THE CORPORATION OF THE TOWN OF LINCOLN
REQUEST FOR TENDER - (RFT)
ISSUED: March 19, 2019

COVER PAGE

RFT / BID NO:	**2019002PW**
RFT / BID NAME:	**Elizabeth Street Road Reconstruction**
SITE LOCATION	**Beamsville**
CLOSING TIME:	**2:00:00 p.m. EST on April 2nd, 2019**
DEADLINE FOR QUESTIONS:	**4:00:00 p.m. EST on March 27, 2019**
CONTACT:	**Name:** Lisa Scheffler **Title:** Procurement Agent **Email address:** procurement@lincoln.ca

Sealed Tenders, on the prescribed FORM OF TENDER will be received by:

Attention: Finance & Administration Department
The Corporation of the Town of Lincoln
4800 South Service Road
Beamsville, Ontario
L0R 1B1

Late Bids will not be accepted. The lowest or any Bid will not necessarily be awarded a Contract

NOTICE

This contract utilizes the **Niagara Peninsula Standard Contract Document (Latest Revision).** This document constitutes the specification for this project and must be utilized in preparing bids for tenders or quotations.

The Niagara Peninsula Standard Contract Document is available on the Regional Municipality of Niagara's website at:
http://www.niagararegion.ca/business/tenders/npscd/default.aspx

Contracts issued through tender calls and quotations will reference the Standard Document and the responsibility for obtaining or having access to the Document will rest with the bidder. Once purchased, the Standard Document can be utilized on all projects which clearly indicate reference and use of the Niagara Peninsula Standard Contract Document. The Standard Document is intended to be used as a reference specification and need not be purchased with each tender or quotation call.

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IN THE TOWN OF LINCOLN

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SPECIAL INSTRUCTIONS TO BIDDERS

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SPECIAL INSTRUCTIONS TO BIDDERS

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SPECIAL INSTRUCTIONS TO BIDDERS

1. Named Parties

For the purposes of this contract the following parties are identified:

Owner: **The Corporation of The Town of Lincoln**

Contract Administrator: **Associated Engineering Ltd. (Ont.)**

Contact for Enquiries: **Josh Trim, P.Eng**

Telephone No. 289-974-0354 Email: trimj@ae.ca

2. Tender Procedure

The following policy regarding the submission of tenders and the tender opening procedures will be applicable for this project. Tenderers are requested to adhere strictly to the instructions concerning submission.

(a) **All tenders must be sealed and submitted to:**

Attn: **Finance and Administration Department**

Address: **Town of Lincoln, 4800 South Service Road, Beamsville, Ont. L0R 1B1**

By the following time:

Time: **2:00 p.m. Local Time**

Date: **April 2nd, 2019**

(b) Tenders received later than the time specified will not be accepted, regardless of the postal seal date. Tenders must be plainly marked to reveal the contents and the Tenderer's name and address.

(c) Tenders shall be submitted in two envelopes, as follows:

i) The first envelope shall contain:

* "Agreement to Bond", duly signed and sealed (no copies or facsimiles will be accepted).

* Tender deposit in the form of a **certified cheque, Bid Bond,** and in the amount of **$ 50,000.00** .

ii) The second envelope shall contain:

* Form of Tender (including addenda if applicable).

Please note that the tender specifications shall not be included in the second envelope. In the event the first envelope does not contain the proper documents, the second envelope will not be opened.

(d) Tenders will be opened the same day that tenders close.

Time: **2:05 p.m. Local Time**.....

Location: **Town of Lincoln Municipal Offices** .....

The public, including all Firms submitting tenders will be permitted to attend the tender opening.

(e) The total tender price will be announced for each tender opened, (excluding H.S.T.).

3. Tender Award

The award of this tender is subject to Town Council's approval and will be subject to a review of the Tenderer's qualification and experience. This Tender will not necessarily be awarded to the low bidder.

Construction may only commence following receipt of MOECC for storm sewer and Council approvals.

4. Construction Standards

This project utilizes OPS Specifications and Drawings, Niagara Peninsula Standard Contract Documents and the Town of Lincoln's Municipal Design Standards. Where there is a conflict in the design standards, specifications or material requirements, the following precedent will be used to determine the applicable standards to be used on this project:

1. Town of Lincoln's Municipal Design Standards (latest revision).
2. Niagara Peninsula Standard Contract Documents (latest revision)
3. OPS Specifications and Drawings (latest revision)
4. ASTM Standards

Contractors will be responsible for obtaining copies of these documents and making themselves familiar with their content.

5. Maintenance Holdback

The following maintenance holdback will apply to this contract:

Five (5%) percent of the Final Contract Value

Clause G18 (iv) Maintenance Holdback of the "Special Provisions – General" of the Niagara Peninsula Standard Contract Documents does not apply to this contract.

6. Liquidated Damages

The liquidated damages for this contract shall be **One Thousand Dollars ($1,000.00)** for each and every day's delay as outlined in Special Provisions - General G16.

7. Additional Insured

The following parties are identified to be included as additional insured for this project;

The Corporation of the Town of Lincoln
Regional Municipality of Niagara
Landtek Limited Consulting Engineers
Associated Engineering Ltd. (Ont)

8. Additions or Deletions of Tender Items

The Town of Lincoln reserves the right to add or delete from any portion or portions of the Schedule of Work herein. These changes under this contract shall **NOT** be subject to the unit price adjustment provisions in the General Conditions of Contract.

9. Acceptance or Rejection of Tenders

The Town of Lincoln reserves the right in its total discretion to accept or reject any Tender, for any location, for any reason and to accept or reject any bid if considered in its best interest, and to award by location to one or more Tenderers. The lowest or any Tender will not necessarily be accepted.

10. Contractor Health and Safety Checklist

The Contractor will be required to sign the Town of Lincoln Contractor Health and Safety Checklist form at the pre-construction meeting in the presence of the Contract Administrator.

11. Contractor Rating Form

Upon completion of the work, the Town will evaluate the Contractor's performance on this contract according to the criteria on the Contractor's Rating Form and the Contractor Rating Guideline. The evaluation will influence the award of future work.

12. Tender Period Question Cut-Off Date

Bidders may submit questions through the Town's Bidding System using the "Submit a Question" link associated with the RFT prior to March 27th, 2019 at 4:00pm. The Town shall not be responsible for responding to questions that are posed by any other method.

No verbal inquiries will be accepted.

13. Disposal of Surplus or Unsuitable Excavated Material

The Contractor shall be responsible for disposal of all excess excavated material and associated costs with the disposal as per OPSS 180. The Contractor shall make themselves aware of the landfill permits required by the local municipalities for disposal of fill on private lands. All unsuitable excess materials becomes the property of the Contractor and from thereon, the Contractor has full responsibility and liability to arrange for its removal and disposal outside the area of work at no additional cost to the Owner. All materials suitable for recycling, where so specified (e.g., asphalt, concrete) shall be separated and delivered to an appropriate recycling location, and paid for under the applicable removal item. The Contractor must provide the CA with written authorization for use of any private disposal site, including a brief description of the key terms and condition of authorization.

The Contractor shall refer to the attached Geotechnical Report regarding the material composition of the subgrade and requirements of disposal. The Town of Lincoln and Landtek do not guarantee nor assume any responsibility for the accuracy and contents of this report

14. Construction Schedule

The successful tenderer shall submit a construction schedule to the CA within seven (7) days of the contract award. The contractor shall be required to update and resubmit the construction schedule monthly or additionally as requested by the Engineer.

15. WSIB Certificate of Clearance

A generic and/or specific Certificate of Clearance shall be provided to the Owner and the Certificate shall be valid for sixty (60) days from the date of commencement of the project and provided with each and every progress payment that falls out of the 60-day validity period.

16. Accessibility Regulations

Contracted employees, third party employees, agents and others that provide customer service on behalf of Owner are legally responsible to be in compliance with the provisions outlined in Section 6 of the Ontario regulation 429/07 with respect to training under the Customer Service Standard of the Accessibility for Ontarians with Disabilities Act (2005). The Contractor shall ensure that such training includes, without limitation, a review of the

purposes of the Act and requirements of the Regulation. By signing the Statement “D” the bidder has agreed to be in full compliance with this regulation. The successful bidder will be expected to complete the confirmation form, prior to the issue of the agreement.

Contractors shall be responsible for notifying the general public when planning /implementing a disruption to any transportation walkway, pathway, driveway, roadway, etc. It shall be the Contractor’s responsibility to notify the general public of any disruption to regular service; prior to the commencement of the disruption. Where construction will cause disruption to normal service appropriate signage shall be installed. At the Owner’s request information relating to the disruption shall be supplied to allow for the posting of the disruption notices.

17. Permits (Regional)

The contractor is responsible for obtaining all required permits (i.e. Encroachment Permit) from the Regional Municipality of Niagara in order to work within the Regional Road 18 right of way (Mountain Street) and must conform to all required restoration requirements.

The contractor shall provide Niagara Region staff a minimum of 72 hours’ notice for all inspections. All permits must be obtained prior to commencement of the pertinent work.

INSTRUCTIONS TO BIDDERS

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INSTRUCTIONS TO BIDDERS

Refer to Niagara Peninsula Contract Documents

FORM OF TENDER

CONTRACT NO. 2019002PW

ELIZABETH STREET ROAD RECONSTRUCTION
IN THE TOWN OF LINCOLN

FORM OF TENDER

We, the undersigned Contractor(s) have carefully examined the attached documents as herein listed and forming part of this tender.

DOCUMENTS INCLUDED IN CONTRACT

Special Instructions to Bidders
Instructions to Bidders
Form of Tender
Agreement to Bond
Form of Contract Agreement
Sketches (as noted)
Addenda (if applicable)
General Conditions (Refer to O.P.S.)

and have carefully examined the site and location of the work to be done under this Contract. We, the undersigned Contractor(s), understand and accept the said drawings and contract documents and, for the prices set forth in this Tender, hereby offer to furnish all machinery, labour, tools, apparatus and other means of construction, furnish all materials except as otherwise specified in the Contract, and to complete the work in strict accordance with the drawings and contract documents referred to above, for the total tender price of

_____ Dollars.

($ _____) excluding H.S.T.

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ADDENDA

We acknowledge that we have received _____ Addendum/Addenda No. _____ inclusive, and that all changes specified in the Addendum/Addenda have been included in the prices submitted.

COMMENCEMENT AND COMPLETION

We agreed to commence work as specified to proceed continuously to the completion and to complete all the work within **90** working days.

TENDER IS OPEN TO ACCEPTANCE & IRREVOCABLE

We agree that this tender is to continue open to acceptance and irrevocable until the formal contract has been executed by the successful tenderer for the said work, and the bond or bonds as specified have been executed by the approved surety or sureties, and that the Owner may, at any time, within 45 (forty-five) calendar days of closing date, accept this tender without notice, whether any tender has been previously accepted or not.

*** to be filled in by Tenderer**

OFFERED ON BEHALF
OF THE CONTRACTOR

_____
Print Name

_____
Signature

_____
Company Name

_____
Address

_____
Witness

_____
Date

Insert Workers'
Compensation Board
Account No.

Contractor's Seal

_____
Witness

NOTE:

a) If the Tenderer is a Corporation, the Corporate seal must be affixed under the signature of a duly authorized officer or officers of the Corporation.

b) If the Tenderer is not a Corporation or a Partnership, the Tenderer must sign in the presence of a witness who must also sign.

c) If the Tenderer is Partnership, each member of the Partnership must sign in the presence of a witness who must also sign.

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SCHEDULE OF QUANTITIES AND UNIT PRICES

ITEM NO.	SPEC NO.	DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL PRICE
		SECTION 'A' - GENERAL				
A1	A1	**Bonding**	1	L.S.		
A2	A2 S1	**Pre-Construction Survey**	1	L.S.		
A3	A4 S2	**Construction layout** a) Layout b) Progress and Final Record Photography c) Record Survey and Drawings	 1 1 1	 L.S. L.S. L.S.		
A4	A5 S3	**Clearing and Grubbing** a) Remove Existing Trees b) Remove Existing Sumps	 2 2	 each each		
A5	S4	**Tree Protection** a) Protect Existing Trees (OPSD 220.010)	1	L.S.		
A6	A7 S5	**Install, Maintain and Remove Silt Control Devices**	1	L.S.		
A7	A8 S6	**Construction Signs, Traffic Control and Traffic Management Plan**	1	L.S.		
A8	A9	**Contingency Allowance**	1	L.S.		
		TOTAL SECTION 'A' - GENERAL				

ITEM NO.	SPEC NO.	DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL PRICE
		SECTION 'B' - ROADS				
B1	B2 S7	**Excavation** *Includes sawcutting and disposal of surplus or unsuitable excavated materials*				
		a) Roadway	3,110	m^3		
		b) Sidewalk Excavation >150mm	190	m^3		
B2	B27 S8	**Removals**				
		a) Asphalt Material (any thickness)	5,380	m^2		
		b) Concrete Driveways and Sidewalks (any thickness)	480	m^2		
		c) Curb and/or Curb and Gutter any type	80	m		
B3	B3 S9	**Granular Material**				
		a) Granular A	23,665	t		
		b) 19mm Clear Stone – Subdrain	280	t		
		c) Import Native Material	750	m^3		
B4	B6 S10	**Subdrain** Perforated HDPE Pipe c/w Filter Cloth per OPSD 216.021 *(includes 'Coring of' and 'Connection to' existing structures, where required*				
		a) 100mm dia.	944	m		
B5	B8 S11	**Concrete Curb and Gutter**				
		a) Barrier Curb w/ Standard Gutter – Tangent (OPSD 600.040)	944	m		
		b) Private Curb – Any Type (to match existing)	10	m		
B6	B9 S12	**Concrete Sidewalks** *30MPa Concrete*				
		a) Standard – 125 Thickness	770	m^2		
		b) Private Sidewalk – Any type (to match existing)	25	m^2		
B7	B11 S13	**Asphalt Milling**				
		a) <50mm depth (incl. tapers at limits and butt joints)	470	m^2		
B8	B12	**Supply and Application of Tack Coat**	4510	m^2		
B9	B14 S14	**Supply & Place Hot Mix Asphalt**				
		a) Roadways				
		i. HL3 HS Surface Course – [40mm]	500	t		
		ii. HL8 HS Base Course – [60mm]	720	t		
		b) Residential Driveways				

		i. HL3F – 50mm thickness	780	t		
B10	B13 S15	**Adjustment of Appurtenances** a) Existing Catchbasin/ Ditch Inlet Frame & Grate i. < 300mm b) Existing Maintenance Hole/ Valve Chamber Frame & Cover i. < 300mm c) Existing Valve/Curb Boxes	 3 3 5	 each each each		
B11	B15 S16	**Asphalt Walkways and Driveways** a) Preparation & Handwork	850	m²		
B12	B16	**Concrete Pavement and Driveways** *Includes Concrete, Preparation, & Handwork*	375	m²		
B13	B21 S17	**Topsoil and Sod** *Includes any grading necessary to provide positive drainage* a) 100mm Topsoil & Sod	 1794	 m²		
B14	B34	**Tactile Warning Surfaces** a) Straight Plates (610mm x 610mm)	18	each		
B15	S18	**Permanent Signage** a) Stop Signs	9	each		
B16	S19	**Pavement Markings** *Organic Solvent-Based Traffic Paint with Reflectorized Glass Beads* a) Directional Dividing Line i. Solid White – 100mm Wide b) Stopbars – Solid White – 600mm Wide	 60 20	 m m		
B17	S22	**Swale** a) Insert Swale	370	m		
		TOTAL SECTION 'B' - ROADS				

ITEM NO.	SPEC NO.	DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL PRICE
		SECTION 'C' – GRAVITY SEWERS (STORM & SANITARY)				
C1	C1 S20	**Sewers** *Includes Removal and Disposal of Existing Sewer – Any Type/Depth/Dia. (unless otherwise noted)*				
		a) Storm Sewers				
		i. 300mm PVC	97	m		
		ii. 375mm PVC	42	m		
		iii. 450mm PVC	161	m		
		iv. 525mm PVC	151	m		
		b) Sanitary Sewers – PVC DR35				
		i. 200mm	457	m		
		c) Sewer/ Structure Connections				
		i. Proposed Sewer to Existing Sewer and/or Structures	4	each		
		ii. Existing Sewer to Proposed Structures	2	each		
C2	C2	**Sewer Laterals/Leads**				
		a) Storm Leads – PVC DR35				
		i. 250mm Dia.	180	m		
		ii. 300mm Dia.	20	m		
		b) Sanitary Sewer Laterals – Green PVC DR28 (unless otherwise noted)				
		i. 100mm Dia.	396	m		
C3	C6 S21	**Precast Concrete Maintenance Holes and Catchbasins**				
		A. Precast Concrete Maintenance Holes *Includes Self-Leveling Frames & Covers*				
		a) Storm 1200mm Dia – OPSD 701.013				
		i. STMMH_1, approx. 2.6m deep	1	each		
		ii. STMMH_2, approx. 2.8m deep	1	each		
		iii. STMMH_3, approx. 1.8m deep	1	each		
		iv. STMMH_4, approx. 1.8m deep	1	each		
		v. STMMH_5, approx. 2.0m deep	1	each		
		vi. STMMH_6, approx. 2.5m deep	1	each		
		vii. STMMH_7, approx. 1.9m deep	1	each		
		viii. STMMH_8, approx. 2.0m deep	1	each		
		ix. STMMH_9, approx. 1.6m deep	1	each		
		x. STMMH_10, approx. 1.7m deep	1	each		
		b) Sanitary 1200mm Dia – OPSD 701.010				
		i. SANMH_1, approx. 4.5m deep	1	each		
		ii. SANMH_2, approx. 3.2m deep	1	each		
		iii. SANMH_3, approx. 3.2m deep	1	each		
		iv. SANMH_4, approx. 1.6m deep	1	each		

		v. SANMH_5, approx. 1.7m deep	1	each		
		B. Precast Concrete Catchbasins *Includes Frame & Grate (OPSD 400.020) Rim Elevations as Noted on Contract Drawings*				
		a) 600x600mm Single – OPSD 705.010	26	each		
		b) 600x1450mm Double – OPSD 705.020	4	each		
C4	C6	**Flush and TV Inspection Sewers**				
		a) Sanitary Mainline	457	m		
		b) Storm Mainline	451	m		
		c) Sanitary Laterals	28	each		
C5	C7	**Cleanouts**				
		a) New Lateral	28	each		
C6		**Remove & Dispose of Ex. Sewers, Laterals/Leads and/or Structures** *Includes Any Material Type/Size/Depth/Dia. And Salvage/Delivery of Existing Frames & Covers/Grates to Town's Public Works Yard*				
		a) Sewer/culverts (applies to pipes where no replacement in the same trench)	350	m		
		b) Catchbasins (single and double)	6	each		
		c) Sanitary Laterals	285	m		
		d) Sanitary/Storm Manholes (all types)	5	each		
		TOTAL SECTION 'C' - STORM SEWERS				

ITEM NO.	SPEC NO.	DESCRIPTION	EST. QTY.	UNIT	UNIT PRICE	TOTAL PRICE
		SECTION 'D' - PROVISIONAL				
D1	S23	**Test Pits**				
		a) Depth up to 0.5m	3	each		
		b) Depth up to 1.0m	3	each		
		c) Depth up to 2.0m	3	each		
		d) Depth up to 4.0m	3	each		
		e) Via Hydro Vac (any depth)	8	hour		
D2	B23	**Dust Control**				
	B24	a) Application of Water	500	m^3		
	S24	b) Application of Calcium Chloride	10	t		
D3	B25 S25	**Cold Mix, Open Graded Bituminous Pavement**	10	t		
D4	B35 S26	**Disposal of Excavated Contaminated Soils** *Based on net weight as recorded by certified weigh scale @ disposal site – Weigh Tickets must be provided*	80	t		
D5	S27	**Rock Excavation in Trench**	150	m^3		
D6	S28	**Unshrinkable Fill**	10	m^3		
D7	D1, D14, D15	**Watermain** PVC – Class 150 DR18 (by Open Trench) including Tracer Wire				
		a) 200mm Dia.	30	m		
		b) 300mm Dia.	30	m		
D8	D4, D5, D6, D7, D10	**Water Service** *Including Main Stop, Curb Stop and Box Set* a) 19mm – Type 'K' Soft Copper	2	each		
D9	D9, S29	**Watermain Insulation**	30	m		
D10	D9, S29	**Water Service Insulation**	30	m		
D10	D13	**Watermain Disinfection and Testing**	1	L.S.		
		TOTAL SECTION 'D' - PROVISIONAL				

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TENDER SUMMARY

SECTION 'A'	**GENERAL**	**$ _____**
SECTION 'B'	**ROADS**	**$ _____**
SECTION 'C'	**GRAVITY SEWERS**	**$ _____**
SECTION 'D'	**PROVISIONAL**	**$ _____**
TOTAL TENDERED PRICE (EXCLUDING H.S.T.):		**$ _____**

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ELIZABETH STREET ROAD RECONSTRUCTION
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STATEMENT 'A'

LIST OF SUB-CONTRACTORS

The bidders shall list hereunder the names of all sub-contractors intended to be used in the execution of this work subject to the approval of the Contract Administrator.

All work not performed by the Contractor's forces shall be included in this list. Unless this list is properly completed, the Tender may be disqualified. All changes to this list must be approved by the Contract Administrator.

SUB-TRADE	NAME OF SUB-CONTRACTOR	ADDRESS OF SUB-CONTRACTOR

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STATEMENT 'B'

TENDERER'S EXPERIENCE IN SIMILAR WORK

YEAR COMPLETED	DESCRIPTION OF WORK	FOR WHOM WORK PERFORMED	VALUE

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IN THE TOWN OF LINCOLN

STATEMENT 'C'

FEDERAL HARMONIZED SALES TAX

(a) Federal Harmonized Sales Tax:

The Contractor shall **NOT** include any amount in his tender price for the Harmonized Sales Tax (H.S.T.). Any amount to be levied with respect to the H.S.T. will be included as a separate item on the payment certificate. The appropriate H.S.T. levy will be paid to the Contractor in addition to the amount approved by the Contract Administrator for work performed under the contract and will, therefore, not affect the amount of the contract. The Contractor will be required to make the appropriate remittance to Revenue Canada in accordance with the legislation.

i) Total Tender Price ..... $_____

ii) Estimated Cost of Harmonized Sales Tax ..... $_____

iii) Total Contract Amount [(i) + (ii)] ..... $_____

iv) H.S.T. Registration Number: _____

_____ _____
Company Name Contractor's Signature

_____ _____
Address Contractor's Seal

Witnesses _____

_____

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IN THE TOWN OF LINCOLN

STATEMENT 'D'

ACCESSIBILITY REGULATIONS FOR CONTRACTED SERVICES CONFIRMATION FORM

If the nature of your business with the Corporation of the Town of Lincoln (the "Owner") creates the opportunity that any of your staff, contractors or any others associated with you would interact with the public on behalf of the Owner, it is necessary that the Owner ensure those providing service on our behalf have received the Customer Service Training in order that we retain our compliance with the requirements of the Accessibility for Ontarians with Disabilities Act 2005.

Please sign below to ensure you are the person able to bind your company. Companies whose employee's role may require them to interact with the public on behalf of the Owner, shall receive the CUSTOMER SERVICE STANDARD TRAINING of the ACCESSIBILITY FOR ONTARIANS WITH DISABILITIES ACT 2005.

If you have any questions, please contact:

Department of Corporate and Legislative Services
(905) 563-8205

Please enclose this form with your bid submission.

Company Name: _____

Signature of Authorized Individual: _____

Position: _____

AGREEMENT TO BOND

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AGREEMENT TO BOND

We, the undersigned, hereby agree to become bound as surety for _____

_____

_____

In a Bond totaling One Hundred Percent (100%) of the contract amount, and conforming to the Instruments of Contract attached hereto, for the full and due performance of the works shown as described herein if the Tender for

CONTRACT NO. 2019002PW
ELIZABETH STREET ROAD RECONSTRUCTION

is accepted by the Owner.

It is a condition of this Agreement that if the above mentioned tender is accepted, application for a Performance Bond and Labour Materials Payment Bond must be completed with the undersigned within fourteen (14) days of acceptance of the tender related thereto, otherwise this Agreement shall be null and void.

Dated this _____ day of _____, 20_____.

(COMPANY SEAL)

_____
Name of Bonding Company

_____
Signature of Authorized Person
Signing for Bonding Company

_____
Position

FORM OF
CONTRACT AGREEMENT

AGREEMENT BETWEEN OWNER AND CONTRACTOR

This agreement made on the _____ day of _____

In the year Two Thousand and _____

By and Between

The Corporation of the Town of Lincoln

Hereinafter called the "Owner"

And

_____

Hereinafter called the "Contractor":

Witnesses: that the parties agree as follows

ARTICLE A-1 THE WORK

The contractor shall:

(a) perform the work required by the Contract documents:

ELIZABETH STREET ROAD RECONSTRUCTION
CONTRACT NO.: 2019002PW

Which have been signed by the parties, and which were prepared by Associated Engineering acting as hereinafter called the Engineer.

(b) Do and fulfill everything as indicated by this Agreement, and

(c) Commence the Work by the ____ day of _____, 2019 and attain completion of the Work, as certified by the Contract Administrator.

ARTICLE A-2 CONTRACT DOCUMENTS

The following is an exact list of the Contract Documents referred to in Article A-1 of this Agreement. This list is subject to subsequent amendments in accordance with the provisions of the Contract and agreed upon between the parties.

List of Contract Documents

Table of Contents

Title Page

Table of Contents

Special Instructions to Bidders

Instructions to Bidders
(Refer to Niagara Peninsula Standard Contact Documents)

Form of Tender
- Form of Tender Declaration
- Schedule of Quantities and Unit Prices
- Tender Summary
- Statement A – List of Sub-Contractors
- Statement B – Tenderer's Experience in Similar Work
- Statement C – Harmonized Sales Tax
- Statement D – Accessibility Regulations for Contracted Services Confirmation Form

Agreement to Bond
Form of Contract Agreement
Schedule of Drawings
Town of Lincoln – Contractor Health and Safety Checklist
Town of Lincoln – Contractor Rating Comment Form
Town of Lincoln – EFT Vendor Form
Special Provisions – General (Refer to Niagara Peninsula a Standard Contact Documents)
Special Provisions – Contract Items (Refer to Niagara Peninsula Standard Contract Documents)
Special Provisions – Supplementary
Standard Drawings – (Refer to Niagara Peninsula a Standard Contact Documents)
Supplementary General Conditions of Contract – (Refer to Niagara Peninsula Standard Contract Documents)
OPS General Conditions of Contract (Refer to Niagara Peninsula Standard Contract Documents)
Geotechnical Report

ARTICLE A-3 CONTRACT PRICE

(a) The quantities shown in the Schedule of Tender Unit Prices are estimated. The Contract Price shall be the final sum of the products of the actual quantities that are incorporated in, or made necessary by the Work, as confirmed by count and measurement, and the appropriate Tender Unit Prices, together with any adjustments that are made in accordance with the provisions of the Contract Documents.

(b) The Estimated Tender Value shall be the sum of the products of the estimated quantities and the appropriate Tender Unit Prices in the schedule.

(c) The Schedule of Quantities and Unit Prices, as per page FT-4 to FT-10 included as part of this Contract.

(d) Based on the Schedule of Unit Prices, refer to Article A-3 (c), the tender value is

$ _____

_____

In Canadian Funds (excluding H.S.T.)

ARTICLE A-4 PAYMENT

(a) The Owner shall pay the Contractor in Canadian funds for the performance of the Contract, the amounts being determined by the actual measured quantities of the individual work items contained in the Schedule of Tender Unit Prices in Article A-3 (c) of this Agreement, and measured in accordance with the methods of measurement given in the specification.

(b) Subject to applicable legislation and the provisions of the Contract Documents, and in accordance with legislation and statutory regulations respecting holdback percentages and, where such legislation or regulations do not exist or apply, subject to a holdback of **ten percent (10%)**, the Owner shall:

(1) Make monthly payments to the Contractor on amount of the work performed 30 days after the Contract Administrator approves and signs the payment certificate as certified by the Contract Administrator, and

(2) Upon completion of the Work as certified by the Contract Administrator pay to the Contractor the unpaid balance of holdback monies then due, and

(c) If the Owner fails to make payments to the Contractor as they become due under the terms of this Contract or in an award by arbitration or court, interest of **zero percent (0%)** per annum on such unpaid amounts shall also become due and payable until payment. Such interest shall be calculated and added to any unpaid amounts monthly.

ARTICLE A-5 RIGHTS AND REMEDIES

(a) The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

(b) No action or failure to act by the Owner, Contract Administrator or Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence of any breach thereunder, except as may be specifically agreed in writing.

ARTICLE A-6 RECEIPT OF AND ADDRESSES FOR NOTICES

Communications in writing between the parties or between them and the Contract Administrator shall be considered to have been received by the addressee on the date of delivery if delivered by hand to the individual or to a member of the firm or to an officer of the Corporation for whom they are intended or if sent by fax, to have been delivered within five (5) working days of the date of mailing, or dispatch when addressed as follows:

The Owner at: 4800 South Service Road
Beamsville, Ontario
L0R 1B1

The Contractor at:

_____

(Street and Number and Postal Box Number, if applicable)

_____

(Post Office or District, Province, Postal Code)

The Contract Administrator at: 509 Glendale Avenue East, Suite 300
Niagara on the Lake, Ontario
L0S 1J0

ARTICLE A-7 LAW OF THE CONTRACT

The law of the Place of Work shall govern the interpretation of the Contract.

ARTICLE A-8 LANGUAGE OF THE CONTRACT

This agreement is drawn in English at the request of all parties hereto.

ARTICLE A-9 SUCCESSION

The General Conditions of the Unit Price Contract hereto annexed, and the other aforesaid Contract Documents, are to be read into and form part of this Agreement and the whole shall constitute the Contract between the parties and subject to law and the provisions of the Contract Documents shall ensure to the benefit of and be binding upon the parties hereto, their respective heirs, legal representatives, successor, and assigns.

In witness whereof the parties hereto have executed this Agreement under their respective corporate seals and by the hands of their proper offices hereunto duly authorized.

SIGNED, SEALED AND DELIVERED

In the presence of:

OWNER

The Corporation of the Town of Lincoln

_____ _____

signature witness

Sandra Easton (Mayor) _____

Name and title Name and Title

_____

signature

Julie Kirkelos Clerk

Name and title

CONTRACTOR

_____

Name

_____ _____

Signature Witness

_____ _____

Name and title Name and Title

_____

Signature

_____

Name and title

SCHEDULE OF DRAWINGS

SCHEDULE OF DRAWINGS

1. CONTRACT DRAWINGS

Drawing No.	Description
GENERAL	
5246-COVER	COVER PAGE
5246-G101	DRAWING INDEX AND GENERAL NOTES
5246-G102	BLOCK LEGEND SHEET
5246-G201	BASELINE LAYOUT
CIVIL	
5246-C101	ROAD GEOMETRICS – FROM STA. -0+005 TO 0+135
5246-C102	ROAD GEOMETRICS – FROM STA. 0+135 TO 0+275
5246-C103	ROAD GEOMETRICS – FROM STA. 0+275 TO 0+415
5246-C104	ROAD GEOMETRICS – FROM STA. 0+415 TO 0+468
5246-C105	STRUCTURES
5246-C121	INTERSECTION I
5246-C122	INTERSECTION II
5246-C123	INTERSECTION III
5246-C201	LINE PAINTING AND SIGNAGE – FROM STA. -0+005 TO 0+275
5246-C202	LINE PAINTING AND SIGNAGE – FROM STA. 0+275 TO 0+468
5246-C301	CROSS SECTIONS I
5246-C302	CROSS SECTIONS II
5246-C303	CROSS SECTIONS III
5246-C304	CROSS SECTIONS IV
5246-C501	DETAILS

2. TOL QUALITY STANDARDS DRAWINGS

Drawing No.	Description
D.W.P. – 302	Urban Residential Entrance
D.W.P. – 304	Standard Walkway
D.W.P. – 306	Standard Sidewalk Detail
D.W.P. – 406	Service Installation in the Roadway Area (Open Cut Method)
D.W.P. – 500	Trench Bedding and Embedment for Pipes
D.W.P. – 501	Sewer Lateral Connections
D.W.P. – 503	Standard Sewer Lateral Installation
D.W.P. – 505	Private Drain Connection Cleanouts
D.W.P. – 602	Water Service Installation Details for 20mm and 25mm

	Diameter Sizes
D.W.P. – 609	Temporary Flushing/ Testing Connection
D.W.P. – 706	Regulatory Sign and Street Name Sign Installation
D.W.P. – 708	Typical Prefabricated Trench Protection Arrangement
D.W.P. – 711	Typical Utility Support

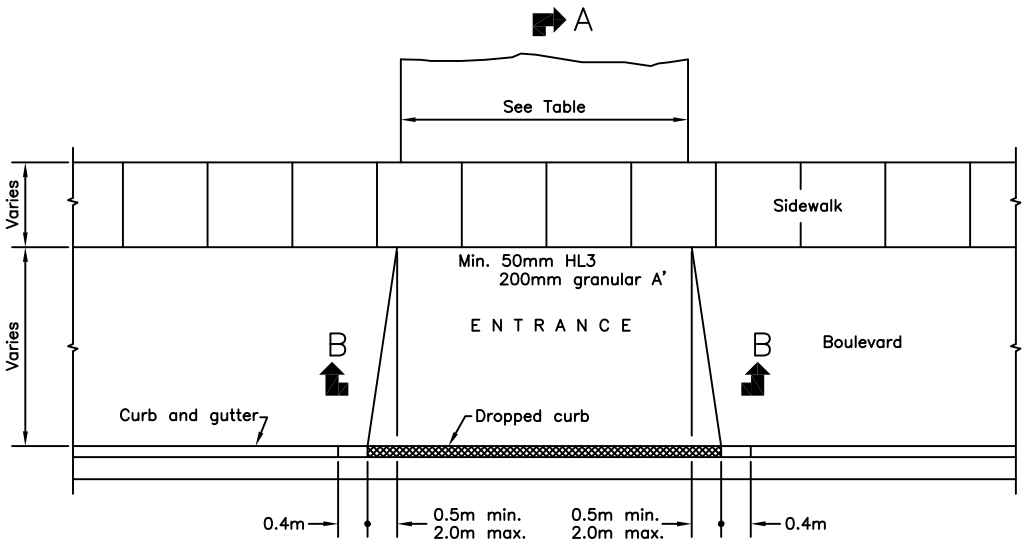
Contractor to construct in accordance with all relevant TOL Standard Drawings as indicated on the Contract Drawings and in these Specifications as well as those identified in the Town of Lincoln's Engineering Design Standards unless otherwise directed by the Engineer.

3. CANADA POST

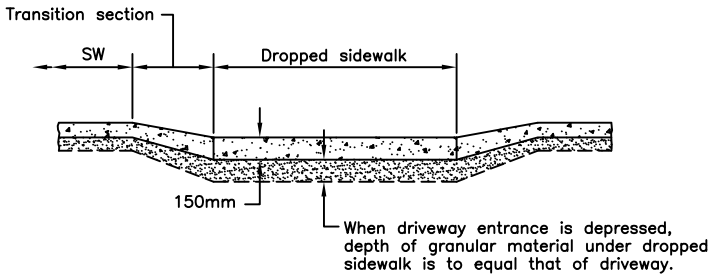
Drawing No. 8413 Typical CMBB Sidewalk Site Municipal Installation

4. O.P.S.D (NOT INCLUDED IN CONTRACT DOCUMENTS)

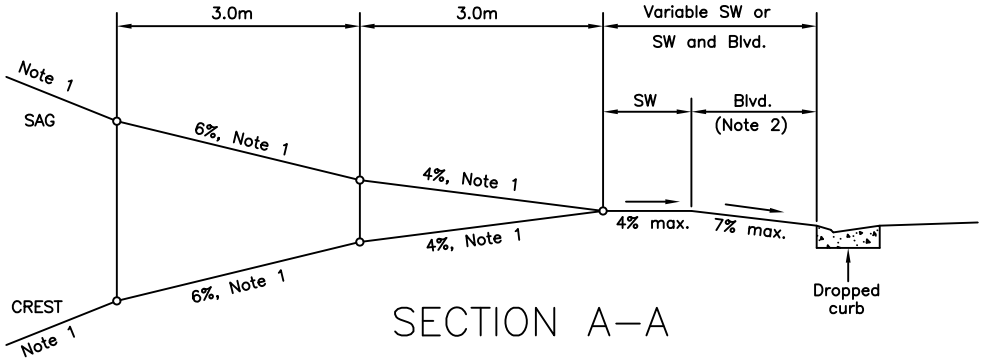
Contractor to construct in accordance with all relevant O.P.S.D.'s as indicated on the Contract Drawings and in these Specifications unless otherwise directed by the Engineer.



PLAN



SECTION B–B



SECTION A–A

NOTES:

1. Maximum grade shall be 7%.
2. Where boulevard width is less than 3.0m, a steeper boulevard is permissible.
3. All dimensions are in metres unless otherwise shown.
4. A minimum offset of 1.0m from property lines and above ground utilities (i.e. streetlights, hydrants).

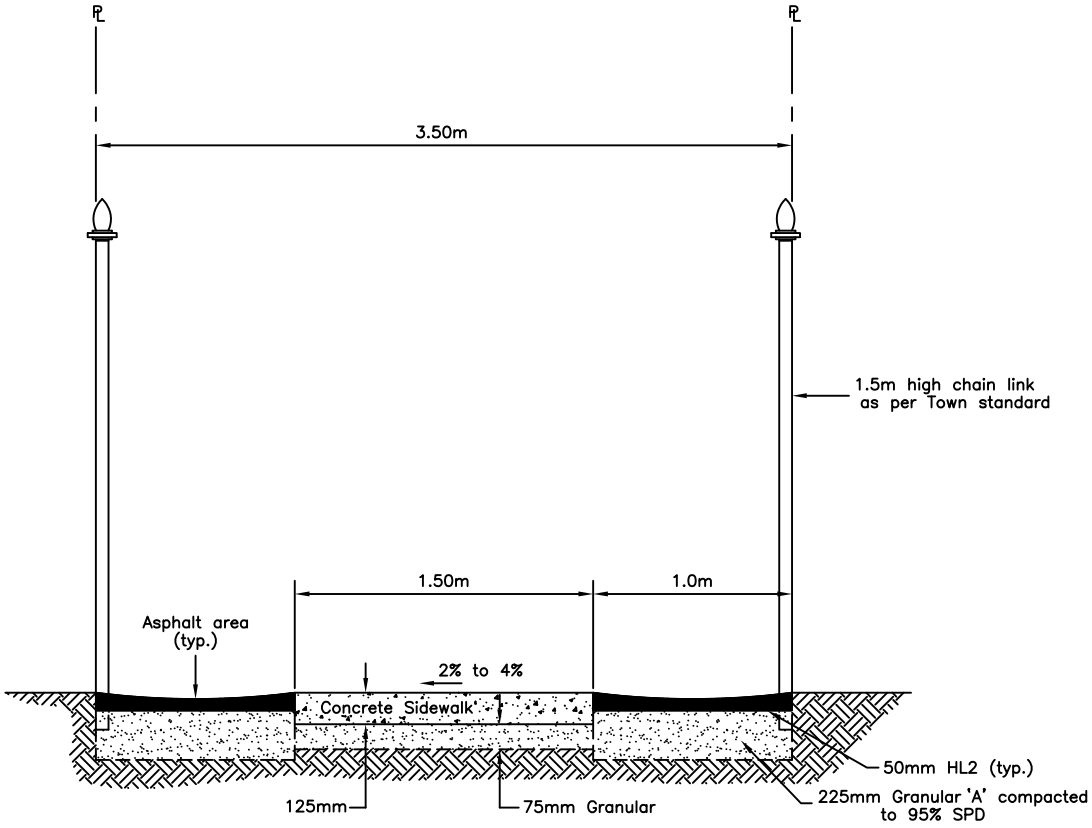
DRIVEWAY DIMENSIONS				
LAND USE	WIDTH (m)			
	Single		Double	
	min	max	min	max
Residential	3.0	4.3	6.0	7.3

URBAN RESIDENTIAL ENTRANCE

TOWN of LINCOLN
STANDARD DRAWING

DPW - 302

Rev. No.: 3 | Date: Jan. 2018
Scale: N.T.S.



TYPICAL SECTION

NOTES

1. All dimensions are in metres unless otherwise shown.

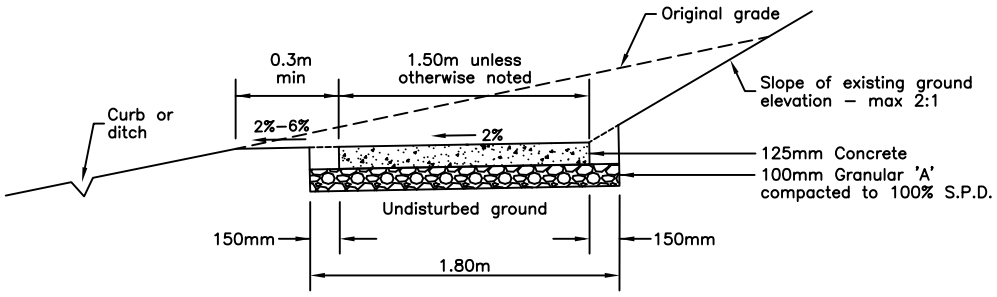
STANDARD WALKWAY

TOWN of LINCOLN
STANDARD DRAWING

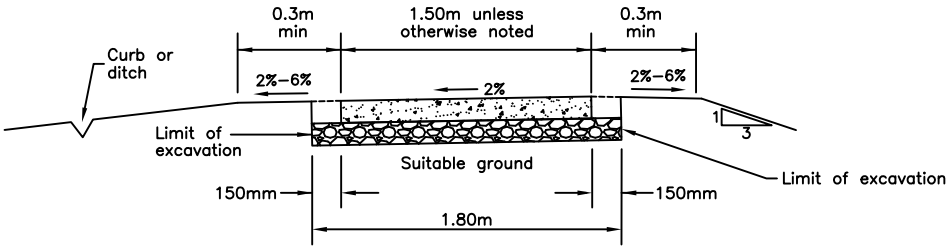
DPW - 304

Rev. No.: 3 | Date: Sept. 2000

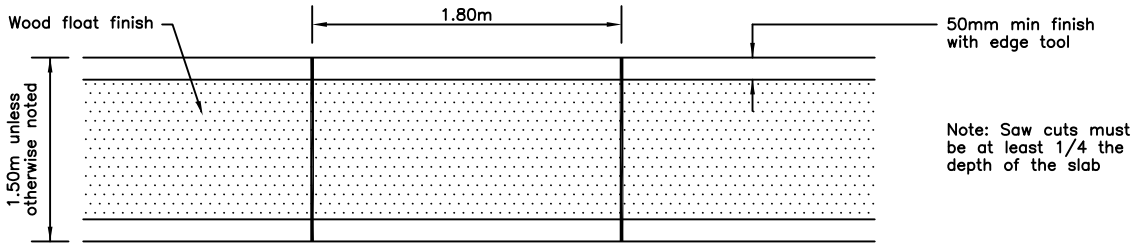
Scale: N.T.S.



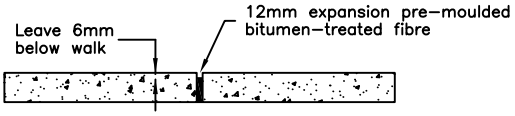
IN CUT



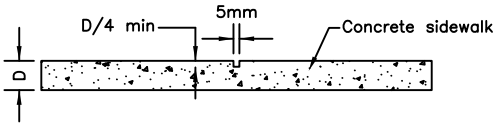
IN FILL



PANEL DETAIL



EXPANSION JOINT



CONTRACTION JOINT

NOTES

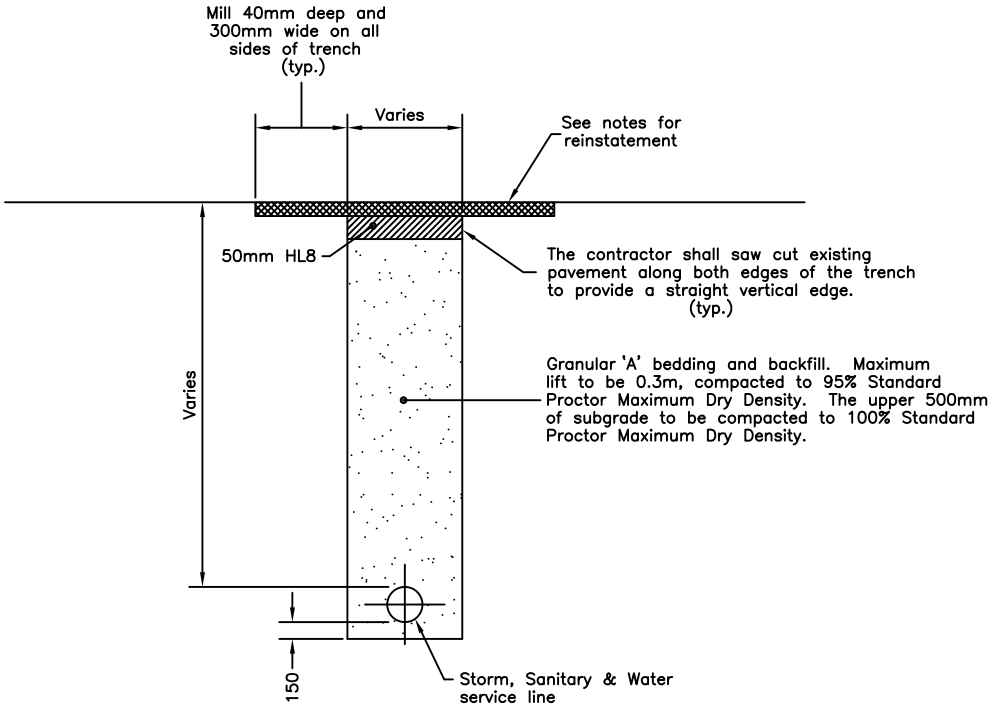
1. The boulevard on the street side of the walk shall be graded down so as to provide adequate slop to the curb or top of ditch.
2. Residential sidewalk shall be 125mm thick, 175mm thick through residential driveways, and 200mm thick through commercial/industrial driveways.

STANDARD SIDEWALK DETAIL

TOWN of LINCOLN
STANDARD DRAWING

DPW - 306

Rev. No.: 1 | Date: Jan. 2018
Scale: N.T.S.



NOTES FOR ASPHALT REINSTATEMENT

1. TEMPORARY:
   Cold mix 90mm in trench or 90mm HL8. The contractor shall maintain cold mix asphalt regularly prior to final reinstatement.

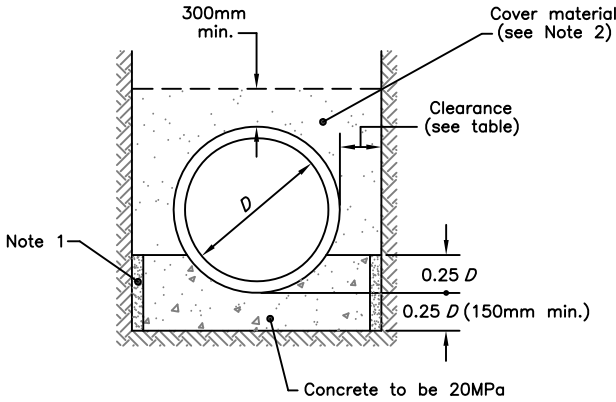
2. FINAL:
   Removal of cold mix (if applicable). Mill 40mm deep and 300mm wide on all sides of the trench. Place compacted 50mm HL8 in trench. Top with compacted 40mm HL3 in both trench and milling areas.

SERVICE INSTALLATION IN THE ROADWAY AREA (Open Cut Method)

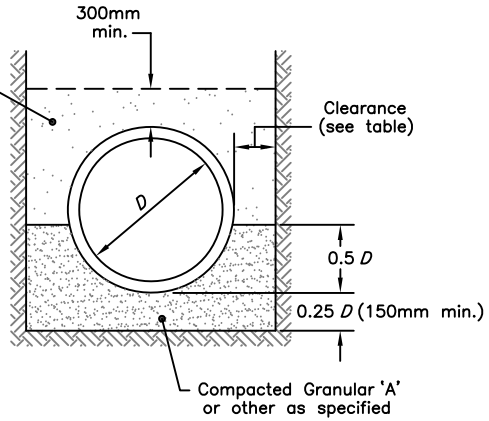
TOWN of LINCOLN
STANDARD DRAWING

DPW - 406

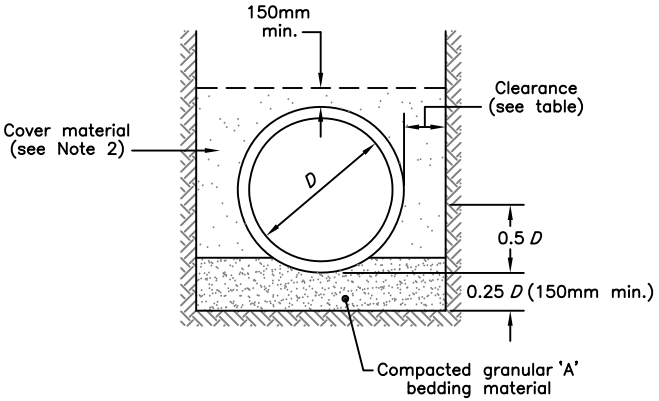
Rev. No.: 2 | Date: May 1999
Scale: N.T.S.



TYPE 'A'
CONCRETE CRADLE

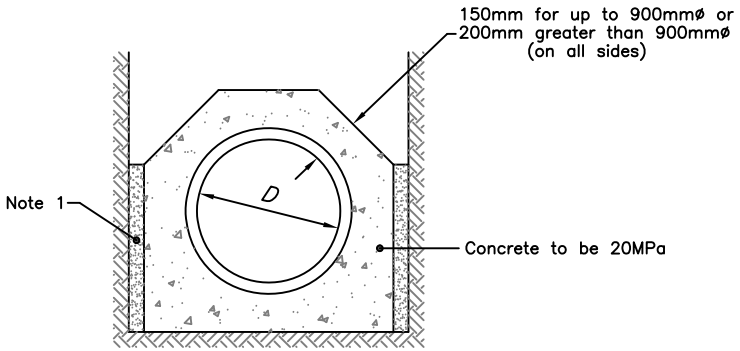


TYPE 'B'
GRANULAR TO SPRINGLINE



TYPE 'C'
GRANULAR FOUNDATION

Pipe Inside diameter (mm)	Min. Working Clearance (mm)
900 or less	300
Over 900	500



TYPE 'D'
CONCRETE ENCASEMENT

NOTES

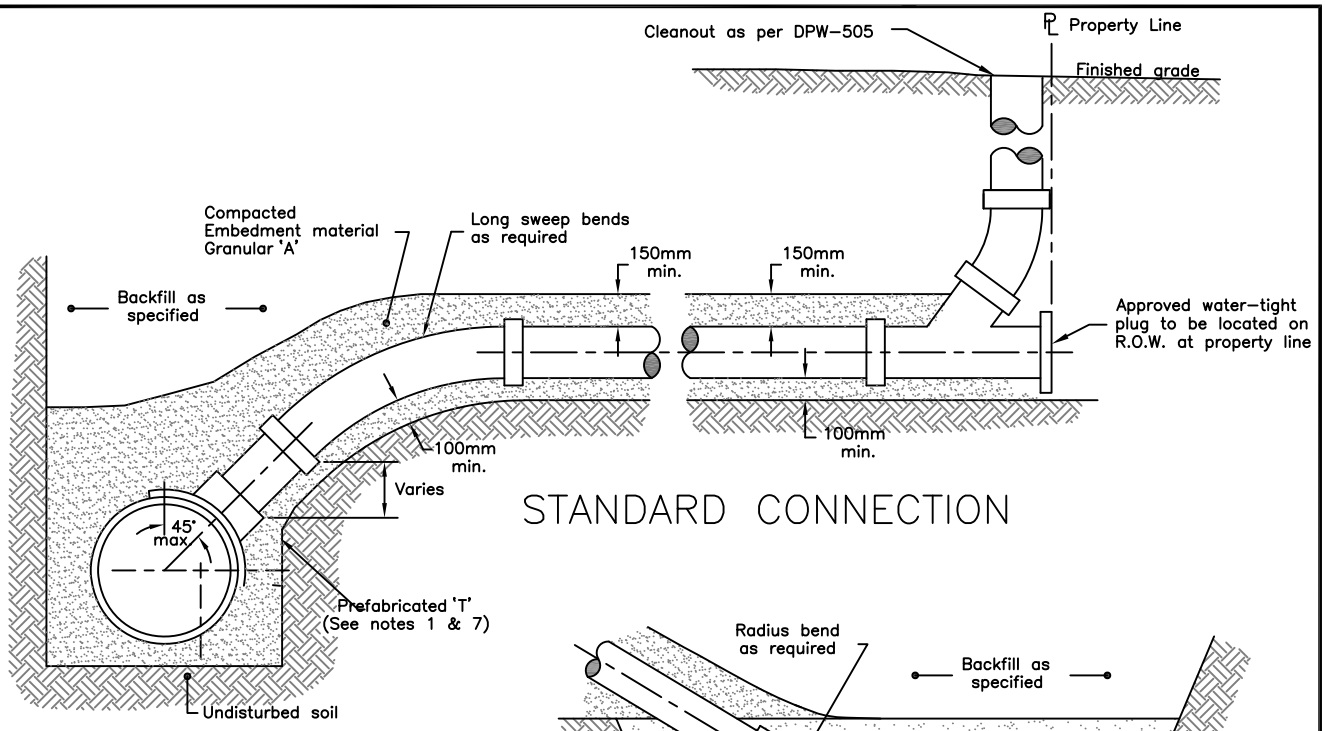
1. In rock excavation provide a 50mm layer of compressible material between trench walls and concrete.
2. Cover material – no stones greater than 25mm will be permitted.
3. In rock excavation a minimum of 150mm granular material bedding is required underneath the pipe.
4. The pipe bed is to be carefully shaped to receive the lowest segment of pipe.
5. All dimensions are in millimetres unless otherwise shown.

TRENCH BEDDING AND EMBEDMENT FOR PIPES

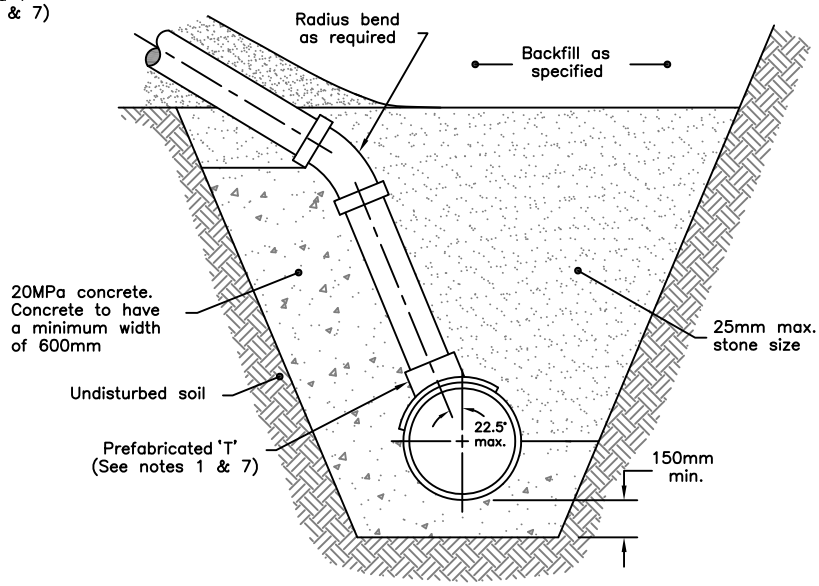
TOWN of LINCOLN
STANDARD DRAWING

DPW - 500

Rev. No.: 2 | Date: May 1999
Scale: N.T.S.



STANDARD CONNECTION



VERTICAL RISER DETAIL
(RIGID PIPE ONLY)

NOTES

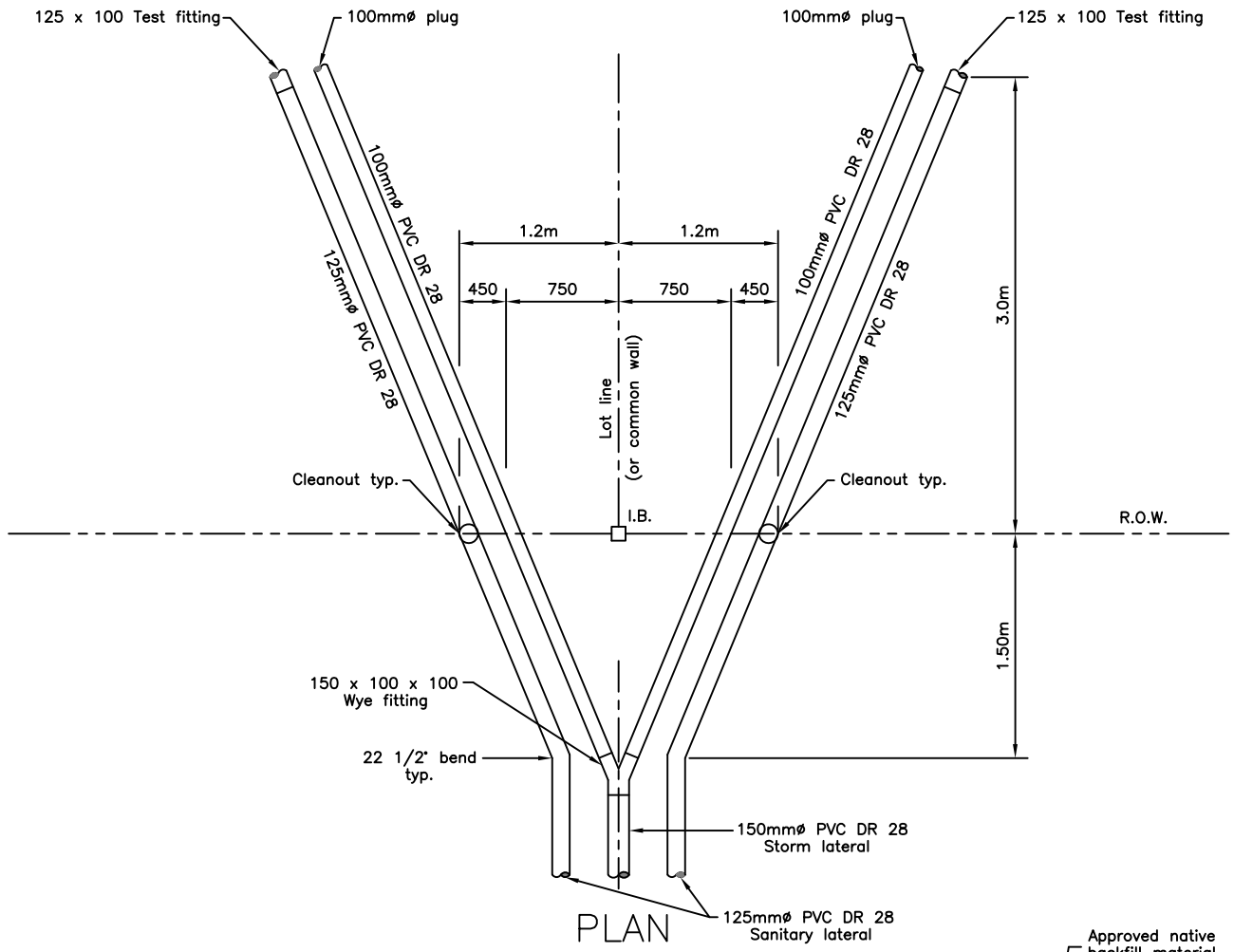
1. For sewers smaller than 300mmø, connections must be made using factory made tees. For all other sizes, either factory made tees or approved strap–on saddles may be used.
2. Strap–on saddles must be installed on the main pipe before that pipe is laid.
3. Approved cut–in tool must be used for field made tees.
4. Service connection must be securely plugged at property line with an expanding type plug or an approved equal.
5. Plug at property line shall be adequately braced to withstand testing pressures.
6. Double connections shall be made using a factory made wye.
7. For connections into existing sanitary main sewers, an approved manufactured saddle may be used. Saddle must have two straps and be coupled together with stainless steel bolts.
8. Standard connection sizes – residential sanitary 125mmø, residential storm 100mmø.
9. For sanitary sewers – minimum grade 20mm/m.
10. For storm sewers – minimum grade 10mm/m.
11. Wood stake min. 150mm above grade, painted green for sanitary sewer lateral and red for storm sewer lateral.
12. Cleanout and omni ball marker to be installed at property line as per DPW–505.
13. All dimensions are in millimetres unless otherwise shown.

SEWER LATERAL CONNECTIONS

TOWN of LINCOLN
STANDARD DRAWING

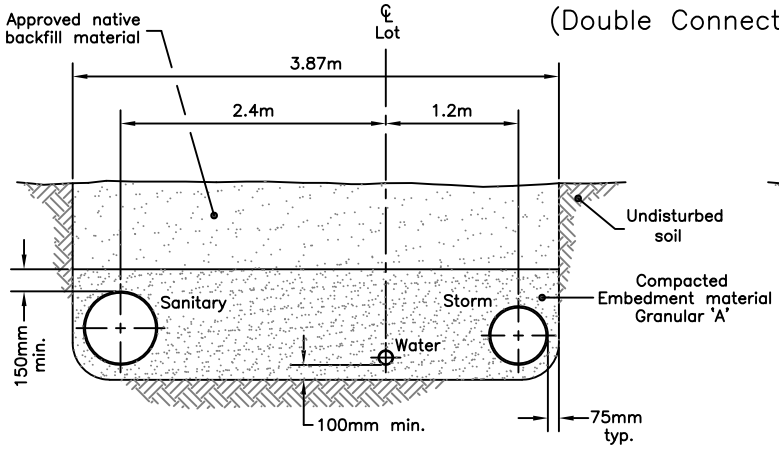
DPW - 501

Rev. No.: 4 | Date: Jan. 2018
Scale: N.T.S.



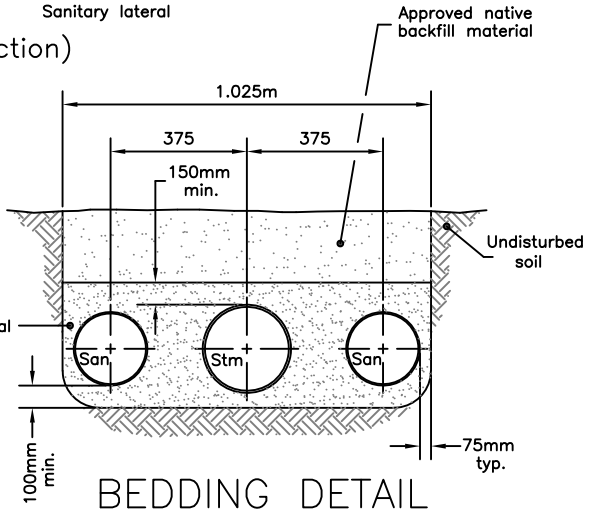
PLAN

(Double Connection)



BEDDING DETAIL

(Single Connection)



BEDDING DETAIL

(Double Connection)

NOTES:

1. Connections are not to be placed on previously disturbed ground.
2. For connecting laterals to main pipe, use DPW–501.
3. Driveways not to be placed directly over laterals.
4. Sanitary pipe to be colour green and storm pipe to to be colour white.
5. Cleanout and omni ball marker to be installed at property line as per DPW–505.
5. All dimensions are in millimetres unless otherwise shown.

STANDARD SEWER LATERAL INSTALLATION

TOWN of LINCOLN

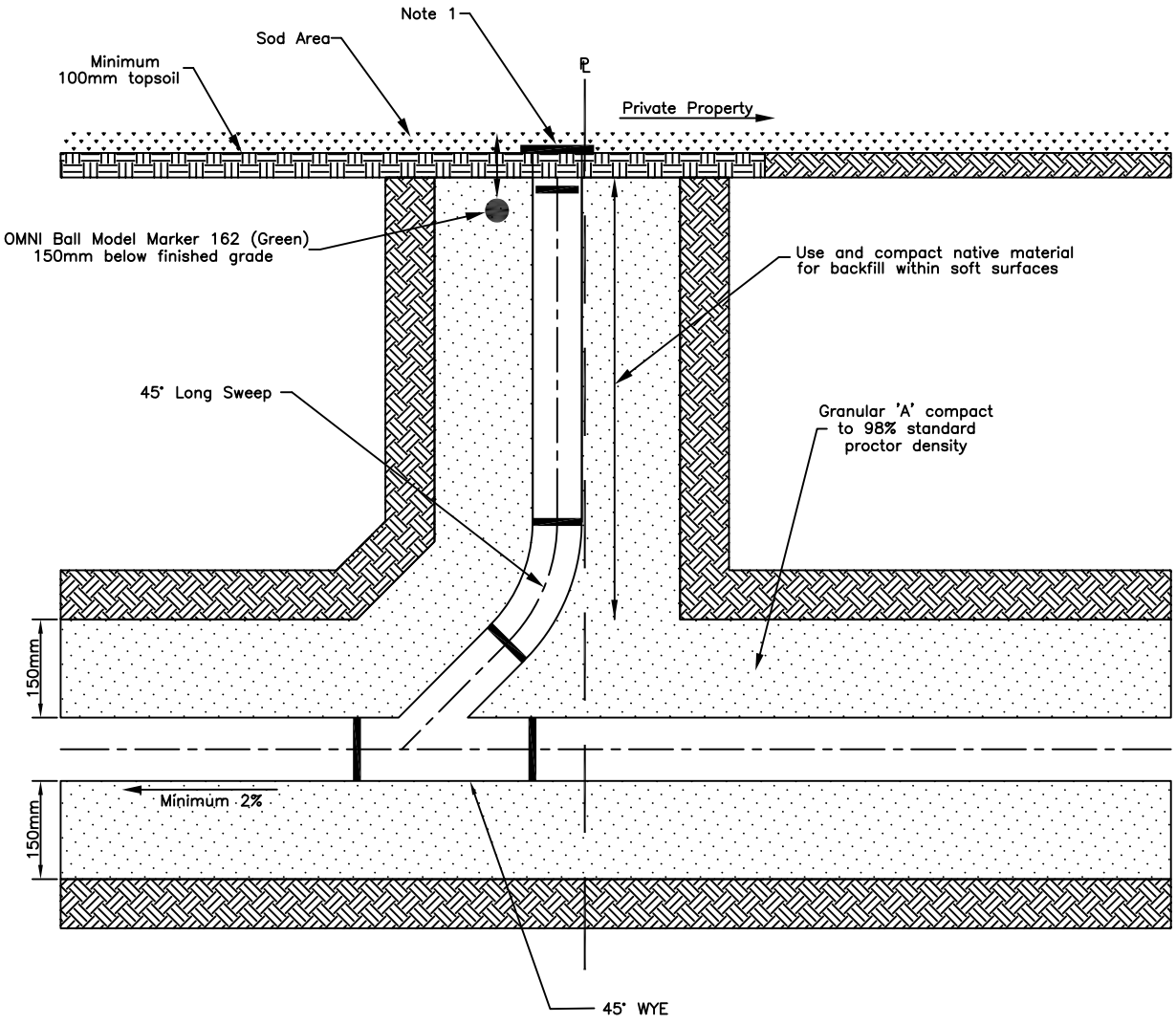
STANDARD DRAWING

DPW - 503

Rev. No.: 4 | Date: Jan. 2018

Scale: N.T.S.

1. The minimum inside diameter for sanitary private drain connection cleanout is 100mm.
2. Approved prefabricated WYE's and long radius sweeps shall be used for all private drain connection cleanout connections.
3. Where applicable, approved end caps are required at property line to complete the private drain connection installation. They shall be braced to withstand pressure testing when required.



NOTE 1

a) Cleanout Hard (Asphalt, Concrete, Granular) Surface Installation: Use cast iron cap and install flush with surface.

Cleanout 100mm – EMCO#DF44 – SKU 6463049 with gasketed adapter (IPEX#043724)
Where cleanout is within granular driveway, the tee and vertical riser shall be ABS pipe and fittings (not PVC).

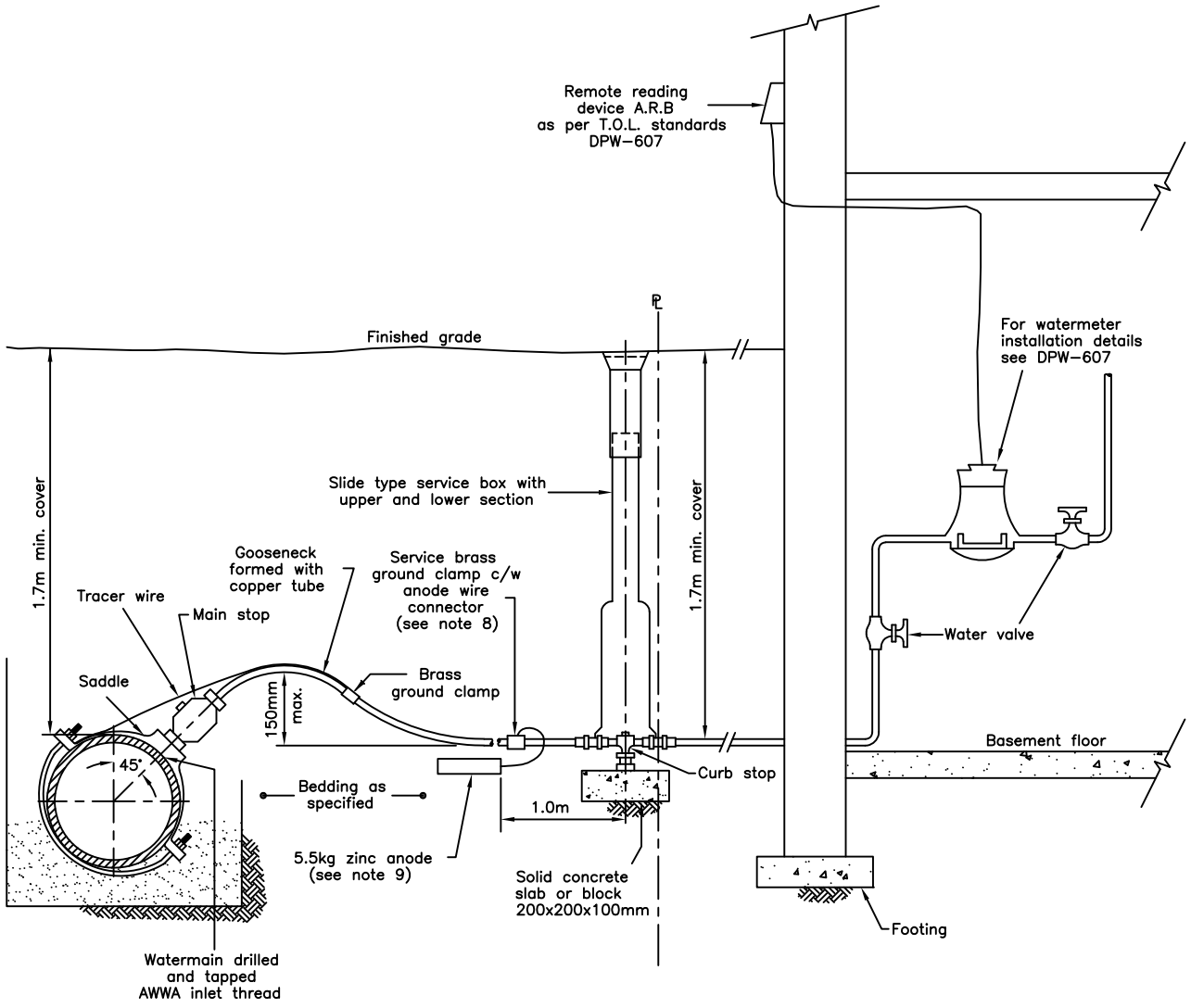
b) Cleanout Soft Surface (Grass) Installation: Use standard plastic cap, just below finished surface.
100mm bds threaded adapter EMCO#SKU 6012213
100mm bds threaded plug EMCO#SKU 6015263

PRIVATE DRAIN CONNECTION CLEANOUTS

TOWN of LINCOLN
STANDARD DRAWING

DPW - 505

Rev. No.: 1 | Date: Jan. 2018
Scale: N.T.S.



NOTES

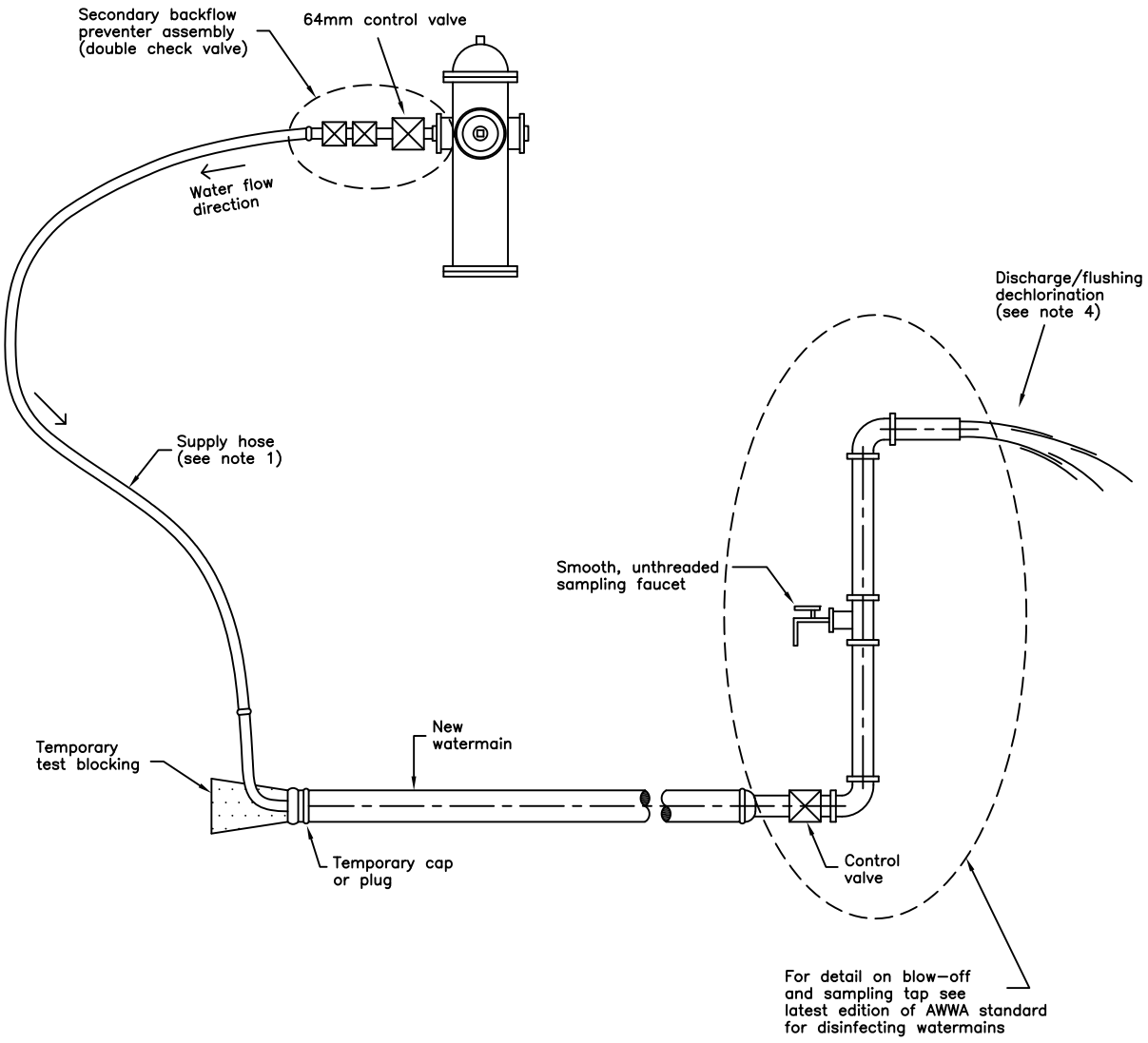
1. Plastic pipe services are NOT permissible.
2. All connections to be made with approved, compression–type couplings only.
3. All water services to be installed at right angles to the watermain.
4. Stainless steel saddles with double stainless steel bolts and nuts to be used on all watermains.
5. All water services to have anode protection as per Town standards.
6. Service pipe to be 760mm from inside of wall.
7. Watermeter to be installed horizontally.
8. Service brass ground clamp to be coated with T.C. mastic or wrapped with "Scotchfill" electrical putty or approved equal.
9. Anode to be placed at least 1.0m away from water service and as deep as the bottom of the service.
10. Service box rods shall be made of stainless steel and stainless steel cotter pin.
11. Tracer wire – 10 gauge.
12. All dimensions are in millimetres unless otherwise shown.

WATER SERVICE INSTALLATION DETAILS FOR 20mm AND 25mm DIAMETER SIZES

TOWN of LINCOLN
STANDARD DRAWING

DPW - 602

Rev. No.: 4 | Date: Dec. 2003
Scale: N.T.S.



NOTES

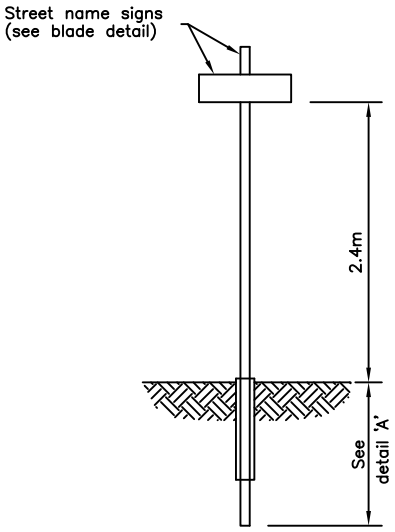
1. Clean potable–water hose (food–grade) only. This hose is to be removed prior to the hydrostatic pressure test.
2. Double check valve assembly to be installed by licenced Town of Lincoln operators only.
3. Location and use of hydrant to be determined by Town of Lincoln.
4. Prior to disposal into the environment, an approved neutralizing chemical shall be applied to all chlorinated water used for disinfecting, testing or flushing.

TEMPORARY FLUSHING/TESTING CONNECTION

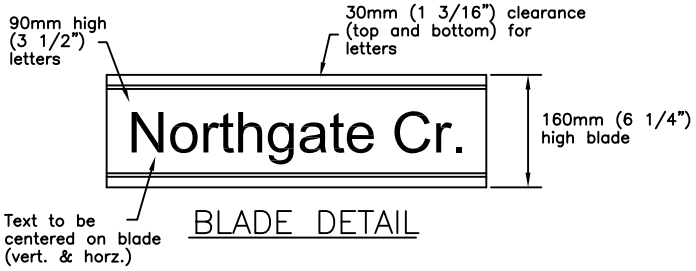
TOWN of LINCOLN
STANDARD DRAWING

DPW - 609

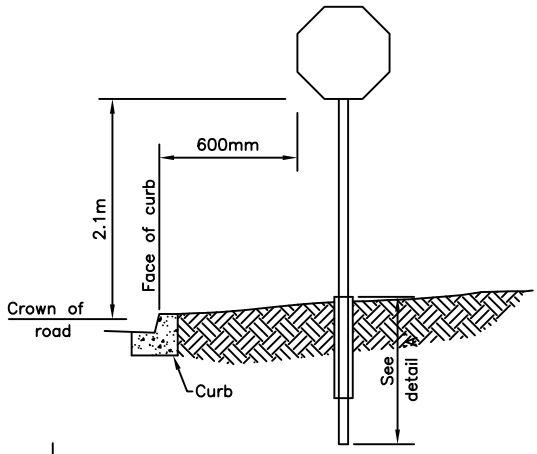
Rev. No.: 1 | Date: Mar. 2005
Scale: N.T.S.



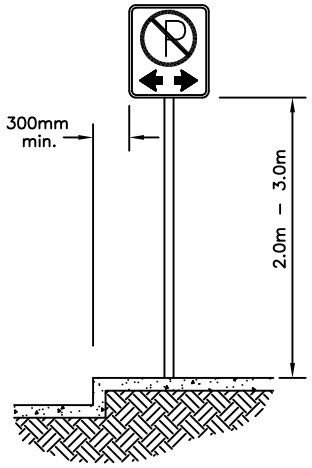
STREET NAME SIGN



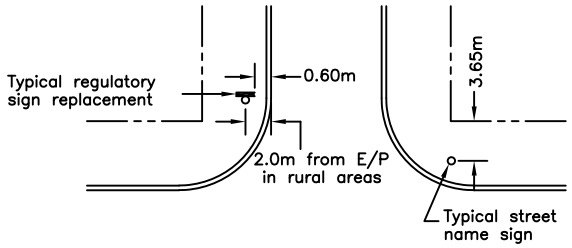
BLADE DETAIL

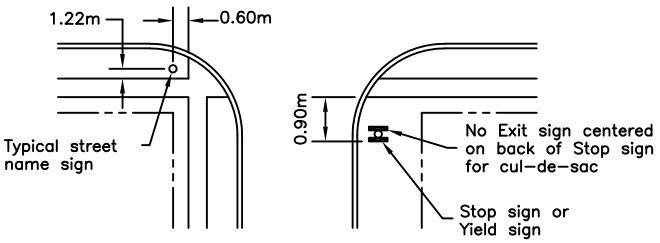


YIELD & STOP SIGN

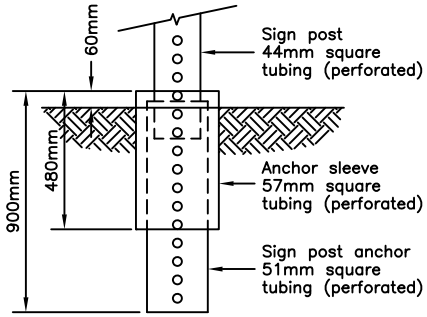


PARKING SIGN





LOCATION PLAN



DETAIL 'A'

ANCHOR ELEVATION

NOTES

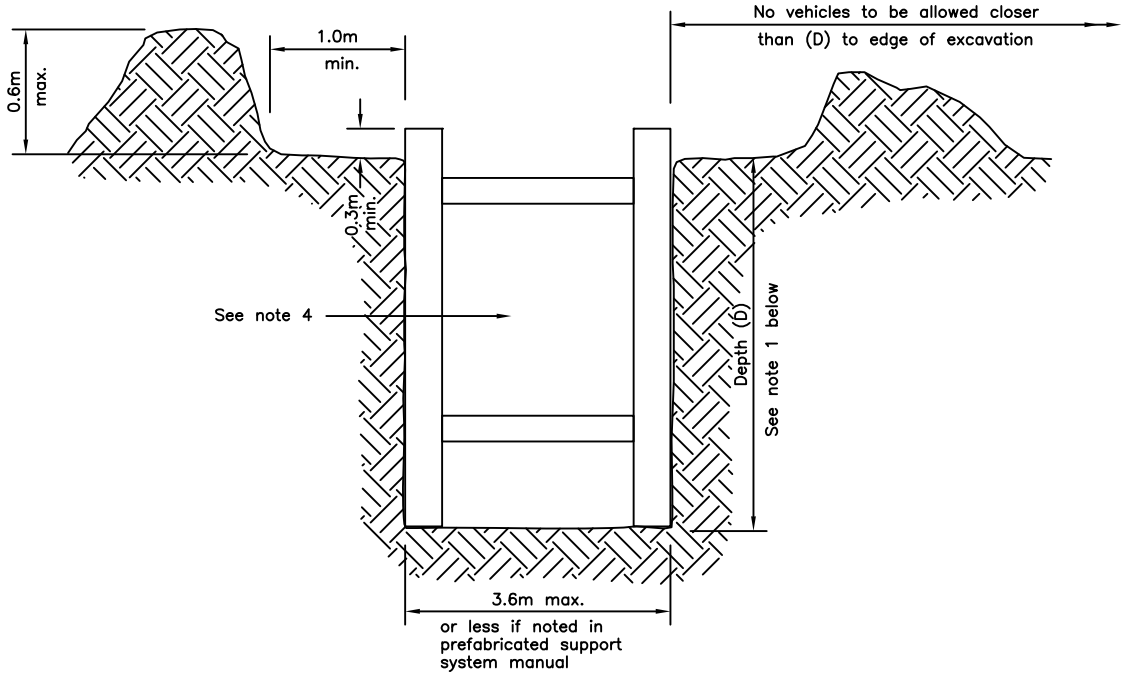
1. Colour, shape, and size of all regulatory signs shall conform to the Manual for Uniform Traffic Control Devices for Ontario.
2. All regulatory signs shall be mounted at approximately right angles to the direction of traffic that they are intended to serve, except for "No Parking" or "No Stopping" signs.
3. "No Parking" and "No Stopping" signs shall be placed at an angle of no less than 30°, and no more than 45° to a line parallel to the flow of traffic.
4. For signs 900mm square or smaller, see detail 'A'.
5. For signs larger than 900mm square:
   - Sign posts to be 51mm square tubing or 100mmx100mm pressure treated wood posts (sunk 1.0m below surface),
   - Sign post anchor to be 57mm square tubing,
   - Anchor sleeve to be 63mm square tubing.
6. Signs attached to tubing using drive rivets.
7. All dimensions are in millimetres unless otherwise shown.

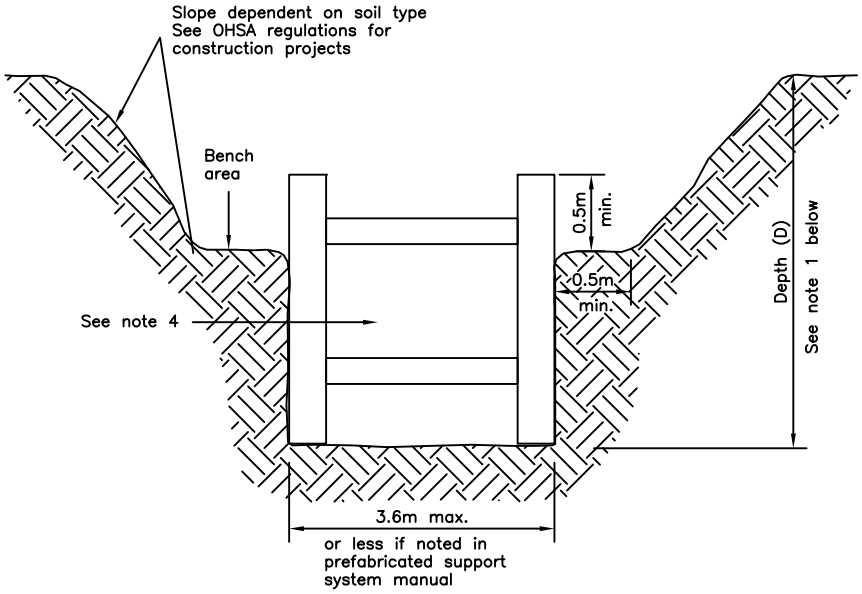
REGULATORY SIGN AND STREET NAME SIGN INSTALLATION

TOWN of LINCOLN
STANDARD DRAWING

DPW - 706

Rev. No.: 4 | Date: Mar. 2005
Scale: N.T.S.





NOTES:

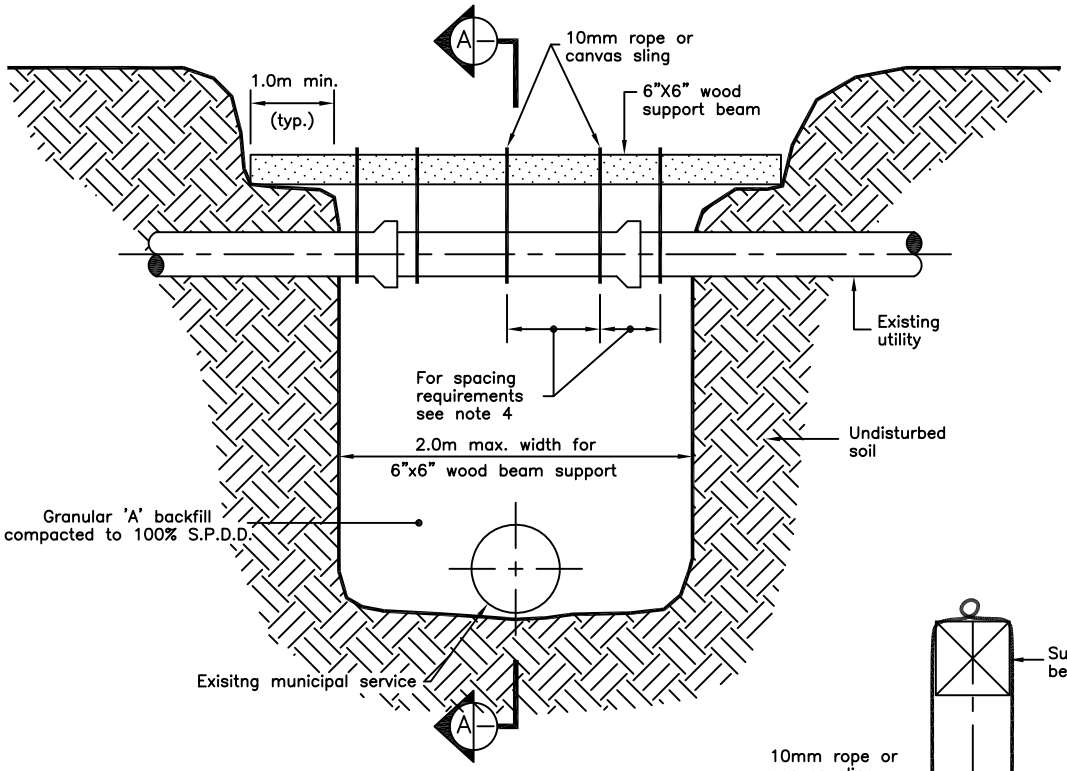
1. Maximum trench depth is as follows:
   i) For underground pipe breaks, the maximum depth of trench permitted is 3.6m or less if specified in the manufacturer's drawings and specifications.
   ii) For construction, the maximum depth of the trench permitted is 6.0m or less if specified in the manufacturer's drawings or specifications.
2. Prefabricated support system to be installed as per the manufacturer's specifications.
3. All dimensions apply to both sides of trench.
4. For underground pipe breaks, end pieces to be installed as per the manufacturer's drawings and specifications.
5. For type 4 soil, prefabricated system cannot be used.

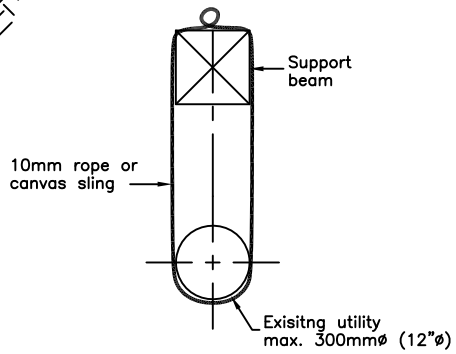
TYPICAL PREFABRICATED TRENCH PROTECTION ARRANGEMENT

TOWN of LINCOLN
STANDARD DRAWING

DPW - 708

Rev. No.: 2 | Date: Sept. 2002
Scale: N.T.S.





SUPPORT DETAIL A
SCALE: N.T.S.

NOTES

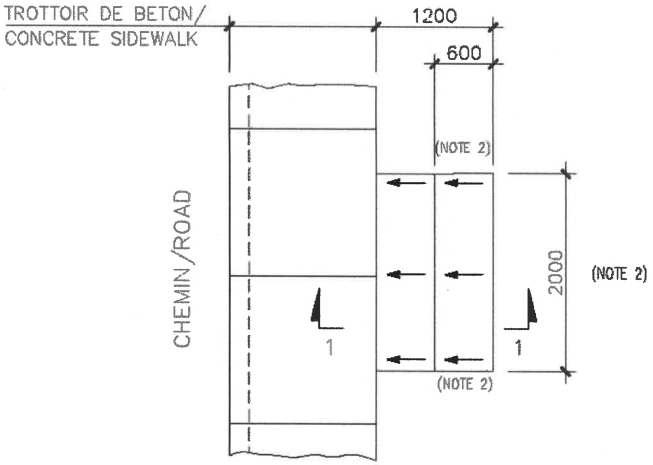
1. Temporary support shall remain in place until the backfill material underneath the utility is compacted adequately to restore support.
2. Mechanical equipment shall not be operated within 0.3m of a utility. Hand excavation shall be performed when locating and digging within 0.3m of a utility.
3. Hand held compaction equipment shall be used within 1.0m of the sides or top of utilities.
4. All exposed joints shall be supported by canvas sling or rope at either side of the joint and at 1.0m max. spacings along the utility's length
5. The support beam shall be one continuous length grade No. 1 spruce–pine–fir (S–P–F) or equivalent and shall be placed above the utility with the ends placed on undisturbed soil.
6. For utilities over 300mmø (12"ø) refer to utility company for temporary support requirements.

TYPICAL UTILITY SUPPORT

TOWN of LINCOLN
STANDARD DRAWING

DPW - 711

Rev. No.: | Date: Mar. 2005
Scale: N.T.S.

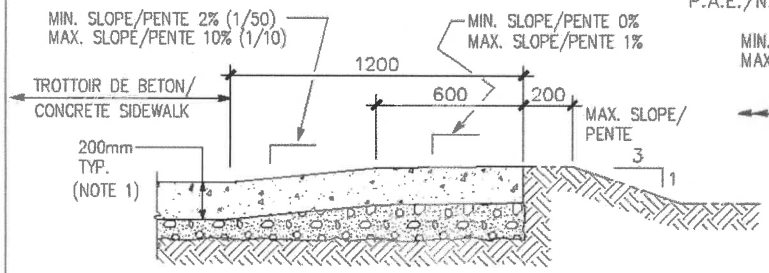


VUE EN PLAN/VIEW PLAN

EMPLACEMENT DES BPCS AVEC TROTTOIR/CMBB SITE WITH SIDEWALK

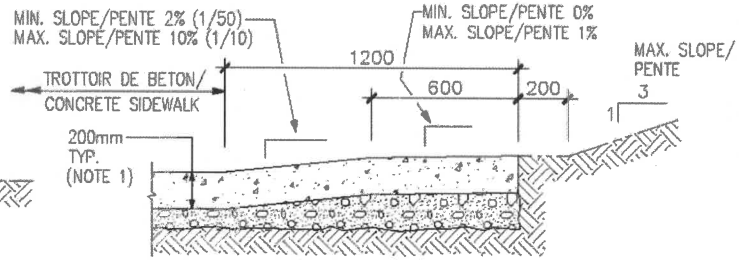
INSTALLATION TYPIQUE/TYPICAL INSTALLATION

P.A.E./N.T.S.



EMPLACEMENT PENTE DESCENDANTE

LOCATED ON DOWN HILL SLOPE



EMPLACEMENT PENTE MONTANTE

LOCATED ON UP HILL SLOPE

COUPE/SECTION 1-1

P.A.E./N.T.S.

NOTE 1: (BETON/CONCRETE)
- 200mm OU SELON LES STANDARDS MUNICIPAUX.
- 200mm OR TO MUNICIPAL STANDARDS.

NOTE 2:
- A 1 METER CLEARANCE IS REQUIRED FROM THE ROAD TO EITHER SIDE OR BACK OF THE MODULES. IF THERE IS NO CURB OR A ROLLYOER CURB,. EITHER SIDE OR BACK OF MODULES MUST BE SETBACK 2 METERS.
- UN DEGACEMENT DE 1 METRE EST REQUIS ENTRE LE CHEMIN ET LES MODULES SI LE CHEMIN N'A PAS DE BORDURE OU UNE BORDURE ARRONDIE, LE DEGAGEMENT ENTRE LES COTES OU LE DOS DES MODULES ET LE CHEMIN DOIT ETRE 2 METRE

PROFAC
Management Group Limited

PROJECT / PROJET: CMB INSTALLATION PROGRAM
PROGRAMME D'INSTALLATION DES BPCOM

WORK ORDER No.COMMANDE	SERVICE AREA AIRE DE SERVICE	DWG. CODE CODE DESSIN	SERIE	REV.
0058487	SQ1C	42DD	056	03

	NAME NOM	DATE
DRAWN BY DESSINÉ PAR	J. GALIPEAU	98-11-04
CHECKED BY VÉRIFIÉ PAR	M. BERNARDIN	98-11-04
APPROVED BY APPROUVÉ PAR		

REV.NO No REV.	DATE	BY PAR	CHKD VER	DA RD	DCC CCD
	DESCRIPTION				
	09.07.30	M.B.	M. B.		
03	Boulevard access design changed				
	08.05.20	M.B.	M. B.		
02	Boulevard access design spec.				
	03.11.18	J. B.	M. B.		
01	REVISED AS SHOWNED				

MAIL POSTE
Canada Post Corporation/
Societe canadienne des postes
Engineering Services / Services techniques

DESIGN ACTIVITY GROUP / GROUPE RESPONSABLE DU DESIGN	MECH. ENG.
DRAWN BY / DESSINÉ PAR	DATE
CHECKED BY / VÉRIFIÉ PAR	DATE
DESIGN AUT. / RESP.DU DESIGN	DATE
DCC / CCD	DATE

TOL.
FRAC. —
DEC. —
ANGLE —
FINISH / FINI —
SCALE / ECHELLE —

PROJECT / PROJET: E-5 COMMUNITY MAILBOX GENERATION 2C

TITLE / TITRE: TYPICAL CMBB SIDEWALK SITE MUNICIPAL INSTALLATION

DRAWING NO / Nº DU DESSIN: 8413

TOWN OF LINCOLN – CONTRACTOR HEALTH AND SAFETY CHECKLIST

Town of Lincoln

4800 SOUTH SERVICE RD
BEAMSVILLE, ON L0R 1B1

905-563-8205

Contractor Health and Safety Checklist

Project Name: _____

Name of Contractor: _____

The Contractor shall do the following:

1. Provide current and valid WSIB Clearance Certificates for the project's duration.
2. Form 1000 shall be filled out in accordance with the Occupational Health and Safety Act.
3. The Ministry of Labour "Notice of Trench Work" form must be filed with the Ministry of Labour in accordance with the Construction Regulations.
4. Provide qualified workers with all appropriate training for work to be performed.
5. Ensure all work is performed in accordance with governing legislation.
6. Ensure the health and safety of workers. Any worker not working safely and/or not wearing the appropriate personal protective equipment required to perform the work shall be required to leave the work site(s).
7. Possess all necessary licenses, permits, registration and insurance required.
8. Notify immediately the Town of Lincoln of any potential hazards beyond those regularly expected with the work to be performed.
9. Ensure that workers are aware of Emergency Procedures and Confined Space Procedures.
10. Ensure a copy of relevant health and safety program documents and procedures are on site at all times.
11. Ensure that applicable Traffic Control Plans are prepared as required and on site.
12. Ensure relevant Material Safety Data Sheets are available on site at all times.
13. Bear any and all costs associated with the above responsibilities.

Date: _____

Signed: _____ Witness: _____

Contractor Contract Administrator

For office use only

Health and Safety Evaluation of Contractor – Post Project

Were any unsafe work practices by the contractor observed?	Y	N
Were these unsafe work practices identified and appropriate corrective actions taken?	Y	N

Date: _____ Contract

TOWN OF LINCOLN – CONTRACTOR RATING FORM

Town of Lincoln

4800 SOUTH SERVICE RD
BEAMSVILLE, ON L0R 1B1

905-563-8205

TOWN OF LINCOLN
CONTRACTOR RATING FORM

Contractor:			
Contract:			
Contract Price:	**Date:**		
Item	Rating Criteria	Maximum Points Obtainable	Actual Points Awarded
1	**Commencement** Any rating below 5 indicates extent of delay by Contractor in commencing work or effort required by the Project Manager in order to get Contractor to commence project on time.	5	
2	**Adequate & Proper Supervision** The extent to which the Project Manager found it necessary to provide more than normal supervision and guidance due to inadequate supervision by the Contractor	10	
3	**Adequate & Proper Equipment** Degree to which the Contractor failed to provide adequate equipment to execute work efficiently and expeditiously.	10	
4	**Workmanship / Service** Measure of "polish" a Contractor gives job or difficulty experience by the Project Manager in obtaining acceptable work. ie: normal workmanship / service = 20+/- difficulties encountered achieving acceptable workmanship/ service = 0-15 exceptional workmanship/ service = 30	30	
5	**Safety Procedures** Degree of pressure required to ensure adequate and proper safety procedures.	10	
6	**Co-Operation** Degree of co-operation with Town officials	5	
7	**Public Relations** Contractor's consideration for general public, motorist and residents	5	
8	**Extras** Request for unreasonable extras	5	
9	**Clean Up** Degree of effort by Project Manager to have project cleaned up in an acceptable manner	5	
10	**Completion** Degree of effort by Contractor to finish on time or whether he finished on time	5	
11	**Financial Arrangements** Degree of unnecessary effort by Project Manager due to assignments by the contractor, ie: liens	10	
TOTAL POINTS FOR THIS CONTRACT		100	
Comments:			
Rated By:		**Approved By:**	

CONTRACTOR RATING GUIDELINE

The completed form provides a record of the Contractors performance on a specific contract. If from a perusal of the completed form, it is felt advisable to discuss this with the parties concerned, the Project Manager will arrange a meeting. The following breakdown of the form is provided to assist the Project Manager preparing the form so that uniformity may be provided in the ratings. This form is prepared in duplicate, one for the Contractor and one for the Town records.

Item	Description	Points
1	Deduct one point from maximum obtainable for each day where unreasonable delay in commencement by Contractor inconvenienced public and/or caused City undue expense	
2	Little supervision required	8 – 10
	Moderate supervision required	4 – 7
	Considerable supervision required	0 – 3
3	Adequate equipment	10
	Short of adequate equipment	6 – 9
	Inadequate equipment	0 – 5
4	Average to extraordinary workmanship with little or no Town effort	25 – 30
	Average workmanship with some Town effort	15 – 25
	Average workmanship with considerable Town effort and pressure.	0 – 15
5	No pressure to ensure adequate safety	10
	Some pressure to ensure adequate safety	5 – 9
	Considerable pressure to ensure adequate safety	0 – 4
6 & 7	Excellent	5
	Good	4
	Fair	3
	Poor	0 – 2
8	None	5
	Few prices high or few quantities high	4
	Some prices high and many quantities high	3
	Few prices high and few quantities high	3
	Most prices high and many quantities high	0 – 1
9	Excellent clean-up without direction	5
	Clean-up with direction	4
	Clean-up with pressure and direction	3
	Clean-up with considerable delay and pressure	2
	Clean-up with considerable delay, pressure and causing inconvenience to the public	1
	Clean-up completed by the Town and charged to Contractor	0
10	Satisfactory effort to expedite work	5
	Not overly concerned with time allowance	2 – 4
	No effort to expedite work – very slow	0 –1
11	No problem with financial arrangements	10
	Payment made out to bank, ect.	4
	Interim payments requested and cheques picked up	3
	Interim payments and suppliers receiving payments, ect.	0 – 2

Excellent 95 – 100, Very good 90 – 95, Good 85 – 90, Fair 75 – 85, Poor – below 75 points

TOWN OF LINCOLN – ELECTRONIC FUNDS EFT TRANSFER FORM

Town of Lincoln

4800 SOUTH SERVICE RD
BEAMSVILLE, ON L0R 1B1

905-563-8205

Dear Supplier

PAYMENT BY ELECTRONIC FUNDS TRANSFER (EFT)

This letter is to advise you that the Town of Lincoln has implemented changes to our payment methods. The most important change and the one with the greatest benefit to you is the change from cheque payments to direct deposit via Electronic Funds Transfer (EFT). EFT is a safe, secure and efficient payment method of transferring money from one bank account directly to another without the exchange of cheques or cash.

The benefits of EFT payments:

- Your payment will be directly deposited to your bank account. Your bank statement will show the Town of Lincoln as the remitter.
- Immediate availability of funds.
- Eliminates mail delays or possibility of misplaced cheques.
- Removes your need for cheque banking procedures.
- A remittance advice will be emailed to you prior to each payment transfer.

EFT has become the Town of Lincoln's preferred method of payment and we would like to encourage its use. However, the Town of Lincoln will continue to provide cheque payments, though beginning April 1, 2016 the frequency of these runs will be reduced to monthly.

Please find on the underside a "Vendor Electronic Fund Transfer Form" for you to complete and return to us at your earliest convenience by either email or fax. Once this information is submitted and verified, you will receive all future payments electronically in your bank account.

If you have any questions or comments regarding this process, please do not hesitate to contact our Accounts Payable Clerk by phone at (905)563-8205 extension #236 or by email to ap@lincoln.ca.

Sincerely,

Angela Cifani, CPA, CGA
Deputy Director of Finance

Vendor Electronic Fund Transfer (EFT) Form

☐ Enrollment ☐ Modification

Vendor Information

Vendor Name:	
Address:	
City & Province:	**Postal Code:**
Contact Person:	**Title:**
Phone Number:	**Contact Email Address:**
Fax Number:	**Email Address for REMITTANCE NOTIFICATION:**

Bank Information

A void cheque or direct deposit form must accompany this form.

Bank:		
Address:		
City & Province:	**Postal Code:**	
Bank Number:	**Transit Number:**	**Account Number:**

Vendor Authorization

I authorize the Town of Lincoln to deposit funds via EFT to the account indicated above for the purpose of paying vendor invoices.	
Vendor Signature	**Date**

Please fax this form to (905) 563-6566 or email to ap@lincoln.ca

For Internal Use Only: **Vendor #:** _____

AP Clerk: _____ **Approved By:** _____

Date: _____ **Date:** _____

SPECIAL PROVISIONS - GENERAL

CONTRACT NO. 2019002PW

Elizabeth Street Road Reconstruction
IN THE TOWN OF LINCOLN

SPECIAL PROVISIONS – GENERAL

Refer to Niagara Peninsula Contract Documents

SPECIAL PROVISIONS – CONTRACT ITEMS

CONTRACT NO. 2019002PW

Elizabeth Street Road Reconstruction
IN THE TOWN OF LINCOLN

SPECIAL PROVISIONS –CONTRACT ITEMS

Refer to Niagara Peninsula Contract Documents

SPECIAL PROVISIONS - SUPPLEMENTARY

CONTRACT NO. 2019002PW

Elizabeth Street Road Reconstruction
IN THE TOWN OF LINCOLN

SPECIAL PROVISIONS – SUPPLEMENTARY

While the Niagara Peninsula Standard Contract Document – Special Provisions Contract Items apply to this contract, some variances and conditions as outlined below are to be included.

GENERAL REQUIREMENTS AND INFORMATION 2
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S2. CONSTRUCTION LAYOUT 5
S3. CLEARING AND GRUBBING 6
S4. TREE PROTECTION 7
S5. INSTALL, MAINTAIN AND REMOVE SILT CONTROL DEVICES 8
S6. CONSTRUCTION SIGNS, TRAFFIC CONTROL AND TRAFFIC MANAGEMENT PLAN 8
S7. EXCAVATION 9
S8. REMOVALS 10
S9. GRANULAR MATERIALS 12
S10. SUBDRAIN 13
S11. CONCRETE CURB AND GUTTER 14
S12. CONCRETE SIDEWALKS 14
S13. ASPHALT MILLING 15
S14. SUPPLY AND PLACE HOT MIX ASPHALT 16
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S19. PAVEMENT MARKINGS 21
S20. GRAVITY SEWERS 21
S21. PRECAST STRUCTURES 24
S22. SWALE 25
S23. TEST PITS 26
S24. DUST CONTROL 26
S25. COLD MIX, OPEN GRADED BITIMIOUS PAVEMENT 27
S26. DISPOSAL OF EXCAVATED CONTAMINATED SOILS 27
S27. ROCK EXCAVATION IN TRENCH 28
S28. UNSHRINKABLE FILL 30
S29. WATERMAIN INSULATION 30

GENERAL REQUIREMENTS AND INFORMATION

Construction Standards

All work shall be done in accordance with the Town of Lincoln's Municipal Design Standards, Niagara Peninsula Standard Contract Document (latest revision) and the Ontario Provincial Standard Specifications and Drawings except as amended or extended in these Contract Specifications. The precedent is Town of Lincoln Standards, NPSCD, OPS, then ASTM.

Additions or Deletions

The **Town of Lincoln** reserves the right to add to or delete from any portion or portions of the Schedule of Work. These changes under this contract shall **NOT** be subject to the unit price adjustment provisions in the General Conditions of Contract.

Site Facilities

The Contractor shall be responsible for providing all on site washroom facilities for all staff, providing power (temporary, portable or otherwise) for all construction work activities, and shall thoroughly acquaint himself with the local regulations governing acceptable noise limits.

Existing Utilities

The Contractor shall take all necessary precautions during construction of the site works to prevent damage to all existing utilities (buried or overhead). The Contractor shall adhere to the safety requirements of the local authorities while working under and around high voltage lines. All costs associated with supporting/bracing poles, cables, conduits, pipelines, structures, etc. shall be included in the lump sum and unit prices. Preservation of existing utilities shall be per OPSS 491. For utilities greater than 300mm diameter the Contractor shall submit shop drawings, **stamped by a Professional Engineer licensed in the Province of Ontario**, to the Engineer detailing the temporary and permanent support. The Contractor shall advise the Utility Owner when he will be working in the vicinity of their plant. No special payment will be made for this item. The cost of utility supports shall be included in the unit and lump sum prices.

The Contractor shall protect and maintain all service crossings including but not limited to sanitary sewer laterals, water services, storm sewer catchbasin leads, existing watermain, sanitary and storm sewers, bell, hydro, gas, cable television, fibre optic cable, etc. All damaged mains and services shall be repaired by the Contractor to original

condition or better and to the satisfaction of the utility service provider at no additional cost to the Owner

Site Security and Safety

The Contractor shall install approved security fencing around all staging and storage areas in accordance with the Occupational Health and Safety Act. Public safety is a priority and as such all open trenches must be secured and barricaded off in accordance with the Occupational Health and Safety Act and the Ministry of Transportation Guidelines and requirements.

Shop Drawings

The Contractor **shall** submit detailed design and shop drawings for all contract items including but not limited to precast structures, piping certification, concrete mix design, valves, restraints, fittings, pipe supports, frame & cover, insulation, waterproofing, asphalt mix design and all other materials not specifically noted that are required to complete the construction works. **All items must be reviewed by the Engineer prior to ordering or installation of materials**. Any costs associated with modifications to or return of materials/equipment, as a result of shop drawings not submitted for review by the Engineer, shall be borne by the Contractor.

Review by Engineer is for the sole purpose of ascertaining conformance with the general design concept. This review does not mean that Engineer approves the detail design inherent in the shop drawings, responsibility for which remains with Contractor, and such review does not relieve Contractor of the responsibility for errors or omissions in the shop drawings or of the responsibility for meeting all requirements of the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job-site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of the work of all sub-trades.

Dewatering

The Contractor shall be responsible for controlling water inflow into excavations. The control of water inflow at excavations shall be carried out in a manner such that the construction areas are maintained in a dry state. Control of water inflow shall be deemed to commence at the start of the excavation and shall continue until completion of the work.

Site Housekeeping

The Contractor is responsible for keeping the roads within the limits of construction well graded, free of pot holes and clean. **The Contractor shall resolve immediately, within 2 hours, to requests by the Engineer or Town Staff to clean the roadways, provide dust control and fill pot holes**. The Contractor is responsible for keeping access roads (Mountain Street) clean. The Granular base must be kept in a well-graded condition and for the safety of the traffic; any pothole must be promptly eliminated. Contaminated materials must be removed prior to fine-grading and placement of base course asphalt. The unit price bid shall be deemed to have made due allowance for all these requirements specified.

Operation of Existing Water System

All work completed by the Contractor on any existing water system shall be done in accordance with the Safe Drinking Water Act, 2002, Section 12. Section 12 requires that "No person shall operate a municipal drinking water system or a regulated non-municipal drinking water system unless the person holds a valid operator's certificate issued in accordance with the regulations." Certified Region and City operators must be present to directly supervise all work being completed on the drinking water system and only certified Region and City operators shall operate valves on their respective system. In addition, disconnecting and reconnecting of water services must be completed by a certified operator or under the direct supervision of a certified operator. The Contractor shall provide a minimum 72 hours' notice prior to any work. Local businesses must also be notified within 72 hours of potential water disruptions. The Contractor must submit, to the Contract Administrator, the letter noted for distribution prior to delivery.

Water usage via hose connection (e.g. filling of tanker trucks) or connections of any sort should only be obtained from designated hydrant(s) with a reduced pressure principle backflow preventer and meter installed by the Town of Lincoln's Public Works Department (see DPW-609). It is the Contractor's responsibility to contact the Municipal Works Centre for the installation. It is the Contractor's responsibility to provide and install an approved backflow preventer if the Town is unable to supply one of theirs. Any connection to a hydrant without a properly installed backflow preventer is strictly prohibited. The Contractor is liable for any and all potable water contamination and related investigation costs and damages resulting from non-compliance of this hydrant usage protocol (as per By-law 01-134).

The Contractor may supply their own backflow preventer, however proof of certification upon installation must be provided to the Town. Town licensed water operators must install. The Contractor is not permitted to turn any hydrants or valve.

Construction Schedule And Co-Ordination

The Contractor is to provide a detailed construction schedule at the preconstruction meeting, showing his schedule of work to meet the instructions shown in the Special Instructions to Bidders. The Contractor is responsible for all co-ordination with the Town and Niagara Region and must follow their procedures and requirements.

S1. PRECONSTRUCTION SURVEY

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall also apply.
The Contractor shall provide **three (3) complete copies** of the preconstruction survey and field reports to the Engineer, together with, any subsequent inspection report related to claims investigation forthwith. **The preconstruction survey must be completed and submitted to the Contract Administrator prior to mobilization on site.**

The Contractor shall provide Contract Administrator a sample distribution letter and a map of the residents/landowners that the letter will be sent to for review and comment prior to distribution.

The Contractor shall ensure all residents and/or landowners participate in the survey. If the residents/landowners do not wish to participate the Contractor shall obtain written authorization from those owners.

All claims brought to the Contractors attention shall be addressed within 30 days of receipt of claim. The Contractor must provide the Contract Administrator weekly progress in regards to claim so he/she may keep the resident and/or landowner informed.

The preconstruction survey must, upon the approval of the property owner and any tenants, include the taking of high resolution video or still photos of all properties inspected. A record must be kept of all properties where the owner or tenants will allow the videos or photos.

S2. CONSTRUCTION LAYOUT

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall also apply. Failure to comply with the following conditions will result in a reduction in payment for this item.

The survey layout shall be carried out using trained Survey Staff conversant in the day-to-day layout and preparation of grade sheets and calculation methods for municipal works, using accurate survey equipment.

The Contractor shall include in the lump sum cost for this item the setting and checking of all grades and alignment as required to ensure proper adherence to design, re-staking of layout lost due to destruction or removals and any additional layout within the intent of the contract for minor revisions as required.

An absolute minimum of three (3) layout stakes shall be provided for any single line of layout. Maximum spacing of grade stakes shall be 20 metres for all layout and at all changes of grade and/or direction.

Layout for curb and gutter shall include offset stakes placed a maximum of 2 metres behind the proposed lip of gutter. Layout for curb shall also include the drop locations for all curb depressions, the bottom of slope shall be marked out, on site, prior to curb pour.

Catchbasin layout shall consist of 3 grade stakes installed in line with the inside back wall of the catchbasin (front face of curb) a centre stake representing centre of catchbasin and a 3 metre offset stake to the left and right of the centre line stake.

Contractor shall provide temporary geodetic benchmarks every 200 m along project limits. All benchmarks must be installed and appropriate documentation provided to the Engineer prior to the start of construction.

If a survey monument is damaged due to the Contractor's works, the survey monument shall be replaced by the Contractor at their own cost. Only a Certified Ontario Land Survey shall replace the survey monument.

The Contractor is advised that the property lines shown on the Contract Drawings are based on the compiled property plans. Some of the bars identified in the field may not conform to the compiled property plan. Therefore, the accuracy of the location of the property bars shown on the plans is not guaranteed. As part of the Contractor due diligence, the Contractor shall confirm the location of all property bars located in the field with the Contract Drawings in order to ensure proper layout of the proposed works.

Should adjustments be required, the Contractor shall notify the Engineer, within 24 hours, of construction so that corrections can be made if required. All costs associated with this shall be deemed to be included in the tender price. No additional fees will be considered.

S3. CLEARING AND GRUBBING

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall also apply.

This item shall include the complete removal and disposal of all trees, gardens, vegetation, hedges and shrubs, including stumps, as specified on the contract drawings, or as directed by the Contract Administrator to complete the work. All stumps shall be removed to 300 mm below the finished boulevard grade or, in the case where existing tree roots may interfere with the installation of works in the contract, remove the entire stump and dispose of off-site.

It is assumed that the Contractor has reviewed the site to confirm the extent of clearing and grubbing required including size and type of trees and plantings. The Owner will not consider any additional costs for variances in tree sizes, stump sizes, access difficulties, buried utilities or any other items that may arise during clearing and grubbing works.

Payment shall be as per the units indicated in the Schedule of Quantities and Unit Prices for each item noted.

S4. TREE PROTECTION

The provisions of OPSS 801 and Special Provision General G22 shall apply except as amended or extended herein.

During the course of the Contract work the Contractor shall be responsible for the protection of all trees not marked for the removal and within the project right-of-way from any damage that may occur.

Protective barrier fencing shall be orange construction fencing and shall be placed as per OPSD 220.010, as indicated on the Contract Drawings or as directed by the Contract Administrator.

Where work is required within the dripline of a tree or trees which are designated not to be removed, operation of equipment within that dripline area shall be kept to a minimum necessary to perform the work required.

In order minimize root loss, the Contractor will be required to use vertical walls on all excavations with appropriate wall support systems when excavating within the dripline of trees. All exposed roots over 25mm in diameter shall be cut back cleanly to the soil surface immediately, within two (2) hours. Overhead branches and limbs should be trimmed by the contractor prior to start of excavation. All branch pruning, and root cutting must be approved by the Town prior to work being undertaken.

If root damage or loss is extensive, portions of the tree shall be pruned.

Payment shall be as per the units indicated in the Schedule of Quantities and Unit Prices.

S5. INSTALL, MAINTAIN AND REMOVE SILT CONTROL DEVICES

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall also apply.

Prior to the start of construction, the Contractor shall place temporary sediment control measures in the following locations not specifically identified on the Contract Drawings:

- Limit of construction on all sides of the work area
- Surrounding all stockpiles
- All existing catchbasins not identified as being removed within the work zone.

The Contractor shall add to or place additional erosion protection as directed by the Contract Administrator or Town of Lincoln.

Each sediment control device shall be inspected by the Contractor after every major rain event. If there have been no major events, the sediment control devices should be inspected every 2-3 weeks. Sediment must be removed when the accumulation reaches fifty (50) percent full. Sediment control devices shall be removed after restoration of the site is complete and/or when entire site is stabilized as directed by the Contract Administrator. Any silt deposited in the catchbasin due to a faulty installation of the silt control device shall be removed by the Contractor at no additional cost to the Town.

Sediment controls shall be installed before any construction work commences.

Silt fence shall be installed in compliance with OPSD 219.110.

Silt control devices must remain in place and be diligently maintained until full restoration of the area is complete.

S6. CONSTRUCTION SIGNS, TRAFFIC CONTROL AND TRAFFIC MANAGEMENT PLAN

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall also apply. Failure to comply with the following conditions will result in a reduction in payment for this item. The submission of the plan shall be at least two weeks prior to the start of construction.

The provisions of GC7.06 and OPSS.MUNI 706 apply except as amended or extended herein.

The Contractor shall maintain local access through the work zone at all times during construction activities, with a minimum of one (1) lane of traffic available. The Contractor shall provide traffic control in accordance with the Ontario Traffic Manual Book 7.

The Contractor shall provide at least 48 hours advance written notice to all home/business occupants before their driveway entrances are disrupted. Effort should be taken to minimize the disruption and shall NOT exceed four (4) hours. There should be at least one functional access to businesses at all times so that transport/delivery services can be maintained. At the conclusion of the work day, all affected Driveways must be made passable unless written approval has been obtained from the contract administrator.

The Contractor shall advise the Police Department, Fire Department, Ambulance Services, Public Transit, School Buses, Waste and recycling disposal services, the Ministry of Transportation, etc., prior to start of construction and on a daily basis, the current status of the construction as it pertains to passage of traffic within the contract limits.

References:

- The following publications are referred to in this Special Provision:
- Latest edition: Ontario Traffic Manual Book 7- Temporary Conditions.
- Latest edition: Traffic Control Manual for Roadway Work Operations – Field Edition
- Canadian General Specifications Board (CGSB).

Construction signs mean all traffic control devices and signs identified in OTM Book 7, including vehicles, etc. provided to support signs and equipment to supply sign lighting.

Signs shall be in place before work-affecting traffic begins and shall be well maintained to be effective at all times and remain operational throughout the duration of construction including shutdown periods.

The Contractor shall maintain 24-hour access for Emergency Services and shall coordinate with Emergency Services regarding all approved closures.

S7. EXCAVATION

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, OPSS.MUNI 206, OPSS 351, OPSS.MUNI 353 and 1350, the following shall apply.

The unit price bid shall include all materials, labour and equipment required for the excavation of the roadway to the proposed subbase elevations as noted on the Contract Drawings and in accordance with the roadway cross section detail including the disposal of all unsuitable roadway base materials (ie. soil/granular) and grading of the subbase to proposed cross section elevation.

All materials removed from the underside of existing asphalt to the proposed roadway subbase elevation shall be disposed of by the Contractor and shall be included in the price of excavation. All costs for disposal shall be deemed to be included in the tender unit price. Payment for excavation shall be made from the underside of the existing asphalt or concrete.

The Contract should note that live and abandoned utility plant may run adjacent, perpendicular or parallel at various locations. It will be the responsibility of the Contractor to confirm the status of utility plant prior to removal. The Contractor shall include for any hand digging around existing utilities that are located within the road base.
During excavation, the Contractor shall take due precautions to protect existing maintenance holes, frames and covers, valve chambers, valve boxes and curb stops not identified for removal within the right-of-way. Any aforesaid appurtenances, if damaged directly or indirectly by the Contractor's operations shall be replaced by the Contractor at his/her own expense. The Contractor shall inform the Contract Administrator of any existing damage prior to start of any work.

All imported clean fill must be approved by the Town prior to placement. All fill must be compacted to 95% SPMDD.

Any excavation relating to the ditching will be paid for separately under the appropriate item in the Schedule of Quantities and Unit Prices. Excavation for new ditches shall be deemed to be included in the cost of the ditching item. No additional payment will be made for excavation for new ditches or swales.

Payment will be made at the unit price noted in the Form of Tender and will be based on the calculated theoretical volume only as determined by the Engineer.

S8. REMOVALS

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall apply.

OPSS.MUNI 510 shall apply to this item.

Tree removal shall be completed in accordance with OPSS 201.

The unit price bid for these items shall include all material, equipment and labour necessary to sawcut as required, remove, separate and dispose of all materials to an approved disposal site as listed in the Form of Tender and where indicated on the Contract Drawings or as directed by the Engineer on-site.

Thickness of concrete and asphalt will vary. No additional compensation will be made for varying depths of asphalt or concrete or for any rebar/wire mesh in the concrete.

Catchbasins and manholes including all frames & grates that are removed become the property of the Contractor. In addition, the unit price bid shall include plugging all abandoned storm sewers/leads with concrete where indicated on the Contract Drawings.

The existing manholes may be cast-in-place with various thicknesses. Mass concrete should be expected on the outside of existing manholes. No additional compensation will be made for the removal of cast-in-place sanitary or storm manholes.

All existing driveway culverts, including headwalls of all types shall be removed. Size and type of culvert may vary. Unit bid price for pipe removal shall include provisions for the varying materials and sizes. The costs to remove and dispose of all end treatments around culverts shall be deemed to be included in the unit price bid. No additional payment for removal of culvert end treatments will be entertained. It is the responsibility of the Contractor to review the site prior to bidding to determine the end treatments that are to be removed. Only pipe removal where there is no replacement within the same trench will be paid.

Removal of signs shall include all types of existing street signs. Removed signs shall be delivered to the Town of Lincoln Public Works Yard. It is the responsibility of the Contractor to inventory all existing signs, including those to be removed.

Contractor to relocate the existing Canada Post community mailbox as shown on the drawings. The Contractor shall install a new concrete pad for the installation of the mailbox. All Canada Post standards shall be followed for the relocation of the community mailbox. The typical drawing for the sidewalk side community mailbox has been attached to the Appendices of these Contract Documents. The cost for the relocation is inclusive of all materials and labour to complete the installation to the standards of the Canada Post. No additional compensation will be made for the installation of the concrete pad.

Asbestos Cement/Transite Pipe

The following list outline the designated substances that may be present within the construction limits of the above noted project.

Designated Substance

Asbestos – contained in concrete as Asbestos Cement (AC)/Transite Pipe (TR) also commonly referred to and noted on the contract drawings TR or AC.

The AC/TR pipe as noted above is expected to be in fair condition and non-friable.

'Friable Materials' are deemed to be those that:

- when dry can be crumbled, pulverized or powered by hand pressured: or
- is crumbled, pulverized or powdered.

Given the spring/summer construction period and the wet condition of the trenches within the construction limits, the exterior of the existing AC/TR pipe is expected to be wet.

Per the definitions of O.Reg. 278/05, subsection 12(2), removal of the AC/TR pipe is expected to be a 'Type 1' Operation.

There are no additional designated substances expected to be within the limits of the construction activities and associated with the above noted project.

Payment will be made at the unit and lump sum prices noted in the Form of Tender and will be by field measurement or percentage complete as determined by the Engineer.

S9. GRANULAR MATERIALS

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall also apply.

The unit price bid shall be complete compensation for the supply, hauling, placement, grading and compaction of all granular materials to 100% Standard Proctor Maximum Dry Density.

This item will be used for the construction of all works unless otherwise noted.

Granular 'A' must be installed on all road and sidewalk trenches to the existing grade to provide a safe access for automobile and pedestrian traffic. The Contractor must include in the unit price all labour and equipment to remove the excess Granular 'A' from the

trenches prior to final restoration, and delivery of the Granular 'A' to a location specified by the Engineer. The Contractor is responsible to remove the Granular 'A' in a manner that avoids contamination of the Granular 'A' with asphalt, concrete or native material. Any contaminated material is to be removed at the Contractor's expense. Any cost for these requirements is deemed to be included in the unit price,

Granular 'A' shall be crushed limestone only. The use of recycled granular material under this contract is strictly prohibited.

All granular materials shall be placed to the depths as specified in the Contract Specifications and on the Contract Drawings.

Payment for granular materials will be based on the weigh bills from a Government certified weigh scale and will be by the tonne. To control granular costs, the Contract Administrator staff will be strictly controlling the vertical trench requirement and roadway base depth. The onus will be on the Contractor to ensure that the Engineer is furnished will all delivery slips as these will form the method of measurement for payment. No payment will be made for delivery slips not signed by the Engineer.

When using select import native fill, the compacted backfill shall consist of selected native soil and shall be constructed in 300mm lifts to achieve 98% of the Standard Proctor Density.

S10. SUBDRAIN

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall also apply.

The subdrain shall be 100 mm diameter CL 300 (BIG 'O'-BOSS 2000) perforated rigid high density corrugated polyethylene pipe with geotextile sock meeting Class 324430C and ASTM D3350, with connectors.
The unit price bid shall also include all fitting connections to install the subdrain in its proper location and connection to catchbasin outlets. The Contractor shall note that the subdrain location shall be directly behind the concrete curb and gutter, and shall be connected to the nearest downstream catchbasin or as directed.

Granular 'A' surround shall be paid for under the Granular item in the Form of Tender.

Payment will be made at the unit price noted in the Form of Tender and will be by field measurement as determined by the Engineer.

S11. CONCRETE CURB AND GUTTER

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document and the Town of Lincoln Municipal Design and Quality Standards, the following shall also apply.

The Contractor shall take due precaution to protect freshly placed concrete from being damaged, marred or defaced. In the event that the green concrete is marred or damaged in any way, the Contractor shall break out and replace the damaged sections. Patching or grinding of damaged, marred or defaced concrete will not be accepted. The unit price bid shall be deemed to have allowed for this contingency.

A total tolerance (or elevation variance) of 5mm will be accepted as reasonable variance from the specified curb and gutter elevations. This is in relation to all vertical alignments, horizontal alignments and slopes. If the curb and gutter is not constructed within the allowable elevation variance of 5mm, the Contractor shall, at their expense, rectify such error, remove and replace defective works and assume the associated extra costs of all related and affected items to the satisfaction of the Town.

"Capping" of curb depressions will not be permitted.

Sawcutting of curb depressions will not be allowed.

Supply, placement and compaction of Granular 'A' to be paid under the appropriate item. The exact location of dropped curbs will be determined in the field by the Engineer.

The unit price bid for concrete curb and gutter and sidewalk shall include costs for hand work, protection during cold weather concreting, and conform to OPSS 351 and OPSS.MUNI 353. No premium or change order will be acknowledged.

Payment will be made at the unit price noted in the Form of Tender and will be by field measurement as determined by the Engineer.

S12. CONCRETE SIDEWALKS

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document and the Town of Lincoln Municipal Design and Quality Standards, the following shall also apply.

The Contractor shall take due precaution to protect the finished surface of freshly laid concrete from being damaged, marred or defaced. In the event that the freshly placed concrete is marred or damaged in any way, the Contractor shall break out and replace the entire damaged sections. Patching or grinding of damaged, marred or defaced concrete

will not be accepted. The unit price bid shall be deemed to have allowed for this contingency.

For sidewalks, the unit price bid shall include excavation to subgrade, forming, finishing and curing of 30 MPa concrete, 125mm thick (residential) or 150 mm thick (commercial) on 150 mm granular 'A' base including all materials and labour, all in accordance with municipal standards and OPSS.

Private concrete sidewalks shall be constructed to match the existing depth/width and paid for under the standard sidewalk item.

The Contractor shall adjust the concrete sidewalk crossfall where required to allow for positive drainage from the driveway and housewalks. Where the new sidewalk has caused ponding, the Contractor shall remove and replace the sidewalk at no additional cost to the Contract. The Contractor shall include the supply and installation of a bond breaker (either plastic or tar paper) when the new sidewalk is installed adjacent to the concrete curb. An expansion joint at this location is not required.

Contractor is advised about OPSS.MUNI.904 and specifically requirements for Cold Weather concrete work. Cold Weather means those conditions when the ambient air temperature is at or below 5°C. It is also considered to exist when the ambient temperature is at or likely to fall below 5°C within 96 hours after completion of concrete placement. Temperature refers to shade temperature. Therefore, all costs associated with incidentals for cold weather work as defined by OPSS.MUNI.904 shall be deemed to be included in the associated unit price for concrete work. Engineer reserves the right to postpone a scheduled pour should in his opinion cold weather measures need to be undertaken by the Contractor and required materials and equipment are not available on-site. No additional payment will be considered for concrete protection and curing measures and/or delay due to cold weather.

Payment will be made at the unit price noted in the Form of Tender and will be by field measurement as determined by the Engineer.

S13. ASPHALT MILLING

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall apply.

The unit price shall include all handwork required around appurtenances.

A 50 mm thick asphalt surface must be maintained along the lip of the gutter, at the centre of the roadway, at tie-in sections and at all edges of all appurtenances.

All asphalt milling shall be completed 24 hours prior to the asphalt overlay so that the Engineer can review the milled areas and request modifications if necessary. Any costs associated with re-mobilization of the milling machine and labour to modify areas shall be included in the unit price.

Disposal of the asphalt millings shall be the responsibility of the Contractor.

Payment will be made at the unit price noted in the Form of Tender and will be by field measurement as determined by the Engineer.

S14. SUPPLY AND PLACE HOT MIX ASPHALT

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document and the Town of Lincoln Municipal Design and Quality Standards and, the following shall also apply;

The Contractor shall include in the unit prices all materials, labour and equipment necessary for the supply, placement and compaction of hot mix asphalt including sawcutting, power sweeping prior to asphalt placement, disposal of debris and the supply and placement of tack coat in accordance with OPSS 310.

Clause B14.09 for price adjustment Provisions is not applicable under this Contract.

Asphalt shall be placed to the depths as indicated in the Form of Tender. Placement of asphalt shall be at a maximum of 60mm lifts.

The asphalt paver used must be capable of paving the entire road in a single pass where it is less than 4.00m wide, including placing the crown where required.

After placement and compaction of asphalt, the Contractor shall ensure that all structure covers and catchbasin grates are free of asphalt and can be opened with minimal effort.

Adjustment of all new appurtenances to base course elevation all maintenance holes, catchbasins, chamber and valves shall be included in the unit price.

Asphalt trench restoration shall be required as determined by the Contract Administrator. The restoration shall consist of a minimum of 100mm of HL8 for local roads and 150mm for Regional roadways.

Compaction testing during placement and rolling stage shall be by nuclear density gauge. The Marshall Maximum Relative Density (MRD) shall have a compaction percentage of

at least 93% and have a minimum of 5 nuclear density test readings in 500m single lane pavement (10 tests per 250m, 2 lane pavement).

For all driveways, asphalt surface shall be HL3F (Fine).

Payment will be based on the weigh bills and will be by the tonne. Contractor to note temporary asphalt ramping will be required at driveways and intersecting roadways. This work is to be included and no additional fees will be considered.

S15. ADJUSTMENT OF APPURTENANCES

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall apply.The provisions of OPSS 408 shall apply except as amended or extended herein.

The unit price shall include all labour, equipment and materials for the adjustment of all **existing** maintenance hole frame & covers, catchbasin frame and grates and valves to finished asphalt elevation. Adjustment to base asphalt elevation is deemed to be included in unit price bid for hot mix base asphalt placement.

No payment will be made under this item for newly constructed manholes or catchbasins. Adjustments for all new precast manholes for base and surface asphalt are deemed to be included their respective unit price in the Form of Tender.

Existing maintenance hole covers and catchbasin frames and grates shall be replaced with new.

Maintenance holes and catchbasins shall be raised to proposed finished grades using precast components in accordance with OPSD 701.010 through 701.081. Single maintenance hole adjustment units shall be installed to a maximum of 150 mm. Should the structure need to be raised beyond 150 mm, the Contractor shall use precast concrete risers sized to suit. In addition, ladder rungs shall be installed to ensure maximum elevation difference from surface to first rung is 450 mm.

Payment will be made at the unit price noted in the Form of Tender and will be by field measurement as determined by the Engineer.

S16. ASPHALT WALKWAYS AND DRIVEWAYS

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall apply.

The unit price bid for this item shall be complete compensation for the restoration of asphalt driveways, aprons and asphalt boulevards, as necessary, and as directed by the Engineer and shall include sawcutting, excavation, subgrade preparation, placement and compaction of required granular 'A' base material and grading for positive drainage.
The supply of granular 'A' and hot mix asphalt shall be paid for under separate item in the Form of Tender.

The Contractor shall note that the asphalt thicknesses specified in the NPSCD are a minimum requirement. Existing driveway thicknesses are to be matched if greater.

The Contractor is required to adjust the driveway, apron and boulevard gradient to allow for positive drainage from the existing asphalt surface to the road right-of-way. Where a restored asphalt has caused ponding, the Contractor shall adjust and restore the asphalt and gradient at no additional cost to the Contract.

In addition to the above, the unit price bid shall cover any required restoration works between the contract limits (property line) and building face, where directed by the Engineer.

Payment will be made at the unit price noted in the Form of Tender and will be by field measurement as determined by the Engineer.

S17. TOPSOIL AND SOD

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document and the provisions of OPSS 802, 803 and OPSS.MUNI 804 shall apply expect as amended or extended herein.

Topsoil (Imported)

Imported topsoil shall contain not less than 4% organic matter for clay loams and not less than 2% for sandy loams, with an acidity value ranging from pH 6.0 to 7.5 and capable of sustaining vigorous plant growth. It shall be free from any admixture of subsoil, clay lumps, stones and any other extraneous matter.

No material will be supplied under this Item without the approval of the Engineer. The Contractor shall supply a sample of the intended topsoil material to the Engineer three weeks in advance of placement.

The approved topsoil material shall be placed at a minimum compacted depth of 100 mm. The finished surface shall be smooth, firm against footprints, with a fine, loose texture before sod is placed.

Payment will be made at the unit price noted in the Form of Tender and will be by field measurement as determined by the Engineer.

Native topsoil shall not be stockpiled for use without prior approval by the Engineer.

Sodding

Sodding shall not commence until topsoil is approved by the Engineer.
During wet weather, allow sod to dry sufficiently to prevent tearing during lifting and handling.

During dry weather, protect sod from drying and water sod as necessary to ensure its validity and prevent dropping of sod in handling. Dry sod will be rejected.

Water immediately after sod laying to obtain moisture penetration through sod into top 50 mm of topsoil.

Provide adequate protection of sodded areas against erosion and mechanical damage. Remove protection after lawn areas have been accepted.

All sod shall be "cut in" flush with the existing sod. An elevation variance, greater than 20mm, will not be acceptable and will be replaced at the cost to the Contractor.

For areas to be sodded with slopes of 3:1 or greater, lay sod sections at right angles to slopes and secure with wooden pegs. Place pegs 2 per m2, 100 mm below top edge and in the centre to prevent shifting of sod and drive pegs flush with top of sod.

Sodded areas will be accepted at final inspection provided that:

- Sodded areas are properly established.
- Sod is free of bare and dead spots and without weeds.
- No surface soil is visible when grass has been cut to height of 40 mm.
- Sodded areas have been cut a minimum of two (2) times.
- Sodded areas shall be rolled with a mechanical roller, providing 2,500 kg/m2 to ensure a good bond between the sod and topsoil and to remove minor depressions and irregularities.
-

Apply a fertilizer of 0-20-0 super phosphate with adequate amount of moisture at a rate of 225 kg/ha prior to sod application.

Sod is to be laid in a continuous fashion. No isolated areas of sod, which are to be integrated with main portion of sod, will be accepted.

One (1) month after installation, if broadleaf weeds begin to appear, apply herbicide in accordance with the manufacturer's direction. Avoid decamba solutions near trees and shrubs.

The Contractor shall provide 120 days of maintenance to ensure the sod is in good health. This includes but not limited to, watering and weeding.

Any areas damaged by the Contractor and/or Sub-Contactor by their method of construction, or by use of equipment, shall be reinstated at no additional cost to the Owner.

All supplied sod must be reviewed and approved by the Engineer prior to cutting and shipping to site.

The Contract unit price for topsoil and sod shall constitute full compensation for supplying & placing of 100mm of topsoil, sod, watering and fertilizer application as specified, and for all labour, equipment and materials necessary to complete the work. In addition, the unit price shall include compensation for extended watering as required during the period of construction up to final inspection to ensure good rooting and growth.

Payment will be made at the unit price noted in the Form of Tender and will be by field measurement as determined by the Engineer.

S18. PERMANENT SIGNS

This specification covers the requirements for the installation of new permanent ground mounted Stop signs, as well as the relocation and removal of existing ground mounted signs. This specification does not include temporary construction signage.

The provisions of the Ontario Traffic Manuals (OTM) Books 1 through 11, OPSS.MUNI 510 Removals, OPSS.MUNI 706 Construction Specifications for Traffic Control Signing, Sign Support Manual, King's Highway Guide Signing Policy Manual and the Highway Traffic Act (HTA) Regulation 615 shall apply except as amended or extended herein.

The Contractor will be responsible for the maintenance and protection of all existing signs in throughout the project. If damaged, the Contractor will replace at their cost.

The Contractor will complete a sign inventory of the location and full description of all signs within the work area prior to the start of construction. The Contractor will ensure all existing signs not to be removed are maintained properly.

Roadside Stop signs will be supplied by the Contractor. The contractor will supply and erect 9 foot sections of 1-3/4" x 1-3/4" galvanized square Telespar sign post tubing set into a three-foot anchor assembly. The anchor assembly (2" x 2") will be and installed as per manufacturer's instruction. A 150mm PVC sleeve will be set in hard surfaces (concrete or asphalt) to allow placement of the sign posts.
Payment shall be made for each sign erected and the unit price bid shall include the supply and installation of the steel post, signs and all applicable hardware required for the installation of the sign board.

Payment at the contract price for the above tender item shall be full compensation for all labour, equipment and material to do the work.

S19. PAVEMENT MARKINGS

The provisions of OPSS 710, OPSS 1713 (Thermal Plastic), OPSS 1714 (Cold Plastic), OPSS 1716 (Waterborne Paint) and OPSS 1750 (Traffic Paint Reflectorizing Glass Beads), shall apply except as amended herein.

The unit price bid shall include all necessary labour, material and equipment to apply the line markings as indicated on the Contract Drawings including all required layout.
Line marking shall be applied to conform to the provisions of Book 11 – Pavement, Hazard and Delineation Markings, of the Ontario Traffic Manual.

All longitudinal lines shall be a nominal 100 mm width. Stop bars shall be 600 mm width.

Pavement markings shall be yellow and white reflectorized thermoplastic pavement marking material or field reacted polymeric pavement marking material or approved equal. Thermoplastic (also known as durable) shall be used at intersections for crosswalks, stop bars and all lines within 30 meters of the stop bars.

Payment will be paid in full upon acceptance by the Town of Lincoln.

S20. GRAVITY SEWERS

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall apply.

The provisions of OPSS.MUNI 410 shall apply except as amended or extended herein.

These specifications apply to all gravity pipes.

The Contractor must use a trench box to install the sanitary sewer, storm sewer, catchbasin leads, sanitary laterals and any other pipes. The width of the trenchbox shall conform with OPSD 802.010 and OPSD 802.020 for Flexible Pipe and OPSD 802.031 for Rigid Pipe. The height of the trench box shall be from 150mm below the bottom of the pipe to the level of the existing ground. If the Contractor does not wish to use a trench box as described above, then payment for the granular 'A' material will be based on the theoretical dimensions, which are as follows:

Width	Follow OPSD 802.010, OPSD 802.020 and OPSD 802.031 as applicable
Height	From 150 mm below the pipe to the level of the existing ground surface
Length	Equal to the pipe length
Granular 'A'	To calculate granular 'A' weight (t)
	Granular 'A' (t) = 2.4 x (Width x Height x Length - (p x D^2 x L) / 4) where: 'D is the outside diameter of the pipe 'L' is the length of pipe 'P' is approximated at 3.1416

Precast concrete pipe shall be Type HS (Type 50). Pipe and fittings shall conform to CAN/CSA A257.1 or A257.2, Ontario Provincial Standards and be marked with a "Prequalification Stamp" and shall be in conformity with the specified strength.

PVC storm and sanitary pipe and fittings shall be Ring-Tite PVC conforming to CSA Standard B182.2, ASTM D3034 and ASTM F679.

All concrete pipe connections to existing and proposed structures shall be as detailed on the Contract Drawings and as follows:

.1 Pipe diameter ≤ 1050 mm using Kor-n-Seal adapters or reviewed equal.

.2 Pipe diameter > 1050 mm in accordance with pipe manufacture and the Ontario Concrete Pipe Association recommendations.

All PVC pipe connections to existing and proposed structures and pipelines shall be as detailed on the Contract Drawings and as follows:

.1 PVC pipe connections to structures shall be made using Kor-n-Seal adapters or reviewed equal.

.2 PVC pipe connections to new sewers shall be made with pre-manufactured tees.

.3 PVC pipe connections to existing sewers shall be made with "InsertaTee".

.4 Sanitary laterals shall be 125mm dia. PVC installed as per DPW-501 and green in colour.

.5 All sanitary laterals to be connected to pipeline and no connection to be made to manholes.

Connections must be watertight. Any visible leakage detected during construction or maintenance period shall be repaired by the Contractor at no additional cost to the Owner.

The Contractor shall ensure that the new sewer pipe does not protrude more than 20 mm into an existing or new maintenance hole. Existing maintenance holes shall be re-benched to accommodate new connections per OPSD 701.021.

The unit prices bid shall include excavation of all types of soil including asphalt, road base for a vertical trench, any required dewatering, sheathing, shoring and bracing for the vertical trench, temporary and permanent supports of all utilities and services within the trench, placement of bedding, pipe installation, connections to existing or new maintenance holes and existing or new service laterals, placement or removal of manufactured plugs, placement of cover and backfill material, compaction, disposal of surplus excavated material, removal and disposal of existing sewers.

During the sewer installations, the Contractor shall be responsible to maintain the proper functioning of each sanitary, storm and water service lateral located in the field or shown on the construction drawings, at no additional cost to the Contract.

The Contractor is to note that full Granular 'A' will be used for backfill in shoulders, driveways, sidewalks and travelled roadways unless otherwise noted by the Contract Administrator. Native material will be used in all other areas. Where native material is used, the Contractor is to include in their price for all handling, hauling, stockpiling, placement and compaction. Supply of Granular 'A' will be paid for under separate item in the Form of Tender.

The unit price bid for catchbasin leads shall include connections to the sewer main using pre-manufactured tees for pipe size less than and equal to 600 mm diameter and inserta-tees for pipe sizes greater than 600 mm diameter, all bends, proper couplings at maintenance holes and catchbasins, manufactured plug or cap at property lines, and reconnecting existing rear yard catchbasin leads using appropriate reducers and couplings. The unit price bid shall also include extending existing leads, when required, regardless of its length and any required sawcutting.

Where the new pipe installation crosses or is adjacent to an existing pipe or structure, the Contractor shall support the existing pipe or structure. In the event the existing pipe or structure becomes disturbed, the Contractor shall replace or repair the pipe or structure regardless of the material and at no additional cost to the Contract.

Where the new pipe or lateral installation crosses a pipe which is abandoned, or is to be abandoned and requires removal, the abandoned pipe sections remaining shall be plugged and sealed with concrete on either side of the new pipe at no additional cost to the Contract. Verification of the abandoned or to be abandoned pipe shall be the responsibility of the Contractor.

The Contractor shall note that the removal and disposal of the roadway asphalt in the sewer trench and road reconstruction areas will be paid under a separate item.
The unit price bid for this item shall include all sawcutting required.

The Contractor shall be responsible for all bypass pumping of active sewer lines as necessary.

Payment will be made at the unit price noted in the Form of Tender and will include all items in the "Basis of Payment", as specified in OPSS.MUNI 410.

Payment will be made at the unit price noted in the Form of Tender.

S21. PRECAST STRUCTURES

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document and Special Provisions the following shall also apply.

Maintenance Holes

Materials and installation shall be in accordance with OPSS 407 and any other specification referenced therein and include benching, aluminium safety rungs, any required safety gratings, bulkheads, adjustable frame and cover - full lid for standard maintenance hole and Grate Lid for catchbasin maintenance hole, adjustment units and Kor-n-Seal adapters. All maintenance holes shall be supplied with monolithic base.

Frame and cover shall be as specified in the adjustment of existing maintenance holes and include manhole identification label (ie. STORM, WATER or SANITARY) and year of installation cast into the cover to allow for easy identification in the field. Concrete collars around all new maintenance holes shall be included in the price for new maintenance holes and shall be High-early-strength.

In addition to the installation of the precast maintenance hole manufacturer's rubber gaskets and additional bitumastic tape, the one of the following waterproofing membranes shall be installed on all sanitary sewer manhole riser sections:

.1 Colphene 3000 complete with Elastocol Stick primer as supplied by Soprema Inc., Toronto, ON (800-265-2842).

.2 Infi-Shield External Sealing System as supplied by Aqua-Spec Ltd., London, ON (519-657-7504)

.3 WrapidSeal Manhole Encapsulating System complete with primer as supplied by Emco, St. Catharines, ON (905-685-3626).

If precast concrete adjustments are used, the waterproofing noted above shall be applied to the exterior of all adjustment units and must be overlapped onto the cap of the precast maintenance hole. All exterior joints with separation greater than 5mm shall be parged prior to the installation of the waterproofing membrane.

Catchbasins/Ditch Inlets

The frame grating shall be in accordance with OPSD 400.020 or OPSD 400.010 or OPSD 403.010. The catchbasin shall provide for a minimum 1.5 m depth to invert of catchbasin lead unless otherwise specified and the placements of a minimum 100 mm to a maximum 300mm of concrete adjustment units as per OPSD 704.010.

All costs for granular shall be included under the appropriate item in the Form of Tender. Precast structures shall be placed on a minimum of 300 mm thick crushed limestone Granular 'A' bedding compacted to 100% S.P.M.D.D. or as indicated on the Contract Drawings.

Adjustments for all new precast catchbasins for base asphalt are deemed to be included in the unit price in the Form of Tender.

Adjustments for new precast manholes for both base and surface asphalt are deemed to be included in the unit price.

S22. SWALE

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall also apply.

The contractor shall utilize a telescopic boom, carrier mounted (rubber tired) excavator (Gradall or equivalent) to carry out the required ditch regrading.

The unit price bid shall include the following:

- Layout as required to provide positive drainage for the designated sections of ditch to be regraded.
- Excavation and reshaping of the ditch as shown on the Contract Drawings
- Associated reinstatement work (sod, seed, shouldering, etc.) will be paid for under the separate items identified in the Schedule of Quantities.

All excess material shall be disposed of off-site by the Contractor in accordance with NPSCD Special Provisions - General - Item G11.

Measurement for payment at the Contract price shall include all labour, equipment and materials required to complete the proposed ditches as shown on the Contract Drawings. Measurement will be per linear metre measured along the centerline of the proposed ditch. All excavation works associated with the proposed ditches are deemed to be included in the unit price bid for ditching. No additional payment for excavation will be made.

S23. TEST PITS

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall also apply.

The Contractor shall provide all necessary labour, materials and equipment to excavate and backfill exploratory test holes at locations and depths as directed by the Contract Administrator. Backfill shall be Granular 'A' compacted to 100% Standard Proctor Maximum Dry Density and disposal of the excavated material. Payment for granular shall be paid for under the appropriate item in the Form of Tender.

If excavation is within the roadway, the surface layer shall be temporarily reinstated with 50 mm cold mix asphalt. All costs for asphalt surface reinstatement shall be deemed to be included in the unit prices.

The purpose of these test holes shall be to verify existing infrastructure where a design change may be required due to possible conflicts during construction or for test digs on existing services (laterals) to determine their function and/or location or for any other reason required by the Contract Administrator.

S24. DUST CONTROL

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall also apply.

The Contractor shall resolve within two (2) hours all requests by the Engineer or Region to clean the roadways, provide dust control and fill pot holes regardless of the time or day. Any calcium chloride shall conform to OPSS 506 and be applied uniformly by means of a mechanical spreader when and as directed by the Contract Administrator.

Calcium chloride will be measured in tonnes for that quantity used in the work for dust control.

Dust control (water or calcium chloride) must be applied within two (2) hours of request on weekends and holidays.
Payment will be based on the unit price in the Form of Tender as confirmed by the Engineer.

S25. COLD MIX, OPEN GRADED BITIMIOUS PAVEMENT

The provisions of the Niagara Peninsula Standard Contract Documents, Item B25, shall apply except as amended or extended herein.

The trench at road crossing, as directed by the Contract Administrator, shall be temporarily reinstated with 50 mm cold mix bituminous material on top of the compacted backfilled trench

The unit price bid for this item shall also include the removal and disposal of the temporary cold mix reinstatement prior to the final reinstatement.

The Contractor shall be responsible for maintaining the temporary cold mix reinstatement until the final reinstatements are completed.

The measurement for payment shall be by the tonne for material placed.

The Contractor shall incorporate all these provisions into the unit price bid for this item.

S26. DISPOSAL OF EXCAVATED CONTAMINATED SOILS

The unit price bid shall include all materials, labour and equipment required for the removal and disposal of contaminated excavated material as determined by the Owner's geotechnical consultant on site during construction.

The Contractor will be required to coordinate and conduct test pitting as required in the subject area in advance of construction works it order for test samples to be taken by the Owner's Geotechnical Consultant for verification of existence and extent of contamination.

The location and frequency of test pits shall be defined by the Geotechnical Consultant. All costs for pre-construction test pitting shall be deemed to be included in the Tender Price submission. No additional payment will be made.

Contaminated material shall be defined as all oil material having Total Petroleum Hydrocarbon for gas diesel, TPH (gas/diesel) greater than 100 mg/kg and material with heavy metal concentration that exceed MOE Table 3 Standard. Suspect materials shall be defined as soil material having an odour, staining or appearance that may indicated that the material has been impacted by contamination. These materials shall be disposed of at a MOE Licensed Disposal Facility which holds a Certificate of Approval (COA) to accept contaminated or waste materials.

Waste/contaminated materials must be disposed of in accordance with the latest Ontario Regulations regarding handling and disposal of contaminated materials.

Material must be transported by a MOE licensed carrier of such material. Contractor to provide COA's and carrier licenses for waste disposal facilities and waste carriers, respectively.

The Contractor shall comply with all vehicle, transportation and disposal regulations and all precautions shall be made to avoid spills and leaks. Clean-up of any spills that may occur is the responsibility of the Contractor and all costs associated with the clean-up shall be deemed to be included in the unit price.

Payment will be based on tonnes and shall be verified by net weight as recorded by a government certified weigh scale. All costs associated with the requirements listed above and Ontario Regulations shall be deemed to be included in the unit price.

S27. ROCK EXCAVATION IN TRENCH

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, OPSS.MUNI 206 and OPSS 403, the following shall apply.

The unit price bid shall include all materials, labour and equipment required to remove and dispose of rock within the project limits by hoe ramming only.

Rock removal by excavation using excavator bucket or rock bucket is not an identified separate pay item and is not considered under this rock excavation item. Costs for excavation of rock by excavator bucket or rock bucket is deemed to be included as part of standard excavation.

Techniques used for rock removal must prevent damage to adjacent pipes, structures, property and work. Resulting ground vibrations must consistently be maintained below levels that will cause damage to adjacent pipes, structures, property and work. Rock removal shall not be permitted within 30 m distance of fresh concrete or grout poured within 24 hours.

Contractor must protect adjacent property, workers, Engineer, Owner and the general public from damage or injury from improper handling of removed rock, excessive ground vibrations and/or excessive airblast overpressure levels. Rock removal operations shall comply with the requirements of the Ontario Health and Safety Act.

Rock removal by means of blasting will not be permitted.

To reduce unnecessary rock over break, the Contractor may use pre-line drilling as required. All costs shall be deemed to be included in the unit price.

Definition of rock: Any solid material which cannot be removed by means of heavy duty mechanical excavating equipment with bucket. Frozen material will not be classified as rock.

Remove rock to alignments, profiles, and cross sections as indicated. Use rock removal procedures to produce uniform and stable excavation surfaces.

Excavate trenches to lines and grades to minimum of 300 mm below pipe invert indicated. Provide recesses for bell and spigot pipe to ensure bearing will occur uniformly along barrel of pipe. Cut trenches to widths as indicated.

Rock excavation shall be limited to a maximum depth of 300 mm below roadway structure base. Correct unauthorized rock removal at no extra cost, by filling over-excavated areas with fill concrete as specified. Measurement for payment for rock excavation shall not exceed the above maximums.

THE OWNER WILL NOT ENTERTAIN ANY CLAIMS REGARDING DIFFICULTIES IN REMOVING ROCK OR VARIATIONS IN QUANTITIES OF THE REQUIRED ROCK EXCAVATION. COMPENSATION WILL NOT BE CONSIDERED FOR OVER BREAKAGE.

Dispose of excavated rock off site.

Do not dispose of rock into landfill. Material must be sent to appropriate disposal site as outlined in the Special Instructions to Bidders found at the beginning of this document.

Provide the Engineer with affidavit or release from disposal site owners indicating that permission has been obtained to dispose of excavated rock at said site.

Payment will be made at the unit price noted in the Form of Tender and will be by field measurement as determined by the Engineer.

S28. UNSHRINKABLE FILL

This item shall be used to substitute unshrinkable backfill for native or granular backfill material where the Contractor has been directed to do so by the Contract Administrator. The price shall cover all additional costs involved in substituting shrinkable fill for any other backfill materials, including the removal and disposal of surplus material that will not be used as backfill as a result of this substitution. Unshrinkable backfill shall be supplied, mixed and placed in accordance with OPSS.

Measurement for payment shall be by volume as specified within OPSS.

S29. WATERMAIN INSULATION

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall apply:

Where the minimum 1.5m cover cannot be achieved, the Contractor shall provide sufficient insulation to prevent freezing of the specified watermain and services. Contractor to wrap services with 13mm thick Tundra Seal or approved equivalent wrap, and 50mm of Touch N Foam professional or approved equivalent spray foam. The insulation material shall be 65mm of Strofoam HI-40 or approved equivalent extruded polystyrene, protected on both faces by a layer of 6mm plywood.

Payment will be made at the unit price noted in the Form of Tender and will be by field measurement as determined by the Engineer.

END OF SECTION

SUPPLEMENTARY
GENERAL CONDITIONS OF CONTRACT

CONTRACT NO. 2019002PW

Elizabeth Street Road Reconstruction
IN THE TOWN OF LINCOLN

SUPPLEMENTARY GENERAL CONDITIONS OF CONTRACT

Refer to Niagara Peninsula Contract Documents

STANDARD DRAWINGS

CONTRACT NO. 2019002PW

Elizabeth Street Road Reconstruction
IN THE TOWN OF LINCOLN

STANDARD DRAWINGS

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SUPPLEMENTARY
GENERAL CONDITIONS OF CONTRACT

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OPS GENERAL CONDITIONS OF CONTRACT

CONTRACT NO. 2019002PW

Elizabeth Street Road Reconstruction
IN THE TOWN OF LINCOLN

OPS GENERAL CONDITIONS OF CONTRAT

Refer to Niagara Peninsula Contract Documents

GEOTECHNICAL REPORT

LANDTEK LIMITED
Consulting Engineers

205 Nebo Road, Unit 3
Hamilton, Ontario
Canada
L8W 2E1

Phone: 905-383-3733
Fax: 905-383-8433
engineering@landteklimited.com
www.landteklimited.com

Geotechnical Investigation
Proposed Sanitary Sewer Replacement and Road Reconstruction
Elizabeth Street from Mountain Street to Highland Park Drive
Beamsville, Town of Lincoln, Ontario

Prepared for:

The Town of Lincoln
Public Works Department
4800 South Service Road
Beamsville, Ontario
L0R 1B1

File: 12087
June 5, 2012

EXECUTIVE SUMMARY

Landtek Limited is pleased to submit the geotechnical investigation report for the sanitary sewer replacement and road reconstruction proposed by the Town of Lincoln on Elizabeth Street between Mountain Street and Highland Park Drive in Beamsville Ontario. The work was initiated following receipt of the authorization to proceed on May 14, 2012 from the project design consultant, AECOM Canada, on behalf of the Town of Lincoln.

Information provided by AECOM indicates that the work includes replacement of sanitary sewers, construction of storm sewers, and full width and depth road reconstruction to an urban cross-section with concrete curbs and sidewalks on Elizabeth Street.

Fieldwork at the site was carried out in May 2012. Five boreholes were drilled on May 24, 2012, to depths of between 5.2 m and 8.2 m. The borehole locations are shown on drawing 1 in Appendix C. The borehole logs are also provided in Appendix C.

The ground elevations at the boreholes were estimated from project topographic data supplied by AECOM Canada and the elevations are considered approximate. The elevations refer to the geodetic datum.

SITE AND SUBSURFACE CONDITIONS

The borehole conditions are presented on the borehole logs in Appendix C. Photographs 1 to 4 inclusive in Appendix E illustrate the typical site conditions. The road section is approximately 460 m in length and is a bituminous surfaced two lane residential street with negligible shoulders. The difference in ground elevation between the east end of the project at Mountain Street and the west end at Highland Park Drive is in the order of 10 m. Figure 1 provides a key plan of the road sections.

The pavement on Elizabeth Street exhibits several areas of repair with widespread age-related map cracking, liner cracking in the wheelpaths, outer edge rutting and distortion, and longitudinal centreline joint cracking. The pavement structure on Elizabeth Street generally consists of about 75 mm of bituminous material over 255 mm to 380 mm of granular base. Borehole 5 is in a cracked and distressed pavement area within the turning radius at Mountain Street onto Elizabeth Street and there is about 150 mm of bituminous material over 150 mm of granular base.

Geologic mapping of the study area [1] as well as geotechnical information [2, 3, and 4] indicates that the predominant native subsurface deposits are red shale of the Queenston formation and silty clay till of the Halton formation. The borehole data on Elizabeth Street is consistent with the background information and indicates that silty clay till overlies red shale in boreholes 1 (at Highland Park Drive), 2 (at Charles Street), and 3 (at St. George's Drive) at depths of 4.0 m, 3.5 m, and 2.3 m respectively, which relates to elevations 131.0 m, 127.7 m, and 128.1 m. At boreholes 4 and 5 near the east end of Elizabeth Street were advanced to depths of 8.2 m and 6.7 m respectively and red shale was not encountered and silty clay till is the predominant native subsurface stratum. At boreholes 2 and 5 a grey organic silty clay layer was encountered immediately below the granular road base.

PAVEMENT STRUCTURE CONSIDERATIONS

The study road section of Elizabeth Street accommodates low volumes of mainly car traffic with a low percentage of light commercial trucks. The recommended minimum pavement structure for reconstruction is provided in Table 4.1 of the report text and has an expected design life of about 20 years. That is, the number of years of service to the first major rehabilitation of the pavement provided routine maintenance is carried out. A 20 year design typically would require crack sealing at about year 9 and base repairs by year 14.

MANAGEMENT OF EXCAVATED SOIL AND ENVIRONMENTAL CONSIDERATIONS

The chemical analyses for metals and inorganic parameters that were carried out on four selected soil samples are provided in Appendix D. The samples were tested in relation to Table 3 soil quality standards for Residential/Parkland/Institutional property use given in the MOE document "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", dated April 15, 2011. The results are summarized in Table 5.1 of the report text.

The test results are within the allowable soil quality standard limits for metals and inorganic parameters on two of the four samples tested. The samples for boreholes 1 and 5 have elevated Electrical Conductivity values that are marginally above the soil quality standard for residential/parkland/institutional land use. The results for the Electrical Conductivity (EC) parameter are considered to be related to the historical use of road salts for winter de-icing operations and do not present an adverse health risk. Ontario Regulation 153/04 (as amended by Reg. 511/09) indicates that elevated residual road salt parameters in soils within the road allowance that result from winter salting applied to address road safety issues are not regarded as an environmental problem that requires remediation.

The chemical test data indicates that there is no requirement to dispose of the excavated soils as a waste material at a registered landfill site. In the event that excess excavated soils are to be disposed of off-site the contractor may be required to carry out additional chemical testing to address the soil quality criteria that were established for the site receiving the materials.

The text of the report provides additional information and comments with respect to the soil and groundwater conditions, excavations and backfill, subsurface concrete, pavement design and construction.

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1.0 INTRODUCTION

Landtek Limited is pleased to submit the geotechnical investigation report for the sanitary sewer replacement and road reconstruction proposed by the Town of Lincoln on Elizabeth Street between Mountain Street and Highland Park Drive in Beamsville, Ontario. The work was initiated following receipt of authorization to proceed on May 14, 2012 from the project design consultant, AECOM Canada, on behalf of the Town of Lincoln. The work was carried out in accordance with the Landtek Limited scope of work and fee estimate that was submitted to AECOM Canada on May 1, 2012.

Information provided by AECOM indicates that the work includes replacement of sanitary sewers, construction of storm sewers, and full width and depth road reconstruction to an urban cross-section with concrete curbs and sidewalks on Elizabeth Street.

The primary objectives of the investigation were: (1) determine the existing pavement structure and subsurface soil and groundwater conditions to be encountered during sewer replacement and road reconstruction; (2) provide design and construction recommendations with regards to pavement structure thicknesses and materials, and trench backfill and compaction requirements. Information has also been provided to identify the environmental characteristics of the subsoils and their suitability for reuse on the site.

2.0 METHODOLOGY

Fieldwork at the site was carried out in May 2012, and included borehole layout, service clearances, borehole drilling and soil sampling, drill supervision, traffic control, and a condition evaluation of the pavement on the subject road. Five boreholes were drilled on May 24, 2012 with boreholes 1, 2, 3, 4, and 5 drilled to depths of 6.1 m, 5.2 m, 6.1 m, 8.2 m, and 6.7 m respectively. The borehole locations were established in the field by representatives of Landtek Limited and the borehole locations are shown on drawing 1 in Appendix C. The borehole logs are also provided in Appendix C.

Borehole drilling was carried out using a specialist soil drilling contractor, equipped with continuous flight, solid stem augers. Standard Penetration Tests (SPT's) and split spoon samples were taken during drilling at selected depths. Full time supervision of drilling and soil sampling operations was carried out by a representative of Landtek Limited.

The soil samples were transported to our laboratory and visually examined in the laboratory to determine their textural classification. Moisture contents were carried out on all samples.

Four soil samples were selected for analytical testing to determine metals and inorganic parameter concentrations. The test results are provided in Appendix D and the metals and inorganic parameters are presented in comparison to the soil quality standards and land use criteria given in the document "Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011". The chemical testing was completed by AGAT Laboratories Ltd. for Landtek Limited.

The ground elevations at the boreholes were estimated from project topographic data supplied by AECOM Canada and the elevations are considered approximate. The elevations refer to the geodetic datum.

3.0 SITE AND SUBSURFACE CONDITIONS

The borehole conditions are presented on the borehole logs in Appendix C. Photographs 1 to 4 inclusive in Appendix E illustrate the typical site conditions. The road section is approximately 460 m in length and is a bituminous surfaced two lane residential street with negligible shoulders. The difference in ground elevation between the east end of the project at Mountain Street and the west end at Highland Park Drive is in the order of 10 m. Figure 1 provides a key plan of the road sections.

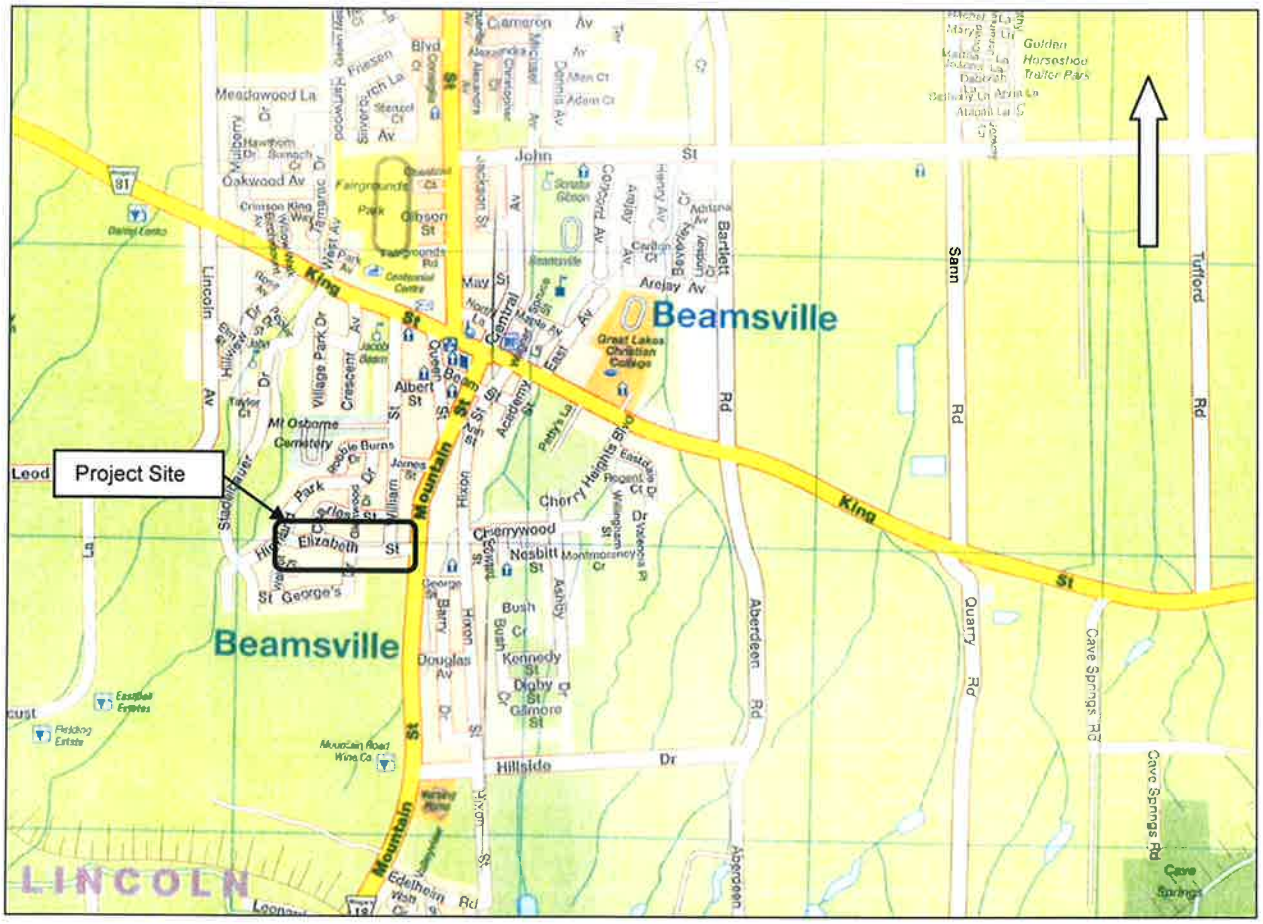


Figure 1 – Key Location Plan of the Road Section

The following text presents the findings of the borehole drilling. The borehole conditions are summarized in Table 3.1.

The pavement on Elizabeth Street exhibits several areas of repair with widespread age-related map cracking, liner cracking in the wheelpaths, outer edge rutting and distortion, and longitudinal centreline joint cracking. The pavement structure on Elizabeth Street generally consists of about 75 mm of bituminous material over 255 mm to 380 mm of granular base. Borehole 5 is in a cracked and distressed pavement area within the turning radius at Mountain Street onto Elizabeth Street and there is about 150 mm of bituminous material over 150 mm of granular base.

Geologic mapping of the study area [1] as well as geotechnical information [2, 3, and 4] indicates that the predominant native subsurface deposits are red shale of the Queenston formation and silty clay till of the Halton formation. The borehole data on Elizabeth Street is consistent with the background information and indicates that silty clay till overlies red shale in boreholes 1 (at Highland Park Drive), 2 (at Charles Street), and 3 (at St. George's Drive) at depths of 4.0 m, 3.5 m, and 2.3 m respectively, which relates to elevations 131.0 m, 127.7 m, and 128.1 m.

At boreholes 4 and 5 near the east end of Elizabeth Street the red shale formation was not encountered and silty clay till is the predominant native subsurface stratum. At boreholes 2 and 5 a grey organic silty clay layer was encountered immediately below the granular road base.

ORGANIC SILTY CLAY AND FILL

The organic silty clay was encountered in boreholes 2 and 5 and is very moist to wet with plant fibres and is firm to stiff in consistency with SPT values in the order of 5 to 9 blows for the full penetration of the split spoon sampler. At boreholes 2 and 5 the organic silty clay extends to depths of 2.1 m and 1.4 m respectively. Silty clay fill was encountered in borehole 1 and extended to a depth of about 1.0 m.

SILTY CLAY TILL

The silty clay till is a glacial deposit that is a mixture of silt, clay, sand, gravel rock fragments, and red shale pieces. The deposit is generally oxidized brown to reddish-brown, moist with moisture contents between 10 % and 14 %, and very stiff to hard with SPT values between 16 and 49 blows for the full penetration of the sampler. At borehole 4 the till unit became grey to reddish-grey in colour below about 4.5 m depth. The silty clay till is considered to be a CL type soil in the Unified Soil Classification System which relates to soils that are inorganic gravelly clays of low to moderate plasticity. The till unit is known to contain occasional cobbles and boulders.

SHALE

The red shale is a sedimentary layered rock deposit that typically is weathered in the upper few metres to the consistency of very stiff to hard silty clay. Below depths of about 1.5 m to 2.0 m into the shale it is relatively sound and hard. At borehole 2 practical auger refusal was encountered in the shale at a depth of 5.2 m. Coring of the shale was not completed to assess the rock quality.

SPT values in the shale are typically in the order of 50 blows for less than 150 mm to 200 mm penetration of the sampler. SPT values in the sound hard shale at several metres into the stratum are typically 50 blows for less 25 mm penetration of the spit spoon sampler. The shale stratum contains grey siltstone layers and may contain limestone seams. Moisture contents in the shale range from about 6 % to 14 %.

GROUNDWATER

Boreholes 1, 4, and 5 were dry on completion of drilling without water seepage. Boreholes 2 and 3 encountered some seepage on completion of drilling with water levels measured at depths of 3.4 m and 3.1 m respectively. Depending upon the precipitation levels and seasonal moisture conditions at various times of the year the water seepage conditions may vary from the conditions in the boreholes with water perched in the till, organic soils, and materials above the shale bedrock.

TABLE 3.1 - SUMMARY OF BOREHOLE CONDITIONS

Borehole No. and Location	Pavement Structure	Approx. Shale Contact Levels		Subsurface Conditions
		Depth	Elevation	
Borehole 1 Just east of intersection with Highland Park Drive	75 mm Bituminous Material 255 mm Granular	±4.0 m	131.0 m	Clay fill to ±1.0 m; Silty Clay Till to ±4.0 m; Shale to EOH @ 6.1 m;
Borehole 2 Opposite intersection with Charles Street	75 mm Bituminous Material 380 mm Granular	±3.5 m	127.7 m	Organic Silty Clay to ±2.1 m; Silty Clay Till to ±3.5 m; Shale to auger refusal @ EOH @ 5.2 m;
Borehole 3 Opposite intersection with St. George's Drive	75 mm Bituminous Material 330 mm Granular	±2.3 m	128.1 m	Silty Clay Till to ±2.3 m; Shale to EOH @ 6.1 m;
Borehole 4 Just west of intersection with William street	75 mm Bituminous Material 255 mm Granular	na	na	Silty Clay Till to EOH @ 8.2 m;
Borehole 5 Just west of intersection with Mountain Street	150 mm Bituminous Material 150 mm Granular	na	na	Organic Silty Clay to ±1.4 m; Silty Clay Till to EOH @ 6.7 m;

Note. EOH means End of Hole.

4.0 PAVEMENT STRUCTURE CONSIDERATIONS

The study road section of Elizabeth Street accommodates low volumes of mainly car traffic with a low percentage of light commercial trucks. The recommended minimum pavement structure for reconstruction is provided in Table 4.1 and has an expected design life of about 20 years. That is, the number of years of service to the first major rehabilitation of the pavement provided routine maintenance is carried out. A 20 year design typically would require crack sealing at about year 9 and base repairs by year 14. The pavement design recommendations in Table 4.1 should be compared to Town of Lincoln requirements and standard pavement sections since the local standards may exceed the recommendations of this report. For Elizabeth Street the environmental conditions with respect to frost depth should override the pavement structure thickness requirements based on vehicle loading conditions. Pavement structure design best practice is to have the total thickness of the pavement to be at least one-half the expected depth of frost penetration. In this case the total minimum pavement structure thickness should be 600 mm.

Table 4.1
Recommended Pavement Structure Layer Thicknesses (Note 1)

PAVEMENT STRUCTURE LAYER	RECOMMENDATIONS
SURFACE COURSE ASPHALT	40 mm OPSS 1150 HL 3
BINDER COURSE ASPHALT	60 mm OPSS 1150 HL 8 (1 lift of 60 mm)
GRANULAR BASE COURSE	150 mm OPSS 1010 Granular A
GRANULAR SUBBASE COURSE	350 mm OPSS 1010 Granular B, Type II (Note 1)
TOTAL THICKNESS	600 mm

Note 1: The Town of Lincoln standard pavement sections may override the recommendations of Table 4.1.

Granular Basecourse and Subbase

The granular base course materials should meet OPSS Granular A specifications, or current Town of Lincoln granular basecourse specifications. Subbase material should meet OPSS 1010 Granular B Type II material which is typically in the Niagara area a quarried 50 mm size limestone product, crushed to Granular "B" Type II gradation specifications.

Hot Mix Asphalt

The binder course asphalt should meet current OPSS 1150 requirements for HL 8 material and the surface asphalt should meet OPSS requirements for HL 3 material. Alternatively, the asphalt mix properties should meet Region of Niagara specifications. The minimum Marshall stability for the HL 8 and HL 3 mixes should be 11,000 N and 9,500 N respectively.

The contract specification should specify a minimum inplace compacted mix thickness without consideration of construction tolerances. The minimum surface asphalt compacted thickness should be 40 mm.

Asphalt cement should meet the requirements of performance graded asphalt in OPSS 1101, and should, as a minimum, be PG 58-28 for both the binder and surface course mixes. Given the relatively light vehicle loads on the subject road sections it is not considered necessary for a bump-up to a higher grade of asphalt cement.

Granular base course and subbase course fill material should be compacted to 100 percent Standard Proctor Density. Hot mix asphalt should be compacted to a minimum 93 percent of the Marshall Maximum Relative Density (MRD) as per current OPSS specification.

4.1 RECLAMATION AND REUSE OF EXISTING PAVEMENT MATERIALS

The existing bituminous material and granular can be reclaimed and reused on the project as granular trench backfill. The gradation of the reclaimed material is expected to not consistently meet OPSS Granular B Type I gradation limits, however, it should be compactable and suitable as trench backfill under the new pavement.

If granular and bituminous materials are reclaimed the preferred methodology is to complete in-place pulverization and reclamation as per OPSS 330 to a depth equal to at least double the existing bituminous thickness. In this regard, the typical pulverization depth should be taken to be about 150 to 200 mm. It is likely that the reclaimed granular will be too variable to be suitable for road subbase granular. If it is proposed to reuse the reclaimed pulverized material as road subbase, it should be stockpiled and sampled to allow for a proper evaluation of the material.

4.2 SUBGRADE PREPARATION

The subgrade support conditions are expected to be variable along the road section due to the fact that significant depths of organic silty clay were encountered at boreholes 2 and 5 just below the existing pavement structure. In some locations subgrade repairs may be required to facilitate pavement construction and involve the excavation of organic soils and replacement with suitable fill. It is recommended that prior to the placement of pavement granular fill the exposed subgrade soil should be inspected and proof-rolled using a loaded tandem axle truck to traverse the exposed subgrade and provide for full coverage. The proof-rolling should be monitored by a geotechnical representative of this office to delineate any soft areas which may require repair. Repairs should be undertaken to avoid creating "bathtub" conditions in the subgrade within the pavement structure.

4.3 GRADING SECTIONS AND DRAINAGE

Pavement improvements should focus on improved longitudinal surface drainage and subsurface drainage. The following OPSD standard drawings are expected to apply to the road reconstruction work to an urban cross-section:

OPSD 216.020	Section Details for Asphalt on Granular Base in an Urban Section
OPSD 216.021	Subdrain Pipe Connection and Outlet Details for an Urban Section

5.0 MANAGEMENT OF EXCAVATED SOIL AND ENVIRONMENTAL CONSIDERATIONS

The chemical analyses for metals and inorganic parameters that were carried out on four selected soil samples are provided in Appendix D. The samples were tested in relation to Table 3 soil quality standards for Residential/Parkland/Institutional property use given in the MOE document "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", dated April 15, 2011. The results are summarized in Table 5.1.

The test results are within the allowable soil quality standard limits for metals and inorganic parameters on two of the four samples tested. The samples for boreholes 1 and 5 have elevated Electrical Conductivity values that are marginally above the soil quality standard for residential/parkland/institutional land use. The results for the Electrical Conductivity (EC) parameter are considered to be related to the historical use of road salts for winter de-icing operations and do not present an adverse health risk. Some variability in soil quality parameters may occur within a given sample as well as along the length of the project. During the course of subgrade excavation and mixing of soils from different depths it is possible that the quality of the bulk mixed soils may not be an issue. Ontario Regulation 153/04 (as amended by Reg. 511/09) indicates that elevated residual road salt parameters in soils within the road allowance that result from winter salting applied to address road safety issues are not regarded as an environmental problem that requires remediation.

The chemical test data indicates that there is no requirement to dispose of the excavated soils as a waste material at a registered landfill site. In the event that excess excavated soils are to be disposed of off-site the contractor may be required to carry out additional chemical testing to address the soil quality criteria that were established for the site receiving the materials.

TABLE 5.1 - SUMMARY OF CHEMICAL TEST DATA

SAMPLE IDENTIFICATION	COMPARISON TO TABLE 3 CRITERIA (Full Depth Generic Site Standards for Non-Potable Ground Water) Residential/Parkland/Institutional/Land Use	
	Meets Soil Standard Criteria	Does Not Meet Soil Standard Criteria
Borehole 1, Sample SS1, 0.8 m to 1.4 m		Electrical Conductivity exceeds 0.785 > 0.7
Borehole 2, Sample SS1, 0.8 m to 1.4 m	√	
Borehole 3, Auger sample of granular road base @ ±0.45 m depth		Electrical Conductivity exceeds 0.792 > 0.7
Borehole 5, Sample SS1, 0.8 m to 1.4 m	√	

6.0 EXCAVATIONS, BACKFILL & PIPE BEDDING

All temporary excavations and unbraced side slopes should conform to standards set out in the Occupational Health and Safety Act. The majority of the soils to be encountered during excavation at the site are expected to be "Type 2" materials according to the Occupational Health and Safety Act classification in Part III. Type 2 materials are described as hard with a low natural moisture content and are consistent with the hard silty clay till and weathered upper levels of the red shale deposit. Sound shale bedrock encountered at the site is considered to be consistent with Type 1 material. The fill and organic silty clay soils are considered to be similar to Type 3 soils which are previously excavated materials. In accordance with the Occupational Health and Safety Act (OHSA), Paragraph 227 (3), the soil influencing the excavation must be classified as the type with the highest classification number.

For trench conditions which cannot satisfy the Occupational Health and Safety Act requirements for unbraced side slopes, a trench box system should be used, or temporary shoring should be installed to maintain safe working conditions. Excavations in the hard silty clay till should be stable for construction at about 60 degrees to the horizontal. For excavations in fill, the slopes are not expected to be stable for construction at greater than about 45 ° to the horizontal. Excavation slopes in the shale should be stable for the relatively short construction period at near vertical side slopes. However, the stability of excavation walls in native materials can be compromised by backfill in adjacent trenches with the result that sudden collapse of excavation walls can occur in what appear to be competent conditions. In this regard, OHSA worker protection and safety requirements in trenches should be strictly enforced.

Groundwater seepage from perched water in trench backfill and soil fissures is expected to be variable depending upon the season of the year, and the depth and location across the site. Control of water seepage into excavations is expected to be possible by pumping from sumps at the base of the excavations.

Backfill in service trenches should be selected to be compactable and easy to place in narrow trench conditions. The on-site excavated silty clay till and shale are re-usable as trench backfill. However, experience indicates that uniform and satisfactory compaction is difficult to achieve in narrow trench conditions on a consistent basis. The compactibility of the excavated shale will also be influenced by weather conditions. In order to minimize the risk of trench backfill settlements in the new pavement it is recommended that trench backfill should be imported granular material conforming to OPSS Granular B Type I specifications as a minimum requirement. Trench backfill should be uniformly compacted to a target value of 97% Standard Proctor Maximum Dry Density (SPMDD) with no individual tests below 95 % SPMDD. In the event that the excavated shale is to be used as trench backfill the contractor's methodology for reuse of the shale should be setout prior to construction and should include; (1) breakdown of the shale to maximum size pieces of 150 mm; (2) moisture conditioning of the shale to moisture contents within 3 % of the optimum value of the shale; (3) placement of loose lifts of shale backfill in layer thicknesses not exceeding 300 mm; and, (4) compaction of the shale using a large steel drum vibratory pad-foot compactor to ensure continuous coverage of the backfill lift.

Pipe bedding requirements for open cut operations should comply with the latest OPSS specifications. Based on the borehole data, special bedding requirements are generally not anticipated. Exceptions could occur if existing fill is present at the pipe bedding level and the fill is wet and unstable.

The fill soils and existing trench backfill materials can be excavated using conventional hydraulic backhoe equipment. Experience indicates that the red shale becomes more sound with depth and may require additional excavation efforts by the contractor to facilitate removal. In some areas limestone layers may be present which could require special excavation and removal efforts. It should be possible to excavate the weathered shale in the upper 1 to 2 m of the shale formation with an hydraulic backhoe. A rock bucket designed for shale excavation can be used to facilitate excavations that proceed several metres into the shale stratum.

7.0 SUBSURFACE CONCRETE

The requirements for subsurface concrete subject to a sulphate environment are presented in Canadian Standards Association (CSA) specification CAN/CSA-A23.1-04. Based on experience in the area the site is not expected to exhibit aggressive sulphate conditions. It is recommended that subsurface concrete at the site have the following characteristics:

- minimum 28-day compressive strength = 25 MPa;
- minimum 56-day strength = 30 MPa;
- maximum water to cement ratio = 0.50;
- cementing materials; GUb or GULb, or MS hydraulic cement or MSb; as per CSA A23.1
- Air content; 4 – 7 % for 14 mm to 20 mm nominal size coarse aggregate
  3 – 6 % for 28 mm to 40 mm nominal size coarse aggregate

The concrete should be placed without segregation and should be consolidated to achieve a uniform dense mass.

8.0 CLOSURE

The Limitations of Report, as stated in Appendix A, are an integral part of this report.

Soil samples will be retained and stored by Landtek for a period of three months after the report is issued. The samples will be disposed of at the end of the three month period unless a written request from the client to extend the storage period is received.

I trust this report will be of assistance with the design of the project. Should you have any questions, please do not hesitate to contact our office.

Yours very truly,

LANDTEK LIMITED



Paul Anderson, P.Eng.

Ralph Di Cienzo, P.Eng.

REFERENCES

[1] Quaternary Geology of the Niagara Area, Ontario Division of Mines, Ministry of Natural Resources, Map P764, 1972

[2] Landtek Geotechnical Investigation Report #00075, Reconstruction of Ontario Street Between John Street and the CNR Tracks, Beamsville, Ontario, August 2000

[3] Landtek Geotechnical Investigation Report #00075, Reconstruction of King Street Between Queen Street and Bartlet Street, Beamsville, Ontario, July 2000

[4] Landtek Geotechnical Investigation Report #07006, Proposed Building Development at 4413 Ontario Street, Beamsville, Ontario, February 2007

APPENDIX A
LIMITATIONS OF REPORT

The conclusions and recommendations given in this report are based on information determined at the borehole locations. Subsurface and ground water conditions between and beyond the Boreholes may be different from those encountered at the borehole locations, and conditions may become apparent during construction that could not be detected or anticipated at the time of the geotechnical investigation. It is recommended practice that Landtek be retained during construction to confirm that the subsurface conditions throughout the site are consistent with the conditions encountered in the Boreholes.

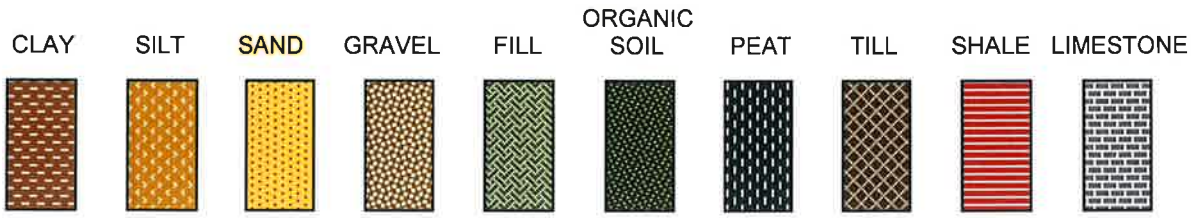
The comments made in this report on potential construction problems and possible remedial methods are intended only for the guidance of the designer. The number of Boreholes may not be sufficient to determine all the factors that may influence construction methods and costs. For example, the thickness and quality of surficial topsoil or fill layers may vary markedly and unpredictably. Additionally, bedrock contact depths throughout the site may vary from what was encountered at the exact borehole locations. Contractors bidding on the project, or undertaking construction on the site should make their own interpretation of the factual borehole information, and establish their own conclusions as to how the subsurface conditions may affect their work.

The survey elevations in the report were obtained by Landtek Limited or others, and are strictly for use by Landtek in the preparation of the geotechnical report. The elevations should not be used by any other parties for any other purpose.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Landtek Limited accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

This report does not reflect environmental issues or concerns related to the property unless otherwise stated in the report. The design recommendations given in the report are applicable only to the project described in the text and then only if constructed substantially in accordance with the details stated in this report. Since all details of the design may not be known, it is recommended that Landtek Limited be retained during the final design stage to verify that the design is consistent with the report recommendations, and that the assumptions made in the report are still valid.

APPENDIX B
SYMBOLS AND TERMS USED IN THE REPORT



RELATIVE PROPORTIONS

Term	Range
Trace	0 - 5%
A Little	5 – 15%
Some	15 – 30%
With	30 – 50%

CLASSIFICATION BY PARTICLE SIZE

Boulder ---------- > 200 mm
Cobble ---------- 80 mm – 200 mm
Gravel -
- Coarse ---------- 19 mm – 80 mm
- Fine ---------- 4.75 mm – 19 mm

Sand -
- Coarse ---------- 4.75 mm – 2 mm
- Medium -------- 2 mm – 0.425 mm
- Fine ---------- 0.425 mm – 0.75 mm

Silt ---------- 0.075 mm – 0.002 mm
Clay ---------- < 0.002 mm

DENSITY OF NON-COHESIVE SOILS

Descriptive Term	Relative Density	Standard Penetration Test
Very Loose	0 – 15%	0 – 4 Blows Per 300 mm Penetration
Loose	15 – 35%	4 – 10 Blows Per 300 mm Penetration
Compact	35 – 65%	10 – 30 Blows Per 300 mm Penetration
Dense	65 – 85%	30 – 50 Blows Per 300 mm Penetration
Very Dense	85 – 100%	Over 50 Blows Per 300 mm Penetration

CONSISTENCY OF COHESIVE SOILS

Descriptive Term	Undrained Shear Strength kPa (psf)	N Value Standard Penetration Test	Remarks
Very Soft	< 12 (< 250)	< 2	Can penetrate with fist
Soft	12 – 25 (250 – 500)	2 – 4	Can indent with fist
Firm	25 – 50 (500 –1000)	4 – 8	Can penetrate with thumb
Stiff	50 – 100 (1000 – 2000)	8 – 15	Can indent with thumb
Very Stiff	100 – 200 (2000 – 4000)	15 – 30	Can indent with thumb-nail
Hard	> 200 (> 4000)	> 30	Can indent with thumb-nail

Notes: 1. Relative density determined by standard laboratory tests.
2. N value – blows/300 mm penetration of a 623 N (140 Lb.) hammer falling 760 mm (30 in.) on a 50 mm O.D. split spoon soil sampler. The split spoon sampler is driven 450 mm (18 in.) or 610 mm (24 in.). The "N" value is the Standard Penetration Test (SPT) value and is normally taken as the number of blows to advance the sampler the last 300 mm.

APPENDIX B continued - TERMS USED IN THE REPORT

Angle of Repose – The maximum inclination at which a loose granular material will just remain stable. It is also known as critical slope. Steeper than this slope, coarse particles begin to fall under the influence of gravity. For clean dry granular soils, the effect of slope height is negligible. For cohesive soils, the effect of height of slope is so great that the angle of repose is meaningless. Angle of repose varies with the shape and gradation of the material, water content, etc. Clean, loose, dry or submerged granular materials usually stand at angles between 25^0 and 35^0; but some well-graded granular materials may exceptionally stand on slopes as high as 45^0 – e.g. the wooded frontal slope on some glacial deltas, kame terraces, and the sides of kettleholes in some deep coarse outwash plains and valley trains.

Bedding Plane – The plane of deposition of sedimentary material.

Competent Rock – Rock that is relatively strong and acts as a brittle material when it fails. Generally speaking, most unaltered igneous and metamorphic rocks and also hard limestones, dolomites, sandstones and conglomerates are classed as competent. Competent rocks tend to fail by fracture rather than by folding. Often used loosely and in a very general way.

Creep – Slow mass movement of soil and rock debris down gentle to steep slopes, primarily under the influence of gravity but facilitated by saturation with water, by alternate freezing and thawing, or by alternate swelling and contraction. Also, gradually increasing deformation of rock or concrete or other rigid materials under long-continued low stresses.

Differential Settlement – Uneven sinking of different parts of an engineering structure or of the ground surface as a result of applied loads, including lowering of the groundwater table.

Differential Weathering – Variations in the rate of weathering on different parts of a soil or rock body. As a result of differential weathering, the more resistant parts of these bodies stand out in relief whereas less-resistant parts tend to form recesses and depressions.

Dip – Angle of inclination of a bed with the horizontal measured at right angle to the direction of strike.

Dip Slope – A slope whose inclination is in the same direction and of the same amount as the dip of the underlying rock strata.

Drainage – The process of removal of surplus surface water or groundwater by natural or artificial means. Includes surface and subsurface drainage. Also, a drainage basin, or its area, tributary to a stream.

Erode – To wear away or remove the land surface by wind, water (streams, rain waves), ice or other geological agents of erosion, including the pull of gravity (landslides, creep, solifluction, etc.) and groundwater action (corrosion or solution).

Erosion – The wearing away and removal of sols, rocks, and landforms by the physical and chemical action of moving water, ice, air, and gravity. Simply, the detachment and movement of soil or rock by water, wind, ice or gravity.

Frost Action – Freezing and thawing of moisture in materials and the resulting effects on these materials and on engineering structures of which they are a part, or with which they are in contact. Cyclic freezing and thawing is an important weathering process that causes the mechanical breakdown (disintegration) of rocks. Such alternate freezing and thawing of water held in pores, cracks, and fissures usually takes place at the surface of rocks and in the upper layers of soil at the earth's surface.

Joint – A fracture in a rock. A joint differs from a fault in lacking displacement on opposite sides of the fracture. A fracture in rock along which no movement, or dislocation, has taken place.

Limestone – A sedimentary rock composed predominantly of calcium carbonate ($CaCO_3$). If dolomite ($CaMg(CO_3)_2$) is present in appreciable quantities, it is called a dolomitic limestone. It may have an organic, chemical, biochemical, or mechanical origin.

Massive – Homogeneous rock structure without stratification, flow-banding, foliation, close spaced fractures, or bedding planes. Occurring in uniform thick beds relatively free from physical discontinuities.

Permeable Rocks – Porous rocks which allow water, oil, or gas to be transmitted through them. Porous sandstone is an example. Considered synonymous with pervious rocks.

Physical Properties of Soils – Those characteristics, processes, or reactions of a soil which are caused by physical forces and which can be described by or expressed in physical terms or equations. Examples of physical properties are density, permeability, porosity, grain-size distribution, etc.

Physical Weathering – The breakdown of rock and mineral particles into smaller particles by physical forces, as alternate freezing and thawing or wetting and drying.

Riprap – A layer of broken rock or boulders on an earth surface to protect it against erosion by running water or waves.

Scarp – An escarpment, cliff, or steep slope, usually along the margin of a plateau, mesa, terrace, or bench. It may be a more or less continuous line of cliffs or steep slopes facing in one general direction. It may be caused by erosion or faulting or by a combination of these processes.

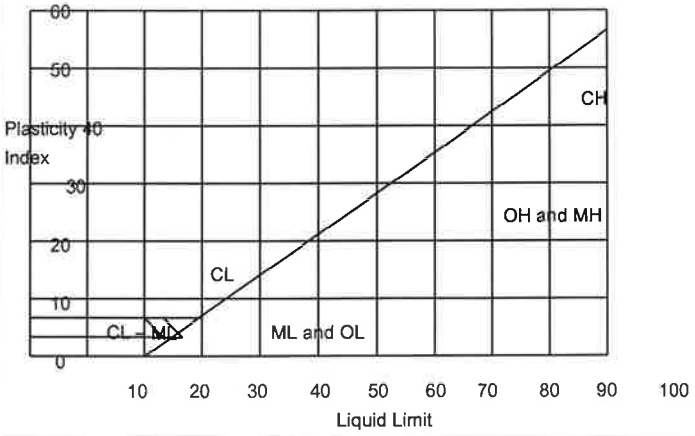
Scree – A pile of rock waste at the base of a cliff, usually a sheet of coarse angular rock debris mantling the steep sides of a mountain slope or the base of an escarpment. Normally the coarsest material is found at or near the bottom of scree-forming slopes. All sizes of debris may be present. Scree deposits commonly rest at an angle of about 35^0, and may be remarkably uniform in size of material. Synonymous with talus.

Sedimentary Rock – A rock formed from materials transported from their place of origin by gravity, water, wind, or ice and deposited by currents or settled from suspension or precipitated from solution and having been subject to diagenesis. The principal sedimentary rocks are shales, siltstones, sandstones, conglomerates, and limestones. Rock is formed by consolidation, cementation, recrystallization or other processes during diagenesis acting at ordinary temperatures at or closely beneath the earth's surface.

Seepage – Slow percolation of gravitational water through a soil, the banks of a canal, through a masonry wall, from a surface or underground water reservoir, etc. Inward seepage is called influent seepage. Outward seepage is called effluent seepage.

APPENDIX B CONTINUED
CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES
ASTM Designation: D 2487 - 69 AND D 2488 – 69
(Unified Soil Classification System)

Major Divisions			Group Symbols	Typical Names	Classification Criteria		
Coarse-grained soils More than 50% retained on No. 200 sieve *	Gravels 50% or more of coarse fraction retained on No. 4 sieve	Clean gravels	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	Classification on basis of percentage of fines Less than 5% pass No. 200 sieve . . . . . GW, GP, SW, SP More than 12% pass No. 200 sieve . . . . . GM, GC, SM, SC 5 to 12% pass No.200 sieve . . . . . Borderline classifications requiring use of dual symbols	C_u=D60/D10 greater than 4; $C_z = (D30)^2/(D10xD60)$ between 1 and 3	
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines		Not meeting both criteria for GW	
		Gravels with fines	GM	Silty gravels, gravel-sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures		Atterberg limits above "A" line with P.I. greater than 7	
	Sands More than 50% of coarse fraction passes No. 4 sieve	Clean Sands	SW	Well-graded sands and gravelly sands, little or no fines		C_u=D60/D10 greater than 6; $C_z = (D30)^2/(D10xD60)$ between 1 and 3	
			SP	Poorly graded sands and gravelly sands, little or no fines		Not meeting both criteria for SW	
		Sands with fines	SM	Silty sands, sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures		Atterberg limits above "A" line with P.I. greater than 7	
Fine-grained soils 50% or more passes No. 200 sieve *	Silts and clays Liquid limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	Plasticity Chart For classification of fine-grained soils and fine fraction of coarse-grained soils. Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols. Equation of A-line: PI=0.73 (LL-20)		
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silts			
			OL	Organic silts and organic silts of low plasticity			
	Silts and clays Liquid limit greater than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts			
			CH	Inorganic clays of high plasticity, fat clays			
			OH	Organic clays of medium to high plasticity			
	Highly organic soils		Pt	Peat, much and other highly organic soils	* Based on the material passing the 3 in. (76mm) sieve.		



APPENDIX C

SITE PLAN SHOWING BOREHOLE LOCATIONS

LOGS OF BOREHOLES





KEY PLAN

LEGEND:

Boreholes drilled by Landtek Limited on May 24, 2012.

NOTES:

1. Borehole Locations are considered approximate.
2. Base plan and elevations taken form drawing by AECOM.

LANDTEK LIMITED
CONSULTING ENGINEERS
205 NEBO ROAD, HAMILTON, ONTARIO, L8W 2E1

DRAWING:	Borehole Location Plan
PROJECT:	Road Reconstruction Elizabeth Street, Beamsville (Town of Lincoln), Ontario.

SCALE:	NTS	**PROJECT NO.**	12087
DATE:	June 2012.	**DRAWING NO.**	1

LANDTEK LIMITED

LOG OF BOREHOLE NO. 1

Project No.:	12087	Drill Date:	May 24, 2012
Project:	Proposed Road Reconstruction	Drill Method:	[x] solid stem [ ] hollow stem [ ] vibratory
Location:	Elizabeth Street, Lincoln, Ontario	Datum:	Geodetic

Material Description	Symbol	Elev. Depth	Samples No.	Samples Type	Scale (m)	SPT "N" Value	Soil Moisture (%)	GWL	Monitor Details	Test Data
Ground Surface		±135.0								
±75 mm Bituminous Material ±255 mm Granular Base		0.0								
FILL silty clay, mottled, brown, moist		134.0	SS	1		13	15.9			
		1.0								
SILTY CLAY TILL fractured and fissured, some sand and gravel sizes, red shale pieces, moist, brown to reddish-brown (STIFF TO HARD)			SS	2		30	14.0			
			SS	3		42	12.9			
- numerous red shale pieces below ±3.0 m			SS	4		49	12.9			
		131.0								
		4.0								
SHALE (Queenston Formation) layered, siltstone seams, weathered, red, moist (HARD)			SS	5		50/125 mm	7.2			
		128.9	SS	6		50/15 mm	6.4			
BOREHOLE TERMINATED		6.1								

0.0 -0.5 -1.0 -1.5 -2.0 -2.5 -3.0 -3.5 -4.0 -4.5 -5.0 -5.5 -6.0 -6.5 -7.0 -7.5 -8.0 -8.5 -9.0 -9.5 -10.0

SPT "N" Value: 0 25 50 75 100

Soil Moisture (%): 0 25 50

Notes: 1. On completion, borehole was open and dry to 5.8 m.

PP = pocket penetrometer TCV = total combustible vapour BRD = bulk relative density
PL = plastic limit LL = liquid limit PI = plasticity index FV = field vane LV = lab vane VS = vane sensitivity

LANDTEK LIMITED
205 Nebo Road, Unit 3
Hamilton, Ontario, Canada, L8W 2E1
Ph: (905) 383-3733 Fax: (905) 383-8433
www.landteklimited.com

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LANDTEK LIMITED

LOG OF BOREHOLE NO. 2

Project No.:	12087	Drill Date:	May 24, 2012
Project:	Proposed Road Reconstruction	Drill Method:	[x] solid stem [ ] hollow stem [ ] vibratory
Location:	Elizabeth Street, Lincoln, Ontario	Datum:	Geodetic

Material Description	Symbol	Elev. / Depth	Samples No.	Samples Type	Scale (m)	SPT "N" Value	Soil Moisture (%)	GWL	Monitor Details	Test Data
Ground Surface		±131.2								
±75 mm Bituminous Material ±380 mm Granular Base		0.0								
ORGANIC SILTY CLAY plant fibres, grey, very moist to wet (FIRM)			SS	1		5	21.9			
			SS	2		8	25.3			
		129.1								
SILTY CLAY TILL fractured and fissured, some sand and gravel sizes, red shale pieces, moist, brown to reddish-brown (VERY STIFF TO HARD)		2.1	SS	3		20	19.3			
			SS	4		45	13.0			
SHALE (Queenston Formation) layered, siltstone seams, weathered, red, moist (HARD)		3.5	SS	5		50/100 mm	13.7			
		126.0	SS	6		50/0 mm				
BOREHOLE TERMINATED DUE TO PRACTICAL AUGER REFUSAL		5.2								

SPT "N" Value: 0 25 50 75 100 | Soil Moisture (%): 0 25 50 | Scale (m): 0.0, -0.5, -1.0, -1.5, -2.0, -2.5, -3.0, -3.5, -4.0, -4.5, -5.0, -5.5, -6.0, -6.5, -7.0, -7.5, -8.0, -8.5, -9.0, -9.5, -10.0

Notes: 1. On completion, borehole was open to 5.2 m and water level at 3.4 m.

PP = pocket penetrometer TCV = total combustible vapour BRD = bulk relative density
PL = plastic limit LL = liquid limit PI = plasticity index FV = field vane LV = lab vane VS = vane sensitivity

LANDTEK LIMITED
205 Nebo Road, Unit 3
Hamilton, Ontario, Canada, L8W 2E1
Ph: (905) 383-3733 Fax: (905) 383-8433
www.landteklimited.com

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LOG OF BOREHOLE NO. 3

Project No.:	12087	Drill Date:	May 24, 2012
Project:	Proposed Road Reconstruction	Drill Method:	[x] solid stem [ ] hollow stem [ ] vibratory
Location:	Elizabeth Street, Lincoln, Ontario	Datum:	Geodetic

Material Description	Symbol	Elev. / Depth	Samples No.	Samples Type	Test Data
Ground Surface		±130.4			Moist BRD
±75 mm Bituminous Material ±330 mm Granular Base		0.0			
SILTY CLAY TILL fractured and fissured, some sand and gravel sizes, red shale pieces, moist, brown to reddish-brown (VERY STIFF)			SS	1	
			SS	2	2.241
		128.1			
SHALE (Queenston Formation) layered, siltstone seams, weathered, red, moist (HARD)		2.3	SS	3	2.255
			SS	4	
			SS	5	
		124.3	SS	6	
BOREHOLE TERMINATED		6.1			

SPT "N" Value: 25, 23, 80/250 mm, 50/100 mm, 72/280 mm, 50/0 mm

Soil Moisture (%): 14.4, 13.9, 14.2, 10.4, 12.4

GWL

Monitor Details

Notes: 1. On completion, borehole was open to 5.5 m and water level at 3.1 m.

PP = pocket penetrometer TCV = total combustible vapour BRD = bulk relative density
PL = plastic limit LL = liquid limit PI = plasticity index FV = field vane LV = lab vane VS = vane sensitivity

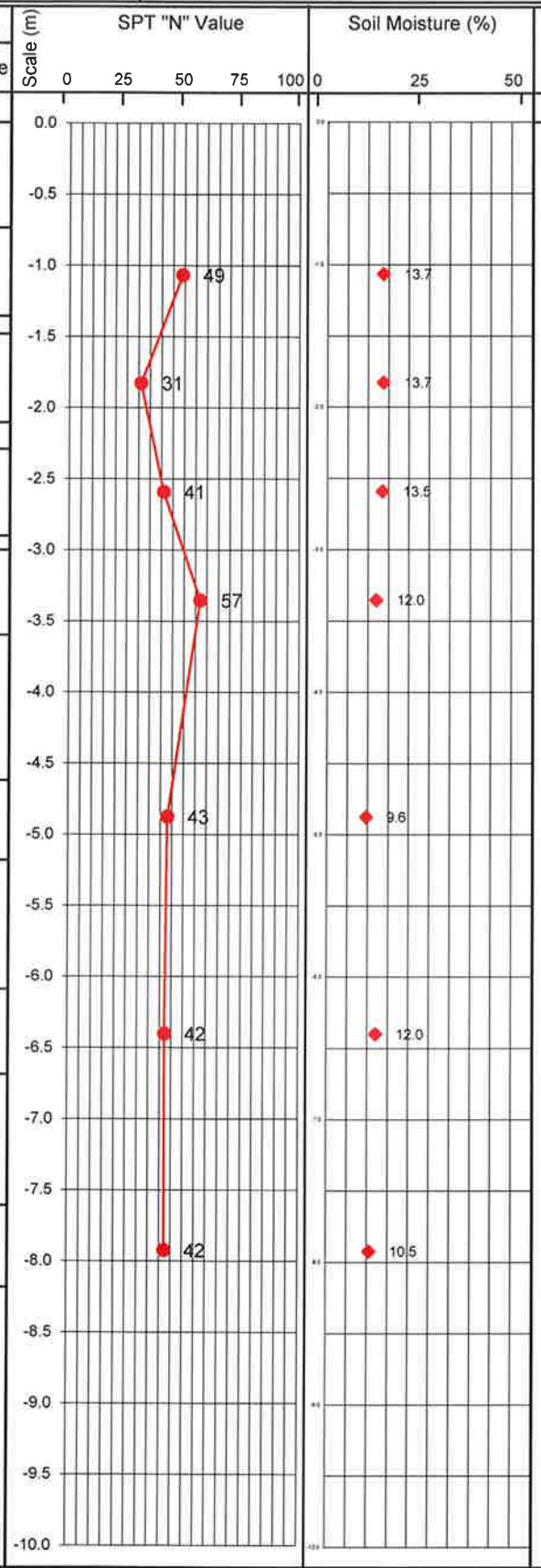
LANDTEK LIMITED
205 Nebo Road, Unit 3
Hamilton, Ontario, Canada, L8W 2E1
Ph: (905) 383-3733 Fax: (905) 383-8433
www.landteklimited.com

LANDTEK LIMITED

LOG OF BOREHOLE NO. 4

Project No.:	12087	Drill Date:	May 24, 2012
Project:	Proposed Road Reconstruction	Drill Method:	[x] solid stem [ ] hollow stem [ ] vibratory
Location:	Elizabeth Street, Lincoln, Ontario	Datum:	Geodetic

Material Description	Symbol	Elev. Depth	Samples No.	Samples Type	Test Data
Ground Surface		±126.6			moist BRD
±75 mm Bituminous Material ±255 mm Granular Base		0.0			
SILTY CLAY TILL fractured and fissured, some sand and gravel sizes, red shale pieces, moist, brown to reddish-brown (HARD)			SS	1	2.246
			SS	2	2.263
			SS	3	2.242
			SS	4	2.280
- becoming unoxidized grey below ±4.5 m			SS	5	2.285
- reddish-grey below ±6.0 m			SS	6	2.279
			SS	7	2.298
		118.4			
BOREHOLE TERMINATED		8.2			



GWL | Monitor Details

Notes: 1. On completion, borehole was open and dry to 8.1 m.

PP = pocket penetrometer TCV = total combustible vapour BRD = bulk relative density
PL = plastic limit LL = liquid limit PI = plasticity index FV = field vane LV = lab vane VS = vane sensitivity

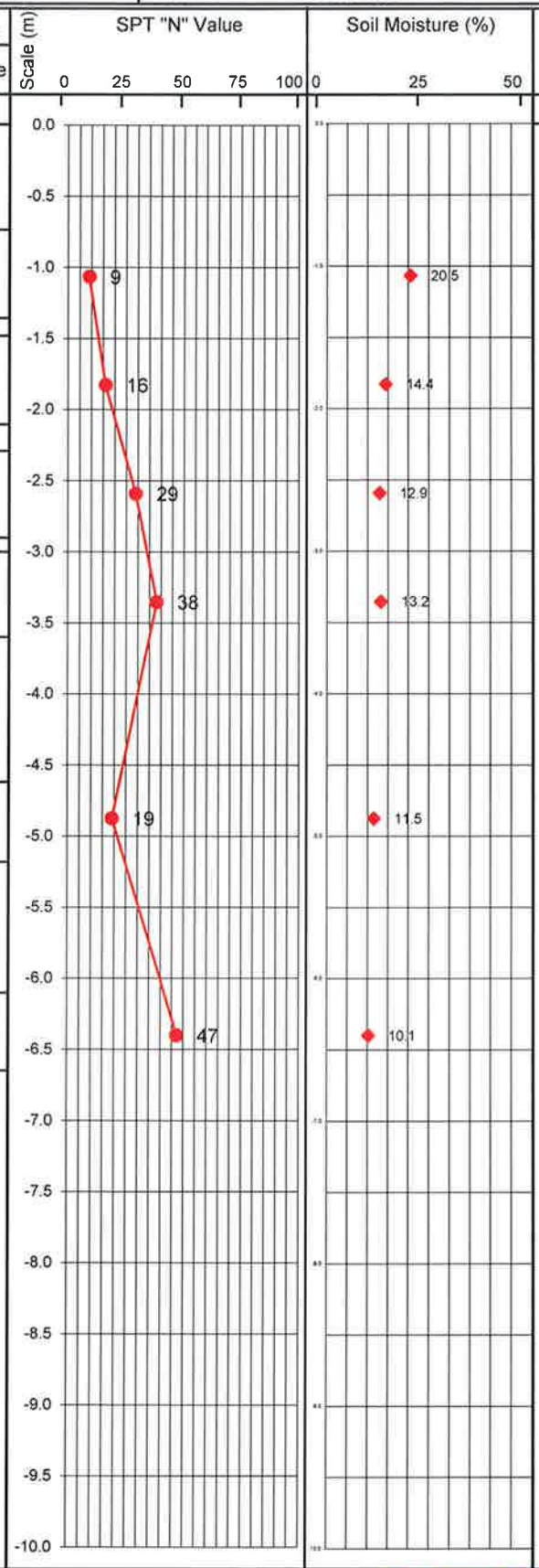
LANDTEK LIMITED
205 Nebo Road, Unit 3
Hamilton, Ontario, Canada, L8W 2E1
Ph: (905) 383-3733 Fax: (905) 383-8433
www.landteklimited.com

LANDTEK LIMITED

LOG OF BOREHOLE NO. 5

Project No.:	12087	Drill Date:	May 24, 2012
Project:	Proposed Road Reconstruction	Drill Method:	[x] solid stem [ ] hollow stem [ ] vibratory
Location:	Elizabeth Street, Lincoln, Ontario	Datum:	Geodetic

Material Description	Symbol	Elev. / Depth	Samples No.	Samples Type	Test Data
Ground Surface		±124.3			
±150 mm Bituminous Material ±150 mm Granular Base		0.0			
ORGANIC SILTY CLAY plant fibres, grey, moist (STIFF)		122.9	SS	1	
SILTY CLAY TILL fractured and fissured, some sand and grave lsizes, red shale pieces, moist, brown to reddish-brown (VERY STIFF TO HARD)		1.4	SS	2	
			SS	3	
			SS	4	
			SS	5	
		117.6	SS	6	
BOREHOLE TERMINATED		6.7			



GWL | Monitor Details

Notes: 1. On completion, borehole was open and dry to 6.3 m.

PP = pocket penetrometer TCV = total combustible vapour BRD = bulk relative density
PL = plastic limit LL = liquid limit PI = plasticity index FV = field vane LV = lab vane VS = vane sensitivity

LANDTEK LIMITED
205 Nebo Road, Unit 3
Hamilton, Ontario, Canada, L8W 2E1
Ph: (905) 383-3733 Fax: (905) 383-8433
www.landteklimited.com

APPENDIX D

RESULTS OF CHEMICAL ANALYSES BY AGAT LABORATORIES LTD.

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 12T603419

PROJECT NO: 12087

CLIENT NAME: LANDTEK LTD.

ATTENTION TO: Kevin Roberts

O. Reg. 153(511) - Metals & Inorganics (Soil)

DATE SAMPLED: May 24, 2012 | **DATE RECEIVED: May 25, 2012** | **DATE REPORTED: Jun 04, 2012** | **SAMPLE TYPE: Soil**

Parameter	Unit	G / S	RDL	BH3-GRAN 3369731	BH2-SS1 3369734	BH1-SS1 3369735	BH5-SS1 3369736
Antimony	µg/g	7.5	0.8	<0.8	<0.8	<0.8	<0.8
Arsenic	µg/g	18	1	6	5	6	3
Barium	µg/g	390	2	124	126	121	85
Beryllium	µg/g	5	0.5	0.7	0.7	0.6	0.6
Boron	µg/g	120	5	12	11	12	<5
Boron (Hot Water Soluble)	µg/g	1.5	0.10	0.26	0.30	0.25	0.31
Cadmium	µg/g	1.2	0.5	<0.5	<0.5	<0.5	<0.5
Chromium	µg/g	160	2	22	23	24	19
Cobalt	µg/g	22	0.5	9.8	11.3	11.6	9.7
Copper	µg/g	180	1	32	28	40	20
Lead	µg/g	120	1	20	14	11	13
Molybdenum	µg/g	6.9	0.5	<0.5	0.5	<0.5	0.5
Nickel	µg/g	130	1	21	24	25	15
Selenium	µg/g	2.4	0.4	<0.4	<0.4	<0.4	<0.4
Silver	µg/g	25	0.2	<0.2	<0.2	<0.2	<0.2
Thallium	µg/g	1	0.4	<0.4	<0.4	<0.4	<0.4
Uranium	µg/g	23	0.5	<0.5	0.6	0.6	0.5
Vanadium	µg/g	86	1	32	33	32	29
Zinc	µg/g	340	5	122	67	63	59
Chromium VI	µg/g	10	0.2	<0.2	<0.2	<0.2	<0.2
Cyanide	µg/g	0.051	0.040	<0.040	<0.040	<0.040	<0.040
Mercury	µg/g	1.8	0.10	<0.10	<0.10	<0.10	<0.10
Electrical Conductivity (2:1)	mS/cm	0.7	0.005	**0.793**	0.684	**0.785**	0.498
Sodium Adsorption Ratio	N/A	5	N/A	2.20	2.31	4.87	2.32
pH, 2:1 CaCl2 Extraction	pH Units			8.06	7.47	7.91	6.54

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to T3(RPI,MFT) Current

3369731-3369736 EC & SAR were determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil). pH was determined on the 0.01M CaCl2 extract prepared at 2:1 ratio.

Certified By: Tony Nash

Results relate only to the items tested and to all the items tested

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Guideline Violation

AGAT WORK ORDER: 12T603419

PROJECT NO: 12087

CLIENT NAME: LANDTEK LTD.

ATTENTION TO: Kevin Roberts

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	GUIDEVALUE	RESULT
3369731	BH3-GRAN	T3(RPI,MFT) Current	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity (2:1)	0.7	0.793
3369735	BH1-SS1	T3(RPI,MFT) Current	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity (2:1)	0.7	0.785

Results relate only to the items tested and to all the items tested

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MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
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Quality Assurance

CLIENT NAME: LANDTEK LTD.

PROJECT NO: 12087

AGAT WORK ORDER: 12T603419

ATTENTION TO: Kevin Roberts

Soil Analysis

RPT Date: Jun 04, 2012

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inorganics (Soil)															
Antimony	1		< 0.8	< 0.8	0.0%	< 0.8	124%	70%	130%	83%	80%	120%	83%	70%	130%
Arsenic	1		2	2	0.0%	< 1	108%	70%	130%	101%	80%	120%	108%	70%	130%
Barium	1		27	27	0.0%	< 2	98%	70%	130%	102%	80%	120%	100%	70%	130%
Beryllium	1		< 0.5	< 0.5	0.0%	< 0.5	88%	70%	130%	98%	80%	120%	95%	70%	130%
Boron	1		< 5	< 5	0.0%	< 5	75%	70%	130%	105%	80%	120%	92%	70%	130%
Boron (Hot Water Soluble)	1	3369734	0.30	0.29	5.4%	< 0.10	127%	60%	140%	110%	70%	130%	110%	60%	140%
Cadmium	1		< 0.5	< 0.5	0.0%	< 0.5	100%	70%	130%	112%	80%	120%	92%	70%	130%
Chromium	1		15	15	0.0%	< 2	98%	70%	130%	108%	80%	120%	90%	70%	130%
Cobalt	1		3.5	3.5	0.0%	< 0.5	90%	70%	130%	97%	80%	120%	92%	70%	130%
Copper	1		8	8	0.0%	< 1	103%	70%	130%	110%	80%	120%	100%	70%	130%
Lead	1		8	8	0.0%	< 1	101%	70%	130%	101%	80%	120%	95%	70%	130%
Molybdenum	1		< 0.5	< 0.5	0.0%	< 0.5	100%	70%	130%	101%	80%	120%	99%	70%	130%
Nickel	1		8	8	0.0%	< 1	93%	70%	130%	100%	80%	120%	93%	70%	130%
Selenium	1		< 0.4	< 0.4	0.0%	< 0.4	83%	70%	130%	94%	80%	120%	98%	70%	130%
Silver	1		< 0.2	< 0.2	0.0%	< 0.2	82%	70%	130%	98%	80%	120%	90%	70%	130%
Thallium	1		< 0.4	< 0.4	0.0%	< 0.4	95%	70%	130%	93%	80%	120%	95%	70%	130%
Uranium	1		< 0.5	< 0.5	0.0%	< 0.5	99%	70%	130%	95%	80%	120%	95%	70%	130%
Vanadium	1		32	33	3.1%	< 1	103%	70%	130%	100%	80%	120%	92%	70%	130%
Zinc	1		20	20	0.0%	< 5	96%	70%	130%	100%	80%	120%	95%	70%	130%
Chromium VI	1		< 0.2	< 0.2	0.0%	< 0.2	93%	70%	130%	97%	80%	120%	90%	70%	130%
Cyanide	1		< 0.040	< 0.040	0.0%	< 0.040	100%	70%	130%	108%	80%	120%	94%	70%	130%
Mercury	1		< 0.10	< 0.10	0.0%	< 0.10	101%	70%	130%	100%	80%	120%	97%	70%	130%
Electrical Conductivity (2:1)	1		0.048	0.047	2.1%	< 0.005	100%	90%	110%	NA			NA		
Sodium Adsorption Ratio	1		1.13	1.14	1.0%	N/A	NA			NA			NA		
pH, 2:1 CaCl2 Extraction	1	3369736	6.54	6.56	0.3%	NA	103%	90%	110%	NA			NA		

Comments: NA signifies Not Applicable.

Certified By: Tony Tpach

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Results relate only to the items tested and to all the items tested

AGAT Laboratories

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MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
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http://www.agatlabs.com

Method Summary

CLIENT NAME: LANDTEK LTD.

AGAT WORK ORDER: 12T603419

PROJECT NO: 12087

ATTENTION TO: Kevin Roberts

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Barium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Boron	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Boron (Hot Water Soluble)	MET-93-6104	EPA SW 846 6010C; MSA, Part 3, Ch.21	ICP/OES
Cadmium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Copper	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Lead	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Nickel	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Selenium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Silver	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Thallium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Uranium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Zinc	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium VI	INOR-93-6029	SM 3500 B; MSA Part 3, Ch. 25	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	MOE CN-3015 & E 3009 A;SM 4500 CN	TECHNICON AUTO ANALYZER
Mercury	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Electrical Conductivity (2:1)	INOR-93-6036	McKeague 4.12, SM 2510 B	EC METER
Sodium Adsorption Ratio	INOR-93-6007	McKeague 4.12 & 3.26 & EPA SW-846 6010C	ICP/OES
pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	PH METER

Results relate only to the items tested and to all the items tested

APPENDIX E

PHOTOGRAPHS OF TYPICAL SITE CONDITIONS



Photograph #1
View Looking West Along Elizabeth St. from Mountain St.



Photograph #2
View Looking West Toward Intersection of
Elizabeth St. & St. George's Dr.

LANDTEK LIMITED

Date:	June, 2012	Project No. 12087
Project:	Proposed Road Reconstruction Elizabeth Street Beamsville, Town of Lincoln, Ontario	
Title:	Photographs of Typical Site Conditions	



Photograph #3
View of Location at Borehole 2 Opposite Intersection With Charles Street



Photograph #4
View of Location of Borehole 5,
Just West of Intersection with Mountain St.

LANDTEK LIMITED

Date:	June, 2012	Project No. 12087
Project:	Proposed Road Reconstruction Elizabeth Street Beamsville, Town of Lincoln, Ontario	
Title:	Photographs of Typical Site Conditions	