

| | | | |
|----------|----------|----------------------------|-------------|
| 71-F-100 | 89-69-03 | HWY 126 & ST THOMAS EXPWY. | 40I14-60 |
| W.O. | W.P. | LOCATION | GEOCRES NO. |

• DATA ON FILE IN SOIL MECHANICS SECTION

REFER TO: W.P. FILE

PROJECT CANCELLED

REMARKS

GEOCRES INDEXING CARD FOR REPORTS NOT MICROFILMED

GI-20 AUG. 74

OVERSIZED DRAWINGS

Program Status Report

MEMORANDUM

To: Mr. A. G. Stermac,
Principal Foundation Engineer,
Foundation Office,
Design Services Branch,
ATTENTION: DOWNSVIEW, Ontario.

FROM: Bridge Planning,
Southwestern Region,
London, Ontario.

DATE: September 7, 1971.

OUR FILE REF.

IN REPLY TO

SUBJECT: W.P. 89-69-03, Bridge Site 5-215
Hwy. 126 Interchange Overpass
St. Thomas Expressway
District 2, London

Would you kindly arrange to have a foundation investigation conducted at the above location. I have enclosed two copies of the plan B-120-22 showing the probable footing locations for two possibilities (a) in blue - the St. Thomas Expressway over Highway 126 and (b) in red - the St. Thomas Expressway under Highway 126. Please report on the two possibilities. Plate 55 of the Functional Planning Report is enclosed to show the profiles of the St. Thomas Expressway over Highway 126. The profile grades in the area of the structure will be interchanged for St. Thomas Expressway under Highway 126.

A field reconnaissance report and a general location plan are also enclosed for your information.

By a copy of this memorandum and plan B-120-22, Engineering Surveys have been supplied the necessary information for setting out the probable footing locations upon request.

A. P. Watt

APW/Is
Encls.

A. P. Watt,
Regional Bridge Planning Engineer,
Southwestern Region.

cc: Mr. C. Grebski
Mr. A. Crowley
Mr. D. R. Fusee

FIELD RECONNAISSANCE REPORT
REQUIRED BY FOUNDATION SECTION
FOR

FF-69
SEPT. 1968

ST THOMAS
EXPRESSWAY

W.P. NO. 89-69-03 HIGHWAY NO. _____ DISTRICT 2 SITE PLAN NO. B-120-22 PROFILE NO. PLATE 55
RIVER CROSSING ☐ GRADE SEPARATION ☒ R.R.X. ☐ OTHER (SPECIFY) _____
ALTERNATE SCHEME (IF ANY) _____

EXISTING SITE CONDITIONS

DESCRIPTION:

TOPOGRAPHY: HILLY ☐ ROLLING ☐ VALLEY ☒ GULLIED ☐ FLAT ☐
VEGETATION: TREES ☒ BRUSH ☒ GRASS ☐ SWAMP ☐ FARM CROPS ☐ CLEARED ☐
SNOW COVER: 0"-6" ☐ 6"-12" ☐ >12" ☐
ROCK OUTCROP (SPECIFY LOCATIONS) N/A

UNDERGROUND UTILITIES:

UTILITY COMPANY

TELEPHONE NO. FOR DEFINITE LOCATION

- 1 UNION GAS - MR. L. ANDERSON ST. THOMAS 631-5660 288 WALLINGTON ST. ST. THOMAS
2 _____
3 WATER - PUBLIC UTILITIES COMM. MR. J. RUPPE 631-5550 36 ST. CATHERINE ST. ST. THOMAS
4 _____
5 BELL CANADA - MR. C. McLEOD - LONDON 439-0489 479 CLARENCE LONDON, ONT.

EXISTING STRUCTURE(S):

FOUNDATIONS: SPREAD FOUNDATIONS ☐ SIZE _____ ELEVATION(S) _____
PILES ☐ TYPE _____ LENGTH(S) _____
DESIGN LOAD _____ T.S.F. _____ TONS/PILE _____
CONDITION OF STRUCTURE _____

APPROACHES: CUT ☐ FILL ☐ SIDE SLOPES _____
BERMS YES ☐ NO ☐

OTHER OBSERVATIONS (USE BACK OF SHEET TO DESCRIBE ANY FAILURES IN AREA, PAST PERFORMANCE OF EXISTING APPROACHES & STRUCTURE, ETC.)

ACCESSIBILITY

IS STRUCTURE LOCATED ON D.H.O. RIGHT OF WAY? YES ☐ NO ☒ IF NO,
HAS PERMISSION BEEN OBTAINED TO ENTER PROPERTY? YES ☐ NO ☒ IF NO,
PROPERTY OWNER(S):

NAME

ADDRESS

TELEPHONE NO.

- 1 _____
2 _____
3 _____
4 _____

WHO WILL OBTAIN NECESSARY PERMISSION? FOUNDATION OFFICE
HAS SITE BEEN SURVEYED & STAKED? YES ☐ NO ☒ IF YES, DATE OF MOST RECENT SURVEY _____
WILL CLEARING BE NECESSARY TO ENTER SITE AREA? YES ☐ NO ☒
IS SITE ACCESSIBLE TO WHEELED VEHICLES? YES ☒ NO ☐

IF RIVER CROSSING:

WILL A RAFT BE NECESSARY? YES ☐ NO ☐ IF YES, GIVE MAX. DEPTH OF WATER _____ FT.
CURRENT: SWIFT ☐ MODERATE ☐ SLOW ☐

DRILLING OPERATIONS

NEAREST SOURCE OF WATER (GIVE HAULING DISTANCE, IF KNOWN) NEAREST FARM
ADDITIONAL INVESTIGATION REQUIRED FOR THE FOLLOWING PURPOSES:
ALTERNATE SCHEME: YES ☐ NO ☐ IF YES, SPECIFY _____
HYDROLOGIC REASONS: YES ☐ NO ☐ IF YES, SPECIFY (SCOUR, ETC.) _____

REMARKS

NEAREST AVAILABLE ACCOMODATION: ST. THOMAS
OTHER COMMENTS: _____

DATE SEPT 2/71

REGIONAL BRIDGE LOCATION ENGINEER A.P. WATT

Department of Transportation and Communications

XXXXXXXXXXXXXXXXXXXX

MEMORANDUM

40I-60

TO: Mr. A. P. Watt, (2)
Regional Bridge Planning Engineer,
Southwestern Region,
London, Ontario.

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

ATTENTION: DATE: December 2, 1971.

OUR FILE REF.

IN REPLY TO

DEC 16 1971

SUBJECT:

FOUNDATION INVESTIGATION REPORT
For

Proposed Crossing At Hwy. 126
Extension and St. Thomas Expressway
Twp. of Yarmouth, Co. of Elgin
District No. 2 (London)
W.O. 71-11100 - W.P. 89-69-03

40I-60

GEOCREs No.

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

AGS/ao
Attach.

cc: Messrs. D. W. Farren

B. R. Davis

A. Rutka

W. A. Zonnenberg

L. E. Walker

B. J. Giroux

J. R. Roy

G. A. Wrong

B. A. Singh

Foundations Files ✓

Documents

A. G. Stermac,

PRINCIPAL FOUNDATION ENGINEER.

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 6. DISCUSSION AND RECOMMENDATIONS.
 7. MISCELLANEOUS.
-

FOUNDATION INVESTIGATION REPORT
For
Proposed Crossing At
Hwy. 126 Extension and St. Thomas Expressway
Twp. of Yarmouth, Co. of Elgin
District No. 2 (London)
W.O. 71-11100 - W.P. 89-69-03

1. INTRODUCTION:

A request for a foundation investigation for a bridge at the crossing of the proposed Hwy. 126 Extension and St. Thomas Expressway, was received from Mr. A. P. Watt, Regional Bridge Planning Engineer, in a memo dated September 7, 1971.

A field investigation was subsequently carried out by the Foundation Section to determine the subsoil conditions existing at the site. This report contains the results of this investigation and our recommendations pertaining to the design of the proposed structure foundation and approach cuts.

2. DESCRIPTION OF SITE:

The site of the proposed crossing is located just outside the north-west city limits of St. Thomas.

The surrounding area is flat and barren, except on the south side which is covered with trees. There are three sets of high-voltage hydro transmission lines crossing over the proposed location of the structure.

Physiographically, the site is located in the region referred to as the Mount Elgin Moraines.

3. FIELD AND LABORATORY INVESTIGATION PROCEDURES:

A total of five sampled boreholes and five dynamic cone penetration tests was carried out during the course of the field work. Boring was achieved by means of a C.M.E. hollow stem auger machine, adapted for soil sampling purposes. During the field work, disturbed samples were obtained by means of a standard split-spoon sampler: the energy used in driving it, conformed to the requirements of the Standard Penetration Test. Undisturbed samples were recovered using 2-inch I.D. Shelby tubes which were pushed into the soil hydraulically.

Dynamic cone penetration tests were carried out adjacent to each borehole. Driving energy used to advance the cone was 350 ft. - lbs. per blow.

All boreholes were surveyed in the field by personnel from London Region Engineering Survey Section. The locations and elevations of the borings are shown on Drawing No. 71-110100A which accompanies this report.

All samples were visually examined and classified at the site as well as in the laboratory. Following this inspection, laboratory tests were carried out on selected samples to determine the following physical properties:

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

The results of the field and laboratory tests are summarized on the Record of Borehole sheets contained in the Appendix to the report.

4. SUBSOIL CONDITIONS:

4.1) General:

Generally, uniform subsoil conditions were found to prevail over the area investigated. The subsoil consists of a deep deposit

of clayey silt with some sand and traces of gravel, overlying very hard glacial till.

The boundaries between various soil types are shown on the Record of Borehole sheets. The estimated stratigraphical profile shown on Drawing No. 71-11100A is based upon this information.

A detailed description of soil types and soil properties is given as follows.

4.2) Clayey Silt, Some Sand, Traces of Gravel:

This material was encountered from ground level (approx. elevation 756 ft.) down to approximate elevation 680 ft.

The material consists of clayey silt, with some sand and traces of gravel, and is of glacial origin. No conspicuous sand layers were intersected, but it is possible that some randomly distributed sand partings could be present.

The consistency of the material varies from stiff to hard. The upper 16 ft. down to approx. elevation 730 ft. constitutes very stiff to hard crust with N values between 13 and 43 blows/ft. From elevation 730 down to approx. elevation 710 ft. the shear strength varies from 1100 p.s.f. to over 2,000 p.s.f. (N values 5 - 22 blows/ft.). Between approx. elevations 710 ft. and 680 ft., the N values vary from 20 to 37 blows/ft. indicating a shear strength well in excess of 2,000 p.s.f.

Physical properties of the material, as determined from laboratory tests, are as follows (see Figure 1):

| | |
|--------------------------|----------|
| Liquid Limit | 23 - 49% |
| Plastic Limit | 13 - 26% |
| Natural Moisture Content | 15 - 29% |

Grain-size analyses indicate the following distributions, and are plotted on Figure 2.

| | |
|--------|----------|
| Sand | 0 - 4% |
| Gravel | 0 - 16% |
| Silt | 30 - 57% |
| Clay | 34 - 67% |

4.3) Clayey Silt with Sand, Traces of Gravel (Glacial Till):

This soil deposit was encountered between elevations 680 and 682 ft. All boreholes were terminated in this stratum.

The material, in general, consists of clayey silt with sand and traces of gravel and is of glacial origin. The consistency of the material is hard, and the undrained shear strength is well in excess of 4,000 p.s.f. The blows on the split-spoon sampler were, in general, more than 100 per ft., and often more than 100 blows for 6 inches penetration.

Physical properties of the material, as determined from laboratory tests, are as follows (see Figure 1):

| | |
|--------------------------|----------|
| Liquid Limit | 20 - 23% |
| Plastic Limit | 11 - 14% |
| Natural Moisture Content | 7 - 10% |

Grain-size analyses indicate the following distributions and are plotted on Figure 3.

| | |
|--------|----------|
| Gravel | 0 - 8% |
| Sand | 24 - 35% |
| Silt | 42 - 49% |
| Clay | 16 - 25% |

5. GROUNDWATER CONDITIONS:

The following water levels were observed in the boreholes at the time of investigation.

| | |
|------------|-----------------|
| Borehole 1 | Elev. 683.1 ft. |
| Borehole 2 | Elev. 728.5 ft. |
| Borehole 3 | Elev. 691.2 ft. |
| Borehole 5 | Elev. 681.4 ft. |

No water level was established in Borehole 4.

It is felt that the above levels do not necessarily represent true groundwater level, because of the relatively impermeable nature of the deposit and the short duration during which boreholes were left open. Based upon the subsoil stratigraphy, and the water level in Borehole 2 which was left open for the longest duration, it is

estimated that the groundwater level is between elevations 725 and 730 ft.

6. DISCUSSION AND RECOMMENDATIONS:

It is proposed to construct a four-span structure at this location; either an underpass or an overpass, the decision not having been made to date. The prevailing ground level is at approximate elevation 756 ft. The grades of St. Thomas Expressway and Highway 126 are interchangeable, being elevation 761 ft. and elevation 737 ft. approximately. This will require a cut, about 19 ft. deep and a fill about 5 ft. high.

In general, the subsoil consists of 75 ft. of stiff to hard silty clay to clayey silt with traces of sand and gravel, overlying a deposit of hard clayey silt with sand and traces of gravel (glacial till).

It is recommended that the entire structure be supported on steel H-piles driven to refusal in the hard glacial till layer. It is estimated that refusal will be met at approximate elevation 670± ft. For design purposes, the maximum allowable load for the particular section adopted may be used.

Alternatively the abutments may be supported on spread footing type foundations placed at elevation 750 ft. A net allowable bearing pressure of 2 t.s.f. may be used for design purposes. In this case maximum differential settlements between the piers and the abutments of about 1 in. may occur.

No stability problems are foreseen for 2:1 cut or fill slopes.

No dewatering problems are anticipated because the natural groundwater level is below the level of the excavation, and because of the relatively impermeable nature of the subsoil.

7. MISCELLANEOUS:

The field investigation was carried out during the period of September 27 to October 7, 1971, under the supervision of

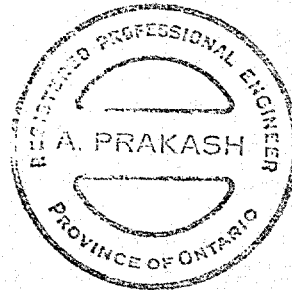
Mr. A. Prakash, Project Foundation Engineer, who also prepared this report.

Equipment was owned and operated by P.V.K. and Sons Ltd.

This report was reviewed by Mr. K. G. Selby, Supervising Foundation Engineer.

A. Prakash

A. Prakash, P. Eng.



K. G. Selby

K. G. Selby, P. Eng.

AP/ao
December 1, 1971.

APPENDIX I

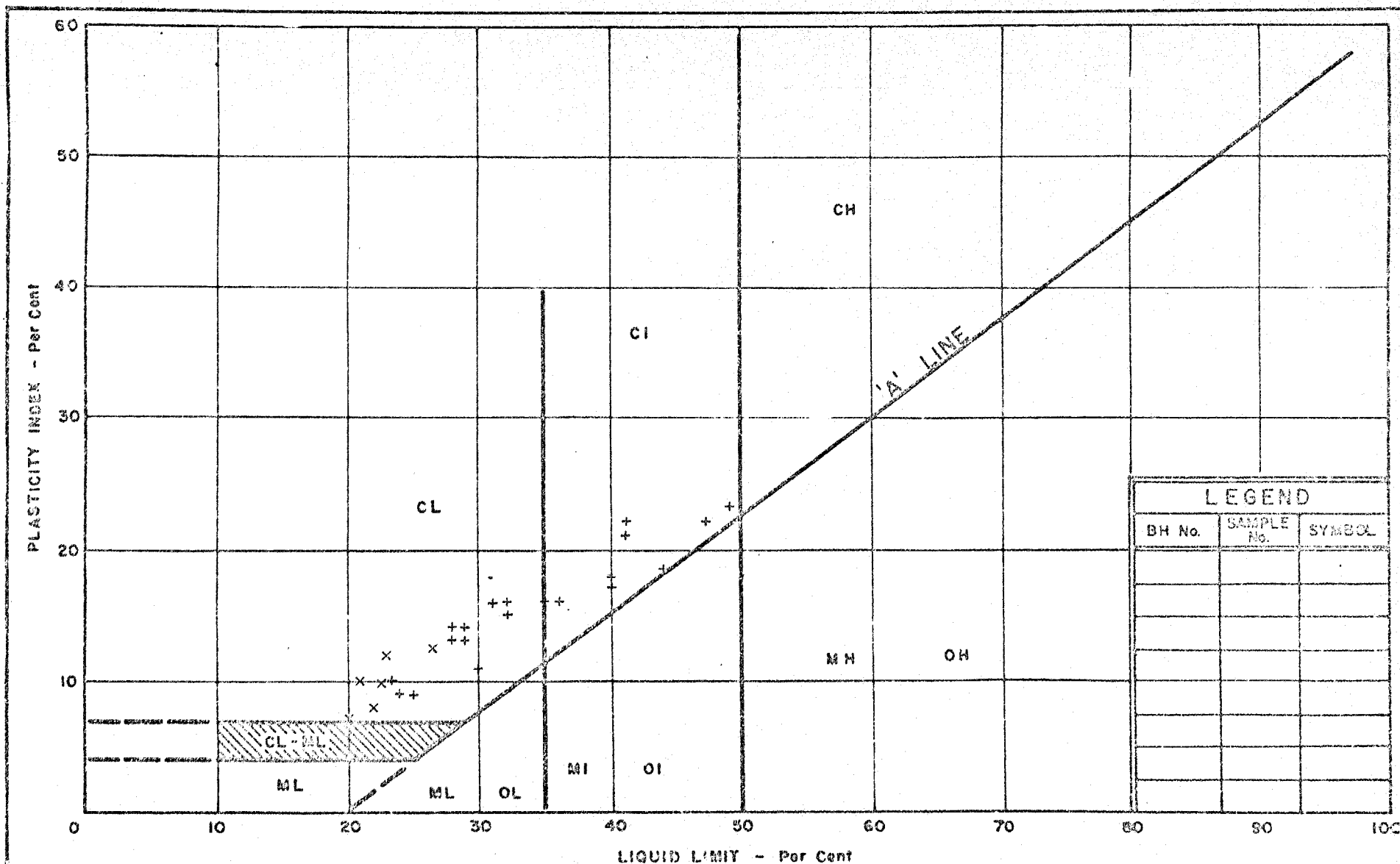
OVERSIZES DRAWINGS

RECORD OF BOREHOLE # 1

2

3

4
5-



DEPARTMENT OF HIGHWAYS
MATERIALS and
TESTING
DIVISION

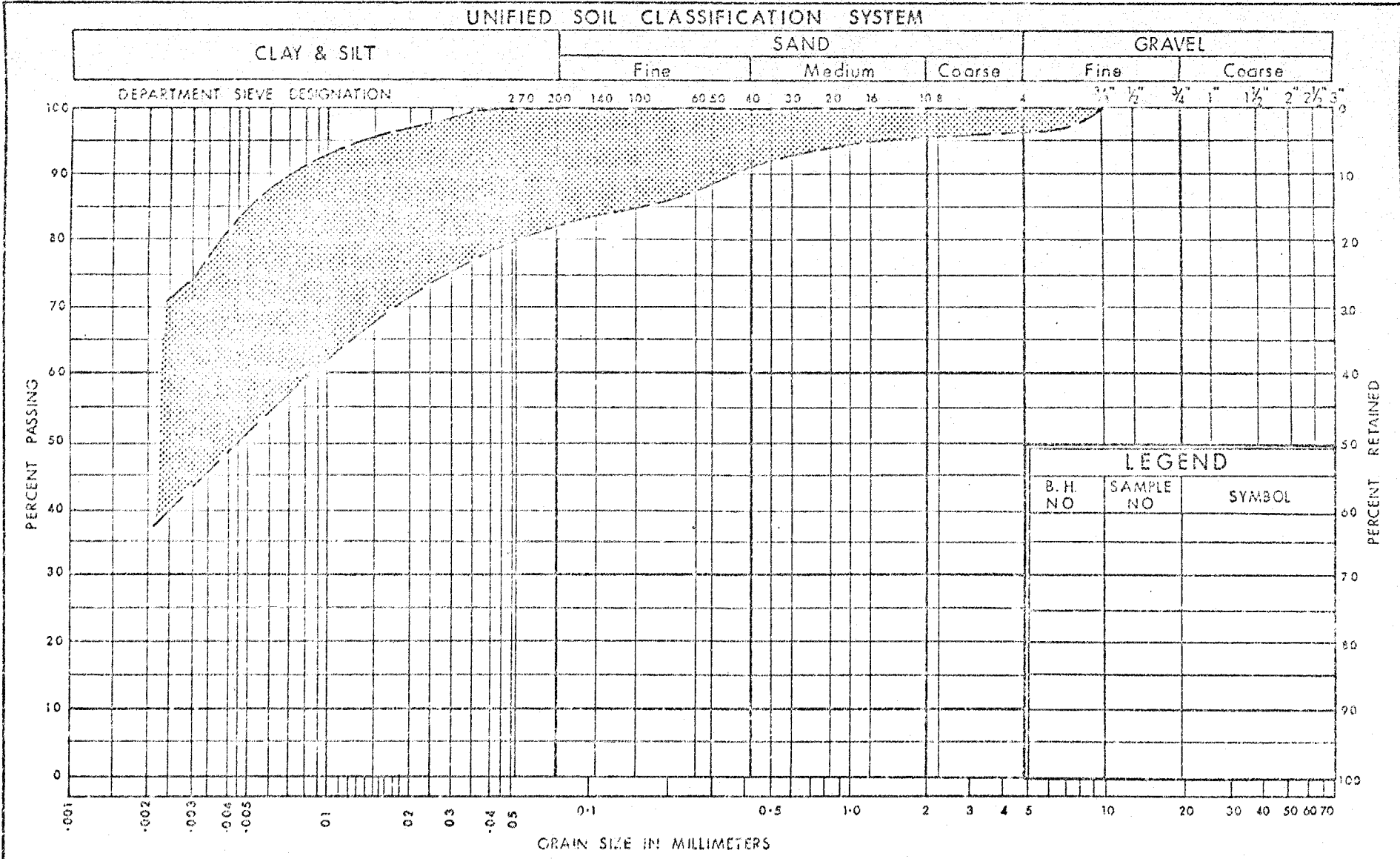
PLASTICITY CHART

- + SILTY CLAY TO CLAYEY SILT—TRACES OF SAND & GRAVEL
- x CLAYEY SILT WITH SAND, TRACES OF GRAVEL

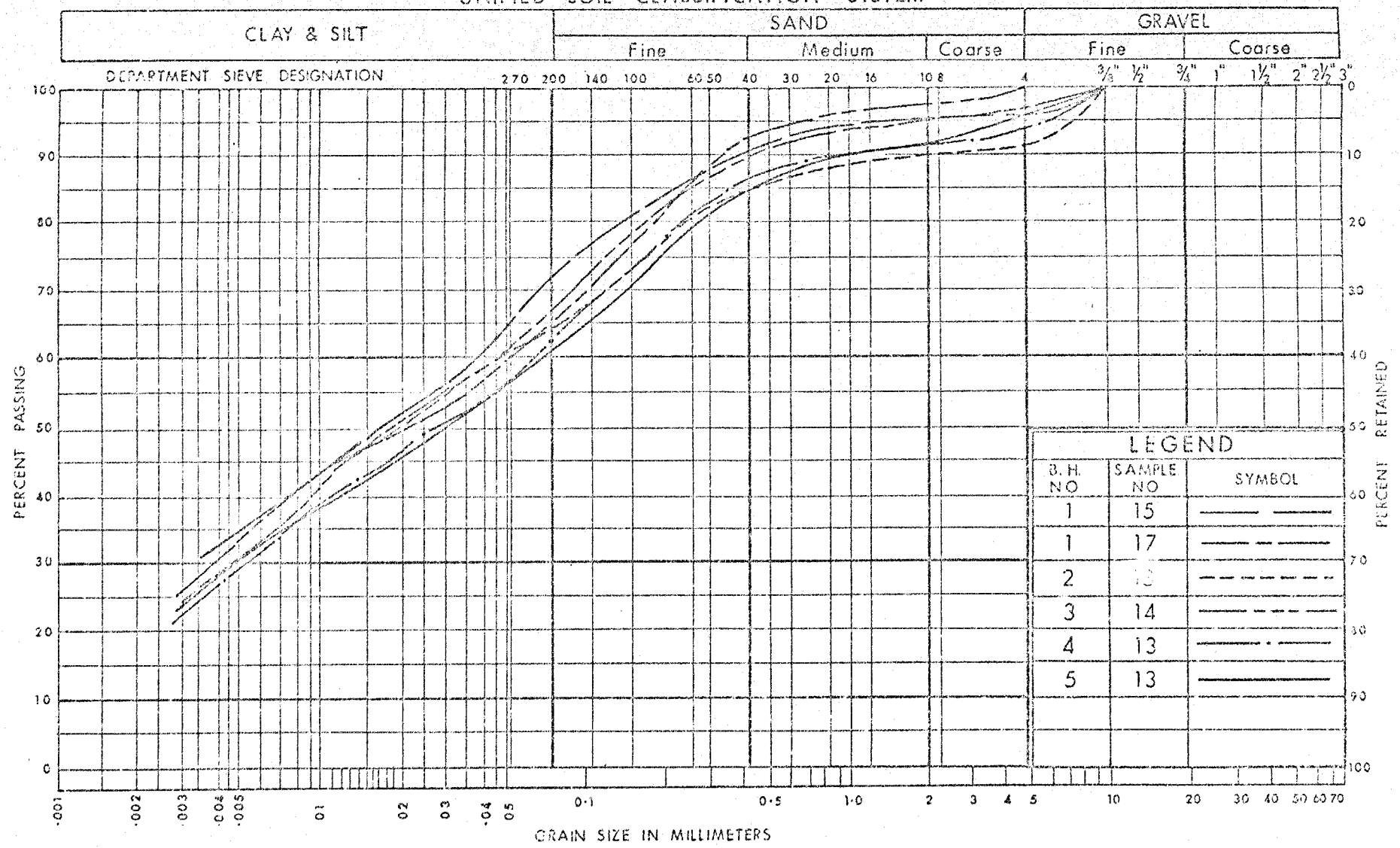
WR No. 89-69-03

JOB No. 71-11100

FIG. 1



UNIFIED SOIL CLASSIFICATION SYSTEM



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

| | | | |
|-----|---------------------------------|------|-----------------|
| 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

| | |
|------------|-----------------------------------------------------------------------|
| 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 |
| 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

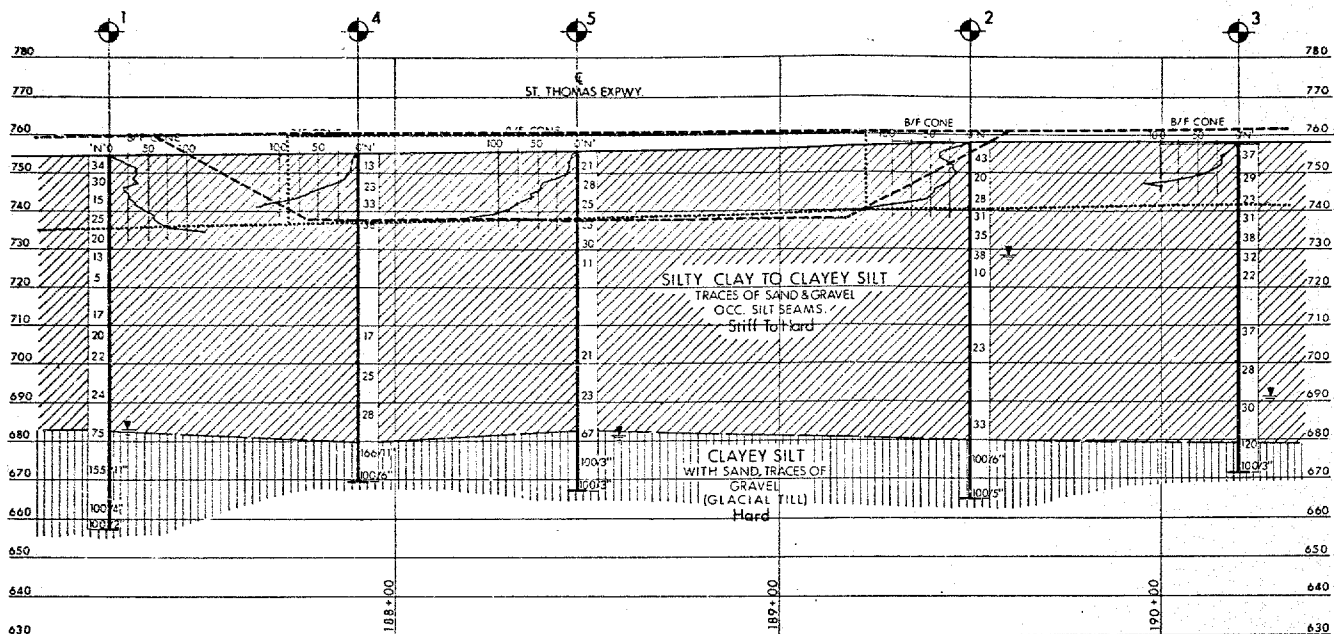
| | |
|----------|---------------------------------------------------------------------------------------------------------------|
| d | DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE |
| δ | ANGLE OF WALL FRICTION |
| K | DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS 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 |

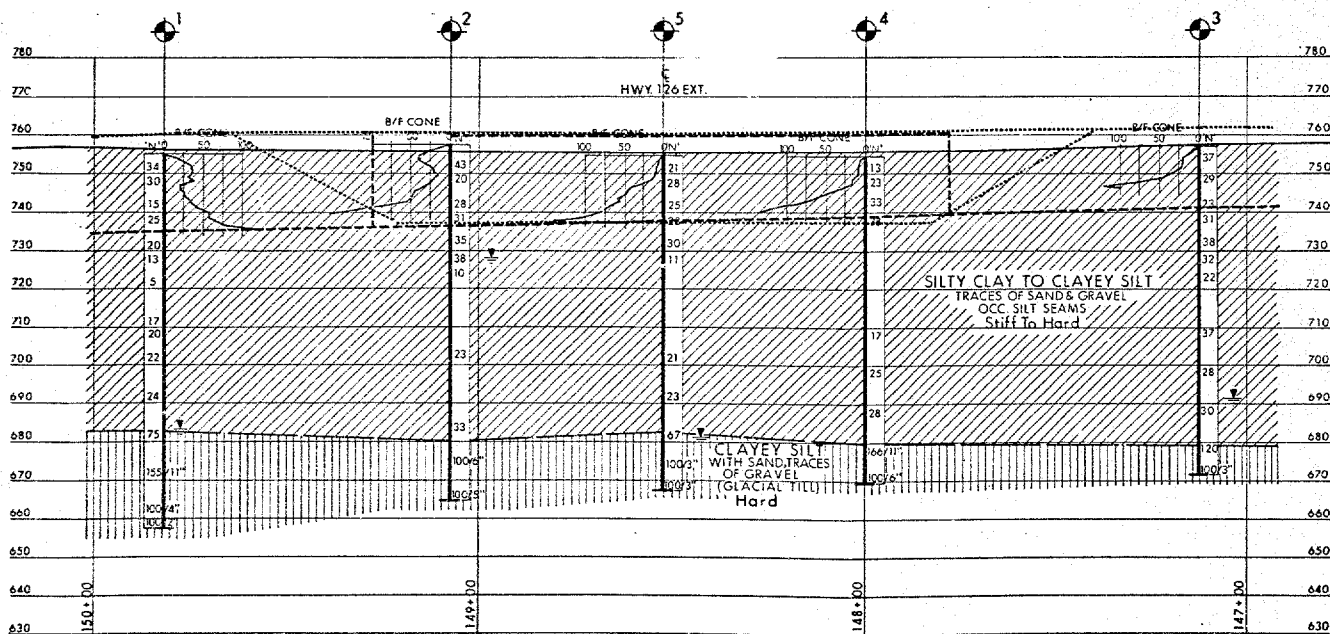
SLOPES

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



☪ PROFILE HWY. 126 EXTENSION

SCALE 20 10 0 20 40 FT.

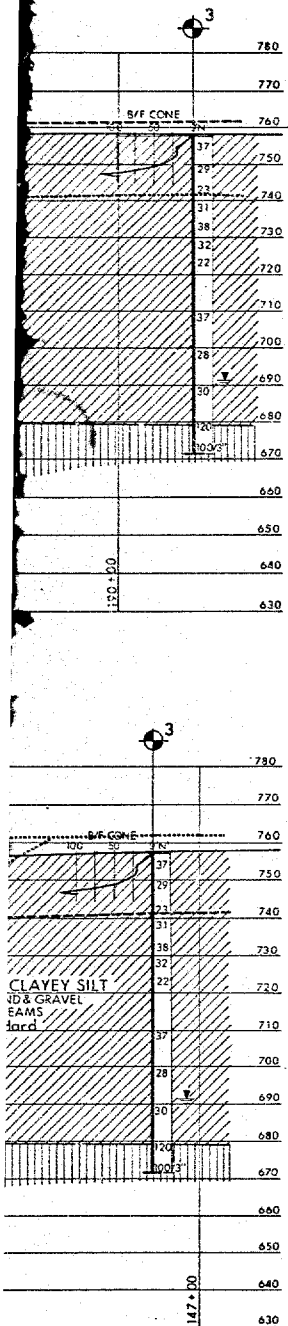


☪ PROFILE ST. THOMAS EXPWY.

SCALE 20 10 0 20 40 FT.

CORD
DATE





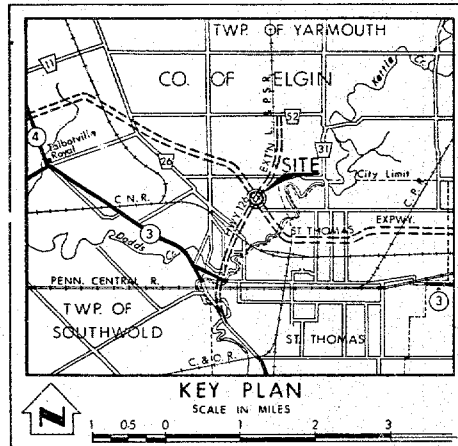
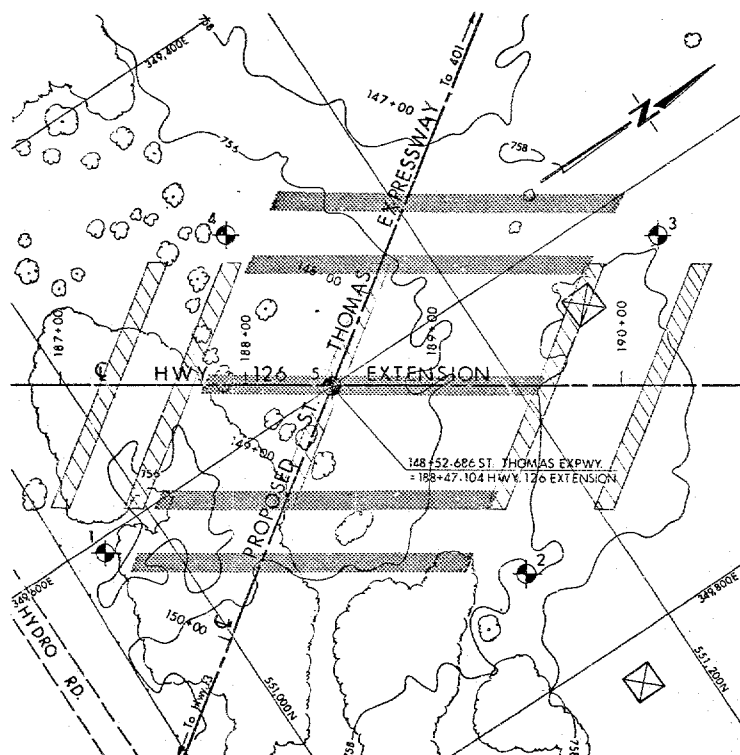
PROPOSED
FOOTINGS

S C H E M E S

PROPOSED
GRADES



St. Thomas Expwy. over Hwy. 126
St. Thomas Expwy. under Hwy. 126



LEGEND

- Bore Hole
- ⊕ Cone Penetration Test
- ⊕ Bore Hole & Cone Test
- Water Levels established at time of field investigation, SEPT., 1971
- Water Level not established in Borehole No. 4.

| NO. | ELEVATION | CO-ORDINATES | |
|-----|-----------|--------------|---------|
| | | NORTH | EAST |
| 1 | 755.1 | 550,968 | 349,607 |
| 2 | 757.6 | 551,149 | 349,740 |
| 3 | 757.2 | 551,307 | 349,629 |
| 4 | 754.8 | 551,115 | 349,502 |
| 5 | 754.9 | 551,119 | 349,600 |

— 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.

| REVISIONS | DATE | BY | DESCRIPTION |
|-----------|------|----|-------------|
| | | | |
| | | | |
| | | | |

DEPARTMENT OF TRANSPORTATION & COMMUNICATIONS
DESIGN SERVICES BRANCH—FOUNDATION OFFICE

HIGHWAY 126 EXTENSION

HIGHWAY NO. ST. THOMAS EXPWY. DIST. NO. 2
CO. ELGIN
TWP. YARMOUTH LOT CON.

BORE HOLE LOCATIONS & SOIL STRATA

| | | |
|----------------------------------------------------------|--------------------------------------------------------------|--------------------|
| SUBMD. A. P. CHECKED <input checked="" type="checkbox"/> | W.P. NO. 89-69-03 | DRAWING NO. |
| DRAWN <input checked="" type="checkbox"/> | CHECKER <input checked="" type="checkbox"/> JOB NO. 71-11100 | 71-11100A |
| DATE NOV. 22 - 1971 | SITE NO. | BRIDGE DRAWING NO. |
| APPROVED <input checked="" type="checkbox"/> | CONT. NO. | |

VISUAL CLASSIFICATION SHEET

| PROJECT <u>71-1100</u> SITE _____ BOREHOLE No. <u>1</u> GROUND ELEVATION _____ | | | | | | | | | | | | | | | | |
|--------------------------------------------------------------------------------|----------|-------------------------|---------|------------|------|-------------|--------------|-------|------------|-----------|-----------|--------|-----------|-----------------------------------------|---------------------------------|--------|
| SAMPLE No. | DEPTH | GRAIN SIZE DISTRIBUTION | | | | | DRY STRENGTH | SHINE | DIALATANCY | TOUGHNESS | ODOR | COLOUR | ACID TEST | CONSISTENCY OR UNDRAINED SHEAR STRENGTH | CLASSIFICATION WITH DESCRIPTION | SYMBOL |
| | | LARGEST GRAIN SIZE | SHAPE | PERCENTAGE | | | | | | | | | | | | |
| | | | | GRAVEL | SAND | SILT & CLAY | | | | | | | | | | |
| 12 | 52-53.5 | 1/4" | SUBSANG | 10 | 10 | 80 | MED | DULL | SLOW | Loose | Expanding | Brown | MED | | CLAYEY SILT WITH SOME SA & CL | |
| 13 | 62-63.5 | | | | | 100 | " | " | " | " | " | " | " | | CLAYEY SILT | |
| 14 | 72-73.5 | | | | 10 | 90 | " | " | " | " | " | " | " | | CLAYEY SILT WITH TRACES OF SA | |
| 15 | 82-83.5 | 1/8" | SUBSANG | 15 | 15 | 70 | " | " | " | " | " | " | " | | CLAYEY SILT WITH SOME SA & CL | |
| 16 | 92-93.5 | 3/16" | " | 15 | 20 | 65 | " | " | " | " | " | " | Strong | | " " " " " " | |
| 17 | 90.2-101 | 1/2" | " | 15 | 20 | 65 | " | " | " | " | " | " | MED | | " " " " " " | |
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NOTES:- VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

| PROJECT <u>7-1100</u> | | SITE _____ | | BOREHOLE No. <u>2</u> | | GROUND ELEVATION _____ | | | | | | | | | | |
|-----------------------|-------------|-------------------------|-------|-----------------------|------|------------------------|--------------|-------|------------|-----------|------|--------|-----------|-----------------------------------------|---------------------------------|--------|
| SAMPLE No. | DEPTH | GRAIN SIZE DISTRIBUTION | | | | | DRY STRENGTH | SHINE | DIALATANCY | TOUGHNESS | ODOR | COLOUR | ACID TEST | CONSISTENCY OR UNDRAINED SHEAR STRENGTH | CLASSIFICATION WITH DESCRIPTION | SYMBOL |
| | | LARGEST GRAIN SIZE | SHAPE | PERCENTAGE | | | | | | | | | | | | |
| | | | | GRAVEL | SAND | SILT & CLAY | | | | | | | | | | |
| 1 | 12" 0.5" | round | 10 | 15 | 75 | Med | Dull | Sl. | Low | Emery | Grey | Med | | Clayey silty fine sand | | |
| 1 | 14" 0.5" 1" | " | 15 | 20 | 65 | " | " | " | " | " | " | " | Sand | Clayey silty fine sand | | |
| | | | | | | | | | | | | | | | | |
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NOTES:- VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:-

MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 71-11100 SITE _____ BOREHOLE No. 2 GROUND ELEVATION _____

| SAMPLE No. | DEPTH | GRAIN SIZE DISTRIBUTION | | | | | DRY STRENGTH | SHINE | DIALATANCY | TOUGHNESS | ODOR | COLOUR | ACID TEST | CONSISTENCY OR UNDRAINED SHEAR STRENGTH | CLASSIFICATION WITH DESCRIPTION | SYMBOL |
|------------|--------------|-------------------------|-------|------------|------|-------------|--------------|-------|------------|-----------|--------|-------------|-----------|-----------------------------------------|-------------------------------------------|--------|
| | | LARGEST GRAIN SIZE | SHAPE | PERCENTAGE | | | | | | | | | | | | |
| | | | | GRAVEL | SAND | SILT & CLAY | | | | | | | | | | |
| 1 | 25-40 | - | - | - | 5 | 95 | Med | DULL | SLAT | Low | EARTHY | BROWN | SLAND | | CLAYEY SILT WITH TRACES OF SA. | |
| 2 | 45-60 | - | - | - | - | 100 | Hard | SHINY | WONK | Med | EARTHY | BROWN | SLAND | | SILTY CLAY | |
| 3 | 75-100 | - | - | - | 5 | 95 | Med | DULL | SLAT | Low | EARTHY | BROWN | " | | CLAYEY SILT | |
| 4 | 125-140 1/2" | COARSE | | 5 | 5 | 90 | " | " | " | " | " | Green Brown | Med | | CLAYEY SILT WITH TRACES OF SA. & GR. SIL. | |
| 5 | 225-240 5' | " | " | 5 | 5 | 90 | " | " | " | " | " | " | " | | " " " " " " " " | |
| 6 | 245-260 | - | - | - | - | 100 | " | " | " | " | " | " | SUBST | | CLAYEY SILT | |
| 7 | 325-340 | - | - | - | - | 100 | " | " | " | " | " | " | " | | " " | |
| 10 | 525-540 1/2" | SUBGR. 10 | | 5 | 10 | 85 | " | " | " | " | " | " | " | | " " WITH SOME SA. & GR. SIL. | |
| 12 | 725-740 1/8" | - | - | - | 5 | 95 | " | " | " | " | " | " | " | | " " WITH TRACE OF SA. | |

NOTES:- VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 71-11100 SITE _____ BOREHOLE No. 3 GROUND ELEVATION _____

| SAMPLE No. | DEPTH | GRAIN SIZE DISTRIBUTION | | | | | DRY STRENGTH | SHINE | DIALATANCY | TOUGHNESS | ODOR | COLOUR | ACID TEST | CONSISTENCY OR UNDRAINED SHEAR STRENGTH | CLASSIFICATION WITH DESCRIPTION | SYMBOL |
|------------|---------|-------------------------|----------|------------|------|-------------|--------------|---------------|------------|-----------|------|--------|-----------|-----------------------------------------|---------------------------------|--------|
| | | LARGEST GRAIN SIZE | SHAPE | PERCENTAGE | | | | | | | | | | | | |
| | | | | GRAVEL | SAND | SILT & CLAY | | | | | | | | | | |
| 1 | 2.5-4 | — | — | — | — | 100 | MED | SHINE TO DULL | SLOW | MED | LAZY | BRN | STRONG | | CLAYEY SILT | |
| 2 | 4.5-8 | — | — | — | 5 | 95 | " | DULL | SLOW | LOW | " | " | " | | CLAYEY SILT WITH TRACE OF SAND | |
| 3 | 8.5-11 | 1" | SUBROUND | 5 | 10 | 85 | " | " | " | " | " | " | MED | | " " " " SOME SAND / TRACE OF G. | |
| 4 | 11.5-19 | 1/2" | " | — | 10 | 90 | " | " | " | " | " | " | " | | " " " " " " | |
| 5 | 22.5-24 | 1/2" | " | — | 10 | 90 | " | " | " | " | " | " | MED | | " " " " " " | |
| 6 | 27.5-29 | 1/2" | " | — | 10 | 90 | " | " | " | " | " | " | " | | " " " " " " | |
| 7 | 30.5-31 | — | — | — | — | 100 | " | " | " | " | " | BRN | " | | CLAYEY SILT | |
| 10 | 47.5-49 | 1" | SUBROUND | 10 | 15 | 75 | " | " | " | " | " | " | " | | " " " " WITH SOME SILT | |
| 11 | 57.5-59 | 1/2" | " | 10 | 10 | 80 | " | " | " | " | " | " | " | | " " " " " " | |

NOTES:— VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:—

MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

| PROJECT <u>71-11100</u> | | SITE _____ | | BOREHOLE No. <u>3</u> | | GROUND ELEVATION _____ | | | | | | | | | | |
|-------------------------|---------|-------------------------|-----------------|-----------------------|------|------------------------|--------------|-------|------------|-----------|-------|--------|-----------|-----------------------------------------|---------------------------------|--------|
| SAMPLE No. | DEPTH | GRAIN SIZE DISTRIBUTION | | | | | DRY STRENGTH | SHINE | DIALATANCY | TOUGHNESS | ODOR | COLOUR | ACID TEST | CONSISTENCY OR UNDRAINED SHEAR STRENGTH | CLASSIFICATION WITH DESCRIPTION | SYMBOL |
| | | LARGEST GRAIN SIZE | SHAPE | PERCENTAGE | | | | | | | | | | | | |
| | | | | GRAVEL | SAND | SILT & CLAY | | | | | | | | | | |
| 12 | 645-600 | 1" | Subs. to SUBARK | 10 | 10 | 80 | Med | Brill | Slow | Low | Earth | Brown | 3007 | Med | Clayey silt with some sand | |
| 13 | 715-782 | 1/2" | Subark | 10 | 20 | 70 | | | | | | | | | | |
| 13 | 807-70 | 3/4" | Sub. to SUBARK | 15 | 25 | 60 | | | | | | | | | Sand / C. | |
| 14 | | 1/2" | " | 10 | 30 | 60 | | | | | | | | | " + trace of gravel | |
| | | | | | | | | | | | | | | | | |
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NOTES:- VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

| PROJECT <u>71-11100</u> | | SITE _____ | | BOREHOLE No. <u>4</u> | | GROUND ELEVATION _____ | | | | | | | | |
|-------------------------|-------------|-------------------------|-------|-----------------------|--------------|------------------------|------------|-----------|------|--------|-----------|-----------------------------------------|-----------------------------------|--------|
| SAMPLE No. | DEPTH | GRAIN SIZE DISTRIBUTION | | | DRY STRENGTH | SHINE | DIALATANCY | TOUGHNESS | ODOR | COLOUR | ACID TEST | CONSISTENCY OR UNDRAINED SHEAR STRENGTH | CLASSIFICATION WITH DESCRIPTION | SYMBOL |
| | | LARGEST GRAIN SIZE | SHAPE | PERCENTAGE | | | | | | | | | | |
| | | GRAVEL | SAND | SILT & CLAY | | | | | | | | | | |
| 1 | 25-40 | | | 100 | Med | SLIGHT | SLOW | Med | LOW | EDDY | BROWN | STRONG | CLAYEY SILT | |
| 2 | 25-60 | | | 100 | " | " | " | " | " | " | " | " | " | |
| 3 | 40-11 1/2" | | 10 | 90 | " | " | " | LOW | " | " | " | " | " WITH TRACES OF SAND | |
| 4 | 25-40 | | | 100 | " | " | " | " | " | BROWN | GRAY | STRONG | CLAYEY SILT | |
| 10 | 425-49 1/4" | SUBANG | 5 | 5 | 90 | " | " | " | " | " | " | " | " WITH TRACES OF SAND & SILT | |
| 11 | 515-51 1/4" | " | 5 | 5 | 90 | " | " | " | " | " | " | " | " | |
| 12 | 605-60 1/4" | " | 5 | 5 | 90 | " | " | " | " | " | " | MED | " | |
| 12 | 715-70 3/4" | " | 10 | 20 | 70 | " | " | " | " | " | " | STRONG | CLAYEY SILT WITH SOME SAND & SILT | |
| 14 | | " | 20 | 30 | 50 | " | " | " | " | " | " | " | " | |

NOTES:— VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:—

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 71-11100 SITE _____ BOREHOLE No. 5 GROUND ELEVATION _____

| SAMPLE NO. | DEPTH | GRAIN SIZE DISTRIBUTION | | | | | DRY STRENGTH | SHINE | DIALATANCY | TOUGHNESS | ODOR | COLOUR | ACID TEST | CONSISTENCY OR UNDRAINED SHEAR STRENGTH | CLASSIFICATION WITH DESCRIPTION | SYMBOL |
|------------|-----------|-------------------------|---------|------------|------|-------------|--------------|---------------|-------------|------------|-------|-----------------|-----------|-----------------------------------------|-----------------------------------------|--------|
| | | LARGEST GRAIN SIZE | SHAPE | PERCENTAGE | | | | | | | | | | | | |
| | | | | GRAVEL | SAND | SILT & CLAY | | | | | | | | | | |
| 1 | 15.20 | - | - | - | - | 100 | MED | SHINE TO DULL | N/L TO SLOW | MED TO LOW | ORG | GRY BROWN STAIN | - | - | CLAY, SILT TO SILTY CLAY WITH SOME ORG. | |
| 2 | 15.90 | - | - | - | - | 100 | MED | SHINE | N/L | MED | LARTY | BROWN | MED | - | SILTY CLAY | |
| 3 | 12.5-11.0 | 1/2" | SUBANG. | 5 | 5 | 90 | " | DULL | SLOW | LOW | LARTY | GRY BROWN | SLAW | - | CLAY, SILT WITH TRACES OF SO. & LL | |
| 4 | 10.5-10.0 | 1/4" | - | 5 | 5 | 90 | " | " | " | " | " | " | " | - | " | |
| 5 | 12.5-24.0 | - | - | - | - | 100 | " | " | " | " | " | BROWN GRAY | " | - | CLAY, SILT | |
| 6 | 21.5-19 | - | - | - | - | 100 | " | " | " | " | " | " | " | - | CLAY, SILT | |
| 10 | 52.11 | 1/2" | SUBANG. | 5 | 5 | 90 | " | " | " | " | " | " | " | - | CLAY, SILT WITH TRACES OF SO. & LL | |
| 11 | 62.63 | - | - | - | - | 100 | " | " | " | " | " | " | " | - | CLAY, SILT | |
| 12 | 72-73 | - | - | - | - | 100 | " | " | " | " | " | " | " | - | CLAY, SILT | |

NOTES:- VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

| PROJECT <u>4-1100</u> | | SITE _____ | | BOREHOLE No. <u>5</u> | | GROUND ELEVATION _____ | | | | | | | | | | |
|-----------------------|-------|-------------------------|-------|-----------------------|------|------------------------|--------------|-------|------------|-----------|------|--------|-----------|-----------------------------------------|---------------------------------|--------|
| SAMPLE No. | DEPTH | GRAIN SIZE DISTRIBUTION | | | | | DRY STRENGTH | SHINE | DIALATANCY | TOUGHNESS | ODOR | COLOUR | ACID TEST | CONSISTENCY OR UNDRAINED SHEAR STRENGTH | CLASSIFICATION WITH DESCRIPTION | SYMBOL |
| | | LARGEST GRAIN SIZE | SHAPE | PERCENTAGE | | | | | | | | | | | | |
| | | | | GRAVEL | SAND | SILT & CLAY | | | | | | | | | | |
| 13 07 01 | 3' | GRANULAR | | 20 | 25 | 55 | Med DRY | Slm | | Low | Edm. | Grey | Smooth | | Clayey sand with some s.s. 12 | |
| 14 07 92 | 6' | GRANULAR | | 20 | 25 | 55 | " | | | | | | | | | |
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NOTES:- VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 71-11100 SITE _____ BOREHOLE No. 1 GROUND ELEVATION _____

| SAMPLE No. | DEPTH | GRAIN SIZE DISTRIBUTION | | | | | DRY STRENGTH | SHINE | DIALATANCY | TOUGHNESS | ODOR | COLOUR | ACID TEST | CONSISTENCY OR UNDRAINED SHEAR STRENGTH | CLASSIFICATION WITH DESCRIPTION | SYMBOL |
|------------|---------|-------------------------|--------|------------|------|-------------|--------------|-------|-------------|-----------|--------|-----------------|-----------|-----------------------------------------|--------------------------------------------|--------|
| | | LARGEST GRAIN SIZE | SHAPE | PERCENTAGE | | | | | | | | | | | | |
| | | | | GRAVEL | SAND | SILT & CLAY | | | | | | | | | | |
| 1 | 25-40 | - | - | - | 10 | 90 | High | SHINE | LOW TO NONE | MED | Earthy | DRY BROWN STAIN | | | CLAYY SILT TO SILTY CLAY WITH TRACE OF SA. | |
| 2 | 25-40 | - | - | - | 10 | 90 | | | " | " | " | " | " | | " | |
| 3 | 25-40 | - | - | - | 10 | 90 | MED | DULL | LOW | LOW | " | " | SLIGHT | | CLAYY SILT WITH TRACE OF SAND | |
| 4 | 17.5-40 | 1/2" | SUBANG | 5 | 10 | 85 | " | " | " | " | " | " | " | | " | |
| 5 | 22.5-40 | 1/2" | " | 5 | 10 | 85 | " | " | " | " | " | " | " | | " | |
| 6 | 21.5-40 | - | - | - | 5 | 95 | " | " | " | " | " | " | " | | CLAYY SILT WITH TRACE OF SA. | |
| 7 | 32.5-34 | - | - | - | 100 | MED | " | " | " | " | " | " | " | | CLAYY SILT | |
| 10 | 42.5-47 | 1/4" | SUBANG | 5 | 15 | 80 | " | " | " | " | " | " | " | | CLAYY SILT WITH SOME SA & CL | |
| 11 | 47-48.5 | 1/4" | " | 10 | 15 | 75 | " | " | " | " | " | " | " | | " | |

NOTES:— VISUAL CLASSIFICATION MUST BE CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:—

DOCUMENT MICROFILMING IDENTIFICATION

GU-20 SEP 1976

GEOCRE No. 10114-60
DIST. 2 REGION SOUTHWESTERN
W.P. No. 89-69-03
CONT. No. N.A. PROJECT CANCELLED
W. O. No. 71-F-100
STR. SITE No 5-215
HWY. No. 126
LOCATION HWY. 126 ST. THOMAS
EXPWY.

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT 6

REMARKS: UNFOLD DOCUMENTS BEFORE
MICROFILMING

[illegible]

401W-60.

20
12.5 % STRAIN AT FAILURE
10

40114-60
ORIGINAL

| DEPARTMENT OF HIGHWAYS - ONTARIO | | | | | | | | | | |
|----------------------------------|--------------------------|--------------------------------------|---------------|--------------|--------------|--------------------------------|------------------|------------------|-------------------|---------|
| MATERIALS & TESTING OFFICE | | | | | | | | | | |
| RECORD OF BOREHOLE No. 3 | | | | | | | | | | |
| FOUNDATION SECTION | | | | | | | | | | |
| JOB: 11-723 | | LOCATION: 401 Highway at Highway 101 | | | | ORIGINATED BY: J. A. | | | | |
| WP: 11-723 | | BORING DATE: July 14, 1971 | | | | COMPILED BY: J. A. | | | | |
| DATUM: 1985-11-6 | | BOREHOLE TYPE: GEOTECHNICAL | | | | CHECKED BY: E. J. J. | | | | |
| ELEV. (FEET) | SOIL PROFILE DESCRIPTION | SAMPLING METHOD | SAMPLE NUMBER | DEPTH (FEET) | ELEV. (FEET) | DYNAMIC PENETRATION RESISTANCE | | WATER CONTENT | | REMARKS |
| | | | | | | BLOWS/FOOT | RESISTANCE (PSF) | LIQUID LIMIT (%) | PLASTIC LIMIT (%) | |
| 100.0 | Topsoil | 1 | 1 | 0.0 | 100.0 | 10 | 100 | 20 | 15 | |
| 95.0 | Clay | 2 | 2 | 5.0 | 95.0 | 15 | 150 | 25 | 20 | |
| 90.0 | Clay | 3 | 3 | 10.0 | 90.0 | 20 | 200 | 30 | 25 | |
| 85.0 | Clay | 4 | 4 | 15.0 | 85.0 | 25 | 250 | 35 | 30 | |
| 80.0 | Clay | 5 | 5 | 20.0 | 80.0 | 30 | 300 | 40 | 35 | |
| 75.0 | Clay | 6 | 6 | 25.0 | 75.0 | 35 | 350 | 45 | 40 | |
| 70.0 | Clay | 7 | 7 | 30.0 | 70.0 | 40 | 400 | 50 | 45 | |
| 65.0 | Clay | 8 | 8 | 35.0 | 65.0 | 45 | 450 | 55 | 50 | |
| 60.0 | Clay | 9 | 9 | 40.0 | 60.0 | 50 | 500 | 60 | 55 | |
| 55.0 | Clay | 10 | 10 | 45.0 | 55.0 | 55 | 550 | 65 | 60 | |
| 50.0 | Clay | 11 | 11 | 50.0 | 50.0 | 60 | 600 | 70 | 65 | |
| 45.0 | Clay | 12 | 12 | 55.0 | 45.0 | 65 | 650 | 75 | 70 | |
| 40.0 | Clay | 13 | 13 | 60.0 | 40.0 | 70 | 700 | 80 | 75 | |
| 35.0 | Clay | 14 | 14 | 65.0 | 35.0 | 75 | 750 | 85 | 80 | |
| 30.0 | Clay | 15 | 15 | 70.0 | 30.0 | 80 | 800 | 90 | 85 | |
| 25.0 | Clay | 16 | 16 | 75.0 | 25.0 | 85 | 850 | 95 | 90 | |
| 20.0 | Clay | 17 | 17 | 80.0 | 20.0 | 90 | 900 | 100 | 95 | |
| 15.0 | Clay | 18 | 18 | 85.0 | 15.0 | 95 | 950 | 105 | 100 | |
| 10.0 | Clay | 19 | 19 | 90.0 | 10.0 | 100 | 1000 | 110 | 105 | |
| 5.0 | Clay | 20 | 20 | 95.0 | 5.0 | 105 | 1050 | 115 | 110 | |
| 0.0 | Clay | 21 | 21 | 100.0 | 0.0 | 110 | 1100 | 120 | 115 | |

20
10-5 % STRAIN AT FAILURE
10

40714-60

| | | | | | |
|--------------------------------|--|-------------------------------------------|--|---------------------|--|
| DEPARTMENT OF HIGHWAYS-ONTARIO | | RECORD OF BOREHOLE No. 1 | | FOUNDATION SECTION | |
| MATERIALS & TESTING OFFICE | | LOCATION: 60-100 Highway 100, Highway 100 | | ORIGINATED BY: A.D. | |
| JOB: 10-10-100 | | BORING DATE: 10-10-100 | | COMPILED BY: A.D. | |
| W.P. 10-10-100 | | BOREHOLE TYPE: 10-10-100 | | CHECKED BY: A.D. | |
| DATUM: 10-10-100 | | | | | |

| SOIL PROFILE | | SAMPLES | | DYNAMIC PENETRATION RESISTANCE | | LIQUID LIMIT | | REMARKS |
|--------------|-------------|---------|-----------|--------------------------------|----------------|---------------|---------------|-----------|
| ELEV. DEPTH | DESCRIPTION | NUMBER | TYPE | BLOWS/FOOT | SHEAR STRENGTH | PLASTIC LIMIT | WATER CONTENT | |
| 10.0 | 10-10-100 | 1 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 10.1 | 10-10-100 | 2 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 10.2 | 10-10-100 | 3 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 10.3 | 10-10-100 | 4 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 10.4 | 10-10-100 | 5 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 10.5 | 10-10-100 | 6 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 10.6 | 10-10-100 | 7 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 10.7 | 10-10-100 | 8 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 10.8 | 10-10-100 | 9 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 10.9 | 10-10-100 | 10 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 11.0 | 10-10-100 | 11 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 11.1 | 10-10-100 | 12 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 11.2 | 10-10-100 | 13 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 11.3 | 10-10-100 | 14 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 11.4 | 10-10-100 | 15 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 11.5 | 10-10-100 | 16 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 11.6 | 10-10-100 | 17 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 11.7 | 10-10-100 | 18 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 11.8 | 10-10-100 | 19 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 11.9 | 10-10-100 | 20 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 12.0 | 10-10-100 | 21 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 12.1 | 10-10-100 | 22 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 12.2 | 10-10-100 | 23 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 12.3 | 10-10-100 | 24 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 12.4 | 10-10-100 | 25 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 12.5 | 10-10-100 | 26 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 12.6 | 10-10-100 | 27 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 12.7 | 10-10-100 | 28 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 12.8 | 10-10-100 | 29 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 12.9 | 10-10-100 | 30 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 13.0 | 10-10-100 | 31 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 13.1 | 10-10-100 | 32 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 13.2 | 10-10-100 | 33 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 13.3 | 10-10-100 | 34 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 13.4 | 10-10-100 | 35 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 13.5 | 10-10-100 | 36 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 13.6 | 10-10-100 | 37 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 13.7 | 10-10-100 | 38 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 13.8 | 10-10-100 | 39 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 13.9 | 10-10-100 | 40 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 14.0 | 10-10-100 | 41 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 14.1 | 10-10-100 | 42 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 14.2 | 10-10-100 | 43 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 14.3 | 10-10-100 | 44 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 14.4 | 10-10-100 | 45 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 14.5 | 10-10-100 | 46 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 14.6 | 10-10-100 | 47 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 14.7 | 10-10-100 | 48 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 14.8 | 10-10-100 | 49 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 14.9 | 10-10-100 | 50 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 15.0 | 10-10-100 | 51 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 15.1 | 10-10-100 | 52 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 15.2 | 10-10-100 | 53 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 15.3 | 10-10-100 | 54 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 15.4 | 10-10-100 | 55 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 15.5 | 10-10-100 | 56 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 15.6 | 10-10-100 | 57 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 15.7 | 10-10-100 | 58 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 15.8 | 10-10-100 | 59 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 15.9 | 10-10-100 | 60 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 16.0 | 10-10-100 | 61 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 16.1 | 10-10-100 | 62 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 16.2 | 10-10-100 | 63 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 16.3 | 10-10-100 | 64 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 16.4 | 10-10-100 | 65 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 16.5 | 10-10-100 | 66 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 16.6 | 10-10-100 | 67 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 16.7 | 10-10-100 | 68 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 16.8 | 10-10-100 | 69 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 16.9 | 10-10-100 | 70 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 17.0 | 10-10-100 | 71 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 17.1 | 10-10-100 | 72 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 17.2 | 10-10-100 | 73 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 17.3 | 10-10-100 | 74 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 17.4 | 10-10-100 | 75 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 17.5 | 10-10-100 | 76 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 17.6 | 10-10-100 | 77 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 17.7 | 10-10-100 | 78 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 17.8 | 10-10-100 | 79 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 17.9 | 10-10-100 | 80 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 18.0 | 10-10-100 | 81 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 18.1 | 10-10-100 | 82 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 18.2 | 10-10-100 | 83 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 18.3 | 10-10-100 | 84 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 18.4 | 10-10-100 | 85 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 18.5 | 10-10-100 | 86 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 18.6 | 10-10-100 | 87 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 18.7 | 10-10-100 | 88 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 18.8 | 10-10-100 | 89 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 18.9 | 10-10-100 | 90 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 19.0 | 10-10-100 | 91 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 19.1 | 10-10-100 | 92 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 19.2 | 10-10-100 | 93 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 19.3 | 10-10-100 | 94 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 19.4 | 10-10-100 | 95 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 19.5 | 10-10-100 | 96 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 19.6 | 10-10-100 | 97 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 19.7 | 10-10-100 | 98 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 19.8 | 10-10-100 | 99 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |
| 19.9 | 10-10-100 | 100 | 10-10-100 | 10 | 10 | 10 | 10 | 10-10-100 |

10
10-10-100
10

Ministry of
Transportation and
Communications

Division
W.P. 89-88-030

PRIORITY DEVELOPMENT BRANCH

PROGRAM STATUS REPORT

UNUSUAL & CONFIDENTIAL

Dist. 2 HWY. 3N TYPE OF WORK Struct.

DESCRIPTION Hwy. 126 Interchange O'pass

PRESENT PROGRAM YEAR 198x DATE INITIATED June 27, 1974

As the W.P.'s 177-85-010 and 177-85-020 pertaining to the Hwy. 126 route south of London, have been removed from the program, the above project is also cancelled.

W.P. No. 89-88-030 Group No. 89-88-03

40114-65
GEORES No.

JG/ap

REMARKS

| PRE-CONTRACT | | ENGINEERING SCHEDULE | |
|-------------------------------|--|-------------------------------|--|
| 1. STATUS REPORT | | 21. STRUCT. QUANT'S COMPLETE | |
| 2. FEASIBILITY STUDY REPORT | | 22. STR. PLANS B 04 TO 5.0.0. | |
| 3. TRAFFIC ISSUED | | 23. H.W.P.A. APPL'N SUBM'D. | |
| 4. PRE-DESIGN PHOTOGRAMMETRY | | 24. H.W.P.A. APPROVAL REC'D. | |
| 5. DRAINAGE STUDY ISSUED | | 25. SOILS DESIGN REPORT | |
| 6. DESIGN CRITERIA | | 26. 40' TO 1" PLANS ISSUED | |
| 7. TITLE SEARCH REQUEST | | 27. CO-ORDINATED ALIGNMENT | |
| 8. PRE-DESIGN REPORT | | 28. STRUCTURE SITE GEOMETRICS | |
| 9. FINAL ALIGNMENT REQUEST | | 29. INTERSECTION DESIGN COMP. | |
| 10. DESIGN X-SECTIONS REQ'T. | | 30. FINAL PROPERTY REQUEST | |
| 11. DESIGN X-SECTIONS ISSUED | | 31. R.T.C. APPL'N SUBM'D. | |
| 12. PLANS & PROF. TO S.D.O. | | 32. R.T.C. APPROVAL REC'D. | |
| 13. PLANS & PROF. ISSUED | | 33. DETAIL DESIGN REPORT | |
| 14. E & G PLANS ISSUED | | 34. ILLUMINATION DESIGN COMP. | |
| 15. ENG. & TITLE RECORDS | | 35. SYSTEMS DESIGN CONSULTS. | |
| 16. FOUNDATION REPORT REQ'D. | | 36. PERCENT COMPLETE S.D.O. | |
| 17. FOUNDATION REPORT ISSUED | | 37. STRUCT. DESIGN CONSULTS. | |
| 18. STRUCT. PLANNING REPORT | | 38. PERCENT COMP. STR. DESIGN | |
| 19. PRELIM. STRUCTURE PLANS | | 39. DOCUMENTS IN SCRUTINY | |
| 20. STRUCTURE DESIGN COMPLETE | | 40. PROPERTY CLEARANCE | |

PRELIM. STUDY ENGINEER

DATE

REGIONAL DIRECTOR

DATE

SCHEDULE ENGINEER

DATE

AS-79-N 1-74