

III-I | GEOTECHNICAL TECHNICAL SUMMARY

A comprehensive geotechnical investigation was initiated by the GCEDC in December 2017 and expanded through subsequent fieldwork in 2021 focusing on the southern campus. These evaluations involved a series of 25 test borings, the installation of five groundwater observation wells, and seismic shear wave surveys. Laboratory testing was also performed on soil and bedrock samples to determine the site's mechanical properties. Recent fieldwork in February 2026 included 14 test borings (advanced to depths up to 46.5 feet), 15 test pits, and specialized seismic testing, including five Seismic Cone Penetration Tests (SCPTu) and a Multichannel Analysis of Surface Waves (MASW) survey.

Subsurface Conditions and Composition

The investigations reveal a consistent and favorable subsurface profile for large-scale development. The site is primarily underlain by medium-firm to hard, low-plasticity clay. This layer eventually transitions into weathered dolomite bedrock, typically encountered at depths below 30 feet. Groundwater levels are generally expected to be found between 10 and 15 feet below grade.

Engineering and Seismic Specifications

The subsurface data supports the following design parameters:

- **Foundation Support:** Preliminary allowable bearing capacities range from 3 ksf to 5.5 ksf. The proposed structures may be supported on conventional shallow foundations, provided ground improvements—specifically Rigid Inclusions (RIs)—are installed. This method was selected over deep foundation options (such as driven piles or caissons) due to time, cost, and noise considerations.
- **Settlement:** Soils are expected to behave in an elastic manner, with settlement typically concluding within 1 to 3 months following the placement of new fills.
- **Seismic Classification:** The site's seismic properties were refined using shear wave velocity (V_s) measurements. The time-weighted average V_s in the upper 100 feet (V_{s100}) was calculated at 2,016 feet/second. The site is classified as Seismic Class "C" based on measured shear wave profiles, indicating moderate seismic ground motion and consistent with the New York State Building Code and ASCE 7-22.
- **Hazard Mitigation:** Analysis indicates a low potential for liquefaction and negligible risk regarding soil corrosion or sulfate attack on buried concrete and metal components.

Ongoing and Future Evaluations

The 2017, 2021, and 2026 studies confirm that the underlying geotechnical makeup supports the project's foundational requirements. Additional geotechnical investigations will be conducted as required and these localized studies will refine the final structural engineering and allow for the development of tailored construction methodologies specific to individual buildings and infrastructure.

Localized Dewatering for Construction

Construction-related dewatering is not anticipated to have a significant adverse impact on the groundwater table, private water wells, or the downstream ecosystems of the Tonawanda Seneca Nation.

The documented subsurface profile consisting of low-plasticity clay and dolomite bedrock typically encountered below 30 feet establishes a favorable environment for hydraulic containment. The site's geological makeup provides high confidence that the "cone of depression" from localized pumping will remain well within the project boundaries and will not affect distant residential water supplies.

Furthermore, while the site naturally drains toward Tributary 2 and northern drainages into Wetland 4, these features outlet via Tributary 1 onto private property north of the STAMP site rather than onto the Nation's territory. The low-permeability clay typical of the area prevents the subsurface "draining" of these features, maintaining the existing hydrological balance. To ensure the continued protection of downstream resources, the project will utilize Best Management Practices (BMPs), including sedimentation basins and monitored filtration. These measures are designed to ensure that the volume and quality of water discharged from the site remain consistent with natural, pre-construction conditions.