

Section 3 - Drainage Summary

A full drainage analysis and report has been completed and provided to the Planning Division and DPW for review. Within this section the summaries of that drainage report have been included as an overview with this application along with a recreation trail detail showing how runoff will flow towards the existing quarry.

1. EXECUTIVE SUMMARY

The purpose of this project is to construct a retail site development with associated parking, drainage, and utilities located on the existing Pike Industries parcel bounded by Maine Street, Larrabee Road, the Westbrook Arterial, and U.S. Interstate 95 in Westbrook, ME.

A drainage analysis of the development site and its offsite contributing watershed areas was conducted for the purpose of estimating the peak rate of stormwater runoff and to subsequently design adequate drainage structures. Two models were compiled, one for the area in its existing (pre-development) condition, and a second for its proposed (post-development) condition. The analysis was conducted using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment. A summary of the existing and proposed conditions peak rates of runoff is as follows:

COMPONENT	PEAK DISCHARGE COMPARISON									
	1 Year		2 Year		10 Year		25 Year		100 Year	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Analysis Point #1	111.48	89.18	142.99	113.62	234.47	202.58	257.50	213.43	289.38	240.40

The drainage design intent for this site is to maintain the post-development peak flow to the pre-development peak flow conditions to the extent practicable and to effectively treat stormwater from the development of this site. This has been accomplished through the use of underdrained grass swales, wet ponds, gravels wetlands, and sand filters to maintain the peak discharge and effectively treat stormwater exiting the site.

5.1 INTRODUCTION

The intent of this project is to construct a retail commercial development consisting of multiple retail buildings and restaurants totaling 491,886 sq.ft. with associated parking, drainage, and utilities on City of Westbrook Map 42B / Lots 9, 10, 11, & 14.

5.2 METHODOLOGY

The existing and proposed watersheds were modeled utilizing HydroCad stormwater software, version 9.10. The watersheds were analyzed utilizing the SCS TR-20 methodology for hydrograph development and the TR-55 methodology for Time of Concentration (Tc) determination. The Dynamic-Storage-Indicating method for reach and pond routing was utilized. Type III, 24-hour hydrographs were developed for the 1-year, 2-year, 10-year, 25-year, and 100-year storm events corresponding to rainfall events of 2.80", 3.30", 5.00", 5.80" & 6.90" respectively.

Existing topography and site features were obtained through on-ground topography and existing conditions survey completed by Jones & Beach Engineers and Aerial Photography completed by Sewall Consulting. Existing soil conditions were derived from a combination of borings performed by Jones and Beach Engineers, a Site Specific Soil Survey conducted by Michael Cuomo, CWS, PWS, CSS, CPESC, and soils information obtained from the NRCS Web Soil Survey.

5.3 EXISTING CONDITIONS ANALYSIS

The study area consists of the subject property and upstream contributing area. The study area contains 212.789 acres including offsite contributing areas. The existing site was previously disturbed and is currently operated as a gravel quarry with concrete plant. The majority of the site is disturbed with multiple stockpiles located throughout.

Existing soil conditions were obtained from Site Specific Soils Mapping, on-site test pits, and NRCS Web Soil Survey. The existing soils are classified by the NRCS as a combination of Buxton, Elmwood, Hinckley, Hollis, Scantic, and Swanton soils. Areas of prior disturbance or prior fill were classified based upon the underlying soils.

One (1) Analysis Point (AP) is defined for this project.

Analysis Point #1 is defined as the culvert located under Interstate 95 located in the south-east portion of the site.

The existing site is divided into multiple watersheds. Drainage direction is generally from north to south with roadway drainage being directed to a closed drainage system along Maine Street and Larrabee Road and discharging to the existing stream located in the southern portion of the site.

Drainage collected in the existing quarry is pumped to an existing catch basin located in the eastern portion of the site and is discharged to the wetlands located in the southern portion of the site.

5.4 PROPOSED CONDITIONS ANALYSIS

The proposed site includes the construction of multiple retail buildings and restaurants totaling 491,886 sq.ft. Drainage from the proposed site is collected in a series of closed drainage systems and treatment features throughout the site.

The majority of the drainage on the North Campus is collected in closed drainage systems and directed to the existing quarry. Prior to discharge to the quarry, stormwater is treated via Grassed Underdrained Soil Filters, Underground Sand Filters, and/or Gravel Wetlands. The existing quarry has been designed to operate as a wet pond for stormwater treatment and detention. The discharge from the existing quarry has been designed to gravity drain to the existing wetlands on the South Campus.

North Campus drainage not directed to the existing quarry is treated via Grassed Underdrained Soil Filters and/or Underground Sand Filters and discharged to the existing closed drainage systems located within Maine Street and Larrabee Road. These systems are collected along Larrabee Road and discharged to the existing stream located on the South Campus.

South Campus drainage is collected within closed drainage systems. Stormwater is treated via Grassed Underdrained Soil Filters and/or Wet Ponds prior to discharge to the existing wetland system and stream located within the South Campus.

As the table in the Executive Summary demonstrates, the proposed peak rates of runoff have been maintained at the existing peak rates of runoff for the analyzed storms to the extent practicable.

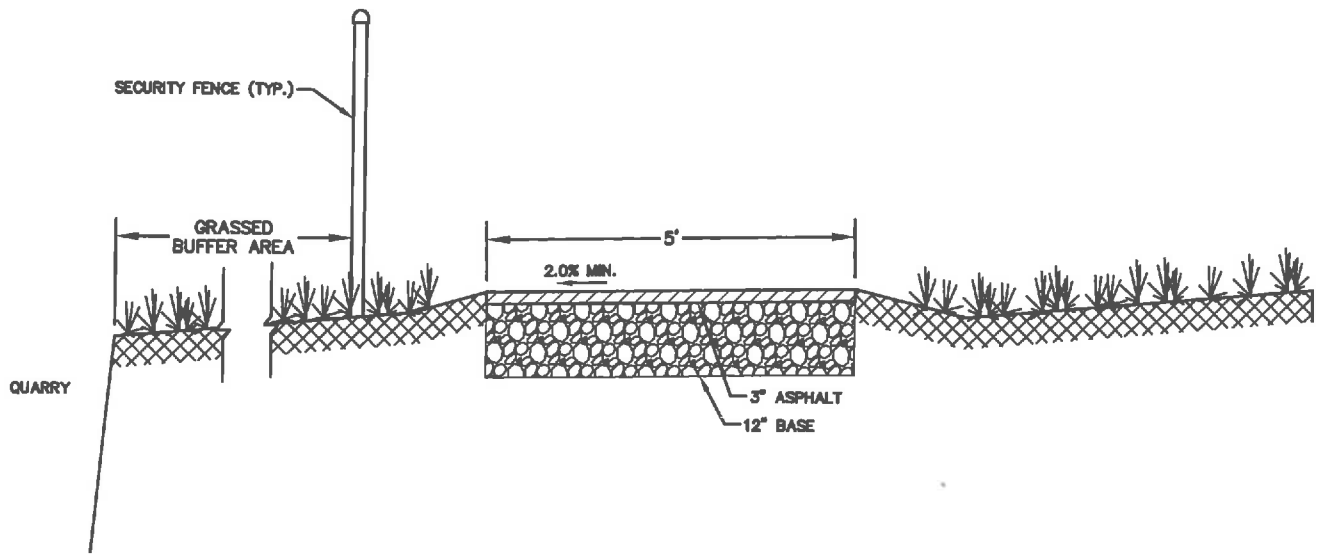
Infiltration was deemed impractical for this site due to the underlying marine clay soils throughout the site.

5.5 CONCLUSION

This proposed site development will have minimal adverse effect on abutting infrastructures or properties by way of stormwater runoff or siltation. Peak runoff rate from the proposed site has been maintained to the existing conditions peak rate to the extent practicable. Stormwater has been treated through the use of Grassed Underdrained Soil Filters, Underground Sand Filters, Wet Ponds, and/or Gravel Wetlands.

Respectfully Submitted,
JONES & BEACH ENGINEERS, INC.

Barry W. Gier, P.E.
Senior Project Manager



RECREATION TRAIL DETAIL

NOT TO SCALE

J/B Designed and Produced in NH
Jones & Beach Engineers, Inc.
Civil Engineering Services

85 Portsmouth Ave.
 PO Box 219
 Stratham, NH 03885

603-772-4746
 FAX: 603-772-0227
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Drawing Name: **REC. TRAIL DETAIL**

Project: **"DIRIGO PLAZA"**

Owner of Record:
 PIKE INDUSTRIES, INC. 3 EASTGATE PARK ROAD, BELMONT, NH 03220
 LL LATHROP LLC - 10 MOULTON STREET SUITE 4, PORTLAND, ME 04101

DRAWING No.

TD

SHEET 1 OF 1

JBE PROJECT
 No. 14110