

DRAINAGE REPORT

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OCT 2 2013

**Planning, Assessing,
Zoning & Code Enforcement**

Prepared for:

Kappa Delta Sorority

25 Madbury Road

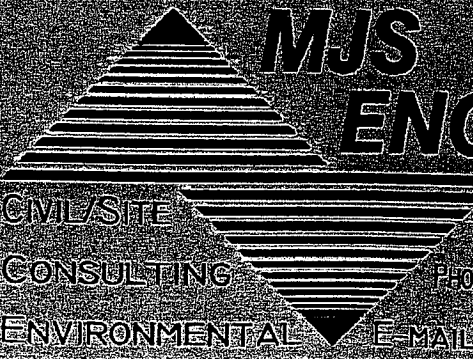
Durham, New Hampshire

Tax Map 2, Lot 12-2

Prepared on:

October 1, 2013

Prepared by:



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<u>Appendix Number</u>	<u>Date</u>	<u>Description</u>
A	9/30/13	Pre-Development Drainage Analysis and Plan
B	9/30/13	Post-Development Drainage Analysis and Plan

Project Background / Purpose

The subject property, also known as the "Kappa Delta Sorority", is shown as Tax Map 2, Lot 12-2 on the Durham tax maps, it is located at 25 Madbury Road. The parcel consists of approximately 0.6 acres and is improved with one residential structure, parking lot and landscaping. The property lies entirely in the Central Business District. The parcel slopes gently from the northeast to the southwest, with a low point located in the southwest corner of the parcel. The parcel is wooded along the westerly and southerly border to a depth of approximately 20' to 25' into the lot. Within the wooded area is a steep slope towards the abutting property.

The purpose of this project is to provide eight (8) new parking spaces for the Sorority use utilizing the area between the existing parking lot and the southerly boundary line. The grade slopes from the edge of the existing parking lot to the property line and will require the construction of a concrete retaining wall to build the additional parking spaces.

The proposed new parking lot will be constructed of porous pavement and sub base materials. This type of pavement will allow rainfall to seep through the surface and into the base materials reaching an under-drain system which will outlet the runoff through the front face of the concrete retaining wall and into a proposed swale. This combined system will collect, treat, detain, and infiltrate runoff from the property thereby greatly improving the water quality leaving the site.

Soil Mapping

The soils have been identified in accordance with the NRCS web soil survey for Strafford County. The following table lists the soil types that are within the modeled drainage area.

Soil Types

<u>Label</u>	<u>Description</u>	<u>HSG</u>
HcB	Hollis-Charlton Fine Sandy Loam (3-8% slopes)	C
HdB	Hollis-Charlton Very Rocky Fine Sandy Loam (3-8% slopes)	C

Drainage Analysis

Drainage conditions have been analyzed based on the runoff characteristics for one point of analysis (POA).

This analysis utilizes HydroCAD modeling software. This program models the runoff based on the SCS TR-20 method and the time of concentration based on the SCS TR-55 method. This analysis compares the runoff rates for the 2, 10, 25, and 50-year USDA/SCS Type III 24-hour storm events. The rainfall data used in the model is for the Town of Durham.

Comparison of Pre- vs. Post-Conditions

The following table quantifies the peak rate of discharge leaving the parcel at the point of analysis as shown on the Pre- and Post-Development Drainage Plans.

Table 1: Peak Rate of Runoff Comparison Table (cfs)

	2 Year Storm	10 Year Storm	25 Year Storm	50 Year Storm
Pre Development				
POA 1	0.60	0.97	1.20	1.35
Post Development				
POA 1	0.53	0.92	1.17	1.33

At POA 1, there is a decrease in all of the storms. This analysis assumes an infiltration rate of 5 in/hr which more closely mimics the performance of the porous pavement after 10 or more years of use.

Erosion & Sediment Control

Temporary and permanent practices are used to prevent and minimize erosion and sedimentation on site. The installation of Silt Soxx™ at the perimeter of construction areas will provide sediment retention during the construction phase of the development. Jute matting is proposed in the swale to prevent erosion prior to the establishment of permanent vegetation. Stone check dams may be installed in swale to reduce runoff velocity and allow for the settling of suspended solids, if necessary.

Conclusion

The enclosed comparative hydrologic model provides sufficient evidence that the proposed porous pavement will mitigate the typical increase in peak rate of stormwater discharge resulting from the increased impervious coverage. In addition, this new parking area collects additional onsite runoff that currently flows across and off the site thereby providing treatment that is not currently provided. The use of erosion and sediment controls and proper construction practices will minimize the impact of this project and minimize impacts to downstream surface waters.