



DUNKELBERGER ENGINEERING & TESTING, INC.

Geotechnical • Materials Testing/Inspection • Environmental

City of West Palm Beach
Engineering Services Department
1000 45th Street, Suite 15
West Palm Beach, FL 33407

June 21, 2007
Project No. 07-21-6867

Attention: Mr. Carl A. Shepherd, P.E.

Subject: ***Subsurface Study***
FEC Railway Yard Buffer Wall
From 15th Street to 23rd Street
West Palm Beach, Florida

Gentlemen:

INTRODUCTION

This firm has completed a subsurface study in connection with the buffer wall to be constructed along the east side of the Florida East Coast (FEC) Railway yard between 15th Street and 23rd Street in West Palm Beach, Florida. Results of the study are presented herein.

PROJECT CONSIDERATIONS

The project will involve the construction of an 8± foot high buffer wall that extends from 15th Street to 23rd Street over a length of 2300± feet. The wall system will consist of precast concrete panels that are supported at their ends on 36-inch diameter drilled piers which extend about four feet below grade.

SUBSURFACE CONDITIONS

Subsurface conditions along the wall alignment were explored with fifteen engineering borings located as shown on Sheet 1. The borings were extended to 16 feet below grade using a truck mounted customized drill rig that employed mud rotary techniques. Samples of the in-place materials were obtained at frequent vertical intervals utilizing a standard split barrel driven with a 140 pound drop hammer freely falling 30-inches (the Standard Penetration Test after ASTM 1586). The upper four feet of the borings were drilled with a hand auger to avoid possible conflict with underground utilities. Manual cone penetrometer tests were conducted at one foot intervals in each profile as the borings were advanced to assess the relative density of the upper soils. A Brainard-Kilman Model S-214 cone penetrometer was used for this purpose. Logs of the borings along with records of the Standard Penetration Tests and cone penetrometer tests are provided on Sheets 2A and 2B.

With minor variations, the borings disclosed the buffer wall alignment to be mantled by 1 to 5 feet of loose to medium dense, fine to medium sand with scattered gravel and shell fragments. Loose to medium dense fine sand follows and continues to the terminal depth of exploration.

Groundwater levels were measured in the borings when the free water surface was initially intercepted. The depth to the water table on the dates of the field exploration (June 11 and June 12, 2007) ranged from 11.1 to 13.0 feet below the ground surface and averaged 11.9 feet. The variations in the water table depth are attributed to differences in the ground surface elevation at the boring locations. We expect that the water table at the site could rise by as much as two feet above the measured levels during the height of the wet hydroperiod when rainfall and recharge are at a maximum.

FOUNDATION DESIGN

The sandy soils which exist along the alignment of the buffer wall have modest shear strength and compressibility. Therefore, they will provide adequate support to the drilled pier foundations that support the wall panels.

The piers will principally support the gravity loads imposed by the wall panels in end bearing. Thirty six inch diameter piers that are embedded at least four feet below the lowest adjacent grade may be proportioned for an allowable bearing pressure of 2,200 pounds per square foot. The allowable bearing pressure is contingent on the piers being able to safely withstand a total settlement of one half inch. This settlement will occur virtually as rapidly as the gravity loads are applied.

Lateral loads which are applied to the piers will be resisted by earth pressure mobilized in the soils in which they are embedded. The table below provides soil parameters that may be used in determining horizontal earth pressure.

<u>Soil Parameter</u>	<u>Recommended Value</u>
Soil Unit Weight	105 pcf (moist) 43 pcf (submerged)
Angler of Internal Friction	29 degrees
Cohesion	0 psf
Active Earth Pressure Coefficient	0.347
Passive Earth Pressure Coefficient	2.88

- Notes: 1. pcf denotes pounds per cubic foot.
2. psf denotes pounds per square foot.



This study has been performed in support of the construction of the buffer wall to be installed along the east side of the FEC Railway yard between 15th Street and 23rd Street in West Palm Beach, Florida. DE&T warrants that the recommendation provided herein are based upon recognized practice in the disciplines of soils mechanics and foundation engineering. No other warranties are implied or expressed.

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We trust that the information presented herein is clear and understandable. Should the contents of this report require any clarification or amplification, please feel free to contact us.

Very truly yours,

DUNKELBERGER ENGINEERING & TESTING, INC.



Jason DuBois
Engineering Associate



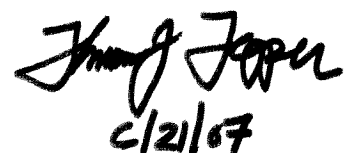
Thomas J. Tepper, P.E.
Principal Engineer
FL Registration No. 27451

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Attachments: Sheet 1 – Boring Location Plan
Sheets 2A and 2B – Subsurface Profiles

cc: Addressee (3) ... *via fax and U.S. Mail*

DE&T



c/21/07