Appendix D

Environmental Site Assessment Report

and Soil Report

TESTING SERVICE CORPORATION

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Local Office
July 28, 2009

Mr. Dan Stevens
Spaceco, Inc.
9575 W. Higgins Road, Suite 700
Rosemont, Illinois 60018

Re: L-73,237A
Proposed Detention Basin
SEC North & Prospect Avenues
Bartlett, Illinois

Dear Mr. Stevens:

This report presents results of seven (7) soil borings performed in connection with a proposed detention basin in Bartlett, Illinois. These geotechnical services have been provided in accordance with the attached General Conditions (as modified for Spaceco), incorporated herein by reference. Four (4) soil borings were originally drilled for this project in April 2009, the associated preliminary report under L-73,237 being dated May 6, 2009.

The project site is located at the southeast corner (SEC) of the intersection between North and Prospect Avenues. This roughly triangular-shaped parcel is bordered on its southeast side by a railroad siding, encompassing approximately 14 acres. Standing water and/or marshy vegetation cover a large portion of the site centered on the east-central portion. Much of the remainder is wooded or contains scattered trees. It is understood that the average ground elevation is approximately 788.

High water level (HWL) and normal water level (NWL) for the proposed detention basin have been preliminarily set at Elevations 788 and 779, respectively. The bottom of the basin will mostly be 1-foot deep, with a small area of open water to probably be about 5 feet deep. Excavation depths are therefore expected to be on the order of 10 to 15 feet, with almost all of the material to be hauled offsite.

Field Investigation and Laboratory Testing

Borings 3-6 were originally drilled on the western and southern portions of the site. Borings 1 and 2 on the northern portion and B-7 nearer the center were added after a beaver dam was removed in order to drop the water level. The east-central portion could still not be drilled due to the presence of standing water. A Boring Location Sketch is attached herewith; it is understood that boring locations and elevations will be tied in by the project surveyor.

Borings 1-7 were all extended to 20 feet below existing grade. They were drilled and samples tested in accordance with currently recommended American Society for Testing and Materials specifications. Soil sampling was performed at 2½-foot intervals in conjunction with the Standard Penetration Test, for which driving resistance to a 2" split-spoon sampler (N values in blows per foot) provides an indication of the relative density of granular materials and consistency of cohesive soils. Water level readings were taken during and following completion of drilling operations.

All soil samples were examined in the laboratory to verify field descriptions as well as to classify them in accordance with the Unified Soil Classification System. Laboratory testing included moisture content and dry density determinations as well as measurements of unconfined compressive strength, as

appropriate. Reference is made to the attached boring logs which indicate subsurface stratigraphy and soil descriptions, water level observations, and results of field and laboratory tests. Definitions of descriptive terminology are also included.

Discussion of Test Data

Surficial topsoil was approximately 12 inches thick at Borings 1, 2 and 5, extending 2½ to 5 feet below existing grade at the remaining boring locations. The clayey topsoil materials had moisture contents ranging from 24 to 36 percent. The deeper topsoil at Borings 3 and 4 appeared to at least partially consist of fill.

Peat, organic clay and very soft silty clay were found underlying the topsoil layer at Borings 3 and 7, extending to approximately 8 and 13 feet below existing grade, respectively. Peat encountered in the upper 8 feet of B-7 had very high moisture contents in the range of 165 to 225 percent. Organic clay found underlying it as well as in the upper 5 feet of B-3 had moisture contents of 50 to 90 percent. The very soft silty clay also present at B-3 had a pocket penetrometer reading of less than 0.25 tons per square foot (tsf) at a moisture content of 30 percent.

Relatively moist silty clay of medium to high plasticity was found directly underlying the topsoil layer in the upper 3 feet of Borings 1, 2 and 5. These materials had unconfined compressive strengths ranging from about 0.5 to 1.5 tsf at moisture contents of 30 to 33 percent. Loose clayey sand, silty sand and medium to fine sand layers underlie relatively soft clay soils at B-1, extending from approximately 3 to 13 feet below existing grade. These intermediate/granular deposits had N-values ranging from 9 to 12 blows per foot (bpf).

Stiff to very tough silty/sandy clay soils of low to medium plasticity otherwise predominated, extending to the bottom of the borings. These cohesive materials had unconfined compressive strengths typically ranging from 1.0 to 3.0 tsf at moisture contents of 13 to 23 percent. Loose clayey silt and clayey sand layers were also found interbedded within the cohesive soil mass, directly underlying the topsoil layer at 5 feet deep in B-4.

Free water was initially encountered at 2½ to 5½ below existing grade in the majority of the borings, up to approximately 10 feet deep at B-2. Water levels in the boreholes upon completion of drilling had risen in most cases, to within 0 to 4 feet of the ground surface. The one exception was B-2 which was noted to be dry.

Analysis and Recommendations

Stiff to very tough silty/sandy clay soils which predominate in the Borings 2 and 4 - 6 are considered relatively favorable for design and construction of a proposed detention basin. In this regard, the cohesive materials should be stable on maximum 4H:1V slopes typically used for this purpose. They also represent suitable borrow materials, i.e. could be placed as structural fill in building pad and pavement areas subject to reworking and recompaction.

Loose to firm clayey sand, silty sand and medium to fine sand deposits were encountered from approximately 3 to 13 feet below existing grade in B-1. These intermediate/granular materials were in a wet to saturated condition at the time of drilling, with groundwater present at approximately 1 to 3 feet deep. They are expected to be unstable in side slope excavations, to slough relatively quickly when exposed. Flatter slopes on the order of 6H:1V will be required in connection with them, with a clay cap

or gravel cover also recommended. Loose clayey silt and clayey sand layers also encountered in the other borings may lead to localized sloughing.

Peat, organic clay and very soft silty clay were encountered in Borings 3 and 7, extending to approximately 8 and 13 feet below existing grade, respectively. Flatter slopes on the order of 10H:1V or removal and replacement will be required if these weaker materials are encountered on the perimeter of the basin excavation. The organic soil types are also unsuitable as borrow, i.e. cannot be placed in building pad or pavement areas.

Groundwater seepage should not be a major problem due to the cohesive nature of the subsurface soils at the majority of the borings. Although permeability tests were not performed on the clay materials, we would estimate their coefficients of permeability to be in the range of 10^{-7} to 10^{-8} cm/sec, making them practically impervious. However, concentrated seepage should be expected from thicker sand deposits which are present at B-1, to also occur locally from silt and sand layers otherwise found interbedded within the cohesive soil mass. The seepage zones may have a negative impact on side slope stability, to also likely be localized except at B-1.

The reader should note that a large portion of the site is presently under standing water, i.e. is relatively low-lying in relationship to the presently drilled boring locations. It is possible that less favorable soil conditions are present in these areas, centered on the east-central portion of the site. The site would have to be pumped down in order to drill there; limited access could also be gained along the railroad siding. In any event, the presence of relatively deep organic clay and peat in this area could significantly impact design plans.

Closure

The analyses and recommendations submitted in this report are based upon the data obtained from the seven (7) soil borings performed at the locations indicated on the Boring Location Plan. This report does not reflect any variations which may occur between these borings or elsewhere on the site, the nature and extent of which may not become evident until during the course of construction. If variations are then identified, recommendations contained in this report should be re-evaluated after performing on-site observations.

It has been a pleasure to assist you with this work. Please call if there are any questions or if we may be of further service.

Respectfully submitted,

TESTING SERVICE CORPORATION

Michael V. Machalinski
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Enc. (3 books)