Appendix G

Spring Creek North Ecosystem Restoration Study

Appendix G

Geotechnical Discussion

SPRING CREEK – Geotechnical Report
Brooklyn, Kings County, New York

PROJECT DESCRIPTION

Subsurface exploration was conducted at Spring Creek in 2003 as part of an effort to restore coastal wetland ecology to the area. Data was obtained by taking soil borings and geoprobes at several locations in the project area. The purpose of the investigation was to determine the geotechnical properties of the soils in the site and to determine the extent of placed debris in the project area.

SITE HISTORY

Spring Creek is located at the northern edge of Jamaica Bay, west of JFK International Airport, and north of the Shore Parkway (see Spring Creek Survey, July 2002 for location map). Historically, the creek was part of a tidal wetland draining into Jamaica Bay. Anthropogenic activities have degraded the wetland over time. Municipal waste was placed in the area approximately forty-five years ago. Demolition debris has also been disposed of in the area of the creek. The placed material has resulted in a narrowing of the historic creek channel and has displaced the wetlands.

SUBSURFACE EXPLORATION PLAN

Soil borings were collected from several locations within the study area. A derelict bridge was used as a point of reference to plan the drilling. Drilling was performed north of the derelict bridge, along the edge of the creek every 200 feet. A second area, south of the first, was also explored. Several samples were taken at a mound area in the middle of

the project area. Soil in a municipal placement area was also sampled by geoprobe along with an area west of the mound area.

SUBSURFACE EXPLORATION RESULTS

Spring Creek

Five borings were executed along Spring Creek (see Figure 5, Geotechnical Sampling Locations, borings SCSC1, 2, 3, 4, and 5). Debris was found to a depth of between 10 and 14 feet (10-14') at the five sample locations. The debris consisted of wood, glass, slag, metal, and rubber. Below the debris, natural soil was found. The first indication of natural soil below the debris was the presence of a meadowmat material consisting of organics and clay. Below the organic clay layer there is a layer of gray sand occurring between seventeen and eighteen feet (17-18'). No Shelby Tubes were taken in the clay layers.

Mound Area

There were six borings conducted in the mound area of the project (see Figure 11, Soil Boring Locations, borings SCMA-1, 2, 3, 4, 5 and 6). The borings were augered to a depth of ten to fourteen feet (10-14') and then SPT sampling was conducted. Generally, sand was found in the mound area (borings 1, 2, 3, and 5), the northern-most boring, boring 4, had a clay layer at the top and then sand. Boring 6, separated and to the west of the other five borings also had sand and no clay layers.

Placement Area

Geoprobes were conducted at the municipal placement area (see Figure 10, Geotechnical Sampling Locations, probes SC2B1, 2, 3, 5, 6, 8, and 9). The placement area has packed gravel placed over soil, approximately four feet (4') deep. The debris includes material such as ash, glass, and metal. Natural soil was found ten to eighteen feet (10-18') below the ground surface, indicated by the presence of meadowmat. Below the meadowmat, a layer of medium to coarse grained sand was found.

West Area

Matrix Environmental performed geoprobes east of the Mound Area (see Figure 5, Geotechnical Sampling Locations, borings SCSC-5, SCM-9, and 10 (labeled LC-1 through LC-8 by Matrix Environmental)) taking several probes at each location. A layer of asphalt, two feet deep, covers the area. The geoprobes went to a depth of between seven and sixteen feet (7 and 16'), finding fill material for most of that distance. Fill included glass, metal, wood, cinder, roofing debris, and coal. Meadowmat was found at LC-1 and natural soil was not found at any other probe location.

Spring Creek North Ecosystem Restoration Study

Appendix G

Design Discussion

Spring Creek North
Engineering Appendix G

PROJECT AREA

The Spring Creek North project area was divided into nine discrete areas to facilitate the design process. These nine areas are shown in Table- G1. The design was accomplished using Bentley MicroStation V8i SS3, a 3-dimensional computer-aided design (CAD) software. Three-dimensional surfaces were created from the designs using Bentley InRoads SS2, enabling volume calculations for clearing and grubbing, excavation and placement (cut and fill) and the clean fill layers for each of the nine design areas. 2012 LiDAR data of the project area were used to create an existing conditions surface, against which the design surfaces were evaluated.

Table G-1 Project design areas

Design location	Area (acres)
A	3.13
B Marsh	6.88
B Upland/Maritime	2.83
C	0.49
D	1.46
E Marsh	1.35
E Upland/Maritime	9.28
F Upland/Maritime	2.70
G Upland Maritime	6.90

DESIGN ELEVATIONS FOR MARSH VEGETATION

Design elevations for the marsh plantings were based on bio-benchmarks that were collected in 2003 (Refer to the main text of this report, Section 3.3.6 Wetland Hydrology). Based on the 2003 data, the elevation range for low marsh was determined to be between 0.60 ft and 2.63 ft (NAVD); the high marsh range was determined to be between 2.60 ft and 3.0 ft (NAVD). Maritime upland was determined to be at elevation 3.0 ft NAVD and above.

To account for future sea level rise due to climate change, the design elevations were set between the middle to upper elevations within the vegetation ranges. These mid-to-upper elevations should facilitate the gradual migration of the vegetation toward higher elevations as the tidal

datums increase over time. Design elevations used are shown in Table G-2. The Sandy Hook, NJ tide gage, which is appropriate for the waters of Jamaica Bay, shows an upward trend in sea level rise at a rate of 3.97 mm/year.

Table G-2 Design elevations for vegetation communities

Vegetation Community	Low Elevation (ft NAVD)	High Elevation (ft NAVD)
Low Marsh	1.5	2.3
High Marsh	2.3	3.2
Scrub-shrub	3.2	4.0
Upland/ Maritime	4.0 and above	

PROPOSED GRADING PLAN

The proposed grading plan was designed with the goals of minimizing offsite disposal of excavated material while attempting to maximize the restoration of low and high marsh. The proposed design requires the excavation of approximately 104,000 cubic yards of material and it is assumed that approximately 5% of that material will not be suitable for reuse onsite due to buried trash and debris. The proposed design requires the redistribution of approximately 99,000 cubic yards, which is approximately the remaining quantity of excavated material, less the quantity assumed to be unusable.

If, during construction, a lesser-than-assumed quantity of excavated material is actually available, Placement Areas F & G can be constructed to a lower elevation without consequence.

Figure G-1 shows the proposed grading plan.

A:\en\Spring Creek 2014\Spring_Creek_CRB_L_Drive\Spring Creek_Bethany\Microstation\gsw_Jan2015\SprCrkDesign_12Feb16_2D.dgn
A:\en\Spring Creek 2014\Spring_Creek_CRB_L_Drive\Spring Creek_Bethany\Microstation\gsw_Jan2015\Pen Tables\SprCrk_grading.tbl

MAY 2009 NYD BORDER

ALL DIMENSIONS/EXISTING CONDITIONS SHOWN SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE. ANY DISCREPANCIES SHALL BE IMMEDIATELY REPORTED TO THE GOVERNMENT FOR CLARIFICATIONS. DRAWING SHALL NOT BE SCALED TO OBTAIN DIMENSIONS OR DISTANCES.

100 50 0 100 200FT
SCALE: 1"= 100'

US Army Corps of Engineers
New York District

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U. S. ARMY ENGINEER DISTRICT
NEW YORK
http://www.nan.usace.army.mil

CIVIL RESOURCES BRANCH
ECOSYSTEM RESTORATION TEAM
CENAN-EN-H

DESIGNED BY: GSW		DATE:
DWN BY: GSW	CKD BY:	SOLICITATION NO.:
SUBMITTED BY: GSW		CONTRACT NO.:
FILE NAME:		
SIZE: ANSI D	PLOTTED BY:	PLOT DATE: 6/16/2016

Spring Creek North Marsh Restoration Site
Queens, New York

Proposed Grading Plan

Figure G-1