the Definitions section should include any technologies or terms that will help to achieve these actions.

Explore MAPC's resources on climate zoning:

<https://www.mapc.org/resource-library/climate-zoning/>



Additional Zoning Ordinance Resources

[Green Zoning: Using Local Zoning to Achieve Community Energy Efficiency and Resiliency](#)¹²: This guide was developed by Northeast Energy Efficiency Partnerships (NEEP) to provide case studies on how green zoning measures can be applied in Massachusetts cities and towns.

[New York Battery Energy Storage System Guidebook for Local Governments](#)¹³: This resource was developed by the New York State Energy Research and Development Authority (NYSERDA) to support cities and towns in planning for and managing the deployment of energy storage in their communities. The guide includes model laws, permits, and electrical checklists.

[Renewable Energy Ordinance Framework – Geothermal](#)¹⁴: This guidance document was developed by the Delaware Valley Regional Planning Council's (DVRPC) Alternative Energy Ordinance Group. The document provides example ordinance language and guidance on how municipalities could approach incorporating the language locally.

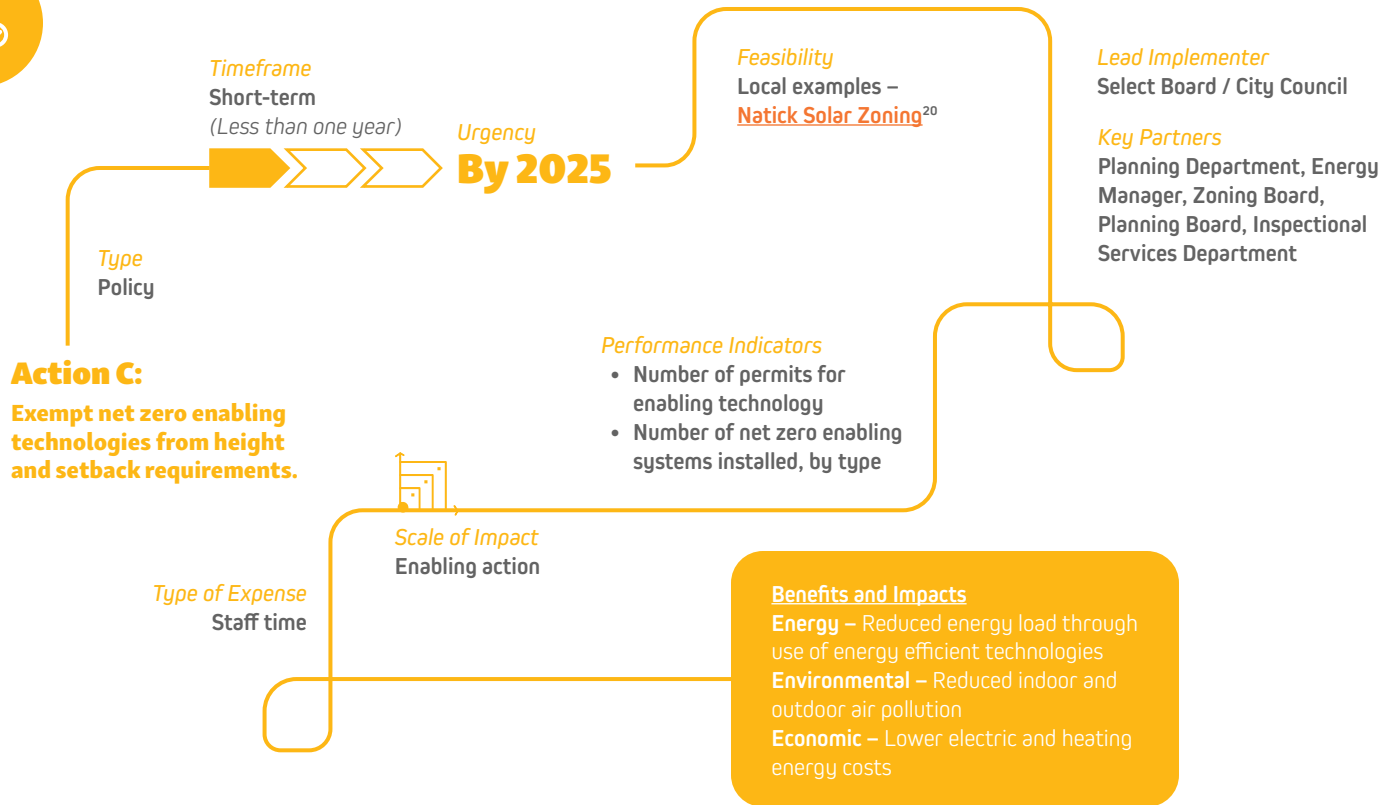
[Guide to Streamlining the Solar PV Permitting Process and Developing Supportive Zoning Bylaws](#)¹⁵: MAPC developed this solar permitting and zoning toolkit to support municipalities in increasing solar adoption across their community.

[Massachusetts Model Solar Zoning Ordinance](#)¹⁶: The Massachusetts Department of Energy Resources (DOER) developed model language for cities and towns to use to support the deployment of solar PV in their communities.

[Solar Energy Toolkit for Local Governments](#)¹⁷: SolSmart developed a toolkit for municipalities on supporting the growth of solar energy. This section of the toolkit focuses on how local governments can use planning, zoning, and development as tools to facilitate solar growth.

[How and Why to Permit for Small Scale Wind Systems](#)¹⁸: This report developed by the American Wind Energy Association covers the ins and outs of small-scale wind system deployment at the local level.

[Climate Resilient Land Use Strategies](#)¹⁹: This online resource compiles example regulatory language and policies that can be used to increase climate resilience in Massachusetts, including the impacts of flooding, drought, and heat.





Exempt net zero enabling technologies from height and setback requirements.

Height and setback requirements determine how tall and how close to the property lines structures can be within a particular zone. Some height and setback requirements can cause unintentional barriers to installing net zero enabling technologies or increase installation costs and timeline. For example, height requirements may make it more difficult for buildings to install rooftop solar PV if they are already built to the maximum height, and other mechanical equipment may need to get special permits if located within a setback. By exempting appropriate net zero enabling technologies, such as those that are accessory use by-right, the municipality can help reduce costs and approval timelines and encourage the integration of these technologies in designs and retrofits.

A municipality should consider exemptions for additional insulation to improve energy efficiency, rooftop solar PV, rooftop solar thermal, eco-roofs, accessory energy storage, and heat pump equipment, from height and setback requirements (where appropriate). For example, a rooftop solar PV system may require a few inches of space between the roof surface and the panels to function optimally, and for electrical boxes and a disconnect switch to be installed on the side of a building. Exemptions enable the addition of solar more easily into the building footprint without having to sacrifice height or setback space. Moreover, setback exemptions can obviate the need for a developer to have to choose between ample living space and the additional insulation and other weatherization measures needed to construct a better building envelope.

This is an enabling action that improves the impact of by-right zoning (**Action A**), as well as other net zero zoning actions.



Equity Considerations

The setback exemptions are particularly relevant in densely populated areas and areas with smaller lot sizes, as these lots will have competing needs that need to be met in a small space. Allowing smaller homes and apartments to expand their building envelope provides more opportunity for low-income residents and renters to benefit from the resiliency, comfort, and cost savings of more robust building shells, lower heating and cooling loads, and improved indoor air quality. Buildings in communities with the most need should be prioritized and supported to maximize these benefits.



Immediate Next Step

Municipalities can get started by reviewing their existing zoning and determining what unintentional barriers may already exist. They can also review current compliance by existing buildings with height restrictions and setback requirements. If most existing structures are out of compliance already, it may be worth including further exemptions or exempting net zero enabling technologies entirely so that efforts to enforce non-compliance do not trigger a zoning review or other additional burdens for prioritized projects.



Strategy: **Establish climate zoning overlays**

Action D

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Action E

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Action F

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Action D:

Create a climate overlay zone that reduces greenhouse gas (GHG) emissions per building type.

Type
Policy

Timeframe
Intermediate
(1 to 5 years)



Urgency

By 2030

Benefits and Impacts

Energy – Reduced fossil fuel energy use in building stock to comply with GHG caps, and associated energy demand reductions from increased energy efficiency

Economic – Reduced energy costs

Health – Improved indoor air quality

Scale of Impact
Measurable /
high impact

Type of Expense
Staff time and capital, including for emissions modeling and zoning enforcement

Key Partners

Planning Department, Energy Manager, Zoning Board, Planning Board, Inspectional Services Department, Building Owners

Lead Implementer
Select Board/City Council

Performance Indicators

- Percentage of buildings in compliance with GHG caps
- Number of new Net Zero buildings constructed

Feasibility

Leadership opportunity – look to [NYC Local Law 97](#)²¹ and [Institute for Market Transformation Building Performance Standards](#)²²



Create a climate overlay zone that reduces greenhouse gas (GHG) emissions per building type.

Similar to **Action A** in the [Net Zero Buildings Chapter](#)²³, this type of climate overlay zone is another mechanism that could be instituted to set a maximum annual GHG emissions cap per square foot for buildings located within a defined boundary.

Determine the initial maximum GHG emissions per square foot for different building types (i.e., commercial, single family, and multi-family) located within the overlay zone. For **form-based zoning**, the maximum can more easily be formatted by building type across different zones since these categories will likely already be established. For **traditional zoning**, the building types that are present within the specific overlay boundary will need to be categorized.

- Establish a stakeholder process to enable different building interests, occupants, and experts to participate in the cap determinations and timeline.
- Consider phasing in more challenging building types or functions and lowering the caps over time.

Continued on the next page.



Choose **compliance and enforcement mechanisms** best suited to your community.

- Two potential compliance pathways include requiring the building developer to either complete GHG emissions modeling at the time of construction or benchmark the building's operational emissions from a set year. Either pathway requires annual reporting for tracking compliance.
- Noncompliance could be addressed through fines or alternative compliance payments, both of which could be collected by the municipality to help support low- to moderate-income building owners and environmental justice communities to comply with the overlay.

This action is one of the most direct ways to drive GHG emissions reductions through zoning but will require robust and thoughtful planning to deploy successfully. Implementation can also be tied to a robust building energy use disclosure ordinance to support data collection and analysis and ensure compliance (see **Action B** of the [Net Zero Buildings Chapter](#)).



Equity Considerations

Municipalities should consider pairing this action with affordable housing requirements. One approach could be to encourage affordable net zero housing for the municipality's most vulnerable residents. Another approach to implementation could be to strengthen tenant rights while establishing the overlay in multi-family zones. Additionally, municipalities should consider dedicating the revenue raised through any noncompliance fees or alternative compliance payments to support for low- to moderate-income building owners and environmental justice communities.



Immediate Next Step

Communities should begin with a thorough greenhouse gas inventory to get an understanding of the emissions for which the building sector in the community is currently responsible. Further analysis will be needed to separate these emissions into different building categories (i.e., types of commercial properties), and enable the municipality to set appropriate GHG emissions reduction targets by building type.

Explore MAPC's Community Greenhouse Gas Inventory Tool

to establish a baseline of community-wide emissions: <https://www.mapc.org/resource-library/community-ghg-inventory-resources/>

Check out MAPC's resources on Climate Zoning:

<https://www.mapc.org/resource-library/climate-zoning/>



Action E:

Create a climate overlay
for high performance
building standards.

Type
Policy

Timeframe
Intermediate
(1 to 5 years)

Urgency

By 2030



Feasibility
Leadership
opportunity – look to
Boston, MA, [Green
Building Guidelines](#)²⁴;
Somerville, MA, [2019
Zoning Ordinance](#)²⁵



Scale of Impact
Hard to measure / high impact

Benefits and Impacts

Energy – Reduced energy use in building stock from
the development of more energy efficient buildings

Economic – Reduced energy costs and maintenance
costs for buildings

Health – Improved indoor air quality from
weatherization measures and elimination of on-site
combustion

Performance Indicators

- Compliance with climate overlay
- Modeled energy use reductions
- Modeled or reported GHG reductions

Key Partners

Planning Department, Energy
Manager, Zoning Board, Planning
Board, Inspectional Services
Department, Building Owners

Lead Implementer
Select Board /
City Council

Type of Expense
Staff time





Create a climate overlay for high performance building standards.

Within this type of climate overlay zone, buildings will be required to meet one of a menu of high-performance building standards, such as [Passive House](#),²⁶ [LEED Zero](#),²⁷ or [Living Building Challenge](#),²⁸ with multiple pathways for compliance.

This overlay accomplishes many of the same objectives as a GHG emissions cap climate overlay (**Action D**), while potentially being easier to track compliance. High performance building standards require developers to meet a certain number of points or choose certain energy efficiency, climate, resilience, and renewable energy measures to include in the building and landscape design. It is essential that the chosen building standard or standards have a variety of ways for a developer to comply to not unintentionally overlap with the building code. However, due to this flexibility, this action does not have as direct an impact on GHG emissions as the GHG emissions cap overlay.

The LEED standards have some precedent in municipal zoning code, such as in the City of Boston's zoning²⁹, City of Cambridge Section 22.000³⁰, and City of Somerville's Development Standards³¹ LEED certification can be met via measures in various sectors, ranging from energy to waste and water use in a building. While compliance with LEED silver, gold, or platinum standards may be less impactful on GHG emissions than other more rigorous standards such as Passive House, Living Building Challenge, and LEED Zero, by offering a menu of compliant standards, a community can offer choice within high-performance bounds. Communities may also want to consider combining this action with a Green Code to incentivize green infrastructure (**Action H**).



Equity Considerations

The location of the overlay will have a direct impact on where highly efficient buildings are located, and thus who will live, work, and spend time in them. It is worth thinking through where this overlay can best benefit residents who would not otherwise get the benefits of a high-performance building. Municipalities can also consider including healthy-living or landscape standards such as WELL³² or SITES³³ in collaboration with high-performance building standards in order to emphasize holistic goals of achieving co-benefits such as health, safety, and resiliency.



Immediate Next Step

Municipalities should explore different high-performance building standards to determine which may best fit the community's goals. Municipalities should look for building standards for which the options for compliance are weighted in alignment with municipal goals. For instance, a municipality that has not yet seen much high-performance construction may wish to include LEED gold or silver in the menu to provide developers a range of stringency in the standards available.

Check out MAPC's resources on Climate Zoning:

<https://www.mapc.org/resource-library/climate-zoning/>





High Performance Building Standards

LEED (Leadership in Energy and Environmental Design)³⁴ is one of the most widely used green building rating systems globally. LEED certification can be pursued for virtually all building types and provides a framework for healthy, highly efficiency, and cost-saving green buildings.

LEED Zero³⁵ complements LEED and verifies the achievement of net zero goals. LEED projects can achieve LEED Zero certification when they demonstrate any or one of the following: net zero carbon emissions, net zero energy use, net zero water use, or net zero waste.

The **Living Building Challenge**³⁶ is an international sustainable building certification program. Living Buildings are defined as regenerative buildings that connect occupants to light, air, food, nature, and community, and remain within the resource limits of their site. The Living Building Challenge is organized into seven performance areas: place, water, energy, health and happiness, materials, equity, and beauty.

Passive House³⁷ is a building performance standard that focuses on efficient building design with low energy consumption. This could be achieved through quality design paired with continuous insulation, high-performance windows, and heat recovery ventilation. In addition to energy efficiency, passive buildings offer long-term benefits such as minimal energy consumption, better indoor air quality, and increased building resiliency.

The **WELL Building Standard**³⁸ provides a framework for buildings and organizations to create spaces that enhance human health. WELL strategies advance health by setting performance standards for design interventions, operational protocols and policies, and commitment to foster health and wellness. Spanning ten concepts with specific health intents, WELL Certification offers a roadmap for improving the quality of air, water, and light with mindful design decisions.



Urgency

By 2025

Timeframe

Short-term

(Less than one year)

Type

Policy

Action F:

Enable and incentivize transit-oriented development (TOD).

Feasibility

Local examples – Growing Station Areas ETOD³⁹; South Salem Transit Oriented Development⁴⁰



Scale of Impact

Hard to measure / high impact

Lead Implementer

Select Board / City Council

Key Partners

Planning Department, Transportation Department, Energy Manager, Zoning Board, Planning Board, Inspectional Services Department

Performance Indicators

- Number of vehicle miles traveled within municipality
- Number of affordable units built within an overlay or district
- Number of parking spaces within an overlay or district



Type of Expense

Staff time and capital (if paired with infrastructure changes)

Benefits and Impacts

Economic – Reduced transportation and housing costs for multi-family units

Health - Improved physical and mental health outcomes from active mobility and shorter commute times

Environmental - Improved outdoor air quality



Enable and incentivize transit-oriented development (TOD).

Transit-oriented development encourages increased proximity and access to public transit and active modes of getting around. This can address the challenges for the first and last mile of a commute and provide a more connected and car-free commute through options such as walking and biking. TOD should benefit residents who utilize public transportation and are able to limit the use of single passenger vehicle trips.

- Allow for and incentivize high density and mixed-use buildings close to transit centers such as T-stops, commuter rail stops, bus stops, and bike infrastructure.
- Allow for lower parking minimums for development within walking distance of public transit.
- Discourage and/or re-locate parking away from transit centers in denser municipalities; in suburban and rural municipalities, co-locate parking and transit centers to encourage use of public transit.
- Demonstrate leadership by establishing a car-free block or neighborhood, re-locating parking to the perimeter of the block, and re-purposing roadways in the center for bikes, pedestrians, and green space.





Equity Considerations

In creating the transit-oriented development overlay or district, municipalities should take care to hear lived experiences of residents who rely on public transit, and those who walk and bike for transportation. An overlay or district can be designed to include additional requirements for affordability and community amenities. This recommendation should also be paired with strategies that preserve affordable housing, such as community land trusts, and protect against displacement.

Immediate Next Step

Refer to the [MAPC Growing Station Areas](#) resource through which municipalities can identify community goals and options that may be a good fit given the types of transportation that would be emphasized. Those communities serviced by the MBTA should refer to guidance from the Massachusetts Department of Transportation and the MBTA on the requirements enacted by the Housing Choice legislation in 2021.⁴¹ Through this legislation, all MBTA communities must have at least one multifamily district of reasonable size permitted by right.

Explore MAPC's work with communities on TOD:

<https://www.mapc.org/transportation/>



Strategy:

Mandate energy efficiency and renewable energy as appropriate

Action G

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Action H

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Action I

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Action J

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Action G:

Require all new construction and roof replacements to implement an eco-roof.



Type
Policy

Timeframe to Implement

Short-term

(Less than one year)

Urgency

By 2025



Type of Expense
Staff time



Scale of Impact
Hard to measure/
high impact

Benefits and Impacts

Energy – Increased renewable energy through the development of new rooftop renewable systems. Lower building energy demand.

Economic – Reduced heating and cooling loads leads to savings on energy bills.

Environmental – Reduced urban heat island effect and mitigation of stormwater runoff. Improved outdoor air quality due to addition of green infrastructure, provision of food and habitat for pollinators.

Performance Indicators

- Square footage of eco-roofs implemented
- kW of solar installed
- Gallons of stormwater diverted

Key Partners

Planning Department, Energy Manager, Zoning Board, Planning Board, Inspectional Services Department

Feasibility

Local examples and national examples – [Watertown, MA - Solar Requirement](#)⁴², [Cambridge, MA – Green Roofs](#)⁴³, [Toronto, Ontario - Green Roof By-Law](#)⁴⁴, [NYC Cool Roofs Ordinance](#)⁴⁵, [Philadelphia, PA - Blue Roofs](#)⁴⁶



Lead Implementer

Select Board / City Council



Require all new construction and roof replacements to implement an eco-roof.

An “eco-roof” is a term used to describe a climate-smart roof that provides multiple benefits. Eco-roofs can generate renewable energy, manage stormwater, reduce heating loads in a building, and/or mitigate urban heat island effect, depending on the type of roof installed.

- Establish an eco-roof requirement for new construction and roof replacements to ensure developers make use of frequently underutilized rooftop space to advance net zero goals and co-benefits.
- Allow for flexibility within the requirement by allowing developers and building owners to select the best option for each building and location. For instance, the requirement could be fulfilled by either a roof with solar PV or solar thermal, a blue roof that helps to manage stormwater, a green or living roof that uses green infrastructure to store water, reduce heat, and improve air quality, or a white roof that has a finishing surface that reflects sunlight to reduce temperature.
- Consider limiting or prioritizing the types of eco-roof options to those most advantageous to the building types and goals within your community. Different roofs may be more applicable in different municipalities depending on the location of lots available for new construction, or the needs of the community. For example, a more densely populated area may have more need for measures that reduce heat.



Equity Considerations

Some of the options for eco-roofs provide multiple benefits to a greater area than their lot. For example, blue roofs can make an impact over an area larger than the rooftop by reducing stormwater runoff. Energy generation from solar PV could be offered as community shared solar. When planning for the particular eco-roof types available for compliance, municipalities should survey the populations most affected for feedback. Additionally, municipalities should consider providing financial incentives to support deployment in low- and moderate-income neighborhoods.



Immediate Next Step

Municipalities can get started by assessing the solar potential, stormwater mitigation needs, and impacts of urban heat island effect in different areas of the community to determine which eco-roof types may be more feasible and useful. Municipalities should consider supporting this action by adding prioritized rooftops to the Definitions section of their zoning code (see **Action B**); this can help encourage eco-roof deployment even before requirements are in place.





Types of Eco-Roofs

Type	Definitions	Benefits
Solar Roof	A solar roof could be a solar photovoltaic (PV) system for renewable energy generation or a solar thermal system to offset the heating load of the building by pre-heating the building's water with heat generated from solar collectors on the roof.	• Generates renewable energy - either electricity via solar PV or thermal energy in terms of solar hot water. • Reduces energy costs to occupants over time.
Green (or Living) Roof	A roof with living green infrastructure for the purpose of mitigating heat, storing water, and improving air quality; can also function as a location for urban farming, pollinators, and passive recreation.	• Provides many co-benefits including water filtration, improved air quality, localized cooling, and reduced heating and cooling loads. • Can serve as a public amenity, providing open space.
White (or Cool) Roof	A finishing or surface that reflects more light than it absorbs. This lowers the temperature of the air around it, helping to reduce urban heat island impacts by as much as a third globally if all roofs in major cities were treated. ⁴⁷	• Low-cost option that reduces energy load in the summer, thereby also decreasing need for mechanical cooling. • May be paired with other eco-roofs or solar roof.
Blue Roof	A roof system employed in stormwater management. This could encompass active or passive rainwater storage and drainage systems.	• Improves water quality by reducing strain on sewer system and overflow events. • Reduces flooding.



Action H:

Adopt a Green Code with resiliency and mitigation incentives. Set minimum requirements for compliance in each zone.

Type
Policy

Timeframe to Implement
Short-term
(Less than one year) Urgency

By 2025

Feasibility

Local and national examples – Somerville, MA – [2019 Zoning Ordinance](#)⁴⁸ ; Seattle, WA – [Green Factor Standard](#)⁴⁹

Lead Implementer

Select Board / City Council

Key Partners

Planning Department, Energy Manager, Zoning Board, Planning Board, Inspectional Services Department



Performance Indicators

- Number of permits meeting the Green Score criteria

Scale of Impact
Hard to measure/
high impact

Type of Expense
Staff time

Benefits and Impacts

Health – Improved management of urban heat island impacts
Environmental – Improved management of stormwater and outdoor air quality



Adopt a Green Code with resiliency and mitigation incentives.

A Green Code provides development incentives to encourage a variety of environmentally sustainable building and site measures. Many nature-based or green strategies also present opportunities for emissions reductions if implemented holistically. For example, a green roof improves air quality and localized cooling benefits, but it also has the mitigation benefit of reduced heating and cooling load in the building. A Green Code allows for multiple pathways of compliance, as applicants choose actions from a pre-set list (examples include native plants, de-paving, and percent lot coverage), and encourages the inclusion of green infrastructure within each lot on a points-based system. The Green Code builds off impervious surface requirements from low-impact development and adds guidance for green infrastructure.

- Assess whether a Green Code is a good fit for your community. Municipalities experiencing new development and redevelopment may want to incentivize green infrastructure that increases multiple co-benefits, including improvements to air quality, water quality, and natural cooling.
- Include incentives in the Green Code for climate mitigation measures that are implemented along with the climate resiliency measures. Such as shade trees that are planted intentionally to shade structures and reduce heating/cooling loads in nearby buildings.
- Ensure that the Green Code aligns with your community's values so that the actions worth the most points are those from which the community would most benefit, as opposed to just the most difficult to implement. This can include prioritizing trees near walking paths and sidewalks, and green infrastructure for stormwater management.



Equity Considerations

Depending on where the Green Code is implemented, there could be concern around “green gentrification,” such as in the potential for displacement of residents in neighborhoods experiencing increased investment in local amenities. A zoning ordinance could be paired with housing strategies, such as community land trusts and mechanisms for preserving and requiring affordability, to address this concern. Engage residents from at-risk communities in the planning and development of the Green Code to improve the likelihood for a more equitable and impactful outcome. The specific factors and multiplier should be determined based on local needs and priorities.



Immediate Next Step

Municipalities can start by reviewing the existing examples of Green Codes (see Somerville, MA, Green Score, and Seattle, WA, Green Factors, local zoning ordinances), and conducting stakeholder engagement sessions to determine which factors should be weighted most heavily for your community.



Action I:

Require energy efficiency licensing for rental units. Include requirements for ongoing compliance.

Type
Policy

Timeframe
Intermediate
(1 to 5 years)

Urgency

By 2040

Benefits and Impacts

Equity – Increased affordability, safety, and comfort of rental units
Economic – Reduced energy costs for renters

Health – Improved resiliency and indoor air quality

Scale of Impact

Hard to measure/high impact

Performance Indicators

- Percentage of rental units licensed
- Number of energy efficiency measures installed in licensed units

Type of Expense

Staff time and operations (could be offset by noncompliance fees)

Feasibility

Leadership opportunity – look to [Somerville, MA](#)⁵⁰; [Boulder, CO](#)⁵¹; [NYSERDA Energy Efficiency Retrofit Program](#)⁵²

Lead Implementer

Inspectional Services Department

Key Partners

Housing Department, Energy Manager, Renters, Property Owners, Advocacy and Consumer Protection Organizations, Board of Health



Require energy efficiency licensing for rental units.

One of the largest barriers to implementation of energy efficiency in rental units is that it requires those who own and manage the property, such as landlords and building managers, to invest in efficiency upgrades while those occupying the building units – assuming they are responsible for the utility payments – experience the benefits, including economic, quality of life, resilience, and health benefits. This is known as a “split incentive.” Rental licensing helps to address this challenge and promote energy efficiency in existing buildings by requiring that certain actions, such as energy audits and weatherization, be implemented in rental properties and pass a regular inspection during the point of leasing.

- Establish requirements within the rental licensing process for landlords and building managers to improve the health, safety, and welfare of renters. This could include requirements to provide a minimum level of energy efficiency for lighting, heating and cooling, and hot water their units.
- Formalize the timeline of energy efficiency measures so that landlords and building managers can implement appropriate measures strategically. Consider starting with a voluntary program with recognition for joining the program, and ramping up to required rental licensing over time.
- Provide landlords with flexibility in how to comply, such as the ability to choose which technology, from among a prioritized list or degree of efficiency, is most appropriate.
- Inspections of rental units should happen at minimum when the lease changes. However, municipalities could require more regular inspections at a standard interval of time. Results of the inspection should be publicly available for renters.
- Consider adopting commercial property assessed clean energy (PACE) financing in your community or other financing policies to help to defray the costs for licensees (see **Action I** of the [Net Zero Buildings Chapter](#)).



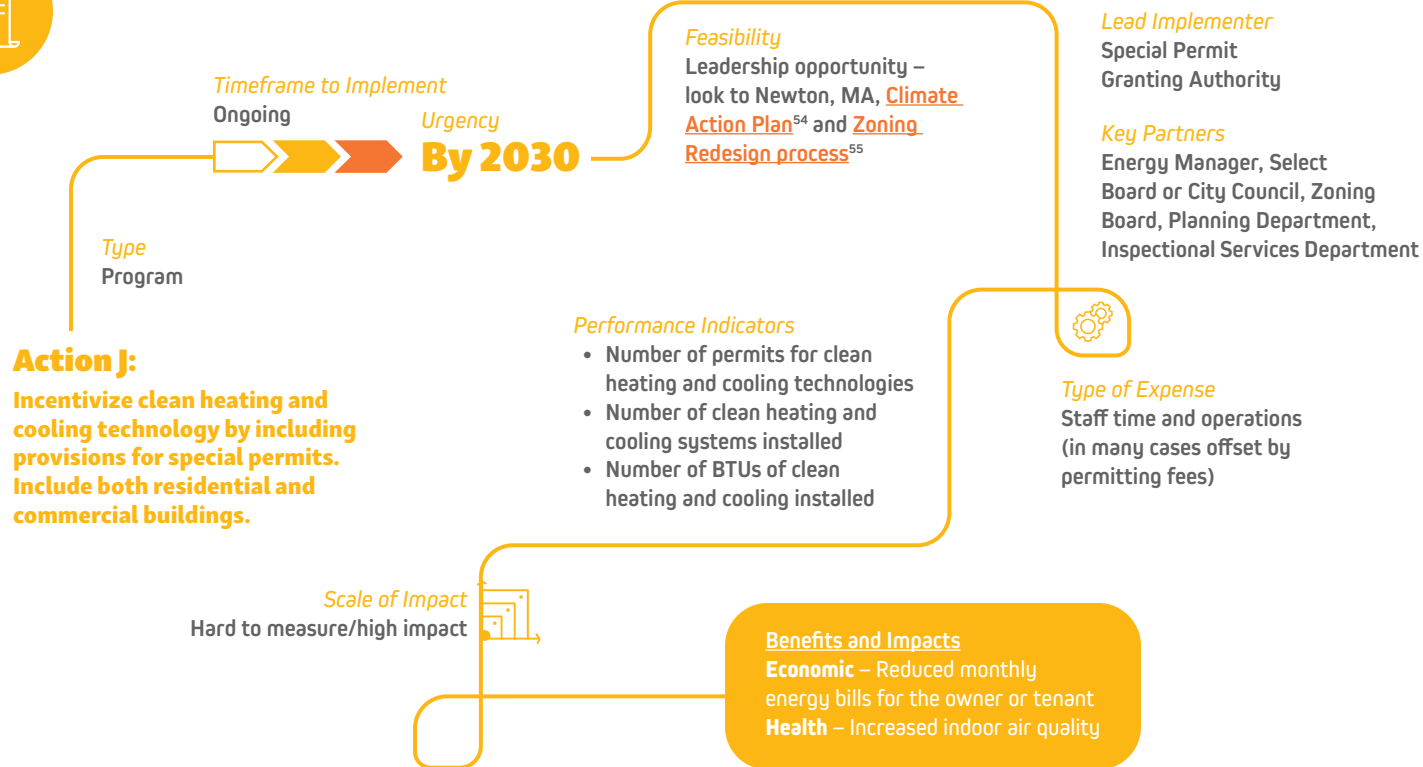
Equity Considerations

This action should be paired with protection for renters so that they are not displaced by resulting improvements to the property. Municipalities enacting this action should enact complementary policies and programs, such as renter protections, free renter legal aid, and renter support phone-lines. One of the primary goals of this policy should be to implement energy efficiency measures, such as clean heating and cooling technologies, and weatherization in units occupied by those often underserved by these benefits, including low- and moderate-income residents and small businesses, environmental justice communities, and those with limited English proficiency. Renters across these communities have long been a priority of the MA Energy Efficiency Advisory Council due to the challenges of the split incentive issue and significant intersection of renters with other prioritized groups.⁵³



Immediate Next Step

Municipalities can start by establishing a list of rental units and a contact list of landlords within the municipality for communication about the licensing policy under development. Municipalities should also survey renters and obtain feedback on beneficial protections.





Incentivize clean heating and cooling technology by including provisions for special permits.

Developers must seek special permits to build specific types of uses in specific zones, such as density bonus or allowing a mixed-use multifamily in a commercial district. Municipalities have the authority to incentivize the inclusion of additional amenities in order to be able to grant a special permit that align with their goals. Amenities such as solar energy systems or clean heating and cooling technologies(ground-source or air-source heat pumps or solar hot water), could be required for developers applying for a special permit.

- Create guidance for the Special Permit Granting Authority (SPGA)⁵⁶ on clean heating and cooling technologies amenities and ensure that information on the technologies is provided during special permit hearings. Once familiarity with the technology is increased, adoption of clean heating and cooling can be required as part of the special permitting process.
- Phase in the requirement of clean heating and cooling technology within the special permitting process by end use. For instance, a municipality could first require this technology to be used for space heating and cooling, and soon after include incentives for domestic hot water in single-family and then multi-family buildings.





Equity Considerations:

To ensure that low-income residents, communities of color, and other populations that are disproportionately affected by poor indoor and outdoor air quality are beneficiaries of this action, municipalities can consider equity indicators in the permitting process, prioritize permitting for multi-family buildings, or provide financial or technical assistance for those populations adopting clean heating and cooling technology.



Immediate Next Step:

Municipalities can start by reviewing their current special permit review process. The incentives for clean heating and cooling can be modeled after existing solar energy system incentives for special permits or density bonuses. Municipalities can also begin educating the select board, city council, zoning board, planning board, board of appeals, or other individuals that are a part of the SPGA on the pathway under development and the benefits and feasibility of clean heating and cooling.

Explore MAPC's resources on clean heating and cooling technologies:

<https://www.mapc.org/resource-library/clean-heating-and-cooling/>



Strategy: **Streamline and expedite permitting for net zero buildings.**

Action K

pg 47

Action L

pg 50



Action K:

Offer expedited permitting and reduced permitting fees for net zero emissions buildings and net zero enabling technologies.

Type
Policy

Timeframe to Implement
Ongoing

Urgency

By 2030

Type of Expense
Staff time and
operations

Benefits and Impacts

Energy – Reduced energy use in building stock from the development of energy efficient and net zero emissions buildings

Economic – Reduced energy costs for the owner or tenant, reduced soft costs for the developer (i.e., non-hardware costs)

Health – Improved indoor air quality

Performance Indicators

- Number of permits for net zero enabling technologies
- Number of permits for net zero emissions buildings
- Average length of permitting process for net zero emissions buildings and enabling technologies

Feasibility

Local and national examples – [Natick, MA – Solar Permitting Checklist](#)⁵⁸; [Seattle, WA - Priority Green Expedited](#)⁵⁹; [Salt Lake City, UT - Green Building Expedited](#)⁶⁰; [San Diego, CA - Green Building Program](#)⁶¹; [Palo Alto, CA – Net Zero Baseline Study](#)⁶²

Key Partners

Energy Manager, Planning Department, Zoning Board,

Lead Implementer

Inspectional Services Department

Scale of Impact

Hard to measure/high impact





Offer expedited permitting and reduced permitting fees for net zero buildings and technology.

The goal of this streamlined permitting pathway is to encourage net zero construction and technologies by providing a transparent, easier, and/or less expensive permitting process. Building developers will find a simple pathway easier to plan for and follow, and will be more likely to submit plans that meet the requirements of the pathway. Reduced or eliminated fees and more predictable timing can also be an enticement.

- Assess the existing permitting pathway for net zero buildings and enabling technologies and then implement measures to streamline the process. A checklist that outlines the permitting pathway is a beneficial starting place, as it improves communication among inspectional services, planning, and zoning staff as well as those pulling the permits. Other measures include electronic permitting, fast response times for pulled permits, automatic approvals for commonplace and prioritized technologies, brief and predictable inspection windows, and virtual inspection options.
- Provide additional substantive guidance to developers on permitting for net zero buildings. This guidance will help encourage developers to meet and exceed building standards for net zero.
- Consider combining with online plan reviews to increase the effectiveness of the process for developers.
- Offer expedited permitting and reduced permitting fees for other high-performance building types as well, perhaps with a sliding scale toward those that are more efficient and low-carbon. Include buildings meeting the requirements of Passive House and/or buildings meeting one of many high-performance building standards (see **Action E**).



Equity Considerations

In developing streamlined permitting processes, municipalities can start by prioritizing feedback from developers that are minority and women-led businesses. These steps will help to ensure that minority and women-led businesses will be able to effectively navigate the permitting pathways. Municipalities should consider increasing the available incentives for multi-family buildings and retrofits to encourage greater adoption of net zero enabling technologies and systems in hard-to-reach buildings. Moreover, they should consider implementing incentives for projects that serve environmental justice communities or share energy savings between renters and landlords in addition to these other permitting mechanisms.



Immediate Next Step

Municipalities should convene relevant staff, including Inspectional Services, Planning, and Zoning, to review the existing permitting pathways for high-performance buildings and net zero enabling building systems (such as clean heating and cooling equipment), and determine how the process can be improved for net zero-related permits. Municipalities can create a checklist of this improved process for clarity and simplicity.

Explore the resources available from MAPC and SolSmart on how to expedite permitting:

<https://www.mapc.org/planning101/best-practices-for-streamlining-solar-permitting-and-inspection-processes/>

<https://www.mapc.org/wp-content/uploads/2017/11/Solar-Permitting-and-Zoning-Bylaws.pdf>

<https://solsmart.org/permitting/>



Action L:

Train reviewers and staff on net zero building standards and design.

Type
Program

Timeframe to Implement
Ongoing

Urgency

By 2030

Feasibility

Local examples – [MAPC SolSmart Solar Permitting Trainings](#)⁶³; [MassCEC Solar Permitting and Inspection Trainings](#)⁶⁴; [Building Operator Certification trainings](#)⁶⁵

Benefits and Impacts

Energy – Reduced energy use in building stock from the development of new energy efficient and net zero buildings

Economic – Reduced operational energy costs

Health – Improved indoor air quality

Lead Implementer
Inspectional Services Department

Key Partners
Certified Trainers, Planning Department, Energy Manager

Type of Expense
Capital and staff time

Performance Indicators

- Participation by Inspectional Services staff in training
- Turnaround time for permits for net zero enabling technology and net zero buildings

Scale of Impact
Enabling action



Train reviewers and staff on net zero building standards and design.

Since the development of a net zero building utilizes different building standards, calculations, and codes than are typically used in construction, building inspectors and plan reviewers may not have a familiarity with best practices.

- Train planning board, building inspectors, and related staff in net zero building standards to familiarize them with high-performance building practices, to empower them to conduct relevant energy and performance calculations during plan review, and to enable inspectors to identify common construction mistakes and code violations so that they can conduct effective inspections.
- Provide a thorough curriculum that covers topics such as LEED, Net Zero, Passive House and other high-performance standards, HERS ratings, life safety benefits of high-performance buildings, and energy modeling.
- Provide continuing education units for the trainings to enhance professional development.



Equity Considerations

Training for plan reviewers and inspectors should include multi-family units, as appropriate depending on the community. There are some existing examples of net zero and net positive multi-family buildings primarily where housing is built by a state or municipality. However, significant barriers exist for renters due to the split incentive issue referenced in **Action I**. By focusing on multi-family buildings, a municipality can make this permitting pathway easier and more familiar for both the plan reviewer and the developer, which can reduce time and effort and increase the likelihood that multi-family net zero buildings will be developed.



Immediate Next Step

Municipalities should seek to establish goals for a net zero inspection and plan review training curriculum and identify project partners to conduct the trainings. Municipalities can look to MassCEC⁶⁶, Mass Save⁶⁷, and Built Environment Plus⁶⁸ for more resources on trainings.

End Notes

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NEEDHAM PLANNING BOARD
TEMPORARY OUTDOOR SEATING /OUTDOOR DISPLAY POLICY

Enacted May 20, 2020,
revised August 11, 2020, October 6, 2020, November 4, 2020,
June 1, 2021, October 19, 2021, ~~and~~ May 3, 2022 and April 4, 2023

Section 1 - Purpose and Scope

The COVID-19 pandemic has caused not only a public health crisis; it has also triggered a worldwide economic crisis. Public health requirements for social distancing have placed new burdens and challenges on the business community to provide more physical space between customers and staff. In an effort to respond to the new social distancing requirements, the Select Board has adopted a temporary outdoor seating policy that will allow the Town to create outdoor dining spaces on public open spaces, sidewalks, parking lots and on-street parking spaces, to create outdoor dining space opportunities for- the open air consumption of takeout food and beverages from local restaurants. Initial implementation is planned for the Town Common, Needham Heights Common, and Eaton Square. This policy will be in effect through April 1, ~~2023~~2024 or such later date as may be approved by the Massachusetts legislature.

In an effort to further facilitate the re-opening of Needham businesses and recognizing the impacts of COVID-19, the Planning Board has approved this policy to allow additional temporary outdoor seating for restaurants and additional temporary outdoor display space for retail businesses with stand-alone entrances and exits. Restaurants may utilize available outdoor space for seating in addition to any existing approved interior restaurant seating and retail establishments may utilize outdoor space for display and sales in addition to interior store space. The enforcement of outdoor display requirements or prohibitions, take-out service requirements or prohibitions, outdoor seating limitations, and minimum parking standards as contained within any special permit applicable to the restaurant or retail establishment is hereby suspended to enable the above-described activities subject to the following guidelines. This policy will be in effect through April 1, ~~2023~~2024 or such later date as may be approved by the Massachusetts legislature.

Section 2 – Guidelines

All temporary outdoor seating areas and display areas must adhere to the following:

- A. Must comply with provisions of Executive Orders issued by the Governor to State, County, and Town entities, and the Centers for Disease Control and Prevention (CDC) guidelines for social distancing.
- B. Must comply with all Massachusetts and Town of Needham Health Department requirements.
- C. Must comply with all applicable Fire Department regulations and must not impede Police or Fire access.

- D. Must comply with the Massachusetts Division of Alcoholic Beverages & Tobacco consumption on premises requirements.
- E. Must not negatively impact ingress/egress to the building or property; safe ingress and egress shall be provided to the property and building, including emergency access measures at all times.
- F. Must have received the written approval of the Town Manager's office and the Needham Health Department having demonstrated compliance with applicable health and safety regulations. Some parking, including handicapped parking if required, remains available for the restaurant and adjacent businesses (if applicable).
- G. If located within a parking area, a temporary physical barrier must be placed separating the outdoor seating area or display area from the remaining parking.
- H. All tables in temporary outdoor seating areas and display areas shall be located a safe distance from drive aisles, usable parking, and so as to maintain proper distancing from usable parking.
- I. All temporary outdoor seating areas on property owned or leased by a restaurant and temporary retail display and/or sale areas on property owned or leased by a retail establishment, and all such seating areas and display/sale areas on other private or public property licensed to the restaurant or retail establishment for such purposes, and adjacent open areas and/or parking lots, must be maintained clean of litter.
- J. If a restaurant is not the property owner or lessee of the areas intended to be used for the temporary additional outdoor seating area or if the retail establishment is not the owner or lessee of the areas intended to be used for the temporary retail display and/or sale area, then written permission from the property owner must be obtained prior to approval and installation.
- K. If the outdoor seating area or retail display area is to be located upon property of the Town of Needham (e.g. sidewalks, on-street parking spaces, public parking areas adjacent to the restaurant or retail establishment), the use of such area must have received the written approval of the Town Manager's office.

Section 3 – Amendments

This policy may be amended by a majority vote of the members of the Planning Board.

Section 4 – Effective Date

This policy was first adopted at a regular meeting of the Planning Board on May 20, 2020 and became effective as of that date. It was revised to extend the effective date at the Planning Board meeting of August 11, 2020, and again October 6, 2020, November 4, 2020, June 1, 2021, October 19, 2021, ~~and~~ May 3, 2022 and April 4, 2023 and currently is extended through April 1, 202~~4~~³ or such later date as may be approved by the Massachusetts legislature.

From: [Susan Welby](#)
To: [Alexandra Clee](#)
Subject: Re: LWV-Needham Warrant Meetings 4/24
Date: Thursday, March 30, 2023 1:44:25 PM

Just a reminder that Warrant Meetings are scheduled for Monday, April 24, 7:30 pm at the Center at the Heights. If you could give me a list of Planning Board members that can attend by Thursday, April 20, that would be great. This year the rooms will be assigned as follows:

Precincts A/B/C in Room 211 (upstairs)

Precincts D/E in Room 217 (upstairs)

Precincts F/G in Room 219 (upstairs)

Precincts H/I/J in Room 104A (Cafe on first floor)

Zoom option will be set up in the Conference Room upstairs - a representative can attend in person or by zoom. Link to be sent later.

Thank you so much for your help once again this year.

Susan Welby
League of Women Voters-Needham
Warrant Meeting Coordinator
617/834-6097

On Feb 7, 2023, at 2:58 PM, Susan Welby <swelby@comcast.net> wrote:

Please put a **Save the Date** event on the Planning Board calendar for the annual League of Women Voters-Needham **Warrant Meetings on Monday, April 24, at 7:30 pm at the Center at the Heights**. We will follow the same format we had last year - five rooms, four for in-person attendees and one room for a virtual (zoom) option. The virtual option will be hosted in the Conference Room at the Center at the Heights and will allow for a committee representative to be at the table to address any questions Zoom attendees may have, but this could also accommodate a Planning Board representative to attend on Zoom instead if needed. The other 4 rooms will require actual in-person representation. I will be sending a reminder in late March or early April to see if you could identify the people from your board that will be in each room to address Articles on the Warrant.

If you have any questions or comments, please feel free to contact me.

Thank you.

Susan Welby
League of Women Voters-Needham
Warrant Meeting Coordinator
617/834-6097



Commonwealth of Massachusetts
**DEPARTMENT OF HOUSING &
COMMUNITY DEVELOPMENT**

Maura T. Healey, Governor ♦ Kimberley Driscoll, Lieutenant Governor ♦ Jennifer D. Maddox, Undersecretary

March 24, 2023

Kate Fitzpatrick
Town Manager
Needham Town Hall
1471 Highland Avenue
Needham, MA 02492

RE: Determination of Interim Compliance under MGL c. 40A, Section 3A

Dear Manager Fitzpatrick:

The Department of Housing and Community Development (DHCD) is in receipt of the Action Plan submitted by Needham on January 26, 2023. Thank you for taking this step as outlined in the Compliance Guidelines.

I am pleased to inform you that DHCD approved the Action Plan, and that Needham has achieved Interim Compliance. This Interim Compliance is valid until your due date for District Compliance, which is 12/31/2024. Please be advised that pursuant to Section 9(a)(iii) of the guidelines, a community's progress in implementing their Action Plan may be independently evaluated as part of the application review process for any of the funding sources that are subject to compliance with Section 3A.

We appreciate submittal of the Action Plan describing Needham's planning efforts related to Section 3A District Compliance and wish your community the best in implementation of its components. If you have any questions regarding this determination, please contact Nate Carlucci at nathan.carlucci@mass.gov.

Sincerely,

Jennifer D. Maddox
Undersecretary

cc: Nathan Carlucci, MBTA Communities Compliance Coordinator