

# 65-F(R)-59  
CTY. RD. #3  
LANDSDOWNE  
PATROL YARD



## MEMORANDUM

*Dist. 28-8.*

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

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

DATE: July 9, 1965

OUR FILE REF.

IN REPLY TO

SUBJECT:

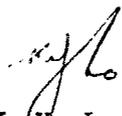
FOUNDATION INVESTIGATION REPORT  
For  
Proposed Lansdowne Patrol Yard  
Township of Lansdowne, County Rd. #3  
District #8 (Kingston)  
W.J. 65-F(R)-59 -- W.P. (N11).

Attached, we are forwarding to you, our detailed foundation investigation report on the subsoil conditions existing at the above structure site.

We believe that you will find the factual data and recommendations contained therein, adequate for your design purposes. Should you require additional information, please feel free to contact our Office.

KYL/MdeF  
Attach.

cc: Messrs. C. S. Moase (4)  
E. J. Orr  
D. W. Farren  
E. A. Cash  
J. E. Gruspier  
A. Watt

  
K. Y. Lo,  
SUPERVISING FOUNDATION ENGINEER

Foundations Office  
Gen. Files ✓

FOUNDATION INVESTIGATION REPORT  
For  
Proposed Lansdowne Patrol Yard  
Township of Lansdowne, County Rd. #3  
District #8 (Kingston)  
W.J. 65-F(R)-59 -- W.P. (N11).

It is proposed to construct a patrol yard approximately two miles south of Lansdowne. A foundation investigation was requested by the Special Services Section in a memo dated April 15, 1965.

In order to determine the subsoil conditions at the site, a foundation investigation consisting of 4 sampled holes and 4 dynamic cone penetration tests was carried out by this Section. The locations and elevations of these boreholes are shown on Drawing #65-F(R)-59A, which is attached to this report.

The site is located approximately 2 miles south of Lansdowne. Physiographically, it lies in the region known as the "Leeds Knobs and Flats". The area consists generally of clay flats left by the Champlain Sea, together with granite rock-knobs. The site is gently undulating and is covered with grass, weeds and trees.

Subsoil at the site consists of a layer of stiff to very stiff clayey silt to silty clay overlying granite bedrock.

Ground water level was found to be 3.5 ft. below the ground surface in B.H. #1.

Bedrock was encountered in the boreholes which were located on the west portion of the proposed garage location.

cont'd. /2 ...

The elevations of the bedrock varies from 289.7 to 303.3 ft. approximately (6.2 to 16.8 ft. below ground surface). Owing to the fact that the surface of the bedrock is undulating and that the structure site is sloping eastward, it is impossible to have the foundation footings all founded either on bedrock or on the overlying clayey material. Therefore, it is suggested the 8-bay patrol garage be relocated so that all the foundation footings can be founded on clay soil. In view of this, it is suggested that the proposed garage should be situated where the proposed salt sheds are located. In such a case, it is recommended that the garage building be supported on continuous strip footings, placed as high as frost conditions will permit. A safe net bearing pressure of 1.5 tons per square foot may be used for design purposes.

As regard to the height of the sand and salt piles, no stability problems are anticipated.

No major dewatering problems are anticipated because of the impermeable nature of the subsoil.

It was found that at the time of the investigation that the nearest wells were approximately 1,500 ft. from the proposed site. Precautions should be taken to prevent contamination of the nearby wells and creeks by the salt piles.

The following recommendations regarding paving of roadways and parking areas were given by Mr. J. E. Gruspier, Regional Materials Engineer, for the Eastern Region.

(1) Type of Granular Materials

The granular materials consist of sand cushion and G.B.C. Class 'A'.

cont'd. /3 ...

(2) Depth and Width of Granular Materials

The granular materials consist of 6" of G.B.C. Class 'A' over sand cushion to the following total granular depths:

Earth cuts and Fills - 21"

Rock cuts and Fills - 12"

The granular materials should be placed full width with a 5' shoulder outside the edge of pavement.

(3) Proposed Pavement

The pavement on the yard and on the entrance road consist of the following:

Wearing Course - 1½" H.L. 3

Binder Course - 2" H.L. 6 or H.L. 8

If the contract for this project is called separately, the binder course should consist of H.L. 6. If it is included with a Hwy. 401 paving contract, the binder course should consist of the same binder course as on Hwy. 401.

(4) Drainage

The drainage should be provided to a minimum depth of 3' below the finished grade around the perimeter of the patrol yard.

(5) Scheduling of Construction

This project should be included with the paving contract for this section of proposed Hwy. 401.

cont'd. /4 ...

The foundation investigation, carried out in June 1965, was undertaken by Mr. T. Chan, Project Foundation Engineer, who also prepared this report. The investigation was carried out under the general supervision of Mr. M. Devata, Senior Foundation Engineer, who also reviewed this report.

July 1965

APPENDIX I.







DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & TESTING DIVISION  
JOB 65-RF-59  
W.P. Nil  
DATUM G.S.C.

RECORD OF BOREHOLE NO. 4

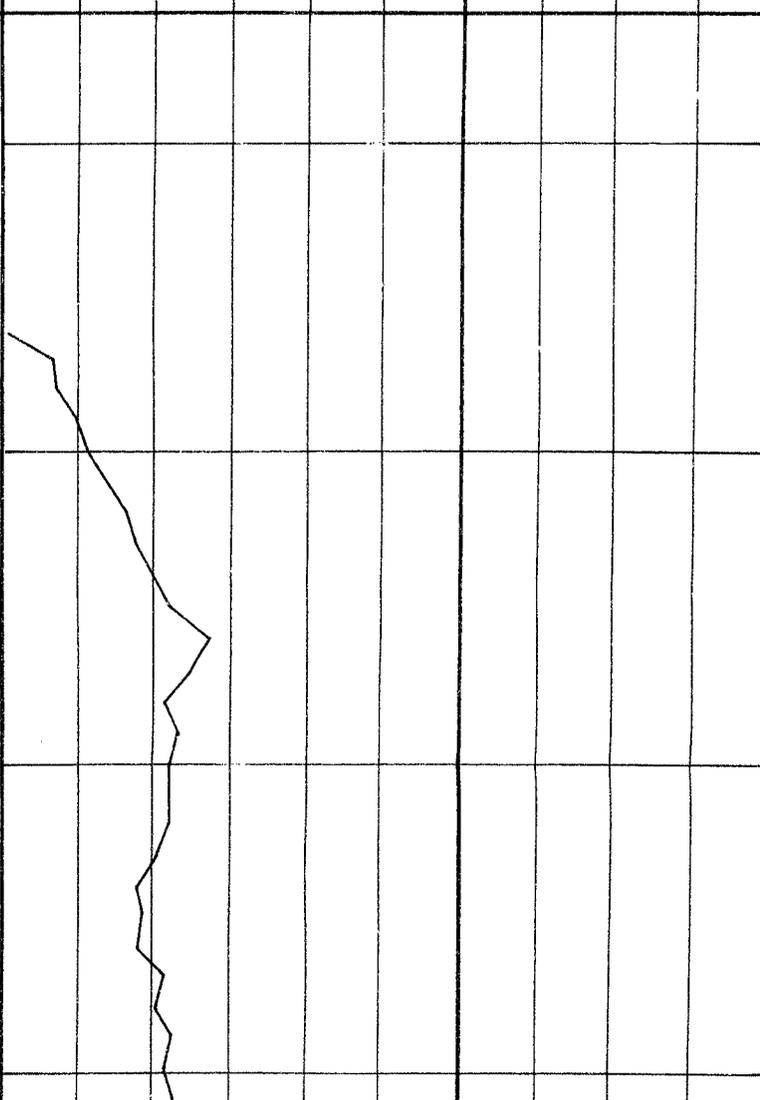
FOUNDATION SECTION

LOCATION Line 'G' Sta. 438+40, 595' Lt. ORIGINATED BY T.C.  
BORING DATE June 1, 1965. COMPILED BY T.C.  
BOREHOLE TYPE Washboring using BX Casing. CHECKED BY \_\_\_\_\_

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT ——— WL PLASTIC LIMIT ——— WP WATER CONTENT ——— W			BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	20	40	60	80	100	WP	W		
304.2	Groundlevel															
0.0	Clayey silt with sand. V. stiff.		1	SS	24	300										
			2	SS	21											
294.2			3	SS	21											
10.0	End of borehole.															

DYNAMIC PENETRATION RESISTANCE  
BLOWS / FOOT  
20 40 60 80 100  
SHEAR STRENGTH P.S.F.

LIQUID LIMIT ——— WL  
PLASTIC LIMIT ——— WP  
WATER CONTENT ——— W  
WP ——— W ——— WL  
WATER CONTENT %



DEPARTMENT OF HIGHWAYS - ONTARIO

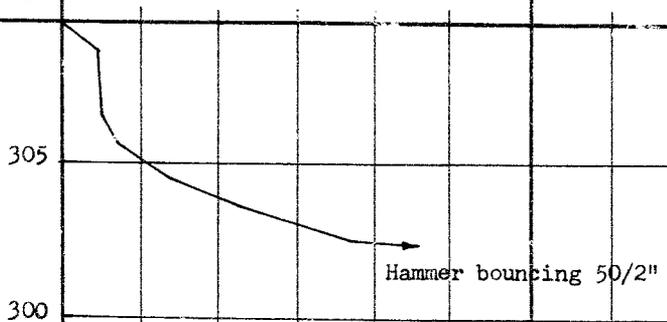
RECORD OF BOREHOLE NO. 5

FOUNDATION SECTION

MATERIALS & TESTING DIVISION

JOB 65-RF-59 LOCATION Line 'G' Sta. 437+25, 635' Lt. ORIGINATED BY T.C.  
 W.P. Nil BORING DATE June 2, 1965. COMPILED BY T.C.  
 DATUM G.S.C. BOREHOLE TYPE Dynamic penetration test. CHECKED BY \_\_\_\_\_

SOIL PROFILE		SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT ——— $w_L$			BULK DENSITY	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		BLOWS / FOOT	BLCWS / FOOT					PLASTIC LIMIT ——— $w_P$				
							20	40	60	80	100	WATER CONTENT ——— $w$				
							SHEAR STRENGTH P.S.F.					$w_P$ ——— $w$ ——— $w_L$  ————— ————— —————  WATER CONTENT %				
309.3	Groundlevel															
0.0																
302.1	Bedrock assumed.															





DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 7

FOUNDATION SECTION

JOB 65-RF-59 LOCATION Line 'G', Sta. 437+95, 635' Lt. ORIGINATED BY T.C.  
 W.P. Nil BORING DATE June 2, 1965. COMPILED BY T.C.  
 DATUM G.S.C. BOREHOLE TYPE Dynamic penetration test. CHECKED BY \_\_\_\_\_

SOIL PROFILE		SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE	LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W WATER CONTENT % W P — W — WL	BULK DENSITY X P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		BLOWS / FOOT			
307.8	Groundlevel								
292.9	Bedrock assumed.								



## 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		
	PH		SAMPLE ADVANCED HYDRAULICALLY
	PM		SAMPLE ADVANCED MANUALLY

### SOIL TESTS

Qu	UNCONFINED COMPRESSION	L.V.	LABORATORY VANE
Q	UNDRAINED TRIAXIAL	F.V.	FIELD VANE
Qcu	CONSOLIDATED UNDRAINED TRIAXIAL	C	CONSOLIDATION
Qd	DRAINED TRIAXIAL	S	SENSITIVITY

## ABBREVIATIONS USED IN THIS REPORT

### SOIL PROPERTIES

$\gamma$	UNIT WEIGHT OF SOIL (BULK DENSITY)
$\gamma_s$	UNIT WEIGHT OF SOLID PARTICLES
$\gamma_w$	UNIT WEIGHT OF WATER
$\gamma_d$	UNIT DRY WEIGHT OF SOIL (DRY DENSITY)
$\gamma'$	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
$\tau_f$	SHEAR STRENGTH
$c'$	EFFECTIVE COHESION INTERCEPT
$\phi'$	EFFECTIVE ANGLE OF SHEARING RESISTANCE, OR FRICTION
$c_u$	APPARENT COHESION
$\phi_u$	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
$\mu$	COEFFICIENT OF FRICTION
$S_1$	SENSITIVITY

### GENERAL

$\pi$	= 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
$\sigma$	NORMAL STRESS
$\sigma'$	NORMAL EFFECTIVE STRESS ( $\bar{\sigma}$ IS ALSO USED)
$\tau$	SHEAR STRESS
$\epsilon$	LINEAR STRAIN
$\gamma$	SHEAR STRAIN
$\nu$	POISSON'S RATIO ( $\mu$ IS ALSO USED)
E	MODULUS OF LINEAR DEFORMATION (YOUNG'S MODULUS)
G	MODULUS OF SHEAR DEFORMATION
K	MODULUS OF COMPRESSIBILITY
$\eta$	COEFFICIENT OF VISCOSITY

### EARTH PRESSURE

d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
$\delta$	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
$K_c$	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
$\beta$	ANGLE OF SLOPE TO HORIZONTAL

DEPARTMENT OF HIGHWAYS ONTARIO  
ROAD DESIGN DIVISION

FIELD INSPECTION REPORT

LOCATION		
<u>New Lansdowne Patrol Yard - north of station 435+00 +, 0.25 miles</u> <u>east of Lansdowne Road interchange -</u>		
W.P. <u>91-62</u>	HWY. <u>401</u>	DIST. <u>8</u>
TYPE OF WORK _____		MILES _____
TOWNSHIP <u>Front of Leeds &amp; Lansdowne</u>		

Work Schedule No. \_\_\_\_\_

*[Handwritten initials]*  
R. Pillar  
Sr. Project Design Eng.

*R.S. Pillar*

Signed

Date February 14, 1966

S. J. Markiewicz  
Regional Road Design Engineer.

*S.J. Markiewicz*

Signed

Date Mar. 8/66

INDEX

<u>PAGE NUMBER</u>	<u>DESCRIPTION</u>
1 -----	General
2 -----	General, Field Information and Soils Design Report Abstracts.
3 -----	Foundation Report Abstracts, Drainage.
4 -----	Drainage
5 -----	Utilities, Design Features.
6 -----	Design Features, Sundry Construction, and Cost Estimate.

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## MEMORANDUM

TO: Mr. S. J. Markiewicz,  
Regional Road Design Engineer,  
Road Design,  
Downsview.

FROM: R. S. Pillar,  
Sr. Project Design Engineer,  
Road Design, Kingston.

DATE: February 14th, 1966.

OUR FILE REF.

IN REPLY TO

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SUBJECT: New Lansdowne Patrol Yard, Twp. Front of Leeds & Landowne,  
Hwy. #401, Kingston District, W.P. 91-62.

GENERAL

The location selected for the Patrol Yard is virgin terrain and consequently the work will consist of clearing and grubbing, grading, drainage, granular base and paving. A rather lengthy ( $\frac{1}{2}$  mile) entrance roadway is also included. Site plan, H-5-327, as prepared by Special Services will form the basis of the design. Preliminary grades for the entrance and the yard area have already been reviewed and approved by the District. Grades on the yard area have been positioned to allow the disposal of surplus rock from the adjacent Highway #401 grading contract, 65-165.

To facilitate the construction of the proposed 8 bay garage, which is to be scheduled as soon as possible, it will be necessary to complete the following works in conjunction with the placing of the rock fill and/or the garage building.

- (1) All grading, drainage work, etc. on entrance roadway and yard area.
- (2) Placing of sand cushion materials (6") to provide a driving surface.
- (3) Placing of utilities ie: water lines, drains, etc. which are affected by grading operation. Details to be supplied by Special Services.

All expenditures on the patrol yard (including the building) are chargeable to Capital Construction funds, and consequently the above mentioned work will be included under the present grading contract or if necessary under a separate I.B. contract. In any event, the follow-up paving project, W.P.91-62, will now include only:--

- (a) Place 6" GBC'A'
- (b) Hot mix paving throughout
- (c) Place asphalt curb and gutter.
- (d) Trimming operations.

Floor elevations for the proposed garage and salt sheds will be supplied to Services and the District by Road Design.

The District are also to be provided with sufficient design information to complete the preliminary grading, drainage work, etc. This information should be available by March 10th, 1966.

The entire design should be finished in time to allow incorporation with W.P.91-62, which is presently scheduled for April 13th, 1966.

#### FIELD INFORMATION

A request was issued on November 25th, 1965, and completed field books, rolls, etc. were received on January 25th, 1966. A tentative gradeline was set on the entrance roadway by R.D.O. and a black line mylar of same sent to Soils on January 31st, 1966, for plotting of borehole logs and recommendations as requested in their report.

#### SOILS DESIGN REPORT ABSTRACTS

An approved report was received in June, 1965. Recommendations may be summarized as follows:--

- (1) Type of Contract - GBC'A' and Sand Cushion
- (2) Depth of Granular Materials - Place full width to the following depths:

Earth cuts and Fills - 21"

Rock Cuts and Fills - 12"

Above depths to consist of 6" GBC'A' and remainder sand cushion.

(3) Pavement Depths

Wearing Course - 1½" H.L.1 (revised per Soils)

Binder Course - 2" H.L.8

- (4) Drainage to be provided 3 feet maximum below finished pavement grades around perimeter of patrol yard.

FOUNDATION REPORT ABSTRACTS

A Foundation Report for this patrol yard was issued on July 9th, 1965.

Recommendations were:--

1. The garage building (and salt sheds) be supported on continuous strip footings placed as high as frost conditions will permit. A safe net bearing pressure of 1.5 tons per square foot may be used for design purposes.
2. No stability problems are anticipated for sand and salt stockpiles.
3. No major dewatering problems are anticipated.

Design Note: Since it is now proposed to place 6'± of rock fill in the garage area, Special Services were requested to investigate the feasibility of constructing the garage foundation on rock fill. This has now been approved.

DRAINAGE

Aerial photographs of the area were used to determine drainage design data. This information was supplemented by a field check by Engineering Surveys. There was good correlation between both sets of data. Form RD-35 showing

calculations, etc. is attached.

(a) Lansdowne Road (County Road #3)

- (1) Station 6+50 - The existing 18" CIP culvert at Station 6+55 is to be replaced with a 30" CIP at this location. The new pipe will be skewed at 60 degrees approx. to suit the streambed. An extension may be required to accommodate the proposed CS19 entrance. A profile along the centre-line of the future pipe and typical cross-sections have been supplied by the District.

(b) Entrance Roadway and Patrol Yard

- (1) Station 0+50± - To eliminate possible conflict with the proposed 30" CIP on the County Road, false grading of the ditch to carry runoff southerly will be investigated. Otherwise a 24" CIP is to be placed at this location.
- (2) Station 7+90 - A man-made ditch crosses the centre-line at this point. Place a 36" CIP, with skew to fit the existing ditch. Allow for 10% buried on the pipe and set gradient to minimize offtake ditching.
- (3) Station 10+00 to 11+25 - This small, shallow, poorly drained pocket is to be ditched ahead on the left and the right. Use minimum ditch gradient of 0.25%.
- (4) Station 14+50± - Place a 30" CIP, AA&AC to drain small area trapped by yard construction. Outlet to small watercourse on right with minimum amount of offtake ditching.
- (5) Station 17+84 - This small watercourse which drains approx. 115 acres of bush and pasture crosses under the southeast corner of the proposed patrol yard. Due to excessive ditching involved to relocate the stream, the District agreed to place a 48" CIP AA&AC in the existing streambed.

Allow for 6" buried and set gradient to minimize offtake ditching.

(c) Stream Diversions

- (1) Station 13+00-14+50 approx. - Relocation of small stream required to avoid roadway. Stream diversion to be based on line run by Engineering Surveys in the field. Use 4' bottom and 2:1 side slopes.
- (2) Northeast Corner of Patrol Yard - Small watercourse to be diverted to clear patrol yard. Alignment to be developed from cross-sections. Use 4' bottom and 2:1 slopes.

UTILITIES

Raising of a Bell Telephone line on the Lansdowne Road to provide 18' clearance over the entrance to the patrol yard will be required.

DESIGN FEATURES

- (1) Grades - Finished grades at the patrol yard have been established and approved by the District. A 6" drop in 10 feet was utilized in front of the proposed garage and 2% gradients (minimum) elsewhere.

- (2) Entrance Roadway - Following design criteria to be used

Pavement width	-	24'
Shoulders	-	3'
Rounding	-	2'

Five foot shoulders will also be used around the patrol yard.

- (3) Clearing and Grubbing - Provide for a minimum width of 100' on the entrance. As required for construction in yard area.
- (4) Stripping and Ditching - Use 12" depth. Material from stripping operations will be used to flatten rock fill slopes to 2:1 minimum. An item, 'Place Topsoil' will be required to remove materials stockpiled from previous grading operations.
- (5) Sand Pad Area
  - (a) Asphalt curbing around perimeter-use SD-6-266
  - (b) Asphalt membrane - Use RS Emulsified asphalt seal coat.

(c) A 2 x 2 C.B. with a 12" CIP, AA & AC will be constructed at the low point to drain surface runoff. Effluent will be diverted into the adjacent watercourse.

(6) Fencing - The District has requested that DHO property be fenced off, however, since there is a good deal of surplus land involved, limits will have to be set.

(7) Garage & Salt Sheds - To be constructed prior to paving project. Provide for pavement to edges of buildings. Rock grading to be set to allow for 2' and 1' sand pads under garage and salt shed respectively.

(8) Maintenance Stockpile - A stockpile of 10,000 tons of 5/8" crushed gravel type 'B' is to be constructed adjacent to this patrol yard.

SUNDRY CONSTRUCTION

The following will be included under W.P. 91-62:----

- (1) Seeding and mulching
- (2) Adjustments to Bell line
- (3) Contingencies

COST ESTIMATE

(a) Tender

Grading, Drainage, Granular Base	30,000.00	
Paving	<u>20,000.00</u>	

(b) Engineering 50,000.00

7,000.00

(c) Materials 15,000.00

(d) Sundry 3,000.00

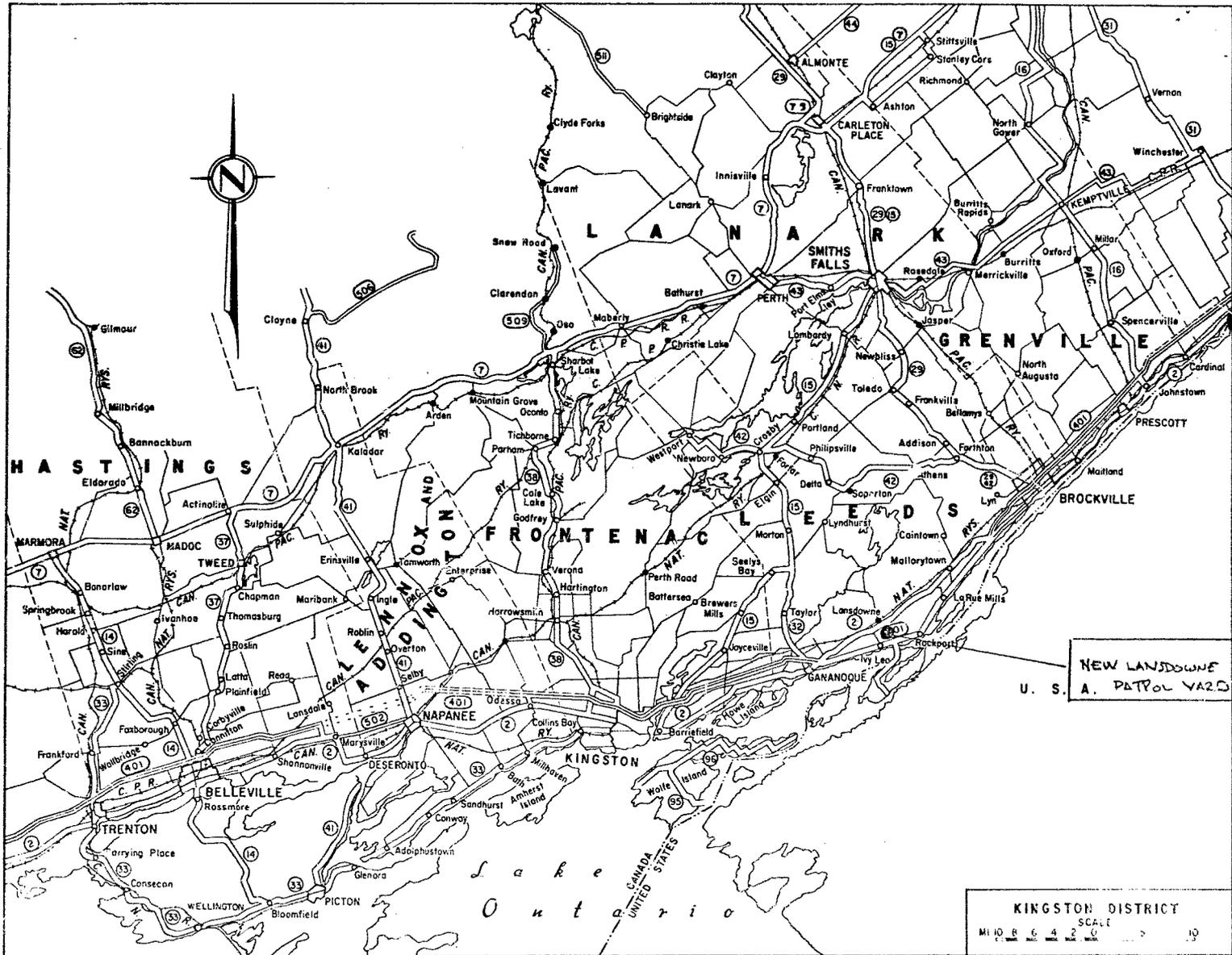
Total: \* 75,000.00

\* Approx. \$36,000.00 will be included with W.P. 91-62, and the remainder expended under Contract 65-165 and/or an I.B. contract. Costs for building and related works are not included in this estimate.

*R.S. Pillar*

R.S. Pillar  
SR. PROJECT DESIGN ENGINEER.

RSP/ss



NEW LANDSDOWNE  
U. S. PAT. NO. 1,422,000

KINGSTON DISTRICT  
SCALE  
MI 10 8 6 4 2 0  
KM 16 12 8 4 0