

# STONEFIELD

## STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

PROPOSED PHARMACY WITH DRIVE-THRU  
BLOCK 5B3, LOT 50  
290 CENTRAL STREET (U.S. ROUTE 202)  
TOWN OF WINCHENDON  
WORCHESTER COUNTY, MASSACHUSETTS

PREPARED FOR:

**FIDC 163, LLC**

PREPARED BY:

**STONEFIELD ENGINEERING & DESIGN, LLC**

JANUARY 26, 2022

BOS-210033



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**JOSHUA H. KLINE, PE**  
MASSACHUSETTS PROFESSIONAL ENGINEER LICENSE # 53936

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## **REPORT CONTENTS**

<b>1.0 PROJECT DESCRIPTION.....</b>	<b>1</b>
<b>2.0 EXISTING CONDITIONS .....</b>	<b>1</b>
<b>2.1 EXISTING DRAINAGE AREAS.....</b>	<b>2</b>
<b>2.2 PROJECT SOILS.....</b>	<b>2</b>
<b>3.0 PROPOSED CONDITIONS .....</b>	<b>3</b>
<b>3.1 PROPOSED DRAINAGE AREAS .....</b>	<b>3</b>
<b>4.0 ANALYSIS METHODOLOGY &amp; DESIGN PARAMETERS.....</b>	<b>3</b>
<b>4.1 HYDROLOGIC &amp; HYDRAULIC ANALYSES.....</b>	<b>3</b>
<b>4.2 MASSACHUSETTS STORMWATER DESIGN PARAMETERS .....</b>	<b>4</b>
<b>5.0 MASSACHUSETTS STORMWATER HANDBOOK STANDARDS .....</b>	<b>6</b>
<b>STANDARD 1: NO NEW UNTREATED DISCHARGES .....</b>	<b>6</b>
<b>STANDARD 2: PEAK RATE ATTENUATION.....</b>	<b>6</b>
<b>STANDARD 3: RECHARGE.....</b>	<b>7</b>
<b>STANDARD 4: WATER QUALITY.....</b>	<b>7</b>
<b>STANDARD 5: LAND USES WITH HIGHER POTENTIAL POLLUTANT LOADS (LUHPPLS).....</b>	<b>7</b>
<b>STANDARD 6: CRITICAL AREAS.....</b>	<b>8</b>
<b>STANDARD 7: REDEVELOPMENTS AND OTHER PROJECTS SUBJECT TO THE STANDARDS ONLY TO THE     MAXIMUM EXTENT PRACTICABLE .....</b>	<b>8</b>
<b>STANDARD 8: CONSTRUCTION PERIOD POLLUTION PREVENTION AND EROSION AND SEDIMENTATION     CONTROL .....</b>	<b>8</b>
<b>STANDARD 9: OPERATION AND MAINTENANCE PLAN.....</b>	<b>8</b>
<b>STANDARD 10: PROHIBITION OF ILLICIT DISCHARGES.....</b>	<b>8</b>
<b>6.0 STORMWATER CONCLUSIONS .....</b>	<b>9</b>
<b>7.0 EROSION AND SEDIMENT CONTROL .....</b>	<b>9</b>
<b>7.1 TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES .....</b>	<b>9</b>
<b>7.2 PERMANENT EROSION AND SEDIMENT CONTROL MEASURES .....</b>	<b>11</b>
<b>7.3 CONSTRUCTION PHASING PLAN AND SEQUENCE OF OPERATIONS.....</b>	<b>11</b>
<b>7.4 FINAL SITE STABILIZATION.....</b>	<b>11</b>
<b>8.0 POST CONSTRUCTION OPERATION AND MAINTENANCE.....</b>	<b>11</b>
<b>8.1 MAINTENANCE EQUIPMENT AND PERSONNEL.....</b>	<b>12</b>
<b>9.0 GENERAL MAINTENANCE .....</b>	<b>13</b>
<b>9.1 CATCH BASINS .....</b>	<b>13</b>



**9.2 STREETS AND PARKING LOTS..... 14**

**9.3 WINTER ROAD MAINTENANCE..... 15**

**9.4 STRUCTURAL STORMWATER BMPs..... 16**

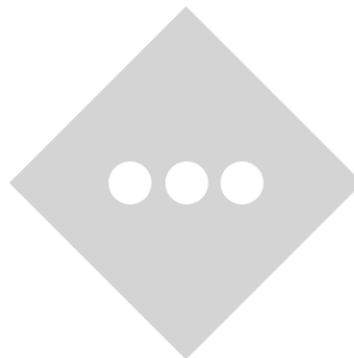
**9.5 SWALE..... 20**

**9.6 SUBMISSION OF MAINTENANCE RECORDS..... 20**

**10.0 STORMWATER CORRECTIVE MAINTENANCE ACTIONS.....20**

**11.0 INSPECTION AND LOGS OF ALL PREVENTATIVE AND CORRECTIVE MEASURES .....21**

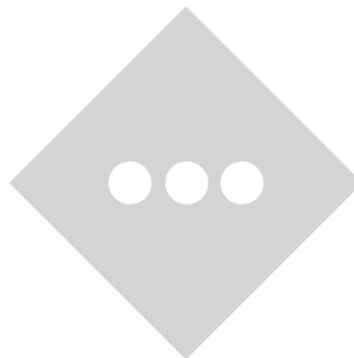
**12.0 ANNUAL EVALUATION OF THE EFFECTIVENESS OF THE PLAN .....21**





## **APPENDICIES**

<b>PROJECT FIGURES.....</b>	<b>A</b>
<i>AERIAL MAP .....</i>	<i>FIGURE 1</i>
<i>TAX MAP.....</i>	<i>FIGURE 2</i>
<i>LOCUS MAP .....</i>	<i>FIGURE 3</i>
<i>FEMA MAP.....</i>	<i>FIGURE 4</i>
<b>NRCS COUNTY SOILS SURVEY.....</b>	<b>B</b>
<b>DESIGN CALCULATIONS &amp; DIAGRAMS.....</b>	<b>C</b>
<i>HYDROCAD ROUTING DIAGRAM.....</i>	<i>C-1</i>
<i>1-YEAR STORM EVENT HYDROGRAPHS.....</i>	<i>C-2</i>
<i>10-YEAR STORM EVENT HYDROGRAPHS.....</i>	<i>C-3</i>
<i>100-YEAR STORM EVENT HYDROGRAPHS .....</i>	<i>C-4</i>
<b>STORMWATER MANAGEMENT CHECKLIST.....</b>	<b>D</b>
<b>DRAINAGE AREA MAPS .....</b>	<b>E</b>
<i>EXISTING DRAINAGE AREA MAP .....</i>	<i>1 OF 2</i>
<i>PROPOSED DRAINAGE AREA MAP.....</i>	<i>2 OF 2</i>
<b>PROJECT PLANS.....</b>	<b>F</b>
<i>SITE PLAN .....</i>	<i>F-1</i>
<i>DRAINAGE PLAN.....</i>	<i>F-2</i>
<i>SOIL EROSION &amp; SEDIMENT CONTROL PLAN .....</i>	<i>F-3</i>
<b>INSPECTION CHECKLISTS.....</b>	<b>G</b>
<i>GENERAL INSPECTION CHECKLIST LOG.....</i>	<i>G-1</i>
<i>GENERAL PREVENTATIVE MAINTENANCE LOG .....</i>	<i>G-2</i>
<i>GENERAL CORRECTIVE MAINTENANCE LOG.....</i>	<i>G-3</i>
<i>ANNUAL EVALUATION RECORD .....</i>	<i>G-4</i>



## **1.0 PROJECT DESCRIPTION**

FIDC 163, LLC is proposing the construction of a 2,502 SF pharmacy with a drive-thru onsite. The subject property is designated at Block 5B3, Lot 50, commonly known as 290 Central Street (U.S. Route 202) located at the intersection of Central Street (U.S. Route 202) and Juniper Street. The site location is depicted in the USGS Quadrangle Map and Aerial Map within **Appendix A**.

The redevelopment property is within the Planned Development District (PD). The project site is currently developed with a small forested pervious area and a paved lot which is informally utilized by neighboring properties for ancillary parking. Please note that formal access along Central Street (U.S. Route 202) is not presently provided for the subject property; however, informal cross-access occurs between the north and south adjacent properties via unimproved access along the northern and southern property borders. The proposed development has residential uses to the northeast, industrial and residential uses to the northwest, the Whitney Pond and residential uses to the southeast, and residential uses to the southwest.

**The total project area is 24,679 SF (0.56 acres), the total area of impervious surfaces has decreased 4,976 SF (0.10 acres), and the total area of disturbance is 27,258 SF (0.63 acres). The overall drainage area was modeled as 24,679 SF (0.56 acres).**

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared to analyze the drainage measures to be implemented for controlling and conveying runoff associated with the on-site improvements and has been prepared in accordance with the standards of the Town of Winchendon and the Massachusetts Department of Environmental Protection (MassDEP) Standards.

The owner/operator at the time of completion of this iteration of the document is:

Tighe J. Mathieu  
105 Island Road  
Winchendon, MA 01475

## **2.0 EXISTING CONDITIONS**

The project site is currently developed with a small forested pervious area and a paved lot which is informally utilized by neighboring properties for ancillary parking. Please note that formal access along Central Street (U.S. Route 202) is not presently provided for the subject property; however, informal cross-access occurs between the north and south adjacent properties via unimproved access along the northern and southern property borders.

There is a one-story church to the northeast, a one-story pharmacy to the northwest, Central Street (U.S. Route 202) southeast, and a parking lot to the southwest. Access is proposed via one (1) full-movement driveway and one (1) egress-only driveway along Central Street (U.S. Route 202).

## 2.1 EXISTING DRAINAGE AREAS

Under existing conditions, the site is comprised of one (1) *Point of Interest* (POI), which ultimately discharges into the municipal stormwater system within Central Street (U.S. Route 202). POI consists of one drainage area (E-1), which consists of parking surface and grass area. The property drains to the west towards Juniper Road and has an average slope across the site of 4.14%. The site currently drains undetained and is collected via two inlets within Juniper Street which flow into the municipal stormwater system within Central Street (U.S. Route 202).

**TABLE 1: EXISTING DRAINAGE AREAS**

Drainage Area	Description	Area Extents (SF)	Impervious Area (SF)	Time of Concentration (Min)
E-1	Existing Drainage to Juniper Street	24,679 SF	20,067 SF	6.0*

\*The minimum time of concentration was utilized.

Detailed information regarding each drainage area can be found on the Existing Drainage Area Map in **Appendix E** of this Report.

## 2.2 PROJECT SOILS

Per the Worcester County Soil Survey data as issued by the Natural Resources Conservation Services (NRCS) data, the soil underlying the project site consists of:

**TABLE 2: NRCS PROJECT SOILS**

Soil Unit Code	Soil Description	Approximate Project Coverage	Hydrologic Soil Group
365B	Skerry Fine Sandy Loam	100.0%	C/D

The hydrologic soil group classifications above have been utilized in the landcover data for the stormwater analysis performed on the project as shown in **Appendix C** of this report.

### **3.0 PROPOSED CONDITIONS**

The existing pavement parking area will be demolished along with the surrounding site features. All features on adjacent properties and the undeveloped planted area at the northern corner of the property will be protected. Proposed improvements include the construction of a pharmacy with a building footprint of 2,502 SF a drive-thru window, associated parking, utilities, landscaping, lighting, and stormwater management facilities. Access is proposed via one (1) full-movement driveway and one (1) egress-only driveway along Central Street (U.S. Route 202).

#### **3.1 PROPOSED DRAINAGE AREAS**

Under proposed conditions, the site is comprised of one (1) drainage area P-1 with one POI. The drainage area P-1 consists of the parking surface, landscaped area, and the proposed building. P-1 is collected via roof leaders, one stormwater inlet, and a yard inlet and is discharged into the proposed manhole along Juniper Street which is upstream of the existing municipal storm system in Central Street (U.S. Route 202). The stormwater in the northeastern corner of the site sheet flows off the property north undetained.

**TABLE 3: PROPOSED DRAINAGE AREAS**

<b>Drainage Area</b>	<b>Description</b>	<b>Area Extents (SF)</b>	<b>Impervious Area (SF)</b>	<b>Time of Concentration (Min)</b>
P-1	Proposed Drainage to Juniper Street	24,679 SF	15,091 SF	6.0*

\*The minimum time of concentration was utilized.

Detailed information regarding each drainage area can be found on the Proposed Drainage Area Map in **Appendix E** of this Report.

### **4.0 ANALYSIS METHODOLOGY & DESIGN PARAMETERS**

#### **4.1 HYDROLOGIC & HYDRAULIC ANALYSES**

The existing and proposed drainage areas have been analyzed utilizing a modified version of the NRCS SCS TR-20 method. The analysis program “HydroCAD” Version 10.00 by HydroCAD Software Solutions LLC was used to calculate and plot the runoff hydrographs. The program incorporates the time of concentration, CN values, 24 hour rainfall events, and project drainage areas to calculate the runoff characteristics. Key variables utilized include the SCS Unit Hydrograph, a minimum time of concentration of 6.0 minutes, separate runoff calculations for impervious and pervious areas, and dynamic storage and conveyance routing to account for any variable tailwater conditions.

## 4.2 MASSACHUSETTS STORMWATER DESIGN PARAMETERS

The total project area is 24,679 SF (0.56 acres), the total limit of disturbance is 27,258 SF (0.63 acres) and the total area of impervious is reduced by 4,976 SF (0.10 acres). Per the Massachusetts Stormwater Handbook, the project is defined as a redevelopment because the project is on a previously developed site that results in no net increase in impervious area. The project is therefore subject to the Stormwater Management Standards only to the maximum extent practicable as a redevelopment project.

**TABLE 4: PROJECT STORMWATER DESIGN INTENT SUMMARY TABLE**

Standard No.	Design Intent for Compliance
1	No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.
2	Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.
3	Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.
4	Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when: a. Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained; b. Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook
5	For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely



	protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.
6	Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A “storm water discharge” as defined in 314 CMR 3.04(2)(a)I or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.
7	A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard I only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.
8	A 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.
9	A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.
10	All illicit discharges to the stormwater management system are prohibited.

## **5.0 MASSACHUSETTS STORMWATER HANDBOOK STANDARDS**

The following outlines how the proposed project meets the Stormwater Management Standards defined in the Massachusetts Stormwater Handbook Volume 1. Per the Massachusetts Stormwater Handbook, the project is defined as a redevelopment and as such is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural stormwater best management practice requirements of Standards 4, 5, and 6. Redevelopment projects shall fully comply with all remaining requirements of the Stormwater Management Standards and ensure the existing condition is improved.

### **STANDARD 1: NO NEW UNTREATED DISCHARGES**

There will be no new untreated discharges. There are no wetlands indicated on the survey within or near the subject property. Based on the Town of Winchendon GIS map viewer, the nearest wetland is located approximately 740 feet to the northwest of the site.

### **STANDARD 2: PEAK RATE ATTENUATION**

The project is designed to conform to the stormwater management requirements set forth by the Town of Winchendon and the Massachusetts Department of Environmental Protection (MassDEP). The application was accepted and stamped on November 3, 2021. The new stormwater regulations sections 8(A), 9(A), and 10(A) defined in the Bylaws of the Town of Winchendon were adopted on November 16, 2021. The application is exempt from the new stormwater regulations.

The 1-, 10-, and 100-year storm event peak flows will be reduced from pre-development to post-development as the proposed condition increases the amount of pervious coverage onsite by 4,976 SF (0.10 acres). Runoff onsite shall all be directed to the existing municipal storm system. An analysis was performed to compare pre-development and post-development conditions on site to ensure that the post-development conditions match or do not exceed pre-development conditions in 1, 10, and 100-year storm events.

The following tables summarize the results for the 1-year, 10-year, and 100-year storm events for each project point of interest:

**TABLE 5: PEAK DISCHARGE ANALYSIS SUMMARY (POI-1):**

Storm Event	Pre-Development Peak Discharge	Post-Development Peak Discharge	Reduction Achieved
1-Year	1.17 CFS	0.94 CFS	19.7%
10-Year	2.25 CFS	1.98 CFS	12.0%
100-Year	4.15 CFS	3.88 CFS	6.5%

**TABLE 6: PEAK VOLUMES ANALYSIS SUMMARY (POI-1):**

Storm Event	Pre-Development Peak Volume	Post-Development Peak Volume	Reduction Achieved
1-Year	4,312 CF	3,484 CF	19.2%
10-Year	8,450 CF	7,274 CF	13.9%
100-Year	15,812 CF	14,374 CF	9.1%

**STANDARD 3: RECHARGE**

The project does not require groundwater recharge as the proposed conditions reduce impervious ground cover.

**STANDARD 4: WATER QUALITY**

It is noted the site is not located within the state specified environmentally sensitive areas. The site is not producing discharge with higher potential pollutant loading, is not located within a Zone II or Interim Wellhead Protection Area (according to the Town of Winchendon GIS map viewer), and is not located near critical areas such as outstanding/special resource waters, bathing beaches, shellfish growing areas, or cold-water fisheries.

The project is defined as a redevelopment because the project is on a previously developed site that results in no net increase in impervious area. As such, the project is not required to comply with the applicable groundwater recharge, stormwater quality, and stormwater quantity requirements.

**STANDARD 5: LAND USES WITH HIGHER POTENTIAL POLLUTANT LOADS (LUHPPLs)**

This standard is not applicable for this project. This site does not contain any higher potential pollutant loads.

## **STANDARD 6: CRITICAL AREAS**

This standard is not applicable for this project. This site is not located within the Zone II or Interim Wellhead Protection Areas of a public water supply or any other critical area.

## **STANDARD 7: REDEVELOPMENTS AND OTHER PROJECTS SUBJECT TO THE STANDARDS ONLY TO THE MAXIMUM EXTENT PRACTICABLE**

Per the Massachusetts Stormwater Handbook, the project is defined as a redevelopment. Per the Massachusetts State Stormwater Handbook, Volume 1, the project has been designed to meet the following standards to at least the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural stormwater best management practice requirements of Standards 4, 5, and 6. All remaining Standards have been met as required per the Stormwater Handbook.

## **STANDARD 8: CONSTRUCTION PERIOD POLLUTION PREVENTION AND EROSION AND SEDIMENTATION CONTROL**

A Soil Erosion & Sediment Control Plan has been prepared in accordance with the latest edition of the “Massachusetts Erosion and Sediment Control Guideline for Urban and Suburban Areas”. Proposed temporary measures during construction include silt fencing, stabilized construction entrances, inlet filters, and soil stockpile areas. Permanent post-construction measures include conduit outlet projection and native vegetation. No land disturbance will occur until a permit has been obtained from the Soil Conservation District. Details for all proposed control measures have also been provided.

## **STANDARD 9: OPERATION AND MAINTENANCE PLAN**

Operation and Maintenance Plan will be submitted for approval to the Town of Winchendon prior to the start of construction. Any required easements or covenants associated with the stormwater improvements will be recorded prior to the start of construction.

## **STANDARD 10: PROHIBITION OF ILLICIT DISCHARGES**

This standard is not applicable for this project. The proposed drainage system does not produce any illicit discharges.

## **6.0 STORMWATER CONCLUSIONS**

As indicated in the tables above, the proposed site will reduce peak runoff rates when compared to pre-development conditions. The proposed project complies with all applicable stormwater management regulations and standards. As such, the project is not anticipated to have any adverse impacts or neighboring properties, downstream watercourses, or conveyance systems within the watershed, and is anticipated to significantly improve upon existing conditions.

## **7.0 EROSION AND SEDIMENT CONTROL**

### ***7.1 TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES***

Under proposed conditions, erosion and sediment controls will be utilized to limit the potential effects due to construction of the proposed development. Refer to the Soil Erosion and Sediment Control Plans in **Appendix F-3** of this report. The following includes the temporary sediment controls proposed for this project:

- **Construction Entrance** – To provide a stable entrance and exit from a construction site and keep mud and sediment off public roads, a temporary stone-stabilized pad located at points of vehicular ingress and egress on a construction site. If the action of the vehicle traveling over the gravel pad is not sufficient to remove the majority of the mud, then the tires must be washed before the vehicle enters a public road. If washing is used, provisions must be made to intercept the wash water and trap sediment before it is carried off-site.
- **Dust Control** – To reduce surface and air movement of dust from exposed soil surfaces during land disturbing, demolition, and construction activities, preventative measures must be taken. Sprinkling or other approved methods must be used to reduce dust generated on the site. Dust control shall be provided by the general contractor to a degree acceptable to the owner/operator, and in compliance with the applicable local and state dust control requirements.
- **Inlet Protection** – A sediment filter or an excavated impounding area around a storm drain, drop inlet, or curb inlet must be used to prevent sediment from entering storm drainage systems prior to permanent stabilization of the disturbed area. During construction, the inlet protection measures shall be replaced as needed to ensure proper function of the structure.

- **Preserving Natural Vegetation** – Natural vegetation should be preserved whenever possible, but especially on steep slopes, near perennial and intermittent watercourses or swales, and on building sites in wooded areas. Clearly flag or mark areas around trees that are to be saved. It is preferable to keep ground disturbance away from the trees at least as far out as the dripline. If possible, place a barrier/fencing around the trees. Inspect flagged areas regularly to make sure flagging has not been removed. If tree roots have been exposed or injured, re-cover and/or seal them.
- **Sediment Fence** – A temporary sediment barrier consisting of a filter fabric stretched across and attached to supporting posts and entrenched must be established along the perimeter of areas to be disturbed before initiation of and during construction. The sediment fence is constructed of stakes and synthetic filter fabric with a rigid wire fence backing where necessary for support. Sediment fence can be purchased with pockets pre-sewn to accept use of steel fence posts. Silt fences should be inspected immediately after each rainfall and at least daily during prolonged rainfall. Repair as necessary. If the fabric tears, decomposes, or in any way becomes ineffective, replace it immediately. Replace burlap used in sediment fences after no more than 60 days.
- **Temporary Seeding** – Disturbed areas that will not be brought to final grade for a period of more than 30 working days or in a season not suitable for permanent seeding shall be temporarily seeded to minimize erosion and sediment loss. Other stabilization methods may be used and shall be in conformance with the *Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas*, latest edition.
- **Temporary Soil Stockpile** – Locate the topsoil stockpile so that it does not interfere with work on the site. Side slopes of the stockpile should not exceed 2:1. Surround all topsoil stockpiles with an interceptor dike with gravel outlet and silt fence. Either seed or cover stockpiles with clear plastic or other mulching materials within 7 days of the formation of the stockpile. Topsoil should not be placed while in a frozen or muddy condition, when the subgrade is excessively wet, or when conditions exist that may otherwise be detrimental to proper grading or proposed sodding or seeding. Do not place topsoil on slopes steeper than 2:1. Maintain protective cover on stockpiles until needed.

## **7.2 PERMANENT EROSION AND SEDIMENT CONTROL MEASURES**

- **Permanent Seeding** – Permanent seeding of grass and planting trees and shrubs shall be established on any graded or cleared area where long-lived plant cover is needed to stabilize the soil in accordance with the accompanying plans. Areas which will not be brought to final grade for a year or more shall also be seeded permanently. Inspect seeded areas for failure and make necessary repairs and reseed immediately. Conduct or follow-up survey after one year and replace failed plants where necessary.
- **Riprap** – A permanent, erosion-resistant ground cover of large, loose, angular stone must be installed in accordance with the accompanying plans to protect slopes, streambanks, channels, or areas subject to erosion by wave action. Riprap should be checked at least annually and after every major storm for displaced stones, slumping, and erosion at edges, especially downstream or downslope. If the riprap has been damaged, it should be repaired immediately before further damage can take place.

## **7.3 CONSTRUCTION PHASING PLAN AND SEQUENCE OF OPERATIONS**

The Soil Erosion & Sediment Control Plans have been phased in order to effectively control erosion and sedimentation and minimize impacts due to seasonal changes. Please refer to **Appendix F-3** for full size phase Soil Erosion & Sediment Control Plans for detailed construction sequencing.

## **7.4 FINAL SITE STABILIZATION**

Recommended practices for final surface stabilization include surface roughening, terrace, topsoiling, permanent seeding, sodding, trees and shrub planting, mulching, and riprap. The stabilization measures shall be in conformance with the *Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas*, latest edition.

## **8.0 POST CONSTRUCTION OPERATION AND MAINTENANCE**

Operation and maintenance of the permanent stormwater control Best Management Practices (BMPs) shall be the responsibility of the operator of the project site at the time that the applicable maintenance is required. The current owner and responsible agent of the project is:

Tighe J. Mathieu  
105 Island Road  
Winchendon, MA 01475

A copy of this report shall be kept on-site at all times both during and after construction. Upon reviewing agency approval, the title and date of the maintenance plan as well as the contact information of the current agent responsible for maintaining the stormwater management measures for the project shall be recorded on the deed of the property on which the measures are located. Any future change in this information such as change in property ownership shall also be recorded on the deed.

The current responsible agent shall evaluate the maintenance plan for effectiveness at least annually and revise the plan as necessary. A detailed, written log of all preventative and corrective maintenance performed for each stormwater management measure must be kept, including a record of all inspections and copies of maintenance-related work orders. Upon request from a public entity with jurisdiction over the project area the responsible agent shall make available the maintenance plan and associate logs and other records for review.

### **8.1 MAINTENANCE EQUIPMENT AND PERSONNEL**

The current responsible agent shall ensure that adequate equipment and training is provided to maintenance personnel to perform the required maintenance tasks. Confined Space Entry Certification shall be required by personnel entering underground structures and pipes. The material and equipment necessary for inspection and maintenance activities shall include, but not be limited to, the following:

- *Landscape Areas:* Material and equipment customary in landscape maintenance practices.
- *Street Sweeping:* Litter vacuum or leaf/litter blower to collect sediment from asphalt surface, brooms, and disposal bags.
- *Hood and Sump Equipment:* Vacuum truck and hose to pump out stormwater for disposal.

The estimated operation and maintenance budget is estimated to be approximately \$5,000.00 per year. Approximate breakdown of yearly routine maintenance budget noted below (excludes structural repairs):

**TABLE 7: OPERATION AND MAINTENANCE BUDGET**

Landscape Areas	\$2,000.00 per year
Hood and Sump Equipment	\$1,000.00 per year
Sediment Debris and Trash Removal	\$1,000.00 per year
Street Sweeping	\$1,000.00 per year



## **9.0 GENERAL MAINTENANCE**

The following general maintenance tasks shall be performed:

### **9.1 CATCH BASINS**

The following catch basin inspection and cleaning procedures shall be performed to reduce the discharge of pollutants:

- Catch basins will be cleaned such that they are no more than 50 percent full at any time. A catch basin sump is more than 50 percent full if the contents within the sump exceed one half the distance between the bottom interior of the catch basin to the invert of the deepest outlet of the catch basin.
- If a catch basin sump is more than 50 percent full during two consecutive routine inspections or cleaning events, the finding will be documented, the contributing drainage area will be investigated for sources of excessive sediment loading, and to the extent practicable, contributing sources will be addressed. If no contributing sources are found, the inspection and cleaning frequency will be increased.
- Catch basins located near construction activities (roadway construction, residential, commercial, or industrial development or redevelopment) are inspected and cleaned more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings (i.e., catch basins more than 50 percent full). Priority will also be given to catch basins that discharge to impaired waters.
- Properly dispose of collected sediments and catch basin cleanings (solid material, such as leaves, sand, and twigs removed from stormwater collection systems during cleaning operations).
- Cleanings from stormwater-only drainage systems may be disposed at any landfill that is permitted by MassDEP to accept solid waste. MassDEP does not routinely require stormwater-only catch basin cleanings to be tested before disposal, unless there is evidence that they have been contaminated by a spill or some other means.
- Sediments may need to be placed in a drying bed to allow water to evaporate before proper disposal. In this case, ensure that the sediments are managed properly to prevent pollution.
- Catch basin cleanings must be handled and disposed in accordance with compliance with the applicable MassDEP regulations, policies, and guidance (<https://www.mass.gov/files/documents/2018/03/09/catch-basins.pdf>).

- Catch basin cleanings may be temporarily stockpiled on the property, but may not be disposed of on parking lots or land.
- Collect data on the condition of the physical basin structure, its frame, and the grate, as well as on the quality of stormwater conveyed by the structure during inspections and cleanings.
- Make note of any potential pollutants or non- stormwater flows within the catch basin. Observations of oil sheen, discoloration, and/or trash and debris can indicate sources of pollution within the storm drain system. Observations of the following can indicate a potential connection of a sanitary sewer to the storm drain system: fecal matter, sewage odors, foaming (such as from detergent), optical enhancers (such as fluorescent dye added to laundry detergent).
- If any signs of pollution and/or sanitary sewer connections are present, the Town must be notified.

## **9.2 STREETS AND PARKING LOTS**

Roadways with curbs and catch basins must be swept at a minimum of once per year. Roadways with curbs and catch basins that discharge to nitrogen or phosphorus impaired waters or their tributaries are swept at a minimum of twice per year, once in the spring and once in the fall. Sweeping on rural uncurbed roads and parking lots with no catch basins must be conducted on an as-needed basis. All street sweepings collected must be disposed of. The responsible party may temporarily store street sweepings in labor yards, but street sweepings must be disposed of offsite in a reasonable timeframe. Street sweepings may not be disposed of on parking lots or lands.

The following street and parking lot sweeping procedures shall be performed to reduce the discharge of pollutants:

- **Sweeping**
  - Street sweeping will be conducted in dry weather. Sweeping will not be conducted during or immediately after rain storms.
  - Dry cleaning methods will be used whenever possible, with the exception of very fine water spray for dust control. Avoid wet cleaning or flushing of the pavement.
  - When necessary, parking bans will be enacted to facilitate sweeping on busy streets.
  - Sweeping will be conducted in a manner that avoids depositing debris into storm drains.

- Sweeping equipment (mechanical, regenerative air, vacuum filter, tandem sweeping) will be selected depending on the level of debris. Brush alignment, sweeper speed, rotation rate, and sweeping pattern will be set to optimal levels to manage debris.
- Sweeping equipment will be routinely inspected and maintained to reduce the potential for leaks.

- **Disposal**

- The reuse of sweepings is recommended by MassDEP. If street sweepings are reused (e.g., as anti-skid material or fill in parking lots), they will be properly filtered to remove solid waste, such as paper or trash, in accordance with their intended reuse. All reuse and/or disposal of street sweepings will be managed in accordance with current MassDEP policies and regulations. <http://www.mass.gov/eea/docs/dep/recycle/laws/stsweep.pdf>
- Street sweepings can be stored for up to one year in approved temporary storage areas. Storage areas will be protected to prevent erosion and runoff and should be located away from wetland resource areas and buffer zones, surface water, or groundwater.
- Sweepings are classified as solid waste and are disposed of at solid waste disposal sites.

### **9.3 WINTER ROAD MAINTENANCE**

Snow and ice operations on state-owned roads and parkways must be coordinated with MassDOT. MassDOT documents their extensive snow and ice control program every 5 years in an Environmental Status and Planning Report (ESPR). MassDOT's Snow and Ice Control Program ESPR from 2017 includes extensive measures to limit chemical usage, improve road salt efficiency, and protect environmental resources. All snow and ice operators are required to be trained annually on the MassDOT practices. MassDOT's latest ESPR can be found here: <https://www.mass.gov/doc/massdot-snow-and-ice-control-environmental-status-planning-report-2017/download>

The following winter maintenance procedures shall be performed to reduce the discharge of pollutants:

- Minimize the use and optimize the application of sodium chloride and other salt (while maintaining public safety) and consider opportunities for use of alternative materials.
- Optimize sand and/or chemical application rates through the use, where practicable, of automated application equipment (e.g., zero velocity spreaders), anti-icing and pre-wetting techniques,

implementation of pavement management systems, and alternate chemicals. Maintain records of the application of sand, anti-icing and/or de-icing chemicals to document the reduction of chemicals to meet established goals.

- Prevent exposure of deicing product (salt, sand, or alternative products) storage piles to precipitation by enclosing or covering the storage piles. Implement good housekeeping, diversions, containment or other measures to minimize exposure resulting from adding to or removing materials from the pile. Store piles in such a manner as not to impact surface water resources, groundwater resources, recharge areas, and wells.
- The MS4 Permit prohibits snow disposal into waters of the United States. Snow disposal activities, including selection of appropriate snow disposal sites, will adhere to the Massachusetts Department of Environmental Protection Snow Disposal Guidance, Guideline No. BWR G2015-01 (Effective Date: December 21, 2015), located at: <http://www.mass.gov/eea/agencies/massdep/water/regulations/snow-disposal-guidance.html>
- MassDEP Snow Disposal Guidance for ice melting operations and skating rinks shall be followed.

#### **9.4 STRUCTURAL STORMWATER BMPs**

In order to function properly and provide associated stormwater benefits, structural stormwater BMPs must be kept in good working order.

- **Inspections** – Structural stormwater BMPs shall be inspected annually at a minimum. During inspections, the following BMP components will be reviewed for signs of potential issues, as listed below.
  - **Inlet and Outlet Structures**
    - Blocked flow paths
    - Inlet is functioning as expected and flow from the contributing area is reaching the BMP
    - Outlet is performing as expected and flow is leaving the BMP appropriately
    - Structural damage

- Vegetation is well established and there are no signs of erosion
- Evaluate level of sedimentation and trash accumulation
- **BMP Treatment Areas**
  - Flow is dispersed evenly throughout the BMP
  - Erosion and rutting on the side slopes
  - Vegetation is well established, and invasive species are not present
  - For infiltration-type BMPs, review to evaluate whether standing water exists 72 hours after a rain event
  - Identify any signs of illicit discharges or vandalism
  - Evaluate level of sedimentation and trash accumulation
- **Underground Components**
  - Evaluate level of sedimentation and trash accumulation
  - Structural damage
  - Access to components are not compromised
  - Inspect dry wells after every major storm for the first 3 months once construction is complete and annually thereafter
- During inspection, assign a level of service to each item reviewed. Areas where follow up maintenance is warranted will be indicated. The following maintenance activities will occur at structural BMPs based on condition determined during annual inspections:
  - Repair structural damage
  - Remove excess sediment, trash, and debris
  - Re-establish vegetation

- Remove invasive vegetation
  - Re-grade areas, as necessary to ensure proper flow patterns
  - Stabilize eroded areas via vegetation establishment, placement of stone, or other energy dissipation measures
- Maintain records of annual inspections and maintenance actions performed for each structural BMP.
  - **Maintenance** – Regular maintenance is important to prevent against premature failure of BMPs. The table on the following page outlines maintenance schedule in general and for specific BMP types. It is important to note that BMP maintenance may not be the responsibility of regular maintenance crews. All maintenance for BMPs should be coordinated with the Town.

**TABLE 8: BMP MAINTENANCE SCHEDULE**

Activity	Responsible Party*	Time of Year	Frequency
<b>General</b>			
Mow	Operations or contracted services	Spring through Fall	As needed, Annually minimum
Remove dead vegetation	Operations	Fall and spring	Bi-annually
Remove invasive vegetation	Operations or contracted services	Spring or fall	Annually
Prune	Operations	Spring or fall	Annually
<b>If identified during inspections as needed</b>			
Replace dead vegetation	Engineering	Spring	As Needed
Stabilize eroded areas	Engineering	Spring through Fall	As Needed
Re-grade areas to ensure proper flowpatterns	Engineering	Spring through Fall	As Needed
Remove excess sediment, trash, and debris	Engineering	Spring through Fall	As Needed
Repair structural damage	Engineering	Spring through Fall	As Needed
<b>Bioretention Areas and Rain Gardens</b>			
Mulch void areas	Operations or contracted services	Spring	Annually
Replace all media and vegetation and repair structural damage as needed	Engineering or contracted services	Late spring/early summer	As needed
<b>Extended Dry Detention Basin and Wet Basin</b>			
Mow upper stage, side slopes, embankment and emergency spillway	Operations or contracted services	Spring through Fall	Bi-annually
Remove sediment from basin	Engineering	Year round	As required, at least once every 5 years
Remove sediment, trash and debris	Engineering	Spring through Fall	Bi-annually (Minimum)
<b>Subsurface BMPs</b>			

Activity	Responsible Party*	Time of Year	Frequency
Inspect subsurface components, as feasible	Engineering	Spring through Fall	Annually
<b>Infiltration Basin</b>			
Mow/rake buffer area, side slopes, and basin bottom	Operations or contracted services	Spring and fall	Bi-annually
Remove trash, debris and organic matter	Engineering	Spring and fall	Bi-annually

\* For all BMPs within the Wachusett Reservoir, the Water Supply Protection Division is responsible for all BMP inspection and maintenance activities.

### 9.5 SWALE

The proposed swale along the curb wall at the northern property line shall be visually inspected for erosion and sediment accumulation. Observations of increased erosion shall be submitted to the Engineer of record for review.

### 9.6 SUBMISSION OF MAINTENANCE RECORDS

A submission to the Town from the owner of the end-of-year maintenance records will be required.

## 10.0 STORMWATER CORRECTIVE MAINTENANCE ACTIONS

Depending on many factors, such as the performance of preventative maintenance actions, weather, or unexpected incidents. Corrective requirements may not be precisely anticipated; however, a list of potential corrective maintenance actions may assist the responsible party in planning and estimating costs in advance.

<b>Potential Corrective Maintenance Actions</b>	<b>Stormwater Management Measures/No.</b>
<ul style="list-style-type: none"> <li>▪ Repair/replacement of eroded or damaged riprap apron</li> <li>▪ Repair/replacement of missing or damaged trash racks</li> <li>▪ Revegetation of eroded side slope, aquatic bench, marsh, basin bottom, grass swales, etc.</li> </ul>	e.g., Grass Swale, Riprap Apron



## **11.0 INSPECTION AND LOGS OF ALL PREVENTATIVE AND CORRECTIVE MEASURES**

The person responsible for maintenance shall maintain a detailed log of all preventative and corrective maintenance for the structural stormwater management measures incorporated into the design of the development, including a record of all inspections and copies of all maintenance-related work orders.

A maintenance plan shall include a schedule of regular inspections and tasks, and detailed logs of all preventative and corrective maintenance performed on the stormwater management measure, including all maintenance-related work orders. The person with maintenance responsibility must retain and, upon request, make available the maintenance plan and associated logs and other records for review by a public entity with administrative, health, environmental, or safety authority over the site. Inspection Checklists in the Field Manual for the stormwater management measures on this site include:

- Appendix G-1: General Inspection Checklist Log
- Appendix G-2: General Preventative Maintenance Log
- Appendix G-3: General Corrective Maintenance Log
- Appendix G-4: Annual Evaluation Records

All inspection and maintenance activities shall be recorded to document frequency of inspection and maintenance, and implementation of corrective action. All regularly scheduled inspections, inspections following one (1) inch of precipitation, maintenance activities, and repairs shall be recorded. Refer to the Appendix of this Manual for the BMP Inspection & Maintenance Log for this facility. This log shall be considered a minimum standard for recording purposes, the Operator and Inspection/Maintenance Personnel are encouraged to supplement the Log with additional notes and photos.

## **12.0 ANNUAL EVALUATION OF THE EFFECTIVENESS OF THE PLAN**

The person responsible for maintenance shall evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed. The responsible party should evaluate the effectiveness of the maintenance plan by comparing the maintenance plan with the actual performance of the maintenance. The items to evaluate may include, but not limited to:

- Whether the inspections have been performed as scheduled;

- Whether the preventive maintenance has been performed as scheduled;
- Whether the frequency of preventative maintenance needs to increase or decrease;
- Whether the planned resources were enough to perform the maintenance;
- Whether the repairs were completed on time;
- Whether the actual cost was consistent with the estimated cost;
- Whether the inspection, maintenance, and repair records have been kept.

If actual performance of those items has been deviated from the maintenance plan, the responsible party should find the causes and implement solutions in a revised maintenance plan.

# **APPENDIX A**

## **PROJECT FIGURES**

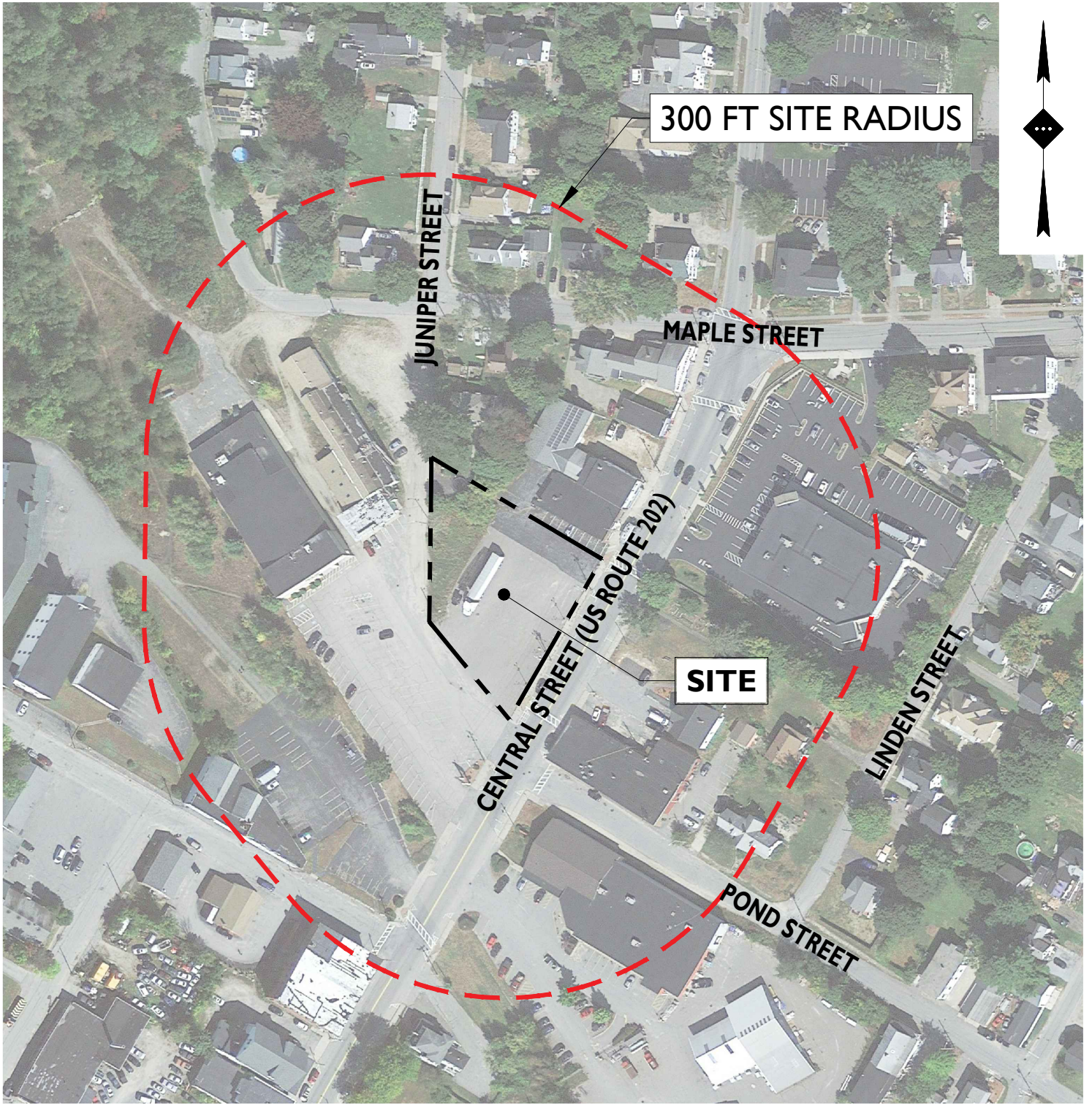
**INVENTORY**

**USGS LOCATION MAP**

**TAX MAP**

**AERIAL MAP**

**FEMA MAP**



300 FT SITE RADIUS

JUNIPER STREET

MAPLE STREET

CENTRAL STREET (US ROUTE 202)

SITE

LINDEN STREET

POND STREET



GRAPHIC SCALE IN FEET  
1" = 150'

# AERIAL MAP

SOURCE: GOOGLE EARTH PRO, DATED 09/20/2019

## PROPOSED PHARMACY WITH DRIVE-THRU

PARCEL ID: 5B3-0-50  
290 CENTRAL STREET (U.S. ROUTE 202)  
TOWN OF WINCHENDON, WORCESTER COUNTY, MASSACHUSETTS

<b>DRAWN BY:</b>	AKPM
<b>CHECKED BY:</b>	AS
<b>DATE:</b>	10/18/2021
<b>SCALE:</b>	1" = 150'
<b>PROJECT ID:</b>	BOS-210033

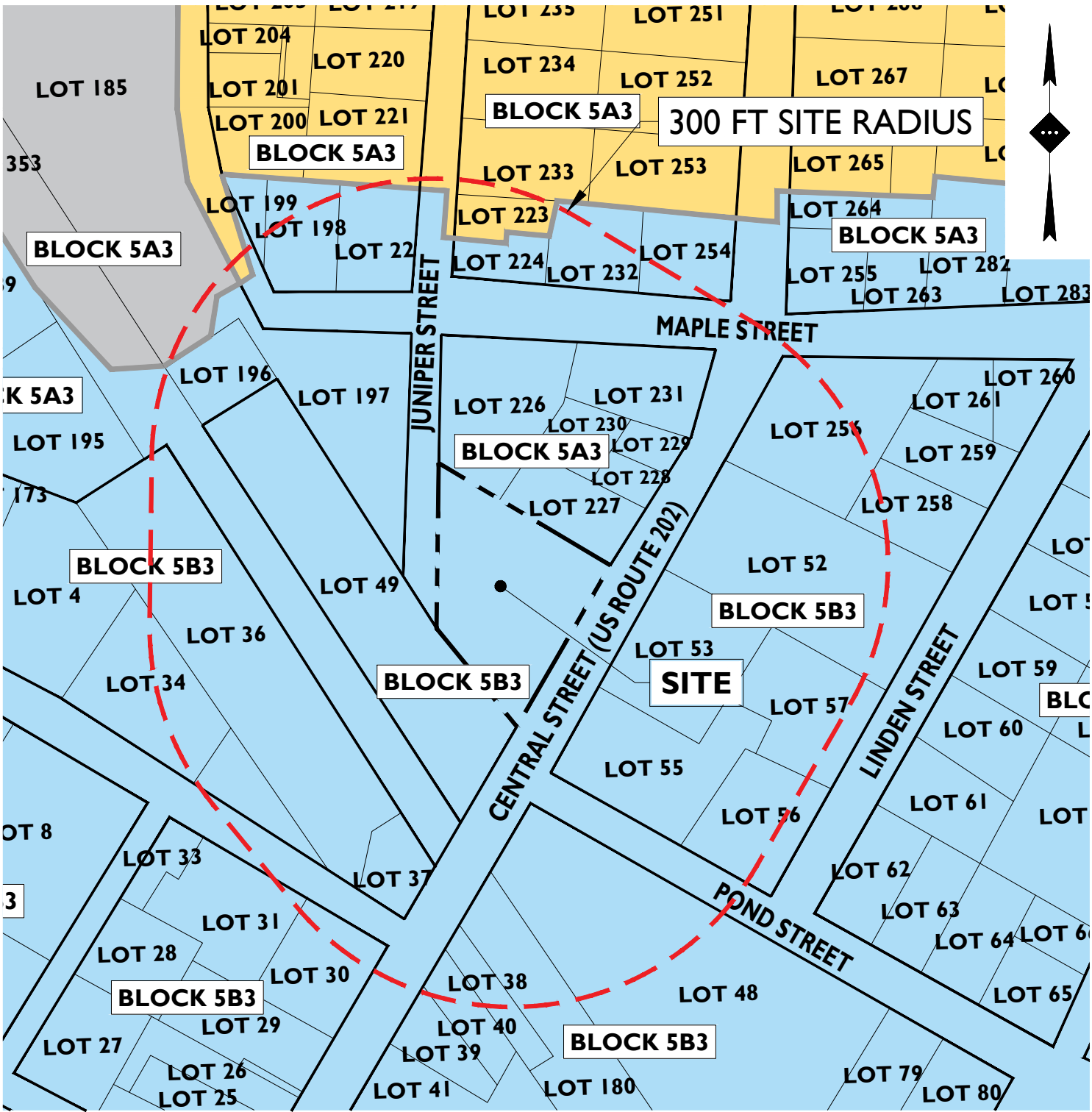


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GRAPHIC SCALE IN FEET  
1" = 150'

# TAX & ZONING MAP

SOURCE: TOWN OF WINCHENDON ZONING MAP DATED 1/29/07 AND TOWN OF WINCHENDON GIS TAX MAP DATED 9/17/21

## PROPOSED PHARMACY WITH DRIVE-THRU

PARCEL ID: 5B3-0-50  
290 CENTRAL STREET (U.S. ROUTE 202)  
TOWN OF WINCHENDON, WORCESTER COUNTY, MASSACHUSETTS

<b>DRAWN BY:</b>	AKPM
<b>CHECKED BY:</b>	AS
<b>DATE:</b>	10/18/2021
<b>SCALE:</b>	1" = 150'
<b>PROJECT ID:</b>	BOS-210033

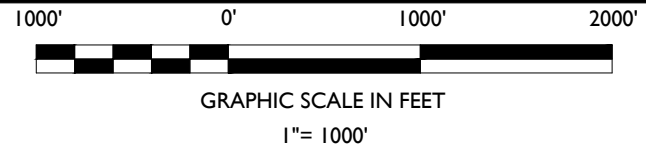
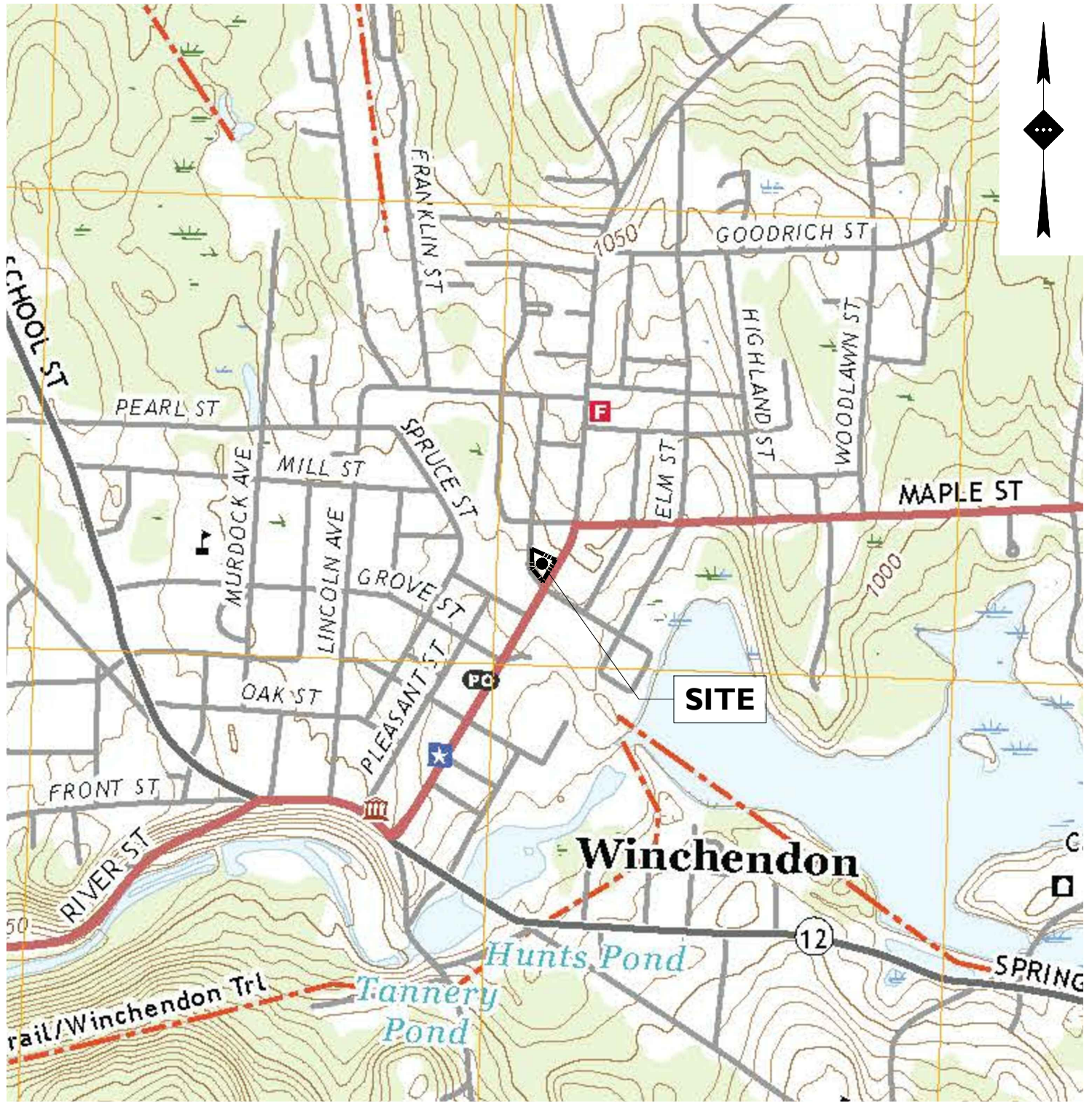


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# USGS QUADRANGLE MAP

SOURCE: USGS QUADRANGLE MAP 7.5 MINUTE SERIES WINCHENDON, MA, DATED 2021

## PROPOSED PHARMACY WITH DRIVE-THRU

PARCEL ID: 5B3-0-50  
 290 CENTRAL STREET (U.S. ROUTE 202)  
 TOWN OF WINCHENDON, WORCESTER COUNTY, MASSACHUSETTS

<b>DRAWN BY:</b>	AKPM
<b>CHECKED BY:</b>	AS
<b>DATE:</b>	10/18/2021
<b>SCALE:</b>	1" = 1000'
<b>PROJECT ID:</b>	BOS-210033

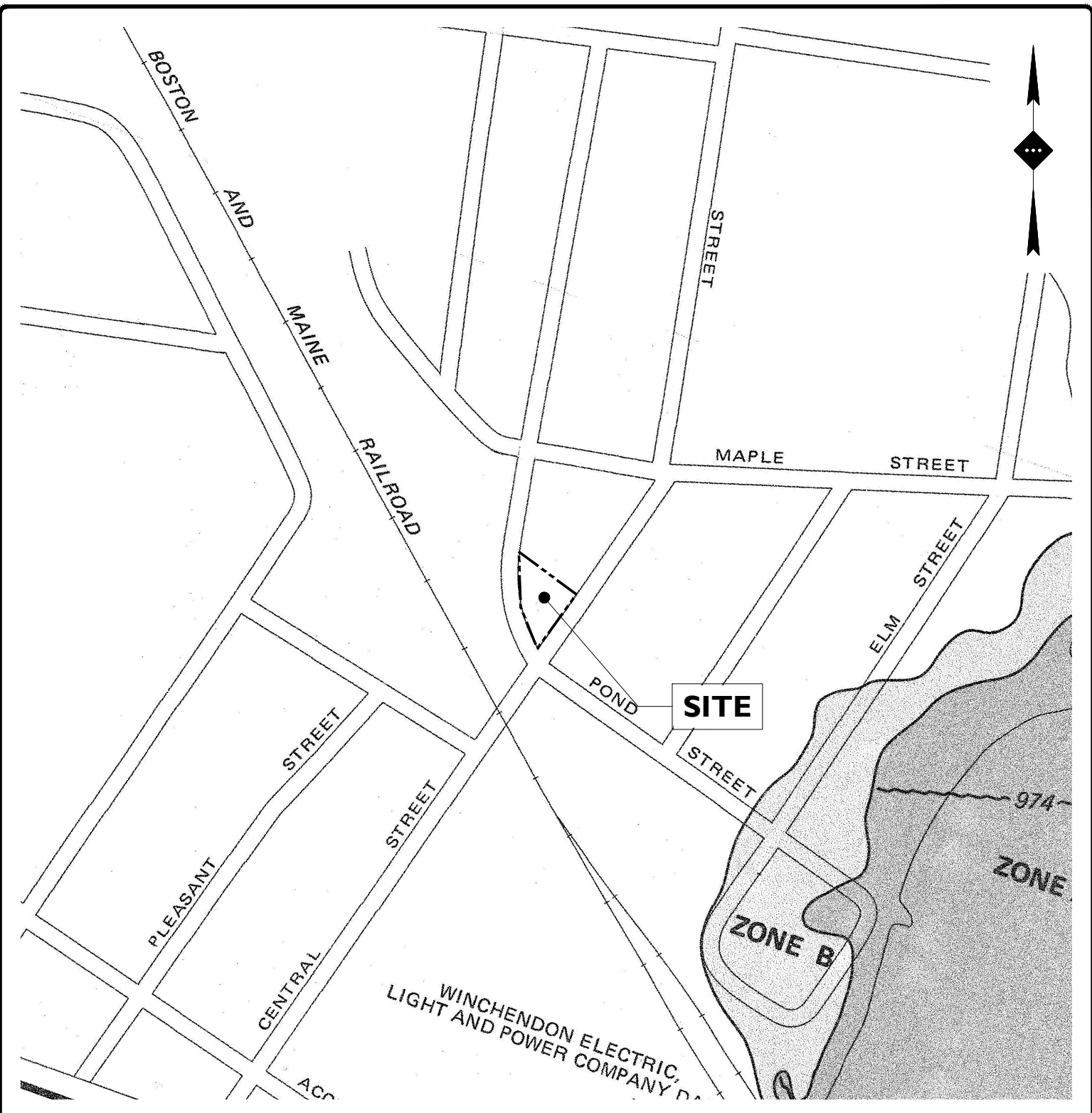
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GRAPHIC SCALE IN FEET  
1" = 300'

# FEMA EFFECTIVE MAP

SOURCE: FEMA FLOOD INSURANCE MAP #FM2503480016B DATED 06/15/1982

## PROPOSED PHARMACY WITH DRIVE-THRU

PARCEL ID: 5B3-0-50  
290 CENTRAL STREET (U.S. ROUTE 202)  
TOWN OF WINCHENDON, WORCESTER COUNTY, MASSACHUSETTS

<b>DRAWN BY:</b>	AKPM
<b>CHECKED BY:</b>	AS
<b>DATE:</b>	10/18/2021
<b>SCALE:</b>	1" = 300'
<b>PROJECT ID:</b>	BOS-210033



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**APPENDIX B**  
**NRCS COUNTY SOIL SURVEY**





United States  
Department of  
Agriculture

**NRCS**

Natural  
Resources  
Conservation  
Service

A product of the National  
Cooperative Soil Survey,  
a joint effort of the United  
States Department of  
Agriculture and other  
Federal agencies, State  
agencies including the  
Agricultural Experiment  
Stations, and local  
participants

# Custom Soil Resource Report for Worcester County, Massachusetts, Northwestern Part



# Custom Soil Resource Report Soil Map



Soil Map may not be valid at this scale.

Map Scale: 1:518 if printed on A portrait (8.5" x 11") sheet.

0 5 10 20 30 Meters

0 25 50 100 150 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84



## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
365B	Skerry fine sandy loam, 3 to 8 percent slopes	0.7	100.0%
<b>Totals for Area of Interest</b>		<b>0.7</b>	<b>100.0%</b>

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

## Custom Soil Resource Report

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## Worcester County, Massachusetts, Northwestern Part

### 365B—Skerry fine sandy loam, 3 to 8 percent slopes

#### Map Unit Setting

*National map unit symbol:* 2w9p8  
*Elevation:* 260 to 1,210 feet  
*Mean annual precipitation:* 31 to 65 inches  
*Mean annual air temperature:* 36 to 52 degrees F  
*Frost-free period:* 90 to 160 days  
*Farmland classification:* All areas are prime farmland

#### Map Unit Composition

*Skerry and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Skerry

##### Setting

*Landform:* Mountains, hills  
*Landform position (two-dimensional):* Backslope, footslope  
*Landform position (three-dimensional):* Mountainbase, interfluve  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear  
*Parent material:* Loamy lodgment till derived from granite and gneiss and/or schist  
over sandy lodgment till derived from granite and gneiss and/or schist

##### Typical profile

*Ap - 0 to 6 inches:* fine sandy loam  
*Bs1 - 6 to 20 inches:* gravelly fine sandy loam  
*Bs2 - 20 to 25 inches:* gravelly fine sandy loam  
*Cd1 - 25 to 34 inches:* gravelly loamy sand  
*Cd2 - 34 to 65 inches:* gravelly loamy sand

##### Properties and qualities

*Slope:* 3 to 8 percent  
*Depth to restrictive feature:* 21 to 43 inches to densic material  
*Drainage class:* Moderately well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.01 to 1.42 in/hr)  
*Depth to water table:* About 18 to 30 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:* Low (about 3.9 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 2w  
*Hydrologic Soil Group:* C/D  
*Ecological site:* F144BY501ME - Loamy Slope (Northern Hardwoods)  
*Hydric soil rating:* No

**Minor Components**

**Colonel**

*Percent of map unit:* 6 percent  
*Landform:* Mountains, hills  
*Landform position (two-dimensional):* Foothills  
*Landform position (three-dimensional):* Mountainbase, interfluvium  
*Microfeatures of landform position:* Closed depressions, closed depressions  
*Down-slope shape:* Linear, concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* No

**Becket**

*Percent of map unit:* 4 percent  
*Landform:* Mountains, hills  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Mountainbase, interfluvium  
*Microfeatures of landform position:* Rises, rises  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

**Brayton**

*Percent of map unit:* 3 percent  
*Landform:* Mountains, hills  
*Landform position (two-dimensional):* Foothills, toeslope  
*Landform position (three-dimensional):* Mountainbase, interfluvium  
*Microfeatures of landform position:* Closed depressions, closed depressions  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

**Hermon**

*Percent of map unit:* 2 percent  
*Landform:* Mountains, hills  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Mountainbase, interfluvium  
*Microfeatures of landform position:* Rises, rises  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

# **Soil Information for All Uses**

---

## **Soil Properties and Qualities**

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

## **Soil Qualities and Features**

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

## **Hydrologic Soil Group**

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

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

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

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

## Custom Soil Resource Report

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

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

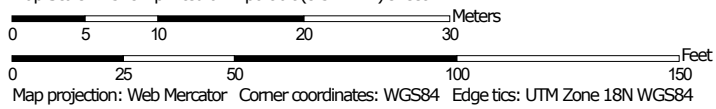
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.



Custom Soil Resource Report  
Map—Hydrologic Soil Group



Map Scale: 1:518 if printed on A portrait (8.5" x 11") sheet.



**Table—Hydrologic Soil Group**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
365B	Skerry fine sandy loam, 3 to 8 percent slopes	C/D	0.7	100.0%
<b>Totals for Area of Interest</b>			<b>0.7</b>	<b>100.0%</b>

**Rating Options—Hydrologic Soil Group**

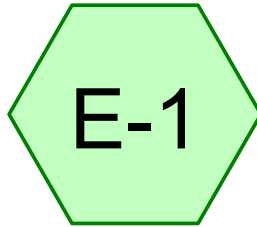
*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

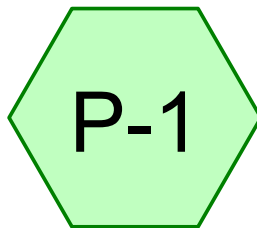
*Tie-break Rule:* Higher

**APPENDIX C**  
**DESIGN CALCULATIONS & DIAGRAMS**

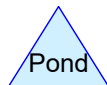
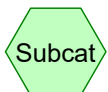
**APPENDIX C-I**  
**HYDROCAD ROUTING DIAGRAM**



DRAINAGE TO  
JUNIPER ROAD



DRAINAGE TO  
JUNIPER



**APPENDIX C-2**  
**I-YEAR STORM HYDROGRAPHS**

**2021-09-15\_HydroCAD**

*NRCC 24-hr D 1-Year Rainfall=2.58"*

Prepared by Stonefield Engineering & Design

Printed 10/11/2021

HydroCAD® 10.00-22 s/n 10626 © 2018 HydroCAD Software Solutions LLC

Page 2

Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points  
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment E-1: DRAINAGE TO**

Runoff Area=24,679 sf 81.31% Impervious Runoff Depth=2.09"  
Flow Length=179' Tc=6.0 min CN=80/98 Runoff=1.17 cfs 0.099 af

**Subcatchment P-1: DRAINAGE TO**

Runoff Area=24,679 sf 61.15% Impervious Runoff Depth=1.69"  
Tc=6.0 min CN=74/98 Runoff=0.94 cfs 0.080 af

**Total Runoff Area = 1.133 ac Runoff Volume = 0.178 af Average Runoff Depth = 1.89"**  
**28.77% Pervious = 0.326 ac 71.23% Impervious = 0.807 ac**

**Summary for Subcatchment E-1: DRAINAGE TO JUNIPER ROAD**

Runoff = 1.17 cfs @ 12.13 hrs, Volume= 0.099 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
NRCC 24-hr D 1-Year Rainfall=2.58"

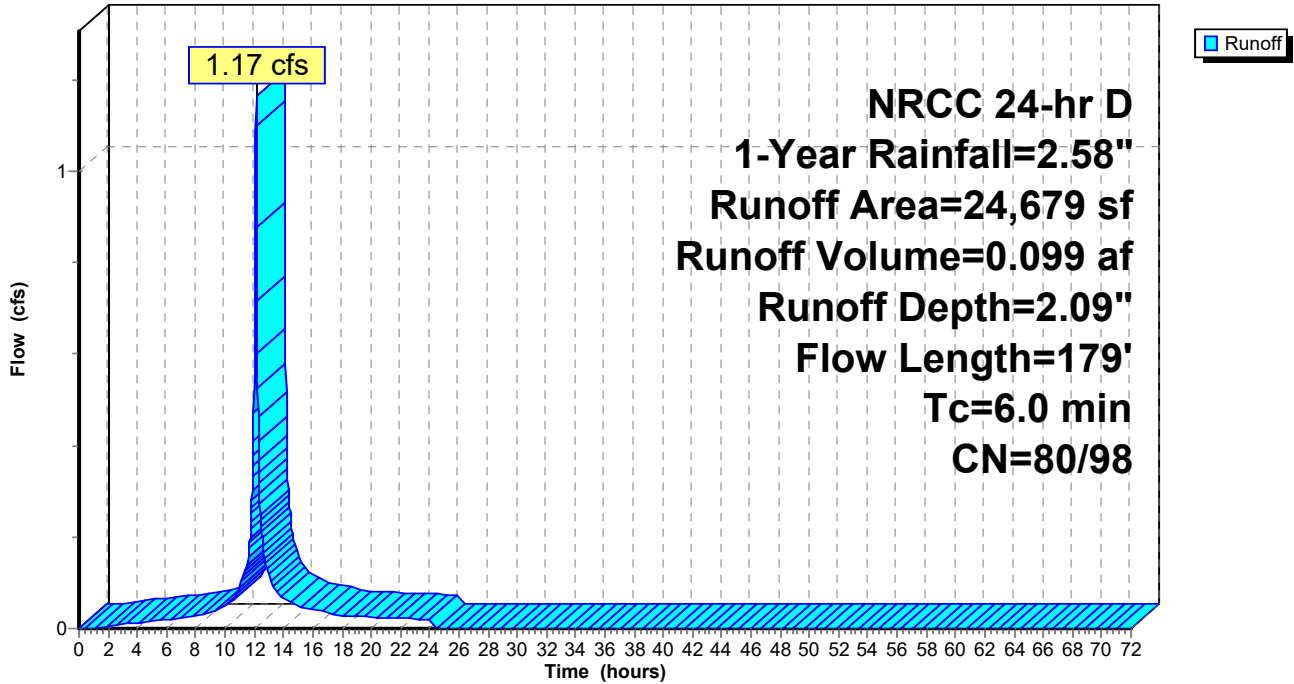
Area (sf)	CN	Description
* 20,067	98	Impervious Areas
4,612	80	>75% Grass cover, Good, HSG D
24,679	95	Weighted Average
4,612	80	18.69% Pervious Area
20,067	98	81.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	46	0.0258	1.29		<b>Sheet Flow, 1A-1B</b> Smooth surfaces n= 0.011 P2= 3.13"
0.6	50	0.0040	1.28		<b>Shallow Concentrated Flow, 1B-1C</b> Paved Kv= 20.3 fps
0.1	22	0.0476	4.43		<b>Shallow Concentrated Flow, 1C-1D</b> Paved Kv= 20.3 fps
0.1	32	0.0625	5.08		<b>Shallow Concentrated Flow, 1D-1E</b> Paved Kv= 20.3 fps
0.1	16	0.0625	5.08		<b>Shallow Concentrated Flow, 1E-1F</b> Paved Kv= 20.3 fps
0.0	13	0.0461	4.36		<b>Shallow Concentrated Flow, 1F-1G</b> Paved Kv= 20.3 fps
4.5					<b>Direct Entry, TO MEET MINIMUM</b>
6.0	179	Total			



### Subcatchment E-1: DRAINAGE TO JUNIPER ROAD

Hydrograph



**Summary for Subcatchment P-1: DRAINAGE TO JUNIPER**

Runoff = 0.94 cfs @ 12.13 hrs, Volume= 0.080 af, Depth= 1.69"

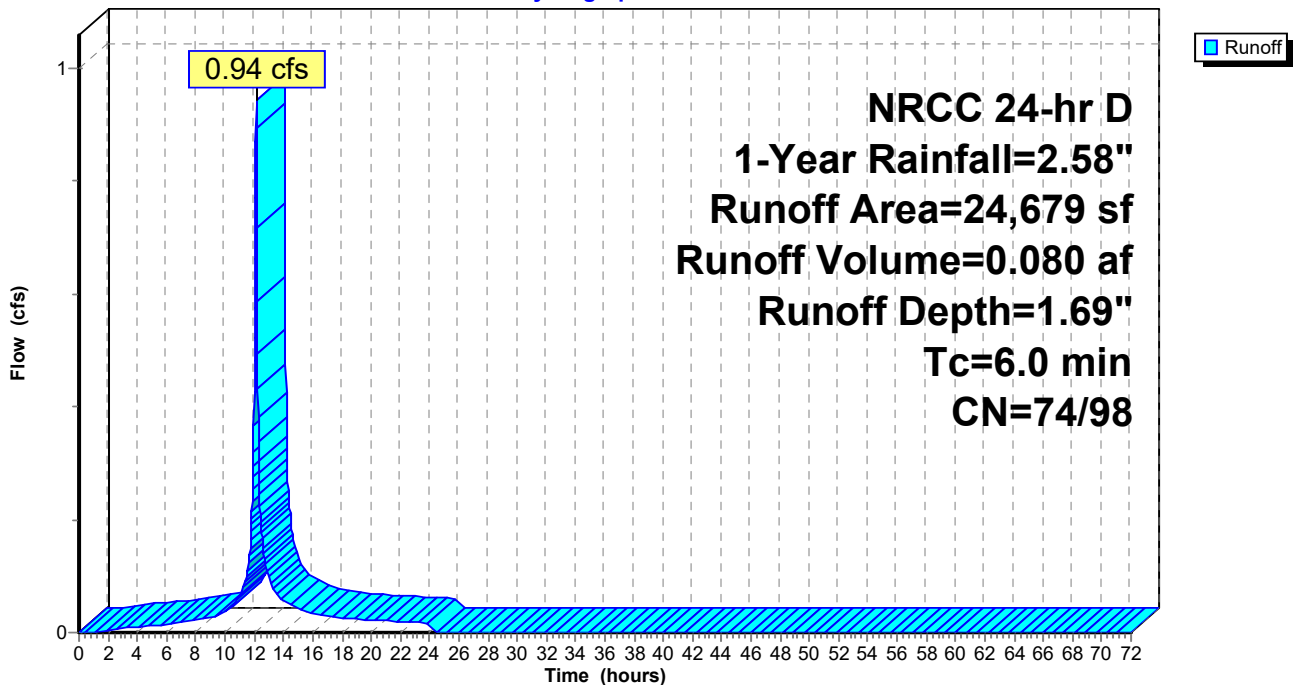
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
NRCC 24-hr D 1-Year Rainfall=2.58"

Area (sf)	CN	Description
15,091	98	Paved parking, HSG C
9,588	74	>75% Grass cover, Good, HSG C
24,679	89	Weighted Average
9,588	74	38.85% Pervious Area
15,091	98	61.15% Impervious Area

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

**Subcatchment P-1: DRAINAGE TO JUNIPER**

Hydrograph



**APPENDIX C-3**  
**10-YEAR STORM HYDROGRAPHS**

Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points  
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment E-1: DRAINAGE TO**

Runoff Area=24,679 sf 81.31% Impervious Runoff Depth=4.10"  
Flow Length=179' Tc=6.0 min CN=80/98 Runoff=2.25 cfs 0.194 af

**Subcatchment P-1: DRAINAGE TO**

Runoff Area=24,679 sf 61.15% Impervious Runoff Depth=3.54"  
Tc=6.0 min CN=74/98 Runoff=1.98 cfs 0.167 af

**Total Runoff Area = 1.133 ac Runoff Volume = 0.361 af Average Runoff Depth = 3.82"**  
**28.77% Pervious = 0.326 ac 71.23% Impervious = 0.807 ac**

**Summary for Subcatchment E-1: DRAINAGE TO JUNIPER ROAD**

Runoff = 2.25 cfs @ 12.13 hrs, Volume= 0.194 af, Depth= 4.10"

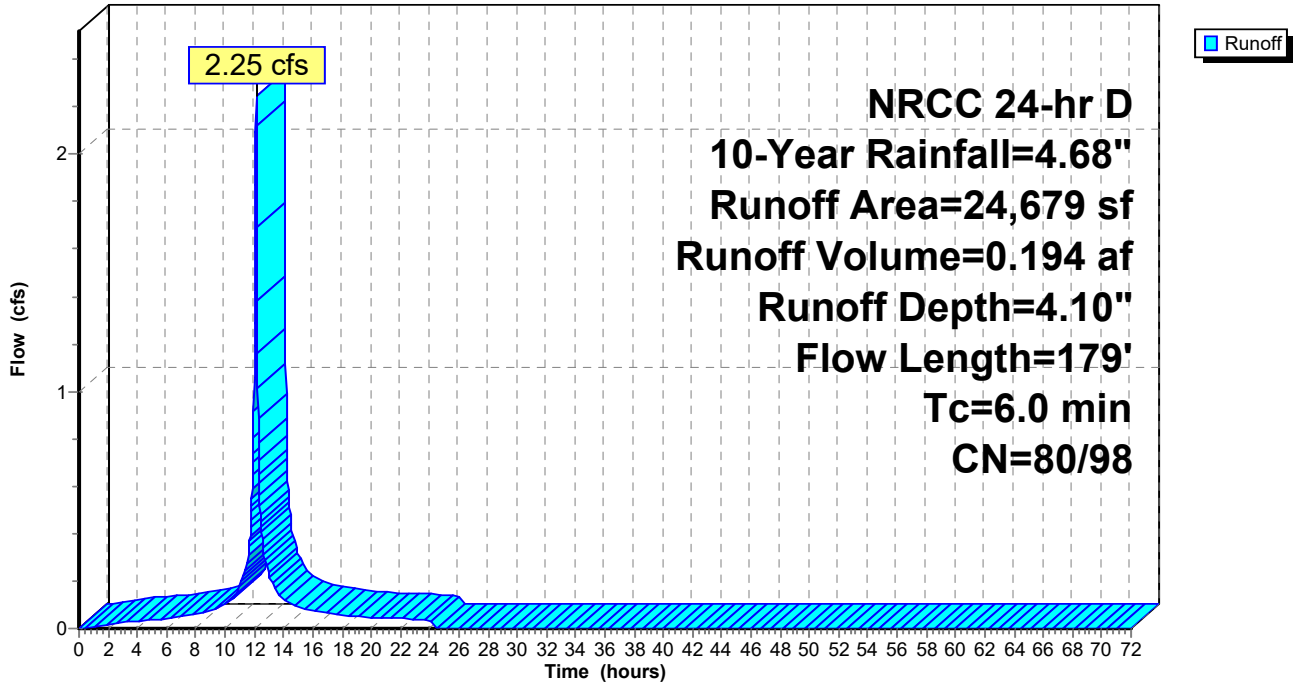
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
* 20,067	98	Impervious Areas
4,612	80	>75% Grass cover, Good, HSG D
24,679	95	Weighted Average
4,612	80	18.69% Pervious Area
20,067	98	81.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	46	0.0258	1.29		<b>Sheet Flow, 1A-1B</b> Smooth surfaces n= 0.011 P2= 3.13"
0.6	50	0.0040	1.28		<b>Shallow Concentrated Flow, 1B-1C</b> Paved Kv= 20.3 fps
0.1	22	0.0476	4.43		<b>Shallow Concentrated Flow, 1C-1D</b> Paved Kv= 20.3 fps
0.1	32	0.0625	5.08		<b>Shallow Concentrated Flow, 1D-1E</b> Paved Kv= 20.3 fps
0.1	16	0.0625	5.08		<b>Shallow Concentrated Flow, 1E-1F</b> Paved Kv= 20.3 fps
0.0	13	0.0461	4.36		<b>Shallow Concentrated Flow, 1F-1G</b> Paved Kv= 20.3 fps
4.5					<b>Direct Entry, TO MEET MINIMUM</b>
6.0	179	Total			

### Subcatchment E-1: DRAINAGE TO JUNIPER ROAD

Hydrograph



**Summary for Subcatchment P-1: DRAINAGE TO JUNIPER**

Runoff = 1.98 cfs @ 12.13 hrs, Volume= 0.167 af, Depth= 3.54"

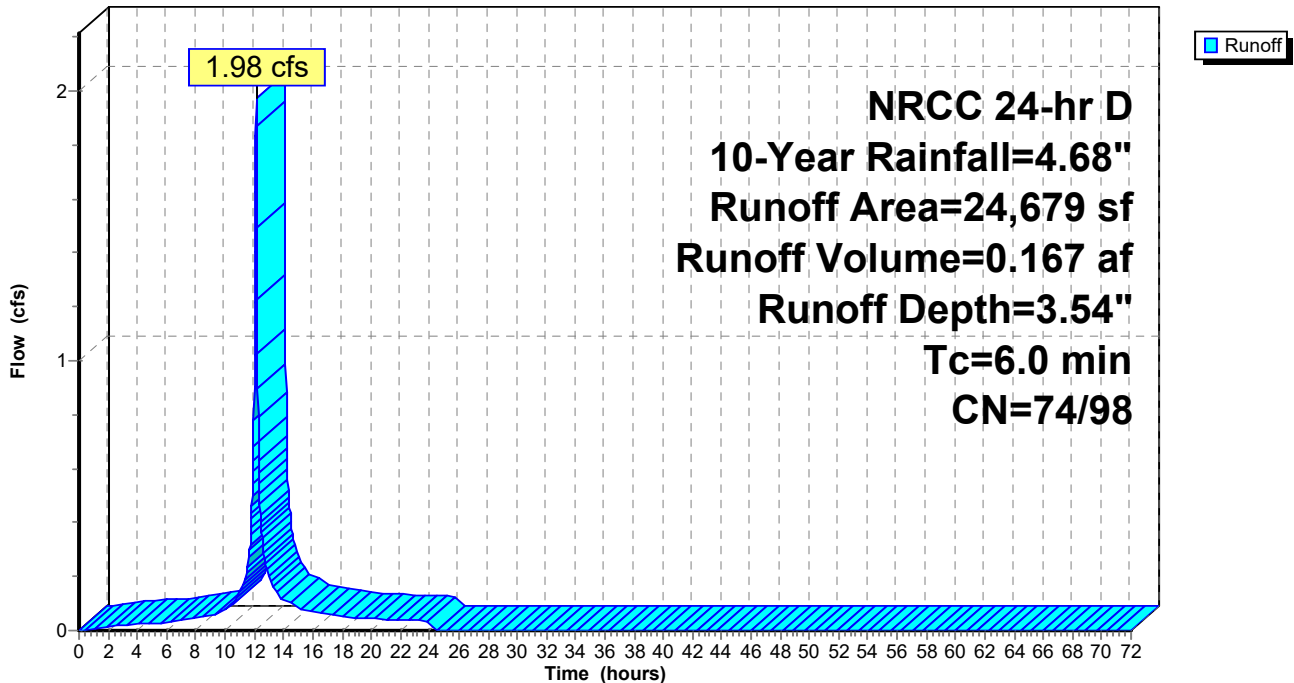
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
NRCC 24-hr D 10-Year Rainfall=4.68"

Area (sf)	CN	Description
15,091	98	Paved parking, HSG C
9,588	74	>75% Grass cover, Good, HSG C
24,679	89	Weighted Average
9,588	74	38.85% Pervious Area
15,091	98	61.15% Impervious Area

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

**Subcatchment P-1: DRAINAGE TO JUNIPER**

Hydrograph



**APPENDIX C-4**  
**100-YEAR STORM HYDROGRAPHS**



Time span=0.00-72.00 hrs, dt=0.02 hrs, 3601 points  
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.  
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment E-1: DRAINAGE TO**

Runoff Area=24,679 sf 81.31% Impervious Runoff Depth=7.70"  
Flow Length=179' Tc=6.0 min CN=80/98 Runoff=4.15 cfs 0.363 af

**Subcatchment P-1: DRAINAGE TO**

Runoff Area=24,679 sf 61.15% Impervious Runoff Depth=6.99"  
Tc=6.0 min CN=74/98 Runoff=3.88 cfs 0.330 af

**Total Runoff Area = 1.133 ac Runoff Volume = 0.693 af Average Runoff Depth = 7.34"**  
**28.77% Pervious = 0.326 ac 71.23% Impervious = 0.807 ac**

**Summary for Subcatchment E-1: DRAINAGE TO JUNIPER ROAD**

Runoff = 4.15 cfs @ 12.13 hrs, Volume= 0.363 af, Depth= 7.70"

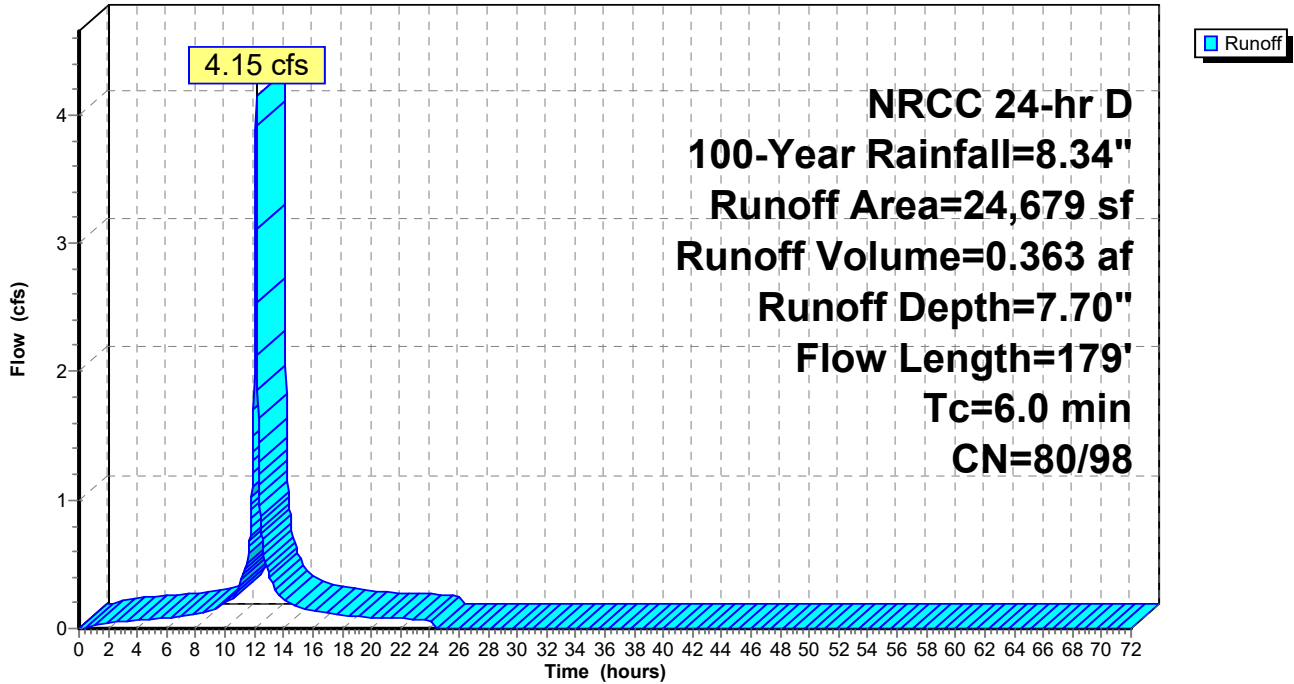
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
* 20,067	98	Impervious Areas
4,612	80	>75% Grass cover, Good, HSG D
24,679	95	Weighted Average
4,612	80	18.69% Pervious Area
20,067	98	81.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	46	0.0258	1.29		<b>Sheet Flow, 1A-1B</b> Smooth surfaces n= 0.011 P2= 3.13"
0.6	50	0.0040	1.28		<b>Shallow Concentrated Flow, 1B-1C</b> Paved Kv= 20.3 fps
0.1	22	0.0476	4.43		<b>Shallow Concentrated Flow, 1C-1D</b> Paved Kv= 20.3 fps
0.1	32	0.0625	5.08		<b>Shallow Concentrated Flow, 1D-1E</b> Paved Kv= 20.3 fps
0.1	16	0.0625	5.08		<b>Shallow Concentrated Flow, 1E-1F</b> Paved Kv= 20.3 fps
0.0	13	0.0461	4.36		<b>Shallow Concentrated Flow, 1F-1G</b> Paved Kv= 20.3 fps
4.5					<b>Direct Entry, TO MEET MINIMUM</b>
6.0	179	Total			

### Subcatchment E-1: DRAINAGE TO JUNIPER ROAD

Hydrograph



**Summary for Subcatchment P-1: DRAINAGE TO JUNIPER**

Runoff = 3.88 cfs @ 12.13 hrs, Volume= 0.330 af, Depth= 6.99"

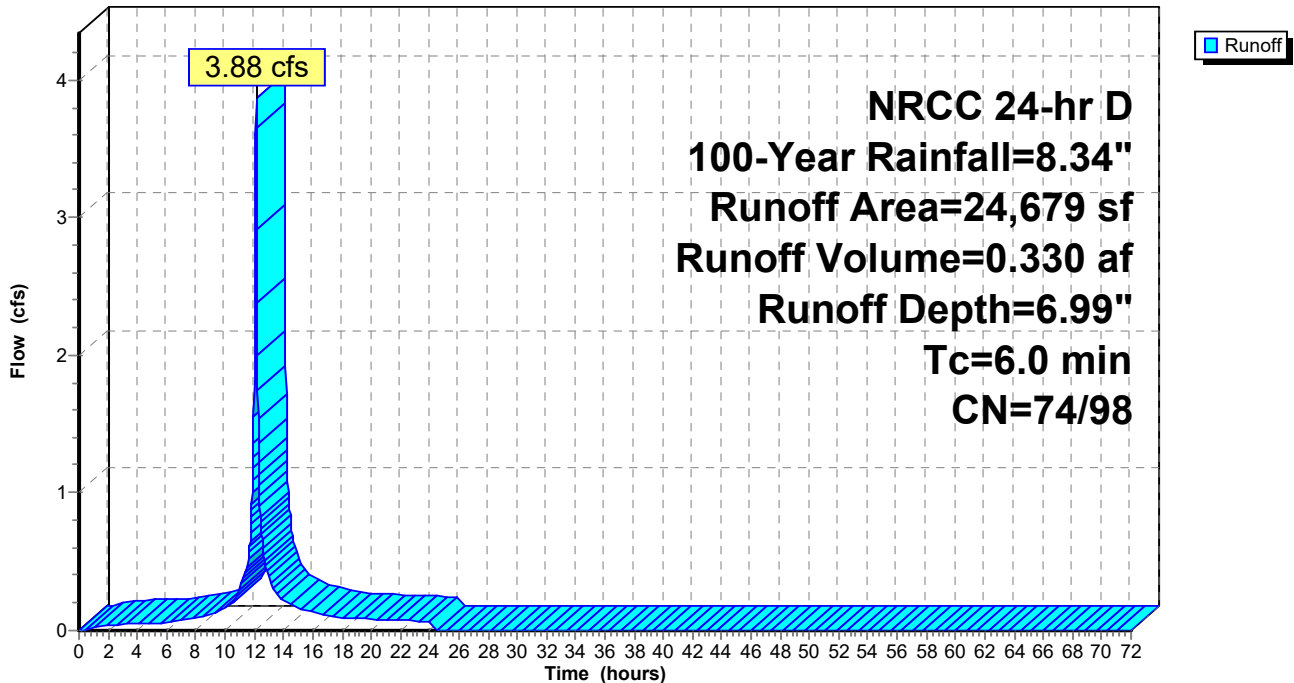
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.02 hrs  
NRCC 24-hr D 100-Year Rainfall=8.34"

Area (sf)	CN	Description
15,091	98	Paved parking, HSG C
9,588	74	>75% Grass cover, Good, HSG C
24,679	89	Weighted Average
9,588	74	38.85% Pervious Area
15,091	98	61.15% Impervious Area

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

**Subcatchment P-1: DRAINAGE TO JUNIPER**

Hydrograph



**APPENDIX D**  
**STORMWATER MANAGEMENT CHECKLIST**



# Checklist for Stormwater Report

## A. Introduction

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



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.<sup>1</sup> This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8<sup>2</sup>
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

<sup>1</sup> The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

<sup>2</sup> For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



# Checklist for Stormwater Report

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## B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

*Note:* Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

---

### Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

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Signature and Date

---

## Checklist

**Project Type:** Is the application for new development, redevelopment, or a mix of new and redevelopment?

- New development
- Redevelopment
- Mix of New Development and Redevelopment



# Checklist for Stormwater Report

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## Checklist (continued)

**LID Measures:** Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- No disturbance to any Wetland Resource Areas
- Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- Reduced Impervious Area (Redevelopment Only)
- Minimizing disturbance to existing trees and shrubs
- LID Site Design Credit Requested:
  - Credit 1
  - Credit 2
  - Credit 3
- Use of "country drainage" versus curb and gutter conveyance and pipe
- Bioretention Cells (includes Rain Gardens)
- Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- Treebox Filter
- Water Quality Swale
- Grass Channel
- Green Roof
- Other (describe): \_\_\_\_\_

### Standard 1: No New Untreated Discharges

- No new untreated discharges
- Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.





# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 2: Peak Rate Attenuation

- Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

### Standard 3: Recharge

- Soil Analysis provided.
- Required Recharge Volume calculation provided.
- Required Recharge volume reduced through use of the LID site Design Credits.
- Sizing the infiltration, BMPs is based on the following method: Check the method used.
  - Static
  - Simple Dynamic
  - Dynamic Field<sup>1</sup>
- Runoff from all impervious areas at the site discharging to the infiltration BMP.
- Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
  - Site is comprised solely of C and D soils and/or bedrock at the land surface
  - M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
  - Solid Waste Landfill pursuant to 310 CMR 19.000
  - Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

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<sup>1</sup> 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 3: Recharge (continued)

- The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

### Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
  - Provisions for storing materials and waste products inside or under cover;
  - Vehicle washing controls;
  - Requirements for routine inspections and maintenance of stormwater BMPs;
  - Spill prevention and response plans;
  - Provisions for maintenance of lawns, gardens, and other landscaped areas;
  - Requirements for storage and use of fertilizers, herbicides, and pesticides;
  - Pet waste management provisions;
  - Provisions for operation and management of septic systems;
  - Provisions for solid waste management;
  - Snow disposal and plowing plans relative to Wetland Resource Areas;
  - Winter Road Salt and/or Sand Use and Storage restrictions;
  - Street sweeping schedules;
  - Provisions for prevention of illicit discharges to the stormwater management system;
  - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
  - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
  - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
  - Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
    - is within the Zone II or Interim Wellhead Protection Area
    - is near or to other critical areas
    - is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
    - involves runoff from land uses with higher potential pollutant loads.
  - The Required Water Quality Volume is reduced through use of the LID site Design Credits.
  - Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 4: Water Quality (continued)

- The BMP is sized (and calculations provided) based on:
  - The ½" or 1" Water Quality Volume or
  - The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

### Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- The NPDES Multi-Sector General Permit does **not** cover the land use.
- LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- All exposure has been eliminated.
- All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

### Standard 6: Critical Areas

- The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- Critical areas and BMPs are identified in the Stormwater Report.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
  - Limited Project
  - Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
  - Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
  - Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
  - Bike Path and/or Foot Path
  - Redevelopment Project
  - Redevelopment portion of mix of new and redevelopment.
- Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

### Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
  - Construction Period Operation and Maintenance Plan;
  - Names of Persons or Entity Responsible for Plan Compliance;
  - Construction Period Pollution Prevention Measures;
  - Erosion and Sedimentation Control Plan Drawings;
  - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
  - Vegetation Planning;
  - Site Development Plan;
  - Construction Sequencing Plan;
  - Sequencing of Erosion and Sedimentation Controls;
  - Operation and Maintenance of Erosion and Sedimentation Controls;
  - Inspection Schedule;
  - Maintenance Schedule;
  - Inspection and Maintenance Log Form.
- A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



# Checklist for Stormwater Report

---

## Checklist (continued)

### Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- The project is **not** covered by a NPDES Construction General Permit.
- The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

### Standard 9: Operation and Maintenance Plan

- The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
  - Name of the stormwater management system owners;
  - Party responsible for operation and maintenance;
  - Schedule for implementation of routine and non-routine maintenance tasks;
  - Plan showing the location of all stormwater BMPs maintenance access areas;
  - Description and delineation of public safety features;
  - Estimated operation and maintenance budget; and
  - Operation and Maintenance Log Form.
- The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
  - A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
  - A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

### Standard 10: Prohibition of Illicit Discharges

- The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- An Illicit Discharge Compliance Statement is attached;
- NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.

# **APPENDIX E**

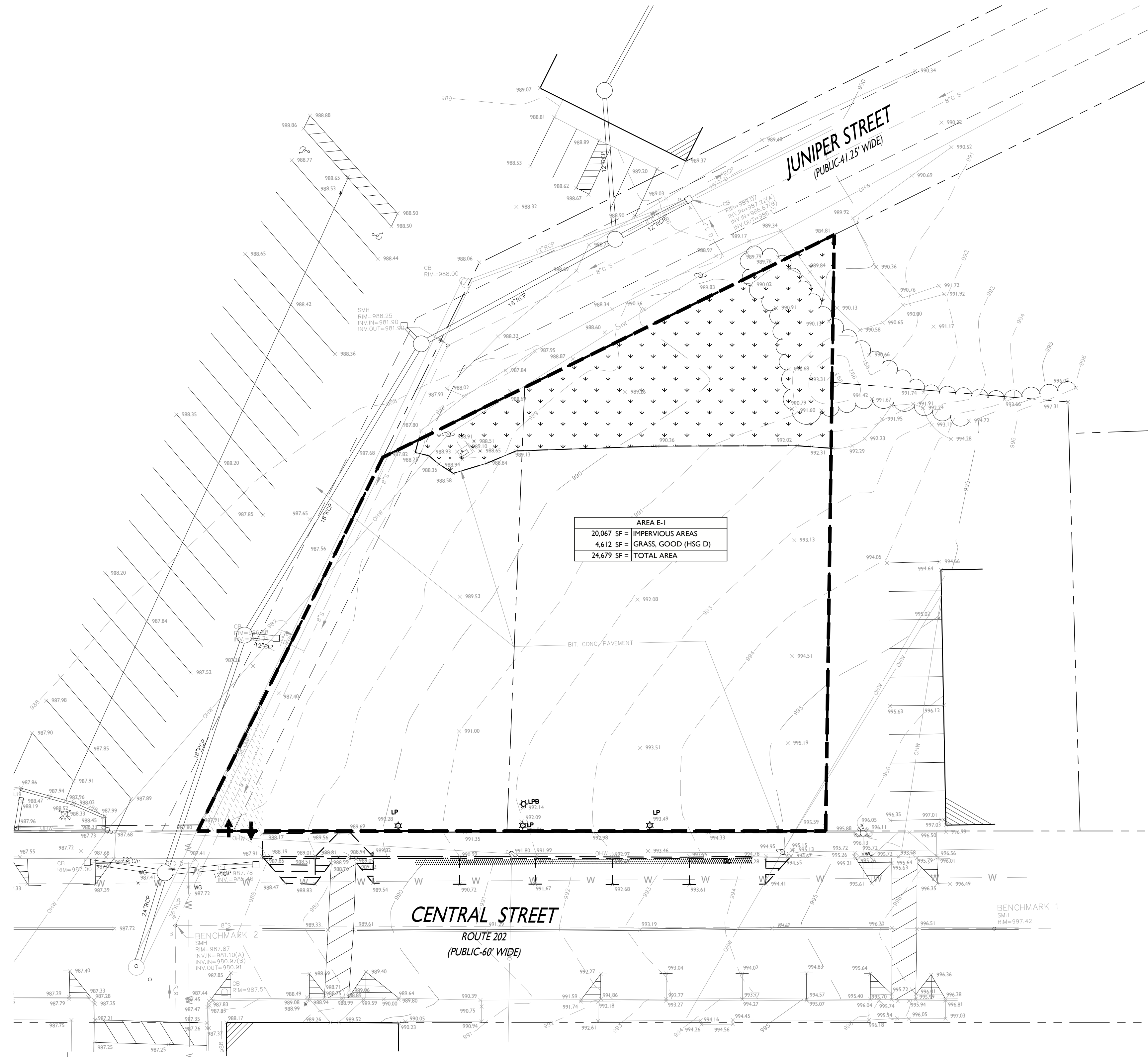
## **DRAINAGE AREA MAPS**

### **INVENTORY**

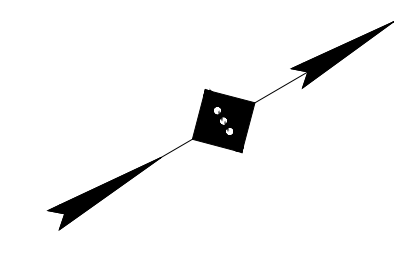
***EXISTING DRAINAGE AREA MAP***

***PROPOSED DRAINAGE AREA MAP***

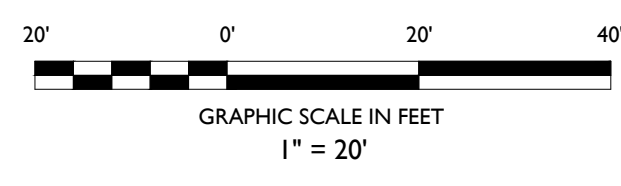
Z:\0107\180200\18021003\COCCA DEVELOPMENT - 290 CENTRAL STREET - WINCHENDON, MASSACHUSETTS\DWG



SYMBOL	DESCRIPTION
	PROPERTY LINE
	EXISTING SITE DRAINAGE AREA
	EXISTING PERVIOUS AREA



**NOTE:**  
**MINIMUM TIME OF CONCENTRATION - 6.0 MINUTES**



NO.	DATE	BY	DESCRIPTION
01	10/08/2021	SPM	FOR CLIENT REVIEW

**NOT APPROVED FOR CONSTRUCTION**

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**COCCA DEVELOPMENT**  
 PROPOSED PHARMACY WITH  
 DRIVE-THRU

BLOCK 5B3, LOT 50  
 290 CENTRAL STREET (U.S. ROUTE 202)  
 TOWN OF WINCHENDON  
 WORCESTER COUNTY, MASSACHUSETTS

JOSHUA H. KLINE, P.E.  
 MASSACHUSETTS LICENSE No. 53936  
 LICENSED PROFESSIONAL ENGINEER

**STONEFIELD**  
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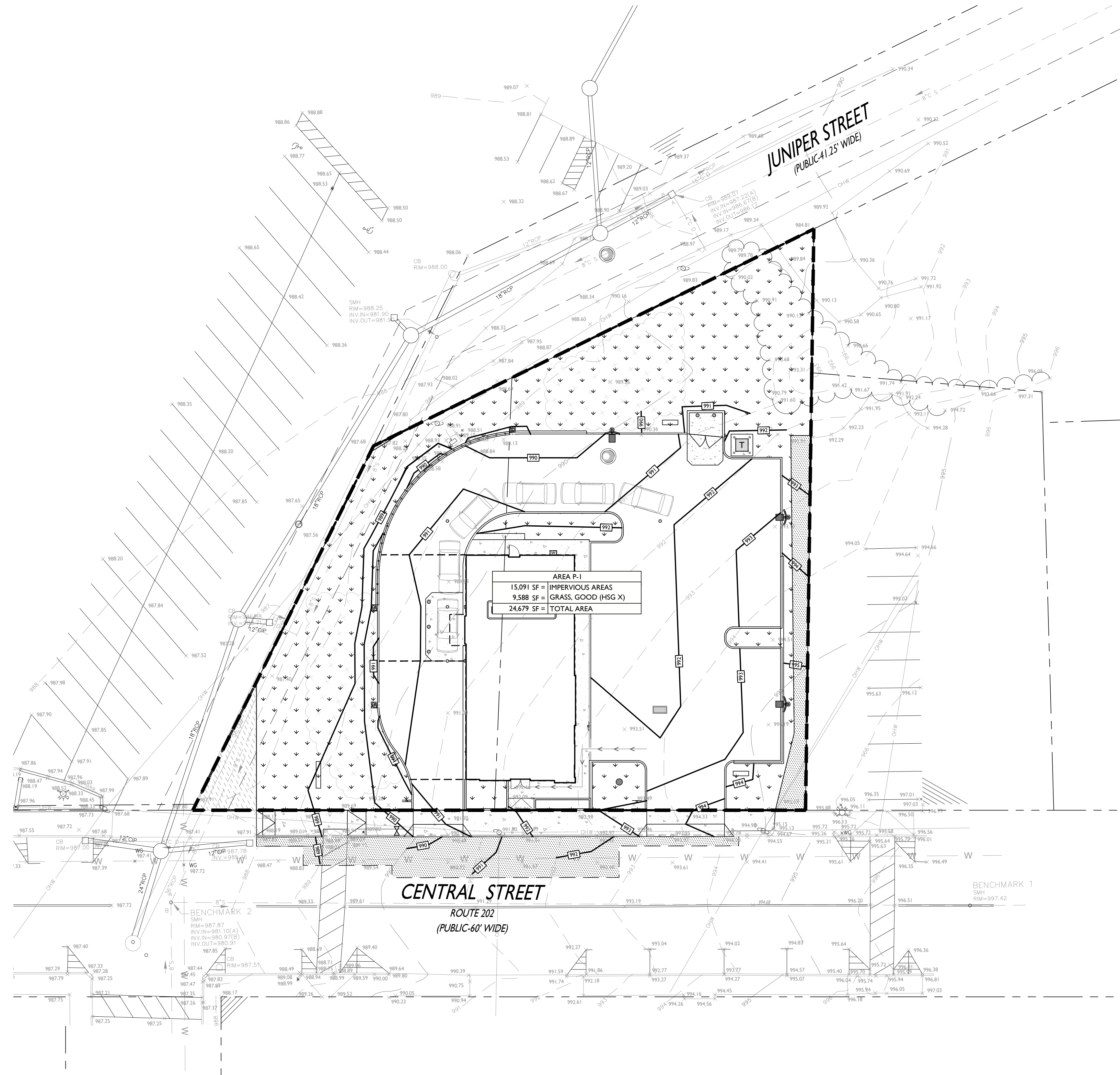
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TITLE:  
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 AREA MAP**

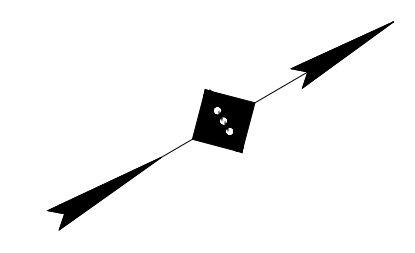
DRAWING:  
**1 OF 2**



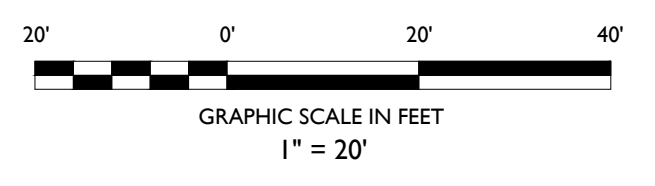
Z:\01074\0205110021003 COCCA DEVELOPMENT - 29 CENTRAL STREET - WINCHENDON, MA\0205110021003.DWG



SYMBOL	DESCRIPTION
---	PROPERTY LINE
---	PROPOSED SITE DRAINAGE AREA
↓ ↓ ↓ ↓ ↓	PROPOSED PERVIOUS AREA



**NOTE:**  
MINIMUM TIME OF CONCENTRATION - 6.0 MINUTES



DATE	BY	DESCRIPTION
01/08/2021	SPM	FOR CLIENT REVIEW

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SCALE: 1" = 20' PROJECT ID: BOS-210033

TITLE:  
**PROPOSED DRAINAGE  
AREA MAP**

DRAWING:  
**2 OF 2**



**APPENDIX F:**  
***PROJECT PLANS***  
***(NOT TO SCALE)***

**APPENDIX F-1:**  
***SITE PLAN***



**APPENDIX F-2:**  
***DRAINAGE PLAN***



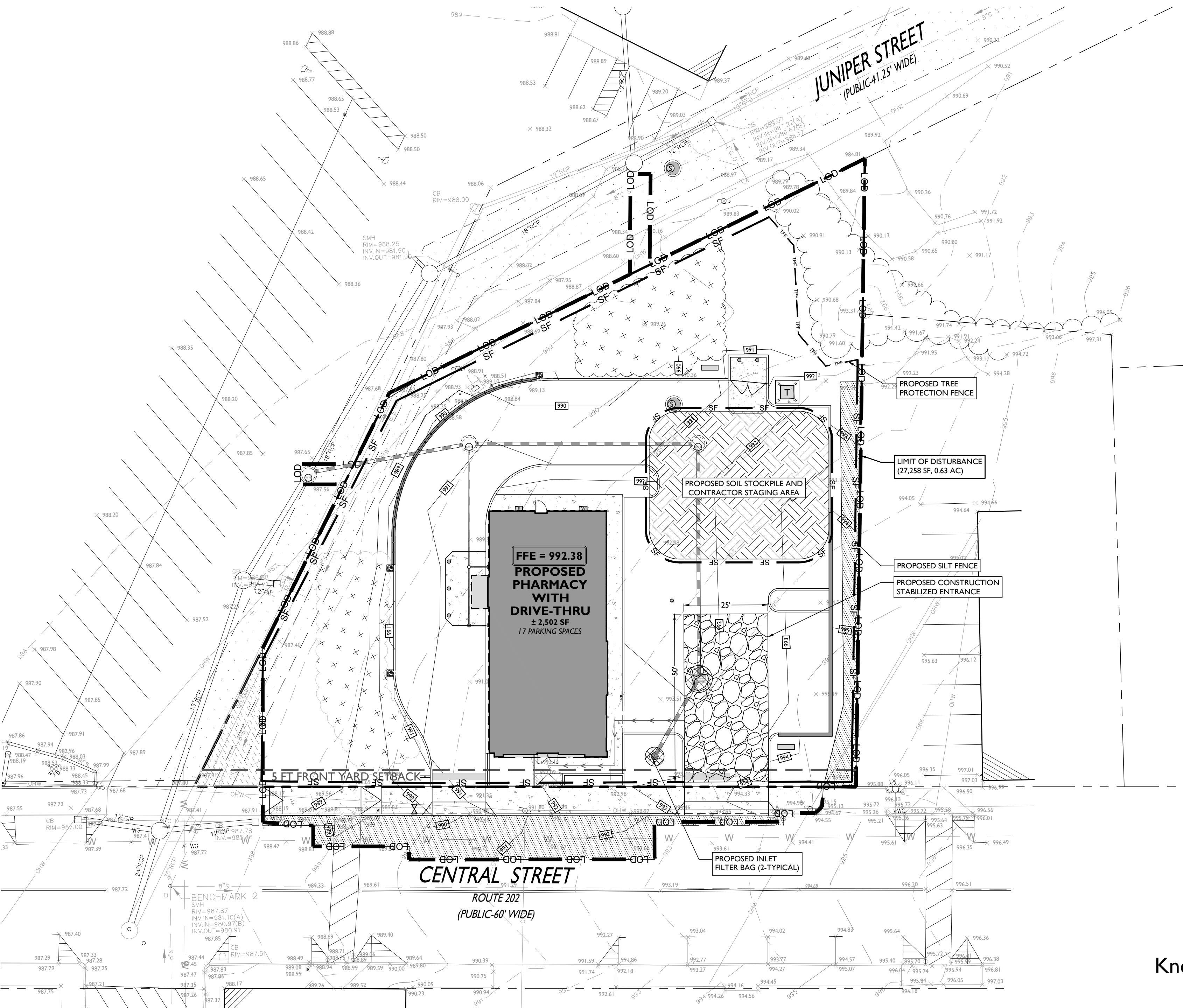


**APPENDIX F-3:**  
***SOIL EROSION & SEDIMENT***  
***CONTROL PLAN***



- TOWN OF WINCHENDON SOIL EROSION AND SEDIMENT CONTROL NOTES**
1. THE TOWN OF WINCHENDON FORBIDS THE USE OF FILL CONTAINING HAZARDOUS MATERIALS.
  2. THE TOWN OF WINCHENDON SHALL REQUIRE THE CLEANING OF CATCHBASINS, SUMPS AND STORMWATER BASINS FOLLOWING CONSTRUCTION AND ANNUALLY THEREAFTER.
  3. RESTRICT THE HAULING OF EARTH MATERIALS TO OR FROM THE SITE TO THE HOUSE BETWEEN 9 A.M. AND 4 P.M. ON WEEKDAYS.
  4. THE TOWN OF WINCHENDON REQUIRES THE DESCRIPTION OF THE MATERIALS TO BE USED IN THE CONSTRUCTION OF IMPERMEABLE SURFACES SUCH AS SIDEWALKS AND DRIVEWAYS.
  5. ALL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO CONSTRUCTION.
  6. EROSION CONTROL SHALL CONFORM TO THE TOWN OF WINCHENDON CONSERVATION COMMISSION REQUIREMENTS AS STATED IN THE ORDER OF CONDITIONS.

SOIL CHARACTERISTICS CHART	
TYPE OF SOIL	SKERRY FINE SANDY LOAM (3658)
PERCENT OF SITE COVERAGE	85.0%
HYDROLOGIC SOIL GROUP	C/D
DEPTH TO RESTRICTIVE LAYER	21 TO 43 INCHES
SOIL PERMEABILITY	0.01 TO 1.42 IN / HR
DEPTH TO WATER TABLE	18 TO 30 INCHES



**STABILIZATION SPECIFICATIONS:**

**I.A. TEMPORARY SEEDING AND MULCHING:**  
 TIME OF PLANTING - PLANTING SHOULD PREFERABLY BE DONE BETWEEN APRIL 1 AND JUNE 30, AND SEPTEMBER 1 THROUGH SEPTEMBER 30. IF PLANTING IS DONE IN THE MONTHS OF JULY AND AUGUST, IRRIGATION MAY BE REQUIRED. IF PLANTING IS DONE BETWEEN OCTOBER 1 AND MARCH 31, MULCHING SHOULD BE APPLIED IMMEDIATELY AFTER PLANTING. IF SEEDING IS DONE DURING THE SUMMER MONTHS, IRRIGATION OF SOME SORT WILL PROBABLY BE NECESSARY.

**SITE PREPARATION -** BEFORE SEEDING, INSTALL NEEDED SURFACE RUNOFF CONTROL MEASURES SUCH AS GRADIENT TERRACES, INTERCEPTOR DIKES/WALES, LEVEL SPREADERS, AND SEDIMENT BASINS.

**SEEDBED PREPARATION -** THE SEEDBED SHOULD BE FIRM WITH A FAIRLY FINE SURFACE. PERFORM ALL CULTURAL OPERATIONS ACROSS OR AT RIGHT ANGLES TO THE SLOPE.

**LIMING AND FERTILIZATION -** APPLY UNIFORMLY 2 TONS OF GROUND LIMESTONE PER ACRE (100 LBS. PER 1,000 SQ. FT.) OR ACCORDING TO SOIL TEST. APPLY UNIFORMLY 10-10-10 ANALYSIS FERTILIZER AT THE RATE OF 400 LBS. PER ACRE (14 LBS. PER 1,000 SQ. FT.) OR AS INDICATED BY SOIL TEST. FORTY PERCENT OF THE NITROGEN SHOULD BE IN ORGANIC FORM. WORK IN LIME AND FERTILIZER TO A DEPTH OF 4 INCHES USING ANY SUITABLE EQUIPMENT.

**SEEDING -** SELECT ADAPTED SPECIES FROM THE ACCOMPANYING TABLE IN THE MA SESC HANDBOOK. APPLY SEED UNIFORMLY ACCORDING TO THE RATE INDICATED IN THE TABLE BY BROADCASTING, DRILLING OR HYDRAULIC APPLICATION. COVER SEEDS WITH SUITABLE EQUIPMENT PER MA SESC HANDBOOK.

**MULCH -** USE AN EFFECTIVE MULCH, SUCH AS CLEAN GRAIN STRAW; TACKLED AND/OR TIED DOWN WITH NETTING TO PROTECT SEEDBED AND ENCOURAGE PLANT GROWTH.

**I.B. PERMANENT SEEDING AND MULCHING:**  
 INSTALL NEEDED SURFACE RUNOFF CONTROL MEASURES SUCH AS GRADIENT TERRACES, BERMS, DIKES, LEVEL SPREADERS, WATERWAYS, AND SEDIMENT BASINS PRIOR TO SEEDING OR PLANTING.

**SEEDBED PREPARATION -** IF INERTILE OR COARSE TEXTURED SUBSOIL WILL BE EXPOSED DURING LAND SHAPING, IT IS BEST TO STOCKPILE TOPSOIL AND RESPADE IT OVER THE FINISHED SLOPE AT A MINIMUM 2- TO 6-INCH DEPTH AND ROLL IT TO PROVIDE A FIRM SEEDBED. IF CONSTRUCTION FILL OPERATIONS HAVE LEFT SOIL EXPOSED WITH A LOOSE, ROUGH, OR IRREGULAR SURFACE, SMOOTH WITH BLADE AND ROLL. LOOSEN THE SOIL TO A DEPTH OF 3-5 INCHES WITH SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT. AERATE TO RECEIVE TOP SOIL SHALL BE TREATED TO FIRM THE SEEDBED AFTER INCORPORATION OF THE LIME AND FERTILIZER SO THAT IT IS DEPRESSED NO MORE THAN 1/4 INCH WHEN STEPPED ON WITH A SHOE. AREAS TO RECEIVE TOPSOIL SHALL NOT BE FIRMED UNTIL AFTER TOPSOILING AND LIME AND FERTILIZER IS APPLIED AND INCORPORATED, AT WHICH TIME IT SHALL BE TREATED TO FIRM THE SEEDBED AS DESCRIBED ABOVE. THIS CAN BE DONE BY ROLLING OR CULTIPACKING.

**COOL SEASON GRASSES -** COOL SEASON GRASSES GROW RAPIDLY IN THE COOL WEATHER OF SPRING AND FALL, AND SET SEED IN JUNE AND JULY. COOL SEASON GRASSES BECOME DORMANT WHEN SUMMER TEMPERATURES PERSIST ABOVE 85 DEGREES AND MOISTURE IS SCARCE.

**LIME AND FERTILIZER -** APPLY LIME AND FERTILIZER ACCORDING TO SOIL TEST AND CURRENT EXTENSION SERVICE RECOMMENDATIONS IN ABSENCE OF A SOIL TEST, APPLY LIME (A PH OF 5.5 - 6.0 IS DESIRED) AT A RATE OF 2.5 TONS PER ACRE AND 10-20-20 ANALYSIS FERTILIZER AT A RATE OF 500 POUNDS PER ACRE (40% OF N TO BE AN ORGANIC OR SLOW RELEASE FORM). INCORPORATE LIME AND FERTILIZER INTO THE TOP 2-3 INCHES OF SOIL.

**SEEDING DATES -** SEEDING OPERATIONS SHOULD BE PERFORMED WITHIN ONE OF THE FOLLOWING PERIODS:

- APRIL 1 - MAY 31
- AUGUST 1 - SEPTEMBER 15
- NOVEMBER 1 - DECEMBER 15 AS A DORMANT SEEDING (SEEDING RATES SHALL BE INCREASED BY 50% FOR DORMANT SEEDINGS)

**SEEDING METHODS -** SEEDING SHOULD BE PERFORMED BY ONE OF THE FOLLOWING METHODS. SEED SHOULD BE PLANTED TO A DEPTH OF 1/2 TO 1 INCHES:

- DRILL SEEDINGS
- BROADCAST AND ROLLED, CULTIPACKED OR TRACKED WITH A SMALL TRACK PIECE OF CONSTRUCTION EQUIPMENT
- HYDROSEEDING, WITH SUBSEQUENT TRACKING

**MULCH -** MULCH THE SEEDINGS WITH STRAW APPLIED AT THE RATE OF 1/2 TONS PER ACRE. ANCHOR THE MULCH WITH EROSION CONTROL NETTING OR FABRIC ON SLOPING AREAS.

**WARM SEASON GRASSES -** WARM SEASON GRASSES BEGIN GROWTH SLOWLY IN THE SPRING, GROW RAPIDLY IN THE HOT SUMMER MONTHS AND SET SEED IN THE FALL. MANY WARM SEASON GRASSES ARE SENSITIVE TO FROST IN THE FALL, AND THE TOP GROWTH MAY DIE BACK. GROWTH BEGINS FROM THE PLANT BASE THE FOLLOWING SPRING.

**LIME AND FERTILIZER -** LIME TO ATTAIN A PH OF AT LEAST 5.5. APPLY A 0-10-10 ANALYSIS FERTILIZER AT THE RATE OF 600 LBS./ACRE. INCORPORATE BOTH INTO THE TOP 2-3 INCHES OF SOIL. (30 LBS. OF SLOW RELEASE NITROGEN SHOULD BE APPLIED AFTER EMERGENCE OF GRASS IN THE LATE SPRING.)

**SEEDING DATES -** SEEDING OPERATIONS SHOULD BE PERFORMED AS AN EARLY SPRING SEEDING (APRIL 1-MAY 15) WITH THE USE OF COLD TREATED SEED. A LATE FALL EARLY WINTER DORMANT SEEDING (NOVEMBER 1 - DECEMBER 15) CAN ALSO BE MADE, HOWEVER THE SEEDING RATE WILL NEED TO BE INCREASED BY 50%.

**SEEDING METHODS -** SEEDING SHOULD BE PERFORMED BY ONE OF THE FOLLOWING METHODS:

- DRILL SEEDINGS (DE-AWNED OR DE-BEARDED SEED SHOULD BE USED UNLESS THE DRILL IS EQUIPPED WITH SPECIAL FEATURES TO ACCEPT AWNED SEED).
- BROADCAST SEEDING WITH SUBSEQUENT ROLLING, CULTIPACKING OR TRACKING THE SEEDING WITH SMALL TRACK CONSTRUCTION EQUIPMENT. TRACKING SHOULD BE ORIENTED UP AND DOWN THE SLOPE.
- HYDROSEEDING WITH SUBSEQUENT TRACKING. IF WOOD FIBER MULCH IS USED, IT SHOULD BE APPLIED AS A SEPARATE OPERATION AFTER SEEDING AND TRACKING TO ASSURE GOOD SEED TO SOIL CONTACT.

**MULCH -** MULCH THE SEEDINGS WITH STRAW APPLIED AT THE RATE OF 1/2 TONS PER ACRE. ANCHOR THE MULCH WITH EROSION CONTROL NETTING OR FABRIC ON SLOPING AREAS.

**SEED MIXTURES FOR PERMANENT COVER**  
 RECOMMENDED MIXTURES FOR PERMANENT SEEDING ARE PROVIDED ON THE TABLE IN THE MA SESC HANDBOOK. SELECT PLANT SPECIES WHICH ARE SUITED TO THE SITE CONDITIONS AND PLANNED USE. SOIL MOISTURE CONDITIONS, OFTEN THE MAJOR LIMITING SITE FACTOR, ARE USUALLY CLASSIFIED AS FOLLOWS:

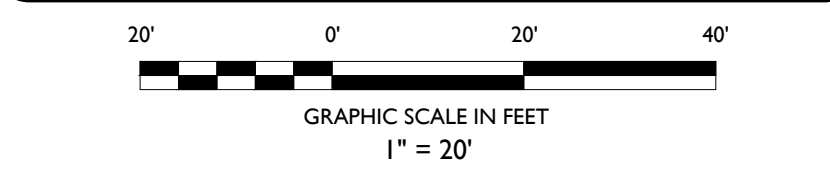
- DRY - SANDS AND GRAVELS TO SANDY LOAMS, NO EFFECTIVE MOISTURE SUPPLY FROM SEEPAGE OR A HIGH WATER TABLE.
- MOIST - WELL DRAINLED TO MODERATELY WELL DRAINLED SANDY LOAMS, LOAMS, COARSE SANDS OR COARSE TEXTURED MATERIAL WITH MODERATE INFLUENCE ON ROOT ZONE FROM SEEPAGE OR A HIGH WATER TABLE.
- WET - ALL TEXTURES WITH A WATER TABLE AT OR VERY NEAR THE SOIL SURFACE, OR WITH ENDURING SEEPAGE, WHEN OTHER FACTORS STRONGLY INFLUENCE SITE CONDITIONS, THE PLANTS SELECTED MUST ALSO BE TOLERANT OF THESE CONDITIONS.

SYMBOL	DESCRIPTION
---	PROPERTY BOUNDARY
- - - -	ADJACENT PROPERTY BOUNDARY
---	LOD
---	PROPOSED LIMIT OF DISTURBANCE
---	PROPOSED SILT FENCE
---	PROPOSED TREE PROTECTION FENCE
---	PROPOSED STOCKPILE & EQUIPMENT STORAGE
---	PROPOSED STABILIZED CONSTRUCTION ENTRANCE
---	PROPOSED INLET PROTECTION FILTER

- SOIL EROSION AND SEDIMENT CONTROL NOTES**
1. THE CONTRACTOR IS RESPONSIBLE FOR SOIL EROSION AND SEDIMENT CONTROL IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS.
  2. THE CONTRACTOR IS RESPONSIBLE FOR DUST CONTROL IN COMPLIANCE WITH LOCAL, STATE, AND FEDERAL AIR QUALITY STANDARDS.
  3. THE CONTRACTOR IS RESPONSIBLE TO INSPECT ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES WEEKLY AND AFTER A PRECIPITATION EVENT GREATER THAN 1 INCH. THE CONTRACTOR SHALL MAINTAIN AN INSPECTION LOG ON SITE AND DOCUMENT CORRECTIVE ACTION TAKEN THROUGHOUT THE COURSE OF CONSTRUCTION AS REQUIRED.

- DUST CONTROL NOTES**
1. VEGETATIVE COVER - FOR DISTURBED AREAS NOT SUBJECT TO TRAFFIC, VEGETATION PROVIDES THE MOST PRACTICAL METHOD OF DUST CONTROL.
  2. MULCH (INCLUDING GRAVEL, MULCH) - WHEN PROPERLY APPLIED, MULCH OFFERS A FAST, EFFECTIVE MEANS OF CONTROLLING DUST.
  3. SPRAY-ON ADHESIVE - LATEX EMULSIONS OR RESIN IN WATER CAN BE SPRAYED ONTO MINERAL SOIL TO PREVENT PARTICLES FROM BLOWING AWAY.
  4. CALCIUM CHLORIDE - CALCIUM CHLORIDE MAY BE APPLIED BY MECHANICAL SPREADER AS LOOSE, DRY GRANULES OR FLAKES AT A RATE THAT KEEPS THE SURFACE MOIST BUT NOT SO HIGH AS TO CAUSE WATER POLLUTION OR PLANT DAMAGE.
  5. SPRINKLING - THE SITE MAY BE SPRINKLED UNTIL THE SURFACE IS WET. SPRINKLING IS ESPECIALLY EFFECTIVE FOR DUST CONTROL ON PAVED ROADS AND OTHER TRAFFIC ROUTES.
  6. STONE - USED TO STABILIZE CONSTRUCTION ROADS, CAN ALSO BE EFFECTIVE FOR DUST CONTROL.
  7. BARRIERS - A BOARD FENCE, WIND FENCE, SEDIMENT FENCE, OR SIMILAR BARRIER CAN CONTROL AIR CURRENTS AND BLOWING SOIL. ALL OF THESE FENCES ARE NORMALLY CONSTRUCTED OF WOOD AND THEY PREVENT EROSION BY OBSTRUCTING THE WIND NEAR THE GROUND AND PREVENTING THE SOIL FROM BLOWING OFFSITE. A WIND BARRIER GENERALLY PROTECTS SOIL DOWNWARD FOR A DISTANCE OF 10 TIMES THE HEIGHT OF THE BARRIER. PERENNIAL GRASS AND STANDS OF EXISTING TREES MAY ALSO SERVE AS WIND BARRIERS.

- SEQUENCE OF CONSTRUCTION**
1. INSTALL CONTROL MEASURES IDENTIFYING LIMITS OF DISTURBANCE AND AREAS INTERNAL TO THE SITE THAT REQUIRE PROTECTION BEFORE START OF LAND DISTURBANCE.
  2. INSTALL ALL EROSION, RUNOFF, AND SEDIMENT CONTROLS AND TEMPORARY POLLUTION PREVENTION MEASURES THAT ARE REQUIRED TO BE IN PLACE AND FUNCTIONAL BEFORE ANY EARTHWORK BEGINS. THIS SHALL BE DONE IN ACCORDANCE WITH THE MA SESC HANDBOOK AND/OR THE MA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (AS AMENDED), UPON ACCEPTABLE COMPLETION OF SITE PREPARATION AND INSTALLATION OF EROSION, RUNOFF, AND SEDIMENT CONTROLS AND TEMPORARY POLLUTION PREVENTION MEASURES, SITE CONSTRUCTION ACTIVITIES MAY COMMENCE.
  3. CONSTRUCTION ACTIVITIES:
    - 3.1 DEMOLISH EXISTING SITE FEATURES (1 WEEK).
    - 3.2 ROUGH GRADING AND TEMPORARY SEEDING (2 WEEKS).
    - 3.3 EXCAVATE AND INSTALL UTILITY IMPROVEMENTS IN ACCORDANCE WITH LOCAL UTILITY AUTHORITY REQUIREMENTS (3 WEEKS).
    - 3.4 BUILDING CONSTRUCTION AND SITE IMPROVEMENTS (12 WEEKS).
    - 3.5 CONSTRUCT RIGHT-OF-WAY IMPROVEMENTS (2 WEEKS).
    - 3.6 LANDSCAPING IMPROVEMENTS AND FINAL SEEDING (1 WEEK).
  4. UPON COMPLETION OF SITE CONSTRUCTION ACTIVITIES, CONTRACTOR SHALL INITIATE APPROPRIATE STABILIZATION PRACTICES ON ALL DISTURBED AREAS AS SOON AS POSSIBLE, BUT NOT MORE THAN FOURTEEN (14) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS TEMPORARILY OR PERMANENTLY CEASED.
  5. PERFORM ROUTINE INSPECTIONS AND MAINTENANCE AND/OR MODIFICATION OF EROSION, RUNOFF, AND SEDIMENT CONTROLS AND TEMPORARY POLLUTION PREVENTION MEASURES WHILE EARTHWORK IS ONGOING AS REQUIRED.
  6. PERFORM FINAL SITE STABILIZATION OF ANY DISTURBED AREAS AFTER EARTHWORK HAS BEEN COMPLETED.
  7. REMOVE OF TEMPORARY EROSION, RUNOFF, AND SEDIMENT CONTROLS AND TEMPORARY POLLUTION PREVENTION MEASURES.
- NOTE: THE DURATIONS ARE APPROXIMATE AND ARE INTENDED TO ACT AS A GENERAL GUIDE TO THE CONSTRUCTION TIMELINE. ALL DURATIONS ARE SUBJECT TO CHANGE BY CONTRACTOR. CONTRACTOR SHALL SUBMIT CONSTRUCTION SCHEDULE TO TOWNSHIP AND ENGINEER. CONTRACTOR SHALL PHASE CONSTRUCTION ACCORDINGLY.



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NO.	DATE	ISSUE	BY	DESCRIPTION
02	01/26/2022		SPM	MUNICIPAL RESUBMISSION
01	10/27/2021		SPM	DRAFT CONSTRUCTION DOCUMENT ISSUANCE

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 PROPOSED PHARMACY WITH  
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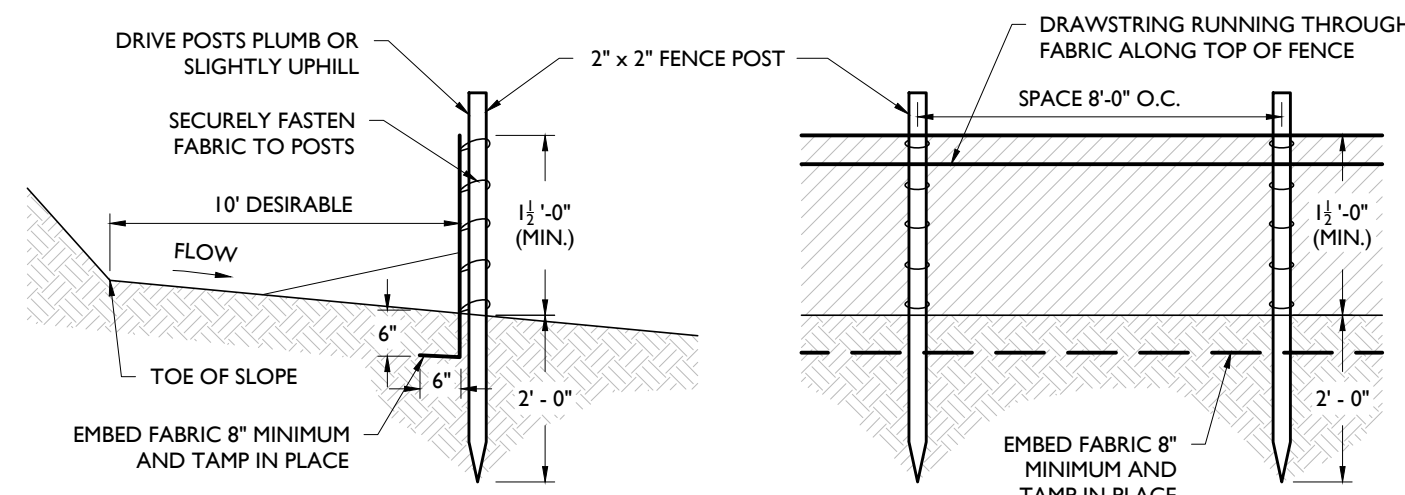
JOSHUA H. KLINE, P.E.  
 MASSACHUSETTS LICENSE NO. 53936  
 LICENSED PROFESSIONAL ENGINEER

SCALE: 1" = 20' PROJECT ID: BOS-210033

TITLE:  
**SOIL EROSION & SEDIMENT CONTROL PLAN**

DRAWING:  
**C-8**



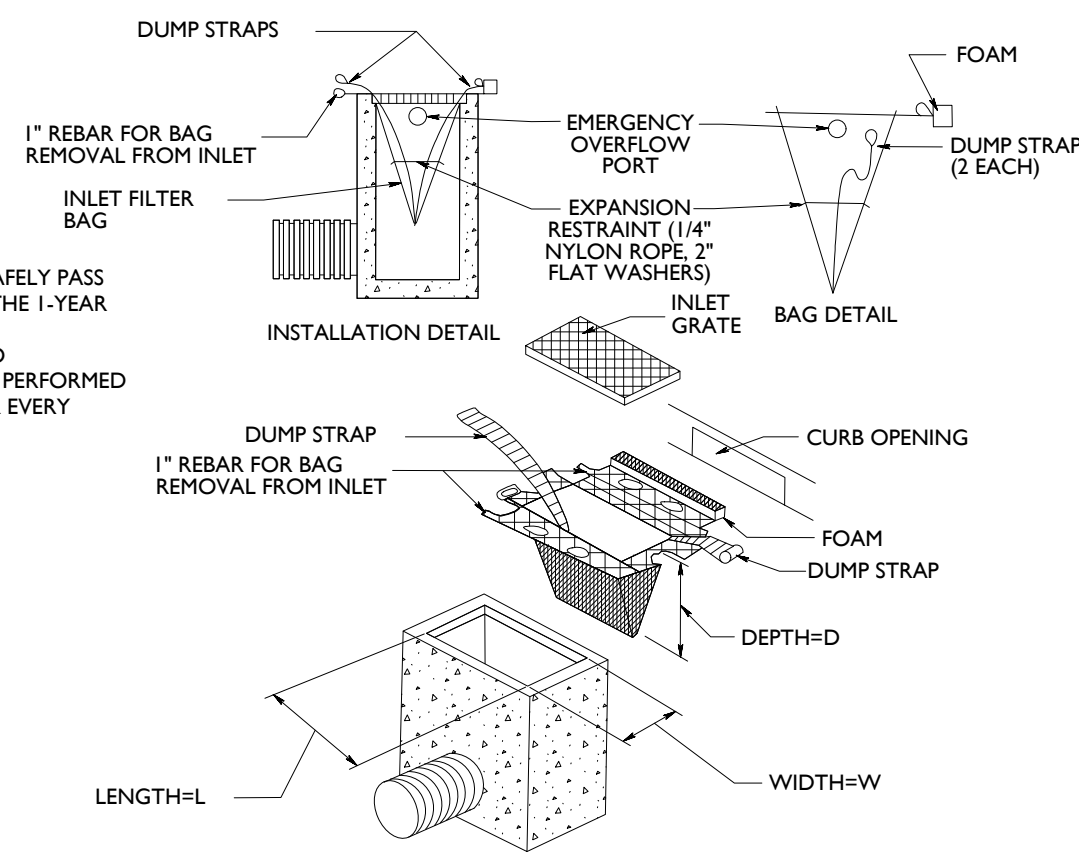


- NOTES:
1. SECURELY FASTEN GEOTEXTILE TO FENCE POST BY USE OF WIRE TIES, HOG RINGS, STAPLES OR POKETS. FOUR TO SIX FASTENERS PER POST.
  2. GEOTEXTILE FABRIC TO BE EMBEDDED 8" (MIN.) AND TAMP IN PLACE.
  3. SECURELY FASTEN ENDS OF INDIVIDUAL ROLLS OF GEOTEXTILE TO A POST BY WRAPPING EACH END OF THE GEOTEXTILE AROUND THE POST TWICE AND ATTACHING AS SPECIFIED IN NOTE 1 ABOVE. SPlicing OF INDIVIDUAL ROLLS SHALL NOT OCCUR AT LOW POINTS.
  4. SET SILT FENCE WITHIN PROJECT LIMITS. 10'-0" IS DESIRABLE.

**SILT FENCE DETAIL**

NOT TO SCALE

1

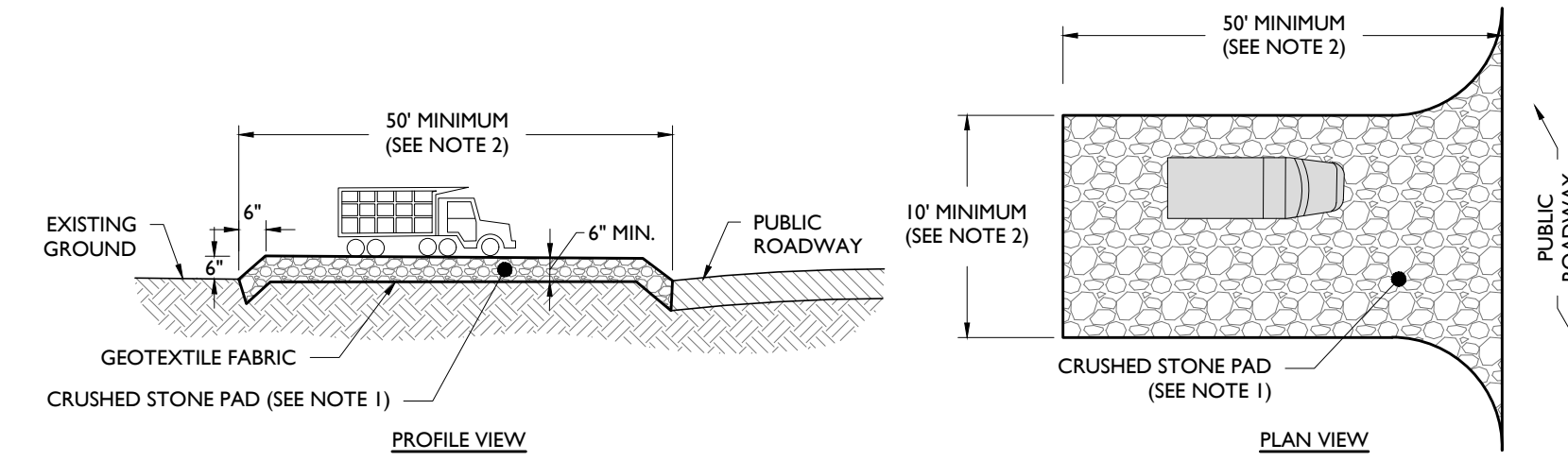


- NOTES:
1. THE FILTER BAG SHALL SAFELY PASS FLOWS GREATER THAN THE 1-YEAR 24-HOUR STORM EVENT.
  2. SEDIMENT REMOVAL AND MAINTENANCE SHALL BE PERFORMED FREQUENTLY AND AFTER EVERY STORM EVENT.

**INLET FILTER BAG DETAIL**

NOT TO SCALE

2

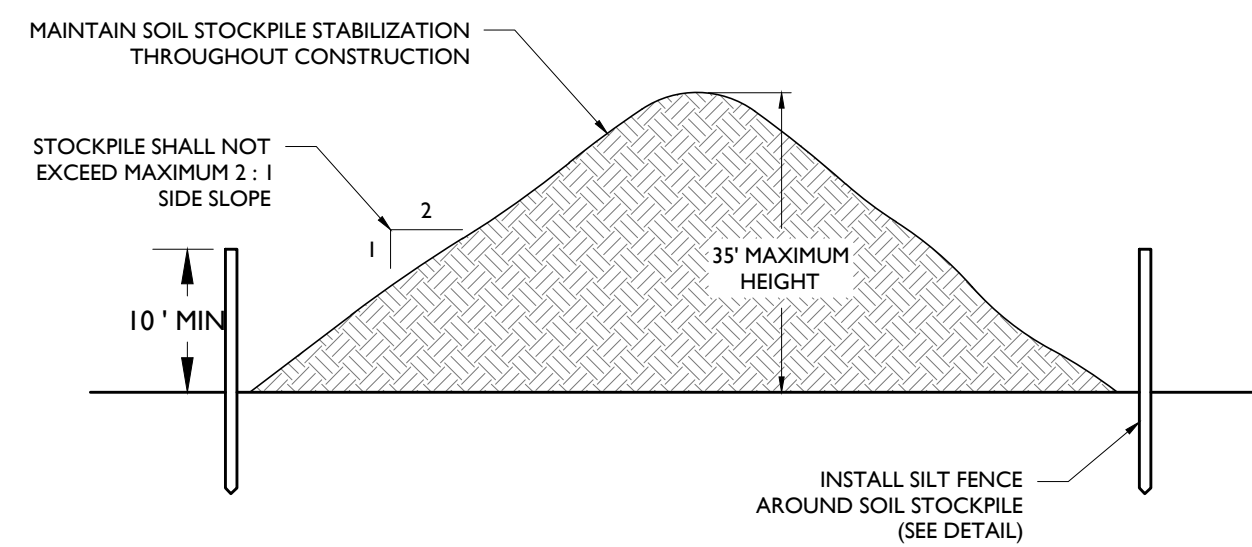


- NOTES:
1. STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 1 TO 3-INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT PLACED ON A STABLE FOUNDATION AS SPECIFIED IN THE PLAN.
  2. THE MINIMUM LENGTH OF THE GRAVEL PAD SHALL BE 50 FEET, EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH MAY BE USED. THE WIDTH SHALL BE 10' MINIMUM OR THE FULL WIDTH OF THE ACCESS POINT, WHICHEVER IS GREATER.
  3. GEOTEXTILE FILTER FABRIC SHALL BE PLACED BETWEEN THE STONE FILL AND THE EARTH SURFACE BELOW THE PAD TO REDUCE THE MIGRATION OF SOIL PARTICLES FROM THE UNDERLYING SOIL INTO THE STONE AND VICE VERSA. FILTER CLOTH IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENCE LOT.
  4. IF THE SLOPE TOWARD THE ROAD EXCEEDS 2%, CONSTRUCT A RIDGE, 6 TO 8 INCHES HIGH WITH 3:1 SIDE SLOPES, ACROSS THE FOUNDATION APPROXIMATELY 15 FEET FROM THE ENTRANCE TO DIVERT RUNOFF AWAY FROM THE PUBLIC ROAD.
  5. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHOULD BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
  6. WASHING: IF THE SITE CONDITIONS ARE SUCH THAT THE MAJORITY OF MUD IS NOT REMOVED FROM THE VEHICLE TIRES BY THE GRAVEL PAD, THEN THE TIRES SHOULD BE WASHED BEFORE THE VEHICLE ENTERS THE ROAD OR STREET. THE WASH AREA SHOULD BE A LEVEL AREA WITH 3-INCH WASHED STONE MINIMUM, OR A COMMERCIAL RACK. WASH WATER SHOULD BE DIRECTED INTO A SEDIMENT TRAP, A VEGETATED FILTER STRIP, OR OTHER APPROVED SEDIMENT TRAPPING DEVICE. SEDIMENT SHOULD BE PREVENTED FROM ENTERING ANY WATERCOURSES.
  7. A FILTER FABRIC FENCE SHOULD BE INSTALLED DOWN-GRADE FROM THE CONSTRUCTION ENTRANCE IN ORDER TO CONTAIN ANY SEDIMENT-LADEN RUNOFF FROM THE ENTRANCE.

**STABILIZED CONSTRUCTION ACCESS DETAIL**

NOT TO SCALE

3

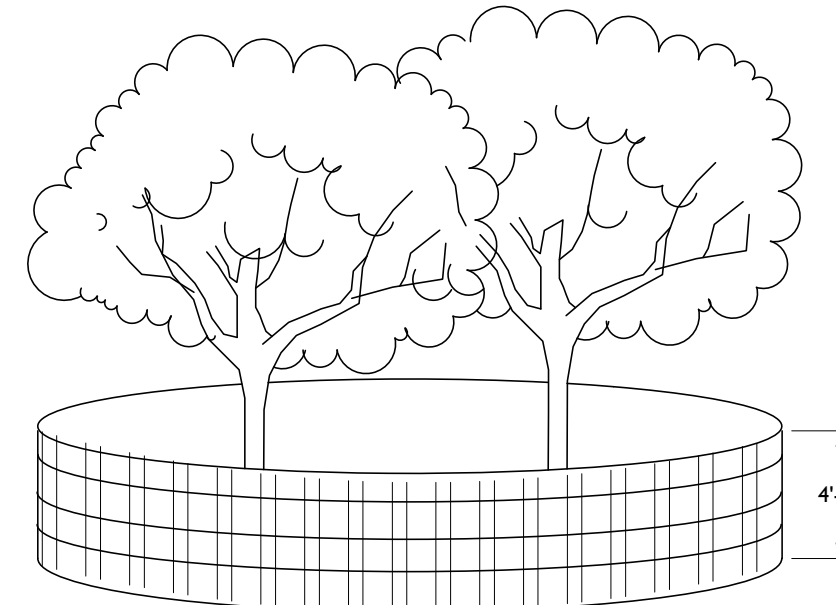


- NOTES:
1. LOCATE THE TOPSOIL STOCKPILE SO THAT IT DOES NOT INTERFERE WITH WORK ON THE SITE.
  2. SURROUND ALL TOPSOIL STOCKPILES WITH AN INTERCEPTOR DIKE WITH GRAVEL OUTLET AND SILT FENCE.
  3. EITHER SEED OR COVER STOCKPILES WITH CLEAR PLASTIC OR OTHER MULCHING MATERIALS WITHIN 7 DAYS OF THE FORMATION OF THE STOCKPILE.

**SOIL STOCKPILE DETAIL**

NOT TO SCALE

4



- NOTES:
1. SNOW FENCING IS TO BE 4'-0" HIGH AND SELF SUPPORTED.
  2. DO NOT STOCKPILE MATERIALS OR STORE EQUIPMENT WITHIN THE TREE PROTECTION FENCING.
  3. SNOW FENCE TO BE INSTALLED AT DRIP LINE OF EXISTING TREE OR TREE CLUSTER TO BE PROTECTED OR NO CLOSER THAN 6' FROM TREE TRUNK IF NECESSARY.
  4. IF THE PROJECT AREA ENCOMPASSES A PORTION OF THE DRIP LINE OF THE TREE, NO MORE THAN ONE THIRD OF THE OF THE TOTAL AREA OF WITHIN THE DRIP LINE SHOULD BE DISTURBED BY CONSTRUCTION OR REGADING AND A 3" THICK LAYER OF MULCH SHALL BE INSTALLED OVER THE AREA OF THE DRIP LINE WHICH IS NOT PROTECTED BY FENCING TO PROVIDE A CUSHION.

**TREE PROTECTION DETAIL**

NOT TO SCALE

5

U:\STONFIELD\CD\CD\SHARED\PROJECTS\2025\1802118031 COCCA DEVELOPMENT - 7N CENTRAL STREET - WINCHENDON, MASS\CD\1802118031-08-24-25\CDWG

NO.	DATE	BY	DESCRIPTION
02	01/26/2025	SPM	MUNICIPAL RESUBMISSION
01	10/29/2024	SPM	DRAFT CONSTRUCTION DOCUMENT ISSUANCE

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**SITE PLAN SET**

**FIDC I63 LLC**  
**PROPOSED PHARMACY WITH**  
**DRIVE-THRU**

BLOCK 5B3, LOT 50  
270 CENTRAL STREET (U.S. ROUTE 202)  
TOWN OF WINCHENDON  
WORCESTER COUNTY, MASSACHUSETTS

JOSHUA H. KLINE, P.E.  
MASSACHUSETTS LICENSE No. 53936  
LICENSED PROFESSIONAL ENGINEER

**STONEFIELD**  
engineering & design

SCALE: 1" = 20' PROJECT ID: BOS-210033

TITLE:  
**SOIL EROSION & SEDIMENT CONTROL PLAN DETAILS**

DRAWING:  
**C-9**



**APPENDIX G:**  
***INSPECTION CHECKLISTS***

**APPENDIX G-I:**  
***GENERAL INSPECTION***  
***CHECKLIST LOG***

## INSPECTION CHECKLIST LOG

1. The responsible party shall report issues to the local authority and mosquito commission as required by local ordinances and regulatory authorities.
2. The maintenance crew should fill out the checklist in the field manual when performing each inspection/maintenance task.
3. After the maintenance task is performed, the checklist should be filed in the Maintenance Plan and recorded in the log below.

<i>Cycle of Inspection</i>	<i>Stormwater Management Measure No.</i>	<i>Checklist No.</i>	<i>Date(s) of Inspection</i>
(1st Quarter)			
(2nd Quarter)			
(3rd Quarter)			
(4th Quarter)			
(Unscheduled Inspection; e.g., after 1" rain)			
(1st Quarter)			
(2nd Quarter)			
(3rd Quarter)			
(4th Quarter)			
(Unscheduled Inspection; e.g., after 1" rain)			
(1st Quarter)			
(2nd Quarter)			
(3rd Quarter)			
(4 <sup>th</sup> Quarter)			
(Unscheduled Inspection; e.g., after 1" rain)			

<b>Cycle of Inspection</b>	<b>Stormwater Management Measure No.</b>	<b>Checklist No.</b>	<b>Date(s) of Inspection</b>
(1st Quarter)			
(2nd Quarter)			
(3rd Quarter)			
(4th Quarter)			
(Unscheduled Inspection; e.g., after 1" rain)			
(1st Quarter)			
(2nd Quarter)			
(3rd Quarter)			
(4 <sup>th</sup> Quarter)			
(Unscheduled Inspection; e.g., after 1" rain)			

**APPENDIX G-2:  
GENERAL PREVENTATIVE  
MAINTENANCE LOG**

**PREVENTATIVE MAINTENANCE LOG**

<b>MAINTENANCE SCHEDULE</b>	<b>STORMWATER MANAGEMENT MEASURE NO.</b>	<b>PREVENTATIVE MAINTENANCE RECORD NO.</b>	<b>DATE(S) OF MAINTENANCE</b>
(1st Quarter)			
(2nd Quarter)			
(3rd Quarter)			
(4th Quarter)			
(Unscheduled Maintenance work; e.g., after 1" rain)			
(1st Quarter)			
(2nd Quarter)			
(3rd Quarter)			
(4th Quarter)			
(Unscheduled Inspection; e.g., after 1" rain)			

**APPENDIX G-3:  
GENERAL CORRECTIVE  
MAINTENANCE LOG**

**CORRECTIVE MAINTENANCE LOG**

<b>Maintenance Schedule</b>	<b>Stormwater Management Measure No.</b>	<b>Corrective Maintenance Record No.</b>	<b>Date(s) of Maintenance</b>
(1st Quarter)			
(2nd Quarter)			
(3rd Quarter)			
(4th Quarter)			
(Unscheduled Maintenance work; e.g., after 1" rain)			
(1st Quarter)			
(2nd Quarter)			
(3rd Quarter)			
(4th Quarter)			
(Unscheduled Inspection; e.g., after 1" rain)			



**APPENDIX G-4: ANNUAL  
EVALUATION RECORD**

## ANNUAL EVALUATION RECORD

The person responsible for maintenance shall evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed.

The responsible party should evaluate the effectiveness of the maintenance plan by comparing the maintenance plan with the actual performance of the maintenance. The items to evaluate may include, but not limited to,

- Whether the inspections have been performed as scheduled;
- Whether the preventive maintenance has been performed as scheduled;
- Whether the frequency of preventative maintenance needs to increase or decrease;
- Whether the planned resources were enough to perform the maintenance;
- Whether the repairs were completed on time;
- Whether the actual cost was consistent with the estimated cost;
- Whether the inspection, maintenance, and repair records have been kept.

If actual performance of those items has been deviated from the maintenance plan, the responsible party should find the causes and implement solutions in a revised maintenance plan.

<b>Evaluator(s)</b>	<b>Date of Evaluation</b>	<b>Decision</b>
		<input type="checkbox"/> Maintain current version OR  <input type="checkbox"/> Revise current version Revision date _____ (also update the last revision date on the cover page)  <input type="checkbox"/> Requires a new deed recording (also update the last recording information on the cover page)
		<input type="checkbox"/> Maintain current version OR  <input type="checkbox"/> Revise current version Revision date _____ (also update the last revision date on the cover page)  <input type="checkbox"/> Requires a new deed recording (also update the last recording information on the cover page)
		<input type="checkbox"/> Maintain current version OR  <input type="checkbox"/> Revise current version Revision date _____ (also update the last revision date on the cover page)  <input type="checkbox"/> Requires a new deed recording (also update the last recording information on the cover page)

