



Ontario

MINISTRY OF TRANSPORTATION  
Structural Section  
1201 Wilson Avenue  
Atrium Tower, 4th Floor  
Downsview, Ontario, M3M 1J8  
Telephone: 235-5507

## memorandum

DATE: February 6, 1996

TO: W. Peck  
Manager, Construction Office

ATTENTION: Paul Arsenault

RE: Contract 94-53 18 Mile Creek structures, Site No. 18-19, Burlington District

During my site visit on February 2, 1996, I noticed that a soil anchor at the west side of the sheet piling wall was installed at the wrong location. The soil anchor was installed at approximately 3.8m from the end wall at the west side rather than 2.5 m from the same location as shown on the approved roadway protection drawing. Please discuss this matter with the Contractor and request the Contractor to submit a remedial work proposal. Meanwhile, the Contractor is not allowed to proceed with the excavation work at the front of the sheet piling wall until this matter is resolved.

Should you have any questions, please contact the undersigned.

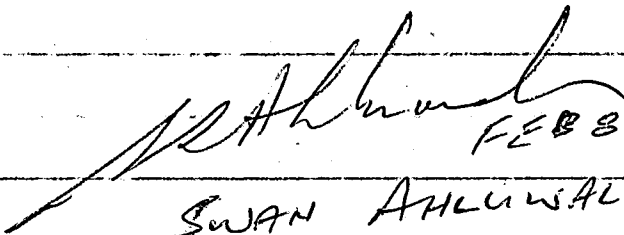
K. Wong  
Sr. Structural Engineer  
for:  
V. F. Boehnke  
Head, Structural Section

c.c. J. Marr  
B. Bennett      Pavement and Foundations Section

BETTY,

PLEASE FIND ATTACHED FIVE COPIES  
OF GT-685-2 FOR SOIL STABILIZATION  
ALREADY SUBMITTED TO YOU. THE DRAWING  
WAS NOT DUELY SIGNED BY P.ENG.  
THEY ADDED A NOTE FOR SPACING  
TO BE INCREASED TO 2.5 FOR N.S. ROAD  
STR. PLEASE REVIEW THE DRAWING  
AND SEND ME A COPY APPROVED  
BY YOU.

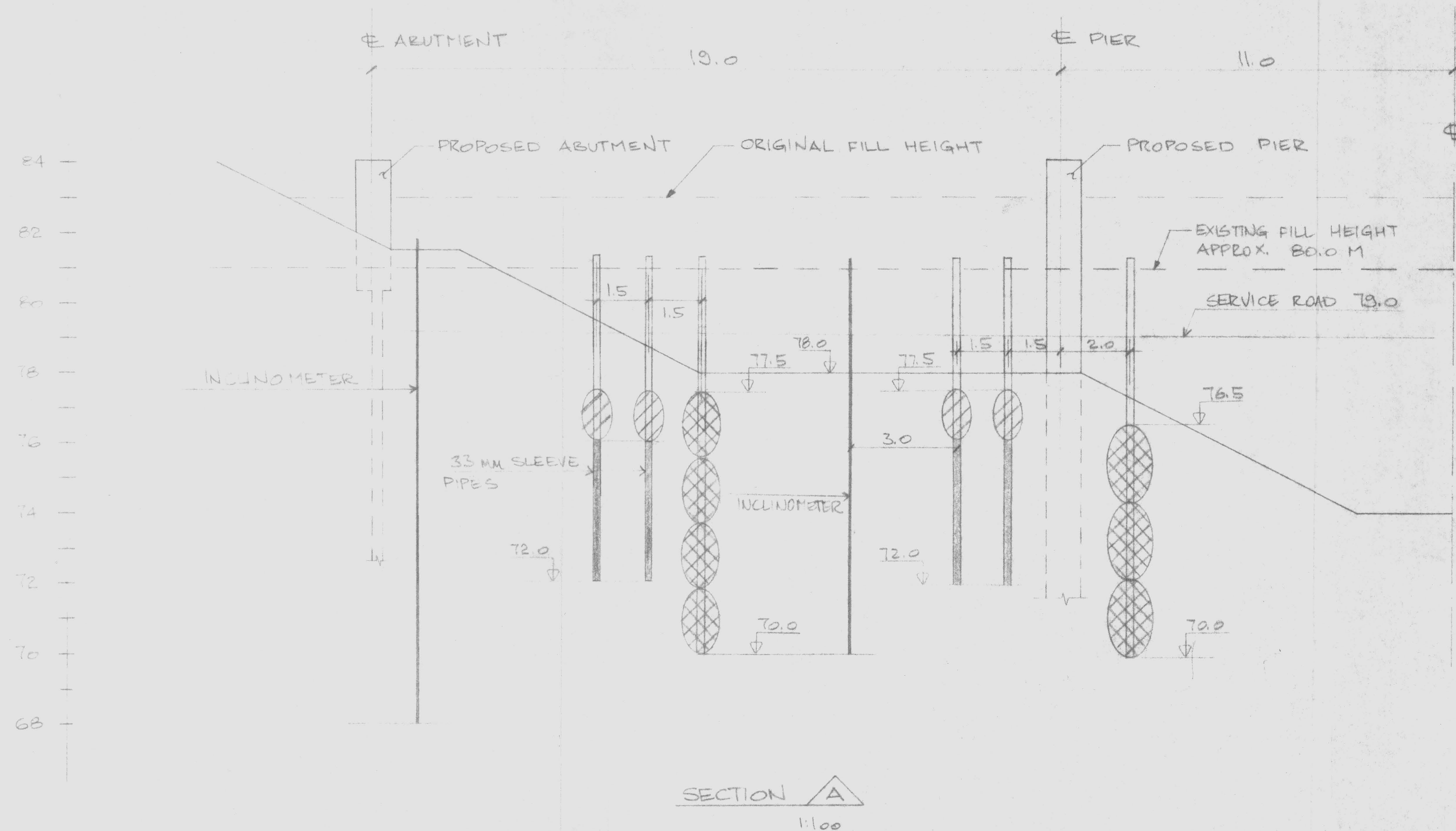
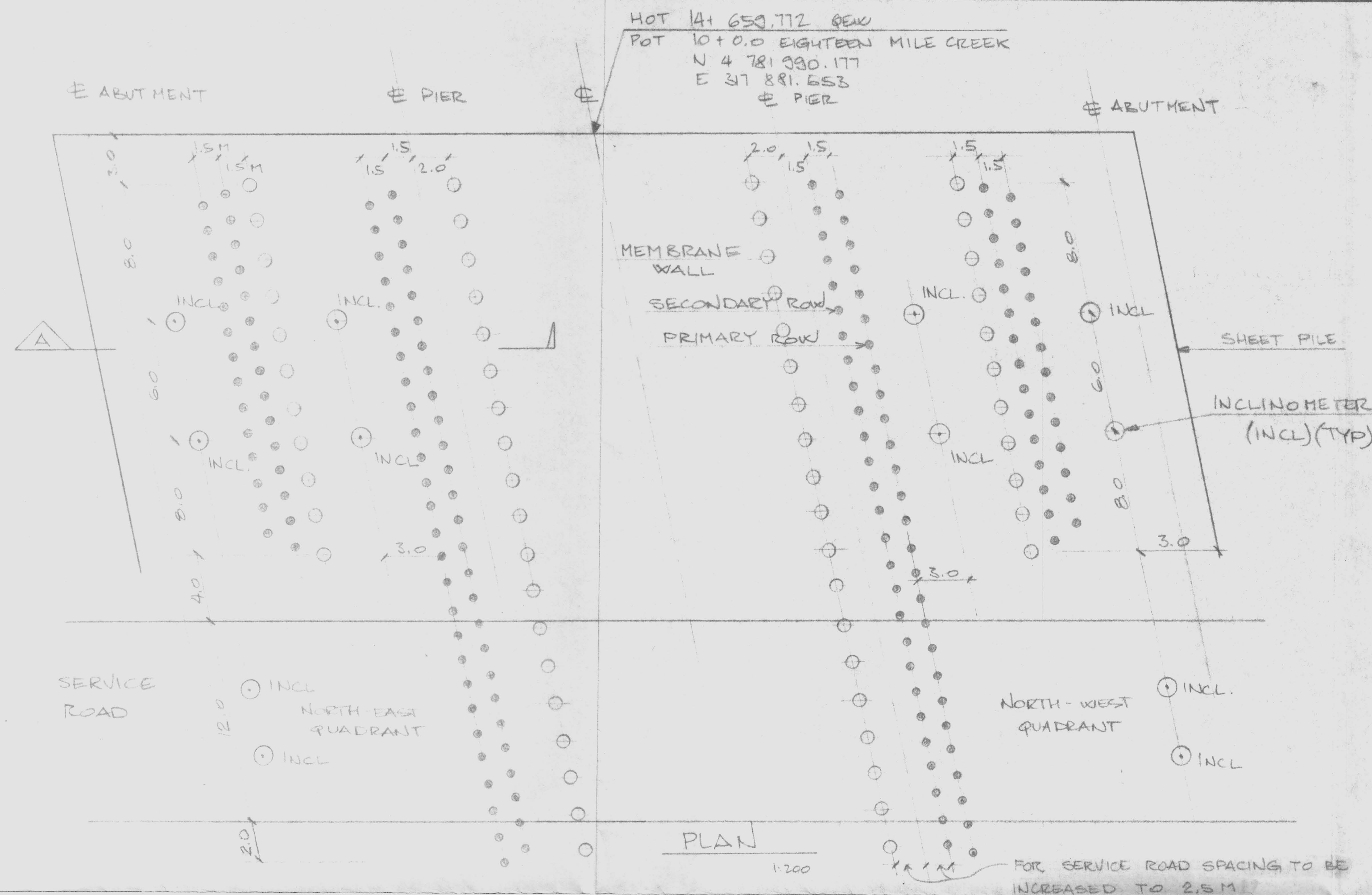
THANKS.

  
FEB 8 1966  
SWAN AHLUWALIA

COHT 94-53

TEL 905-646-2831





# Construction Methodology

## Item 1.0 - Membrane Wall

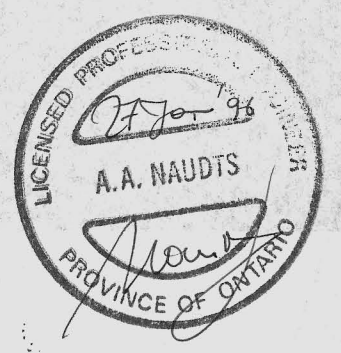
- Holes shall be set out as shown on drawing no. GT 685-2 The membrane units adjacent the pier structure shall have a 2.0 metre spacing from the south end of the west bound bridge and extending 2.0 past the north edge of the service road bridge. Exact location of drill holes shall be determined in the field. The membrane units adjacent the abutment structure shall extend through the west bound bridge area only.
- Using 6" hollow stem auger drill rig, drill each minipile hole to full depth to EL. 70.000.
- Install shop fabricated membrane sleeves in each hole, prior to withdrawing auger, to full depth as set out in contract proposal. Shop fabricated membrane sleeves consist of the following:
  - Proprietary nylon geotextile bag cut and double sewn to dimensions of 300mm diameter x 7.0 metres long.
  - Bags are double clamped to sleeve pipe using punch-loc clamps.
  - Bags are tape wrapped prior to insertion into drill hole to prevent tearing and displacement on sleeve.
  - Geotextile bag shall extend from EL. 77.50 to EL. 70.00
- Withdraw auger in such a manner as to prevent damage to membrane bag.
- Install double packer assembly in sleeved pipe within bag section and locate over existing sleeve. Inflate bag using 0.6 w/c grout mix, carefully monitoring grouting pressures, until an inflation pressure of 50 psi is achieved. A minimum volume of 350 liters of grout should be injected into each bag. Grout mix shall consist of water, normal portland cement and 6 % silica fume. All grout shall be mixed in a colloidal mixer and placed through a progressive cavity moyno pump.
- Maintain pressure on bag for a minimum of 15 minutes to ensure grout refusal. Record time and total grout volume and move to next bag and repeat operation.

## Item 2.0 - Soil Grouting

- Sleeve pipes shall be install as shown on drawing no GT 685-2 Location of holes to be recorded on plan drawing for future records. Holes shall be set out on 1.5 metre spacing over 23 metres within the west bound bridge adjacent the abutment and extend through the service road adjacent the bridge piers. Secondary grout holes shall be 1.5 metres from primary holes and set out in an offset pattern from the primary holes in order to create a staggered grout hole pattern. Exact location to be field determined.
- Within the top 1 meter of each sleeve pipe there shall be attached a membrane bag unit to provide adequate confinement of injection grout.
- Using 6" hollow stem auger drill rig, drill each grout hole to full depth to EL. 72.000.
- Withdraw auger and back grout annular space around sleeved pipe using a casing grout consisting of the following mix:
 

120 liters	H2O
8.0 kg	Bentonite
40 Kg	Type 10 Portland

 Pressure inflate top membrane bag using minipile grout mix design to a pressure of 50 psi.
- Carry out permeability tests of the primary grout holes through the sleeved pipes using a double packer system, located over the sleeve, to determine insitu permeability and grout mix. Permeability tests shall be carried out on 10 % of the grout pipes. Record all information.
- The primary soil grouting program at each sleeved location shall be a normal portland grout mix to permeate and hydrofracture the insitu soil. All mixing of grout materials shall be carried out in a colloidal mixer. Grouting shall be carried out through a progressive cavity moyno pump. Grouting shall continue until the refusal criteria of 1 litre/min, at an effective grouting pressure of 25 psi, has been achieved at each sleeve location. Flow and pressure shall be monitored using an electronic in line grout monitor displaying flow and pressure on an X/Y chart recorder.
- Carry out permeability tests of the secondary grout holes through the sleeved pipes using a double packer system, located over the sleeve, to determine insitu permeability and grout mix. Permeability tests shall be carried out on 10 % of grout pipes. Record all information.
- The secondary soil grouting program at each sleeved location shall be a normal portland grout mix. All mixing of grout materials shall be carried out in a colloidal mixer. Grouting shall be carried out through a progressive cavity moyno pump. Grouting shall continue until the refusal criteria of 1 litre/min, at an effective grouting pressure of 25 psi, has been achieved at each sleeve location. Flow and pressure shall be monitored using an electronic in line grout monitor displaying flow and pressure on an X/Y chart recorder.
- All grouting activity shall be monitored and recorded complete with a construction report at the completion of the work.



drawn/dessiné	date	checked/vérifié	date	scale/échelle
	JAN 12, 96	D.M.H.	JAN 12, 96	AS NOTED
<b>GEOTEC CONTRACTING LTD.</b> P.O. Box 37 Agincourt, Ontario M1S 3B4 Phone (416) 321-5907 QEW/18 MILE CREEK - CONT 04-53 SOIL STABILIZATION				GT-685-2