

DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 316-150

DIST. 9 REGION Eastern

W.P. No. 111-70-01

CONT. No. 73-108

W. O. No. 72-11094

STR. SITE No. _____

HWY. No. 401

LOCATION Hwy. 401 (B.M. E of Hwy. 34)

Interch.

=====

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. _____

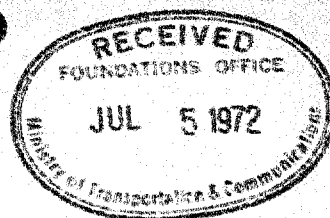
REMARKS: DOCUMENTS TO BE UNFOLDED

BEFORE MICROFILM

DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS

Copy for the information of

Mr. A. G. Stermac



Mr. A. J. Percy,
Regional Manager Systems Design,
KINGSTON, Ontario.

Materials and Testing Office,
KINGSTON, Ontario.

Mr. G. McMillan

June 29th, 1972

W. P. III-70-01, Weigh Scale Site, 8 Miles E. of Hwy. 34 Interchange,
District # 9, Ottawa

We have reviewed the proposed contract drawings and specifications for the above mentioned work project and wish to comment as follows:

1. The small sanitary sewer line from the weigh house to the septic tank should be covered with Granular 'A'.
2. There is no quantity breakdown on new construction sheet # 5. It is required that stripping be carried out under the proposed scale and approaches area. A note to this effect should be shown on the drawings.
3. In view of the proposed grade raise in the area of the proposed scale location and the small allowable movement tolerations on Highway Vehicle Weight Control scales, the drawings should be reviewed by the Foundations Office.

A. M. Batten

A. M. Batten,
Senior Soils Supervisor

AMB/sgp

c. c. - A. G. Stermac
G. A. Wong
J. E. Callaghan
R. J. Forrest

[Handwritten signatures and notes at the bottom of the page, including "A. M. Batten", "S. B. Wheeler", and "Batten"]

MEMORANDUM

72-11-094

TO: Mr. E.R. Saint,
Materials Engineer,
Eastern Region,
KINGSTON, Ontario.

ATTENTION: Mr. A.M. Batten,
Senior Soils Supervisor.

OUR FILE REF.

FROM: Foundations Office,
Design Services Branch,
West Bldg.,
DOWNSVIEW, Ontario

DATE: July 17, 1972

IN REPLY TO

SUBJECT: Weight Scale Site
Hwy. #401 (Station 423+80) -
8 Miles East of Hwy. #34 Interchange
Township of Lancaster County of Glengarry
District No. 9 (Ottawa)
W.P. 111-70-01

*Additions and deletions
by J.R. Warr
July 17/72*

1. INTRODUCTION:

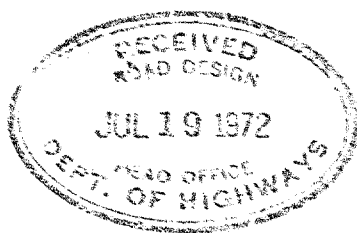
It is proposed to construct a weigh scale pit and house at the aforementioned location on Hwy. #401. Contract drawings (sheets 1 to 19, inclusive), as well as specifications, have been prepared ~~for review by~~ Regional Systems Design (Eastern Region). Mr. A.M. Batten, Senior Soils Supervisor, Eastern Region, has reviewed these drawings and submitted his comments in a memo, dated June 29, 1972. In view of the proposed grade raise in the area of the proposed scale location, and the small allowable movement tolerances on Highway Vehicle Weight Control scales, Mr. Batten requested that the Foundations Office review the scheme.

We have reviewed the scheme proposed. Our comments with regard to its feasibility are presented in this letter.

2. PROBABLE SUBSOIL CONDITIONS AT PROPOSED WEIGHT SCALE SITE:

The Foundations Office has not carried out a subsurface investigation at this particular site. It is known that this area is located in the physiographic region known as the "Lancaster Flats". In this area the surficial stratum is generally composed of a 25 to 50 feet thick relatively soft compressible clay of fresh water origin.

This Office did carry out an investigation for the Service Centre, located approximately 500 feet east of this site (Report No. 64-F-80, dated September, 1964). At this location, the surficial stratum was composed of a sensitive clay which varies from 22 to 54 feet in thickness; the clay is generally most extensive in the westerly portion of the site



July 17, 1972

(closest to weigh scale site). The upper 9 to 12 feet of the stratum is desiccated, forming a stiff crust. The underlying portion, however, is more compressible, having a consistency in the soft to firm range (minimum undrained shear strength 400 p.s.f.). The clay is underlain by a competent cohesive glacial till deposit.

Taking into consideration the results of the Service Centre investigation, it is inferred that the Weigh Scale site is underlain by the soft compressible clay, the base of which probably extends down to as low as elevation 110 (thickness of 45 to 55 feet). The comments, to be presented in the sub-sections to follow, are based on this assumption, which may not be accurate, since it is not uncommon for the engineering properties and thickness of a particular subsoil to vary markedly over relatively short distances. The only way one could be sure of these factors would be if a subsurface investigation was carried out at this site.

3. PROPOSED WEIGH SCALE SCHEME:

Between Stations 419+00 and 432+00, the Hwy. #401 embankment is to be extended in a southerly direction, in order that trucks may drive off the core lanes and be weighed at a weigh scale located at about Station 423+80. The proposed grade of the exit ramp will vary between elevations 164 and 166, while the original ground surface varies between elevations 157 and 161, being lowest in the vicinity of the proposed Weigh Scale. At the profile grade quoted above, up to 9.5 feet of earth fill will have to be placed to form the exit ramp.

The 12.7 by 16.7 feet by 5.9 feet deep Weigh Scale Pit will be supported on a rigid concrete mat foundation, the base of which will be located at elevation 160. The pit is to be covered by 2 inches of styrofoam which, in turn, is to be underlain by 12 inches of well compacted Granular 'A' material. The granular material will be underlain by between 2 and 4 feet of additional fill. A 14 by 20 feet Weigh Scale House is to be integrally connected to the Scale Pit; it is to be founded, at elevation 161, on a spread footing, located around the perimeter of the building. The building will be underlain by 2 to 3 feet of new fill.

SD-4-80
STD.
SHOWS 6"
ONG. CHANG
TO AGREE
D.M.M.

A 70 feet long heavily reinforced concrete approach slab will be placed at either end of the Weigh Scale Platform.

It is understood that the sequence of construction will be as follows:

- i) place and compact the fills along the exit ramp.
- ii) construct the Weigh Scale Pit and House.
- and iii) approximately one year after the placement of the fill and construction of the structures, the settlement sensitive weigh scale equipment will be installed.

July 17, 1972

It has been pointed out that, as far as differential settlement is concerned, the critical transition point will be between the weigh scale platform and the approach fills.

4. COMMENTS WITH REGARD TO FOUNDATION CONDITIONS:

i) Exit Ramp Embankment:

Fill up to 9.5 feet in height will be placed to form this embankment. Fills of this height will be inherently stable, provided standard 2:1 slopes are adopted. The underlying clay stratum will consolidate, however, due to the fill loading. Based on our past experience with clays of similar geologic history, it is inferred that the induced stress increase will remain within the preconsolidation range of the cohesive stratum found at this site. If this is the case, then the settlement will be of a recompression nature. Computations carried out have indicated that the total settlement would be of the order of $1\frac{1}{2}$ inches, the major portion of which should be realized within a period of 24 months.

ii) Weigh Scale Pit and House:

The foundations for these elements could be designed using an allowable bearing value of up to 0.75 t.s.f., provided the fill beneath them is properly compacted. The underlying cohesive subsoil will settle due to the combination of the foundation and underlying new fill loading. This settlement, which will be of a recompression nature should not exceed $\frac{3}{4}$ of an inch. The differential settle between the Weigh Scale Pit and House should be less than $\frac{1}{2}$ inch.

iii) Differential Settlement Between Ramp Embankment and Weigh Scale Platform:

Differential settlement between these elements will become critical once the weigh scale equipment is in place, which is expected to be about 1 year following placement of the ramp fill. Based on the computations carried out, it is estimated that the differential settlement, between the fill and scale platform will be in the range of $\frac{1}{2}$ to $\frac{3}{4}$ of an inch. We feel that the 70 foot long, heavily reinforced approach slabs, located in the critical areas, should be able to bridge such differential movements and that the expected magnitude quoted above should be within tolerable limits, even considering the settlement sensitive nature of the equipment involved.

If it is considered that differential settlements of the order of $\frac{3}{4}$ of an inch cannot be tolerated, we would strongly recommend that a detailed subsurface investigation be carried out at this site to better delineate the extent and engineering characteristics of the compressible cohesive subsoil. This Office, upon notification, could carry out an investigation.

July 17, 1972

We trust that the comments presented in this letter sufficiently outline the foundation considerations at the Weigh Scale site. If we can be of any further assistance to you on this project, please contact this Office.

B.T. Darch

B.T. Darch,
Senior Foundations Eng.,
For: M. Devata,
Supervising Foundations Eng.

BTD/nt

c.c. Messrs. J. Wear
S.G. Wheeler
T.C. Kingsland
L.M. Paverett
Foundations Files
Documents

MEMORANDUM

72-11094

TO: Mr. J. Percy
Manager Regional Systems Design
Kingston Region

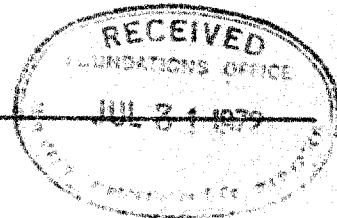
FROM: Systems Design Branch
East Building
Downsview, Ontario

ATTENTION:

DATE: July 26, 1972

OUR FILE REF.

IN REPLY TO



SUBJECT:

W.P. 111-70-01, Contract 72-147, Highway 401, Weigh
Scale Site south side, 8.0 miles east of Highway
number 34, District 9.

This will confirm our recent conversation and advise others of the proceedings arising from the memo, attached, from the Foundations Office concerning anticipated settlement of site foundation materials.

In order to reduce the possibility of differential settlements the following is recommended:

- 1) Construct the entire fill section including the location of the scale foundations to the top of sub-grade prior to the shutdown of construction operations for this year.

- note: 1) B.J. Giroux of the Estimating Office has indicated that commencement of construction operations would be approximately October 2nd and the placing of approximately 15,000 cubic yards of fill would require 16 days. Winter shutdown will be between December 1/72 and June 1/73. Sewer work, styrofoam, fencing and possibly the granular base course etc. could also be completed prior to shutdown. However, the structure foundations and concrete levelling pads are not to be commenced this year.
- 2) C. Wrong, Principal Soils Engineer of the Soils Office, has arranged with E. Saint, Regional Materials Engineer, for a foundation investigation to be carried out. Settlement plates will be installed during the placing of fill and monitored to determine at what time the structure foundations may be constructed.

- 2) An addendum will be required for the contract to specify the above requirements. The Project Review Engineer will make the necessary arrangements.

Cont'd...

Would you therefore please provide the following:

- a) extent of additional earth required to occupy the void of the structure foundations
 - i) borrow required
 - ii) earth excavation
- b) additional granular "A" to place uniformly over the area of the weigh scale structure
- c) locations where settlement plates will be installed and an appropriate special provision
- d) a recommendation for a staging special provision as confirmed with the District Office, Materials and Testing, Special Services, etc.
- e) any additional information as may be required in the contract.

The advertising of the contract will be August 2/72. Any addition to the contract at this point will require an addendum. All arrangements (except as noted) as may be required involving other offices should be handled directly through your office.


J.R. Wear
PROJECT REVIEW ENGINEER

Attach.

JRW/rk

c.c.:

F.G. Allen
D.A. Barr
F.D. Billings
M. Devata✓
D.W. Farren
L. Fraser
B.J. Giroux
D.M. Hopper
A.G. Kelly
T.C. Muir
L.M. Peverett
E.R. Saint
R. Scadding
S.G. Wheeler
E.J. Willis
G. Wrong

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

72-11094

To: Mr. A. G. Stermac,
Principal Foundations Engineer,
DOWNSVIEW, Ontario.

FROM: Materials and Testing Office,
KINGSTON, Ontario.

ATTENTION:

DATE: July 27th, 1972

OUR FILE REF.

IN REPLY TO

SUBJECT:

W. P. III-70-01, Cont. 72-147, Hwy. 401, Weigh Scales,
8 Miles E. of Hwy. 34 Interchange, Dist. # 9

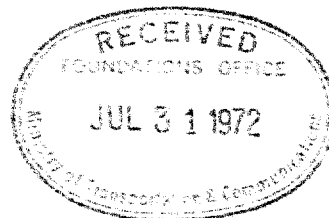
Based on the information presented in your memo of July 17th and subsequent discussions, please investigate the conditions at the site and locate settlement plates to monitor the condition if necessary.



E. R. Saint,
Regional Materials Eng.

ERS/sgp

c. c. - J. E. Callaghan
G. A. Wrong
L. Fraser
G. McMillan



MEMORANDUM

TO: Mr. J. Hear
Project Review Engineer
Systems Design Services Office
DOWNSVIEW, Ontario

FROM: Systems Design Section
KINGSTON, Ontario

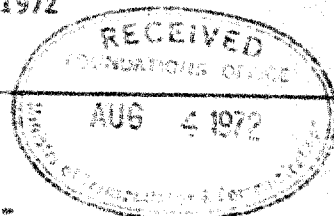
72-11094

ATTENTION:

DATE: August 3rd, 1972

OUR FILE REF.

IN REPLY TO



SUBJECT:

W.P. 111-70-01 - Contract 72-147
Weigh Scale Site South Side of 401
5.0 Miles East of Highway 34 Inter-
change - District 89, Ottawa

Further to your letter of July 26th and as per our telephone conversation yesterday, we would recommend that the split between work to be performed this year and that to be held over till next year be based on the following:

1) Between Station 422+65+ and Station 425+00+, the fill be placed to top of earth elevation. The foundations, services, styrofoam and granular should not be included in this phase, however, the selected subgrade material for the tile bed can be constructed.

2) Outside these limits, everything can be constructed to top of granular this year.

This has been discussed with Foundations and Materials and Testing and they are in agreement. Mr. Devata will be giving you the location for the settlement gauges and has requested that he be given about two weeks notice by the District before any fill is placed.

The documents should be amended such that any excavation required due to this staging is adequately covered for payment purposes.

Also since the pavement will not be completed till next year, the granular quantity should be increased so that in the interim the drop off from the existing edge of pavement on 401 can be levelled off.

If you require any further information, please call.

G. McMillan
Project Design Engineer

Cc/ask

J. Callaghan
E. Saint
B. Giroux
T. C. Laiz

M. Devata ✓
L. Fraser
H. McKay

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

72-11094

TO: Mr. T.C. Muir
Contract Control Engineer
Operations Division

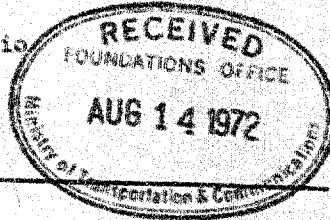
FROM: Systems Design Branch
East Building
Downsview, Ontario

ATTENTION:

DATE: August 10, 1972

OUR FILE REF.

IN REPLY TO



SUBJECT:

Re: W.P. 111-70-01, Contract 72-147, Highway 401,
Weigh Scale Site, South Side of Highway 401
8.0 miles East of Highway 34 Interchange District#9,
Ottawa.

Subsequent to the Head Office Review there was an identification of a possible "foundations" complication on the above contract which is to be concluded as follows.

In accordance with memos of July 26 and August 3, in order to alleviate anticipated differential settlement of site foundation materials, the Contractor will be required to complete the fill placement this year, and excavate to construct the structure foundations next year.

The above requirements are recommended to be included as an addendum to contract as follows.

STAGE CONSTRUCTION

The Contractor shall complete all earth grading including the placement of the select subgrade material for the tile bed, and shall place an earth surcharge over the scale pit and house foundations to elevation 64.5 prior to November 30th, 1972.

The weigh scale structure excavation and foundations, the services to and from the weigh scale foundations, the styrofoam and the granular base course between station 422 + 65 and 425 + 00 shall not be undertaken until the commencement of construction operations in 1973.

Payment for the excavation for the weigh scale structure foundations to the neat lines as shown on the drawings will be included in the item Earth Excavation (Grading).

INSTALLATION OF MEASURING DEVICES AND THEIR PROTECTION DURING CONSTRUCTION

The Ministry will install prior to the placing of the approach fills to the weigh scale, settlement plates, settlement gauges and

Cont'd...

piezometers below the level of the original ground surface. The Contractor shall exercise every precaution to prevent damage to these devices during grading operations.

The Contractor shall provide access to these devices for Ministry vehicles and personnel when required.

The locations of the settlement plates will be as follows:

Sta. 423 + 03	73 ft. rt. of \bar{E} of E.B.L.
Sta. 423 + 83	64.5 ft. rt. of \bar{E} of E.B.L.
Sta. 424 + 53	73 ft. rt. of \bar{E} of E.B.L.

FOUNDATION BORINGS DATA

BH #1

Sta. 423 + 80, 55' RT. of \bar{E} E.B.L. of Highway 401
Ground Elevation 156.0'
Ground Water Level - Elevation 150.9'

Depth

0' to 8.5'	<u>Silty Clay (Desiccated Zone)</u> (Very Stiff to Stiff)
8.5' to 30.0'	<u>Silty Clay</u> (Firm to Stiff)
30.0' to 35.5'	<u>Granular Glacial Till</u> (Dense to Very Dense)

END OF BH.

BH #2

Sta. 424 + 80, 55' RT. of \bar{E} E.B.L. of Highway 401
Ground Elevation 158.0'
Ground Water Level - Elevation 153.0'

Depth

0' to 9.5'	<u>Silty Clay (Desiccated Zone)</u> (Very Stiff to Stiff)
9.5' to 25.0'	<u>Silty Clay</u> (Firm)

25.0' to 28.0'

Silty Sand

(C. pact)

28.0' to 35.5'

Granular Glacial Till

(Very Dense)

END OF BH.

Cone Test #3

Sta. 422 + 80, 35' RT. of E.B.L. of Highway 401
Ground Elevation 158.0'

0' to 30'

Probably Silty Clay

30' to 38.7'

Probably Glacial Till

END OF DYNAMIC CONE PENETRATION TEST.

The District Engineer is to provide 2 weeks advance notice to the Foundations Office prior to the commencement of work in order to place the settlement plates.

JRW/SP

c.c.:

F.G. Allen
D.A. Barr
P.D. Billings
M. Devata ✓
D.W. Farren
L. Fraser
B.J. Giroux
D.M. Hopper
L.M. Peverett
F.R. Saint
R. Scadding
S.G. Wheeler
E.J. Willis
C. Wrong



J.R. Wear

PROJECT REVIEW ENGINEER

for

G.K. Hunter

SYSTEMS DESIGN ENGINEER

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

TO: Mr. E. R. Saint, (2)
Regional Materials Engineer,
Eastern Region,
Kingston, Ontario.

FROM: Foundations Office,
Design Services Branch,
West Bldg., Downsview.

ATTENTION:

DATE: November 20, 1972.

OUR FILE REF.

IN REPLY TO

NOV 21 1972

SUBJECT:

31 G-160

FOUNDATION INVESTIGATION REPORT
for
The Proposed Weigh Scale
Hwy. #401 - 2 Miles East of the Hwy. #34 Interchange
Township of Lancaster, County of Glengerry
District No. 9 (Ottawa)
W.O. 72-11024 -- W.P. 111-70-01

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

We believe that the factual data and recommendations contained therein will prove adequate for your design requirements. Should additional information be required, please do not hesitate to contact our Office.

A. G. Stermac

A. G. Stermac,
PRINCIPAL FOUNDATIONS ENGINEER.

AGS/ao
Attach.

cc: J. Veer
S. C. Wheeler
T. C. Kingsland
J. A. Creickshank
B. R. Davis
G. A. Wrong

Foundations Files
Documents

TABLE OF CONTENTS

1. INTRODUCTION.
 2. DESCRIPTION OF THE SITE AND GEOLOGY.
 3. FIELD AND LABORATORY INVESTIGATION PROCEDURES.
 4. SUBSOIL CONDITIONS.
 - 4.1) General.
 - 4.2) Silty Clay to Clay (Sensitive).
 - 4.3) Sandy Silt.
 - 4.4) Heterogeneous Mixture of Silt, Sand and Gravel, Trace of Clay (Glacial Till).
 5. GROUNDWATER LEVEL CONDITIONS.
 6. DISCUSSION AND RECOMMENDATIONS.
 - 6.1) General.
 - 6.2) Exit Ramp Embankment - Stability and Settlement Considerations.
 - 6.3) Foundations - Weigh Scale Pit and House.
 - 6.4) Differential Settlement Considerations.
 7. SEQUENCE OF CONSTRUCTION AND INSTRUMENTATION.
 8. MISCELLANEOUS.
-

FOUNDATION INVESTIGATION REPORT
for
The Proposed Weigh Scale
Hwy. #401 - 8 Miles East of the Hwy. #34 Interchange
Township of Lancaster, County of Glengarry
District No. 9 (Ottawa)
W.O. 72-11094 -- W.P. 111-70-01

1. INTRODUCTION:

The contract drawings for the aforementioned weigh scale have been reviewed by the Foundations Office (Contract No. 72-147). Comments with regard to the foundation engineering aspects at this site were presented in a memo (dated July 17, 1972) prepared by Mr. B. T. Darrin, Senior Foundation Engineer. In this memo it was stated that the differential settlement between the proposed earth fill embankment and the weigh scale platform may exceed tolerable limits, since available geologic information indicates these elements will be placed on a sensitive compressible marine clay. It was recommended that a detailed subsurface investigation be undertaken at this site to delineate the extent and engineering characteristics of the compressible cohesive subsoil. Mr. E. R. Saint, Regional Materials Engineer, Eastern Region, requested that this investigation be carried out (memo dated July 27, 1972). An investigation was subsequently carried out by this Office to determine the subsoil and groundwater conditions at this site.

This report contains the factual data obtained from the investigation, together with recommendations pertaining to the design of the foundations for the Weigh Scale pit and house, as well as the stability and settlement considerations associated

with the earth fill embankment to and from the Weigh Scale. Weigh scale equipment is extremely sensitive to differential settlement. A means of monitoring differential movement at this site is given.

2. DESCRIPTION OF THE SITE AND GEOLOGY:

The area under investigation is located approximately 8 miles east of the junction of Hwy. 401 and Hwy. 34 along Hwy. 401, in the Township of Lancaster, County of Glengarry. The terrain is flat to gently undulating in relief between elevations 156 and 164. The major portion of the region is being utilized as farm land and is sparsely wooded. A drainage ditch runs parallel to Highway #401; its low gradient has caused stagnation and a profuse growth of algae, weeds and reeds.

Physiographically the area is situated in the region known as the "Lancaster Flats." In this region a till plain is buried beneath soil deposited in the geologic past in the "Champlain Sea." In the area under investigation the predominant deposit is a highly compressible marine clay, the thickness of which varies from 10 to 45 feet. In a few isolated areas drumlins and ridges of glacial till protrude through the cohesive subsoil. The overburden is underlain by limestone and shale bedrock of the Chazy group, Ordovician Period.

Drainage of the area is toward the St. Lawrence River by way of the Raisin River, Bandet River, Sutherland Creek and a number of shorter streams. Nevertheless, the land is so flat that the area is poorly drained.

3. FIELD AND LABORATORY INVESTIGATION PROCEDURES:

Two sampled boreholes and one dynamic cone penetration test were carried out during the course of the field investigation. The holes were advanced by wash boring procedures using a conventional diamond drill rig adapted for soil sampling.

Samples of the overburden were obtained with a 2" O.D. split spoon sampler which was driven in conformance with the

specifications for the Standard Penetration Test. This was supplemented by obtaining some 2" I.D. Shelby tubes in the cohesive deposit. The undrained shear strength of the clay was determined, where possible, by carrying out field vane testing.

The location and elevation of the boreholes and cone test are shown on Drawing W.O. 72-11094A, which accompanies this report. An inferred stratigraphical section across the site is also shown on this drawing.

All samples were visually identified and classified in the field and laboratory; following this inspection laboratory tests were undertaken to determine the following physical properties of the overburden.

- Atterberg Limits
- Moisture Content
- Grain-Size Distribution
- Bulk Density
- Consolidation Characteristics
- Undrained Shear Strength

The test results are summarized on the Record of Borelog sheets and on Figures #1, 2 and 3, all of which are contained in Appendix I of this report.

4. SUBSOIL CONDITIONS:

4.1) General:

The predominant stratum across the site is composed of a firm to very stiff silty clay to clay, which varies from 25 to 30 feet in thickness. The cohesive stratum is underlain by a dense to very dense granular glacial till.

The stratigraphy encountered in the borings is plotted on the Record of Borelog sheets. The stratigraphical profile, shown on Drawing No. W.O. 72-11094A, has been inferred from this data. A brief resume of the subsoil sequence encountered from ground surface downward, is presented in the subsections to follow.

4.2) Silty Clay to Clay (Sensitive):

The predominant stratum across the site is composed of a clay to silty clay, with a trace of sand. This thickness of the stratum ranges from 25 to 30 feet. The upper 8.5 to 9.5 feet is brown in colour which indicates that this zone has been subjected to desiccation. Below this upper zone the clay is grey in colour. A grain-size distribution curve, for a sample obtained from this stratum, is plotted on Figure #1.

The engineering properties of both the upper desiccated portion, as well as the lower zone of the cohesive stratum, are summarized in the table to follow.

<u>Identity Tests</u>	<u>Upper Desiccated Zone - Range (Average)</u>	<u>Lower Zone Range (Average)</u>
Bulk Density (γ) (p.c.f.)	----	94 - 95
Liquid Limit (W_L) (%)	42 - 56	52 - 87 (79)
Plastic Limit (W_p) (%)	27 - 34	26 - 32 (30)
Natural Moisture Content (W) (%)	30 - 36	33 - 96 (67)
Liquidity Index (I_L)	0.1 - 0.3	1.0 - 1.5 (1.2)
<u>Consolidation Characteristics</u>		
Initial Void Ratio (e_o)	3 Tests	2.15 - 2.33 (2.26)
Compression Index (C_c)		1.40 - 2.26 (1.9)
Recompression Index (C_{cr})		.04 - .06 (0.05)
Degree of Preconsolidation ($P_c - P_o'$) (p.s.f.)		1,000 - 1,080 (1,040)
<u>Undrained Shear Strength (C_u)</u> (p.s.f.)		
1) Field Tests	1,650 to 2,000	400 - 600
2) Lab Tests	---	550 - 1,400
<u>Standard Penetration Resistance Testing ('N')</u> (Blows/ft.)		
	4 - 16	

The Atterberg limit test results, given in the table, are also summarized on the Plasticity Chart, Figure #2. These results indicate that the cohesive subsoil is essentially inorganic with a plasticity that ranges from medium to high. The natural moisture content, in the upper desiccated zone generally lies between the liquid and plastic limit, while it exceeds the liquid limit in the lower portion of the stratum. The latter is an indication of the sensitive nature of the soil.

The results of the undrained shear strength testing indicates that the consistency of the upper desiccated portion of the stratum varies from stiff to very stiff. Below this upper zone, however, the consistency is in the firm to stiff range.

The consolidation characteristics of the stratum were determined by carrying out three laboratory tests, the results of which are shown as Void Ratio versus Pressure Plots on Figure #3. The results indicate that the lower portion of the clay stratum is preconsolidated by about 1,000 p.s.f. in excess of the existing overburden pressure. The relatively high values obtained for the initial void ratio (e_0) and the compression index (C_c) are typical for this type of soil and a further indication of the sensitive nature of the clay stratum.

4.3) Sandy Silt:

At B.H. #2 the clay stratum is underlain by a 3 feet thick deposit composed of a compact ('N' value 11 blows/ft.) sandy silt, with some clay. A grain size distribution curve, for a sample obtained from this layer, is plotted on Figure #1.

4.4) Heterogeneous Mixture of Silt, Sand and Gravel, Trace of Clay (Glacial Till):

The cohesive stratum, or the sandy silt layer where it is present, is underlain by a very dense ('N' values 51 to 75 blows/ft.) glacial till sheet composed of a heterogeneous mixture of silt, sand and gravel with a trace of clay. The two boreholes were terminated within the glacial till deposit

after penetrating it for a depth of up to 7.5 feet. Grain size distribution testing was carried out on samples obtained from this material using 2" O.D. sampling equipment. The results are plotted on Figure #1.

5. GROUNDWATER LEVEL CONDITIONS:

Groundwater level observations have been carried out during the period of the investigation by recording the water level in the open borings. The observations are recorded on the borelog sheets and summarized on Drawing No. W.O. 72-11094A. The results indicate that the piezometric groundwater level, within the overburden varies between elevations 151 and 153, which corresponds to a depth of about 5 feet below existing ground surface.

6. DISCUSSION AND RECOMMENDATIONS:

6.1) General:

It is proposed to construct a weigh scale on the south side of Hwy. #401, at a point about 8 miles east of the Hwy. #401 - Hwy. #34 interchange, in the Township of Lancaster, County of Glengarry. The proposed design details for the weigh scale site are shown on the drawings for Contract No. 72-147 (refer to Sheets #5, 6 and 9).

Between Stations 419+00 and 432+00 the Hwy. 401 embankment is to be extended in a southerly direction, in order that trucks may drive off the eastbound core lanes to be weighed at a weigh scale to be located at about Station 423+80. The proposed grade of the exit ramp will vary between elevations 164 and 166, while the original ground surface varies between elevations 157 and 161, being the lowest in the vicinity of the proposed weigh scale. At the profile grade quoted above, up to 9.5 feet of earth fill will have to be placed to form the exit ramp.

The 12.7 feet by 16.7 feet by 5.9 feet deep weigh scale pit will be supported on a rigid concrete mat foundation, the base of which will be located at elevation 160. The pit is to be covered by 2 inches of styrofoam which, in turn, is to

be underlain by 6 inches of well compacted Granular 'A' material. The granular material will be underlain by between 1 and 6 feet of additional fill. A 14 by 20 foot weigh scale house is to be integrally connected to the scale pit; it is to be founded at elevation 161, on a spread footing, located around the perimeter of the building. The building will be underlain by 2 to 3 feet of new fill.

A 70 feet long, heavily reinforced concrete approach slab will be placed at either end of the weigh scale platform. It has been pointed out that, as far as differential settlement is concerned, the critical transition point will be between the weigh scale platform and the approach fill.

6.2) Exit Ramp Embankment - Stability and Settlement Considerations:

Fill up to 9.5 feet in height will be placed to form this embankment. Fills of this height will be inherently stable, provided standard 2:1 slopes are adopted.

The underlying clay stratum will consolidate due to stresses induced by the fill. Based on the laboratory consolidation testing carried out it is inferred that the induced stress increase will remain within the preconsolidation range of the cohesive stratum. Since this is the case the settlement will be of a recompression nature. Computations have been performed and indicate that the maximum expected settlement will be in the order of 1-3/4 inches, the major portion of which should be realized within 24 months after fill placement. Approximately one-half of the aforementioned settlement should occur within the first year.

6.3) Foundations - Weigh Scale Pit and House:

The shallow foundations for these elements can be designed using an allowable bearing value of up to 1.0 t.s.f. provided that the fill beneath them is properly compacted.

The underlying cohesive subsoil will settle due to the combination of the foundation and the underlying fill loading.

This settlement, which will be of a recompression nature, should not exceed $3/4$ of an inch. The time-rate of settlement should be similar to that discussed in Subsection 6.2). The differential settlement between the integrally connected weigh scale pit and house should be less than $1/2$ of an inch.

6.4) Differential Settlement Considerations:

The weigh scale equipment is particularly sensitive to differential movement. As far as differential settlement is concerned, the critical transition point will be between the weigh scale platform and the approach fills. If the structures were constructed and the associated fills and weigh scale equipment placed simultaneously the magnitude of the differential settlement, at these critical transition points, would probably be of the order of 1 to $1-1/4$ inches. This might exceed tolerable limits.

The post-construction differential settlement could be minimized by constructing the fill section, in the vicinity of the weigh scale, prior to installing the buildings and the equipment. Further, it would be advisable to place fill in the area to be occupied by the structures. Using this technique a considerable percentage of the expected settlement will be induced in the foundation subsoil prior to putting the weigh scale into operation. If 1 year is allowed between the placement of fill and the construction of the structures and installation of equipment the differential settlement should be reduced to about $1/2$ inch. If this procedure is adopted, it would be advantageous to monitor the settlement induced in the cohesive foundation subsoil by installing settlement plates. These observations will make it possible to estimate the differential settlement to be expected following construction of the structures and installation of the settlement sensitive equipment.

7. SEQUENCE OF CONSTRUCTION AND INSTRUMENTATION:

The sequence of operations at the weigh scale site will be as follows:

- a) Installation of settlement plates by Foundations Office personnel in order to monitor the settlement induced in the cohesive foundation subsoil by the weigh scale embankment. A plate is to be placed at each of the locations specified below:

<u>Station</u>	<u>Offset</u>
<u> Hwy. #401 E.B.L.)</u>	
423+03	73' RT. of Centre-lane E.B.L.
423+83	64.5' PT. of Centre-lane E.B.L.
424+53	73' RT. of Centre-lane E.B.L.

This Office should be given at least two weeks notice by the District before any fill is placed at this site in order that the plates can be installed. The contractor shall exercise every precaution to prevent damage to these devices during grading operations.

- b) Between Stations 422+65 and 425+00 the fill should be placed to top of earth elevation. This should include the placement of fill at the location to be occupied by the weigh scale pit and house. The foundations, services, styrofoam and granular material should not be included in this phase. Outside these limits everything can be constructed to the top of granular.
- c) The Foundations Office should be notified as soon as phase b) has been completed so that they may take all measures necessary to commence the monitoring of the settlement devices.
- d) Providing the monitored settlement pattern is satisfactory the structures and weigh scale equipment can be installed in the following year.

8. MISCELLANEOUS:

The field work, performed on August 1, 1972, was supervised by Mr. A. Tieman, Student Technician (Field).

The equipment was owned and operated by Master Soil Investigation Ltd., Toronto.

This report was written by Mr. Tieman who was assisted by Mr. B. T. Darch, Senior Foundations Engineer. This report was reviewed by Mr. M. Devata, Supervising Foundations Engineer.

B. T. Darch,
for A. Tieman



M. Devata

AT/ao
Nov. 16, 1972.

M. Devata, P. Eng.

APPENDIX I

RECORD OF BOREHOLE NO 1

JOB 72-11094

LOCATION Sta. L23 + 80 o/s 55' Rt. of R. EEL.

W.P. 111-70-01

BORING DATE Aug. 1, 1972

ORIGINATED BY AT

COMPILED BY AT

DATUM Geodetic

BOREHOLE TYPE Washbore

CHECKED BY

SOIL PROFILE			SAMPLES		ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w	BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		SHEAR STRENGTH P.S.F. O UNCONFINED * FIELD VANE X QUICK TRIAXIAL X LAB VANE 100 200 300 400 500	w_p — w — w_L 20 40 60		
156.0	Ground Level								
0.0	Decalcated		1	GS					
	Brown		2	GS					
147.1	Very Stiff to Stiff		3	GS					150.9
8.5			4	GS					
	Silty Clay to Clay		5	GS					
			6	GS					
	Grey		7	GS					
	Firm to Stiff		8	GS					
126.0			9	GS					
30.0	Mat. mix. of silt, sand & gravel. (Gloia. 2.11)		10	GS					23 21 11 12
120.5	Dense to Very Dense		11	GS					30 48 (13)
35.5	End of Borehole								

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 2

JOB 72-11094

LOCATION Sta. 42h + 80 o/s 55' Rt. of EBL

ORIGINATED BY AT

W.P. 111-70-01

BORING DATE Aug. 1, 1972

COMPILED BY AT

DATUM Geodetic

BOREHOLE TYPE Washbore

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT		LIQUID LIMIT _____ w_L PLASTIC LIMIT _____ w_p WATER CONTENT _____ w		BULK DENSITY Y P.C.F.	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F.		WATER CONTENT %			
							○ UNCONFINED ● QUICK TRIAXIAL	* FIELD VANE x LAB VANE	w_p w w_L	20 40 60		
158.0	Ground Level											
0.0	Desiccated											
	Brown		1	SS	12					10		0 3.63 3h 153.0
	Stiff		2	SS	5							
148.5			3	SS	2							
9.5			4	SS	-							
	Silty clay to Clay		5	TM	PM							0 1.25 7h
			6	TM	PM							Ca=2.1 Cc=2.1
	Grey											
	Firm											
133.0												
25.0	Sandy silt,		7	SS	11							0 0.81 19
130.0	some clay, Compact											
28.0	Het. mix. of silt, sand & gravel, trace of clay (Glacial Till)		8	SS	73							
122.5	Very Dense		9	SS	51							28 h1 25 6
35.5	End of Borehole											

FOUNDATIONS OFFICE

MOB 72-11074

LOCATION Sta. 422 + 80 c/s 55' E. of E. ERL.

ORIGINATED BY AT

W.F. 311-70-01

BORING DATE August 1, 1972

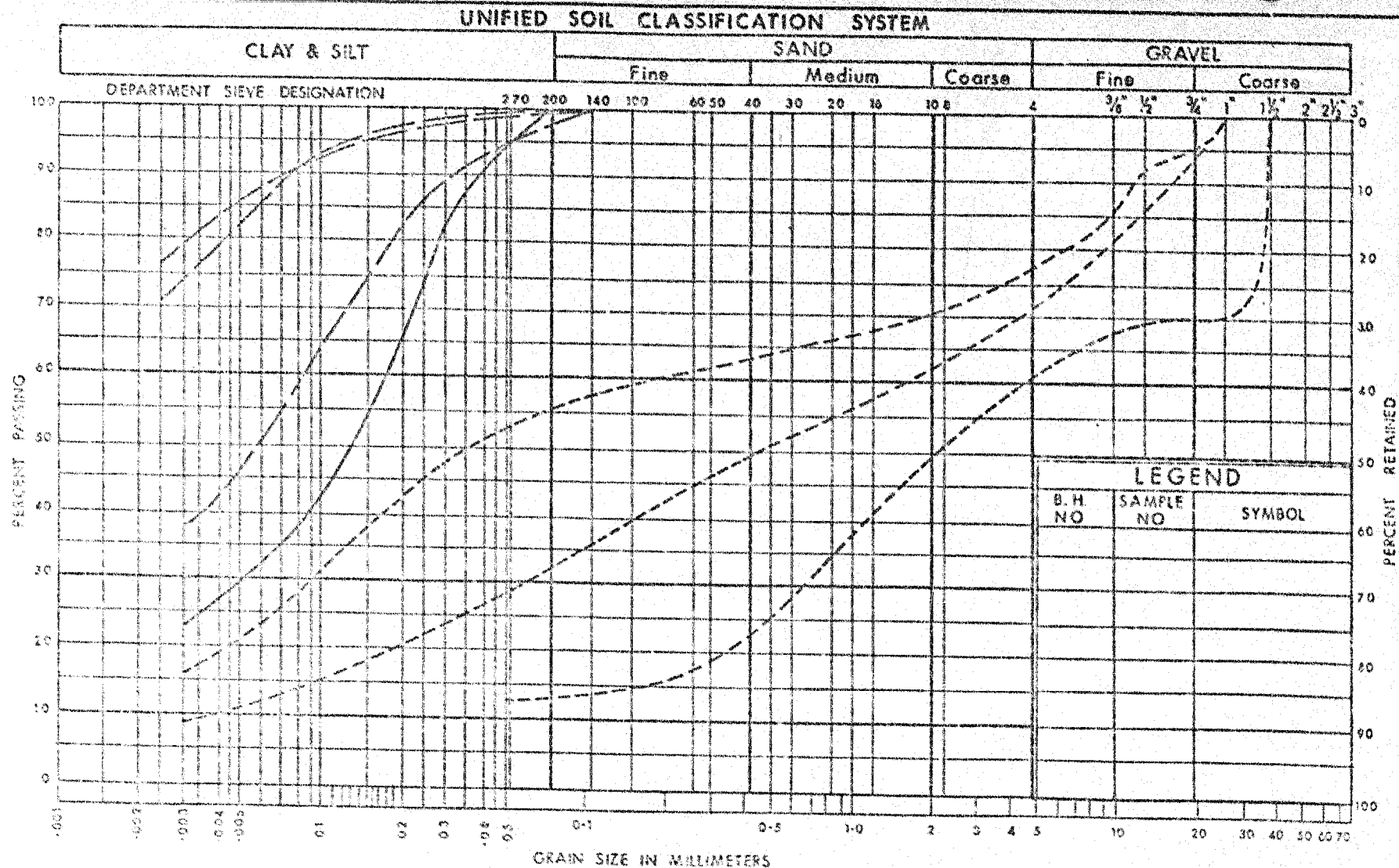
COMPILED BY AT

DATUM Geodetic

BOREHOLE TYPE Core Test

CHECKED BY [Signature]

SOIL PROFILE			SAMPLES	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100	LIQUID LIMIT ——— w _L PLASTIC LIMIT ——— w _P WATER CONTENT ——— w	BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER TYPE	BLOWS / FOOT	SHEAR STRENGTH P.S.F.		
158.0	Ground Level				O UNCONFINED + FIELD VANE • QUICK TRIAXIAL x LAB VANE	w _p ——— w ——— w _L WATER CONTENT %	
0.0	Probably Silty clay to clay	[Hatched Pattern]		150			
129.0	30.0 Probably Glacial Till	[Dotted Pattern]		140			
128.3				130			
38.7	End of Cone Test			120			
				110			



DEPARTMENT
OF
TRANSPORTATION AND COMMUNICATIONS

DESIGN SERVICES
ARCHITECT

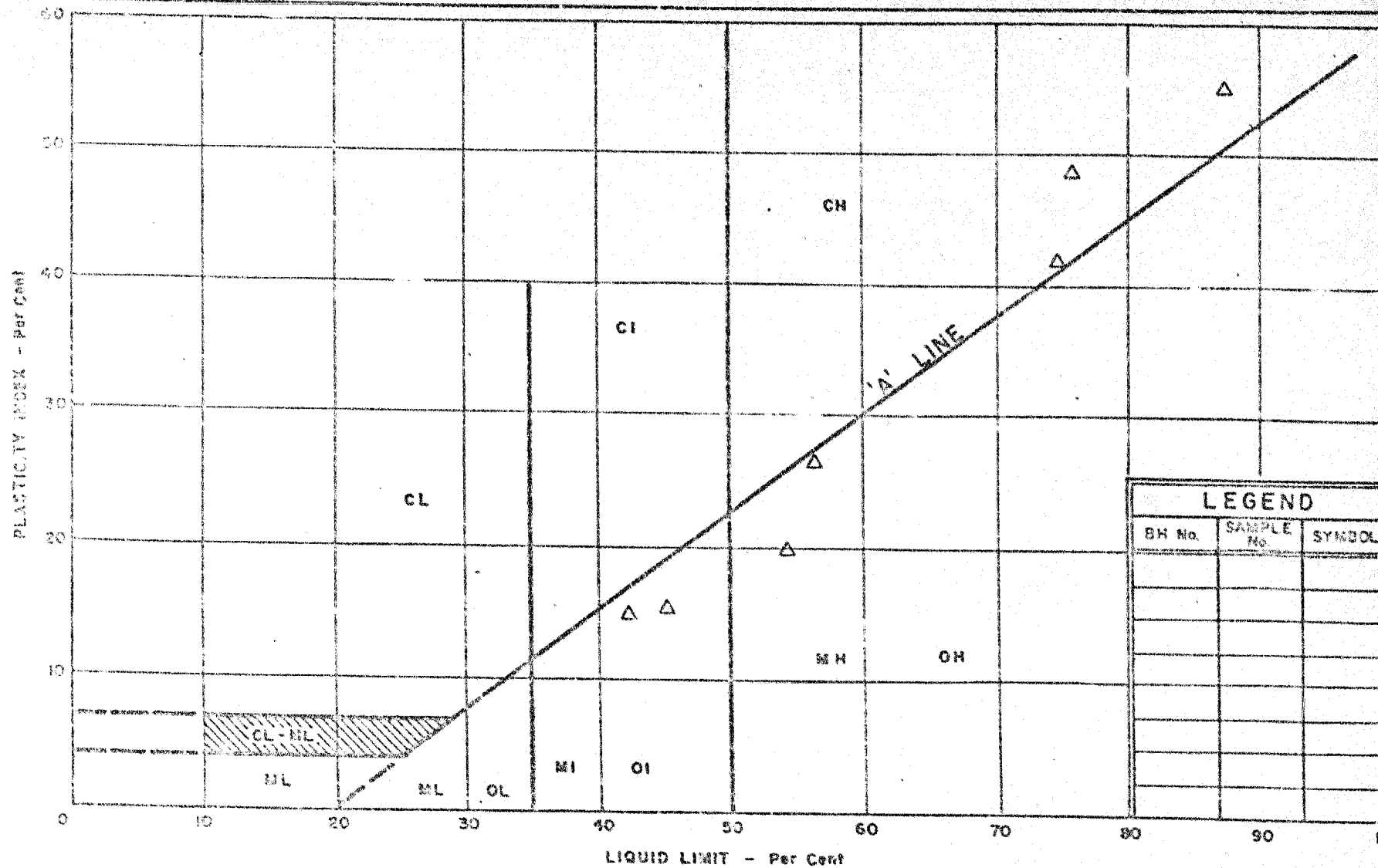
GRAIN SIZE DISTRIBUTION

____ SILT, SOME CLAY
____ GLACIAL TILL (HET. MIX)
____ SILTY CLAY TO CLAY

W.P. No. 111-70-01

JOB No. 72-11094

FIG. No. 1



DEPARTMENT OF HIGHWAYS
MATERIALS and
TESTING
DIVISION

PLASTICITY CHART SILTY CLAY TO CLAY

WCP No. 111-70-01

JCS No. 72-11094

FIG. 2

VOID RATIO - PRESSURE CURVES

JOB NO. 72-11094

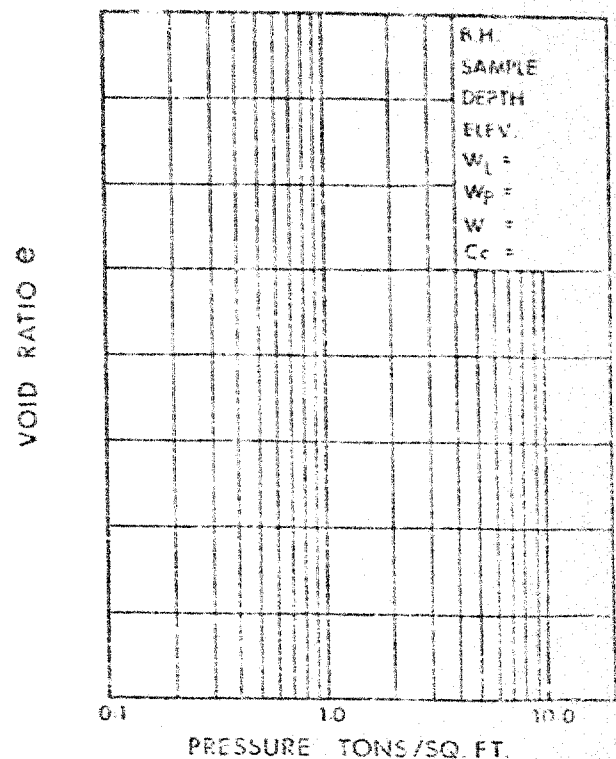
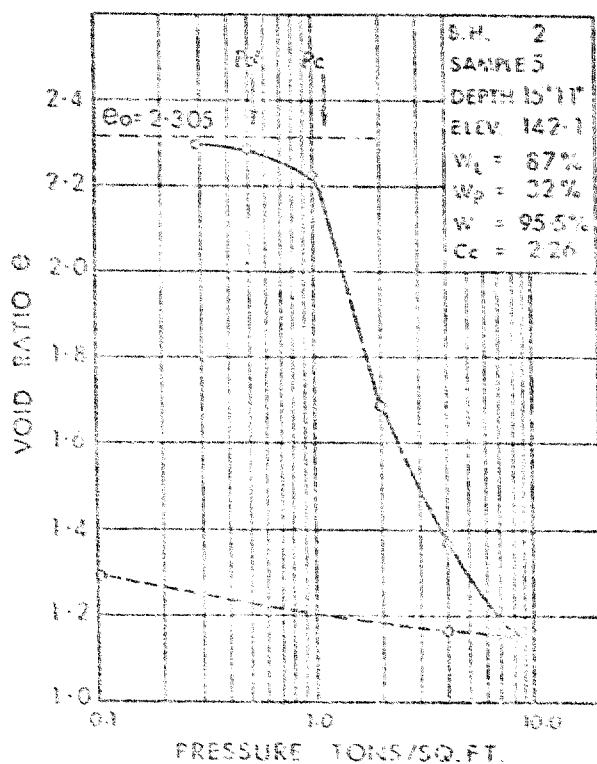
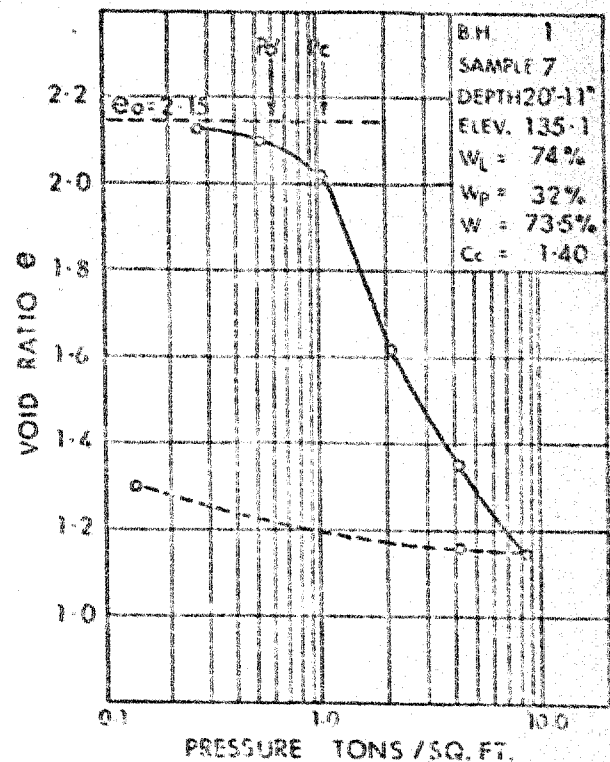
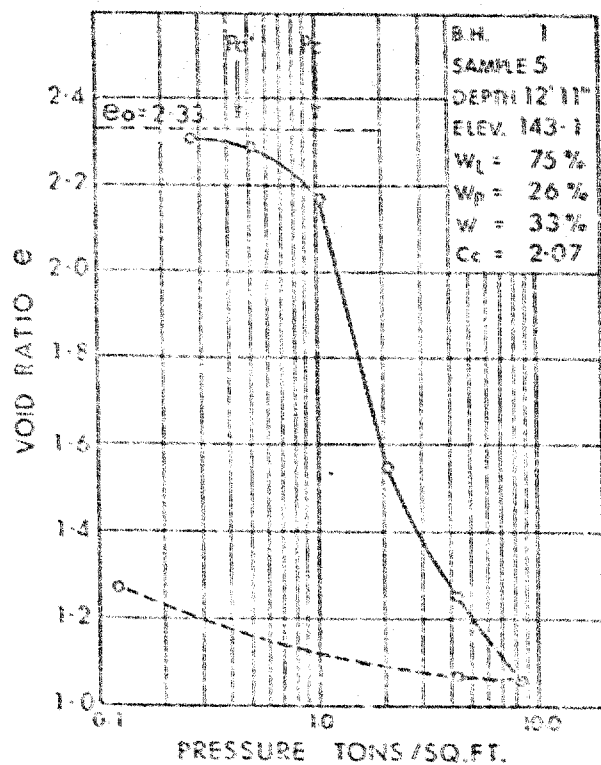


FIG. 3

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>± 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
$\log_e \sigma$ OR $\ln \sigma$	NATURAL LOGARITHM OF σ
$\log_{10} \sigma$ OR $\log \sigma$	LOGARITHM OF σ 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

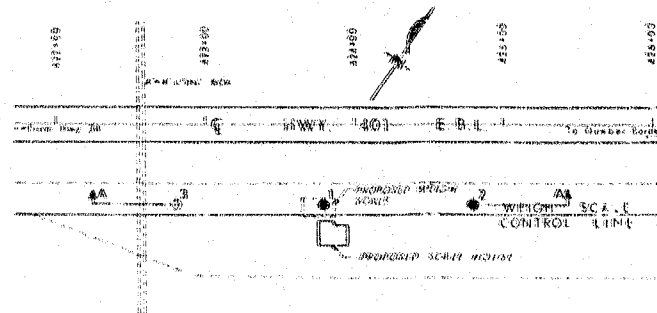
d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
δ	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
K_0	COEFFICIENT OF EARTH PRESSURE AT REST

FOUNDATIONS

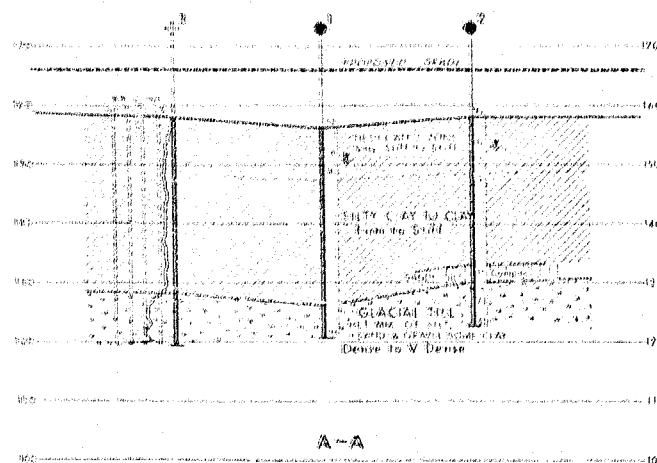
B	BREADTH OF FOUNDATION
L	LENGTH OF FOUNDATION
D	DEPTH OF FOUNDATION BENEATH GROUND
N	DIMENSIONLESS COEFFICIENT USED WITH A SUFFIX APPLYING TO SPECIFIC GRAVITY, DEPTH AND COHESION ETC. IN THE FORMULA FOR BEARING CAPACITY
k_s	MODULUS OF SUBGRADE REACTION

SLOPES

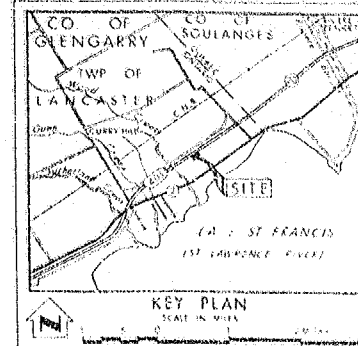
H	VERTICAL HEIGHT OF SLOPE
D	DEPTH BELOW TOE OF SLOPE TO HARD STRATUM
β	ANGLE OF SLOPE TO HORIZONTAL



PLAN
SCALE
0 20 40 60 80 100



A-A
SECTION
SCALE
0 20 40 60 80 100



LEGEND			
●	Bore Hole		
⊙	Camp Location Map		
⊙	Bore Hole & Camp Map		
⊙	Water Level established at time of field investigation Aug 1, 1972		
NO.	1	2	3
COORDINATES	422+80	422+80	422+80
1	150.0	422+80	150.0
2	150.0	422+80	150.0
3	150.0	422+80	150.0

NOTE:
The boundaries between the Bore Hole and Camp Map are not shown. The boundaries between the Bore Hole and Camp Map are not shown. The boundaries between the Bore Hole and Camp Map are not shown.

NO.	1	2	3
COORDINATES	422+80	422+80	422+80
1	150.0	422+80	150.0
2	150.0	422+80	150.0
3	150.0	422+80	150.0

MINISTRY OF TRANSPORTATION & COMMUNICATIONS
DESIGN SERVICES DIVISION - ROAD DESIGN UNIT

PROPOSED WEIGH SCALE
(LIMIT WEST OF QUÉBEC BORDER)

Location: 422+80
CO. OF GLENGARRY
TWP. OF LANCASTER

BORE HOLE LOCATIONS & DATA

DATE: 1972
BY: [Signature]
CHECKED: [Signature]
APPROVED: [Signature]

MEMORANDUM

To: Mr. R. J. Forrest,
Regional Schedule Co-ordinator,
KINGSTON, Ontario.

FROM: Materials and Testing Office,
KINGSTON, Ontario.

ATTENTION:

DATE: December 5th, 1972

OUR FILE REF.

IN REPLY TO

SUBJECT: ① W. P. 111-70-01, Hwy. 401, Weigh Scale Site, S. Side, 7.7 Mi. E. Hwy. 34, 72-11-094
 ② W. P. 861-67-01, Hwy. 34, Lancaster N. Lts. N'y. to Alexandria S. Lts., Ord. R. .,
 ③ W. P. 608-68-02, Hwy. 2, 0.4 Mi. E. Glengarry Cty. Rd. 27 or Summerstown E'y.
 6.4 Miles, Capital Resurfacing, District #9, Ottawa

The foundation report for W. P. 111-70-01, indicates that the fills should be placed one year before construction of the structures and installation of equipment.

W. P. 861-67-01 should be deferred to 1974 to allow advancing projects with a higher need such as W. P. 919-67-01 east of Rockland on Hwy. # 17.

In view of the light traffic on W. P. 608-68-02, and the rate of pavement deterioration, the project could be deferred to the 1975 construction program.

In view of these conditions, it is recommended that a small project be established (possibly invitation bid) for placing earth fill in the vicinity of the weigh scale, scale house or approach slabs. This project could be scheduled for 1973. The completion of grading, granular base and paving could then be carried out in 1974. If W. P. 861-67-01 is deferred to 1974, the completion of the work at the weigh scale site could be grouped with it.

In order to keep an initial grading contract to a minimum, it is recommended that fill be placed in the vicinity of the weigh scale pit and approach slabs to subgrade. The fill should be placed 20' beyond the ends and sides of the proposed approach slabs, scale pit and scale house structures.

The foundation report suggests instrumentation of the fill if stage construction is adopted. It will be necessary for the District to arrange for this with the Foundation Office.

These suggestions have been discussed with the District and they indicate agreement with them.

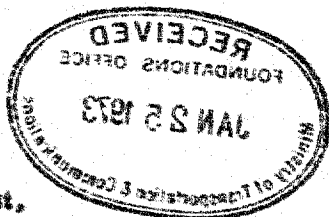
A. M. Barten,
Senior Soils Supervisor

AMB/sgp

c. c. P. D. Billings
 A. J. Percy
 J. E. Callaghan
 A. G. Stenmac, Att: M. Devata

Mr. P. D. Billings,
Regional Director,
Kingston.

Mr. R. J. Forrest,
Reg. Schedule Co-Ordinator



D. A. Barr,
Program Engineer.

January 24, 1973.

W.P. 111-70-01, Highway 401, Weigh Scale Site,
W.P. 608-68-02, Highway 2, From Summerstown Easterly,
W.P. 35-68-04, Highway 653, From Highway 17N Easterly

The above projects have been reviewed with reference to your memorandum dated January 5, 1973.

This office concurs with the recommendations for deferment of the resurfacing from Summerstown easterly and the cancellation of the top course paving on Secondary Highway 653.

Regarding Highway 34 resurfacing and the weigh scale, the present program will be retained. Although it might be feasible to defer the resurfacing, the weigh scale construction has a very high priority within our Ministry. We are most anxious to construct the weigh scale during the 1973/74 fiscal year. The present grouping should provide a reasonably economical contract.

Consideration of advance approach fills is over-shadowed by the need to expedite early construction of the scale site.

Appropriate Status Reports will be issued for the Secondary Highway 653 T.C.P. cancellation, and the Highway 2 resurfacing deferment.

DAB/AIL/sv

D. A. Barr,
Program Engineer.

c.c. A. J. Percy
J. E. Callaghan
A. M. Batten
A. G. Stermac
A. I. Laughren



1990

[Faint, illegible text from the reverse side of the document is visible through the paper.]

1. The first step is to identify the problem. This involves understanding the current situation and the goals that need to be achieved.

[illegible]