Geotechnical Engineering Report for Road Widening
14027 Hurontario Street, Inglewood, ON

Report #4545B – BVD Caledon GT
March 7, 2025

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1.0 INTRODUCTION

1.1 Proposed Construction

Sunny, Jas (Kingdom Team) (the client) retained the services of A & A Environmental Consultants Inc. (A&A) to conduct a geotechnical investigation for a proposed road widening along King Street, providing access to a planned commercial development at 14027 Hurontario Street, Inglewood, Ontario.

As part of this investigation, two (2) boreholes were advanced and sampled. Additionally, the geotechnical report (Report: 4545-BVD Caledon) prepared by A&A Consultants, dated October 25, 2019, was reviewed. The data obtained from the two boreholes, along with the findings from A&A's geotechnical report, were used to provide recommendations for the pavement widening on King Street for the proposed commercial development. See Section 4.0 for additional details of the proposed development.

1.2 Purpose and Limitations of Report

The purpose of this study is to provide geotechnical information, recommendations, and comments for the design and construction of the proposed development (road widening). The number of boreholes has been selected to provide representative information sufficient to determine parameters needed for design, specifications, and construction of the proposed development. Conditions elsewhere near or beneath the footprint of the structures may be found to differ, during construction, from those at the borehole locations. Should this occur, the contractor should contact the design engineer for recommendations as how to best proceed and what changes if any, should be made.

The information in this report is intended for these specific proposed structures and has been prepared for the client, and their nominated engineers and designers. It is assumed that the designers will use all appropriate contemporary standards, governing regulations, and codes in the performance of their work. Third party use or reproduction, in part or in full, of this report is prohibited without written authorization from A&A. This report is also subject to the Statement of Limitations which from an integral part of this document.

1.3 Liaison during design and/or Construction

On-going liaison with A&A during the final design and construction phases of the project is recommended to confirm that they are in keeping with the intentions of this report.

2.0 SCOPE OF WORK

2.1 Proposed Scope of Work

The scope of work for the geotechnical investigation of the proposed development (road widening along King Street) is as follows:

- Advanced two (2) boreholes to sample for geotechnical analysis. These two (2) boreholes were advanced to a maximum depth of 3.0 meters measured below the existing ground level (mbgl).
- Submit select soil samples to a geotechnical laboratory to provide information for the soil samples recovered.
- Review the geotechnical report (Report No.: 4545-BVD Caledon) prepared by A&A Consultants, dated October 25, 2019.
- Prepare a geotechnical report summarizing the results of the field investigation, laboratory testing program and review of geotechnical report) Report No.: 4545-BVD Caledon), to include discussion of specific concerns that need to be addressed during design and/or construction. Specifically, the report is to include:
    - Site plan showing locations of the boreholes.
    - Borehole records.
    - Recommendations for:
        - Site preparation.
        - Earthworks.
        - Pavement structure and drainage

3.0 SITE DESCRIPTION

3.1 Current Land Use and Location

The subject site is a vacant, rectangular-shaped parcel of land located at 14027 Hurontario Street, Inglewood, Ontario. The approximate location of the subject site is shown in **Figure 1**, (**Appendix A**). The approximate UTM coordinates of the site are Zone 17T; 590181.19 m E; 4847414.02 m N.

3.2 Site Topography and Regional Geology

The subject site has a generally flat topography with a slight slope toward the southeast. According to the Toporama map, the average elevation of the site is approximately 287.0 m (mASL).

Groundwater flow is expected to be directed southwest/south toward Etobicoke Creek. However, groundwater movement may also be influenced by utility trenches and other

subsurface structures, potentially migrating through the bedding stone of nearby utility trenches. The actual groundwater flow direction can only be confirmed through long-term monitoring of groundwater elevations at the site.

The site is located within the South Slope physiographic region, specifically in a Till Plains (Drumlinized) landform. The surficial geology is identified as clay to silt-textured till, derived from glaciolacustrine deposits or shale.

4.0 PROPOSED DEVELOPMENT

Based on the drawings and information provided by the client to A&A, the road (pavement structure) on King Street is planned to be widened to provide access to the proposed commercial development at 14027 Hurontario Street, Inglewood, Ontario. The general layout of the proposed road widening, as per the client's drawings, is presented in **Appendix E**.

5.0 METHOD OF INVESTIGATION

5.1 Field Investigation

A&A engaged a utility locating company to map locations of public and private underground utilities. A&A then scheduled the drilling of boreholes for sampling in accordance with the borehole drilling and sampling plan.

The geotechnical investigation for the planned development consisted of the following activities:

- In the month of January 2025, A&A attended the site located at 14027 Hurontario Street, Inglewood, Ontario.
- Boreholes were advanced using a track-mounted drill unit with a 152.4 mm (6-inch) diameter continuous flight hollow stem auger at the locations shown in **Figure 2**. Prior to drilling, two pavement cores were extracted at the borehole locations to determine the thickness of the asphalt and base/subbase materials.
- Sampling of the overburden materials encountered in the boreholes was carried out at regular intervals using a drive open conventional spoon sampler in conjunction with standard penetration testing (SPT) "N" values. The SPT were conducted following the standard method ASTM D1586 and the results of SPT, in terms of the number of blows per 0.3 m of split-spoon sampler penetration, were provided in borehole logs. **Figure 2** in Appendix A depicts the locations of the boreholes in relation to the proposed development. Samples submitted for analysis are to be representative of the boreholes and their locations within the proposed development.

- Two (2) boreholes (BH1 to BH2) were advanced for the geotechnical investigation. Additionally, two (2) soil samples from base/subbase granular materials were selected for soil gradation.

5.2 Sampling Procedures

Two asphalt cores were taken at the borehole locations, with asphalt thickness recorded. Photos of the asphalt cores are provided in **Appendix C**.

Selected samples recovered from the geotechnical investigation were tested for soil gradation, and all soil samples were analyzed for moisture content. The laboratory test results are discussed in this report and presented in **Appendix C**, as well as appended to the borehole logs.

6.0 SUBSURFACE CONDITIONS

6.1 Subsurface Conditions Overview

The surface conditions encountered in the current and previous boreholes advanced along the subject portions of the roadway of King Street and the subject site are provided in **Appendix B.** These borehole logs summarize the soil types observed during drilling. Explanation of the symbols and terms used to describe the borehole logs are also included in **Appendix B**.

It should be noted that the boundaries between the strata on the borehole records have been inferred from drilling observations and non-continuous sampling. The boundaries generally represent a transition from one soil type to another and should not be inferred to represent an exact plane of geological change. Further, conditions will vary between and beyond the boreholes.

Two (2) boreholes were advanced to a maximum depth of 3.0 m (mbgl). The strength variations are detailed in the borehole logs in **Appendix B**.

6.2 Detailed Summary

Two (2) boreholes explored in this investigation revealed underlain the surface to be characterised as follows:

- **Asphalt**
  Asphalt was encountered in boreholes BH1 and BH2, with thicknesses ranging from 135 to 180 mm, overlying a base/subbase layer of granular materials with thicknesses between 250 and 300 mm. The thickness of these layers may vary beyond the borehole locations. The provided data is specific to the borehole locations and should not be used for estimating asphalt or granular material quantities and costs. A summary of the existing pavement structure for King Street is presented in **Table 1**.

Table 1 – Existing Pavement Structure at King Street

Borehole	Thickness of Asphalt and Base/Subbase Layers		Total Average Thickness
	Asphalt	Base/Subbase	
BH1	180 mm	250 mm	430 mm
BH2	135 mm	300 mm	435 mm

Two samples of the granular base and subbase material were tested for particle size distribution. The particle size distribution analysis for the two samples of granular base/subbase are provided in **Appendix C**, with results summarized as follows:

Gravel (> 2 mm size): 59 - 66%

Sand (0.06 mm to 2 mm size): 28 – 33 %

Silt and Clay (< 0.06 mm size): 6 - 8 %

Laboratory test results indicate that the tested samples were within acceptable limits of Granular A (OPSS 1010).

- **Fill**

  Fill materials were encountered beneath the pavement structure, extending to depths of approximately 1.3 to 1.5 m (mbgl). The fill consists of gravelly silty sand to silty sand, damp with no detectable odor, and varying from very loose to compact. It is important to note that the reported fill thickness is based on borehole locations and may vary beyond them. This information is not sufficient for estimating fill quantities or associated costs.

- **Clayey Sandy Silt Till to Sandy Silty Clay Till**

  Beneath the fill material, deposits of clayey sandy silt till to sandy silty clay till were encountered at all borehole locations, extending to the maximum explored depth. These deposits consist of clayey sandy silt to sandy silt clay, trace to some gravel, medium brown to grey in color, ranges from damp to wet, and varies from compact to dense.

6.3 Summary of Subsurface Conditions to Anticipated Depths of Construction

For details of the subsurface conditions, reference should be made to the individual borehole logs. The "Notes on Sample Description" preceding the borehole logs are an integral part of and should be read in conjunction with this report.

6.4 Groundwater Conditions

Ground water observations and measurements were obtained in the open boreholes at the completion of drilling and are summarized on the appended borehole logs. No groundwater was observed after the completion of drilling; however, the bottom of the boreholes remained wet. Perched groundwater may occur above this depth particularly following heavy rainfall or snowmelt. It should be noted that groundwater levels vary and are subjected to seasonal fluctuations and can respond to major precipitation events. The depth of groundwater table can also be influenced by the presence of underground features such as utility trenches. For more information on groundwater table fluctuation and flow direction, refer to hydrogeological investigation report.

7.0 DESIGN DISCUSSION AND RECOMMENDATIONS

7.1 General Considerations

The recommendations presented in the following sections of this report are based on the information available regarding the proposed construction, the results obtained from the Preliminary Geotechnical Investigation, and A&A's experience with similar projects. Since the investigation only represents a portion of the subsurface conditions, it is possible that soil conditions may be encountered during construction that are substantially different than those encountered during the investigation. If these situations are encountered, adjustments to the design may be necessary. A qualified geotechnical engineer should be on-Site during the foundation preparation to ensure the subsurface conditions are the same/similar to what was observed during the investigation.

Contractors and/or subcontractors bidding on or undertaking the work should seek permission from owners to access the site for their own type of investigations, as well may make their own interpretations of the factual borehole results contained in this report. The following general comments are provided with respect to the conditions encountered and the intended scope of development.

7.2 Pavement Structure Recommendations

It is A&A's understanding that the proposed road widening along King Street will start from station 10+042 to station 10+338, with varying widths to accommodate access to the proposed commercial development located at 14027 Hurontario Street, Inglewood, Ontario.

The geotechnical investigation shows that the suitable subgrade soils within project limit is located at an approximate depth ranged from 1.3 to 1.5 m (mbgl) and the compactness of subgrade soil at these depths varied from compact to dense. Therefore, based on the compactness of subgrade soil and existing pavement structure, the required pavement structure for the road widening in between stations 10+042 to station 10+338 along King Street is shown in **Table 2** below.

Table 2 - Recommended Pavement Structure Thickness for King Street Widening

Pavement Layer	Compaction Requirements	Heavy-Duty Parking Area
Asphaltic Concrete (wearing course) (OPSS 310)	92 to 97% SPMDD*	50 mm OPSS HL1
Asphaltic Concrete (binder course)		150 mm OPSS HL8 (50 mm upper binder course, 50 mm middle binder course, and 50 mm lower binder course) compacted to 97% of the Bulk Relative Density (BRD)
OPSS 1010 - Granular **A** Base (or 20mm Crushed Limestone)	100% SPMDD*	150 mm
OPSS 1010 - Granular B Subbase (or 50mm Crusher Run Limestone)	100% SPMDD*	950 mm
Totals		1300 mm
* Standard Proctor Maximum Dry Density, ASTM-D698		

The construction of the HOT Mix Asphalt should be compacted in accordance with the requirement of OPSS 310 Construction Specification for HOT Mix Asphalt. Prior to roller compaction, obvious defects in the HMA material placed must be corrected.

Binder courses must not be placed unless the air temperature at the surface of the road is a minimum of 2 ^{o}C and rising. Surface course must not be placed unless the air temperature at the surface is at least 7 ^{o}C and rising. All materials must meet the latest OPSS specifications and or MTO specifications.

7.2.1 General Recommendations

Additional comments on the construction of road widening along King Street are as follows:

- As part of the subgrade preparation, the road widening area should be stripped of all topsoil, loose to very loose fill and/or native soil materials within a minimum depth of 1.0 m below the underside of the designed subbase and then thoroughly proof rolled by using a loaded truck or a roller with a minimum rated capacity of 20 tons, under the full-time supervision of A&A. Any localized soft or unstable areas detected must be further sub-excavated and bridged by using clean fill materials like adjacent areas placed in shallow lifts (maximum 200mm thick and at or near "±2%" optimum moisture contents) and compacted to at least 98 percent of Standard Proctor Maximum Dry Density (SPMDD). Similarly, the fill required to raise the grade should consist of inorganic soil, placed in the shallow lifts, and compacted to the aforementioned SPMDD requirements.
- The long-term performance of the pavement structure is highly dependent upon the subgrade support conditions. Stringent construction control procedures should be maintained to ensure uniform subgrade moisture and density conditions are achieved. In addition, the need for adequate drainage cannot be over-emphasized. The finished pavement surface and underlying subgrade should be free of depressions and should be sloped (preferably at a minimum grade of two percent) to provide effective surface drainage toward catch basins. Surface water should not be allowed to pond adjacent to the outside edges of pavement areas. Continuous pavement subdrains should be provided along both sides of the driveway/access routes and drained into respective catch basins to facilitate drainage of the subgrade and granular materials. This is particularly important in heavy-duty pavement areas. The subdrain invert should be maintained at least 0.3 m below subgrade level. Subdrains should also be provided at all catch basins within the road widening area.
- The locations and extent of sub-drainage required within the paved areas should be reviewed by this office in conjunction with the proposed lot grading. Assuming that satisfactory crossfalls in the order of two percent have been provided, subdrains extending from and between catch basins may be satisfactory. If shallower crossfalls are considered, a more extensive system of sub-drainage may be necessary and should be reviewed by A&A.
- The above pavement structure considers that construction will be carried out during the dry period of the year. If the subgrade becomes excessively wet or rutted during construction activities, additional sub-base material or placement of geogrids may be

required. The need for additional sub-base material and/or placement of geogrids including filter fabric to stabilize the base is best determined during construction. It is recommended that the existing subgrade be heavily proof rolled prior to placement and any areas showing excessive deflection be replaced prior to placing the granular sub-base material.

- The most severe loading conditions on light-duty pavement areas (if any) and the subgrade may occur during construction. Consequently, special provisions such as restricted access lanes, half-loads during paving, etc., may be required, especially if construction is carried out during unfavourable weather.
- It is recommended that A&A be retained to review the final pavement structure designs and drainage plans prior to construction to ensure that they are consistent with the recommendations.

7.2.2 Curbs and Sidewalks

The concrete for any new exterior curbs and sidewalks should be proportioned, mixed, placed, and cured in accordance with the requirements of OPSS 353, OPSS 1350 and the municipality. During cold weather, the freshly placed concrete should be covered with insulating blankets to protect against freezing. The subgrade for the sidewalks should consist of undisturbed natural soil or well compacted fill. A minimum 100 mm thick layer of compacted (minimum 98% SPMDD) Granular A is recommended below sidewalk slabs.

8.0 LIMITATIONS OF REPORT

This report has been prepared for Sunny, Jas (Kingdom Team), (the client), who retained the services of A&A to conduct a preliminary geotechnical investigation for a proposed road widening along King Street located at 14027 Hurontario Street, Inglewood, ON. Further dissemination of this report is not permitted without A&A's prior written approval. A&A has carefully assessed all information provided to them during this investigation but makes no guarantees or warranties as to the accuracy or completeness of this provided information.

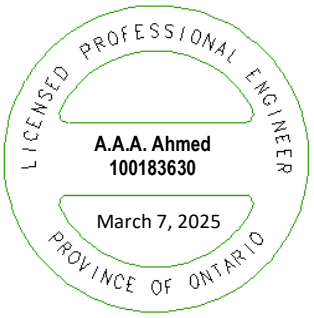
The comments given in this report are intended only for the guidance of design engineers and architects. Contractors bidding on or undertaking the work, should in this light, decide that further field investigations, and interpretations of the factual borehole results are necessary to draw their own conclusions as to how the subsurface conditions may affect them. Should soil conditions during excavation for the foundations prove to be different than what have been described in this report, the author of this report should be notified as soon as possible. No liability or claims may be made by owners or third parties against A&A for factors outside (A&A's)

control. An independent quality control firm must be made available for all concrete and compaction testing associated with construction. All testing results should be made available to the owner, designers, consultant, and general contractor.

The site investigation and recommendations follow generally accepted practice for Geotechnical Consultants in Ontario. Materials testing has been completed in accordance with ASTM or CSA Standards or modifications of these standards that have become standard practice.

For and on behalf of A&A Environmental Consultants Inc.

Thomas Demers, BASc. (Hons. Env.), P Eng.
Project Manager



Reviewed by:

Aly Ahmed, Ph. D., P.Eng., QP_{ESA}

9.0 REFERENCES

Bowles, & E., J. (1996). *Foundation Analysis and Design.* McGraw Hill Inc.

Canadian foundation engineering manual. 5th Edition. (2023). Richmond, B.C : Canadian Geotechnical Society.

Sowers, G. (1979). *Introductory Soil Mechanics and Foundations: Geotechnical Engineering.* New York: MacMillan.

Terzaghi, K., & Peck, R. (1967). *Soil Mechanics in Engineering Practice.* New York: John Wiley.

APPENDIX A – Site Drawings

Figure 1 – Approximate Site Location Map for 14027 Hurontario Street, Inglewood, ON

A&A ENVIRONMENTAL CONSULTANTS INC.
16 Young St.,
Woodstock, ON, N4S 3L4
Tel: 519 266-4680

Location Map Indicating The Subject Site at 14027 Hurontario Street, Inglewood, ON

400 m

Project #: 4545-BVD Inglewood
September 2019

N
W
E
S

Figure 2 - Approximate Geotechnical Borehole Location Plan

A&A ENVIRONMENTAL CONSULTANTS INC.
16 Young St,
Woodstock, ON, N4S 3L4
Tel: 519 266-4680

Satellite Image Indicating Borehole Locations on the Subject Site at 14027 Hurontario Street, Inglewood, Ontario

60 m

Project #: 4545B-BVD Caledon
February 2025

N
W
E
S

APPENDIX B – Borehole Logs and Explanation of Terms and Symbols

LOG OF BOREHOLE BH1

PROJECT: Geotechnical Investigation - Road Widening
CLIENT: Sunny, Jas (Kingdom Team)
PROJECT LOCATION: 14027 Hurontario Street, Inglewood, ON
DATUM: Geodetic
BH LOCATION: Refer to Figure 2 - Approximate Boreholes Location Plan N 4847369.49 E 590298.15

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200mm
Date: Jan-31-2025

PROJECT NO.: 4545B
DRAWING NO.: 1

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	**Asphalt:** 180 mm thickness											
0.2	**Granular Fill:** 250 mm thickness: Sandy gravel, trace silt and clay, medium brown, no odour, damp, compact		1	SS	18				○			66 28 5 1
0.4	**Fill:** Gravelly sand, some silt, trace clay, damp, medium brown to brown, no odour, loose to compact		2	SS	7				○			
1.5	**Clayey sandy Silt Till:** Clayey sandy silt, trace to some gravel, medium brown to grey, moist to wet, no odour, compact to dense.		3	SS	24				○			
			4	SS	40				○			
3.0	**End of Borehole:**											

Notes: Water Level
(i) During Drilling: wet bottom
(ii) After Completion: wet bottom

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

A&A ENVIRONMENTAL CONSULTANTS INC.

LOG OF BOREHOLE BH2

PROJECT: Geotechnical Investigation - Road Widening
CLIENT: Sunny, Jas (Kingdom Team)
PROJECT LOCATION: 14027 Hurontario Street, Inglewood, ON
DATUM: Geodetic
BH LOCATION: Refer to Figure 2 - Approximate Boreholes Location Plan N 4847417.93 E 590334.91

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200mm
Date: Jan-31-2025

PROJECT NO.: 4545B
DRAWING NO.: 2

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	**Asphalt:** 180 mm thickness											
0.1	**Granular Fill:** 250 mm thickness: Sandy gravel, trace silt and clay, medium brown, no odour, damp, compact		1	SS	25				○			59 33 6 2
0.4	**Fill:** Gravelly sand, some silt, trace caly, damp, medium brown to brown, no odour, very loose to compact.		2	SS	3				○			
1.3	**Sandy Silty Clay Till:** Sandy silty, clay, trace gravel, medium brown to grey, damp to moist , no odour, compact to dense.		3	SS	15				○			
			4	SS	35				○			
3.0	**End of Borehole:**											

Notes: Water Level
(i) During Drilling: wet bottom
(ii) After Completion: wet bottom

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

Explanation of Terms and Symbols

The terms and symbols used on the borehole logs to summarize the results of field investigation and subsequent laboratory testing are described in these pages.

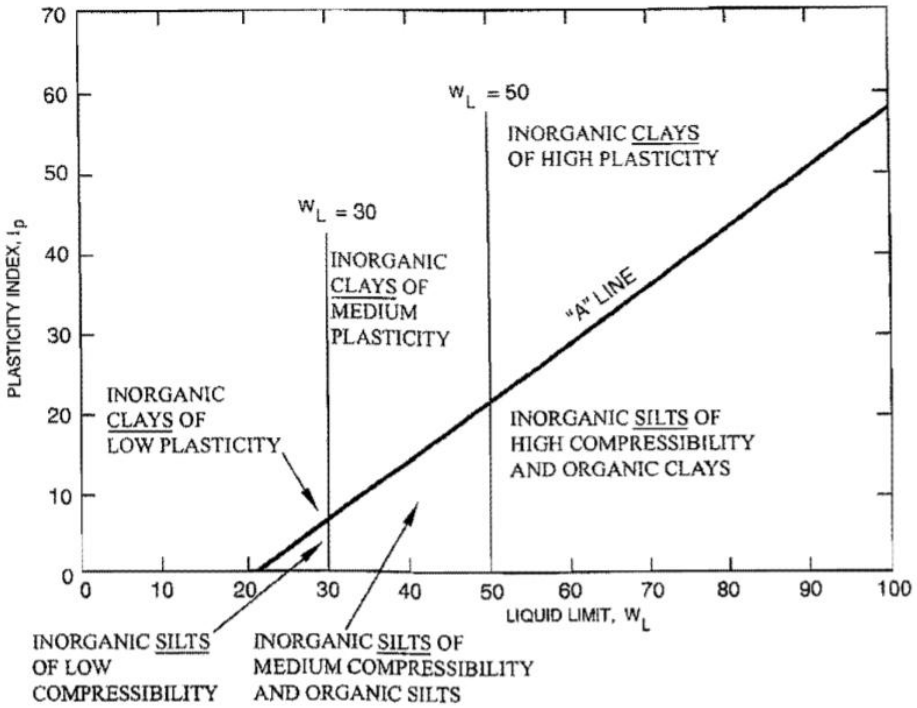
Abbreviations, graphic symbols and relevant test method designations are as follows:

w	Water Content
w_L, LL	Liquid Limit
w_p, PL	Plastic Limit
I_p	Plasticity Index
γ	Soil unit weight
K	Coefficient of Lateral earth pressure
K_s	Module of vertical subgrade reaction
P	Lateral earth pressure
Q	Surcharge load
H	Depth from the ground surface
B	Width of rectangular footing
P	Hydrostatic uplift pressure
d	Depth of structure's base below the design water level
γ_w	Unit weight of water
Φ	Geotechnical resistance factor
ϕ	Internal friction angle of soil
c	Cohesion
c_u, S_u	Undrained shear strength
V_s	Shear wave velocity
SPT-N	Penetration resistance
SPMMD	Standard Proctor Maximum Dry Density
MRD	Marshal Maximum Relative Density

Soils are classified and described according to their engineering properties and behaviours.

Noun	gravel, sand, silt, clay	**> 35 % and main fraction**
"and"	and gravel, and silt, etc.	**>35 %**
Adjective	gravelly, sandy, silty, clayey, etc.	**20 to 35 %**
"some"	some sand, some silt, etc.	**10 to 20%**
"trace"	trace sand, trace silt, etc.	**1 to 10 %**

The plasticity chart (after Casagrande, 1948):



Correlation of soil parameters with uncorrected SPT values for: a) cohesionless soils and b) cohesive soil

Compactness Condition	SPT N-INDEX (blows per 0.3 m)
Very Loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	>50

(a)

Consistency	Undrained Shear Strength (kPa)	SPT N-INDEX (blows per 0.3 m)
Very soft	< 12	0 to 2
Soft	12 - 25	2 to 4
Firm	25-50	4 to 8
Stiff	50 - 100	8 to 15
Very stiff	100 - 200	15 to 30
Hard	>200	>30

(b)

- *Standard Penetration Tests (SPT); followed the methods described in ASTM Standard D1586-08a. The number of blows by a 63.5 kg (140 lb) hammer dropped from 760 mm (30 in.) is recorded for a depth of 460 mm (18"). The last two 150 mm distances (total = 300 mm) are used to calculate the SPT-N index.*

APPENDIX C – Asphalt Cores Photos & Grain Size Distribution Results

Asphalt Cores Photos

Core 1 at BH1

Core 2 at BH2

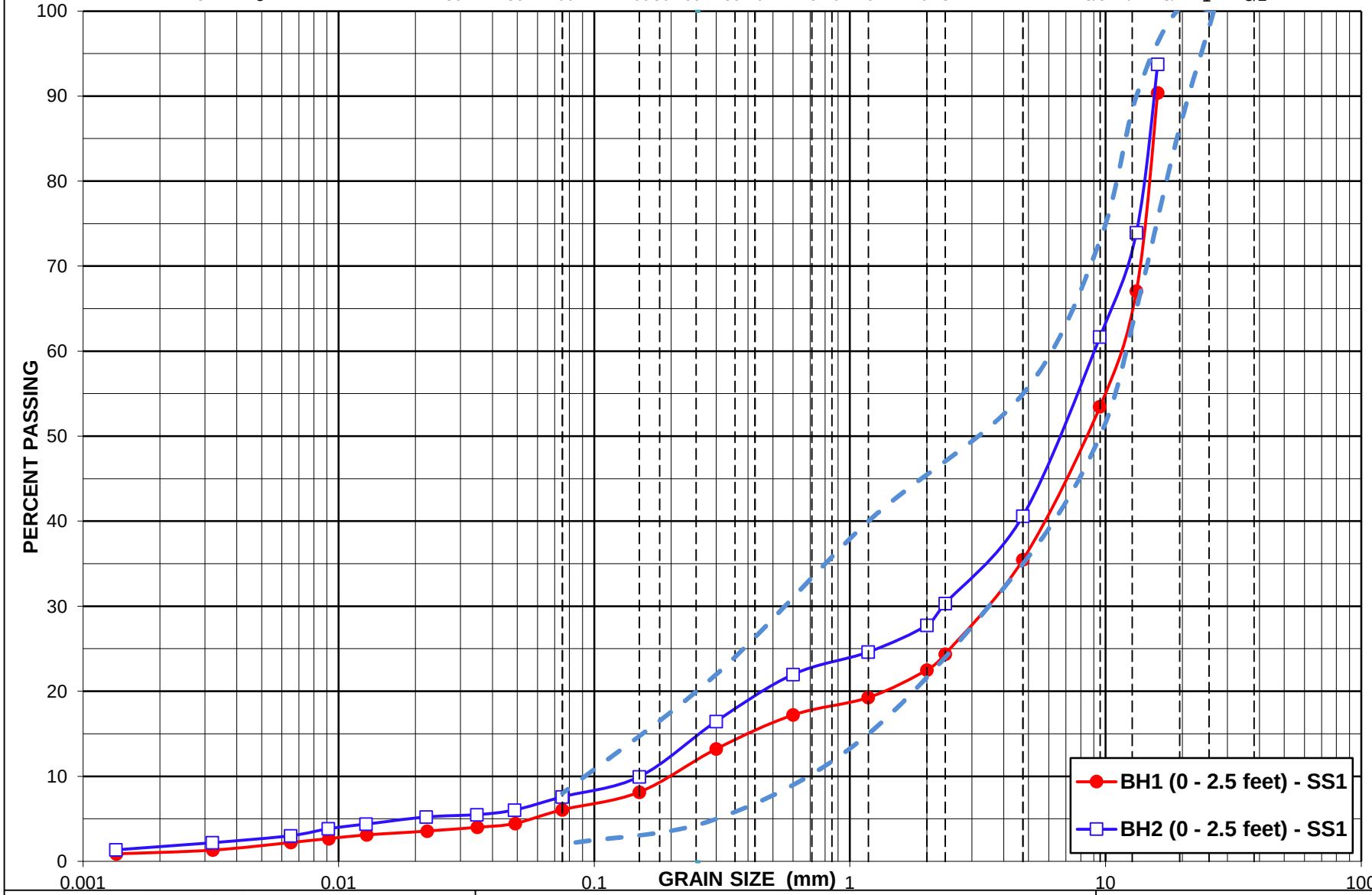
LS 702/D 422

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY AND SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse

GRAIN SIZE IN MICROMETERS: 1 3 5 1 30 50 200

SIEVE DESIGNATION NOMBER (Imperial): 100 80 60 50 40 25 20 16 10 8 4 3/8" 1/2" 3/4" 1" 3/2"



GEOTRUST ENGINEERING LTD.

GRAIN SIZE DISTRIBUTION

Figure No.:	1
PROJECT No. :	GT23001TA
DATE :	Feb. 24, 2025

APPENDIX D – Drawings Provided by the Client

DRAWING LIST

SHEET No.	DRAWING No.	DRAWING DESCRIPTION 1	DRAWING DESCRIPTION 2
1	10000-D	DRAWING INDEX	
2	10001D	REMOVALS	STA. 10+042 TO STA. 10+338
3	10002-D	NEW CONSTRUCTION	STA. 10+042 TO STA. 10+338
4	10003-D	TYPICAL SECTIONS	STA. 10+042 TO STA. 10+338
5	10004-D	PAVEMENT ELEVATIONS AND LAYOUT	STA. 10+042 TO STA. 10+338
6	10005-D	PAVEMENT MARKINGS AND SIGNAGE	STA. 10+042 TO STA. 10+338
7	10006-D	COMPOSITE UTILITY PLAN	STA. 10+042 TO STA. 10+338

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.

REVISIONS

DATE	DETAILS	INIT.

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Designed by

Chkd.

Approved by

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

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HYDRO ONE NETWORKS
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UNION GAS

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ROGERS CABLE
ALLSTREAM (ZAYO)
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)
GT FIBER/360 NETWORK INC.
TELUS COMMUNICATION

100m 0 100 200 300m

HORIZONTAL SCALE 1:1000

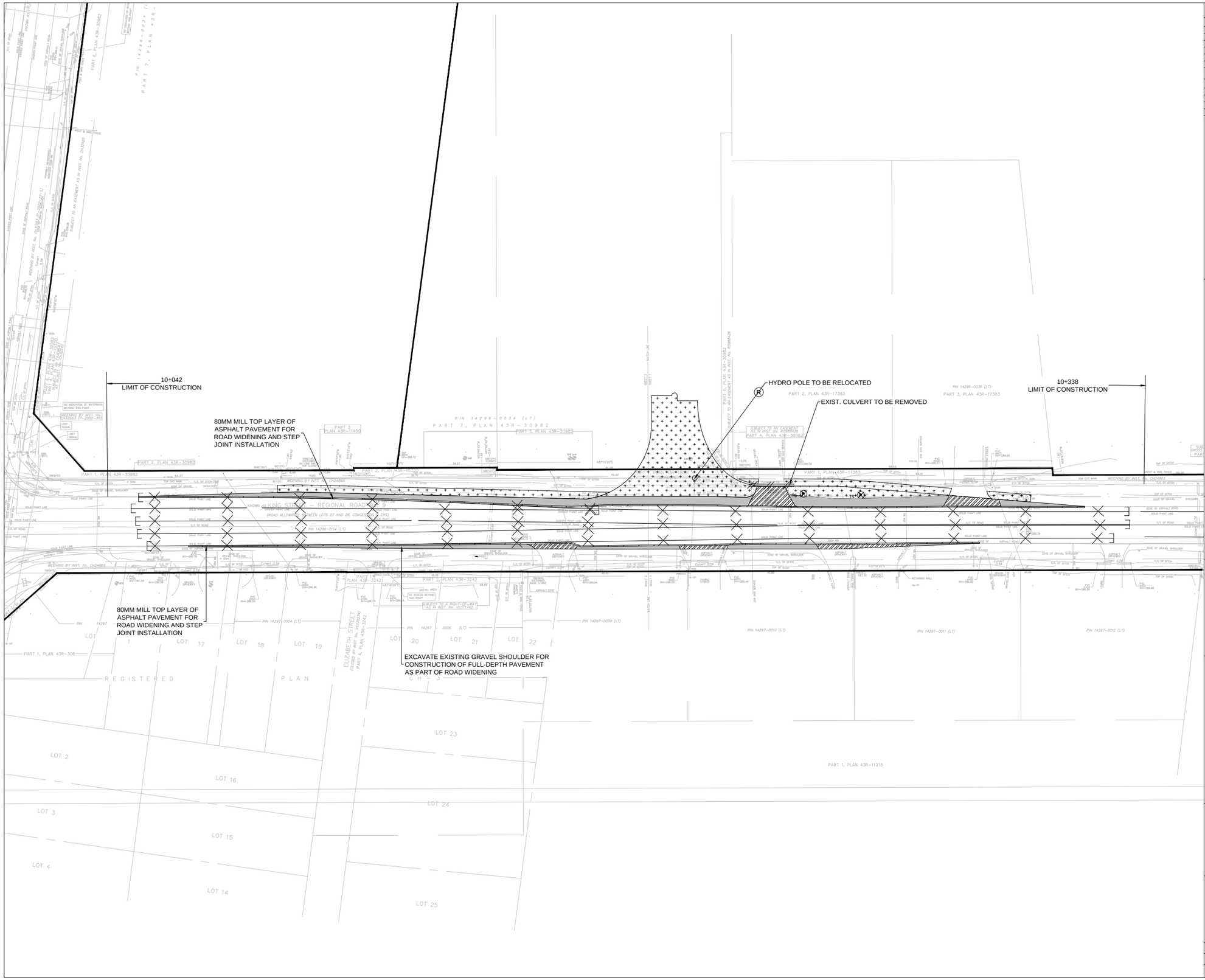
Region of Peel
working with you

KING STREET

DRAWING INDEX

STA. 10+042 TO STA. 10+338

CAD Area	X-XX	Area	X-XX	Project No.	24216
Checked by	M.B	Drawn by	H.S		
Date	JULY 2024	Sheet	1 of 7	Plan No.	10000-D



SERVICE DATA

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PARTIAL DEPTH ASPHALT REMOVAL (MILL UP TO 80mm ASPHALT)

FULL DEPTH ASPHALT REMOVAL

EXISTING SHOULDER TO BE EXCAVATED - FULL DEPTH FOR ROAD WIDENING

CLEARING AND GRUBBING

CULVERT REMOVAL

(R) RELOCATE FEATURES AS INDICATED (by others)

TS (X) REMOVE SIGNS (ALL TYPES)

REMOVAL OF PAVEMENT MARKINGS

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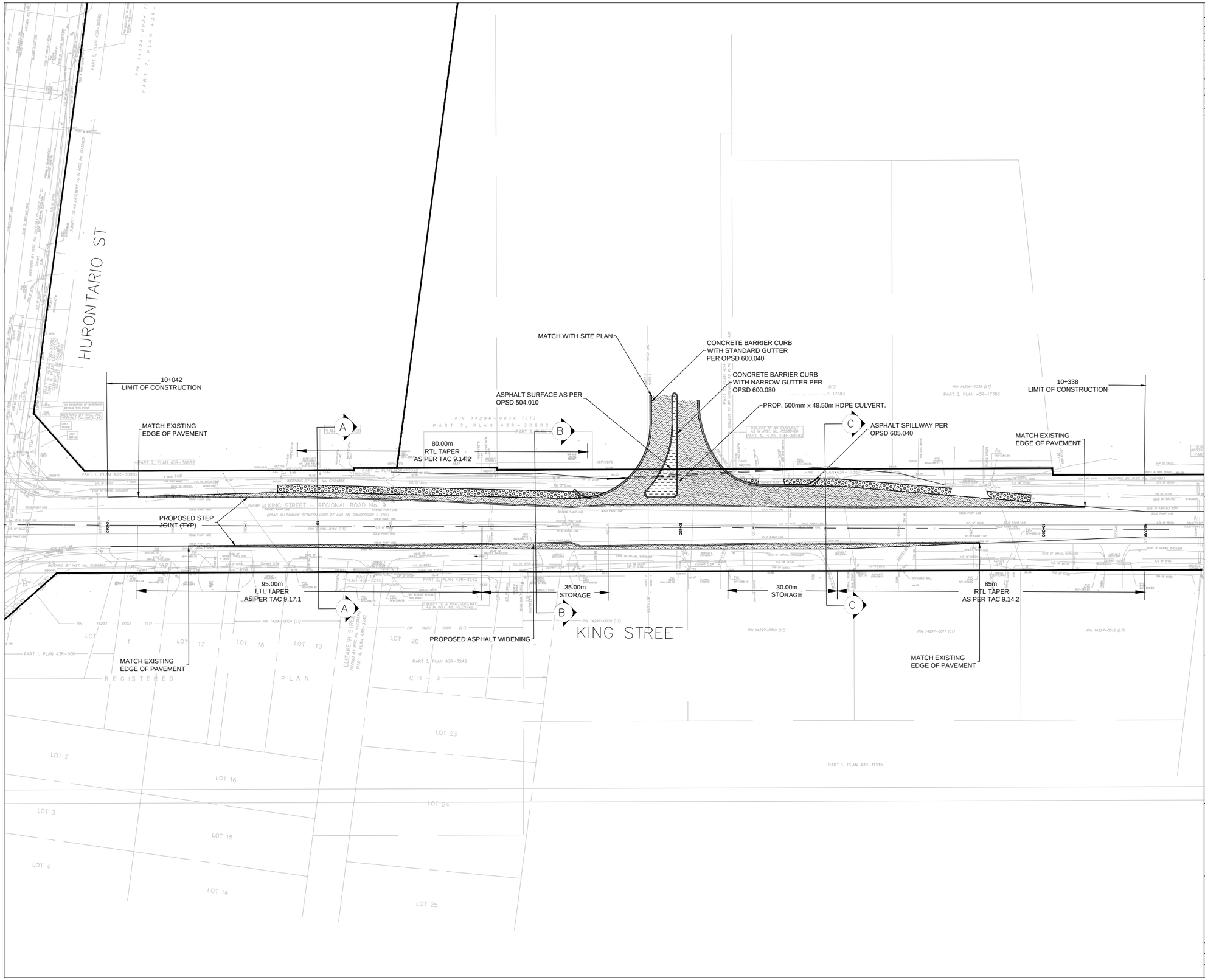
REMOVALS

STA. 10+042 TO STA. 10+338

CAD Area	X-XX	Area	X-XX	Project No.	24216
Checked by	M.B	Drawn by	H.S		
Date	JULY 2024	Sheet	2 of 7	Plan No.	10001-D



SERVICE DATA

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LEGEND:

- PROPOSED ROAD WIDENING
- PROPOSED CONCRETE SURFACE
- PROPOSED GRANULAR SHOULDER
- PROPOSED CURB & GUTTER

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100m 0 100 200 300m
HORIZONTAL SCALE
1:1000

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KING STREET

NEW CONSTRUCTION

STA. 10+042 TO STA. 10+338

CAD Area	X-XX	Area	X-XX	Project No.	24216
Checked by	M.B	Drawn by	H.S		
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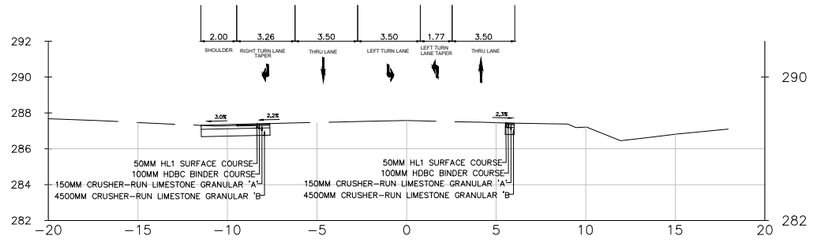
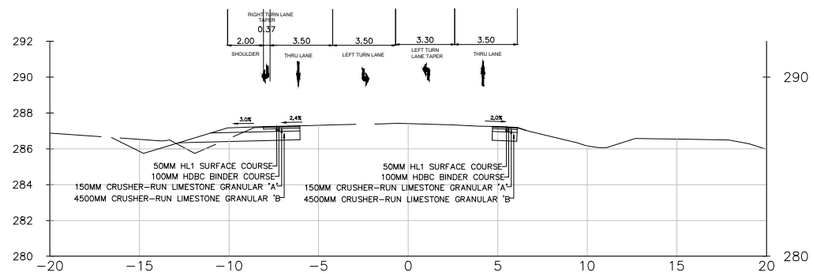
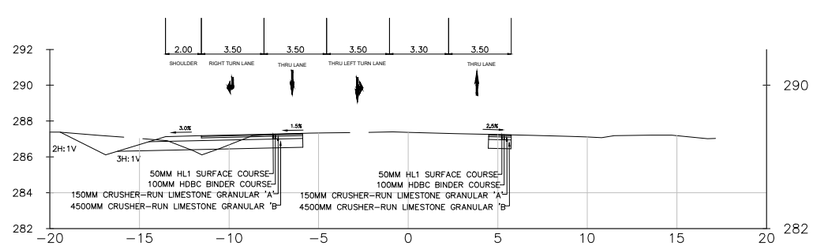


STA. 10+100
(N.T.S)



STA. 10+160
(N.T.S)



STA. 10+240
(N.T.S)

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.

REVISIONS

DATE	DETAILS	INIT.

PROPOSED PAVEMENT WIDENING:
50mm HL1
100mm HDBC
150mm CRUSHER-RUN LIMESTONE GRANULAR A
450mm CRUSHER-RUN LIMESTONE GRANULAR B

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TELUS COMMUNICATION

100m 0 100 200 300m
HORIZONTAL SCALE
1:1000

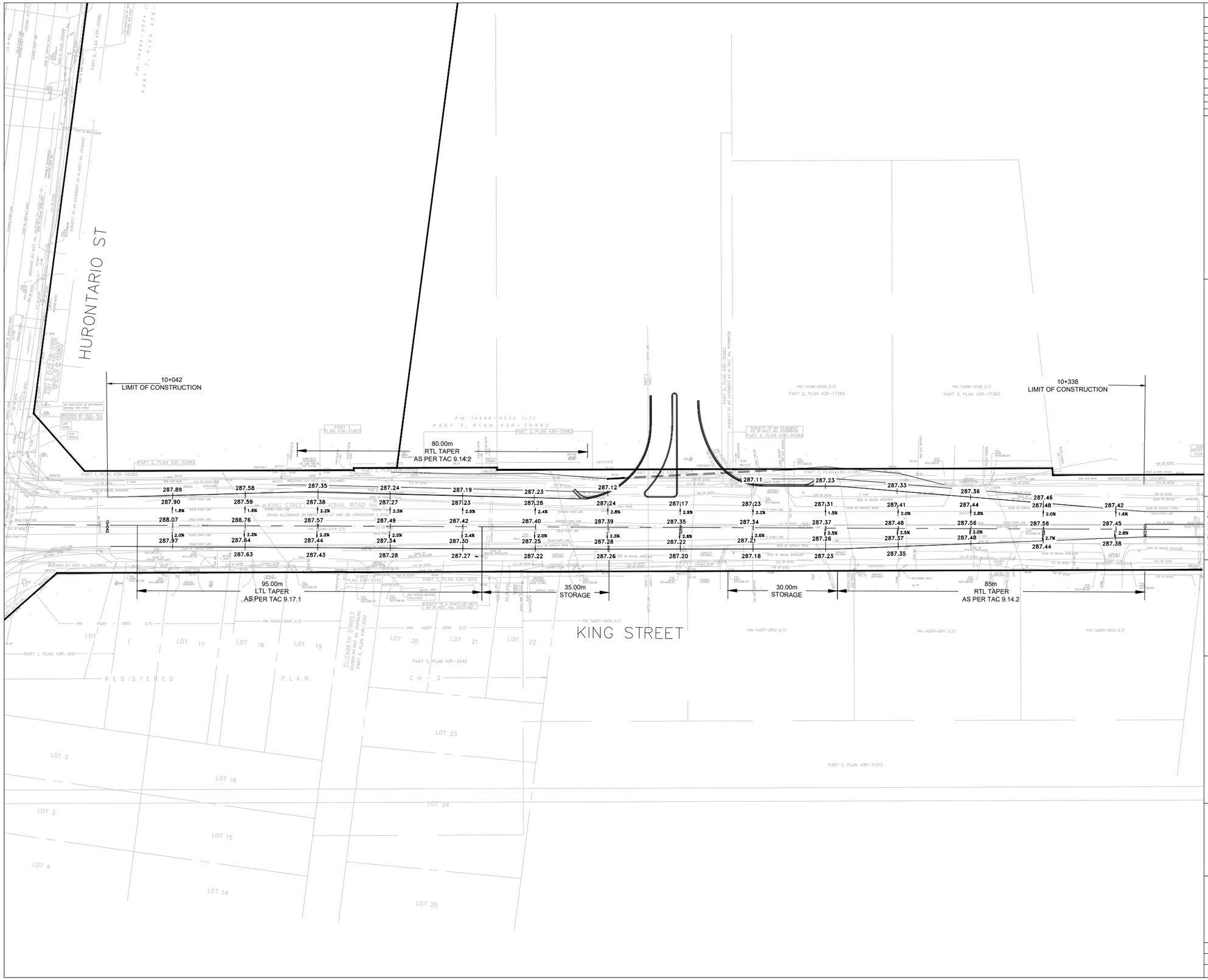
Region of Peel
working with you

KING STREET

TYPICAL SECTIONS

STA. 10+042 TO STA. 10+338

CAD Area	X-XX	Area	X-XX	Project No.	24216
Checked by	M.B	Drawn by	H.S		
Date	JULY 2024	Sheet	4 of 7	Plan No.	10003-D



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100m 0 100 200 300m
HORIZONTAL SCALE 1:1000

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KING STREET

PAVEMENT ELEVATION

STA. 10+042 TO STA. 10+338

CAD Area	X-XX	Area	X-XX	Project No.	24216
Checked by	M.B	Drawn by	H.S		
Date	JULY 2024	Sheet	5 of 7	Plan No.	10004-D

PAVEMENT MARKINGS	
1	SOLID YELLOW, 10cm
2	SOLID DOUBLE YELLOW, 10cm
3	363 BROKEN YELLOW, 10cm
4	SOLID YELLOW, 20cm
5	SOLID WHITE, 10cm
6	333 BROKEN WHITE, 10cm
7	363 BROKEN WHITE, 10cm
8	393 BROKEN WHITE, 10cm
9	SOLID WHITE, 20cm
10	111 BROKEN WHITE, 10cm
11	333 BROKEN WHITE, 20cm
12	333 BROKEN WHITE, 30cm
13	SOLID WHITE, 30cm
14	SOLID WHITE, 45cm
15	SOLID WHITE, 60cm
16	SOLID YELLOW, 30cm
20	SYMBOLS
	LIMITS OF MARKINGS

PROPOSED SIGN DATA

TYPE	STATION	OFFSET (m)	DESCRIPTION	POST TYPE
RB-2	10+073	8.87	EXISTING	WOODEN
WB-2	10+163	8.53	RELOCATE	WOODEN
RA-1	10+186	15.57	NEW	
RB-21	10+197	9.4	NEW	
RB-25L	10+197	9.4	NEW	
WA-33R	10+197	9.4	NEW	
RB-25R	10+198	35.6	NEW	
WA-33L	10+198	35.6	NEW	
RB-12	10+198	35.6	NEW	

EXISTING TRAFFIC SYMBOLS

PROPOSED TRAFFIC SYMBOLS

TRAFFIC DIRECTION

NOTES:

1. 333, 363, 393, DENOTES PAVEMENT MARKING SPACING (IE., 3m LINE, 3m GAP; 3m LINE)
2. USE (1) TO DENOTE PAVEMENT MARKING
3. USE (1) TO DENOTE PAVEMENT MARKING, TEMPORARY
4. USE (1) TO DENOTE PAVEMENT MARKING, TEMPORARY-REMOVABLE
5. USE (1) TO DENOTE PAVEMENT MARKING, DURABLE (HOT) THERMOPLASTIC
6. LADDER PEDESTRIAN CROSSWALK MARKINGS ARE LONGITUDINAL WHITE LINES INSTALLED ACROSS THE PEDESTRIAN CROSSWALK, PARALLEL TO THE DRIVER'S DIRECTION OF TRAVEL. THE LINES ARE 60CM WIDE AND ARE SPACED 60CM APART. THE LINES ARE DURABLE (COLD) THERMOPLASTIC.

HURONTARIO ST

KING STREET

ELIZABETH STREET (REGIONAL ROAD NO. 9)

10+042
LIMIT OF CONSTRUCTION

10+338
LIMIT OF CONSTRUCTION

Rb-25R

Wa-33L

RB-12

Rb-21 on its on post

STOP

Ra-1

WB-2

80.00m
RTL TAPER
AS PER TAC 9.14.2

Rb-25L

Wa-33R

Wa-33LR

Rb-16 install at intersection facing King St (RR9) WB

Install Rb-25R + Wa-33L for EBL

Update circled pavement markings arrows for LT only

If DS on King St (RR9) is 50km/h, posted speed signs shall be updated accordingly

MAXIMUM 70

RB-2

95.00m
LTL TAPER
AS PER TAC 9.17.1

35.00m
STORAGE

30.00m
STORAGE

85m
RTL TAPER
AS PER TAC 9.14.2

3.50m

3.30m

5.60m

2.00m

SERVICE DATA

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100m 0 100 200 300m

HORIZONTAL SCALE 1:1000

Region of Peel
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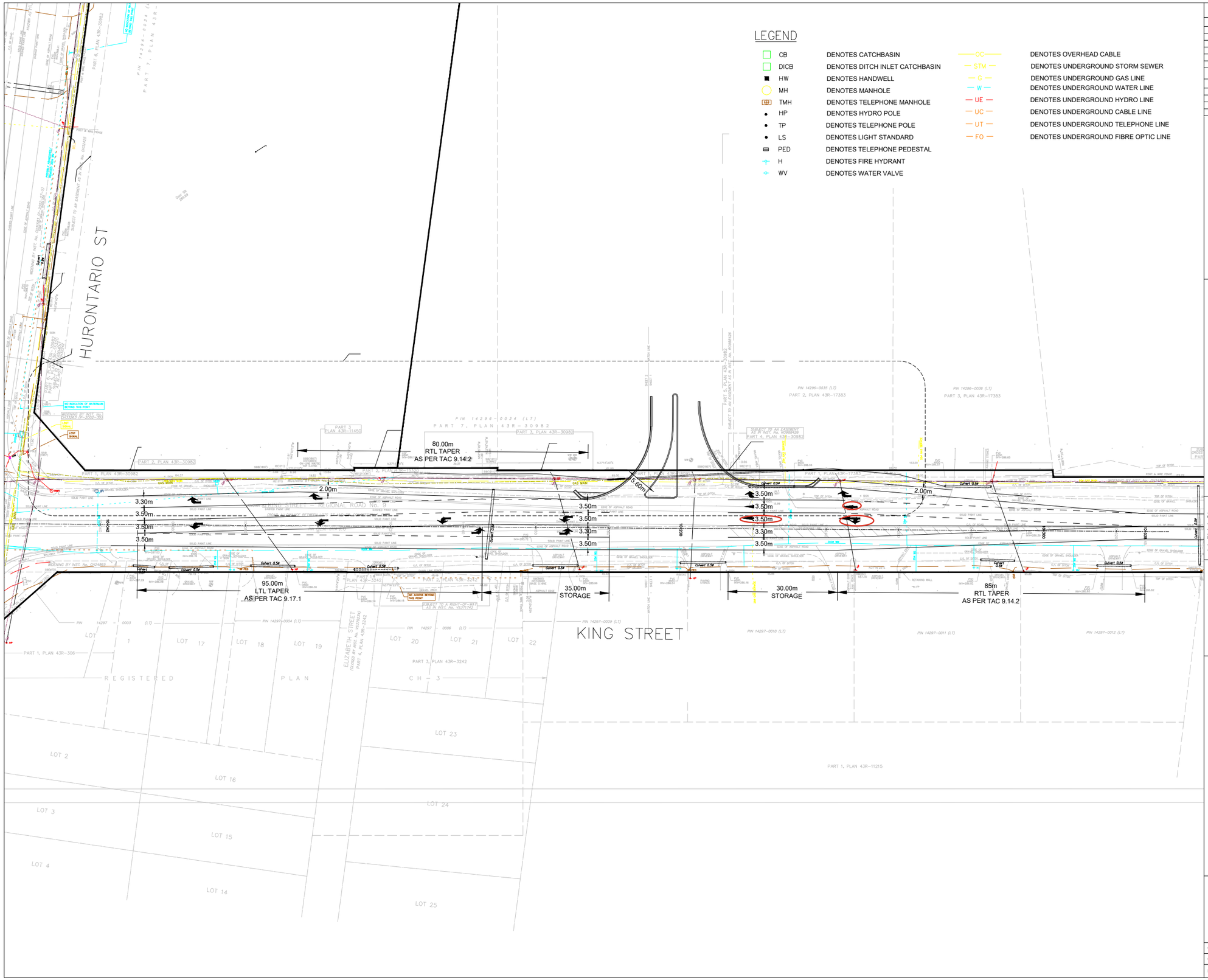
KING STREET

PAVEMENT MARKINGS & SIGNAGE

STA. 10+042 TO STA. 10+338

CAD Area	X-XX	Area	X-XX	Project No.	24216
Checked by	M.B	Drawn by	H.S		
Date	JULY 2024	Sheet	6 of 7	Plan No.	10005-D



LEGEND

CB	DENOTES CATCHBASIN	OC	DENOTES OVERHEAD CABLE
DICB	DENOTES DITCH INLET CATCHBASIN	STM	DENOTES UNDERGROUND STORM SEWER
HW	DENOTES HANDWELL	G	DENOTES UNDERGROUND GAS LINE
MH	DENOTES MANHOLE	W	DENOTES UNDERGROUND WATER LINE
TMH	DENOTES TELEPHONE MANHOLE	UE	DENOTES UNDERGROUND HYDRO LINE
HP	DENOTES HYDRO POLE	UC	DENOTES UNDERGROUND CABLE LINE
TP	DENOTES TELEPHONE POLE	UT	DENOTES UNDERGROUND TELEPHONE LINE
LS	DENOTES LIGHT STANDARD	FO	DENOTES UNDERGROUND FIBRE OPTIC LINE
PED	DENOTES TELEPHONE PEDESTAL		
H	DENOTES FIRE HYDRANT		
WV	DENOTES WATER VALVE		

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KING STREET

COMPOSITE UTILITY PLAN

STA. 10+042 TO STA. 10+338

CAD Area	X-XX	Area	X-XX	Project No.	24216
Checked by	M.B	Drawn by	H.S		
Date	JULY 2024	Sheet	7 of 7	Plan No.	10006-D