



May 28th, 2024

GRIT File No.: GE23-0387-2-GEO-SMP-REV-1-2024-05-28

Tridon Group Limited
Att.: Adrienne Wieler
609 William Street Unit, 200
London, ON, N6B 3G1

**Settlement Monitoring Plan
Sol Haven Sanitary Trunk Sewer Crossing
Bluewater Highway (Hwy 21), South Huron, Ontario
Geocres number 40P05-022**

(85 m Northeast Of 70671 Bluewater Hwy, Grand Bend, Ontario, N0M 1T0)

GRIT Engineering Inc. (GRIT) was retained by Tridon Group Limited (Client) to prepare a settlement monitoring plan for a new proposed sanitary trunk sewer crossing as shown on GRIT Engineering Inc., Project No. GE23-0387-2, DWG C400-402, dated 2024-04-03. The 750 mm diameter steel casing will allow for a new 450 mm diameter sanitary trunk sewer to cross below Bluewater Highway (Hwy 21).

GRIT completed a geotechnical investigation for this project on April 10, 2024, which involved drilling two sampled boreholes (BH4-24 and BH5-24) on the Site/Study Area. The boreholes were drilled to a depth of 5.94 and 9.75 meters below the ground surface (mbgs), respectively. The investigation found that installing the pipe by horizontal directional drilling or jack and bore would be geotechnically feasible based on the soil deposits encountered at the boreholes. The relatively homogenous native silt and clay till soils are expected to be stable and no obstructions are expected based on the results of the boreholes. The sanitary sewer should be installed within the stiff to hard glacial till deposits, where possible.

It is understood the Ministry of Transportation of Ontario (MTO) requires a Settlement Monitoring Plan for the Jack and Bore operations be approved prior to construction. The following paragraphs outline the proposed surface settlement monitoring plan in accordance with MTO document "Pipe Installation by trenchless Method – Non-Standard Special Provision (NSSP)", Section 7.07 – Instrumentation & Monitoring, dated July 2020.

Baseline Survey

Surface settlement monitoring points will be installed on the traffic lanes and shoulders to monitor settlement and stability during and after installation of the proposed sanitary trunk sewer. The surface settlement monitoring points will comprise hardened steel



markers with an expose convex head having a minimum diameter of 12 mm (surveyor's PK nails). The markers will be recessed to allow safe passage of vehicles and will be installed by GRIT.

The markers will be installed centred on the sanitary trunk sewer alignment as arrays of three points at intervals of 5.0 m (maximum) and off-set a lateral distance of 1.5 m on either side of the sanitary trunk sewer centreline, as depicted in Figure 1 enclosed.

The settlement monitoring points are labelled MP1 through to MP15 for easy field identification and will be installed a minimum two weeks prior to the start of the works. Readings of the monitoring points will occur at the time of installation as well as three consecutive reading one week prior to commencement of the work (baseline survey).

The baseline survey results will be summarized in a technical memo and circulated to the project team prior to construction. An average of at least two readings shall be taken to establish the initial conditions.

It is noted all survey equipment and measurements will be completed by GRIT with precision equipment to ± 2 mm of the actual elevation.

A condition survey for the pavement will be carried out prior to the commencement of construction and documented for the purpose of requirement of restoration

Monitoring During Construction

Three (3) sets of settlement monitoring point readings should be taken per day during construction and reported the same day to the project team. The results should also be sent to MTO the same day for review. It is noted if the work spans over a holiday or weekend measurements will also be taken on these days to the same minimum number. The licensed Geotechnical Engineer or Certified Geotechnical Technician will also visit the site daily to document progress of the sanitary trunk sewer crossing installation.

If a maximum value of 10 mm relative to the baseline survey results are reached the engineer will inform the contractor to review or modify the method, rate or sequence of construction or ground stabilization methods to mitigate further ground displacement. It is noted the contractor will be responsible for submitting a plan of action to prevent additional movement from occurring.

It is recommended if the value of **15 mm relative to the baseline survey results are reached construction cease operations** and further investigation completed on the



cause of the settlement. A path forward to mitigate future settlement must also be submitted by the contractor and approved by a licensed geotechnical engineer.

The Contractor is responsible for reinstatement should movements or other surface distresses occur, and provide a reasonable warranty period. Remedial measures shall be approved by MTO.

Post Construction Monitoring

Upon completion of construction the settlement monitoring points shall be surveyed once per week for a period of four weeks or until such time at which all parties agree that further movement has ended. Results of the monitoring will be reviewed by a license geotechnical engineer and provided to the project team on a weekly basis.

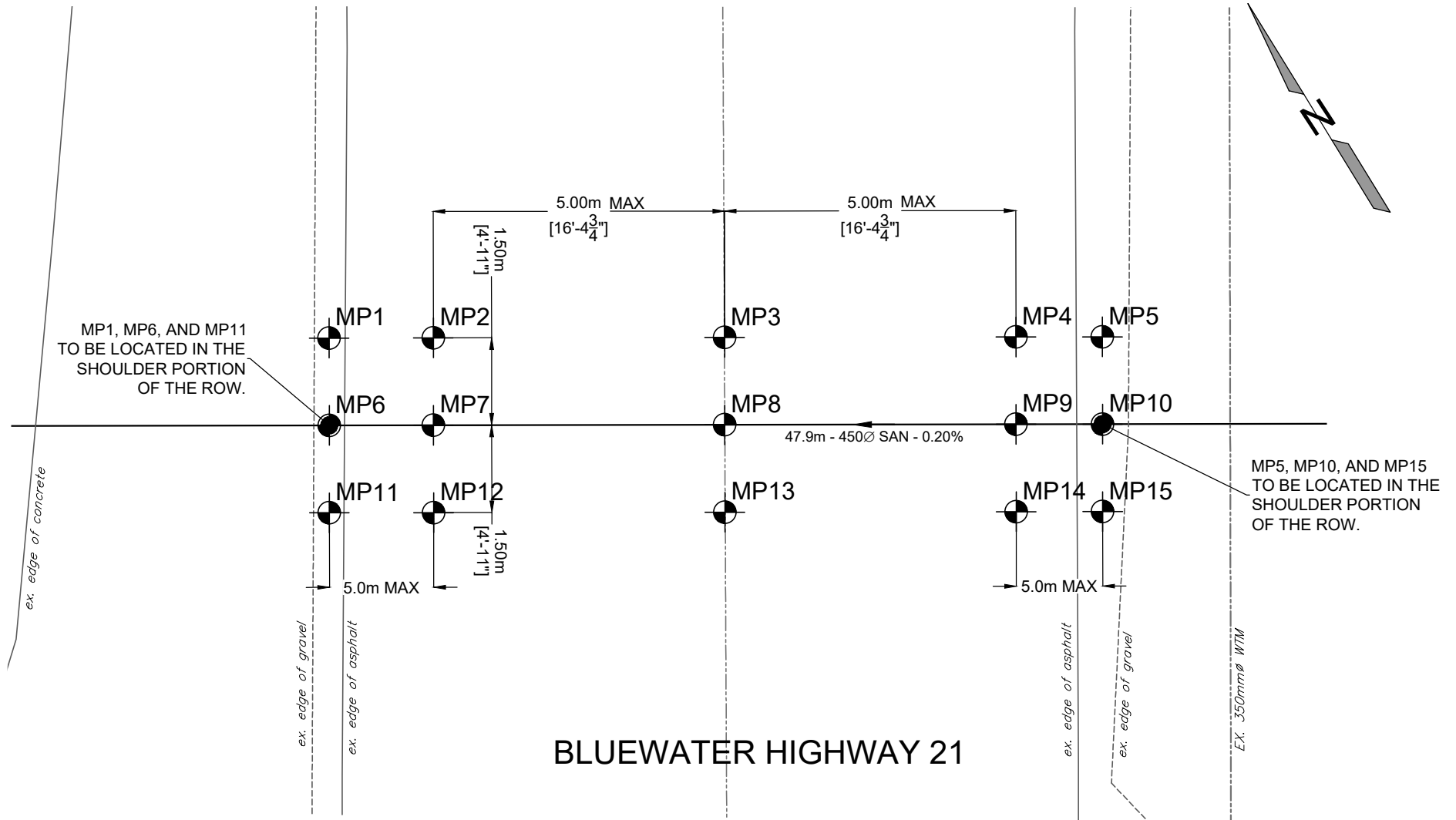
We trust this information satisfies the reporting requirements of the MTO Instrumentation and Monitoring Guidelines for Jack and Bore Installation. If you have any questions or concerns, please do not hesitate to contact GRIT.

Sincerely,

Montana Wilson, EMBA, M.Eng, P.Eng, PMP
Founder & CEO
montana@gritengineering.ca

Encl.: Figure 1 – Surface Settlement Monitoring Points Layout

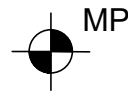
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Legend

PROPOSED SURFACE SETTLEMENT
MONITORING POINTS



PROPOSED SANITARY SEWER



Project:

SOL HAVEN SANITARY TRUNK
SEWER CROSSING
BLUEWATER HIGHWAY 21, GRAND BEND

Figure Title:

SURFACE SETTLEMENT
MONITORING POINTS

Figure No: