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May 31, 2005

Mr. Robert Gilmore, DPW Superintendent
Village of Cornwall-on-Hudson
325 Hudson Street
Cornwall-on-Hudson, New York 12520

Re: VILLAGE OF CORNWALL-ON-HUDSON
New DPW Garage
DH Project No. 7630010

Dear Mr. Gilmore:

Based upon our recent office meeting, we understand that the Village has developed a plan to construct a new DPW building on Village property on Shore Rd. As you requested during that meeting, we have reviewed the previous soils investigation report for the site of the proposed DPW Garage for the purpose of providing guidance on the intended foundation relative to the following comments recently raised concerning this project:

1. One Village Trustee has expressed concern that weak soils could be encountered during the foundation construction which could require field modification of the foundation and has therefore recommended that the Village Engineer make arrangements for a testing firm to be present during the foundation work to check and verify bearing capacity during the construction of the foundation.
2. During the public hearing, the issue of the property being a previous dump site was discussed. The Village would like our office to review the previous sub-surface investigations to provide a determination regarding the presence or absence of toxic materials.

Background

The Village is proposing a new DPW garage on the site of the present DPW storage yard/sanitation garage facility. Based upon the information provided by the DPW Superintendent, the proposed garage is intended to be a 70-foot by 184-foot clear span 'pole barn' structure with a 16-foot ceiling height. The proposed floor slab is intended to be a 12-inch thick concrete slab sitting on 24-inches of item 4 gravel placed over existing soils. The foundation for the poles is intended to have a bottom elevation 2-feet below existing grade and is intended to be a 2-foot wide, 1-foot thick strip footing around the building perimeter. The cost of the building itself is reported as \$800,000, the project cost including site work is reported to be \$910,000.

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A previous sub-surface investigation report was prepared for the purpose of determining if the existing site soils would be suitable for a then proposed DPW garage (1 story, 65-foot wide by 120-foot long). A copy of this report was provided for our review. It was prepared in August 1973 by William G. McEvelly, Professional Engineer and Land Surveyor. The subsurface investigation included the advancement of 3 soil borings (B-1, B-2, and B-3) to depths of 52, 57, and 67 feet, respectively.

Foundation Conditions

Regarding the concerns raised about "weak soils", the sub-surface investigation performed in 1973 did confirm that poor soil conditions are a serious concern at this site. In fact, the report recommended that a pile foundation be utilized for the then proposed DPW garage.

Of the 3 borings performed, boring B-2 appears to be in the immediate vicinity of the northwest corner of the proposed building. This boring indicates topsoil to a 1-foot depth, miscellaneous (loose) fill to a depth of 7-feet, silt and cinders to a depth of 13.5-feet, and layers of peat and organic silt from depths 13.5 feet to 47-feet, with stiff clay layers below that. As the report indicates, only the lowermost layers are expected to provide any suitable bearing capacity. The 33.5 feet of peat and organic silt layers are highly compressible and therefore significant settlement could be anticipated for any large structure, even a pole barn structure, founded on the overlying soils. Also, given the thickness of the compressible soils, a mat style foundation (a floating slab) would also be expected to experience excessive settlement. Therefore, based on the findings of this report, it is our opinion that a pile foundation would be necessary for the proposed structure.

Toxic Materials

Regarding the concern about toxic materials, the previous sub-surface investigation and report were prepared for the purpose of investigating physical characteristics of the sub-surface soils, not their chemical characteristics. Therefore, there is no site specific data contained in the report upon which to comment regarding toxic materials. The borings do make note of the presence of 'cinders and miscellaneous fill (glass, metal, timbers, ashes)' which for the most part might be expected to be relatively inert, but the description of the material is not very detailed and the borings do only represent a 'small' sampling of site materials. Boring B-2 is in the immediately vicinity of the northwest corner of the presently proposed garage which indicated 1 foot of top soil covering the miscellaneous fill. Based on the information available, we would simply recommend that should any excavations on site reveal any questionable materials/conditions (e.g. chemical drums, noxious odors, etc.), that work be halted and any "found" condition be investigated as may be warranted.

Recommendations and Conclusions

As was originally recommended in the 1973 report, we believe that a pile foundation should be utilized for the proposed garage. At least one more (and we would probably recommend several more) borings on the opposite corner of the proposed building should be obtained by a geotechnical engineer and provided to a pile foundation contractor in order to obtain pricing for the foundation. For best performance the building slab should be a structural slab also supported by piles.

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Very approximately, a pile foundation, based on the assumptions noted below, could add over \$230,000 to the cost of the project:

- 75' by 184' building with a loading of approx. 300 psf = 2,070± ton structure
- assume pile capacity of 10 tons each, and pile length of 55 feet, per 1973 report (subject to actual field determination at the time of construction)
- use \$20/linear foot (from current cost estimating guides) for concrete piles, probably more considering location factors, prevailing wages, etc.

During the course of this review, we learned that the builder is proposing to construct the structural framing of the pole barn garage to 'commonly employed standards' for this type of structure. We recommend, however, for a building of this size and expense which is intended to house public employees and equipment, that an engineered design for the building be provided to the Village in order to document that all applicable design codes and loading conditions have been addressed.

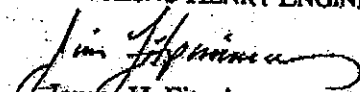
Also, one of the main advantages of pole barn style construction is typically the cost saving in the foundation work. As it appears that a foundation cost savings may not be realized at this site, it may be worthwhile to consider other construction techniques (e.g. pre-engineered steel building, timber column building).

We understand the Village's interest in seeking to move the project to completion. However, the historical geotechnical report on file with the Village strongly suggests that a more extensive foundation design is required than currently intended.

If you have any questions concerning this matter, please do not hesitate to contact our office.

Sincerely,

DUFRESNE-HENRY ENGINEERS AND LANDSCAPE ARCHITECT, P.C.


James H. Fitzsimmons, P.E.
Senior Project Manager

JHF/eam

DH