

Maple GO Transit

SienaStone | Case Study

Learn Why SienaStone.

Overcome poor foundation conditions to achieve suitable bearing capacity

Exceeds MTO's stringent Compressive Strength requirements

Achieves remarkable stability & performance, proven through long-term monitoring



RisiStone
retaining wall systems

Fully Monitored Wall Meets & Exceeds Expectations for MTO Demonstration Project



Wall Engineer

Risi Stone Inc.

Newmarket ON

Civil Engineer

SRM Associates

Manufacturer

Unilock Ltd.

Georgetown ON

Installer

Regent
Landscape Ltd.

Aurora ON

GO Transit, the public transit service for the Greater Toronto and Hamilton areas, planned an ambitious parking expansion project at the existing Maple GO Station in Vaughan, Ontario. A large 6m high, 300m long retaining wall was specified in order to maximize the usable parking area.

Based on several, past successful projects with GO Transit, Risi Stone Systems provided a full wall design utilizing the SienaStone System. The wall contract was awarded to Regent Landscape, one of the GTA's premiere Wall Builders with over 30 years of experience.

This SienaStone wall was constructed in two phases, with the first being a 100m section that required additional foundation replacement and improvement due to poor site conditions. Use of geotextiles and high quality imported fill was mandatory to achieve the bearing capacities stated in the Design. To ensure the minimum 150 kPa allowable Bearing Capacity below the wall, the Site Geotechnical Engineer recommended OPSS Granular B fill material be compacted to 98% SPD in the designated areas. Because the "Wall" is not limited to just the SienaStone facing units, but is in fact the entire Geogrid Reinforced structure, it was necessary to redevelop the foundation for the entire width of the reinforced zone, plus an additional 60cm in front and behind. This is an effective method of reaching the "competent" founding elevations without increasing the height of the Wall.

Prior to the construction of the remaining 200m of wall, it was decided that this wall would be utilized as demonstration project by Risi

Stone Systems and Unilock to advance the SienaStone product on the Ministry of Transportation Designed Source for Materials (DSM) List from the existing status as a "Non-Reinforced" wall to a Geogrid Reinforced System.

The MTO specifications required that the SienaStone product meet a minimum compressive strength requirement of 40 MPa. Research done by the NCMA (National Concrete Masonry Association) has shown that the compressive strength of a block is directly related to its long term durability and freeze-thaw resistance, particularly in cold climates.

As part of the approval process, the MTO also requires the demonstration project to be regularly monitored (every 2 months) following construction for a period of 1 year to observe any settlement or movements that may occur. The size and scale of the GO Transit project was ideal for the type of structure the MTO would consider, so detailed monitoring began shortly after construction. After a year round survey & monitoring program, the SienaStone wall performed beyond expectations, with little to no movement observed. The maximum movement on the 6m height was in the range of 3mm-4mm, which is considered to be within measuring tolerance by the Surveyor.

This level of performance is a testament to the Contractor's thorough quality control and construction practices, which are as important as any aspect of the design or engineering, as well as the stability and dependability of the SienaStone wall system.

