

MEMORANDUM

To: Mr. A. Rutka
Materials & Research Engineer,
DOWNSVIEW.

FROM: R. H. Moran

DATE: May 26, 1964

OUR FILE REF.

IN REPLY TO

SUBJECT: Proposed Patrol Yard,
Lot 5, Concession 1,
Township of Widdifield,
Highway #63, North Bay District

Attached find Property Request Plan 64-3621. Please arrange to have soils tests made on the above property to ascertain if suitable for future erection of a standard D.H.O. Patrol Garage.

RHM:rao
attach.

R. H. Moran
REGIONAL INSPECTOR SPECIAL SERVICES

64-F-49

THIS COPY TO VENDOR *SPECIAL SERVICES*

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

23-67-Ble.

To: Mr. C. S. Moase,
Manager,
Special Services Section,
Admin. Bldg.

FROM: Foundation Section,
Materials & Testing Div.,
Room 107, Lab. Bldg.

DATE: August 4, 1964

OUR FILE REF.

IN REPLY TO

SUBJECT:

FOUNDATION INVESTIGATION REPORT

For

Proposed Patrol Yard, Hwy. No. 63,
Dist. of Nipissing, Twp. of Widdifield,
Con. I, Lot 5, Dist. No. 13, N. Bay.

W.J. 64-F-49 -- W.P. (Nil)

It is proposed to erect a D.H.O. Patrol Garage on Hwy. #63, approx. 1.5 miles East of the Village of Feronia. A request for a foundation investigation was received from Mr. R. H. Moran, dated May 26, 1964.

In order to determine the properties of the soil and decide on the type of foundations, an investigation was carried out by this Section. The field investigation was confined to six sampled boreholes.

The elevations, as well as the locations of the boreholes, are shown on Dwg. No. 64-F-49A, attached to this report.

The stratigraphy of the soil throughout the site was found to be generally uniform. The subsoil consists of soft to hard clayey silt, followed by bedrock.

The safe bearing pressure for spread footings, at a depth of 6 feet below ground level, is estimated to be 2 tons/sq.ft.

cont'd/ 2 ...

August 4, 1964

At the time of the investigation, the ground water level was encountered between 8'-0" and 11'-0" below existing ground elevations.

The sand pile, at any location, may be built without danger of base failure.

Attention is drawn to the existence of a well, located approx. 600 ft. North-West of the proposed yard site.

The recommendations given by Mr. E. R. Saint, Regional Materials Engineer, for grading and paving, are as follows:

(1) Before any granular base is laid all topsoil should be removed.

(2) The granular base thicknesses required for roadways and parking areas are as follows:

a) Silty Clay Areas

Provide 6 inches of G.B.C. Class "A" and 24 inches of sand cushion.

b) Loamy Gravelly Areas

Provide for 6 inches of G.B.C. Class "A" and 18 inches of sand cushion.

c) Gravelly Areas

Provide for 6 inches of G.B.C. Class "A".

(3) The bituminous surfacing should be HL-4 and consist of 2 inches of binder course and $1\frac{1}{2}$ inches of top course.

cont'd. /3 ...

August 4, 1964

The field work performed during July 7, 1964, was undertaken by Mr. W. W. Kulmattickas, Project Foundation Engineer, who also prepared this report.

We believe the information contained in this report will suffice for your design work. However, should future information be required, please do not hesitate to contact our Office.

WWK/MdeF
Attach.

File
A. G. Stermac,
PRINCIPAL FOUNDATION ENGINEER

cc: Messrs. C. S. Moase (4)
E. J. Orr
H. D. McMillan
G. Martens
E. R. Saint
A. Watt

Foundations Office
Gen. Files

APPENDIX I.

ABBREVIATIONS USED IN THIS REPORT

PENETRATION RESISTANCE

STANDARD PENETRATION RESISTANCE 'N' :- THE NUMBER OF BLOWS REQUIRED TO ADVANCE A STANDARD SPLIT SPOON SAMPLER 12 INCHES INTO THE SUBSOIL, DRIVEN BY MEANS OF A 140 POUND HAMMER FALLING FREELY A DISTANCE OF 30 INCHES.

DYNAMIC PENETRATION RESISTANCE :- THE NUMBER OF BLOWS REQUIRED TO ADVANCE A 2 INCH, 60 DEGREE CONE, FITTED TO THE END OF DRILL RODS, 12 INCHES INTO THE SUBSOIL, THE DRIVING ENERGY BEING 350 FOOT POUNDS PER BLOW.

DESCRIPTION OF SOIL

THE CONSISTENCY OF COHESIVE SOILS AND THE RELATIVE DENSITY OR DENSENESS OF COHESIONLESS SOILS ARE DESCRIBED IN THE FOLLOWING TERMS :-

<u>CONSISTENCY</u>	<u>'N' BLOWS / FT.</u>	<u>c LB. / SQ. FT.</u>	<u>DENSENESS</u>	<u>'N' BLOWS / FT.</u>
VERY SOFT	0 - 2	0 - 250	VERY LOOSE	0 - 4
SOFT	2 - 4	250 - 500	LOOSE	4 - 10
FIRM	4 - 8	500 - 1000	COMPACT	10 - 30
STIFF	8 - 15	1000 - 2000	DENSE	30 - 50
VERY STIFF	15 - 30	2000 - 4000	VERY DENSE	> 50
HARD	> 30	> 4000		

TYPE OF SAMPLE

S.S.	SPLIT SPOON	T.W.	THINWALL OPEN
W.S.	WASHED SAMPLE	T.P.	THINWALL PISTON
S.B.	SCRAPER BUCKET SAMPLE	O.S.	OESTERBERG SAMPLE
A.S.	AUGER SAMPLE	F.S.	FOIL SAMPLE
C.S.	CHUNK SAMPLE	R.C.	ROCK CORE
S.T.	SLOTTED TUBE SAMPLE		
	P.H.	SAMPLE ADVANCED HYDRAULICALLY	
	P.M.	SAMPLE ADVANCED MANUALLY	

SOIL TESTS

Q _u	UNCONFINED COMPRESSION	L.V.	LABORATORY VANE
Q	UNDRAINED TRIAXIAL	F.V.	FIELD VANE
Q _{cu}	CONSOLIDATED UNDRAINED TRIAXIAL	C	CONSOLIDATION
Q _d	DRAINED TRIAXIAL	S	SENSITIVITY

ABBREVIATIONS USED IN THIS REPORT

SOIL PROPERTIES

γ	UNIT WEIGHT OF SOIL (BULK DENSITY)
γ_s	UNIT WEIGHT OF SOLID PARTICLES
γ_w	UNIT WEIGHT OF WATER
γ_d	UNIT DRY WEIGHT OF SOIL (DRY DENSITY)
γ'	UNIT WEIGHT OF SUBMERGED SOIL
G	SPECIFIC GRAVITY OF SOLID PARTICLES $G = \frac{\gamma_s}{\gamma_w}$
e	VOID RATIO
n	POROSITY
w	WATER CONTENT
S_r	DEGREE OF SATURATION
w_L	LIQUID LIMIT
w_p	PLASTIC LIMIT
I_p	PLASTICITY INDEX
s	SHRINKAGE LIMIT
I_L	LIQUIDITY INDEX = $\frac{w - w_p}{I_p}$
I_C	CONSISTENCY INDEX = $\frac{w_L - w}{I_p}$
e_{max}	VOID RATIO IN LOOSEST STATE
e_{min}	VOID RATIO IN DENSEST STATE
I_D	DENSITY INDEX = $\frac{e_{max} - e}{e_{max} - e_{min}}$
	RELATIVE DENSITY D_r IS ALSO USED
h	HYDRAULIC HEAD OR POTENTIAL
q	RATE OF DISCHARGE
v	VELOCITY OF FLOW
i	HYDRAULIC GRADIENT
k	COEFFICIENT OF PERMEABILITY
j	SEEPAGE FORCE PER UNIT VOLUME
m_v	COEFFICIENT OF VOLUME CHANGE = $\frac{-\Delta e}{(1+e)\Delta\sigma}$
C_v	COEFFICIENT OF CONSOLIDATION
C_c	COMPRESSION INDEX = $\frac{\Delta e}{\Delta \log_{10} \sigma}$
T_v	TIME FACTOR = $\frac{C_v t}{d^2}$ (d, DRAINAGE PATH)
U'	DEGREE OF CONSOLIDATION
τ_f	SHEAR STRENGTH
c'	EFFECTIVE COHESION INTERCEPT
ϕ'	EFFECTIVE ANGLE OF SHEARING RESISTANCE, OR FRICTION
c_u	APPARENT COHESION
ϕ_u	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
μ	COEFFICIENT OF FRICTION
S_t	SENSITIVITY

GENERAL

π	= 3.1416
e	BASE OF NATURAL LOGARITHMS 2.7183
$\log_e a$ OR $\ln a$	NATURAL LOGARITHM OF a
$\log_{10} a$ OR $\log a$	LOGARITHM OF a TO BASE 10
t	TIME
g	ACCELERATION DUE TO GRAVITY
V	VOLUME
W	WEIGHT
M	MOMENT
F	FACTOR OF SAFETY

STRESS AND STRAIN

u	PORE PRESSURE
σ	NORMAL STRESS
σ'	NORMAL EFFECTIVE STRESS ($\bar{\sigma}$ IS ALSO USED)
τ	SHEAR STRESS
ϵ	LINEAR STRAIN
γ	SHEAR STRAIN
ν	POISSON'S RATIO (μ IS ALSO USED)
E	MODULUS OF LINEAR DEFORMATION (YOUNG'S MODULUS)
G	MODULUS OF SHEAR DEFORMATION
K	MODULUS OF COMPRESSIBILITY
η	COEFFICIENT OF VISCOSITY

EARTH PRESSURE

d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
δ	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
K_0	COEFFICIENT OF EARTH PRESSURE AT REST

FOUNDATIONS

B	BREADTH OF FOUNDATION
L	LENGTH OF FOUNDATION
D	DEPTH OF FOUNDATION BENEATH GROUND
N	DIMENSIONLESS COEFFICIENT USED WITH A SUFFIX APPLYING TO SPECIFIC GRAVITY, DEPTH AND COHESION ETC. IN THE FORMULA FOR BEARING CAPACITY
k_s	MODULUS OF SUBGRADE REACTION

SLOPES

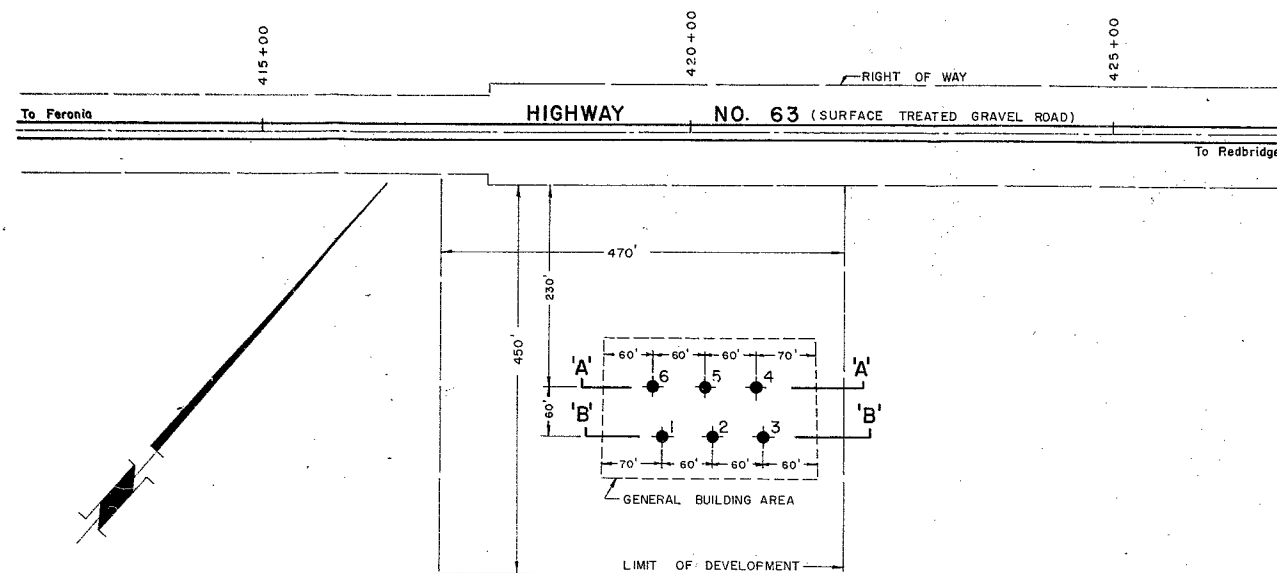
H	VERTICAL HEIGHT OF SLOPE
D	DEPTH BELOW TOE OF SLOPE TO HARD STRATUM
β	ANGLE OF SLOPE TO HORIZONTAL

#64-F-49

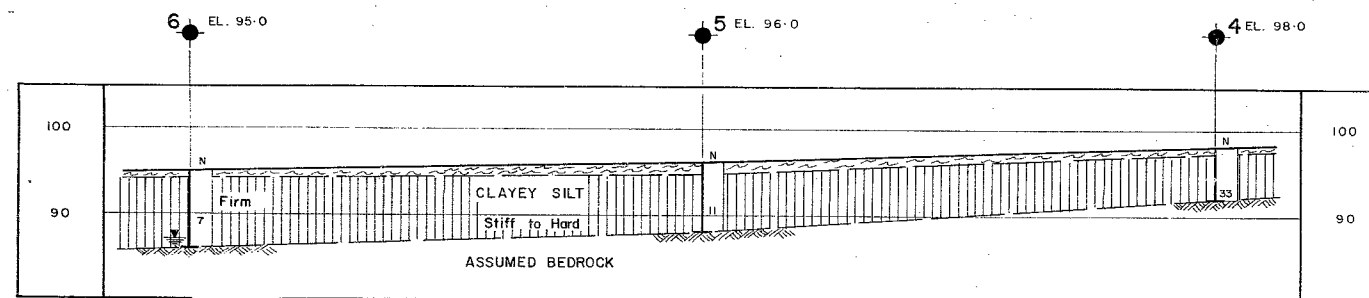
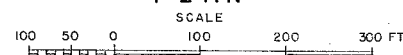
HWY #63

FERONIA

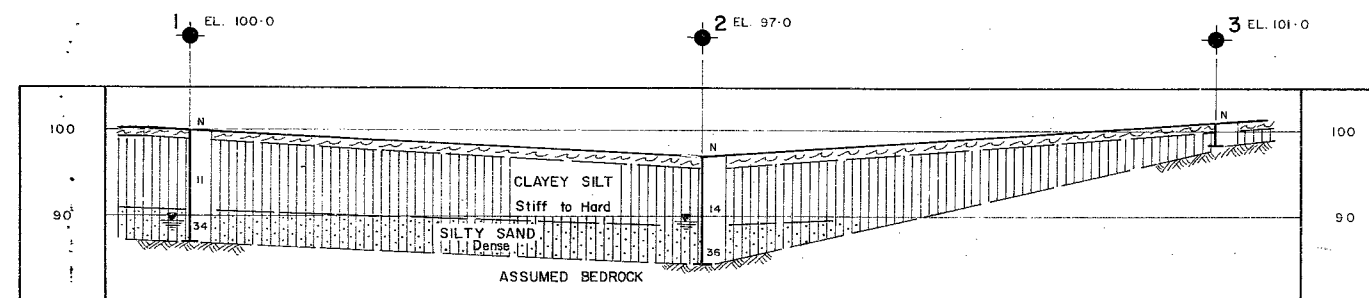
PATROL YARD



PLAN

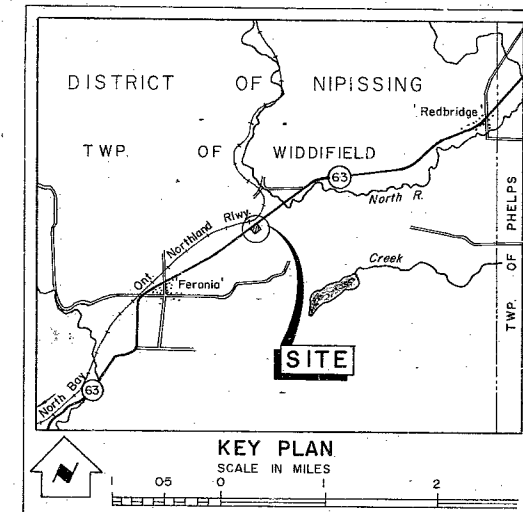
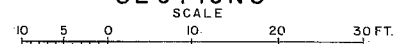


A - A



B - B

SECTIONS



LEGEND

- BORE HOLE
- WATER LEVELS ESTABLISHED AT TIME OF FIELD INVESTIGATION, JULY 7, 1964.

— 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 SECTION		
FERONIA PATROL YARD		
ORIGINATED W.K.	DISTRICT NO. 13	DATE JULY 20, 1964
DRAWN	W.P. NO.	JOB NO. 64-F-49
CHECKED	SCALE	DRAWING NO.
APPROVED	AS SHOWN	64-F-49A

TO CONDITION OF ORIGINAL DOCUMENT

64-F-49

PROPERTY REQUEST PLAN

64 / 3621

LOT 5 , CONCESSION 1

WIDDIFIELD TWP.

HWY. 63 NORTH BAY DISTRICT

PURPOSE - PROPOSED MAINTENANCE YARD

RECOMMENDED -

Ellis Lewis
DISTRICT ENGINEER

May 21/64
DATE

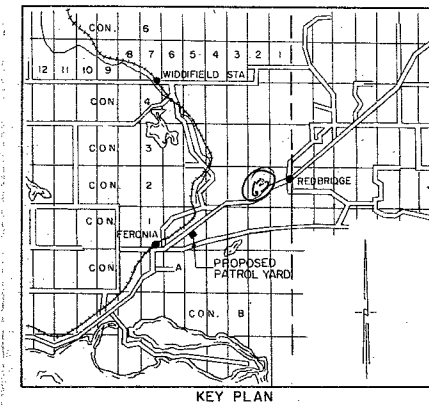
REGIONAL INSPECTOR OF SPECIAL SERVICES Robert H. Munn MAY 12 1964
DATE

REGIONAL PROPERTY SUPERVISOR 1/19/64
DATE

RECEIVED
JAN 10 1964
U.S. AIR FORCE

CON I
LOT 5

Pl^{ce} address... MAY 5/6



KEY PLAN

PINEWOOD VILLAGE LIMITED, 362 FRAZER ST, NORTH BAY
TFR. N° 78215 (1959) N1/2 LOT 5, CON. 1, EXCEPTING HWY., T. 8 N.O. RWY.
AND PCL. 5297 W.&F. SUBJECT TO EASE. N° 63700 & 75805

APPROVED

REGIONAL SERVICES MANAGER
DATE 22 May 64

LOT 5
CON I