 April 12, 2024

Revised: May 8, 2024

STORMWATER MANAGEMENT REPORT

100 New Bond Street
Worcester, MA 01606

Prepared for:

Saint Gobain
1 New Bond Street,
Worcester, MA 01606

Prepared by:

William J. Scully
MA LICENSE NO. 33298

Kimley»»Horn

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1. PROJECT INFORMATION

1.1 – Introduction and Project Background

The project site is located at 100 New Bond Street, Worcester, MA. The applicant proposes a redevelopment in about 2.98 acres of the 28.43 acres existing parcel. The location of proposed redevelopment is within the parking lot to the east of Stores Street. Elevations on the portion of the site to be redeveloped range from 545' at north to 534' at the south end of the parking area. This project proposes an office building of 43,000 square foot building, with associated asphalt paving for parking lot, and landscape.

1.2 – Soils

Based on the Web Soil Survey provided by Natural Resources Conservation Service (NRCS), the site contains soil components of:

- Urban Land – (Map Unit 602), Hydrologic Soil Group Not Applicable

2. STORMWATER MANAGEMENT ANALYSIS

2.1 – Existing Onsite Drainage

The existing site runoff sheet flows to individual catch basins to the south of the proposed development, which discharge into the existing 84" concrete culvert in the site. For the purpose of this project, the study of drainage is limited to the limit of disturbance of the area being redeveloped.

This report analyzes approximately 2.98 acres of the limit of disturbance area within the entire 28.43 acre site. See **Exhibit 1** for a detailed drainage area map of the property and **Appendix B** for HydroCAD analysis for existing conditions.

The Soil Conservation Service Runoff Curve Number Method (SCS Method) was implemented to assess the existing peak flow from the site. In the pre-development state, it was calculated that the area of disturbance was composed of 2.67 acres of impervious surface and 0.31 acres of pervious surface. This scenario was modeled to provide a baseline for comparison to the post-development scenario.

2.2 – Proposed Onsite Drainage

The proposed redevelopment will not increase the amount of impervious on site. The impervious area is being reduced to 2.15 acres and the pervious area with landscape is increased to 0.83 acres. The groundwater table for the site is about 2.8 to 3.5 ft below the existing ground, which creates a constraint for providing a Best Management Practice (BMP) that requires separation from the groundwater table. As a result, multiple deep sumps catch basins are proposed in the site to capture the runoff. The existing site has a series of storm pipes connected through catch basins. The proposed site redevelopment is to tie into one of the existing catch basins to connect to the existing storm system. All proposed storm piping has the catch basin to manhole connection as per the City of Worcester requirements. The stormwater network

proposed within the site will capture some of the runoff from the site and will have the remaining runoff flow into the existing catch basin as it does in the existing condition.

2.3 – Stormwater Modeling

To evaluate the impact of the proposed improvements on the stormwater runoff from the site, a procedure based on the USDA Soil Conservation Service (SCS), TR-20 Method was chosen. The site area was divided into sub-watersheds using requirements set forth in the Massachusetts Stormwater Handbook. The SCS methods developed in TR-20 model the drainage shed's response to rainfall in the form of an excess rainfall (runoff) hydrograph. A drainage shed's response is dependent upon the individual parameters which affect runoff. These parameters include:

1. Storm rainfall amount
2. Watershed size and shape
3. Hydrologic soils group
4. Land use and treatment classification
5. Time of concentration.

The time of concentrations (Tc) for the analyzed area were based on SCS TR-20 Methodology. A minimum Tc of 5 minutes for impervious and directly connected pervious, were used in the calculations. For the Site Stormwater Management analysis, a HydroCAD v10.20-3c computer program developed by HydroCAD software solutions LLC was used. The program is modeled after the SCS, USDA TR-20 Program. The design storm depth is determined from rainfall maps, based on the return period being modeled. Combined with the rainfall distribution, this always specifies the cumulative rainfall depth during the storm.

3. STORMWATER CHECKLIST

3.1 – Standard #1: No New Untreated Discharges

No new stormwater conveyances may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

The proposed improvements will not increase the impervious area of the site. No new untreated discharges are proposed with the project.

3.2 – Standard #2: Peak Rate Attenuation

Stormwater management systems must be designed so that the post-development peak discharge rates do not exceed pre-development peak discharge rates.

There is a reduction in the impervious coverage on the site. Subsequently, there will be no increase in the peak runoff flow runoff rate post-development. The post development rate of runoff from the site will be less than the predevelopment rate. HydroCAD calculations are provided in Appendices B and C and are summarized in the table below.

Table 1: Rate of Discharge

Study Point (Limit of Disturbance)	Peak Rate of Runoff for 2-year Storm Event (3.82")	Peak Rate of Runoff for 10-year Storm Event (5.94")	Peak Rate of Runoff for 25-year Storm Event (7.64")	Peak Rate of Runoff for 100-year Storm Event (10.5")
Pre-Development	15.95 cfs	25.23 cfs	32.63 cfs	45.03 cfs
Post-Development	15.11 cfs	24.56 cfs	32.06 cfs	44.57 cfs

3.3 – Standard #3: Recharge

Loss of annual recharge to groundwater should 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 the 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. The proposed stormwater management improvements include an underground infiltration/detention system to provide compliance with the recharge requirements

The calculated recharge volume is based upon the amount of proposed impervious area and the hydrologic soil classification of the on-site soils, as determined by the published NRCS Soil Survey. There is reduction in impervious coverage on the site. Subsequently, there will be no change to the existing recharge volume. In addition, a review of the NRCS Soil Survey indicates the on-site soils have low permeability throughout the project site, and do not provide substantial recharge of rainfall.

3.4 – Standard #4: Water Quality

Stormwater management systems shall be designed to remove 90% 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.*
- c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.*

This project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a redevelopment project. Deep Sump and Hooded Catch Basin and Street Sweeping – 10% is proposed for the project. The high water table on the site does not allow for any other BMPs on the site.

3.5 – Standard #5: Land Uses with Higher Potential Pollutant Loads (LUHPPL’s)

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 stormwater BMPs determined by the Department to be suitable for such use 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.

The proposed redevelopment and use designation will not generate the significant number of vehicle trips to qualify as a Land Use with Higher Potential Pollutant Loads (LUHPPLs).

3.6 – Standard #6: Critical Areas

Stormwater discharges to a Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or any other critical area require the use of the specific source control and pollution prevention measures and the specific stormwater best management practices determined by the Department to be suitable for managing discharges to such area, 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 or Special Resource Waters shall be set back from the receiving water and receive the highest and best practical method of treatment. A “stormwater discharge,” as defined in 314 CMR 3.04(2)(a)1. 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 the public water supply.

The proposed project area is not known to contain or discharge to any critical areas.

3.7 – Standard #7: Redevelopments and Other Projects Subject to the Standards Only to the Maximum Extent Practicable

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 stormwater best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 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.

This project is considered a redevelopment since this project is limited to reconstruction within an existing parking area. No increase in impervious area will be created due to this project. This project seeks to adhere to all applicable standards to the maximum extent practicable. Standards 1, 8, 9, and 10 are fully met.

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

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.

A detailed Soil Erosion and Sediment Control Plan, with associated Details, has been provided with the civil set.

3.9 – Standard #9: Operation and Maintenance Plan

A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.

An Operation and Maintenance Plan (O&M Plan) for the site facilities is included in **Appendix E** of this report. The property owner shall maintain the site to sustain functionality and aesthetic appeal.

3.10 – Standard #10: No Illicit Discharges

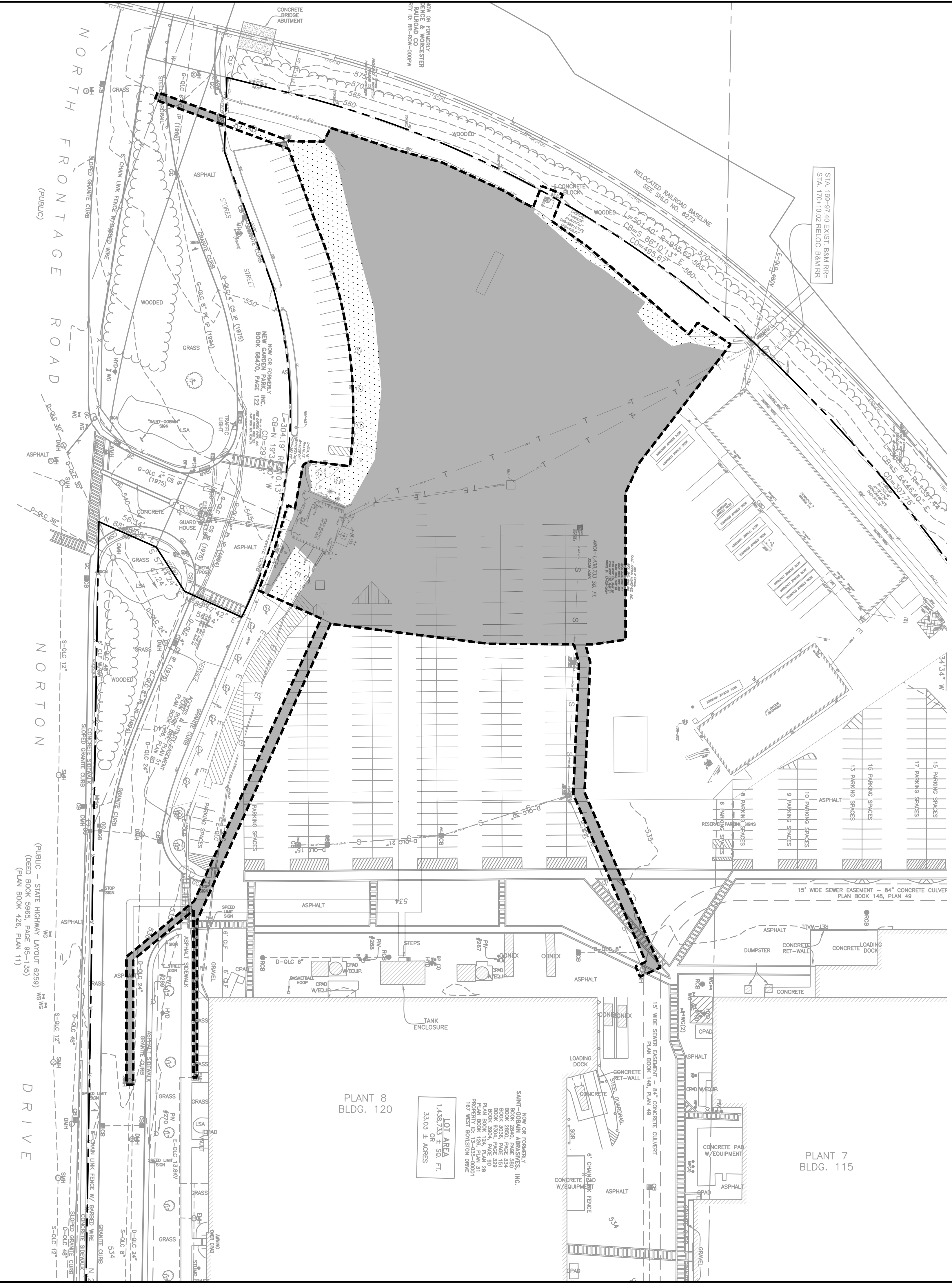
All illicit discharges to the stormwater management system are prohibited.

An Illicit Discharge Statement is attached and can be found in **Appendix F**.

5. EXHIBITS

EXHIBIT 1 – EXISTING CONDITION DRAINAGE MAP

Plotted By: Armstrong, Caroline Sheet Set: S:\Cobain Office Layout\C-504 PRE DAM May 09 2024 11:28:48am K:\BOS Civil\BOS Projects\112966000 Worcester St\Cobain Office\CAD\Plans\Sheets\PRE DEVELOPMENT DRAINAGE.dwg
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LEGEND

IMPERVIOUS

PERVIOUS

PRE-DEVELOPMENT LANDCOVER SUMMARY

	OVERALL AREA (AC)	PERCENTAGE
TOTAL AREA	2.98	
PERVIOUS AREA	0.31	10.4%
IMPERVIOUS AREA	2.67	89.6%

No.	REVISIONS	DATE	BY
7			
6			
5			
4			
3			
2			
1			

Kimley»Horn

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 WWW.KIMLEY-HORN.COM

LICENSED PROFESSIONAL

DATE: 05/08/2024

KHA PROJECT	112966000
DATE	05/08/2024
SCALE	AS SHOWN
DESIGNED BY: SP	
DRAWN BY: EIW	
CHECKED BY: DDL	

PRE DEVELOPMENT DRAINAGE AREA MAP

PROJECT EUROPA
 PREPARED FOR
PURE DEVELOPMENT

CITY OF WORCESTER MASSACHUSETTS

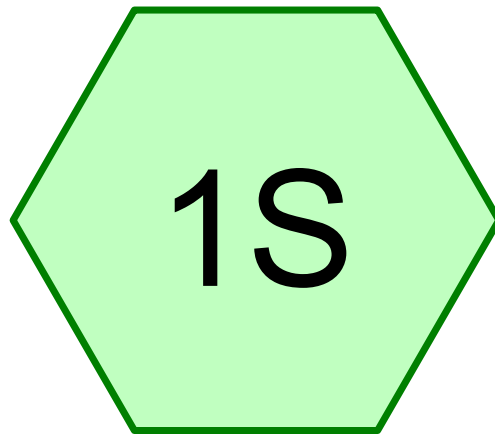
SHEET NUMBER
C-504

**EXHIBIT 2 – PROPOSED CONDITION DRAINAGE
MAP**

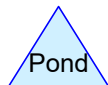
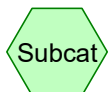
6. APPENDICES

APPENDIX A – SOIL TYPE AND GEOTECH REPORT

APPENDIX B – HYDROCAD ANALYSIS-EXISTING



Pre development



Routing Diagram for St. Gobain

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St. Gobain

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Yrs	Type II 24-hr		Default	24.00	1	3.82	2
2	10-Yrs	Type II 24-hr		Default	24.00	1	5.94	2
3	25-Yrs	Type II 24-hr		Default	24.00	1	7.64	2
4	100-Yrs	Type II 24-hr		Default	24.00	1	10.50	2

St. Gobain

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.670	98	Building and pavement (1S)
0.310	80	Grass/Landscape area (1S)
2.980	96	TOTAL AREA

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
2.980	Other	1S
2.980		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	2.670	2.670	Building and pavement	1S
0.000	0.000	0.000	0.000	0.310	0.310	Grass/Landscape area	1S
0.000	0.000	0.000	0.000	2.980	2.980	TOTAL AREA	

St. Gobain

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Type II 24-hr 2-Yrs Rainfall=3.82"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre development

Runoff Area=2.980 ac 89.60% Impervious Runoff Depth>3.14"
Tc=5.0 min CN=96 Runoff=15.95 cfs 0.779 af

Total Runoff Area = 2.980 ac Runoff Volume = 0.779 af Average Runoff Depth = 3.14"
10.40% Pervious = 0.310 ac 89.60% Impervious = 2.670 ac

Summary for Subcatchment 1S: Pre development

[49] Hint: Tc<2dt may require smaller dt

Runoff = 15.95 cfs @ 11.95 hrs, Volume= 0.779 af, Depth> 3.14"
 Routed to nonexistent node 2R

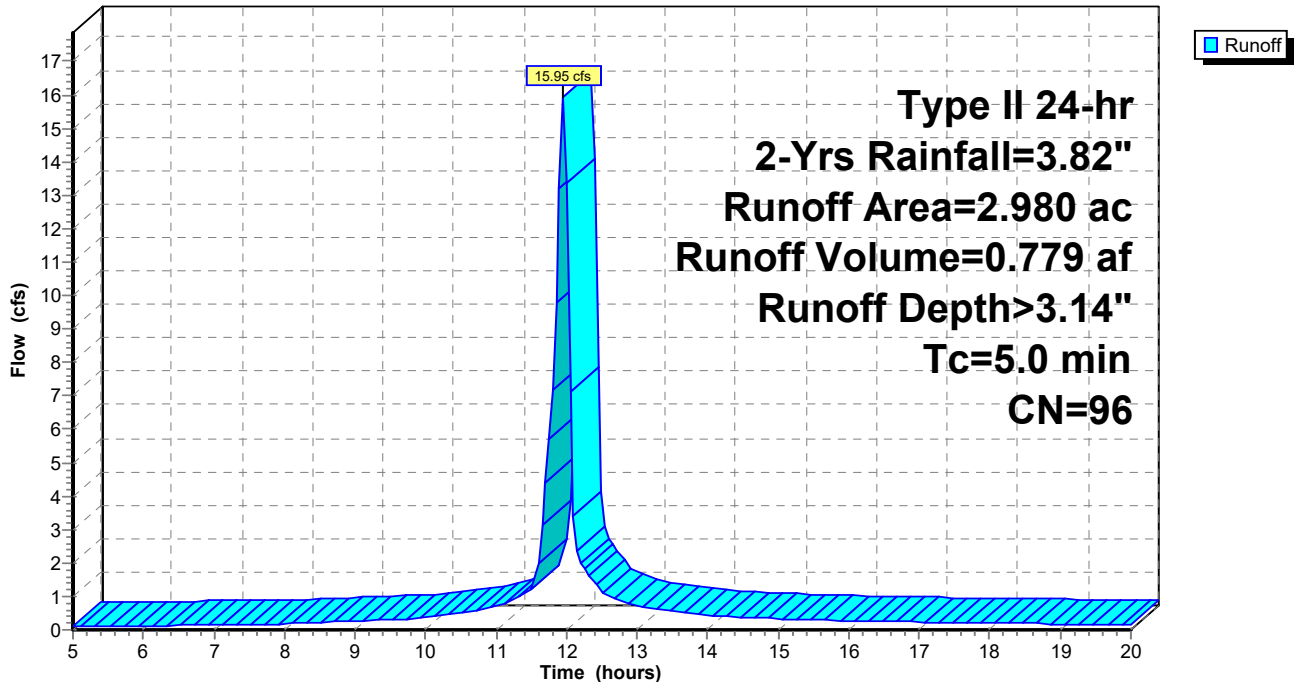
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2-Yrs Rainfall=3.82"

Area (ac)	CN	Description
* 2.670	98	Building and pavement
* 0.310	80	Grass/Landscape area
2.980	96	Weighted Average
0.310		10.40% Pervious Area
2.670		89.60% Impervious Area

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

Subcatchment 1S: Pre development

Hydrograph



St. Gobain

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Type II 24-hr 10-Yrs Rainfall=5.94"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre development

Runoff Area=2.980 ac 89.60% Impervious Runoff Depth>5.07"
Tc=5.0 min CN=96 Runoff=25.23 cfs 1.258 af

Total Runoff Area = 2.980 ac Runoff Volume = 1.258 af Average Runoff Depth = 5.07"
10.40% Pervious = 0.310 ac 89.60% Impervious = 2.670 ac

Summary for Subcatchment 1S: Pre development

[49] Hint: Tc<2dt may require smaller dt

Runoff = 25.23 cfs @ 11.95 hrs, Volume= 1.258 af, Depth> 5.07"
 Routed to nonexistent node 2R

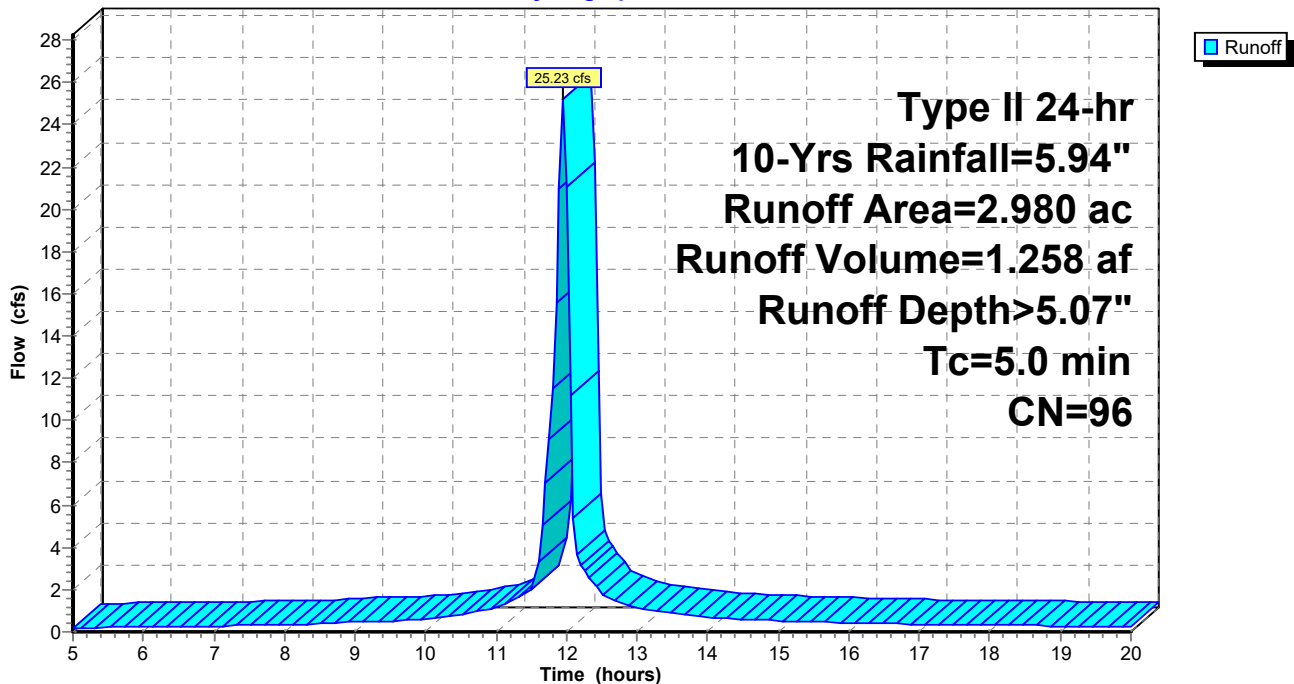
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-Yrs Rainfall=5.94"

Area (ac)	CN	Description
* 2.670	98	Building and pavement
* 0.310	80	Grass/Landscape area
2.980	96	Weighted Average
0.310		10.40% Pervious Area
2.670		89.60% Impervious Area

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

Subcatchment 1S: Pre development

Hydrograph



St. Gobain

Type II 24-hr 25-Yrs Rainfall=7.64"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre development

Runoff Area=2.980 ac 89.60% Impervious Runoff Depth>6.61"
Tc=5.0 min CN=96 Runoff=32.63 cfs 1.640 af

Total Runoff Area = 2.980 ac Runoff Volume = 1.640 af Average Runoff Depth = 6.61"
10.40% Pervious = 0.310 ac 89.60% Impervious = 2.670 ac

Summary for Subcatchment 1S: Pre development

[49] Hint: Tc<2dt may require smaller dt

Runoff = 32.63 cfs @ 11.95 hrs, Volume= 1.640 af, Depth> 6.61"
 Routed to nonexistent node 2R

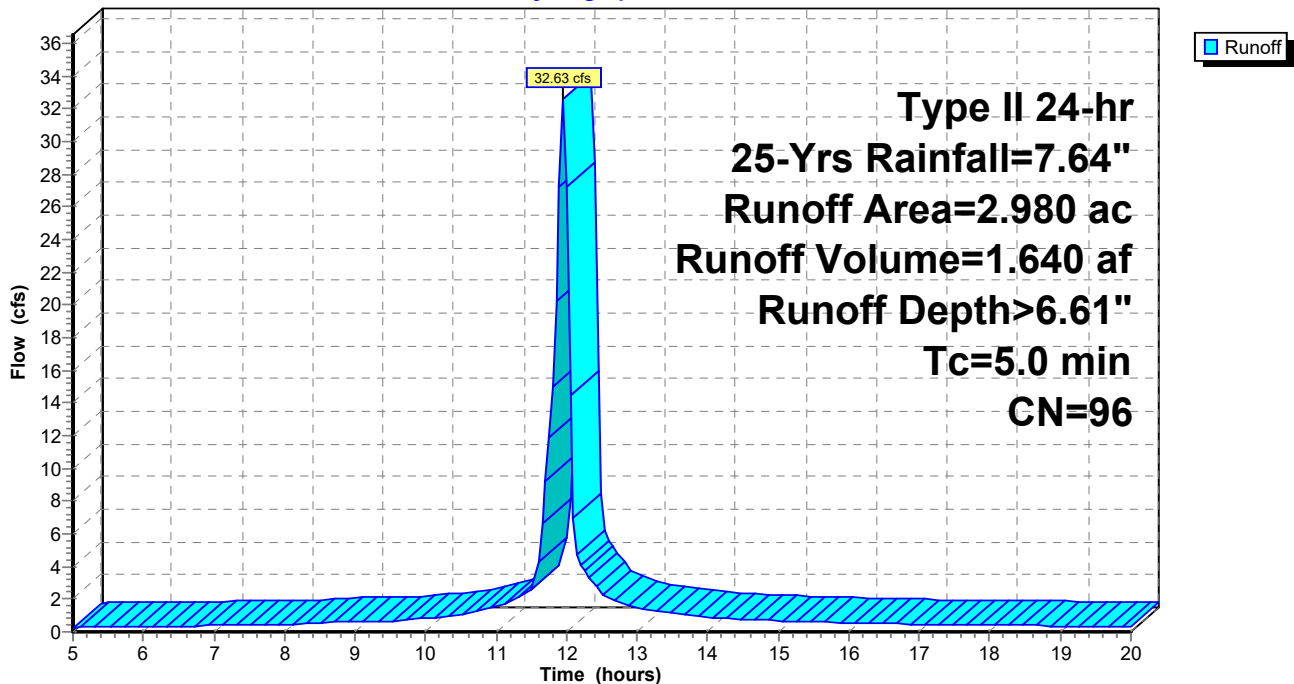
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-Yrs Rainfall=7.64"

Area (ac)	CN	Description
* 2.670	98	Building and pavement
* 0.310	80	Grass/Landscape area
2.980	96	Weighted Average
0.310		10.40% Pervious Area
2.670		89.60% Impervious Area

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

Subcatchment 1S: Pre development

Hydrograph



St. Gobain

Type II 24-hr 100-Yrs Rainfall=10.50"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre development

Runoff Area=2.980 ac 89.60% Impervious Runoff Depth>9.18"
Tc=5.0 min CN=96 Runoff=45.03 cfs 2.281 af

Total Runoff Area = 2.980 ac Runoff Volume = 2.281 af Average Runoff Depth = 9.18"
10.40% Pervious = 0.310 ac 89.60% Impervious = 2.670 ac

Summary for Subcatchment 1S: Pre development

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 45.03 cfs @ 11.95 hrs, Volume= 2.281 af, Depth > 9.18"
 Routed to nonexistent node 2R

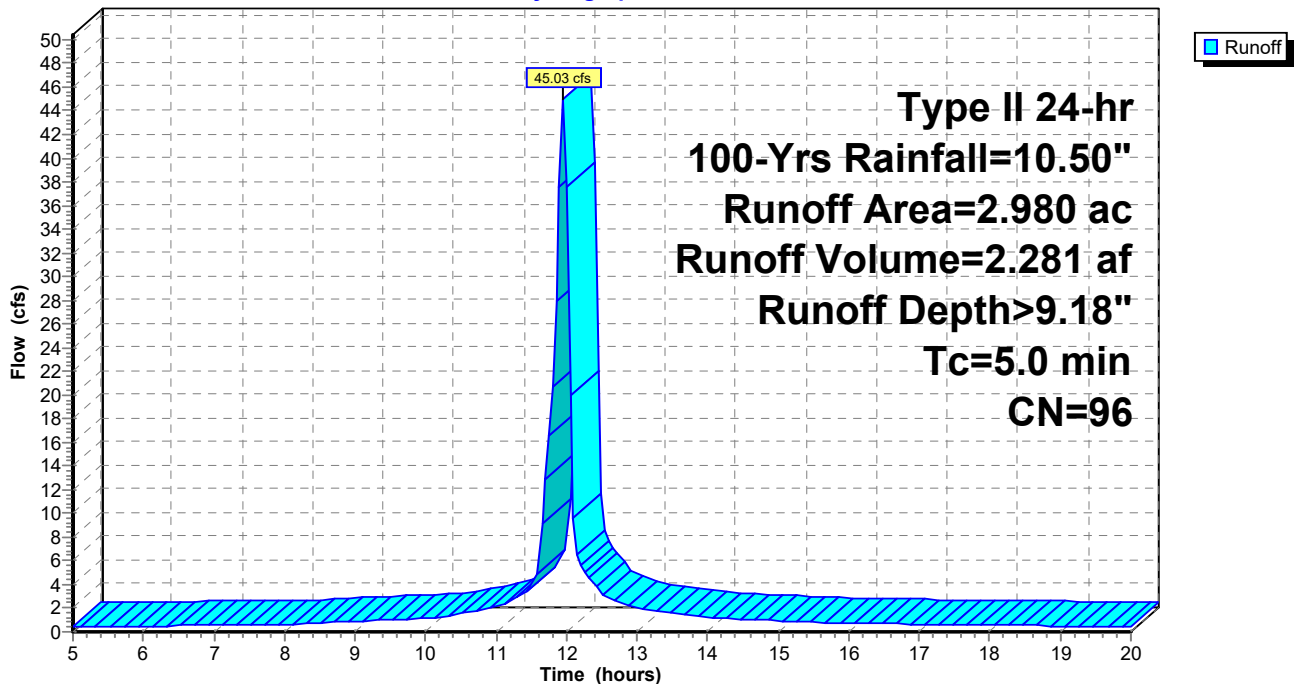
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-Yrs Rainfall=10.50"

Area (ac)	CN	Description
* 2.670	98	Building and pavement
* 0.310	80	Grass/Landscape area
2.980	96	Weighted Average
0.310		10.40% Pervious Area
2.670		89.60% Impervious Area

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

Subcatchment 1S: Pre development

Hydrograph



Events for Subcatchment 1S: Pre development

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-Yrs	3.82	15.95	0.779	3.14
10-Yrs	5.94	25.23	1.258	5.07
25-Yrs	7.64	32.63	1.640	6.61
100-Yrs	10.50	45.03	2.281	9.18

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10-Yrs Event

- 8 Node Listing
- 9 Subcat 1S: Pre development

25-Yrs Event

- 10 Node Listing
- 11 Subcat 1S: Pre development

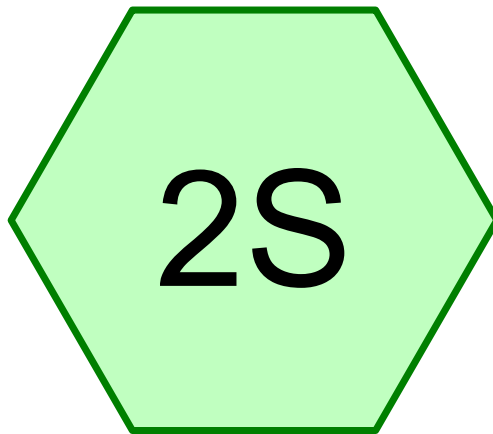
100-Yrs Event

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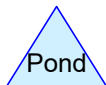
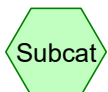
Multi-Event Tables

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APPENDIX C – HYDROCAD ANALYSIS-PROPOSED



Post Development



St. Gobain

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Yrs	Type II 24-hr		Default	24.00	1	3.82	2
2	10-Yrs	Type II 24-hr		Default	24.00	1	5.94	2
3	25-Yrs	Type II 24-hr		Default	24.00	1	7.64	2
4	100-Yrs	Type II 24-hr		Default	24.00	1	10.50	2

St. Gobain

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.150	98	Building and pavement (2S)
0.830	80	grass/landscape area (2S)
2.980	93	TOTAL AREA

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
2.980	Other	2S
2.980		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	2.150	2.150	Building and pavement	2S
0.000	0.000	0.000	0.000	0.830	0.830	grass/landscape area	2S
0.000	0.000	0.000	0.000	2.980	2.980	TOTAL AREA	

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Type II 24-hr 2-Yrs Rainfall=3.82"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment2S: Post Development

Runoff Area=2.980 ac 72.15% Impervious Runoff Depth>2.86"
Tc=5.0 min CN=93 Runoff=15.11 cfs 0.709 af

Total Runoff Area = 2.980 ac Runoff Volume = 0.709 af Average Runoff Depth = 2.86"
27.85% Pervious = 0.830 ac 72.15% Impervious = 2.150 ac

Summary for Subcatchment 2S: Post Development

[49] Hint: Tc<2dt may require smaller dt

Runoff = 15.11 cfs @ 11.95 hrs, Volume= 0.709 af, Depth> 2.86"

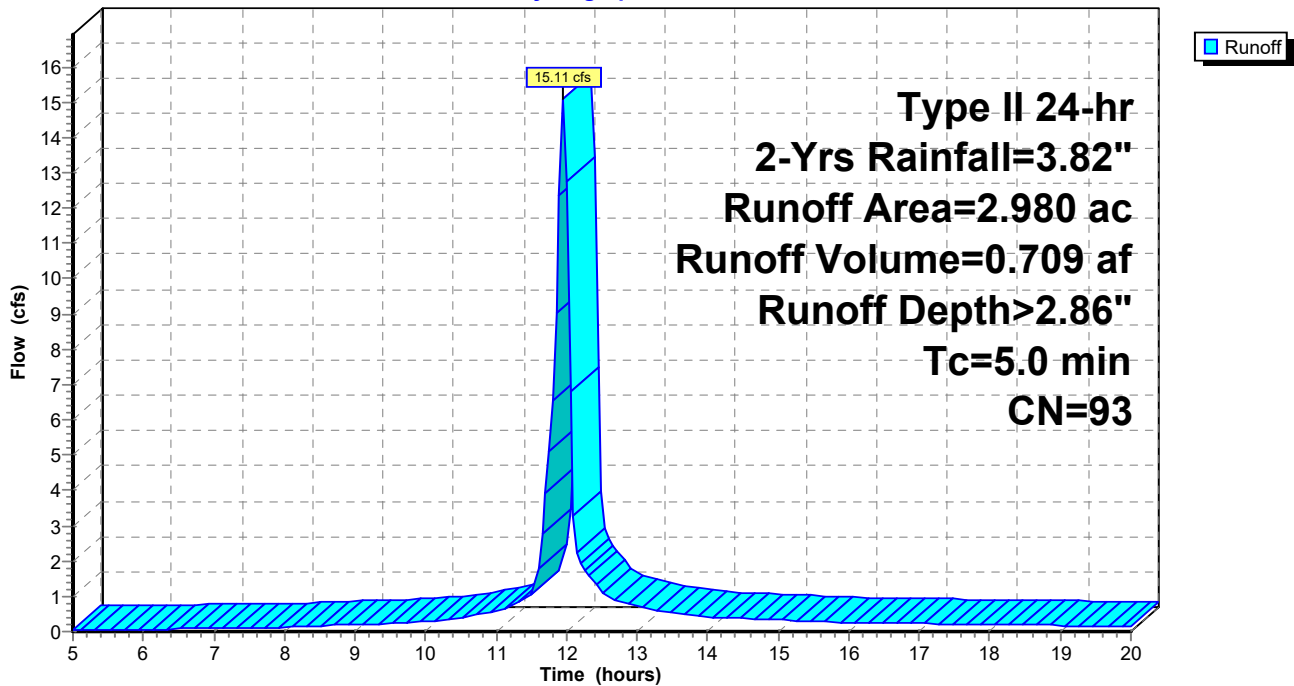
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2-Yrs Rainfall=3.82"

Area (ac)	CN	Description
* 2.150	98	Building and pavement
* 0.830	80	grass/landscape area
2.980	93	Weighted Average
0.830		27.85% Pervious Area
2.150		72.15% Impervious Area

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

Subcatchment 2S: Post Development

Hydrograph



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Type II 24-hr 10-Yrs Rainfall=5.94"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment2S: Post Development

Runoff Area=2.980 ac 72.15% Impervious Runoff Depth>4.79"
Tc=5.0 min CN=93 Runoff=24.56 cfs 1.190 af

Total Runoff Area = 2.980 ac Runoff Volume = 1.190 af Average Runoff Depth = 4.79"
27.85% Pervious = 0.830 ac 72.15% Impervious = 2.150 ac

Summary for Subcatchment 2S: Post Development

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 24.56 cfs @ 11.95 hrs, Volume= 1.190 af, Depth > 4.79"

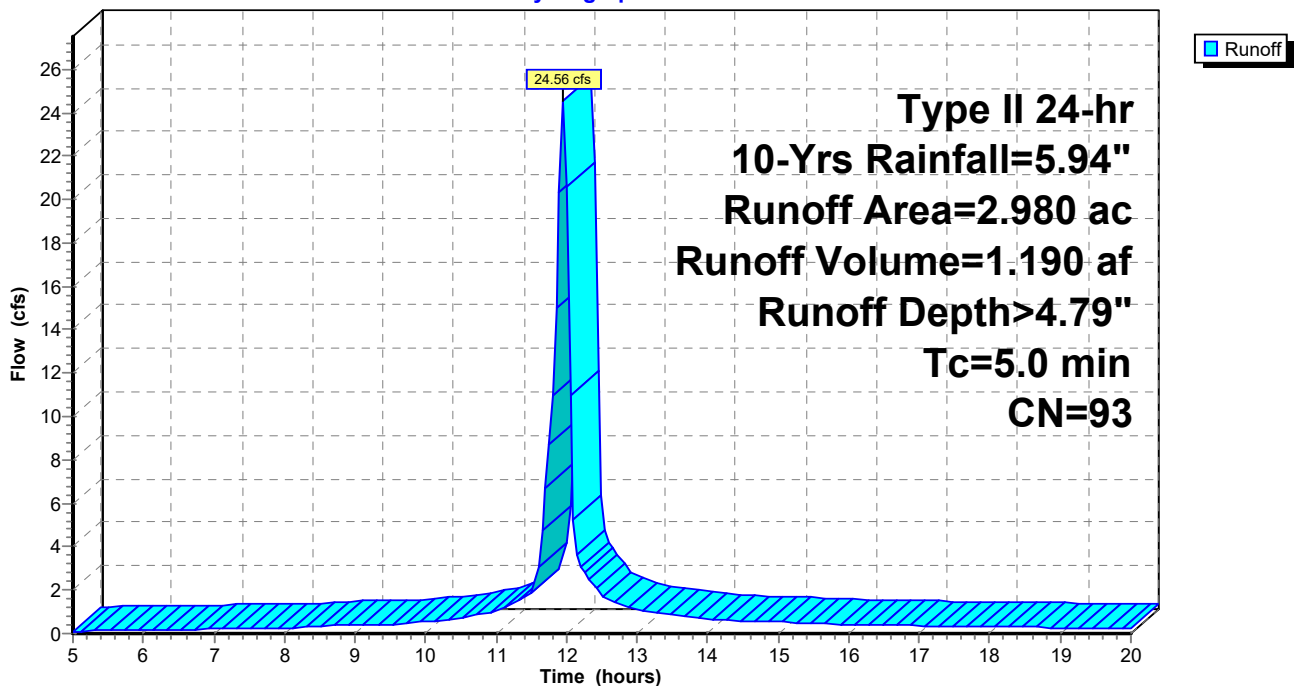
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-Yrs Rainfall=5.94"

Area (ac)	CN	Description
* 2.150	98	Building and pavement
* 0.830	80	grass/landscape area
2.980	93	Weighted Average
0.830		27.85% Pervious Area
2.150		72.15% Impervious Area

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

Subcatchment 2S: Post Development

Hydrograph



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Type II 24-hr 25-Yrs Rainfall=7.64"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment2S: Post Development

Runoff Area=2.980 ac 72.15% Impervious Runoff Depth>6.34"
Tc=5.0 min CN=93 Runoff=32.06 cfs 1.575 af

Total Runoff Area = 2.980 ac Runoff Volume = 1.575 af Average Runoff Depth = 6.34"
27.85% Pervious = 0.830 ac 72.15% Impervious = 2.150 ac

Summary for Subcatchment 2S: Post Development

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 32.06 cfs @ 11.95 hrs, Volume= 1.575 af, Depth> 6.34"

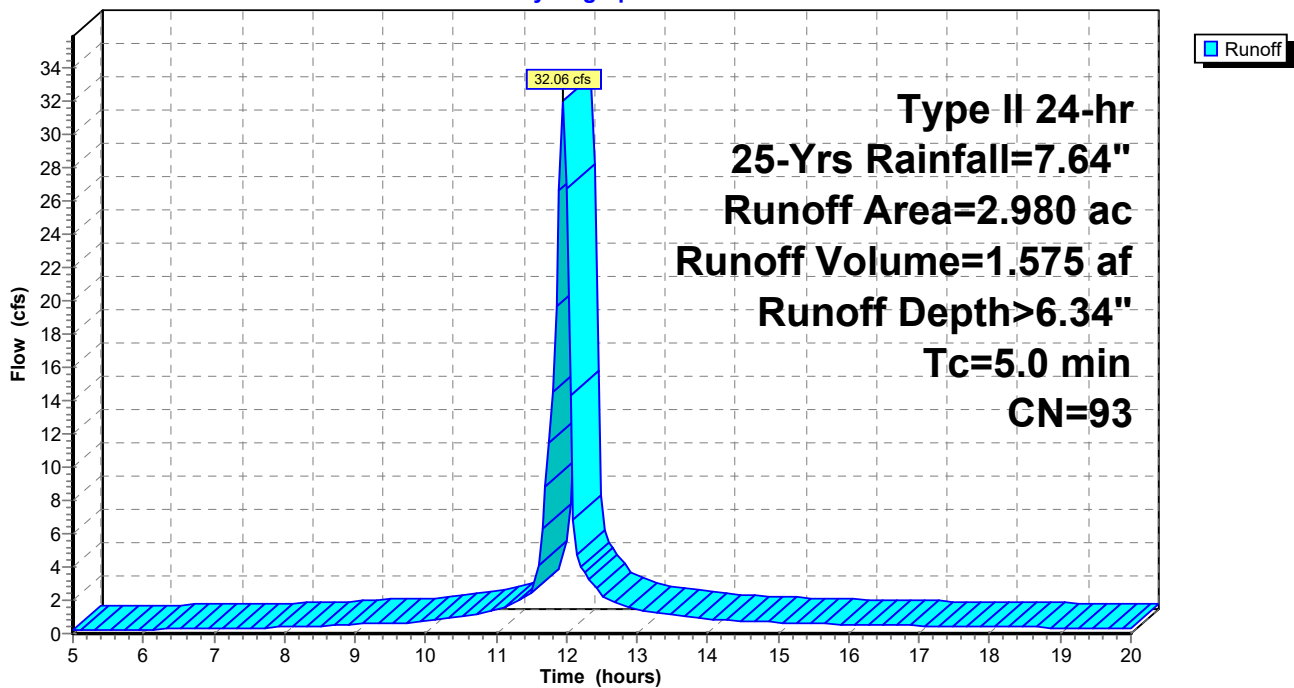
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, $dt= 0.05$ hrs
 Type II 24-hr 25-Yrs Rainfall=7.64"

	Area (ac)	CN	Description
*	2.150	98	Building and pavement
*	0.830	80	grass/landscape area
	2.980	93	Weighted Average
	0.830		27.85% Pervious Area
	2.150		72.15% Impervious Area

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

Subcatchment 2S: Post Development

Hydrograph



St. Gobain

Type II 24-hr 100-Yrs Rainfall=10.50"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment2S: Post Development

Runoff Area=2.980 ac 72.15% Impervious Runoff Depth>8.94"
Tc=5.0 min CN=93 Runoff=44.57 cfs 2.221 af

Total Runoff Area = 2.980 ac Runoff Volume = 2.221 af Average Runoff Depth = 8.94"
27.85% Pervious = 0.830 ac 72.15% Impervious = 2.150 ac

Summary for Subcatchment 2S: Post Development

[49] Hint: Tc<2dt may require smaller dt

Runoff = 44.57 cfs @ 11.95 hrs, Volume= 2.221 af, Depth> 8.94"

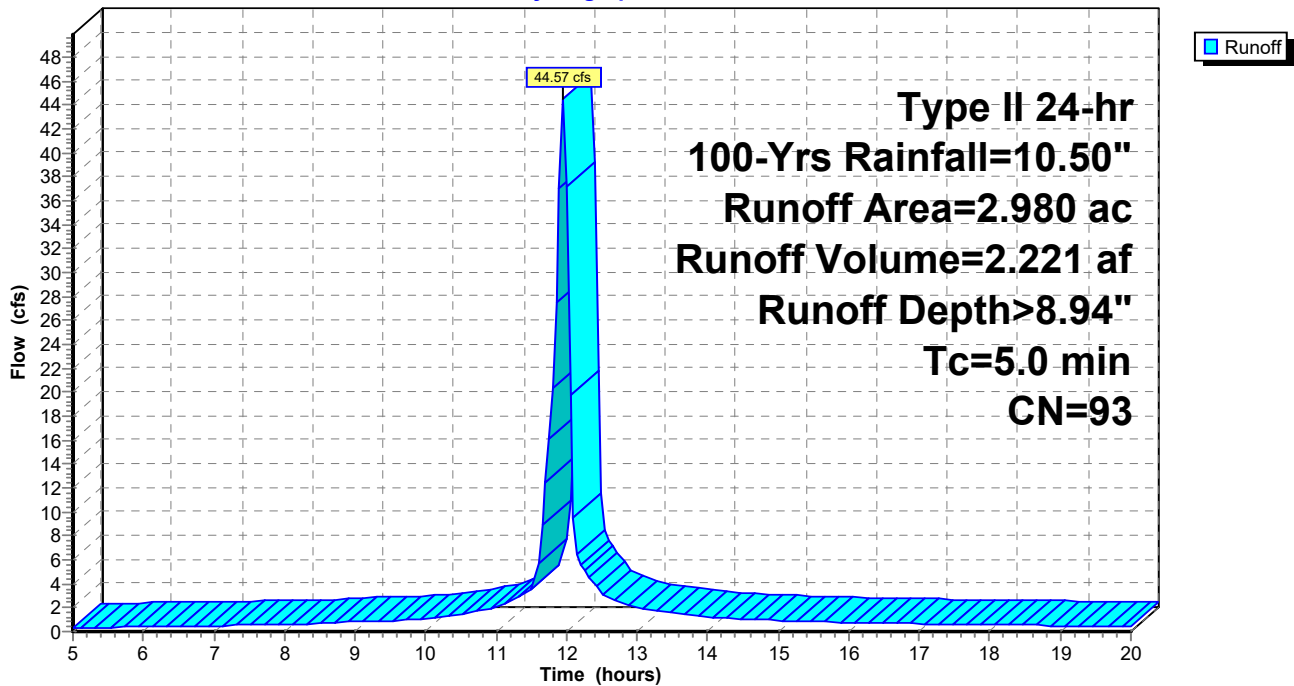
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-Yrs Rainfall=10.50"

	Area (ac)	CN	Description
*	2.150	98	Building and pavement
*	0.830	80	grass/landscape area
	2.980	93	Weighted Average
	0.830		27.85% Pervious Area
	2.150		72.15% Impervious Area

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

Subcatchment 2S: Post Development

Hydrograph



Events for Subcatchment 2S: Post Development

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-Yrs	3.82	15.11	0.709	2.86
10-Yrs	5.94	24.56	1.190	4.79
25-Yrs	7.64	32.06	1.575	6.34
100-Yrs	10.50	44.57	2.221	8.94

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APPENDIX D – CHECKLIST FOR STORMWATER



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.¹ 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 8²
- 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.

¹ 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.

² 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

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.

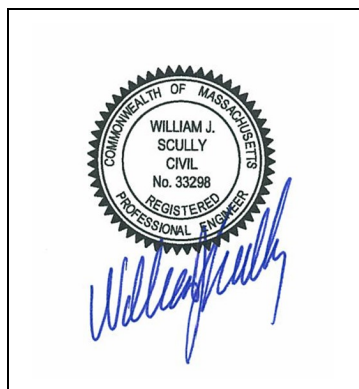
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the 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



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

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

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 Field¹
- 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.

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



Checklist for Stormwater Report

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

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

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 – OPERATION AND MAINTENANCE (O+M) PLAN

 April 2024

STORMWATER MANAGEMENT OPERATION AND MAINTENANCE MANUAL

100 NEW BOND STREET
WORCESTER, MASSACHUSETTS

Prepared for:

Saint Gobain Corporation
1 New Bond Street
Worcester, MA 01606

Prepared by:

William J, Scully
MA LICENSE NO. 33298

Kimley»»Horn

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2. Overview
3. Stormwater Management Practices Descriptions
 - Drainage Structures and Pipes
4. Maintenance Procedures
5. Appendices
 - A. Stormwater Management Practices Location Map
 - B. Inspection Checklists and Maintenance Logs



Contact Information

Stormwater Management Practices Owner

Saint-Gobain Corporation
Robert Doherty Facility & Ground Manager
1 New Bond Street
Worcester, MA
(508) 795-2989
robert.a.doherty@saint-gobain.com

Responsible Party for Operation and Maintenance

Saint-Gobain Corporation
Robert Doherty Facility & Ground Manager
1 New Bond Street
Worcester, MA
(508) 795-2989
robert.a.doherty@saint-gobain.com

Engineer of Record

William J Scully
271 Waverley Oaks Rd, Suite 302
Waltham, MA 02452
617-466-6347
Bill.scully@Kimley-Horn.com

Overview

In accordance with local, state, and federal regulations the subject site contains several deep sumps catch basin that serve as best management practices (BMPs) to collect and convey stormwater, control erosion and sediment, attenuate peak flow rates of runoff, and remove stormwater pollutants. The corresponding Field Manuals for the stormwater management measures are included in the Maintenance Plan. Each measure noted will require maintenance and specific upkeep in order to maintain its functionality as well as remain aesthetically pleasing and assimilate with the surrounding landscaping.

This manual has been prepared to outline general procedures to assist the responsible party in fulfilling operation and maintenance duties of the stormwater management facilities. Please note that the inspection, operation, and maintenance guidelines presented may need to be updated based on actual conditions encountered during the life of the facility.

Saint-Gobain Corporation is the current stormwater management system owner responsible for the operation and maintenance of the existing stormwater management system. If the property is ever transitioned to a new owner, the future property owner inherits responsibility for this operations and maintenance program. This Stormwater Management Practices Operation and Maintenance Manual shall be transferred to the future owner along with the property documents.

Note that some or all of the SWM / BMP facilities may require the Owner to submit inspection reports from a qualified professional. All inspection and maintenance costs shall be the responsibility of the Owner.

Stormwater Management Practices Descriptions

Drainage Structures and Pipes

Stormwater runoff from the site will be collected and conveyed by a system of inlet structures and subsurface drainage piping throughout the project area. Drainage inlets are reinforced concrete boxes with metal grates or curb openings located throughout the site, primarily in low-lying areas. The inlets are collected via a network of pipes that direct stormwater runoff to designated outfall locations by gravity flow. The service life of a concrete, subsurface drainage system is in excess of 50 years.

Maintenance Procedures

General Routine Maintenance

General Routine Maintenance Activities		
No.	Maintenance Task	Frequency of Task
1	Sweep parking lot and other paved areas	Spring and fall, After significant winter storm where salt or sand has been applied, As necessary
2	Maintain landscaping properly by mowing and pruning	As necessary
3	Replace any dying or diseased plant species	As necessary
4	Pick up trash and litter on-site before stormwater runoff can transport debris to the BMPs	Ongoing
5	Walk entire site to inspect for erosion, drainage problems, and damage to the stormwater management practices	Quarterly
6	Inspect pavement over system for any signs of settlement or abnormal cracking	Quarterly
7	Document all inspections using the log provided	Quarterly
8	Remove snow from site as it accumulates – There is no Snow Storage Plan for the site.	After significant winter storms

Drainage Structures and Pipes

Routine Maintenance Activities for Drainage Pipe Networks		
No.	Maintenance Task	Frequency of Task
1	Visually inspect for inlets and drainage structures for signs of damage such as exposed reinforcement and concrete cracking	Quarterly
2	Vacuum accumulated sediment from inlets once depth is greater than 6 inches and dispose of in an approved off-site location	As necessary
3	Vacuum accumulated sediment from pipes once depth is greater than 3 inches and dispose of in an approved off-site location	As necessary
4	Remove any debris or obstructions from inlets	As necessary
5	Remove ice and snow from inlets	As necessary during winter months, After significant winter storms

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Appendix A

Stormwater Best Management Practices Map

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Appendix B

Inspection Checklists and Maintenance Logs



Inspection Checklist and Maintenance Log **Drainage Structures and Pipes**

Project Name: _____ Inspection Date: _____

Project Location: _____ Inspection Personnel: _____

Location of Stormwater Management Practice: _____

Inspection Item	Yes	No	N/A	Corrective Action Required		Completion Date
Damage to Structure?						
Damage to Inlet Pipe(s)?						
Damage to Outlet Pipe(s)?						
Damage to Trash Rack(s)?						
Obstruction(s)?						
Undermining/Undercutting?						
Ponding around Inlets?						
Outlet Protection Washout?						
Settlement above Pipes?						
Accumulated Sediment?						
Accumulated Debris?						
Assessment Item	Good	Fair	Poor	Replace	N/A	Comments
Pavement condition above pipes						

Maintenance Activity Description:

Follow Up Requirements:

Inspector Signature: _____

APPENDIX F – ILLICIT DISCHARGE STATEMENT

Illicit Discharge Compliance Statement

Responsibility:

The owner is responsible for the ultimate compliance with all provisions of the Massachusetts Stormwater Management Policy, the USEPA NPDES Construction General Permit and responsible for identifying and eliminating illicit discharges (as defined by the USEPA).

OWNER NAME: Saint Gobain Corporation

ADDRESS: 1 New Bond Street

WORCESTER, MA 01606,

TEL. NUMBER: 508-795-5000

Engineer's Compliance Statement:

To the best of my knowledge, the attached plans, computations, and specifications meet the requirements of Standard 10 of the Massachusetts Stormwater Handbook regarding illicit discharges to the stormwater management system, and that no detectable illicit discharges exist on the site. All documents and attachments were prepared under my direction and qualified personnel properly gathered and evaluated the information submitted to the best of my knowledge.

Included with this statement are site plans, drawn to scale, that identify the location of systems for conveying stormwater on the site and show that these systems do not allow the entry of any illicit discharges into the stormwater management system. The plans also show any systems for conveying wastewater and/or groundwater on the site and show that there are no connections between the stormwater and wastewater systems.

William J Scully, P.E.

Kimley-Horn and Associates, Inc.

04/12/2024

Date

APPENDIX G – PIPE SIZING CALCULATION

Conduit FlexTable: DOT Report

Label	-Node- Upstream Downstream	-Depth- Upstream Downstream (ft)	-EGL- Upstream Downstream (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)
ST3 TO ST5 (STRM)	ST3 (STRM)	0.63	538.14	544.87	537.90
	ST5 (STRM)	0.62	537.74	545.04	537.27
ST5 TO ST6 (STRM)	ST5 (STRM)	0.62	537.61	545.04	537.36
	ST6 (STRM)	0.62	537.47	544.97	537.01
ST2 TO ST3 (STRM)	ST2 (STRM)	0.45	538.90	544.90	538.74
	ST3 (STRM)	0.63	537.97	544.87	537.90
ST4 TO ST3 (STRM)	ST4 (STRM)	0.43	539.18	544.54	539.02
	ST3 (STRM)	0.63	537.97	544.87	538.91
ST1 TO ST2 (STRM)	ST1 (STRM)	0.45	538.96	544.59	538.80
	ST2 (STRM)	0.45	538.97	544.90	538.69
ST6 TO ST7 (STRM)	ST6 (STRM)	0.62	537.35	544.97	537.10
	ST7 (STRM)	0.99	535.21	541.80	535.57
ST10 TO ST11 (STRM)	ST10 (STRM)	0.73	539.32	542.53	539.01
	ST11 (STRM)	0.73	539.06	543.25	538.53
ST11 TO ST7 (STRM)	ST11 (STRM)	0.73	538.93	543.25	538.63
	ST7 (STRM)	0.99	535.21	541.80	534.57
ST9 TO ST10 (STRM)	ST9 (STRM)	0.73	539.44	542.41	539.13
	ST10 (STRM)	0.73	539.42	542.53	538.93
ST7 TO ST8 (STRM)	ST7 (STRM)	0.99	534.96	541.80	534.53
	ST8 (STRM)	1.15	533.60	536.87	533.29
PIPE -14 (STRM)	ST7A (STRM)	0.43	536.02	538.87	535.86
	ST7 (STRM)	0.99	535.21	541.80	535.40
ST8 TO ST12 (STRM)	ST8 (STRM)	1.15	533.76	536.87	533.29
	ST12	1.15	533.45	535.35	532.23
PIPE -24 (STRM)	ST8A (STRM)	0.84	534.86	536.84	534.48
	ST8 (STRM)	1.15	533.60	536.87	533.69
ST12 TO ST13 (STRM)	ST12	1.15	532.97	535.35	532.50
	ST13	1.14	531.99	534.00	530.91
ST13 TO ST14 (STRM)	ST13	1.14	531.61	534.00	531.14
	ST14	1.43	530.15	534.70	529.87
ST14 TO EX-1 (STRM)	ST14	1.43	530.13	534.70	529.87
	EX-1	(N/A)	(N/A)	534.70	529.90

Conduit FlexTable: DOT Report

-Invert- Upstream Downstream (ft)	Section Discharge Capacity (cfs)	-X- Upstream Downstream (ft)	-Y- Upstream Downstream (ft)
537.27	2.45	573,449.39	2,936,479.67
536.74	6.46	573,502.85	2,936,466.50
536.74	2.43	573,502.85	2,936,466.50
536.48	6.45	573,514.55	2,936,447.13
538.29	1.29	573,350.16	2,936,504.11
537.27	6.45	573,449.39	2,936,479.67
538.59	1.22	573,450.86	2,936,485.48
537.27	6.30	573,449.39	2,936,479.67
538.35	1.29	573,351.59	2,936,509.94
538.29	6.30	573,350.16	2,936,504.11
536.48	2.41	573,514.55	2,936,447.13
533.54	6.46	573,478.00	2,936,298.87
538.28	3.30	573,251.37	2,936,381.82
537.90	6.46	573,276.75	2,936,353.38
537.90	3.28	573,276.75	2,936,353.38
533.54	8.79	573,478.00	2,936,298.87
538.40	3.30	573,260.58	2,936,389.50
538.28	6.46	573,251.37	2,936,381.82
533.54	6.51	573,478.00	2,936,298.87
532.13	12.70	573,518.00	2,936,211.42
535.44	1.17	573,514.14	2,936,315.76
533.54	6.46	573,478.00	2,936,298.87
532.13	10.38	573,518.00	2,936,211.42
531.35	27.36	573,543.23	2,936,166.49
533.64	4.31	573,523.66	2,936,214.01
532.13	18.48	573,518.00	2,936,211.42
531.35	10.31	573,543.23	2,936,166.49
530.00	24.25	573,543.22	2,936,075.16
530.00	10.14	573,543.22	2,936,075.16
528.44	21.84	573,601.06	2,935,980.07
528.44	9.87	573,601.06	2,935,980.07
528.30	26.38	573,593.22	2,935,973.70

