



# **Stormwater Management Report**

**For**

**Herb Chambers Bentley – Maserati – Lamborghini – Rolls-Royce – Alfa  
Romeo of Wayland  
533 Boston Post Road- Route 20  
Wayland, MA**

**January 12, 2023  
Revised: June 9, 2023**

**Prepared for:  
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## **SECTION 1 - NARRATIVE**

## **1.1 EXECUTIVE SUMMARY**

In accordance with the provisions of the Town of Wayland Zoning Bylaws, the Applicant, Herb Chambers 533 Boston Post Road, LLC (HC), proposes a modification and modernization of the existing Bentley - Maserati – Lamborghini – Rolls-Royce – Alfa Romeo of Wayland at 533 Boston Post Road in Wayland, MA. The proposed scope includes renovating the existing automobile dealership to add additional service bays for vehicle service. Site renovations include reconfigured parking for employees, customers, and vehicle inventory storage, as well as upgrades to stormwater management systems, utilities, and landscaping.

The site is bound by Boston Post Road (Route 20) to the north, commercial properties to the east (Richey & Clapper, Inc.) and west (Herb Chambers Jaguar Land Rover), and an undeveloped portion of the Herb Chambers Jaguar Land Rover parcel that extends to the South, which is mostly comprised of wetlands, and borders the Great Meadows National Wildlife Refuge and the former CSX Railway, which was recently purchased by the Town of Wayland. The site is located on Parcel 21-003 and is 2.95 acres. The property is located within the Limited Commercial District.

## **1.2 APPROVALS BEING SOUGHT**

This Stormwater Report is being filed in conjunction with the Notice of Intent (NOI) being filed with the Wayland Conservation Commission (WCC) and the Massachusetts Department of Environmental Protection (MA DEP) and Site Plan approval with the Wayland Zoning Board of Appeals (WZBA) for the proposed work. The Applicant requests that the permit approvals encompass the entirety of the scope listed below, and as shown in the accompanying plan set:

- Upgrade of the existing parking lot to provide employee parking and vehicle storage
- The renovation of the existing single-story structure to be used for vehicle sales and maintenance
- Stormwater BMP's
- Upgrades to utilities, landscaping, and lighting

## **1.3 FEMA – FLOODPLAIN SUMMARY**

The parcel is shown on FEMA Flood Insurance Rate Map Panel 25017C0507F dated 7/7/2014. The developed land on the property is located within Zone X, which is defined as areas determined to be outside the 0.2% annual chance floodplain. There is a Zone AE within proximity of the work proposed. Zone AE is defined as an area inundated by 1% annual chance flooding, where Base Flood Elevations (BFE's) have been determined. The BFE of the Zone AE is elevation 121.0. The work proposed is entirely outside the limits of the FEMA Zone AE.

## **1.4 ON-SITE SOIL INFORMATION**

The Natural Resource Conservation Service (NRCS) maps the entirety of on-site soil as Udorthents-Urban land complex, Soil Map Unit 656, which is defined as "excavated and filled land."

Northeast Geotech performed twelve (12) test borings the week of September 5, 2022, within the limit of work. The test borings performed within the drainage structures footprints revealed a subsurface comprised of a loose to medium dense, brown loamy sand. The subsurface soil conditions

in the area of the expanded parking lot and drainage improvements are consistent with a “B” soil. The proposed infiltration area is located fully within the limits of the HSG B soils and an infiltration rate of 1.02 inches per hour was used as this rate is consistent with sandy loam and we wanted our calculations to be conservative.

Depth to groundwater was noted in the upper right corner of each test pit log and appears to vary throughout the site. In the proposed parking area in front of the building (B-7), groundwater was noted at 5ft below existing grade, or at elevation 121.0±. In the area of the proposed infiltration Retain-It System (UG 2), groundwater was encountered at 5ft below existing grade, or at elevation 119.5±. Measurements for the depth to groundwater were taken again from monitoring wells on March 6<sup>th</sup>, 2023. These measurements confirmed groundwater in the area of UG-3, however these measurements raised the groundwater elevation in the area of UG-2. For more information on the separation of groundwater at each of the infiltration BMP's, please refer to Section 4, Stormwater Calculations.

Refer to Section 6 for complete soil information.

### **1.5 WETLANDS AND ENVIRONMENTAL RESOURCE AREAS ANALYSIS**

The project does contain environmental resource areas, and therefore the project must be permitted through MassDEP and the Wayland Conservation Commission. There is a Bordering Vegetated Wetland (BVW) to the South of the site containing shallow marshes. According to the latest Mass. Division of Fisheries and Wildlife – Natural Heritage Program mapping, the southern portion of the site abuts a Priority Habitat of Rare Species (PHRS) as designated by the Natural Heritage and Endangered Species Program of the Division of Fisheries and Wildlife. There is a potential vernal pool within the PHRS, approximately 300±' from any proposed work. The limit of work is entirely out of the FEMA 100-year floodplain. The proposed project area is entirely developed.

The wetland resource areas located to the south of the property were delineated by Fred King, PE of DGT Associates in July of 2022.

The following is a summary of the buffer and protection zones that portions of the project are proposed within:

1) 100' Bordering Vegetated Wetland (BVW) Buffer (310 CMR10.55).

Work within the 100' Bordering Vegetated Wetland (BVW) Buffer includes but is not limited to sections of the paved parking lots, retaining walls, some of the existing to be renovated building, as well as a portion of the building addition. The proposed scope is an improvement over the existing, which consists of the existing building and paved parking lot.

2) Bordering Land Subject to Flooding

The site is located near a BLSF, associated with the Sudbury River. The elevation of the 100 year (1% chance of flooding) has been determined by the FEMA Flood Study Profile Data as elevation 121.0 (NAVD 88). The boundary of the BLSF is the 121-foot contour and this contour is to the south of the limit of work.

### 3) Priority Habitat of Rare Species (PHRS)

A small portion of the proposed improvements are proposed within the PHRS. As mentioned above, there is a potential vernal pool located within the PHRS, approximately 300±' to the southeast of the limit of work. A copy of the Notice of Intent Application package including the plans will be submitted to NHESP for review.

#### **1.6 OBJECTIVE OF CALCULATIONS**

The purpose of this stormwater analysis is to examine the stormwater runoff from the proposed site based upon the Massachusetts Department of Environmental Protection Stormwater Management Policy and the applicable provisions of the Town of Wayland Bylaws and regulations.

The goal of the stormwater management system design on this project is to comply with the MA Stormwater Management Requirements as well as the Town of Wayland's Stormwater Management Permit Regulations and provide improved water quality, reduce post-development peak runoff rates below pre-development peak flow rates, maximize the opportunities for recharge and infiltration, and protect the surrounding area from any potential flooding and/or environmental impacts associated with the unmitigated condition. The following stormwater hydrology calculations were performed using the 0.5- inch, 1- inch, 1-year, 2-year, 10-year, 25-year, and 100-year frequency, Type III, 24-hour SCS design storms and were compared for both pre-development and post-development conditions. The 1, 2, 10, 25 and 100-year storms and 0.5 and 1-inch storms were evaluated to demonstrate the proposed peak rates of discharge and volumes do not exceed pre-development peak rates and volumes.

#### **1.7 METHODOLOGY**

We utilized the latest version of Hydro CAD for the overall stormwater hydrology/routing analysis to assess and compare peak rates of runoff and volumes at the various discharge points from the subject property. We then used Hydraflow Storm Sewers Extension Pack through AutoCAD Civil 3D to analyze the pipe design and to select appropriate pipe sizing.

Refer to Section 3 – HydroCAD Model, which includes the detailed print-out of the HydroCAD Model Reports for the 0.5 inch, 1-inch, 1, 2, 10, 25 and 100-year storms as well as Section 7 – Hydraulic Pipe Analysis / Sizing, which includes reports for the 10, and 100-year storms for pipe capacity analysis and sizing.

#### **1.8 SITE HYDROLOGY**

##### **Existing Conditions**

Please refer to the attached Existing Conditions Watershed Analysis Plan in Section 3.1. The property has been divided into one (2) subcatchment areas based on the existing site topography and flow paths. The subcatchment's analysis standpoint is the wetland resource areas to the rear of the property. The subcatchment area has been analyzed and assigned an appropriate Curve Number to represent the existing surface cover and underlying soils conditions. The impervious and pervious

surfaces were separated into their own respective subcatchments to better represent site conditions and the actual flow of water. The combination of these subcatchments would create an unrealistic Time of concentration and weighted CN value. Time of concentration have been computed and the extent of pervious vs. impervious cover computed. This data was then input into HydroCAD to determine peak rates of runoff at the design point which provides the location for which to compare existing versus proposed conditions to document compliance that the peak rates and volumes have been reduced in the regulatory storm events as required. A summary table is provided in the Hydrology Model Results and Conclusions Section below. For the purposes of this analysis, the pre- and post- development drainage conditions were analyzed at one (1) “design points” or points of discharge where stormwater runoff currently drains to under existing conditions. The design point is described below:

- Design Point #1 (DP-1) is the BVW (flagged as Wetland A) located to the southwest of the proposed work. This BVW ultimately discharges to Wetland A (PD-6).

The parcel that the proposed project on is approximately 2.95± acres, however the limit of work being analyzed is approximately 3.03 acres of land consisting of an existing one-story building and bituminous driveway and parking area. The site generally conveys stormwater in a southerly direction towards the Wetlands. A more comprehensive description of the existing subcatchment area is provided below:

- Subcatchment E-1 is approximately 1.21AC (52,656 SF) and is comprised of the existing landscaped areas, lawn, and undeveloped woodland area. Stormwater from these surfaces flow overland and undetained to Wetland A, or DP-1. This area consists of the pervious surfaces on the site and encompasses predominately the south east portion of the property (CN: 59) and the calculated time of concentration of 6.1 minutes is used.
- Subcatchment E-2 is approximately 1.82AC (79,211 SF) and is comprised of the existing building, paved areas, and compacted gravel. Stormwater from these surfaces flow overland and undetained to Wetland A, or DP-1. This area consists of the impervious surfaces on the site (CN: 98) and the minimum time of concentration of 5.0 minutes is used.

### **Proposed Conditions**

The proposed project consists of reconfigured parking for vehicle inventory, the renovation and expansion of the existing car dealership. Construction will also include landscaping upgrades, stormwater treatment, drainage improvements and other associated utilities. The site, including the proposed parking areas, has been designed to drain to deep sump hooded catch basins. The catch basins will capture and convey stormwater runoff, via an underground pipe system, to proprietary treatment units, to an underground infiltration system that will recharge the required Water Quality Volume (WQV).

Please refer to the attached Proposed Conditions Watershed Plan. The proposed project has been divided into six (6) subcatchment areas and the various stormwater treatment and infiltration BMPs have been modeled. Appropriate Times of Concentration and Curve Numbers have been assigned for each catchment area. A more comprehensive description of the proposed subcatchment areas is provided below:

- Subcatchment P-1A is approximately 0.574 acres (25,011 SF) consisting of the proposed expanded parking lot and some grassed area (CN:95). Stormwater runoff from this area flows



into deep sump hooded catch basins, and then into the Underground Infiltration System (UG-3), before discharging to DP-1. The minimum time of concentration of 5.0 minutes is used.

- Subcatchment P-1B is approximately 0.406 acres (17,690 SF) consisting of a portion of the reconfigured/expanded parking area, landscaped area, and some wooded area (CN:81). Stormwater from this location flows to deep sump hooded catch basins before discharging to Underground Detention System #1 (UG-1). The minimum time of concentration of 5.0 minutes is used.
- Subcatchment P-1C is approximately 0.694 acres (30,223 SF) consisting of bituminous pavement and landscaped area. Stormwater in this area drains into a deep sump hooded catch basin, piped connection to a water quality separator and into the Underground Detention System #2 (UG-2). Stormwater ultimately flows to a rip rap splash pad at the rear of the property. The area has a CN: 87 and the minimum time of concentration of 5.0 minutes is used.
- Subcatchment P-1D is approximately 0.111 acres (4,815 SF) is at the southwestern corner of the project. This area consists of grass/landscaped surface and the driveway connection between the project and the abutting parking lot. Stormwater in this area travels overland to a rain garden to provide the necessary treatment volume. For the purposes of the HydroCAD model, credit for peak rate and volume attenuation was not taken for the rain garden. This area has a CN: 72, and the minimum time of concentration of 5.0 minutes is used.
- Subcatchment P-1U is approximately 1.242 acres (54,125 SF) consisting of an undisturbed wooded area and grass strip abutting the parking area that flows undetained to the wetlands to the south of the property. Also included in this area is the road runoff which will be colled via roof drains and be directly discharged to the 1R. This area consists mostly of woods and roof (CN: 83). A minimum time of concentration of 5.0 minutes is used.

### **Hydrology Model Results and Conclusions**

The goal of the stormwater design is to comply to the maximum extent practicable with the Massachusetts Stormwater Policy and the Town of Wayland Stormwater Management Regulations. The existing site contains 76,513 SF (1.76AC) of impervious area. The proposed site contains 89,481 SF (2.05 AC) of impervious area, which is an increase of 12,968 SF. The project, as proposed, is a renovation of a previously developed site. However, there is an increase in impervious area, the project is considered a mix of new construction and redevelopment. This analysis confirms that the stormwater system is receiving proper treatment and peak rates of runoff have been reduced to below pre-development rates using stormwater Best Management Practices including deep sump hooded catch basins, Contech CDS Water Quality Units, underground infiltration and detention systems. The discharge points from the site have been engineered to employ properly designed rip-rap splash pads to further reduce discharge velocities and to spread out the discharge to prevent scour and point discharge erosion. The water quality units have been properly sized in accordance with MADEP guidance for water quality flows. Please refer to Section 4 of the Stormwater Report for calculations associated with the sizing.

The results of the pre- and post-development hydrology calculations provided in Section 3 are summarized in the following tables:

Table 1.9.1 shows the peak rate of runoff at each design point for the existing site as well as for the

developed site at 1, 2, 10, 25, 100-year and 0.5 and 1-inch design storms.

Point of Analysis	0.5" Storm (cfs)			1" Storm (cfs)			1-Yr Storm (cfs)			2-Yr Storm (cfs)			10-Yr Storm (cfs)			25-Yr Storm (cfs)			100-Yr Storm (cfs)		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
PD-1 (1R)	1.06	0.55	-0.51	2.02	1.15	-0.87	3.72	2.37	-1.35	5.15	3.39	-1.76	9.71	6.64	-3.07	13.39	9.78	-3.61	20.97	19.02	-1.95

**Table 1.9.1**

As shown in Table 1.9.1, the peak stormwater runoff generated by the development are the same or less in post development conditions versus the existing conditions at all design points, for every storm. All stormwater ultimately discharges to Wetland A. In all storms, the peak stormwater runoff to PD-6 is significantly reduced. Refer to Section 3 for the complete HydroCAD Analysis that documents the above results as well as the Existing and Proposed Conditions Watershed Plans, also enclosed in Section 3.

Table 1.9.2 shows the total volume discharge at each design point for the existing site as well as for the developed site at 1, 2, 10, 25, 100-year, 0.5-inch and 1-inch design storms.

Point of Analysis	0.5" Storm (cf)			1" Storm (cf)			1-Yr Storm (cf)			2-Yr Storm (cf)			10-Yr Storm (cf)			25-Yr Storm (cf)			100-Yr Storm (cf)		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
PD-1 (1R)	3,323	2,717	-606	6,571	5,382	-1,189	11,945	10,445	-1,500	16,374	14,132	-2,242	30,806	27,781	-3,025	42,804	39,670	-3,134	68,260	64,917	-3,343

**Table 1.9.2**

As shown in Table 1.9.2, the total volume discharge generated by the development are the same or less in post development conditions versus the existing conditions at all design points, for every storm. Refer to Section 3 for the complete HydroCAD Analysis that documents the above results as well as the Existing and Proposed Conditions Watershed Plans, also enclosed in Section 3.

## 1.9 STORMWATER MANAGEMENT

The following section describes each of the ten (10) Massachusetts Stormwater Management Standards and describes how the project complies with each.

**Standard 1: No New Untreated Discharges** – No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

**All new stormwater system conveyances are treated prior to discharge and result in no erosion occurring on site. The drainage system has been designed to direct stormwater runoff from impervious areas through various stormwater systems designed to capture, convey, treat, detain, recharge and infiltrate (where appropriate) the runoff prior to discharge. The outfalls have been designed to mitigate erosion in the area of discharge, and the flows will not be increased.**

**Standard 2: Peak Rate Attenuation** – Stormwater management systems should be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

**Please refer to Table 1.9.1 above. The stormwater management system reduces**

**peak rates of runoff to below pre-development levels at all design points. All stormwater ultimately discharges to Wetland A (DP-1), and in all storms, the peak stormwater runoff to DP-1 is significantly reduced. This Standard has been met.**

Standard 3: Recharge – 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.

**The stormwater system includes subsurface infiltration chambers. The stormwater system has been designed to comply with the recharge requirements of the MA Stormwater Management Regulations and meets the requirements for new construction. Refer to Section 4.0 for a summary of the stormwater recharge calculations.**

Standard 4: Water Quality – Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS).

**The project utilizes deep sump hooded catch basins, CDS Water Quality Units and subsurface infiltration systems. Please refer to Section 4.4 for the TSS calculation spreadsheets.**

**Per the Town of Wayland Stormwater Management Bylaw, water quality volume for sizing of BMP's is based on 1-inch of runoff from the tributary area. Please refer to Section 4 of this report for Stormwater Management Calculations.**

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPL) – 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.

**The proposed project is an automobile dealership and includes new and used vehicle sales, display and inventory storage and service. No exterior vehicle service or repair exterior equipment cleaning nor commercial vehicle washing are proposed. As such, the project is not a LUHPPL.**

Standard 6: Critical Areas – 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.

**The project is not located near a critical area; however, the project BMP's have been designed to treat stormwater as if they were discharging to a critical area.**

Standard 7: Redevelopment 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 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.

**The existing site contains 76,513 SF (1.76 AC) of impervious area. The proposed site contains 89,481 SF (2.05 AC) of impervious area, which is an increase of 12,968 SF. The project is a renovation of a previously developed site. However, there is a slight increase in impervious area, the project is considered a mix of new construction and redevelopment. The bullet points below provide a summary of the project's compliance with Standards 2, 3, 4, 5, and 6 to the maximum extent practicable, and Standards 1, 8, 9, 10 to the full extent.**

- **Standard 1: All new stormwater system conveyances are treated prior to discharge and result in no erosion occurring on site. The drainage system has been designed to direct stormwater runoff from impervious areas through various stormwater systems designed to capture, convey, treat, detain, recharge and infiltrate (where appropriate) the runoff prior to discharge. The outfalls are designed to prevent erosion and scour, and the peak rates of runoff will not be increased. Therefore, the project is in full compliance with this standard.**
- **Standard 2: The peak rate at all design points is reduced from the existing conditions using underground infiltration and detention chambers, infiltration basins and outlet control structures. The project is in full compliance with this standard.**
- **Standard 3: Please refer to Section 4 of the report. The existing impervious area within limit of work is 76,513 SF (1.76 acres) including pavement, buildings, compacted gravel parking and driveways. The total proposed impervious area within limit of work is 89,249 SF (2.05 Acres) including pavement and buildings. The entire 89,249 s.f. of impervious would require a total recharge volume of 2,603 c.f. Using the underground infiltration chambers, the project is recharging**

the required volume for all impervious area and provides a recharge volume of 3,492 CF. Therefore, the project provides significantly more recharge than is required by Standard 3.

- **Standard 4: The Stormwater Management Systems have been designed to remove 80% or greater TSS post construction using various BMPs including deep sump hooded catch basins, CDS Water Quality Units, subsurface infiltration/detention systems. Please refer to Section 4.4 for the TSS calculation spreadsheets. The project is in full compliance with this standard.**
- **Standard 5: This standard is not applicable because the site is not considered a LUHPPL as there is no exterior vehicle service or repair exterior equipment cleaning nor commercial vehicle washing are proposed.**
- **Standard 6: This standard is not applicable because the project is not located near a critical area, however, the project BMP's have been designed to treat stormwater as if the site were discharging to a critical area, treating the 1-inch WQV.**
- **Standard 8: An Erosion and Sedimentation Controls Plan has been incorporated into the Site Plans. The project is in full compliance with this standard.**
- **Standard 9: An Operation and Maintenance Plan has been provided in Section 5. The project is in full compliance with this standard.**
- **Standard 10: An Illicit Discharge Compliance Statement is included as required and is enclosed in Section 2.2. This will be provided prior to occupancy. The project is in full compliance with this standard.**

Standard 8: Construction Period Pollution Prevention Plan 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.

**An Erosion and Sedimentation Controls Plan has been incorporated into the Site Plans. A draft SWPPP is also enclosed in Section 8.**

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 has been provided in Section 5 of this Report.**

Standard 10: Prohibition of Illicit Discharges – All illicit discharges to the stormwater management system are prohibited.

**An Illicit Discharge Compliance Statement is included as required and is enclosed in Section 2.2.**

#### **1.10 BEST MANAGEMENT PRACTICES (BMP'S)**

Various combinations of deep sump hooded catch basins, CDS water quality units, a constructed stormwater subsurface infiltration and detention systems, will be used to treat stormwater runoff on the site. See Section 4 for stormwater management calculations.

#### **1.11 PIPE SIZING**

Refer to Section 7 for the Hydraulic Pipe Analysis/Sizing calculations, which utilizes the Hydraflow Storm Sewers Extension Pack through AutoCAD Civil 3D to analyze the pipe design and to select appropriate pipe sizing. Reports are included for the 10 and 100-year storms for pipe capacity analysis and sizing.

The tributary area for each inlet/subcatchment area has been computed along with pipe length, slope and friction coefficient. This approach was used to size the pipes such that the 10-year storm event is contained within the pipe. The 100-year storm was then checked to confirm the hydraulic grade line for the pipe network does not exceed the rim elevations of the drainage structures. In addition, pipe velocities were checked to be within the range of 2fps to 10 fps flowing 1/3 full. Those calculations are included in Section 7 herein.

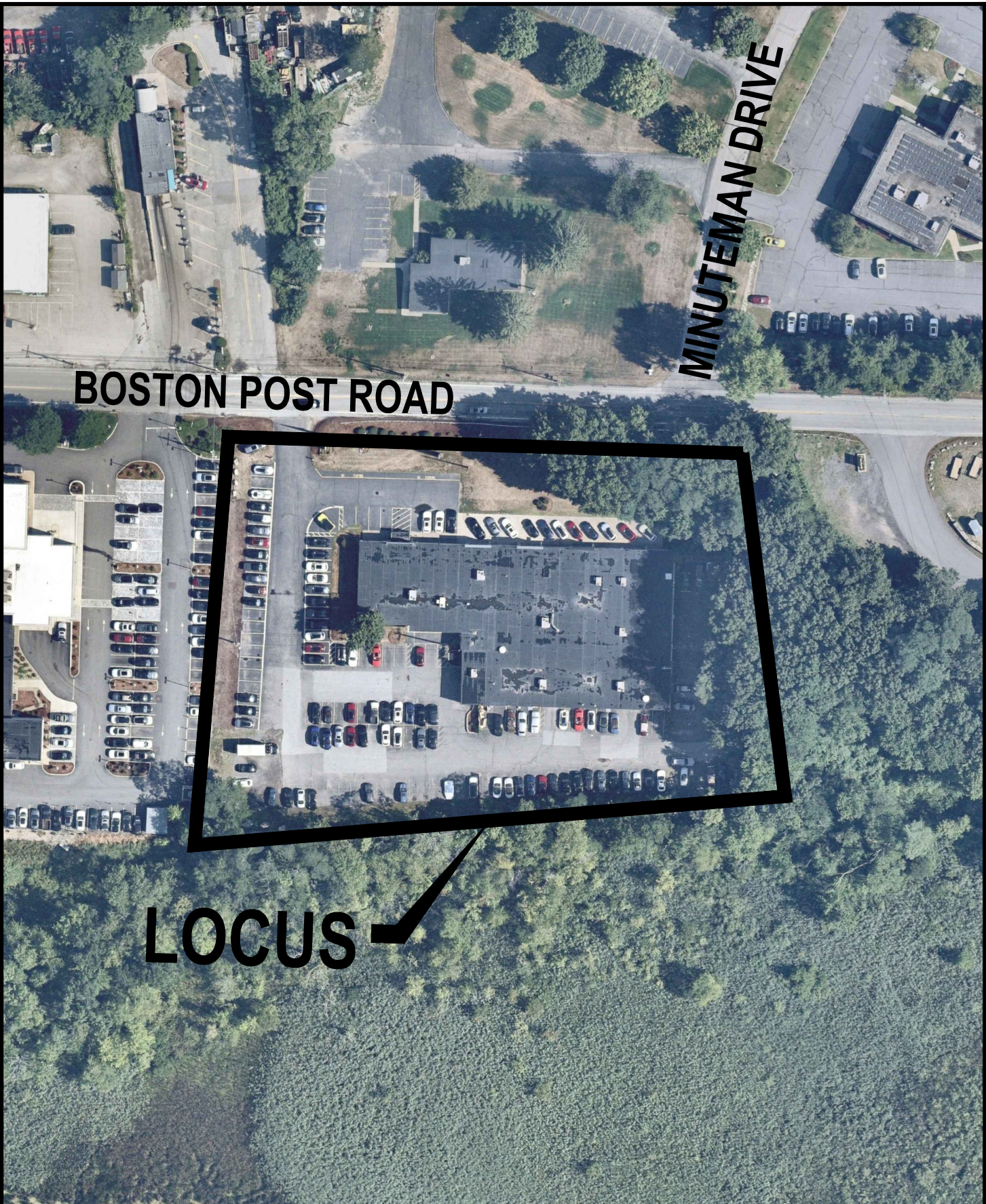
#### **1.12 CONCLUSION**

In conclusion, the project has been designed in accordance with the requirements of the MA DEP's Stormwater Management Standards and in compliance with the Town of Wayland's Conservation Commission Wetland Regulations and Stormwater Management Bylaw.

#### **1.13 Figures**

- FIG 1 ORTHOGRAPHIC MAP
- FIG 2 FEMA FLOODPLAIN MAP
- FIG 3 MASSDEP WETLANDS MAP
- FIG 4 USGS MAP
- FIG 5 NHESP HABITAT MAP





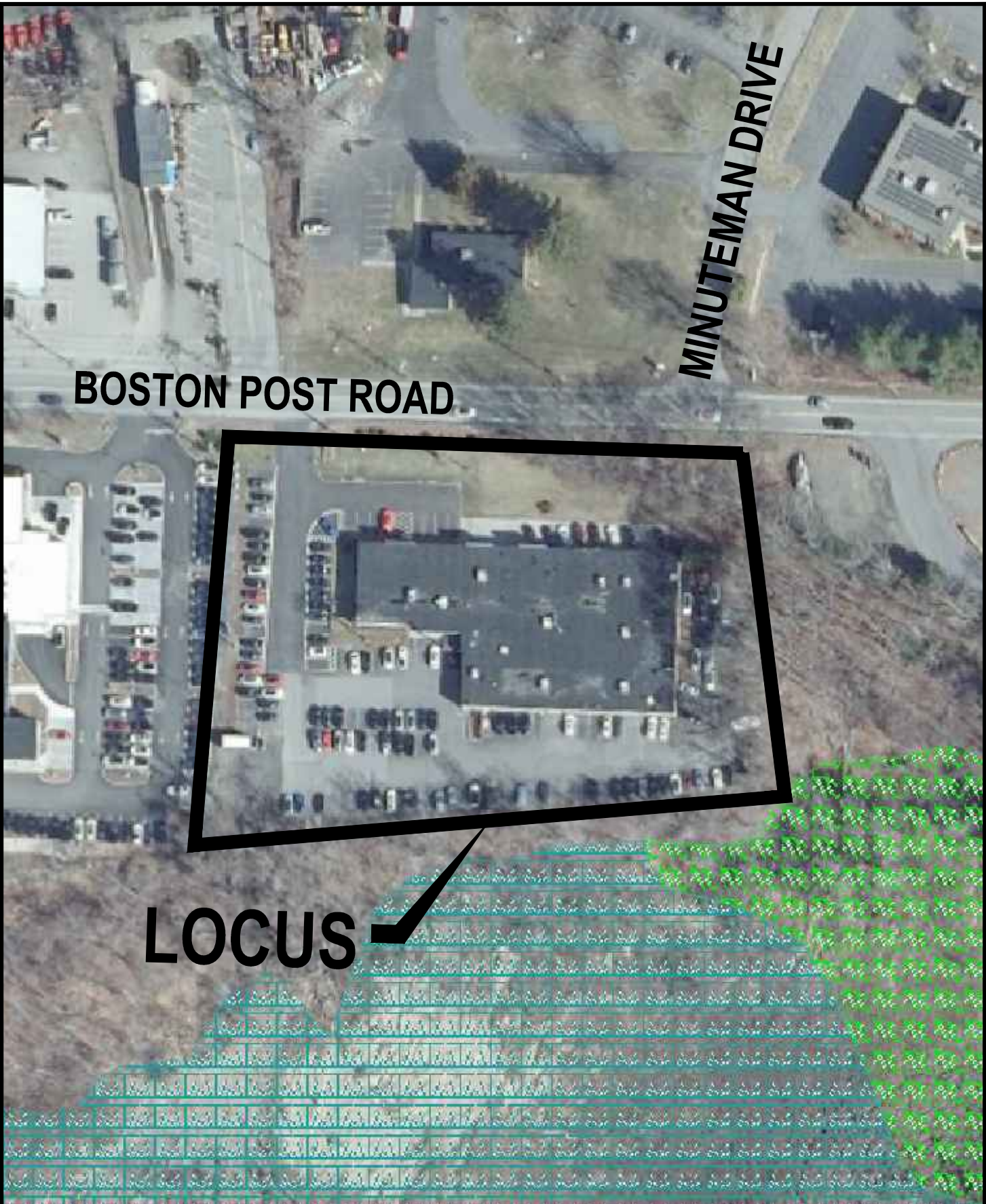
**BOSTON POST ROAD**

**MINUTEMAN DRIVE**

**LOCUS**

<div><div>Crocker Design Group</div><div>2 SHARP STREET, UNIT A HINGHAM, MA 02043</div></div>	Project	Prepared for	Drawing Title		
	MASS DOT SITE  533 BOSTON POST RD - ROUTE 20 WAYLAND, MA 01778	HERB CHAMBERS 533 BOSTON POST RD LLC	AERIAL MAP		
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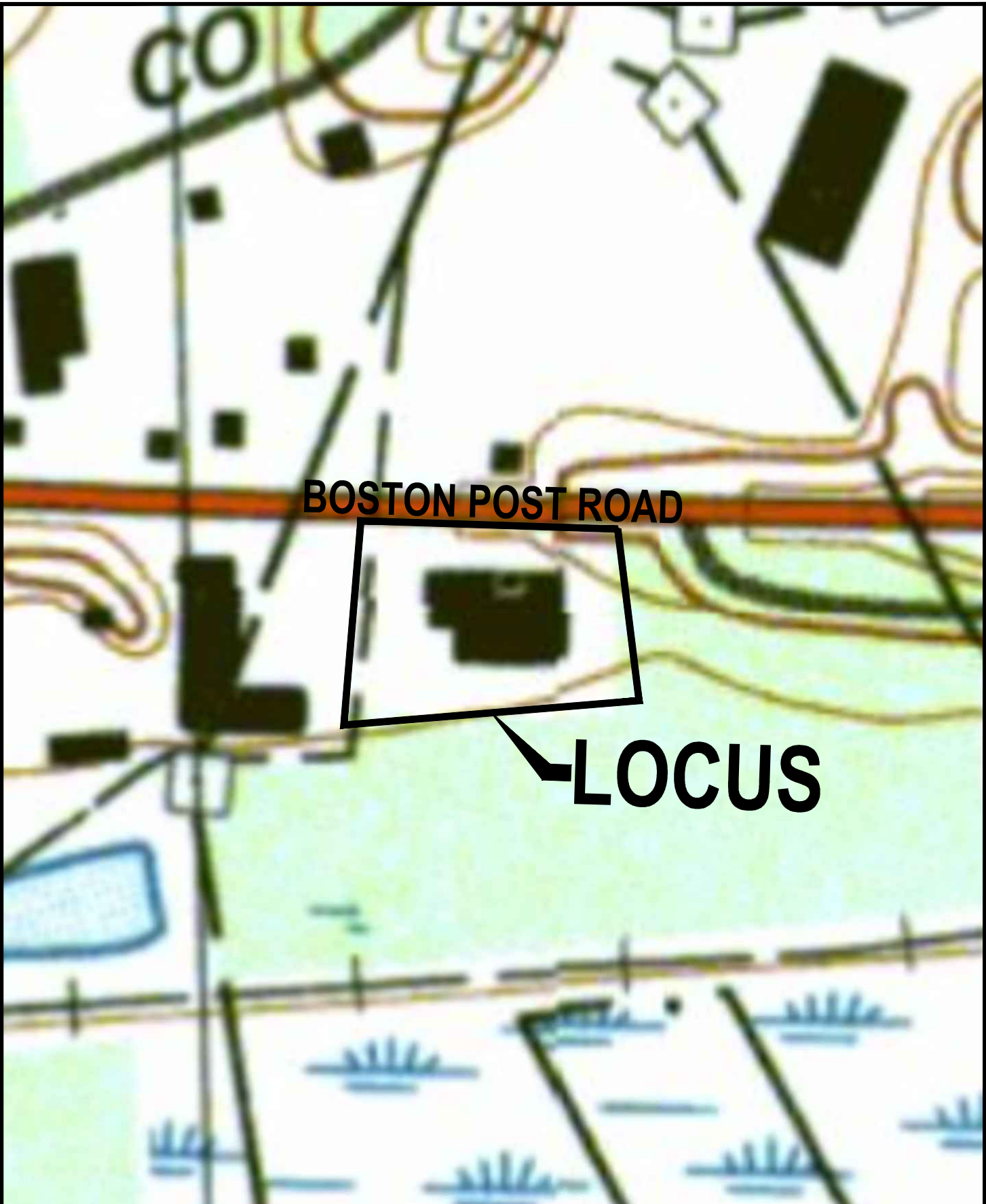
BOSTON POST ROAD

MINUTEMAN DRIVE

LOCUS

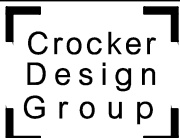
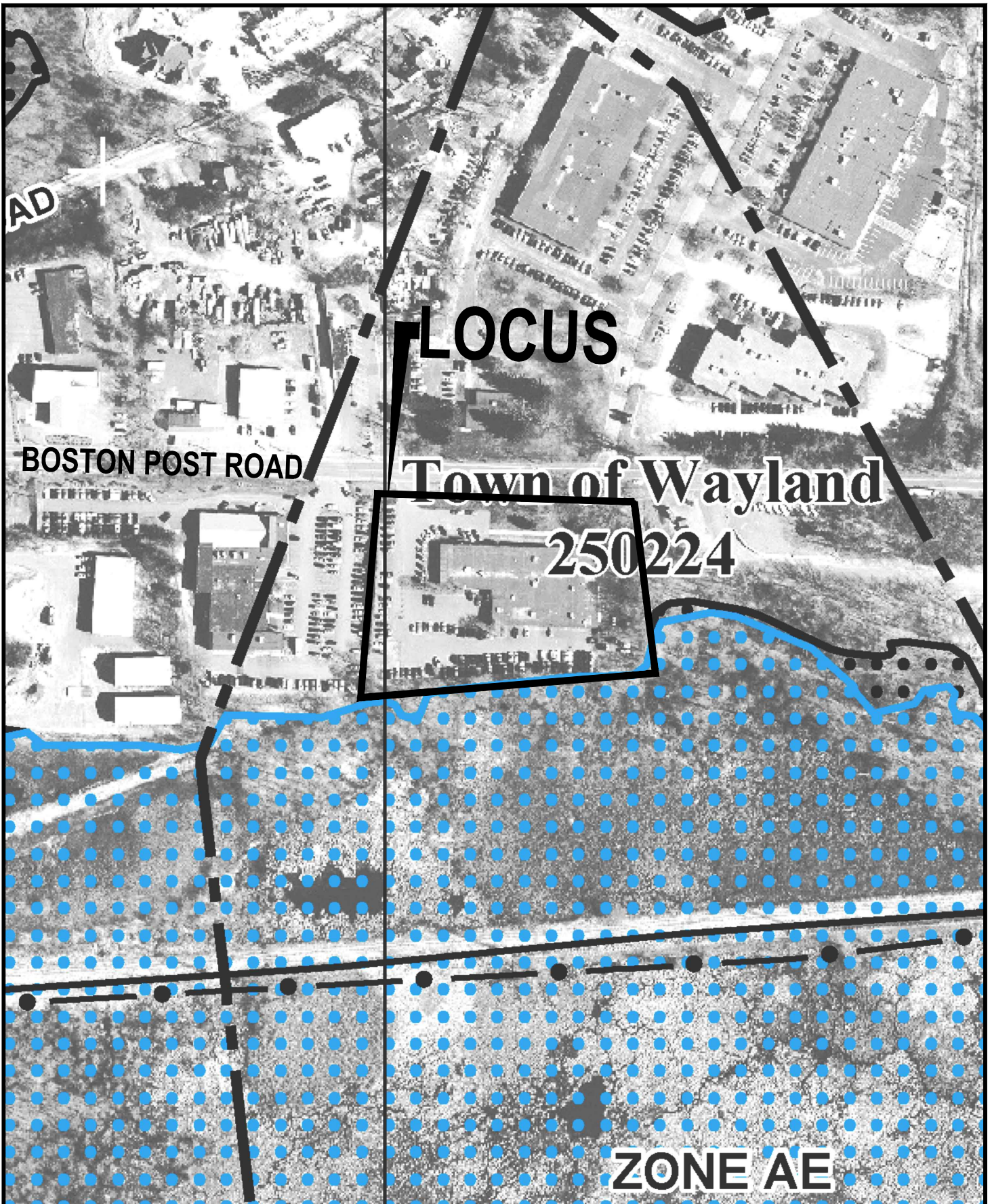
<div><div>Crocker Design Group</div><div>2 SHARP STREET, UNIT A HINGHAM, MA 02043</div></div>	Project	Prepared for	Drawing Title		2
	MASS DOT SITE  533 BOSTON POST RD - ROUTE 20 WAYLAND, MA 01778	HERB CHAMBERS 533 BOSTON POST RD LLC  533 BOSTON POST RD - ROUTE 20 WAYLAND, MA 01778	WETLANDS MAP		
			DATE: 09.07.2022	DRAWN: FJ	
			JOB NO.:100-173	CHECK: DJN	
SCALE: 100 50 0 100					





<div><div>Crocker Design Group</div><div>2 SHARP STREET, UNIT A HINGHAM, MA 02043</div></div>	Project	Prepared for	Drawing Title		
	MASS DOT SITE  533 BOSTON POST RD - ROUTE 20 WAYLAND, MA 01778	HERB CHAMBERS 533 BOSTON POST RD LLC  533 BOSTON POST RD - ROUTE 20 WAYLAND, MA 01778	USGS MAP		
			DATE: 09.07.2022	DRAWN: FJ	3
			JOB NO.:100-173	CHECK: DJN	
			SCALE: 200 100 0 200 		





2 SHARP STREET, UNIT A  
HINGHAM, MA 02043

Project

**MASS DOT SITE**

533 BOSTON POST RD -  
ROUTE 20  
WAYLAND, MA 01778

Prepared for

HERB CHAMBERS  
533 BOSTON POST RD LLC

533 BOSTON POST RD -  
ROUTE 20  
WAYLAND, MA 01778

Drawing Title

**NHESP MAP**

DATE: 09.07.2022

DRAWN: FJ

JOB NO.: 100-173

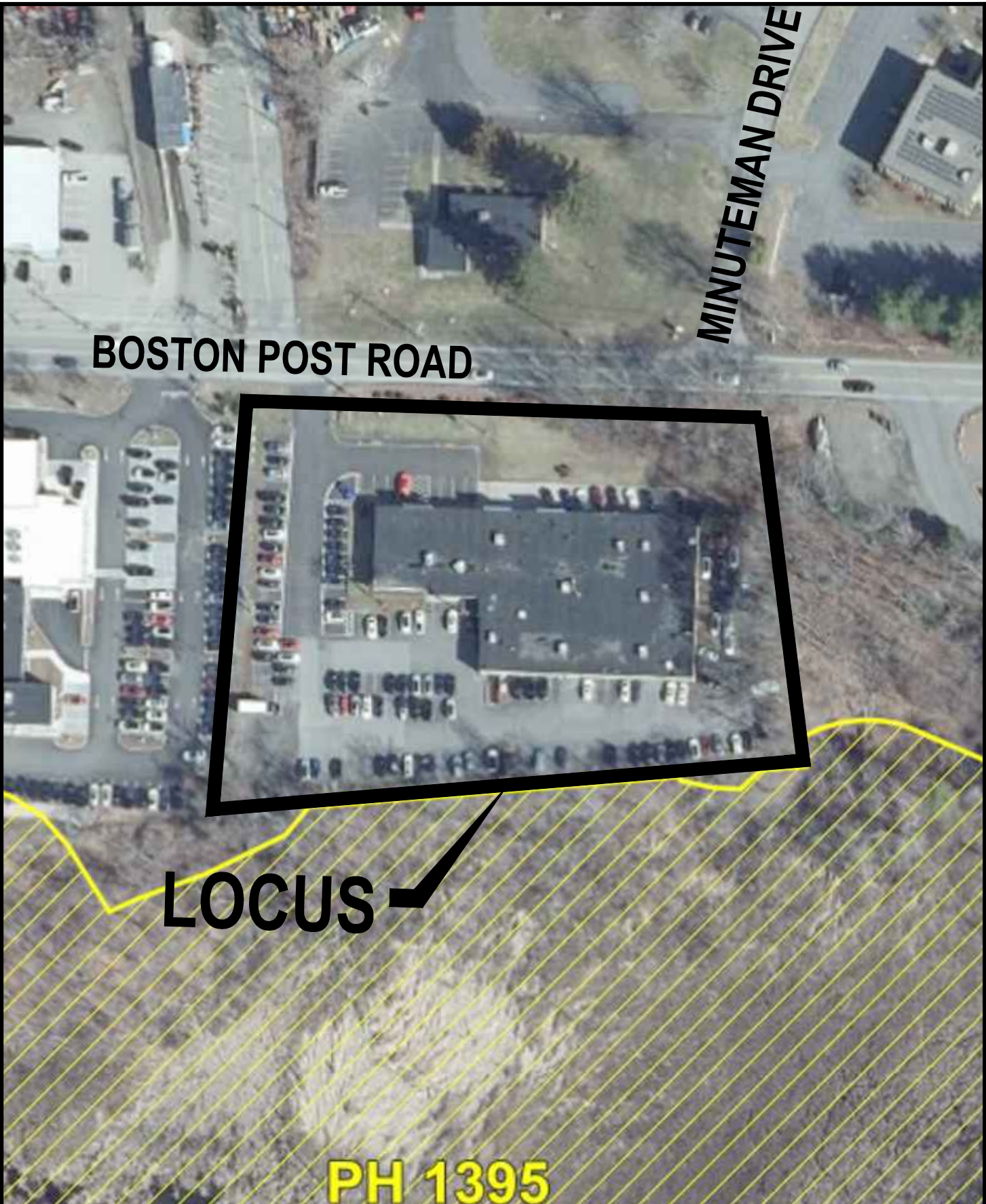
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**4**





<div><div>Crocker Design Group</div><div>2 SHARP STREET, UNIT A HINGHAM, MA 02043</div></div>	Project  <b>MASS DOT SITE</b>  533 BOSTON POST RD - ROUTE 20 WAYLAND, MA 01778	Prepared for  HERB CHAMBERS 533 BOSTON POST RD LLC  533 BOSTON POST RD - ROUTE 20 WAYLAND, MA 01778	Drawing Title  <b>NHESP MAP</b>		<div>5</div>
			DATE: 09.07.2022	DRAWN: FJ	
			JOB NO.:100-173	CHECK: DJN	
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## **SECTION 2 – STORMWATER 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

## 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.

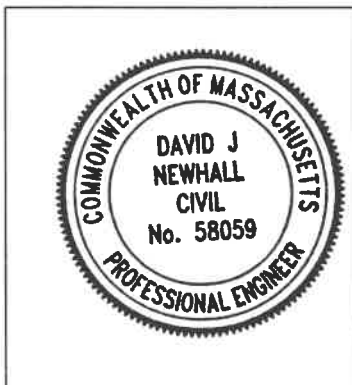
*Note:* Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that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



*David J. Newhall* 6-9-23  
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

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## 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.



# Checklist for Stormwater Report

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## 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.
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  - ☒ 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;
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