

Preliminary Stormwater Management Report

NOVO Riverside Commons

**292-294 Baker Ave
Concord, Massachusetts**

Prepared for:

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1.0 INTRODUCTION

The project site is located at the existing 300-310 Baker Avenue site in Concord. The Applicant is proposing two residential apartment buildings to be constructed along the southern portion of the existing 300-310 Baker Avenue property on a proposed new 10.2-acre parcel. The overall site currently consists of a general office building, and associated parking areas. Stormwater runoff ultimately flows to the Assabet River which abuts the property to the south and west. Portions of the existing development fall within the 100-year Floodplain of the Assabet River.

1.1 Executive Summary

The 10.2-acre residential project site is currently used as a parking lot for the existing office building for 300-310 Baker Avenue. The proposed improvements will result in an increase of approximately one acre of impervious area. The increase in impervious area will be mitigated through the implementation of subsurface chambers which will detain flows prior to discharge to the on-site wetland pond and the bordering vegetated wetlands adjacent to the Assabet River located to the west of the development site.

The increase in runoff volume from the site will be compensated for by increasing the floodplain volume onsite. Floodplain compensation is being provided primarily in underground concrete structures beneath the 294 Baker Avenue parking area.

1.2 Stormwater Runoff Peak Rates and Volume

The pre- and post-development hydrologic conditions are modeled using HydroCAD™ version 10.00 to demonstrate that post-development stormwater runoff rates will be less than or equal to the pre-development rates. Watershed maps with soil types as well as detailed analysis of the model results will be provided.

2.0 PRE-DEVELOPMENT CONDITIONS

2.1 Site Conditions

The proposed 10.2-acre parcel is partially developed with parking areas and site driveways serving for the 300-310 Baker Avenue office building. The western portion of the parcel is bordering vegetated wetlands surrounding the Assabet River. In the central portion of the parcel is a large wetland pond. Stormwater from the existing paved parking areas is collected in catch basins and discharged to onsite wetland pond with minimal treatment of stormwater.

2.2 Soil Description

The National Resource Conservation Service (NRCS) lists the on-site soils as primarily previously disturbed urban land. NRCS does not provide a hydrologic soil classification for this soil.

3.0 POST-DEVELOPMENT CONDITIONS

3.1 Design Strategy

A stormwater management system has been designed to mitigate increased pond rates of runoff and to provide treatment for stormwater runoff associated with the proposed impervious surfaces on site. All stormwater BMPs were designed to treat a minimum of the first 1.0 inch of runoff generated by the on-site impervious areas. Proprietary structural treatment devices and a sediment forebay were designed to treat the runoff rate associated with the water quality volume in accordance with the requirements of the DEP Stormwater Handbook.

During the design phase of the site layout, consideration was given to conserving environmentally sensitive features and minimizing impact on the existing hydrology. To achieve this, extensive grading was avoided and the site was designed to match the existing terrain where feasible. Minimizing earthwork helps to maintain the existing drainage patterns to the maximum extent practicable under post-development conditions. On-site resource areas, such as the Bordering Vegetated Wetlands were excluded from the development envelope and will not be altered by the proposed project.

3.2 Hydrologic Analysis

The established design points used in the pre-development conditions analysis are used in the post-development analysis for direct comparison. The tributary areas and flow paths were modified to reflect post-development conditions. Summaries of each area with respect to Curve Number and Time of Concentration calculations will be included in the Final Stormwater Report.

3.3 Stormwater Management Controls Sizing

Infiltration Chambers

A stormwater infiltration system consisting of subsurface chambers are proposed as part of the residential development. The system is designed with an outlet positioned above the bottom of the chambers, requiring the infiltration chambers to partially fill up prior to discharging.

The system has been designed to meet the required recharge volume, and will fully dewater within 72 hours.

Water Quality Structures

Five (5) water quality structures are proposed as part of the residential development. The water quality structures will treat the majority of pavement on the proposed residential lot except for a small portion of the ponding lot on the north side of the parcel which will drain to a sediment forebay.

Sediment Forebays

A reconstructed sediment forebay is proposed to the north of the wetland pond to provide treatment for a small pavement area prior to discharge to the pond. The sediment forebays provide water quality treatment and reduces the velocity of stormwater runoff prior to discharge.

3.4 Compliance with DEP Stormwater Management Standards

The proposed stormwater management system was designed in compliance with the ten (10) DEP Stormwater Management Standards. The following summary provides key information related to the proposed stormwater management system, its design elements, and mitigation measures for potential impacts.

STANDARD 1: **No new stormwater conveyance (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.**

There will be no direct discharge of untreated stormwater to nearby wetlands or waters of the Commonwealth. Runoff from all new impervious areas of the site will be conveyed to stormwater management practices for water quality treatment prior to discharge to adjacent wetlands. Riprap aprons are provided at all outfall points to prevent erosion in wetlands.

STANDARD 2: **Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.**

The stormwater management design will control post-development peak discharge rates for the 2-, 10-, 25-, and 100-year, 24-hour storms so as to maintain pre-development peak discharge rates.

STANDARD 3: **Loss of annual recharge to groundwater shall be eliminated or minimized through the use of environmentally sensitive site design, low impact development techniques, stormwater 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 types. 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 management system includes a subsurface infiltration system that will recharge groundwater on site to account for the increase in impervious area. As a result, annual groundwater recharge from the post-development site will approximate the annual recharge from the site under existing conditions.

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

The proposed development will meet the Standard 4 requirement to the maximum extent practicable using several on-site treatment trains that achieve 80% of TSS removal for the majority of the site which is a significant improvement over the existing impervious areas.

Structural BMPs designed for water quality treatment include water quality treatment units and the reconstruction of a sediment forebay.

All proposed stormwater management BMPs will be operated and maintained to ensure continued water quality treatment of runoff. The Site Owner's Manual will comply with the Long-Term Pollution Prevention Plan (Standard 4) and the Long-Term Operation and Maintenance Plan (Standard 9) requirements of the 2008 Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards. The Manual will outline source control and pollution prevention measures and maintenance requirements of stormwater best management practices (BMPs) associated with the proposed development.

STANDARD 5: For land uses with higher potential pollutant loads (LUHPPLs), 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 residential development will not be classified as a LUHPPLs

STANDARD 6: Stormwater discharges to critical areas must utilize certain stormwater management BMPs approved for critical areas. Critical areas are Outstanding Resource Waters, shellfish beds, swimming beaches, coldwater fisheries and recharge areas for public water supplies.

There are no stormwater discharges to critical areas associated with this project and; therefore not subject to Standard 6.

STANDARD 7: Redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable. However, if it is not practicable to meet all the Standards, new (retrofitted or expanded) stormwater management systems must be designed to improve existing conditions.

The project site is a mix of new development and redevelopment. The stormwater management system for the post-development complies with the MA DEP Stormwater Management Standards to the maximum extent practicable as mentioned above, and has been designed to improve existing conditions.

STANDARD 8: A plan to control construction-related impacts during 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 draft Stormwater Pollution Prevention Plan (SWPPP) will be developed to comply with Section 3 of the NPDES Construction General Permit for Stormwater Discharges; therefore the requirements of Standard 8 will be fulfilled.

STANDARD 9: **A Long-Term Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed.**

The Site Owner’s Manual will comply with the Long-Term Pollution Prevention Plan (Standard 4) and the Long-Term Operation and Maintenance Plan (Standard 9) requirements of the 2008 Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards. The Manual will outline source control and pollution prevention measures and maintenance requirements of the stormwater best management practices (BMPs) associated with the proposed development.

STANDARD 10: **All illicit discharges to the stormwater management system are prohibited.**

There will be no illicit discharges to the proposed stormwater management system associated with the proposed project. An Illicit Discharge Compliance Statement will be provided.