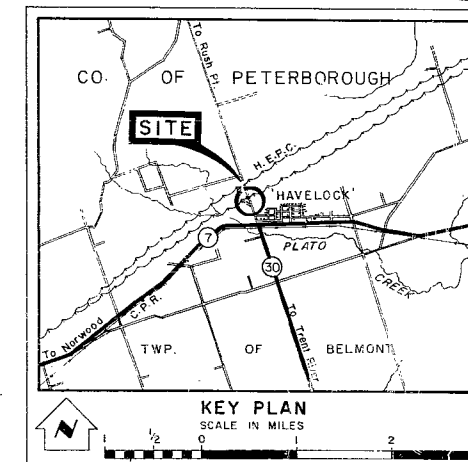
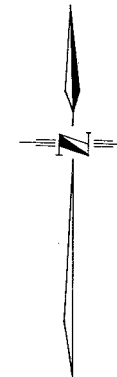
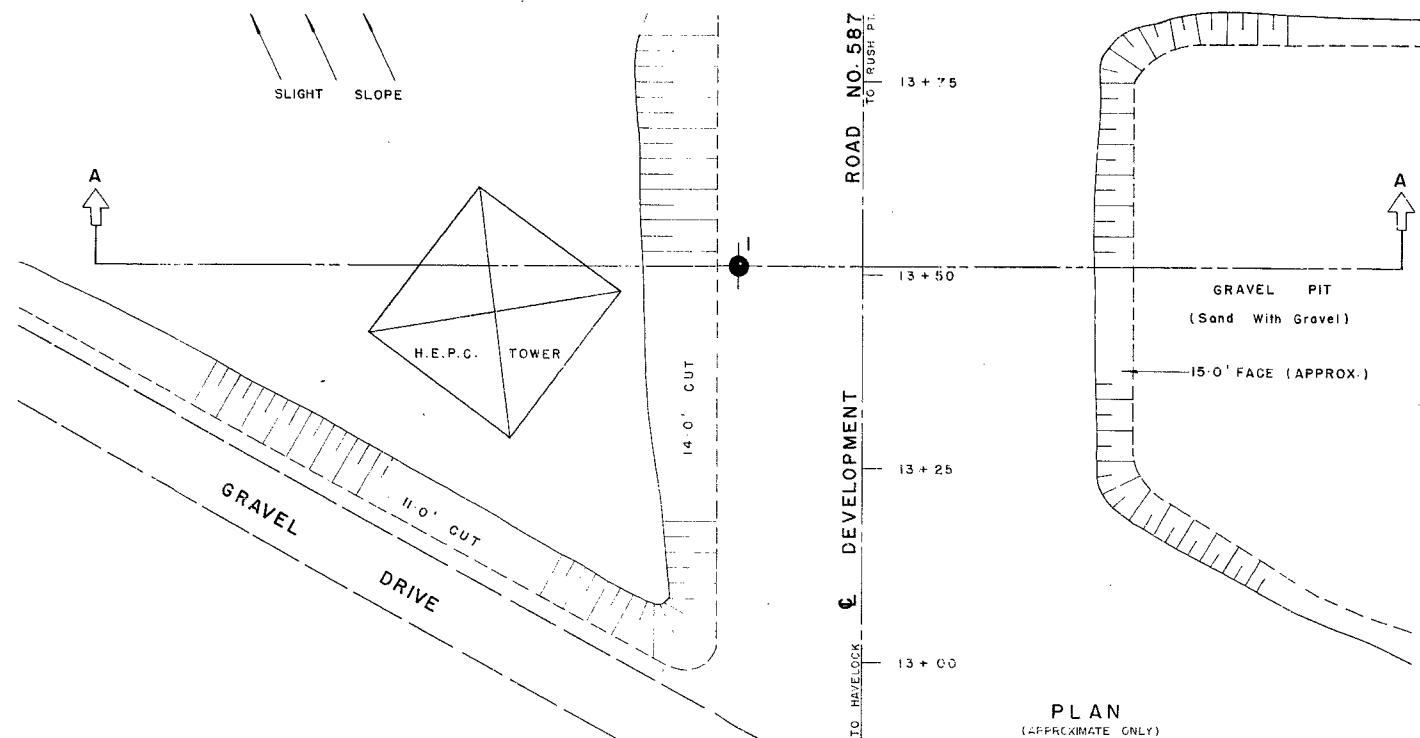


# 62-F-19

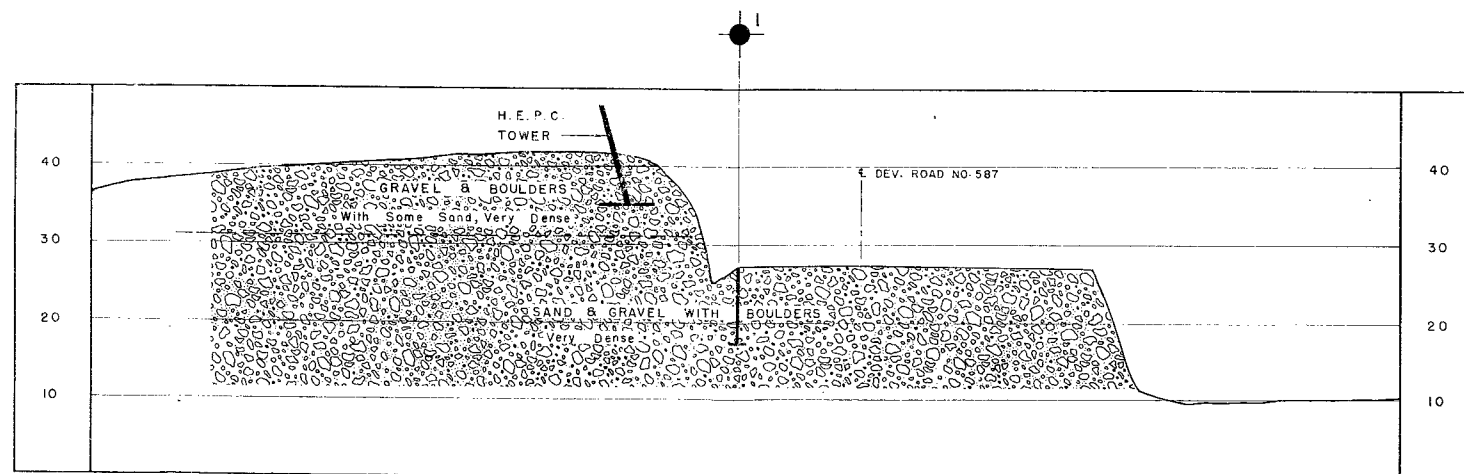
DEV. RD. # 587

± H.E.P.C.

TOWER # 714



LEGEND			
	Bore Hole		
	Cone Penetration Hole		
	Bore & Cone Penetration Hole		
	Water Levels established at time of field investigation		
NO.	ELEVATION	STATION	OFFSET
1	27.0	13+51	16' LT.



**- NOTE -**

The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence and may be subject to considerable error.

DEPARTMENT OF HIGHWAYS - ONTARIO			
MATERIALS & RESEARCH DIVISION - FOUNDATION SECTION			
RETAINING WALL FOR			
H.E.P.C. TOWER NO. 714			
ON			
DEVELOPMENT ROAD NO. 587			
NEAR HAVELOCK			
ORIGINATED	I. HOLUBEC	DISTRICT NO.	7
DATE	MARCH 9, 1962		
DRAWN	F. CLARK	W.O. NO.	60-70104
JOB NO.	62-F-19		
CHECKED	<i>AR</i>	CONTRACT NO.	
APPROVED	<i>AR</i>	DRAWING NO.	62-F-19A

*List # 7*

Mr. A. M. Toye,  
Bridge Engineer.  
Materials & Research Division,  
(Foundation Section)

March 12, 1962.

D.H.O. FOUNDATION INVESTIGATION  
REPORT.  
W.J. 62-F-19 - W.O. 60-70104,  
(Municipal Job)

Attention: Mr. K. L. Kleinsteinber,  
Municipal Bridge Liaison Engr.

Re: Retaining Wall for H.E.P.C. Tower #714,  
Development Rd. No. 587, near Havelock,  
Twp. of Belmont, County of Peterborough,  
D.H.O. District #7.

Attached, we are forwarding to you, our brief report dealing with the subsoil investigation at the above-mentioned site. We believe that the information and the recommendations will be sufficient for you to complete your design.

Should there be any additional questions that you would like to discuss, please feel free to call on our Office.

AGS/Mdef  
Attach.

*A. G. Stermac*  
A. G. Stermac,  
PRINCIPAL FOUNDATION ENGINEER

cc: Messrs. A. M. Toye (2)  
J. P. Howard, Mun. Engr.  
A. A. Ward, Dist. Mun. Engr.  
T. J. Kovich  
Foundations Office ✓  
Gen. Files.  
A. Watt

## FOUNDATION INVESTIGATION

For

Retaining Wall for H.E.P.C. Tower #714,  
Development Rd. No. 587, near Havelock,  
Twp. of Belmont, County of Peterborough,  
District No. 7  
W.J. 62-F-19                      --                      W.O. 60-70104.

In the process of widening Development Road No. 587, part of a low hill on the west side of the road, approx. between Sta. 13+00 and Sta. 14+00, had to be removed. After the necessary material was excavated and removed, it was realized that the stability of a high tension transmission tower, located on the top of the small hill, might be endangered. Although the slopes of the cut were left very steep (in places 1/2:1), the top of the slope came very close to one of the legs of the tower. Any failure of the slope could consequently lead to the toppling of the transmission tower. It was therefore decided to build a structure which would prevent the slope from failing and thus secure the safety of the transmission tower. A foundation investigation was verbally requested by the Bridge Division, to provide the necessary information about the soil stratigraphy and the soil properties and to design the best suited structure. In the following paragraphs, the results of this investigation and the recommendations pertaining to the retaining structure, are submitted for your consideration. A site plan showing the location of borehole, etc., (Dwg. No. 62-F-19A), is enclosed under Appendix I.

cont'd. /2 ...

The site is located in the Norwood Esker which is depicted by numerous gravel pits in this area. A very good understanding of the general subsoil conditions can be obtained by inspecting the exposed slopes in the gravel pits. It can be concluded that, generally, the subsoil is a very dense mixture of sand and gravel with numerous boulders.

At the site of the proposed retaining structure, at the toe of the present slope, one borehole was put down to a depth of 10 ft. below ground surface, on March 7th, 1962. This borehole confirmed the impression obtained from the gravel pits inspection. The 'N' values of the Standard Penetration Test were in excess of 100, indicating the very dense state of the deposit. During the investigation, no ground water was encountered.

On the basis of the above results, spread footings for the retaining structure, are recommended. The choice of the type of the retaining structure is left to the designer. For design purposes, the following figures should be used;\_

Unit weight  $\gamma = 130 \text{ lb./cu. ft.}$

Angle of internal friction  $\phi = 35^\circ$

Coefficient of active earth pressure  $K_A = 0.30$

Allowable bearing pressure  $Q_{all.} = 4.0 \text{ T/sq.ft.}$

Backfilling behind the wall should be carried out with the local free-draining, gravelly material.

It should be noted that a conservative value of the angle of internal friction has been suggested. This is done because of the possible variations in the stratigraphy and properties of the soil.

Because heavy rainfalls and thawing weather would influence very unfavourably the stability of the slope, it is strongly recommended that the construction of the retaining wall be carried out as soon as possible. Since the footings of the wall will have to be at least 4 ft. below ground surface for frost protection, it is recommended that the wall footing excavation be carried out in 10-ft. sections. This would prevent large undercutting - i.e., removing of the toe of the slope for a great length. As one stretch is excavated, the footing should immediately be built and when this is finished, new excavation can be started.

There is no doubt that the construction of a retaining wall as recommended above, will cause some serious construction problems and this, in turn, will be reflected on the costs. We would therefore suggest that very serious consideration be given to the possibility of line shifting. A realignment of the Development Road would eliminate all the problems because the excavated material could be again backfilled and a slope of  $1\frac{1}{2}:1$  formed. In this manner, the previous condition would be restored and the safety of the transmission tower secured. This procedure would perhaps require some backfilling of the gravel pit excavation on the east side of the road, but we believe that this could still be simpler and cheaper than the construction of the retaining wall.

March 1962.

*A. G. Stermac*  
A. G. Stermac,  
PRINCIPAL FOUNDATION ENGINEER

APPENDIX I.

G2-F-19  
W.O.

