patersongroup memorandum

consulting engineers

re: **Geotechnical Assessment**
Proposed Building Renovations
1498 Stittsville Main Street - Ottawa

to: OMNI Construction Services - **Mr. Richard Masse** - richard@omniconstruction.ca

date: October 1, 2020

file: PM12770-MEMO.01

Further to your request, a site visit was made on September 29, 2020 to review conditions in test pits dug inside the existing building located at 1498 Stittsville Main Street. The foundation for the existing building is rather variable. It appears that much of the framing for the building sits on a concrete slab. The rear portion appears to have a shallow foundation wall comprised of rubble concrete (concrete with large aggregate pieces). The existing concrete slab-on-grade is below the exterior ground surface at the front of the building.

A test pit had been dug adjacent to the interior side of the south wall, at approximately 3 m from the southeast corner of the building. At that location, a 100 mm thick layer of rubble concrete was found to be underlain by fill material comprised of large cobbles in a matrix of silty sand. A 50 mm thick layer of ashes or cinders was encountered below the cobble fill, at a depth of 0.55 m below the top of slab. Fill material comprised of light brown sand with silt layers and debris was encountered at a depth of 0.6 m below slab surface. Compact reddish brown silty fine sand was encountered at a depth of 0.9 m below the slab surface. A hand auger hole put down below the bottom of the test pit terminated in silty fine sand at a depth of 1.8 m below the slab surface. Water was not encountered. A plastic pipe was noted at a depth of approximately 0.8 m below the slab surface.

A second pit was dug adjacent to the north wall at approximately 2 m from the northwest corner of the building. The concrete slab was found to be 120 mm thick at this location. A rubble concrete foundation wall was found at this location. The underside of the foundation wall was encountered at a depth of 1.1 m below the slab surface. Adjacent to the foundation wall, the fill material consists primarily of rubble (cobbles in a matrix of silty sand). Dark brown silty topsoil was encountered at a depth of 1.2 m below the slab surface. Compact reddish brown silty fine sand was encountered at a depth of 1.25 m below the slab surface. The test hole terminated in silty fine sand at a depth of 1.5 m below the slab surface. Groundwater was not encountered. The rubble concrete foundation wall was observed to be rather weak and deteriorated.

It is our understanding that it is planned to excavate to construct conventional frost wall foundations where there is sufficient room to do that (primarily the east and west walls). However, due to spacial limitations, underpinning is being considered for the south wall and much of the north wall.

On an undisturbed bearing surfaces, the silty fine sand encountered below the fill and topsoil could be taken to have an allowable bearing pressure (or a bearing resistance at SLS) of 100 kPa and a factored bearing resistance at ULS of 150 kPa.

The silty fine sand is considered to be rather frost susceptible. As such, a soil cover of at least 1.5 m is recommended over the bearing surfaces for the perimeter foundations of a heated building.

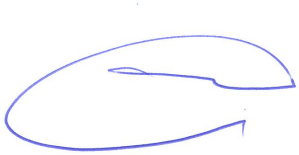
In theory, rigid insulation could be used to supplement soil cover as frost protection, where less than 1.5 m depth of soil cover is provided. A typical frost protection detail requires that rigid insulation extend horizontally, well past the exterior edges of the footing or underpinning. It is our understanding, that the existing building is essentially constructed at the north and south property lines, creating a situation where insulation cannot be extended laterally. In this regard, it is recommended that the north and south foundations be taken to a depth of at least 1.2 m below exterior grade and that 50 mm thick rigid insulation be installed vertically on the exterior face of the concrete (foundation wall or underpinning) from the ground surface to near the underside of concrete to keep the foundation as warm as possible. Where underpinning is being conducted, rigid insulation could be used as the exterior form for the concrete.

It is recommended that all bearing surfaces be reviewed by a member of Paterson staff, prior to the placement of concrete for footings or underpinning sections.

It is our understanding that the new slab-on-grade floor will be up to 380 mm higher than the surface of the existing slab. If the existing slab is removed, it is recommended that the subgrade surface be proof rolled or pre-compacted prior to placing Granular A fill material. If the existing slab is left in place, a layer of Granular A could then be placed and compacted to the underside of the new slab level. It is recommended that all new fill material be compacted to at least 98% of its Standard Proctor Maximum Dry Density.

We trust that this information satisfies your immediate requirements.

Paterson Group Inc.



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