Jacques Whitford

Report

Foundation Investigation and Design Report
Proposed Overhead Sign Support Structures
Highway 401,
Geographic Townships of Blanford and Blenheim, Ontario
District – London
G.W.P. 71-00-00

STANTEC CONSULTING LTD.

PROJECT NO. 1009213.01
GEOCRES NO. 40P2-69

REPORT NO. 1009213.01

REPORT TO	**Stantec Consulting Limited** **1400 Rymal Road** **Hamilton, Ontario**
FOR	**Foundation Investigation and Design Report**
ON	**Proposed Overhead Sign Support Structures** **Highway 401** **Geographic Townships of Blanford and Blenheim, Ontario** **District – London** **G.W.P. 71-00-00** **Geocres. No. 40P2-69**

February 8, 2008

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Jacques Whitford

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Highway 401
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District – London

1.0 INTRODUCTION

Jacques Whitford Limited (Jacques Whitford) was retained by Stantec Consulting Ltd. to complete a Foundation Investigation and Design Report for the five proposed overhead sign support structures along Highway 401 at Station (Sta.) 11+497 in the geographic Township of Blandford and between Sta. 12+700 and Sta. 15+600 in the geographic Township of Blenheim, Ontario (W.P. No. 71-00-00).

The work was carried out under Agreement No. 3005-E-0031 and in accordance with our fee estimate. Authorization to proceed with the investigation was provided by Mr. David Emery, P. Eng., Principal with Stantec Consulting Limited, the prime consultant on this assignment.

The purpose of the investigation was to determine the soil and groundwater conditions in the area of the proposed overhead signs by advancing 5 boreholes, one at each proposed overhead sign location, and provide a Foundation Investigation and Design Report.

This report has been prepared specifically and solely for the project described herein. It contains the factual results of the field investigation and the laboratory testing program.

2.0 SITE DESCRIPTION

The investigation is for 5 proposed overhead sign locations on Highway 401; one at Sta. 11+497 in the geographic Township of Blandford and four between Sta. 12+700 and Sta. 15+600, in the geographic Township of Blenheim, Ontario. There is a change in chainage within the project limits just east of Oxford Road 22 with Sta. 17+940, in the geographic Township of Blanford equivalent to Sta. 10+000 in the geographic Township of Blenheim.

Highway 401 is oriented in an east-west direction with 2 eastbound and 2 westbound lanes. The highway is built to a rural freeway section with wide partially paved shoulders, side ditches and a wide grass covered central median. The road profile is generally level and the pavement is typically constructed on embankments that generally range in height from approximately 1 m to 3 m upwards to about 8 m to 9 m at overpass locations.

The topography of the lands adjacent to the highway is generally undulating.

3.0 PHYSIOGRAPHY

Based on the Physiography of Southern Ontario by Chapman and Putnam (1984), this section of Highway 401 is situated in the physiographic region known as the Oxford Till Plain, which is interlaced with glacial spillways. The till plain is characterized as pale brown calcareous loam and the glacial spillways are generally composed of uniform sandy and gravelly materials.

Physiographic mapping of the site indicates drumlinized till plains.

4.0 SCOPE OF WORK

The scope of work for the investigation was as follows:

- To investigate the soil and groundwater conditions at the proposed overhead sign locations by advancing a total of 5 boreholes, one at each sign location as outlined in the following table:

Sign Location by Station	Borehole Number	Borehole Location by Station	Borehole Offset from Centreline of Highway Median	Comments
11+497	OH-3	11+500	16 m Lt	Westbound lanes approaching Oxford Road 2
12+773	OH-4	12+773	18 m Rt	Eastbound lanes approaching Oxford Road 29
13+773	OH-5	13+775	15 m Rt	Eastbound lanes approaching Oxford Road 29
14+574	OH-2	14+574	22 m Lt	Westbound lanes approaching Oxford Road 29
15+574	OH-1	15+575	20 m Lt	Westbound lanes approaching Oxford Road 29

- To conduct at laboratory testing program on selected samples of the soil obtained from the investigation; and,
- To prepare a Foundation Investigation and Design Report.

5.0 INVESTIGATION PROCEDURES

5.1 Field Program

Prior to commencing the investigation, the borehole locations were established in the field by Jacques Whitford personnel. The borehole locations were cleared of underground utilities by the various public utility companies.

Freeway traffic control during the drilling program was provided by On Track Safety Limited (OTS), using signs, traffic barrels and blocker vehicles, in accordance with the Ontario Traffic Manual (OTM) Book 7 Temporary Conditions.

The field investigation was carried out on November 17 and 18, 2007. A total of 5 boreholes (OH-1 to OH-5) were advanced at the locations identified previously in this report and shown on the drawings provided in Appendix A.

The boreholes were advanced to depths consistent with the requirements outlined in the MTO Sign Support Manual, to depths in the range of approximately 6.6 m to 8.1 m below existing grade using a truck mounted drill rig equipped with 150 mm diameter (outside diameter), solid-stem augers, supplied and operated by London Soils Inc. Soil samples were recovered from the boreholes at regular intervals using a 50 mm Outside Diameter split-spoon sampler by conducting Standard Penetration Tests (SPTs) in general accordance with the procedures outlined in the ASTM specification D1586.

Jacques Whitford field personnel recorded the conditions encountered in the boreholes at the time of the investigation. Soils were described in accordance with the MTO Soils Classification System.

The groundwater levels, where encountered, were measured in the boreholes during and on completion of drilling. The boreholes were backfilled on completion of drilling with bentonite/cement slurry in accordance with Ontario Ministry of the Environment Regulation 903.

All soil samples recovered from the boreholes were placed in moisture-proof bags and transported to our laboratory for detailed classification and testing as required.

The subsurface conditions encountered in the boreholes are summarized on the Record of Borehole sheets in **Appendix B**. Additional comments are provided in the subsequent sections of this report.

5.2 Survey

The borehole locations were established in the field by Jacques Whitford personal by measuring from the existing features at the site. Borehole locations and offsets are referenced to the stations established for the Highway 401 median centreline.

The ground surface elevation at the borehole locations were inferred from drawings provided by Stantec Consulting Limited. It is understood that the cross-section elevation was referenced to a Geodetic datum.

5.3 Laboratory Testing

All samples transported to the laboratory were subjected to detailed visual examination and classification. Approximately 25% of the soil samples were submitted for routine testing including grain size distribution, Atterberg Limits and moisture content determination testing. The laboratory results are provided on the Record of Borehole sheets in **Appendix B**. The results of the grain size analyses and Atterberg Limits tests are shown on Figure Nos. 1 through 4 in **Appendix C**.

Unless requested in advance, all samples will be stored in our laboratory for a period of twelve months from the issue date of this report.

6.0 RESULTS OF THE INVESTIGATION

6.1 Subsurface Conditions

The subsurface conditions encountered in the boreholes are summarized on the Record of Borehole sheets provided in **Appendix B**. An explanation of the terms used on the Record of Borehole sheets is provided in **Appendix B**.

A summary of the soil and groundwater conditions encountered in the boreholes is provided below.

6.2 Soil

6.2.1 Fill

6.2.1.1 Sand and Gravel Fill (SW-SM)

Sand and gravel fill was encountered at the ground surface in all boreholes. The sand and gravel fill extended to depths of approximately 1.5 m to 4.6 m below existing grade, elevations of about 307.7 m to 293.2 m. The sand and gravel fill was generally moist and contained trace silt.

Laboratory testing performed on selected samples consisted of moisture content and a grain size distribution tests. The test results were as follows:

- Moisture content: 2% to 16%
- Grain Size Distribution:
    - 19% gravel;
    - 63% sand; and,
    - 18% fines (silt and clay).

The results of the moisture content tests are provided on the Record of Borehole sheets in **Appendix A**.

The results of the grain size distribution are shown on the Record of Borehole sheets in **Appendix B** and provided on Figure No. 1 in **Appendix C**.

6.2.1.2 Sand Fill (SM)

Sand fill was encountered underlying the sand and gravel fill in Borehole OH-5. The sand fill was encountered at a depth of approximately 1.5 m, an elevation of about 307.7 m, was approximately 4.1 m thick and extended to a depth of approximately 5.6 m below existing grade, an elevation of about 303.6 m. The sand fill was generally moist and contained some silt and trace clay.

Laboratory testing performed on representative samples consisted of moisture content and a grain size distribution tests. The test results were as follows:

- Moisture content: 8% to 11%
- Grain Size Distribution:
    - 0% gravel;

- 80% sand; and,
- 20% silt and clay.

The results of the moisture content tests are provided on the Record of Borehole sheets in **Appendix B**.

The results of the grain size distribution test are shown on the Record of Borehole sheets in **Appendix B** and provided on Figure No. 1 in **Appendix C**.

6.2.2 Native Sand (SW-SM)

Native sand was encountered in Boreholes OH-1 and OH-2 at depths of approximately 3 m and 4.6 m below existing grade, elevations of about 298.9 m and 294.1 m. The sand was approximately 1.8 m thick in OH-1 and extended to a depth of approximately 4.8 m below existing grade, an elevation of about 297.2 m. Borehole OH-2 terminated in the sand at a depth of approximately 6.6 m below existing grade, an elevation of about 292.1 m. The sand was generally moist to wet.

Based on the N-values obtained from the SPTs, the sand is described as compact to dense.

Laboratory testing performed on representative samples consisted of moisture content tests. The test results were as follows:

- Moisture contents: 14% to 18%

The results of the moisture content tests are provided on the Record of Borehole sheets in **Appendix B**.

6.2.3 Silty Clay Till (CL)

Silty clay till was encountered in Boreholes OH-1, OH-3 and OH-4 at depths of approximately 1.5 m to 4.8 m below existing grade, elevations of about 299.9 m to 293.2 m. The silty clay till was approximately 1.3 m and 1.5 m thick in Boreholes OH-1 and OH-4 and extended to depths of approximately 6.1 m and 3.0 m below existing grade, elevations of about 295.9 m and 298.3 m, respectively. Borehole OH-3 was terminated in the silty clay till at a depth of approximately 6.6 m below existing grade, an elevation of about 289.7 m. The silty clay till was moist and contained some sand and trace gravel.

Based on the N-values obtained from the SPTs, the consistency of the silty clay till is described as stiff to very stiff.

Laboratory testing performed on selected samples consisted of moisture content, grain size distribution and Atterberg Limits tests. The test results were as follows:

- Moisture Content: 7% to 18%
- Grain Size Distribution:
  - 4% and 3% gravel;
  - 13% and 16% sand;
  - 52% and 49% silt; and,
  - 31% and 32% clay.

- Atterberg Limits:
    - o Plastic limits: 14% and 15%
    - o Liquid limits: 23% and 23%
    - o Plasticity Indices: 8% and 9%

The results of the moisture content tests are provided on the Record of Borehole sheets in **Appendix B**.

The results of the grain size distribution tests are shown on the Record of Borehole sheets in **Appendix B** and provided on Figure No. 2 in **Appendix C.** The results of the Atterberg Limits tests are shown on the Record of Borehole sheets in **Appendix B** and provided on Figure No. 3 in **Appendix C.**

6.2.4 Silty Sand Till and Sand Till (SP-SM to SW-SM)

Silty sand till and sand till were encountered in Boreholes OH-1, OH-4 and OH-5 at depths of approximately 3.0 m to 6.1 m, elevations of about 295.9 to 303.6 m. The boreholes were terminated in the silty sand till and sand till at depths of approximately 6.6 m to 8.1 m below existing grade, elevations of about 294.8 m to 301.1 m. The sandy silt till and sand till was moist to wet and contained trace gravel and trace clay.

Based on the N-values obtained from the SPTs, the silty sand till and sand till is described as loose to dense.

Laboratory testing performed on selected samples consisted of moisture content tests and a grain size distribution test. The test results were as follows:

- Moisture content: 4% to 15%
- Grain Size Distribution:
    - o 19% gravel;
    - o 70% sand; and,
    - o 11% fines (silt and clay).

The results of the moisture content tests are provided on the Record of Borehole sheets in **Appendix B**.

The results of the grain size distribution test are shown on the Record of Borehole sheets in **Appendix B** and provided on Figure No. 4 in **Appendix C.**

6.3 Borehole Cave and Groundwater Conditions

The following table outlines the cave and groundwater conditions encountered during drilling:

Borehole	Cave on completion of drilling		Groundwater conditions on completion of drilling	
	Depth (m)	Elevation (m)	Depth (m)	Elevation (m)
OH-1	3.6	298.4	3.5	298.5
OH-2	3.4	295.3	3.2	295.5
OH-3	Open	-	Dry	-
OH-4	5.5	295.9	Dry to depth of cave	-
OH-5	Open	-	Dry	-

It is noted that the groundwater conditions may change as they are subject to seasonal fluctuations and in responses to weather events.

7.0 CLOSURE

A soil investigation is a limited sampling of a site. The information is gathered at specific borehole locations and can only be extrapolated to an undefined limited area around the borehole locations. The extent of the limited area depends on the variability of the soil and groundwater conditions as influenced by geological processes, as well as the history of the site reflecting natural conditions, construction activities and site use. Should any conditions at the site be encountered which differ from those at the borehole locations, we request that we be notified immediately in order to assess the additional information.

We trust the above information meets with your present requirements. Should you have any questions or require further information, please do not hesitate to contact us at your convenience.

Regards,

JACQUES WHITFORD LIMITED

Original Signed By:

Geoffrey Creer, P.Eng.
Geotechnical Engineer

Original Signed By:

Janos Garami, P. Eng.
Markham Group Leader, Geotechnical Engineering

Original Signed By:

Fred J. Griffiths, Ph.D., P. Eng
Principal MTO Contact

FOUNDATION DESIGN REPORT

Proposed Overhead Sign Support Structures
Highway 401
Township of Blanford-Blenheim, Ontario
G.W.P. 71-00-00
District – London

8.0 DISCUSSION

8.1 General

Highway 401 is oriented in an east-west direction with 2 eastbound and 2 westbound lanes. The highway is built to a rural freeway section with wide partially paved shoulders, side ditches and a wide grass covered central median. The road profile is generally level and the pavement is typically constructed on embankments that generally range in height from approximately 1 m to 3 m upwards to about 8 m to 9 m at overpass locations.

The topography of the lands adjacent to the highway is generally undulating.

8.2 Proposed Development

It is understood that the Ministry of Transportation is planning to widen a section of Highway 401 just east of Woodstock, Ontario. The planned widening will extend from approximately 1 km east of Interchange No. 238 (Highway 401 and Oxford Road 2), in the geographic Township of Blanford, to approximately 4.1 km east of the Drumbo Road underpass in the geographic Township of Blenheim. The total length of the planned widening will be approximately 15.3 km.

The widening will consist of adding a single lane to both the east and west bound lanes of the highway.

The planned development will include the construction of 5 overhead signs, 3 for the westbound lanes and 2 for the east bound lanes at the locations outlined in the following table:

Borehole Location by Station	Comments
11+500	Westbound lanes Approaching Oxford Road 2
12+773	East bound lanes approaching Oxford Road 29
13+775	East bound lanes approaching Oxford Road 29
14+574	Westbound lanes approaching Oxford Road 29
15+575	Westbound lanes approaching Oxford Road 29

It is understood that the signs will be tri-chord static sign support structures. The footings (one median mounted and one ground mounted for each structure) will be drilled, cast-in-place concrete caissons.

8.3 Subsurface Conditions

The subsurface soil conditions encountered in Borehole OH-3 advanced at Sta. 11+500, in the vicinity of Oxford Road 2, generally consisted of fill underlain by glacial silty clay till. The borehole was open and dry on completion of drilling.

The subsurface soil conditions encountered in Boreholes OH-1, OH-2, OH-4 and OH-5, advanced between Sta. 12+773 and Sta. 15+575, in the vicinity Oxford Road 29, generally consisted of sand and gravel fill underlain by native sand. The sand in Boreholes OH-1, OH-4 and OH-5 was underlain by glacial till, which was composed of silty clay till, silty sand till and sand till.

Cave-in was measured in three of the boreholes at depths of approximately 3.4 m to 5.5 m below existing grade, elevations of approximately 298.4 m to 295.3 m. The remaining borehole was open to the termination depth on completion of drilling.

Groundwater was measured in 2 of the boreholes on completion of drilling at depths of approximately 3.2 m and 3.5 m below existing grade, elevations of approximately 298.5 m and 295.5 m. The remaining boreholes were dry on completion of drilling.

9.0 RECOMMENDATIONS

A list of the standard drawings and specifications referenced in this report is provided in **Appendix D**.

9.1 Soil Parameters

The results of the field investigation and laboratory testing described herein have been used to estimate soil parameters for use in the design of the overhead sign support structure foundations.

Soils at the site have been classified as cohesive or non-cohesive and have been assigned values of undrained shear strength (C_u) or angle of internal friction (Φ'), and bulk unit weight (γ). The Rankine passive earth pressure coefficients have been calculated based on the assigned angle of internal friction. The design parameters recommended for use on this project are shown in the table below. When using the table, the following should be considered:

- The soil parameters provided represent ultimate values and will need to be factored in accordance with the CHBDC.
- The unit weights provided are bulk unit weights. Below the groundwater table the submerged unit weights should be used, which can be obtained by subtracting 9.8 kN/m^3 from the bulk unit weights provided.

Borehole Location by Station Borehole Number	Depth (m)	Soil Type	Soil Behaviour Type	Compactness or Consistency	Unit Weight (kN/m^3)	Effective Friction Angle	Rankine Passive Earth Pressure Coefficient	Undrained Shear Strength (kPa)
11+500 OH-3	0 – 3	Sand & Gravel Fill	Non-cohesive	Compact	21	31	3.12	-
	3 – 6.6	Silty Clay Till	Cohesive	Very Stiff	19	-	-	100
12+773 OH-4	0 – 1.5	Sand & Gravel Fill	Non-cohesive	Compact to dense	21	31	3.12	-
	1.5 – 3	Silty Clay Till	Cohesive	Very stiff	19	-	-	100
	3 – 6.6	Sand Till	Non-cohesive	Dense to compact	20	30	3.00	-
13+775 OH-5	0 – 1.5	Sand & Gravel Fill	Non-cohesive	Compact	21	31	3.12	-
	1.5 – 5.6	Sand Fill	Non-cohesive	Compact	20	30	3.00	-
	5.6 – 8.1	Silty Sand Till	Non-cohesive	Loose to compact	19	30	3.00	-
14+574 OH-2	0 – 4.6	Sand & Gravel Fill	Non-cohesive	Dense to loose	21	31	3.12	-
	4.6 – 6.6	Sand	Non-cohesive	Compact to dense	19	30	3.00	-
15+575 OH-1	0 – 3	Sand & Gravel Fill	Non-cohesive	Compact to dense	21	31	3.12	-
	3 – 4.8	Sand	Non-cohesive	Compact	19	30	3.00	-
	4.8 - 6.1	Silty Clay Till	Cohesive	Stiff	19	-	-	75
	6.1 – 6.6	Silty Sand Till	Non-cohesive	Compact	19	30	3.00	-

9.2 MTO Standard Design

The MTO sign support manual stipulates that the caisson diameter for the standard ground mounted footing is 1200 mm and for the median mounted footing is 1000 mm, each extending to a minimum of 5 m below the frost penetration depth. The MTO Standard Drawings SS118-3 to SS118-5, dated April 2007, are based on the following assumed soil parameters below the frost layer:

Length of Caisson Below the Frost Penetration Depth	Case 1 (Sand)	Case 2 (Clay)
Upper 2/3	$\Phi' = 28^o$	C_u = 25 kPa
Lower 1/3	$\Phi' = 30^o$	C_u = 50 kPa

Where:
Φ' = the Angle of Internal friction
C_u = the Undrained Shear Strength

Given the soil conditions encountered, the foundation details provided by MTO Standard Drawings SS118-3 to SS118-5, dated April 2007, may be used at this site.

Alternatively or if other considerations preclude the use of the standard design, the footings may be redesigned using the suggested design methods and geotechnical design parameters provided in the following sections.

9.3 Cast-In-Place Concrete Caissons

9.3.1 Design Approach

The foundation must be designed to resist overturning moments caused by wind loads and should be designed in accordance with the CHBDC Section 6.13 and the method described by B. B. Broms in the following papers:

- Broms, B. B. 1964, "Lateral Resistance of Piles in Cohesive Soils." J. of Soil Mech. And Found. Div., ASCE, vol. 90, SM2: 27-63.
- Broms, B. B. 1964, "Lateral Resistance of Piles in Cohesionless Soils." J. of Soil Mech. And Found. Div., ASCE, vol. 90, SM3: 123-156.
- Broms, B. B. 1965, "Design of Laterally Loaded Piles." J. of Soil Mech. And Found. Div., ASCE, vol. 91, SM3: 79-99.

9.3.2 Lateral Deflections

The horizontal subgrade reaction may be calculated based on the procedures outlined in the Canadian Foundation Engineering Manual.

The coefficient of horizontal subgrade reaction that is used for deflection calculations may be estimated for cohesive soils as follows:

$$k_s = 67\ C_u/d$$

Where k_s = the coefficient of horizontal subgrade reaction (force per volume)
C_u = undrained shear strength of the soil = 75 kPa for this application
d = caisson diameter

The coefficient of horizontal subgrade reaction that is used for deflection calculations for non-cohesive soils may be estimated as follows:

$$k_s = n_h(z/d)$$

Where k_s = the coefficient of horizontal subgrade reaction (force per volume)
n_h = Coefficient related to soil density. This may be taken as 4,400 kN/m^3 for compact sandy soils (Table 20.3, p. 315, of the Canadian Foundation Engineering Manual, 3rd Edition, 1992)
z = depth below grade (m)
d = caisson diameter (m)

9.4 Frost Considerations

The site is located in an area with a mean freezing index of between 500 and 750 Degree days (^{o}Days), (Canadian Foundation Engineering Manual, 2006). Based on Figure 3.4 of the MTO Pavement Design and Rehabilitation Manual, the frost penetration depth for this area is approximately 1.3 m.

The material within the zone of frost penetration should not be included in the calculations of lateral resistance.

9.5 Soil Profile Type and Seismic Forces

The zonal acceleration ratio for the Woodstock area, as obtained from CHBDC (2006) Table A3.1.1., is 0.05. Soil Profile Type III should be presumed in the design.

10.0 CONSTRUCTION RECOMMENDATIONS

10.1 Caisson Installation

Cave-in was measured in three of the boreholes at depths in the range of approximately 3.4 m to 5.5 m, elevations of approximately 298.4 m to 295.3 m. The remaining 2 boreholes were open on completion of drilling.

Groundwater was measured in 2 of the boreholes at depths of approximately 3.2 m and 3.5 m, elevations of about 298.5 m and 295.5 m, while the remaining boreholes were dry on completion on drilling.

Given that cave-in and groundwater were encountered in some of the boreholes, it is recommended that a temporary liner be used to keep the caisson holes open.

All loose material should be removed from the base of the caisson prior to placement of the reinforcing steel cage (as required) and concrete. Inspection and approval of the base of the caisson by the geotechnical consultant is recommended prior to installation of the reinforcing cage and placement of the concrete. Installation and inspection should be carried out in accordance with SP903S01.

On completion of the foundation installation it is recommended that the ground surface surrounding the structure be graded to prevent surface water from ponding adjacent to the foundation.

10.2 Open Cut Excavations

Excavations and open trenches are not anticipated at this site.

10.3 Staging

Through discussions with representatives of Stantec Consulting, it is understood that the work will be carried out on the right shoulder and in the central median of the east and west bound lanes, during the widening construction and rehabilitation of the highway. Foundations issues due to staging are not anticipated.

10.4 Groundwater Control

Groundwater was encountered in 2 of the boreholes at depths of approximately 3.2 m and 3.5 m below existing grade, elevations of approximately 298.5 m and 295.5 m. Perched groundwater conditions may be encountered anywhere through the soil profiles, but mainly within the fill.

Given the conditions encountered during the investigation, seepage should be expected. However, the seepage for excavations open for a relatively short period of time is anticipated to be readily handled by conventional pumping techniques.

11.0 CLOSURE

Use of this report is subject to the Statement of General Conditions attached. It is the responsibility of Stantec Consulting Limited and the Ministry of Transportation Ontario, who are identified as "the Client" within the Statement of General Conditions, and its agents to review the conditions and to notify Jacques Whitford Limited should any these not be satisfied. The Statement of General Conditions addresses the following:

- Use of the report
- Basis of the report
- Standard of care
- Interpretation of site conditions
- Varying or unexpected site conditions
- Planning, design or construction

Regards,

JACQUES WHITFORD LIMITED

Original Signed By:

Geoffrey Creer, P.Eng.
Geotechnical Engineer

Original Signed By:

Janos Garami, P. Eng.
Markham Group Leader, Geotechnical Engineering

Original Signed By:

Fred J. Griffiths, Ph.D., P. Eng
Principal MTO Contact

STATEMENT OF GENERAL CONDITIONS

USE OF THIS REPORT: This report has been prepared for the sole benefit of the Client or its agent and may not be used by any third party without the express written consent of Jacques Whitford Limited and the Client. Any use which a third party makes of this report is the responsibility of such third party.

BASIS OF THE REPORT: The information, opinions, and/or recommendations made in this report are in accordance with Jacques Whitford's present understanding of the site specific project as described by the Client. The applicability of these is restricted to the site conditions encountered at the time of the investigation or study. If the proposed site specific project differs or is modified from what is described in this report or if the site conditions are altered, this report is no longer valid unless Jacques Whitford is requested by the Client to review and revise the report to reflect the differing or modified project specifics and/or the altered site conditions.

STANDARD OF CARE: Preparation of this report, and all associated work, was carried out in accordance with the normally accepted standard of care in the state or province of execution for the specific professional service provided to the Client. No other warranty is made.

INTERPRETATION OF SITE CONDITIONS: Soil, rock, or other material descriptions, and statements regarding their condition, made in this report are based on site conditions encountered by Jacques Whitford at the time of the work and at the specific testing and/or sampling locations. Classifications and statements of condition have been made in accordance with normally accepted practices which are judgmental in nature; no specific description should be considered exact, but rather reflective of the anticipated material behavior. Extrapolation of in situ conditions can only be made to some limited extent beyond the sampling or test points. The extent depends on variability of the soil, rock and groundwater conditions as influenced by geological processes, construction activity, and site use.

VARYING OR UNEXPECTED CONDITIONS: Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Jacques Whitford must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments of the report conclusions or recommendations are required. Jacques Whitford will not be responsible to any party for damages incurred as a result of failing to notify Jacques Whitford that differing site or sub-surface conditions are present upon becoming aware of such conditions.

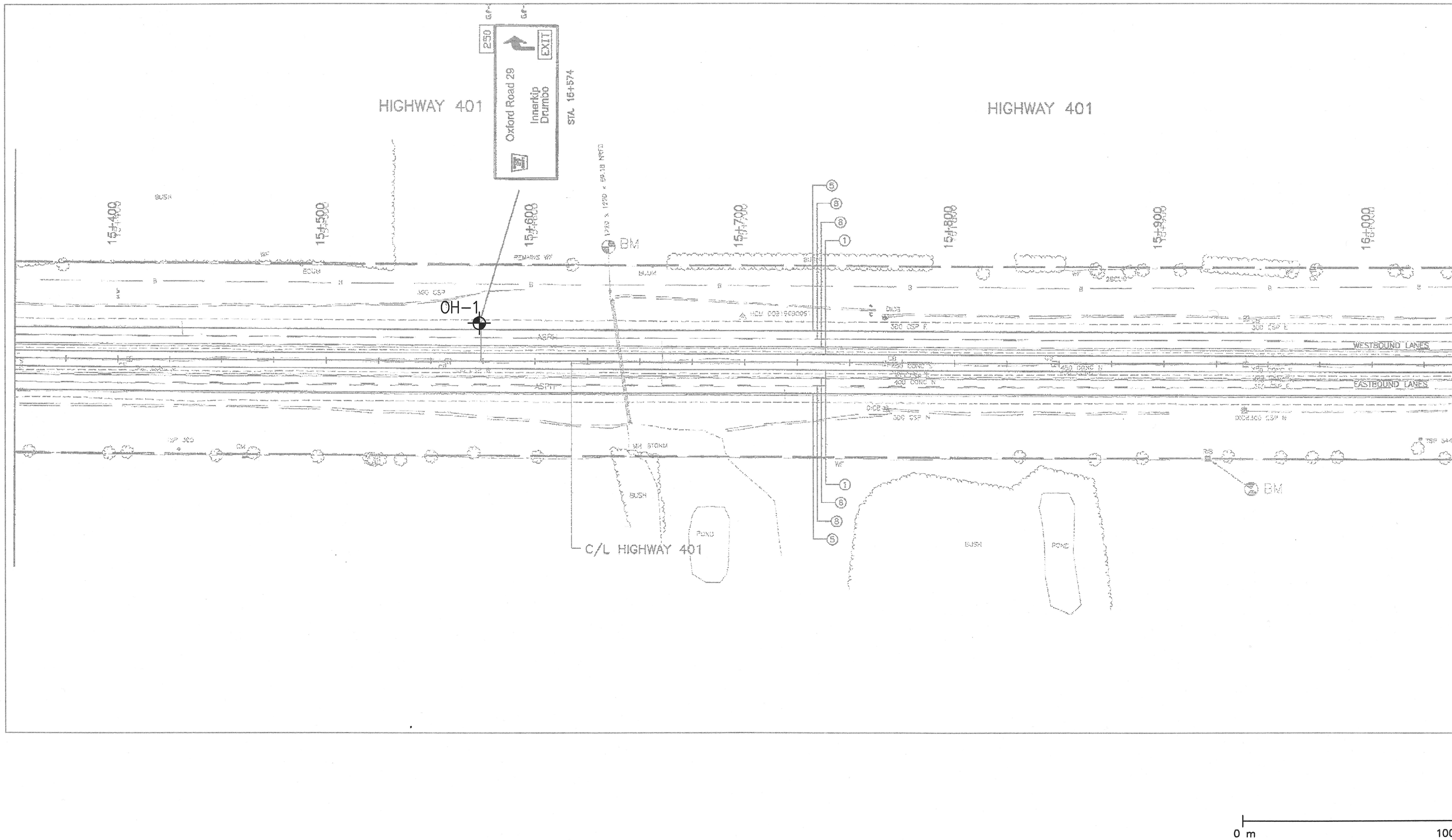
PLANNING, DESIGN, OR CONSTRUCTION: Development or design plans and specifications should be reviewed by Jacques Whitford, sufficiently ahead of initiating the next project stage (property acquisition, tender, construction, etc), to confirm that this report completely addresses the elaborated project specifics and that the contents of this report have been properly interpreted. Specialty quality assurance services (field observations and testing) during construction are a necessary part of the evaluation of sub-subsurface conditions and site preparation works. Site work relating to the recommendations included in this report should only be carried out in the presence of a qualified geotechnical engineer; Jacques Whitford cannot be responsible for site work carried out without being present.

Appendix A

Borehole Location Plans

Jacques Whitford

METRIC
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN



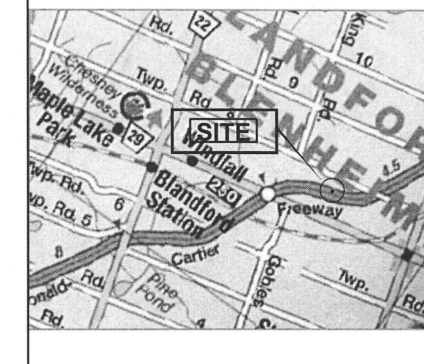
CONT No –
WP No – 71-00-00

TRUE NORTH

SHEET

PROPOSED OVERHEAD SIGN SUPPORT STRUCTURE
STA. 15+574
TWP. BLANDFORD-BLENHEIM
ONTARIO

Jacques Whitford



N.T.S. KEY PLAN

LEGEND

⌖ Borehole

No	ELEVATION (m)	STATION	OFFSET
OH-1	302.0	15+575	20 m LT

=NOTE=
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

NOTE: 1) The complete foundation investigation and design report for this project and other related documents may be examined at the Engineering Materials Office, Downsview. Information contained in this report and related documents is specifically excluded in accordance with the conditions.

2) Base plan provided by Stantec Consulting Ltd.

3) This drawing is for subsurface information only. Surface details and features are for conceptial illistration only.

REVISIONS	DATE	BY	DESCRIPTION

GEOCRES No 40P2 – 69

HWY No 401			DIST
SUBM'D GC	CHECKED	DATE 2008-02-07	SITE –
DRAWN OL OL	CHECKED	APPROVED	DWGOH1LOCATIONPLAN

METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES
UNLESS OTHERWISE SHOWN

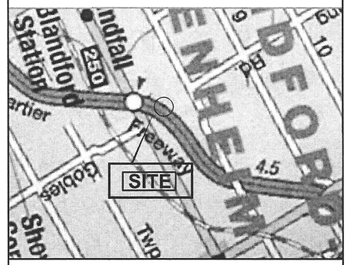
CONT No –
WP No – 71-00-00

TRUE NORTH

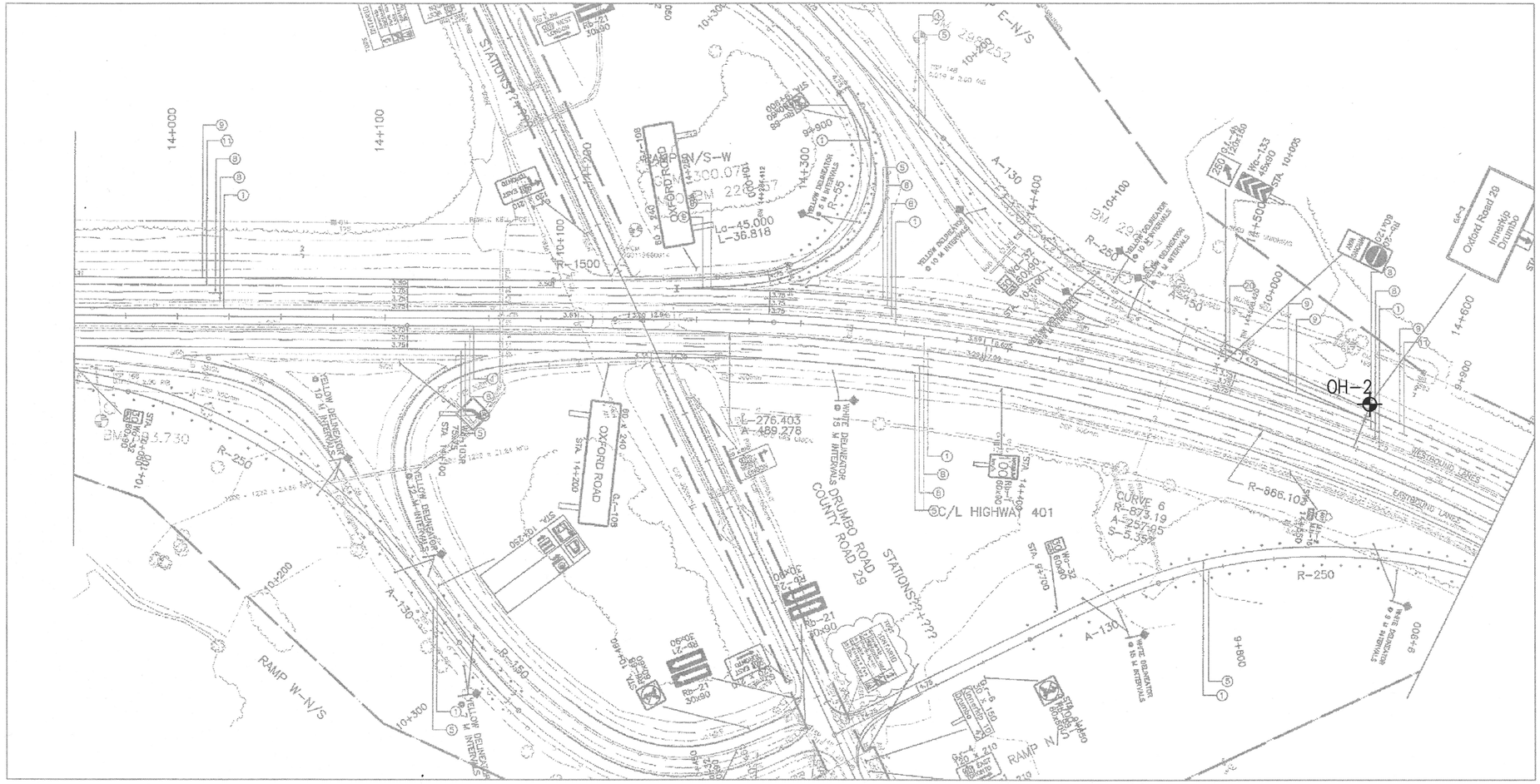
PROPOSED OVERHEAD
SIGN SUPPORT STRUCTURE
STA. 14+574
TWP. BLANDFORD-BLENHEIM
ONTARIO

SHEET

Jacques Whitford



N.T.S. KEY PLAN



LEGEND

Borehole

No	ELEVATION (m)	STATION	OFFSET
OH-2	298.7	14+574	22 m LT

=NOTE=
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

NOTE: 1) The complete foundation investigation and design report for this project and other related documents may be examined at the Engineering Materials Office, Downsview. Information contained in this report and related documents is specifically excluded in accordance with the conditions.

2) Base plan provided by Stantec Consulting Ltd.

3) This drawing is for subsurface information only. Surface details and features are for conceptual illustration only.

REVISIONS			
	—	—	
	DATE	BY	DESCRIPTION

GEOCRES No 40P2 – 69

HWY No 401			DIST
SUBM'D GC	CHECKED	DATE 2008-02-07	SITE —
DRAWN OL OL	CHECKED	APPROVED	DWG OH2LOCATIONPLAN

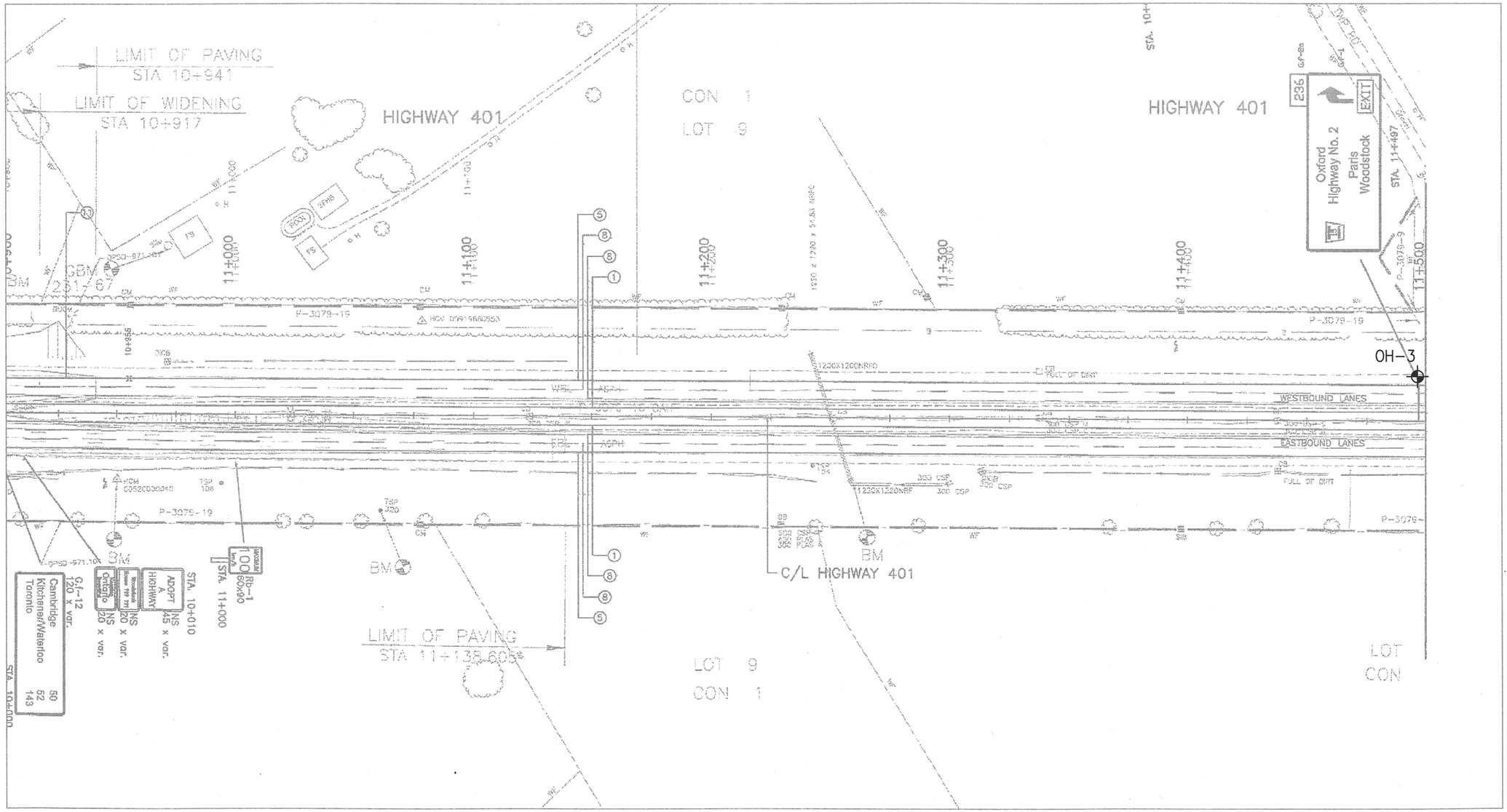
CONT No –
WP No – 71-00-00

TRUE NORTH

PROPOSED OVERHEAD
SIGN SUPPORT STRUCTURE
STA. 11+497
TWP. BLANDFORD-BLENHEIM
ONTARIO

SHEET

METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES
UNLESS OTHERWISE SHOWN



N.T.S. KEY PLAN

LEGEND

Borehole

No	ELEVATION (m)	STATION	OFFSET
OH-3	296.3	11+500	16 m LT

NOTE
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

NOTE: 1) The complete foundation investigation and design report for this project and other related documents may be examined at the Engineering Materials Office, Downsview. Information contained in this report and related documents is specifically excluded in accordance with the conditions.

2) Base plan provided by Stantec Consulting Ltd.

3) This drawing is for subsurface information only. Surface details and features are for conceptial illistration only.

REVISIONS	DATE	BY	DESCRIPTION

GEOCRES No 40P2 – 69

HWY No 401			DIST
SUBM'D GC	CHECKED	DATE 2008-02-07	SITE –
DRAWN OL OL	CHECKED	APPROVED	DWG OH3LOCATIONPLAN

METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES
UNLESS OTHERWISE SHOWN

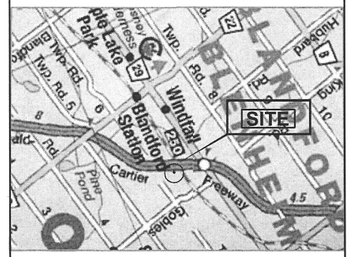
CONT No –
WP No – 71-00-00

TRUE NORTH

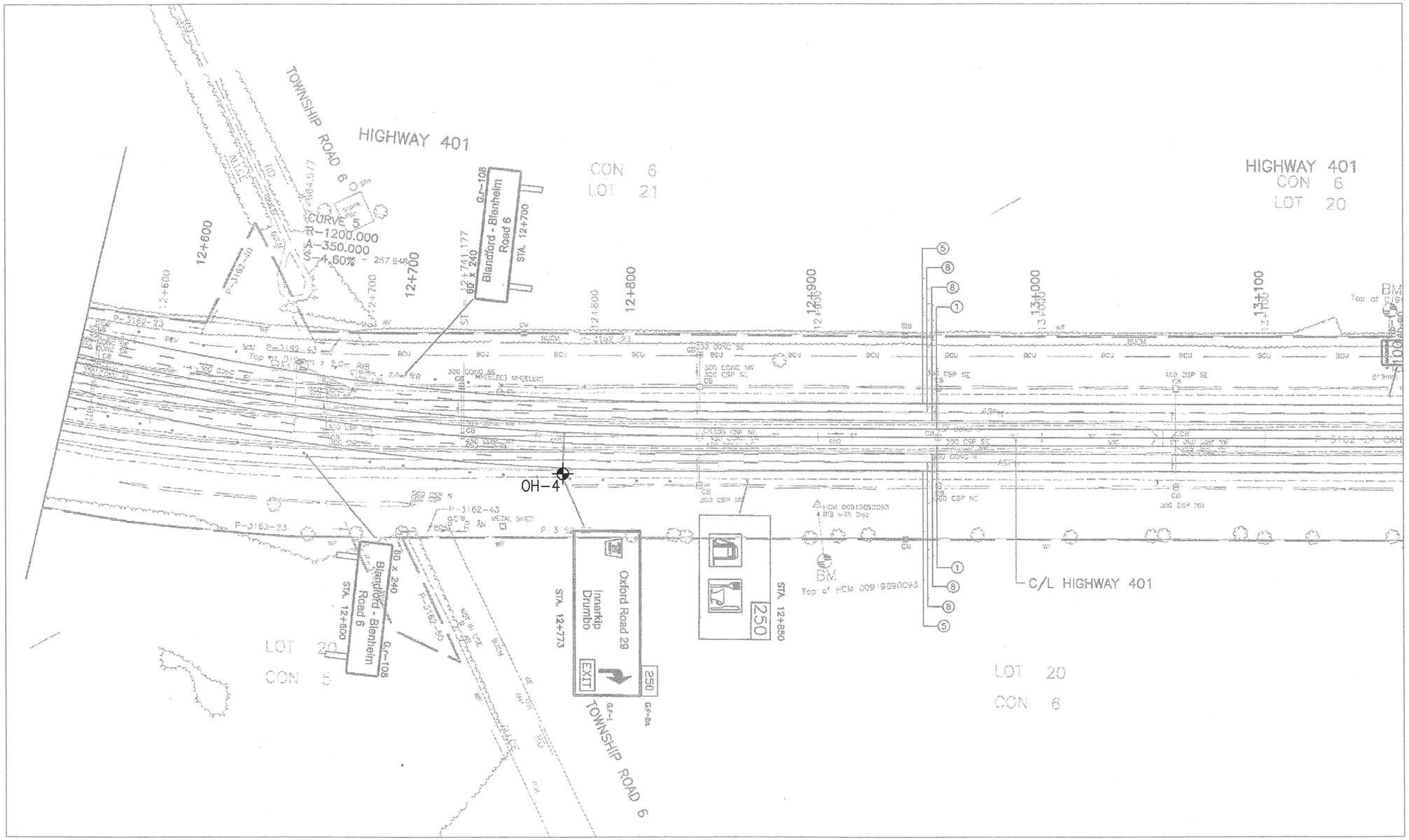
PROPOSED OVERHEAD
SIGN SUPPORT STRUCTURE
STA. 12+773
TWP. BLANDFORD-BLENHEIM
ONTARIO

SHEET

Jacques Whitford



N.T.S. KEY PLAN



LEGEND

Borehole

No	ELEVATION (m)	STATION	OFFSET
OH-4	301.4	12+773	18 m RT

NOTE
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

NOTE: 1) The complete foundation investigation and design report for this project and other related documents may be examined at the Engineering Materials Office, Downsview. Information contained in this report and related documents is specifically excluded in accordance with the conditions.

2) Base plan provided by Stantec Consulting Ltd.

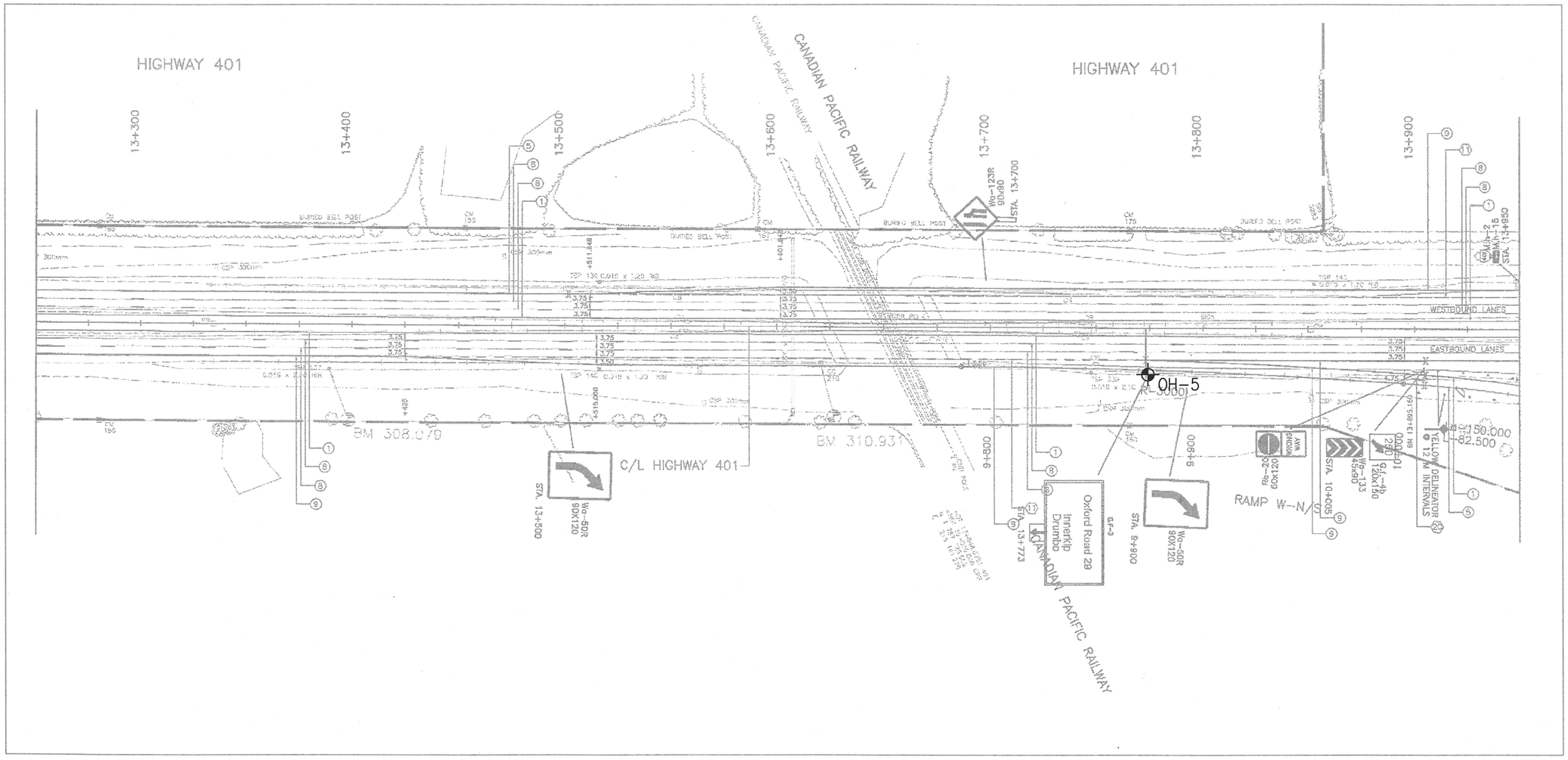
3) This drawing is for subsurface information only. Surface details and features are for conceptial illistuation.n

REVISIONS		
DATE	BY	DESCRIPTION

GEOCRES No

HWY No 401			DIST
SUBM'D GC	CHECKED	DATE 2008-02-07	SITE –
DRAWN OL QL	CHECKED	APPROVED	DWG OH4LOCATIONPLAN

METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES
UNLESS OTHERWISE SHOWN



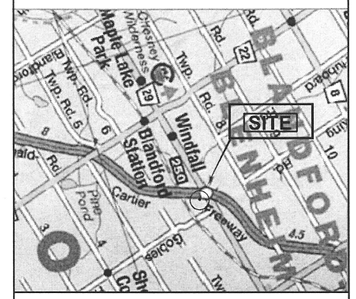
CONT No –
WP No – 71-00-00

TRUE NORTH

PROPOSED OVERHEAD
SIGN SUPPORT STRUCTURE
STA. 13+773
TWP. BLANDFORD-BLENHEIM
ONTARIO

SHEET

Jacques Whitford



N.T.S. KEY PLAN

LEGEND

Borehole

No	ELEVATION (m)	STATION	OFFSET
OH-5	309.2	13+775	15 m RT

NOTE
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

NOTE: 1) The complete foundation investigation and design report for this project and other related documents may be examined at the Engineering Materials Office, Downsview. Information contained in this report and related documents is specifically excluded in accordance with the conditions.

2) Base plan provided by Stantec Consulting Ltd.

3) This drawing is for subsurface information only. Surface details and features are for conceptial illustration only.

0 m 100 m

REVISIONS			
	– –	–	
	DATE	BY	DESCRIPTION

GEOCRES No 40P2 – 69

HWY No 401			DIST
SUBM'D GC	CHECKED	DATE 2008-02-07	SITE –
DRAWN OL OL	CHECKED	APPROVED	DWG OH4LOCATIONPLAN

Appendix B

Terms and Symbols Used on the Record of Borehole Sheet

Record of Borehole Sheet

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

SOIL DESCRIPTION

Terminology describing common soil genesis:

Topsoil	-	mixture of soil and humus capable of supporting good vegetative growth
Peat	-	fibrous fragments of visible and invisible decayed organic matter
Till	-	unstratified and unsorted glacial deposit which may include particle sizes from clay to boulders
Fill	-	materials not identified as deposited by natural geological processes

Terminology describing soil structure:

Desiccated	-	having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.
Fissured	-	material breaks along plane of fracture
Varved	-	composed of regular alternating layers of silt and clay
Stratified	-	alternating layers or beds greater than 6mm (1/4") thick
Laminated	-	alternating layers or beds less than 6mm (1/4") thick
Blocky	-	material can be broken into small and hard angular lumps
Lensed	-	irregular shaped pockets of soil with differing textures
Seam	-	a thin, confined layer of soil having different particle size, texture, or color from materials above and below
Well Graded	-	having wide range in grain sizes and substantial amounts of all intermediate particles sizes
Uniformly Graded	-	predominantly one grain size

Soil descriptions and classification are based on the Unified Soil Classification System (USCS) (ASTM D-2488), which classifies soils on the basis of engineering properties. The system divides soils into three major categories: (1) coarse grained, (2) fine-grained, and (3) highly organic. The soil is then subdivided based on either gradation or plasticity characteristics. This system provides a group symbol (e.g. SM) and group name (e.g. silty sand) for identification. The classification excludes particles larger than 76 mm.

Terminology describing materials outside the USCS, (e.g. particles larger than 76 mm, visible organic matter, construction debris) is based upon the proportion of these materials present and as described below in accordance with the standard of the Ministry of Transportation of Ontario:

Trace or occasional	Less than 10%
Some	10-20%
With	20-30%

The standard terminology to describe cohesionless soils includes the compactness as determined by the Standard Penetration Test 'N'-value*.

Compactness	'N'-value
Very loose	<4
Loose	4-10
Compact	10-30
Dense	30-50
Very dense	>50

Jacques Whitford

Continued Next Page

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

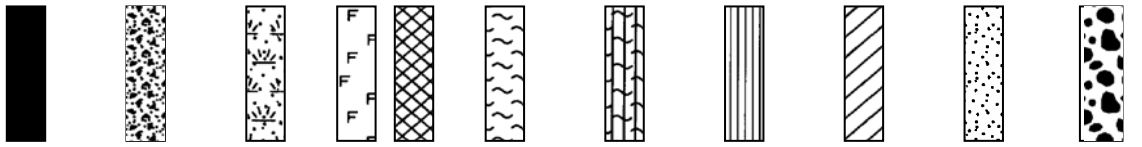
The standard terminology to describe cohesive soils includes consistency, which is based on undrained shear strength as measured by insitu vane tests, penetrometer tests, unconfined compression tests or similar field and laboratory analysis. Standard Penetration Test 'N'-values* can also be used to provide an approximate indication of the consistency and shear strength of fine grained, cohesive soils.

Consistency	Undrained Shear Strength (kPa)	'N'-Value
Very Soft	<12.5	<2
Soft	12.5-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

Note: *'N'-VALUE- The Standard Penetration Test records the number of blows of a 140 pound (64kg) hammer falling 30 inches (760mm), required to drive a 2 inch (50.8mm) O.D. split spoon sampler 1 foot (305mm). For split spoon samples where full penetration is not achieved, the number of blows is reported over the sampler penetration in millimeters (e.g. 50/75).

STRATA PLOT

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols:



Asphalt *Concrete* *Topsoil* *Fill* *Peat* *Organic Silt* *Silt* *Clay* *Sand* *Gravel*

Sedimentary Rock *Metamorphic Rock* *Igneous Rock*

WATER LEVEL MEASUREMENT

Open Borehole or Test Pit

Monitoring Well, Piezometer or Standpipe

SAMPLE TYPE

SS	Split spoon sample (obtained from the Standard Penetration Test)
TW	Thin Wall Sample or Shelby Tube
PS	Piston sample
GS	Grab sample
AS	Auger sample
VT	Vane Test
BS	Bulk sample
WS	Wash sample
HQ, NQ, BQ,etc.	Rock core samples obtained with the use of standard size diamond drilling bits.

RECORD OF BOREHOLE No OH-1

1 OF 1

METRIC

W.P. 71-00-00 LOCATION Stn: 15+575 o/s: 20 m Lt, Twp of Blandford - Blenheim ORIGINATED BY RM

DIST London HWY 401 BOREHOLE TYPE Solid Stem Auger, Split Spoon COMPILED BY OL

DATUM Geodetic DATE 11.17.07 - 11.17.07 CHECKED BY GC

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL × FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
302.0	Gravel Shoulder										
0.0	SAND and GRAVEL FILL (SW-SM), some silt, moist Dense to compact Grey to brown		1	SS	37						
			2	SS	23		301				
	- trace gravel		3	SS	30		300				
298.9											
3.0	SAND (SW-SM), trace silt, moist Compact Brown		4	SS	22	▽	299				
297.2							298				
4.8	Silty CLAY TILL (CL), some sand, trace gravel, moist Stiff Brown		5	SS	13		297				4 13 52 31
295.9							296				
6.1	Silty SAND TILL (SP-SM), some clay, trace gravel, wet Compact Grey		6	SS	19						
295.4											
6.6	END OF BOREHOLE at approximately 6.6 m Borehole caved to a depth of approximately 3.6 m below existing grade (Elev. 298.4 m) on completion of drilling. Groundwater measured at a depth of 3.5 m (Elev. 298.5 m) in caved borehole on completion of drilling.										

$\times^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

RECORD OF BOREHOLE No OH-2

1 OF 1

METRIC

W.P. 71-00-00 LOCATION Stn: 14+574 o/s: 22 m Lt, Twp of Blandford - Blenheim ORIGINATED BY RM

DIST London HWY 401 BOREHOLE TYPE Solid Stem Auger, Split Spoon COMPILED BY OL

DATUM Geodetic DATE 11.17.07 - 11.17.07 CHECKED BY GC

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL × FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
298.7	Gravel Shoulder										
0.0	SAND and GRAVEL FILL (SW-SM), trace silt, moist Dense to loose Grey to brown		1	SS	32		298		○		
			2	SS	27		297		○		
			3	SS	13		296		○		
			4	SS	5	▽	295		○		19 63 (18)
294.1											
4.6	SAND (SW-SM), trace silt, trace gravel, wet Compact to dense Grey		5	SS	16		294		○		
			6	SS	37		293		○		
292.1											
6.6	END OF BOREHOLE at approximately 6.6 m Borehole caved to a depth of approximately 3.4 m below existing grade (Elev. 295.3 m) on completion of drilling. Groundwater measured at a depth of 3.2 m (Elev. 295.5 m) in caved borehole on completion of drilling.										

$\times^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

RECORD OF BOREHOLE No OH-3

1 OF 1

METRIC

W.P. 71-00-00 LOCATION Stn: 11+500 o/s: 16 m Lt, Twp of Blandford - Blenheim ORIGINATED BY RM

DIST London HWY 401 BOREHOLE TYPE Solid Stem Auger, Split Spoon COMPILED BY OL

DATUM Geodetic DATE 11.17.07 - 11.17.07 CHECKED BY GC

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (20 40 60 80 100): ○ UNCONFINED ● QUICK TRIAXIAL × FIELD VANE ⨯ LAB VANE	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
296.3	Gravel Shoulder										
0.0	SAND and GRAVEL FILL (SW-SM), trace silt, moist Compact Grey to brown		1	SS	19		296				
			2	SS	13		295				
			3	SS	28		294				
293.2											
3.0	Silty CLAY TILL (CL), some sand, trace gravel, moist Very stiff Grey		4	SS	18		293				
			5	SS	20		292				3 16 49 32
			6	SS	19		291				
289.7							290				
6.6	END OF BOREHOLE at approximately 6.6 m Borehole open and dry on completion of drilling.										

$\times^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

RECORD OF BOREHOLE No OH-4

1 OF 1

METRIC

W.P. 71-00-00 LOCATION Stn: 12+773 o/s: 18 m Rt, Twp of Blandford - Blenheim ORIGINATED BY RM

DIST London HWY 401 BOREHOLE TYPE Solid Stem Auger, Split Spoon COMPILED BY OL

DATUM Geodetic DATE 11.18.07 - 11.18.07 CHECKED BY GC

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL × FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
301.4	Gravel Shoulder										
0.0	SAND and GRAVEL FILL (SW-SM), trace silt, moist Compact to dense Grey to brown		1	SS	25		301		○		
	- some gravel		2	SS	33				○		
299.9							300				
1.5	Silty CLAY TILL (CL), some sand, trace gravel, moist Very stiff Brown		3	SS	25				○		
298.3							299				
3.0	SAND TILL (SW-SM), some gravel, trace silt and clay, moist Dense to compact Brown		4	SS	36		298		○		19 70 (11)
			5	SS	35		297		○		
							296				
294.8	- with gravel, wet Compact		6	SS	18		295		○		
6.6	END OF BOREHOLE at approximately 6.6 m Borehole caved to a depth of approximately 5.5 m below existing grade (Elev. 295.9 m) on completion of drilling. Caved borehole dry on completion of drilling.										

×³, ×³: Numbers refer to Sensitivity ○³% STRAIN AT FAILURE

RECORD OF BOREHOLE No OH-5 1 OF 1 METRIC

W.P. 71-00-00 LOCATION Stn: 13+775 o/s: 15 m Rt, Twp of Blandford - Blenheim ORIGINATED BY RM

DIST London HWY 401 BOREHOLE TYPE Solid Stem Auger, Split Spoon COMPILED BY OL

DATUM Geodetic DATE 11.18.07 - 11.18.07 CHECKED BY GC

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL × FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
309.2	Gravel Shoulder										
0.0	SAND and GRAVEL FILL (SW-SM), trace silt, moist Compact Grey		1	SS	14		309		○		
	- trace gravel, trace organic matter Brown		2	SS	17		308		○		
307.7											
1.5	SAND FILL (SM), some silt, trace clay, moist Compact Brown		3	SS	30		307		○		0 80 (20)
			4	SS	27		306		○		
			5	SS	15		305		○		
303.6							304				
5.6	Silty SAND TILL (SP-SM), trace gravel, trace clay, moist Compact to loose Dark brown		6	SS	6		303		○		
	- compact		7	SS	25		302		○		
301.1											
8.1	END OF BOREHOLE at approximately 8.1 m Borehole open and dry on completion of drilling.										

$\times^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

Appendix C

Geotechnical Laboratory Test Results

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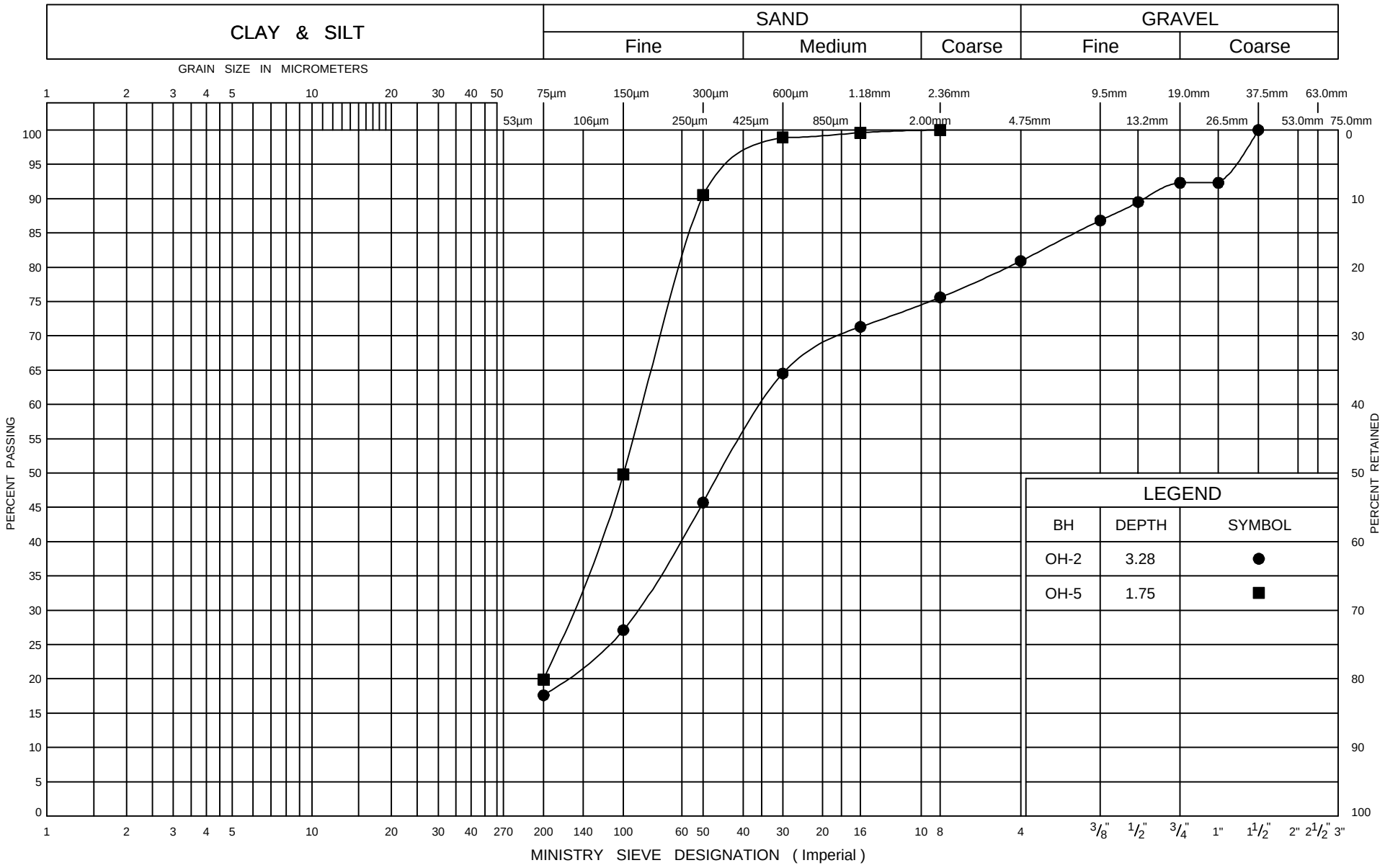
UNIFIED SOIL CLASSIFICATION SYSTEM



ONTARIO MOT GRAIN SIZE 1009213.01_OHS NOV 2007.GPJ ONTARIO MOT.GDT 2/22/08

Ministry of Transportation
Ontario

GRAIN SIZE DISTRIBUTION

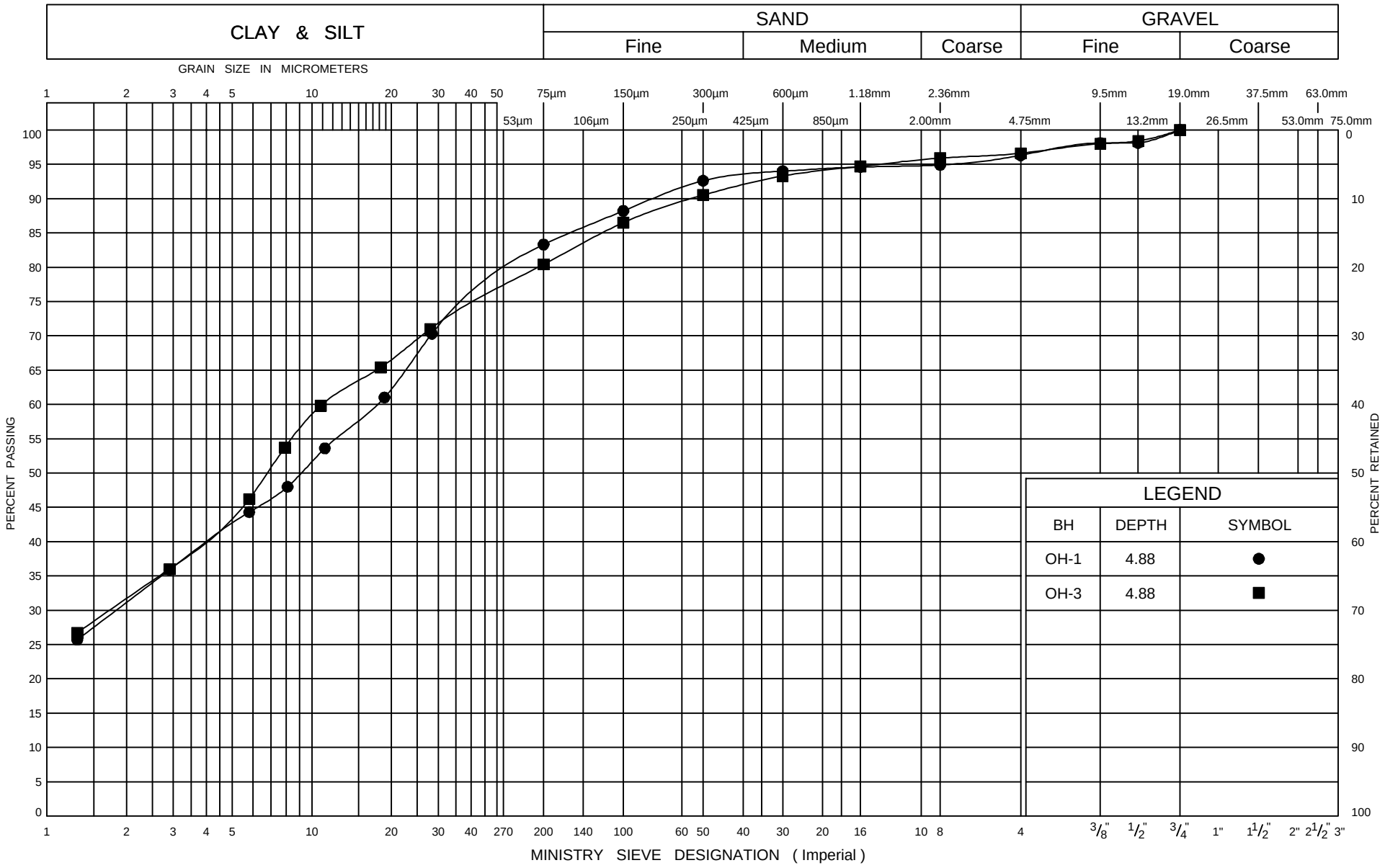
SAND FILL AND SAND AND GRAVEL FILL (SW-SM)

FIG No 1

W P 71-00-00

Proposed Overhead Signs,
Township of Blandford - Blenheim

UNIFIED SOIL CLASSIFICATION SYSTEM



ONTARIO MOT GRAIN SIZE 1009213.01_OHS NOV 2007.GPJ ONTARIO MOT.GDT 2/22/08

Ministry of Transportation
Ontario

GRAIN SIZE DISTRIBUTION

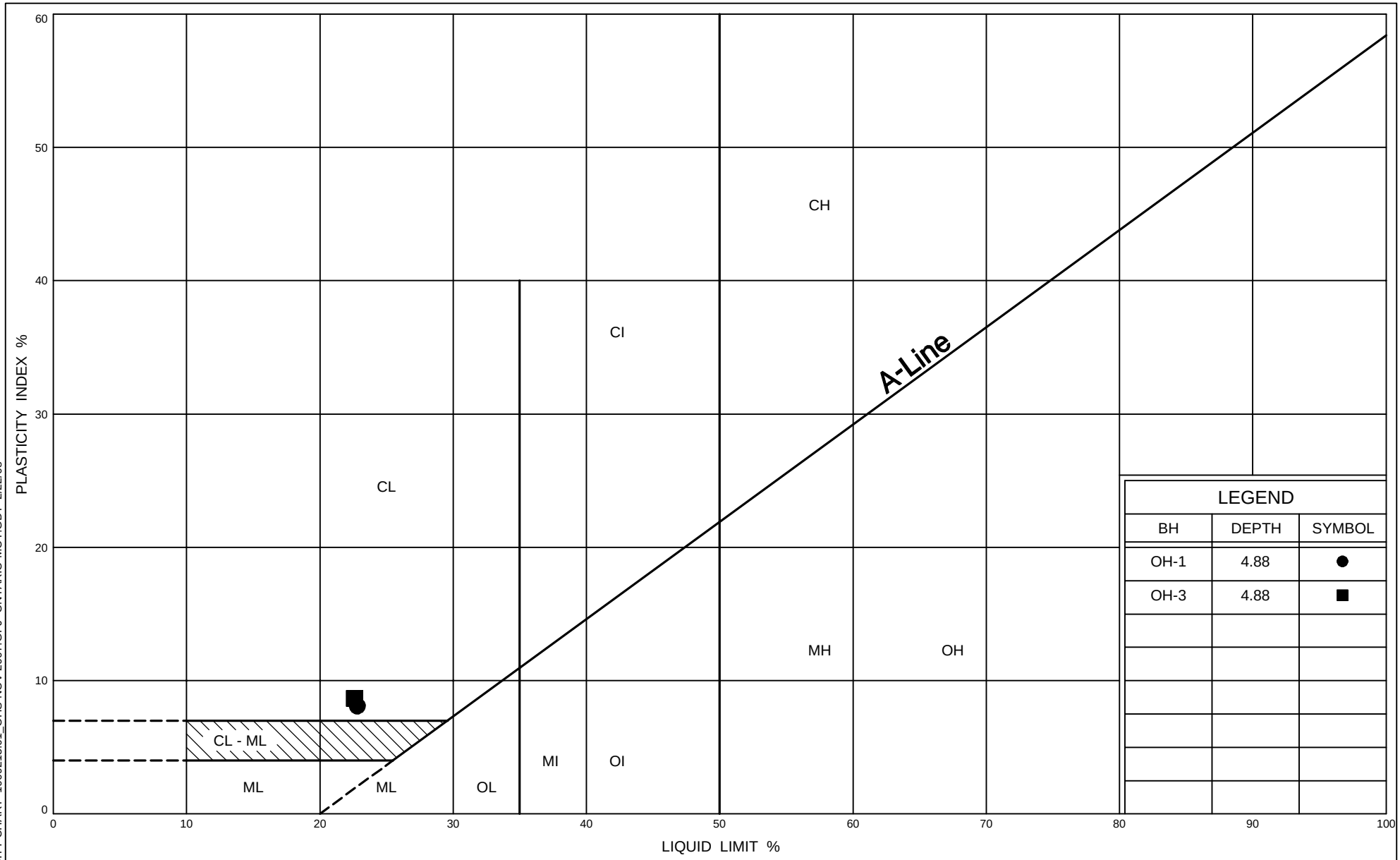
SILTY CLAY TILL (CL)

FIG No 2

W P 71-00-00

Proposed Overhead Signs,
Township of Blandford - Blenheim

Oct 75, FF - S - 21



ONTARIO MOT PLASTICITY CHART 1009213.01_OHS NOV 2007.GPJ ONTARIO MOT.GDT 2/22/08

Ministry of Transportation
Ontario

PLASTICITY CHART

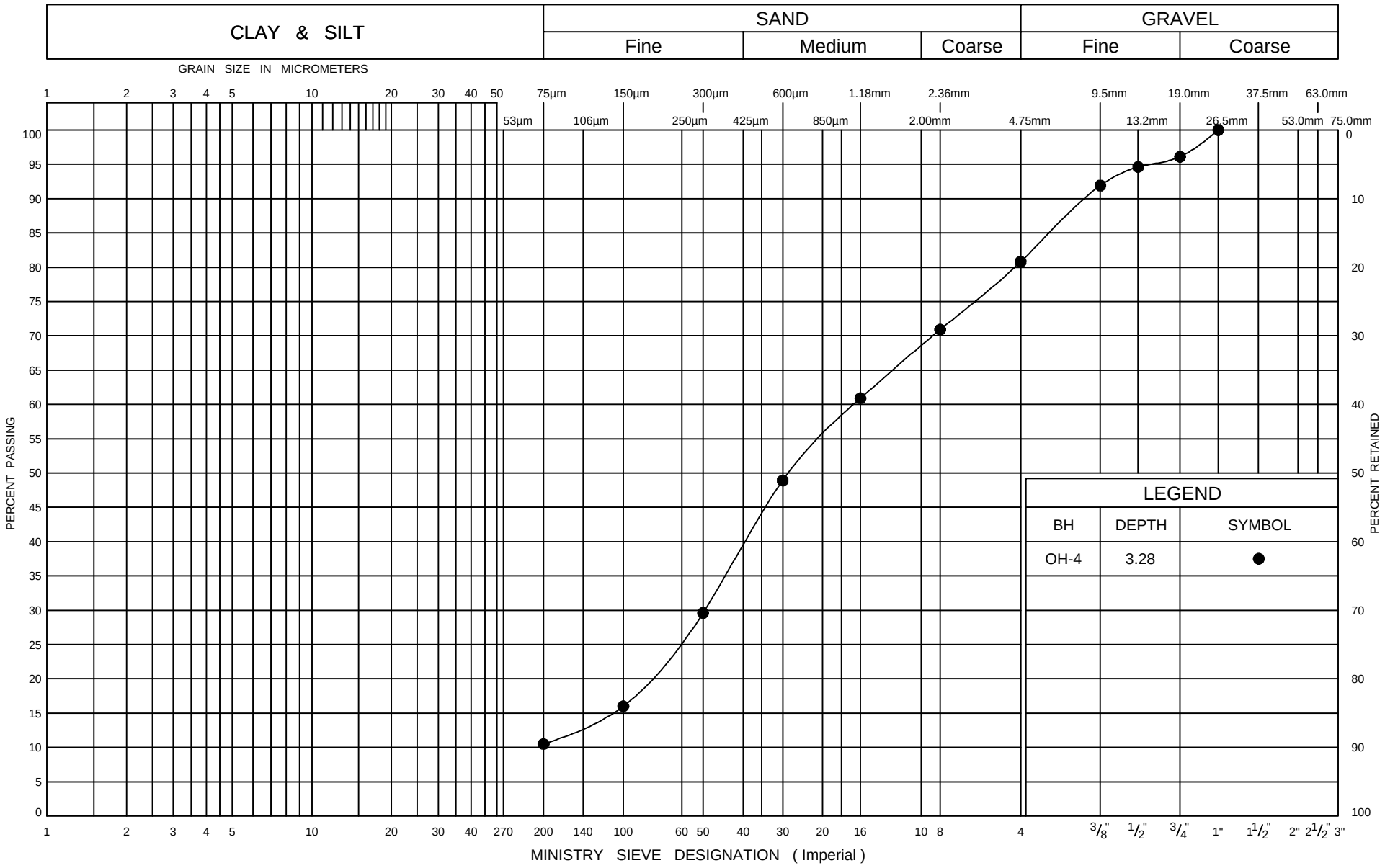
SILTY CLAY (CL)

FIG No 3

W P 71-00-00

Proposed Overhead Signs,
Township of Blandford - Blenheim

UNIFIED SOIL CLASSIFICATION SYSTEM



Ministry of Transportation
Ontario

GRAIN SIZE DISTRIBUTION

SAND TILL (SW-SM)

FIG No 4

W P 71-00-00

Proposed Overhead Signs,
Township of Blandford - Blenheim

ONTARIO MOT GRAIN SIZE 1009213.01_OHS NOV 2007.GPJ ONTARIO MOT.GDT 2/22/08

Appendix D

List of Standard Drawings and Specifications

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Standard Specification and Drawings:

The following is a list of Standard Specifications and Drawings referenced in the Foundation Report for the proposed overhead sign support structures on Highway 401 in the Geographic Townships of Blanford and Blenheim, Ontario.

Standard Drawings:

SS118-3
SS118-4
SS118-5

Special Provisions:

SP903S01