

Reference Agreement A-2017-48
as a Schedule to this By-law.

THE CORPORATION OF THE TOWN OF AMHERSTBURG

BY-LAW NO. 2017- 48

**By-law to enter into a contract with J&J Lepera Infrastructures Inc.
for the Meloche Road Reconstruction**

WHEREAS under Section 9 of the Municipal Act 2001, S.O., 2001, c. 25, as amended, a municipality has the capacity, rights, powers and privileges of a natural person for the purpose of exercising its authority under this or any other Act.

AND WHEREAS under Section 8(1) of the Municipal Act 2001, S.O., 2001, c. 25, as amended, shall be interpreted broadly so as to confer broad authority on municipalities to enable them to govern their affairs as they consider appropriate and to enhance their ability to respond to municipal issues;

AND WHEREAS the Council of The Corporation of the Town of Amherstburg deems it expedient to enter into a contract with J&J Lepera Infrastructures Inc. for the Meloche Road Reconstruction

NOW THEREFORE the Council of The Corporation of the Town of Amherstburg enacts as follows:

1. That the Council of The Corporation of the Town of Amherstburg agrees to enter into the contract as attached hereto as Schedule "A" to this By-law.
2. That the Mayor and Clerk are hereby authorized to sign and seal said agreement on behalf of The Corporation of Town of Amherstburg.
3. This By-law shall come into force and take effect immediately upon the final passing thereof.

Read a first, second and third time and finally passed this 23th day of May, 2017.



MAYOR – ALDO DICARLO



MUNICIPAL CLERK – PAULA PARKER

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MELOCHE ROAD RECONSTRUCTION
PWD-RD-2017-002

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INFORMATION TO BIDDERS

1. BACKGROUND INFORMATION

The Town of Amherstburg is located in southwestern Ontario, approximately 30 kilometers southwest of the City of Windsor and is one of seven lower-tier municipalities in the County of Essex. The current population of the Town of Amherstburg is just over 21,000.

The Town is seeking Tenders from qualified contractors to reconstruct Meloche Road from Lowes Side Road to Alma Street in the Town of Amherstburg.

The Contractor will be under the direct supervision of the Consultant and the Town of Amherstburg Engineering and Public Works Department. An Inspector will be supplied to accompany the Contractor.

This contract must be conducted within the specified timelines.

2. DEFINITIONS

“Contractor” or “Bidder” means the individual, firm, company or corporation submitting a Tender to the Town.

“Contract Administrator” refers to the authorized employee(s) of the Corporation, or his/her designate, to whom carriage and administration of this Contract has been granted. For the purposes of this Contract the Contract Administrator is the Manager of Engineering.

“Corporate Contact” is the Town employee defined as the sole contact in relation to the administration of the Tender process.

“Engineer” refers to the Corporation’s Engineer who has been assigned to oversee this Contract. The Engineer’s duties may be assumed by the Contract Administrator, as the Corporation may so advise the Contractor.

“Project Manager” is the Town employee who will oversee the completion of the contract in accordance to this tender, contract and agreement. This individual will take management of the project after the contract has been successfully awarded.

“Total Tender Price” means an evaluation of quality and service in assessment of Tenders and the sum of all expenses, warranties, taxes, local service costs, lifecycle costs, time of completion or delivery, inventory carrying costs, operating and disposal costs and any applicable disbursements that determine the lowest compliant Tender.

“Town” or “Corporation” means the Corporation of the Town of Amherstburg

2. DEFINITIONS – Continued

“Work” means any of the following tasks, or combinations, thereof:

- a) Supply or provision of articles or materials;
- b) Supply of labour;
- c) Performance of functions and tasks;
- d) Provision of services;
- e) Equipment operated or not operated;
- f) Construction or repairs as specified;
- g) Security deposit

3. TENDER CLOSING DATE AND TIME

Tenders, contained in a sealed envelope with the provided envelope cover (Appendix A) firmly affixed, will be received by:

**Clerks Department
Town of Amherstburg – Town Hall (Upper Level)
271 Sandwich Street South, Amherstburg, Ontario, N9V2A5**

Up until

11:00 am (local time), Wednesday, May 17th, 2017

Tenders will be opened in public shortly after the official closing time.

Tenders must be received at the address noted above no later than the specified closing time. Tenders received after said closing time will not be accepted or considered.

4. METHOD OF SUBMISSION

Tenders must be submitted in a sealed envelope by way of hand delivery, courier service, or mail prior to the Tender closing time.

Delivery of Tender through a third party mail courier service shall be at the risk of the Bidder and must be arranged in due time for the Tender to arrive at the specified location before the Tender closing time. Failure of a third party courier service to submit the Tender prior to the Tender closing time will result in the disqualification of the Tender, and will be at no fault of the municipality.

Tenders sent by email or facsimile will not be accepted.

5. SUBMISSION ENVELOPE

The Tender must be supplied in a sealed envelope with the envelope cover supplied in Appendix A of this document. The envelope cover must be affixed to the Bidder's envelope without any extra exterior covering. Failure to affix the envelope cover to the submission envelope may result in disqualification of the Tender.

6. TENDER SUBMISSION REQUIREMENTS

Tenders shall be prepared and submitted in accordance with the outline set specified in this document.

The Tender shall be bound and contained in a sealed envelope bearing Appendix A – Envelope Cover, and include the following minimum requirements, as found in the Form of Tender (T-#) pages:

- T-1 Contractor Identification Sheet
- T-2 to T-11 Tender Price
- T-12 Contractor Qualifications and Experience
- T-13 to T-14 References
- T-15 Acknowledgement of Tender Documents Received by Bidder and Addenda

7. BID BOND

No tender shall be considered as bona fide unless accompanied by a Bid Bond or Certified Cheque in the amount of 10% of the submission price and made payable to the Corporation of the Town of Amherstburg. The Certified Cheque or Bid Bond of the unsuccessful Proponents will be returned without interest upon execution of the tender with the successful contractor.

The Certified Cheque or Bid Bond of the successful Contractor will be retained as liquidated damages to indemnify the Owner in case of default until such time as the contract is executed. All Certified Cheques or Bid Bonds will be returned without interest should a contract not be executed within ninety (90) days of the date of closing of this quotation.

8. PERFORMANCE BOND AND LABOUR AND MATERIAL PAYMENT BOND

The Contractor, together with a surety company approved by the Owner and authorized by law to carry on business in the Province of Ontario, shall furnish to the Owner a Performance Bond and a separate Labour and Material Payment Bond in the amount of one hundred percent (100%) of the total tender price (not including H.S.T.) and such additional amount, if any, as may be required by the Owner.

8. PERFORMANCE BOND AND LABOUR AND MATERIAL PAYMENT BOND – Continued

The Owner will notify the selected Tenderer accordingly when the Tender has been awarded. The Contractor will be required to execute and furnish to the Owner the Performance Bond and the Labour and Material Payment Bond as required herein and after notification of the award of contract by the Owner. Contracts will not be executed without the provision of said bonds and no work shall commence until said bonds have been provided.

9. EXAMINATION OF SITE, PLANS AND SPECIFICATIONS

Each Proponent must visit the site and review the plans and specifications before submitting his tender and must satisfy himself as to the extent of the work and local conditions to be met during the testing period. He is not to claim at any time after submission of his tender that there was any misunderstanding of the terms and conditions of the contract relating to site conditions. The quantities shown as indicated on the drawings or in the tender are estimates only and are for the sole purpose of indicating to the bidders the general magnitude of the work. The Proponent is responsible for checking quantities for accuracy prior to submitting his tender.

10. AGREEMENT AND GENERAL CONDITIONS

Tenders will be received and contracts awarded only in the form as shown on the tender page unless otherwise provided, for the completion of the whole work or of specified sections thereof in accordance with the plan and specification. The Contractor agrees to enter into a formal contract with the Municipality upon acceptance of the tender.

All work included in the contract must be completed on or before the date fixed in the contract and must, at the time of completion and final inspection, be in first class condition and comply fully with the specifications.

Final inspection will be made by the Amherstburg Public Works Department within 20 days after the Municipality has received notice in writing from the Contractor that the work is completed, or as soon thereafter as weather conditions permit.

The Contractor will be held liable for any damage or expenses occasioned by his failure to complete the work on time and for any expenses of inspecting, superintending or relating due to his neglect or failure to complete the work satisfactorily. Any such expense or damages may be deducted from the amount of the Contract or may be recovered by the Municipality from the Contractor and his sureties.

11. INSURANCE

Upon award of the contract and prior to commencement of work, the Contractor shall furnish the Manager of Engineering with a satisfactory Certificate of Insurance (COI) containing the information below, for the period of the execution of the work:

- a) A Commercial General Liability (CGL) policy that shall be not less than 5 million dollars per occurrence.
- b) The CGL policy shall include bodily injury including death, personal injury, property damage, tenants legal liability, non-owned automobile and contain a cross liability/severability of interest clause. The certificate must also include acknowledgement that coverage under the policy specifically extends to the works in question. The COI shall name the Town of Amherstburg, HCEI and Amec Foster Wheeler as additional insured to the policy.
- c) The CGL policy shall not contain any exclusion or limitation in respect to shoring, underpinning, raising or demolition of any building or structure, pile driving, caisson work, collapse of any structure or subsidence of any property, structure or land from any cause.
- d) The Contractor shall note that where construction works are performed within lands owned by the County of Essex or Ministry of Transportation the CGL policy shall also name the County of Essex and/or the Ministry of Transportation as additional insured to the policy.
- e) The liability insurance shall be endorsed to provide that the policy shall not be altered, cancelled or allowed to lapse without 30 days prior written notice to the Town of Amherstburg.

12. CORPORATE CONTACT AND COMMUNICATIONS

Additional information, including clarifications, regarding this Tender may be obtained by contacting the following person by telephone or email:

Administrative Inquiries (regarding tender procedures, insurance, etc.)

Bobbi Reive, Financial Planning Administrator

Town of Amherstburg

Phone: 519-736-0012 extension 226

Email: breive@amherstburg.ca

12. CORPORATE CONTACT AND COMMUNICATIONS - Continued

Technical Inquiries (regarding the scope of work of the contract)

Justine Arbour, P.Eng

Hrycay Consulting Engineers Inc.

Phone: 519-737-7234

Email: jarbour@hcei.ca

Contact with Town of Amherstburg officials or staff other than the staff members named as is not permitted and will be considered grounds for disqualification in the bidding and selection process. No verbal instructions or verbal information to bidders will be binding on the Town.

After the contract has been awarded, a Project Manager for the Town of Amherstburg may be named which may differ from the contact individual noted above. This individual will be the Manager that will oversee the completion of the contract per the specifications noted in this document.

13. TENDER VALIDITY PERIOD

Tenders shall remain valid and open for acceptance for a period of 90 days from the Tender closing date. Bidders shall ensure that sub-trade and supply tenders are valid for a sufficient length of time to accommodate the noted validity period.

14. SUBMISSION CONFIDENTIALITY

All Tenders submitted to the Town will be considered confidential, conditional to the Municipal Freedom of Information and Protection of Privacy Act. All pricing information regarding content of Tenders will remain confidential as the Town reserves the right to negotiate with bidders.

At no time will bidders divulge any confidential information provided to or acquired by the bidder or disclosed by the Town throughout the course of the intended project.

The successful bidder acknowledges that information of any kind provided throughout the course of the intended project are the exclusive property of the Town and shall not be disclosed or released to any person or organization without written authorization from the Town having been previously provided.

15. INFORMAL OR UNBALANCED TENDERS

Tender documents must be legible. All entries in the Form of Tender shall be made in ink or by typewriter. Entries or changes made in pencil shall be subject to automatic rejection, unless otherwise decided by the Town.

Alterations of any kind must be clearly made and initialed by the bidder, or the Tender may be subject to automatic rejection.

Tenders containing a project period or schedule adverse to the objectives of the Town's interests may be rejected.

Tenders containing prices so unbalanced as to adversely affect the interests of the Town may be subject to rejection.

All items must be bid with the unit price for every item and other entries clearly shown. If any amount within the Tender does not agree with the extension of the estimated quantity and unit price, the unit price shall govern and the amount and the Total Tender Price shall be corrected accordingly, unless the Town decides otherwise.

A discrepancy in addition or subtraction shall be corrected by the Town by adding or subtracting the items correctly and correcting the Total Tender Price, unless the Town decides otherwise. If an error has been made transposing an amount from one part of the Tender to another, the amount shown before transfer shall, subject to any corrections as previously noted, be taken to be correct and the amount shown after the transfer and the Total Tender Price shall be corrected accordingly.

If an omission has occurred wherein an item of work has not been provided a price in the Form of Tender, the bidder shall, unless otherwise stated in his Tender, be deemed to have allocated this price elsewhere in the Form of Tender for the cost of carrying out said item of work and, unless otherwise directed by the Town, no increase shall be made in the Total Tender Price because of said omission.

The Town may wave formalities at its discretion, provided the Town's Purchasing Policy has been adhered to.

16. CORPORATE SEAL

The Form of Proposal requires the application of the Proponent's corporate seal on a number of pages. The corporate seal must be applied on each page as required to make the proposal valid. If a corporate seal is not present on the required Form of Proposal pages, the Proponent must indicate that the proposal signatory is legally authorized to bind the company by completing the acknowledgement provided below the request for the corporate seal.

16. CORPORATE SEAL – Continued

Failure to provide corporate seals or acknowledgement that the signatory is legally able to bind the company in the required locations on the Form of Proposal may result in the rejection of the proposal.

The Town reserves the right to request proof of legal authority to bind the company at its discretion.

17. WORKPLACE SAFETY AND INSURANCE BOARD PAYMENTS

The Contractor will be required to submit to the Municipality a Certificate of Good Standing from the Workplace Safety & Insurance Board prior to the commencement of the work and the Contractor will be required to submit to the Municipality a Certificate of Clearance for the project from the Workplace Safety & Insurance Board before final payment is made to the Contractor.

The Contractor shall provide and maintain the necessary first aid items and equipment as called for under the First Aid Regulations of the Workplace Safety & Insurance Act.

18. RESERVATION OF RIGHT

Contractors will not have the right to change conditions, terms or prices of the Tender once the Tender has been submitted in writing to the Town. Bidders may withdraw a Tender once it has been submitted, in accordance with provisions of Section 28 – Withdrawal or Qualifying of Tenders.

19. ADDENDA

Bidders may be notified during the Tender period of required additions to, deletions from, or alterations in the requirements of the Tender documents.

Any addenda issued after the posting of this Tender will be emailed to each bidder up to 48 hours prior to the Tender closing time. It is the sole responsibility of contractors to review and respond to addenda issued following the issuance of this request for Tender in their submissions.

If addenda are issued within to 48 hours of closing this request for Tender, the closing date of this request for Tender will be adjusted accordingly.

Addenda must be acknowledged on page T-13 and provided with the Tender. Failure to acknowledge addenda may result in the rejection of the Tender. Bidders must also acknowledge if no addenda were received.

20. HARMONIZED SALES TAX (HST)

The Proponent will be required to calculate and include both of the following items in his Tender:

- a) Tender Price (not including HST)
- b) Total Tender Price (including 13% HST)

For the purposes of evaluating Tenders, the Total Tender Price must be the base Tender Price plus 13%. If a percentage other than 13% is added, the Tender will be assumed to be in error and will be corrected accordingly.

21. PRICING TO REMAIN FIRM

Pricing provided under this Tender shall remain firm and unchanged for the entire validity period stated in this Tender. (See Section 13 – Tender Validity Period)

22. COSTS INCURRED BY BIDDERS

Expenses incurred by bidders for the preparation and submission of Tenders to the Town, or any work done in correlation thereof, shall be borne by the bidder.

No payment will be provided for any Tenders submitted or for any other effort made by the bidder prior to the commencement of the services as defined and approved by the Town.

23. TENDER FEES

The Tender Fee shall be a firm price (upset limit) and include all payroll costs, benefits, overhead and profit. All costs for printing, telephone and facsimile charges, and approved travel shall be included.

24. PAYMENT OF FEES

Unit prices are provided for the evaluation of tenders and the selection of a successful contractor. Payment for the items in the tender will be on a unit price basis as per the tender. Quantities have been estimated based on anticipated work required.

25. WITHDRAWAL OR QUALIFYING OF TENDERS

A bidder who has already submitted a Tender may submit a further Tender at any time up to the official closing time. The last Tender received shall supersede and invalidate all Tenders previously submitted by the bidder for this contract.

A bidder may withdraw his Tender at any time up to the official closing time by presenting a letter with his signature and corporate seal. Said letter must be received at the Tender closing location in sufficient time to be marked with the time and date of receipt, and for the Tender contact to note the withdrawal of the Tender prior to the official closing time.

When a request to withdrawal a Tender has been received prior to the closing time, and it has been verified to be signed and sealed by the Town, the unopened submission envelope will be returned to the bidder.

No telegrams, facsimiles, or telephone calls will be considered for official withdrawal of a Tender. If applicable, the bid deposit shall be forfeited to the Town when a bidder attempts to withdraw their Tender after the Tender closing time, in addition to any consequence or applicable legal penalty.

26. DISQUALIFIED TENDERS

The Town will not accept Tenders that:

- a) Are received by the Town at the closing location any time after the closing time advertised for the Tender
- b) Do not contain the required bid bond, certified cheque or bank draft in the required amount (if so required by the request for Tender)

Disqualifications of Tenders shall be subject to the Town's Purchasing Policy.

27. ABILITY AND EXPERIENCE OF CONTRACTOR

The successful contractor must submit satisfactory evidence that they have the ability and experience for this type of work and that they have the necessary plant and capital to enable them to proceed and complete the work in a satisfactory manner. This evidence must be provided on the submitted form of Tender.

The Town of Amherstburg may investigate as it deems necessary to determine the ability of the bidder to perform the work and the bidder shall furnish the Town of Amherstburg all such information and data for this purpose as the Town of Amherstburg may request.

27. ABILITY AND EXPERIENCE OF CONTRACTOR – Continued

The Town of Amherstburg reserves the right to reject any tender if the evidence submitted by or investigation of such bidder fails to satisfy the Town of Amherstburg that the bidder is qualified to carry out the obligations of the contract.

28. PRIVILEGE CLAUSE

The lowest or any Tender may not necessarily be accepted. The Corporation of the Town of Amherstburg reserves the right to delete any part, or parts from the Tender without stating reasons therefore. In the event of any deletion, it is agreed that the contractor will have no claim for loss of potential profit or overhead costs.

29. RECORD AND REPUTATION

Without limitation to any other privilege of the Town, and notwithstanding whether a submitted Tender otherwise satisfies the requirements of the Tender or not, the Town may instantly reject any Tender from a bidder where in the opinion of Council, the affiliation between the Town and said bidder has been damaged by prior or current acts or omission of said bidder, including but not limited to:

- a) Litigation with the Town
- b) The failure of the bidder to pay, in full, any outstanding payments, interests, and costs owing to the Town after the Town has requested payment of same
- c) The refusal of the bidder to enter into the contract with the Town after the bidder's Tender has been accepted by the Town
- d) The refusal of the bidder to perform or complete performance of a contract with the Town at any time after the bidder has been awarded the contract by the Town
- e) The refusal of the bidder to follow logical directions of the Town or to alleviate a default under any contract with the Town when required by the Town or the Town's representative
- f) Acts or omissions by the bidder resulting in a claim by the Town under a bid bond, performance bond or any other security required to be submitted by the bidder on a tender, RFP or RFQ within a five year period immediately preceding the date on which the tender, RFP or RFQ is awarded

30. TENDER ACCEPTANCE OR REJECTION

It is understood that the Corporation of the Town of Amherstburg is not bound to accept the lowest, or any bid submission.

Reporting and authorization of resulting contracts shall be conducted in accordance with the Town's Procurement Policy.

A Tender is accepted by the Town when the agreement is executed by the Town and the successful bidder; or upon written authorization from the Town within the 90 day validity period, where the Town has issued a written order to commence work to the successful bidder. The acceptance of the Tender is also conditional upon the receipt of a Performance Bond (if required), and Labour and Material Payment Bond (if required).

The Town is not responsible for any liabilities, expenses, loss or damage to the Bidder subsequent to or by reason of the acceptance or non-acceptance by the Town of any Tender or by reason of any delay in the acceptance of a Tender. Tenders are subject to a formal contract being prepared and executed.

If an insufficient number of Tenders are received, Tenders may be returned unopened.

31. TENDER RESULTS

A Council report indicating the results of this Tender shall be a matter of public record. The results of the Tender, when requested, may be made public by the Town, and may contain the Total Tender price.

The name of the successful bidder and the contract price shall be deemed public information following the award of contract, however unit prices contained in the form of Tender will not be released.

Unsuccessful bidders may request information regarding their Tender evaluation from the Corporate Contact.

32. AGREEMENT

The successful bidder will be required to enter into an agreement with the Town upon acceptance of their Tender. An agreement will be executed in quadruplicate by the Town and will be provided to the Contractor in the executed contract.

If a mathematical error has been found in the Contractor's submission and has been properly corrected and initialed by the bidder, the price stipulated in the agreement will be the corrected price.

33. CONTRACT EXECUTION

Upon approval of the award of contract, the successful bidder will be notified by the Town that their Tender has been accepted and an official award of contract letter will be provided.

The successful bidder will be given no more than fourteen days from the receipt of the contract documents for execution of the contract documents and to provide the necessary guarantees, insurance, etc. Failure to execute the contract documents, and failure to provide the required guarantees, insurance, etc. within the specified time may result in forfeiture of the Tender deposit (if applicable). No work shall commence on the project until the documents have been executed by the bidder and the insurance and guarantees have been received.

There shall be no variation or substitution from this Tender unless approved in writing by the Town.

Receipt of materials, equipment, work or service will not waive any of the requirements of the contract. Defective goods, materials, or equipment found will be returned at the risk of the supplier and at the supplier's expense.

Failure to deliver or complete the terms of the contract outside of the stipulated project schedule shall entitle the Town to cancel the contract without being liable for any costs, fees, or charges of any kind.

In the event of labour or supplier strikes, or unexpected events that cease work, the Town reserves the right to suspend this contract.

34. BIDDER DECLARATION

The bidder, by submission of a Tender, declares that:

- The bidder has carefully reviewed the required deliverables and specifications in accordance to this Tender
- No one other than the bidder has any interest in this Tender or in the assignment of the pending contract from this Tender
- That all representation in the Tender submission are true and factual
- The bidder and their heirs, administrators, successor, executor and assigns are to forfeit all claims against the Town under the contract. This includes claims for all work done and/or supplies and/or service provided under the contract should it seem that a member of Council or a Town employee has been furnished with a direct or indirect financial benefit

35. CONFLICT OF INTEREST

Contractors participating in this Tender process shall disclose, prior to entering into an agreement, any potential direct or indirect conflict of interest. If such a conflict exists, the Town of Amherstburg may, at its discretion, withhold the award of a contract from the Contractor until the matter is resolved. If the conflict is deemed to remain unresolved, and the Town deems it necessary, the Town reserves the right to withhold the award of contract to the bidder altogether and provide the contract to the next qualified bidder.

36. SUBCONTRACTORS OR SUPPLIERS

If the Contractor proposes to use any product or services from another firm or subcontractor for any part of the work, other than those listed in the Form of Tender, the contractor must request approval in writing from the Project Manager. The Owner reserves the right at any time to object or refuse to accept any subcontractor, firm or supplier for inclusion in the work and shall not be required to give a reason for such objection or refusal.

No substitute for any firm, subcontractor or supplier shall be allowed without written consent from the Project Manager. Nothing contained in the contract documents shall create any contractual relationship between any subcontractor, firm or supplier and the Owner. Should the contractor request to change any subcontractor, firm or supplier, the Owner will not be responsible for any additional costs incurred by the contractor as a result of this request.

37. CONTRACTOR'S LIABILITY

The successful Bidder, his agents, employees, or persons under his control including sub-contractors, shall use due care that no person or property is injured and that no rights are infringed in the prosecution of the work. The Contractor shall be solely responsible for all damages, by whomsoever claimable, in respect to any injury to persons or property of whatever description and in respect of any infringement of any right, privilege or easement whatever, occasioned in the carryon of the work, or by any neglect on the Contractor's part.

38. INDEMNIFICATION

The Contractor will indemnify and save harmless the Town, its officers, partners, agents, employees and Council members from and against all claims, demands, losses, damages, costs, expenses, actions and suits that may arise, directly or indirectly from its performance of the contract or by reason of any matter or thing done, permitted or omitted to be done by the Contractor, its sub-contractors or their agents or employees with respect to the contract.

39. ERRORS AND OMISSIONS

The Town shall not be held liable for any errors or omissions contained in any part of this Tender. The Town has put forth significant effort to ensure accurate data in this Tender. The information contained in this Tender is supplied exclusively as parameters for bidders. The information contained in the Tender documents is not guaranteed or warranted to be accurate, nor is it necessarily comprehensive. No information provided in the Tender is intended to relieve the bidder from forming their own conclusions with respect to the matters contained therein.

40. CONTRACT DOCUMENTS

The Proponent shall take note that the Contract Documents shall include a Contract Agreement, a Certificate from the Workplace Safety & Insurance Board, a Certificate of Insurance, Labour and Materials Payment Bond and a Performance Bond, all to be furnished by the Contractor in a form satisfactory to the Owner's solicitor. The Proponent shall consult with the Owner's solicitor as to the forms required for the Contract and the Proponent shall not qualify his Quotation in respect to these matters.

41. LIQUIDATED DAMAGES

If the works are not entirely completed by **November 1, 2017** the contractor's payment will be reduced for liquidated damages in the amount of \$2,000.00 for each day beyond November 1, 2017 until such time the Town indicates the project has been completed.

42. PROJECT COMMENCEMENT AND COMPLETION DATE

Due to grant funding requirements under the Ontario Community Infrastructure Fund, the project must be completed by **November 1, 2017**. This project shall not proceed until after the award of Contract and execution of the Contract Agreement, and must be complete in every respect by November 1, 2017. Once mobilized, the contractor must remain on site until the work is completed.

43. OCCUPATIONAL HEALTH AND SAFETY ACT

The contractor shall comply with all requirements of the Occupational Health and Safety Act, 1990 and Regulation for Construction Projects and Amendments, as administered by the Ontario Ministry of Labour and all subsequent amendment of said act. In the event that the contractor fails to comply with the requirements of the above mentioned act, the Town may suspend the continuation of the work forthwith and the suspension will remain in

effect until the contractor has taken whatever remedies are necessary to comply with said act.

43. OCCUPATIONAL HEALTH AND SAFETY ACT – Continued

Suspension of the work by the Town on account of the provisions of this clause, shall not allow the contractor an extension of the time of completion and the contractor may be liable for liquidated damages to the Town.

44. PROCUREMENT POLICY BY-LAW / GOVERNING LAW

Tenders will be called, received, evaluated, accepted and processed in accordance with the Town's Procurement and Purchasing Policy, respecting purchasing (copy available upon request). By submitting a Tender for this subject, the Contractor agrees to be bound by the terms and conditions of such Policy and any amendments thereto, as fully as if it were incorporated herein.

Any Contract resulting from this Request for Tender shall be governed by and interpreted in accordance with the laws of the Province of Ontario.

45. ACCESSIBILITY FOR ONTARIANS WITH DISABILITIES ACT (AODA)

The Contractor shall ensure that all its employees, agents, volunteers, or others for whom the Contractor is legally responsible receive training regarding the provision of the goods and services contemplated herein to persons with disabilities in accordance with Section 6 of Ontario Regulation 429/07 (the "Regulation") made under the Accessibility for Ontarians with Disabilities Act, 2005, as amended (the "Act"). The Contractor shall ensure that such training includes, without limitation, a review of the purposes of the Act and the requirements of the Regulation, a review of the Town's Policy on Accessible Customer Service Standards, as well as instruction regarding all matters set out in Section 6 of the Regulation.

The Contractor shall also maintain a record of all training provided to the Contractor's personnel on the Town's accessible customer service standards as required under this section, which shall include at a minimum the dates on which the training was provided and the number of individuals to whom the training was provided. The Vendor shall furnish any required records of accessible customer service training to the Town within ten (10) days of the Town's request, unless otherwise agreed upon by the Town. The Town reserves the right to require the contractor to amend its training policies to meet the requirements of the Act and the Regulation.

The Town's Accessible Customer Service Standards Policy has been provided in Appendix B.

Information on accessible customer service training is available online from the Ministry of Community and Social Services at www.accesson.ca/index.aspx.

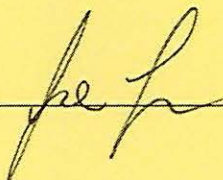
FORM OF TENDER

CONTRACTOR IDENTIFICATION SHEET

BUSINESS NAME OF CONTRACTOR:	J&J Lepera Infrastructures Inc
MAILING ADDRESS OF CONTRACTOR (including postal code):	4405 Seventh Concession Rd Windsor ON N9A6J3
NAME OF CONTACT PERSON REPRESENTING CONTRACTOR:	Joe Lepera
TELEPHONE NUMBER & EXTENSION OF PERSON REPRESENTING CONTRACTOR:	519-972-1700 <i>JK</i>
FAX NUMBER OF CONTRACTOR:	519-972-1706
EMAIL ADDRESS OF PERSON REPRESENTING CONTRACTOR:	info@jjlepera.com
NAME OF PERSON SIGNING ON BEHALF OF CONTRACTOR:	Joe Lepera
TITLE OF PERSON SIGNING ON BEHALF OF CONTRACTOR:	President

SIGNATURE OF PERSON AUTHORIZED TO ACT ON BEHALF OF PROPONENT:

CORPORATE SEAL:



(Please affix Corporate Seal)

If a corporate seal does not exist, please acknowledge the following:

"The signature of the person applied to this tender document is authorized to act on behalf of the proponent and is legally able to bind the company."

_____ Signatory Initials

TENDER PRICE

We the undersigned, having examined the locality and site of the Works, Drawings and Specifications as prepared by The Town of Amherstburg and hereby offer to furnish all materials including all appropriate sales taxes and perform all the work necessary as described in the above documents and in accordance with the said documents under the supervision of the Project Manager of the Town of Amherstburg, made up as follows:

Item No.	Spec. No.	Item	Unit	Estimated Quantity	Unit Price	Estimated Total
PART A - GENERAL WORKS						
A1	1	Mobilization & Demobilization	L.S.	1.00		\$ 5400
A2	2	Contractor Layout	L.S.	1.00		\$ 4600
A3	3	Contract Bonding, Insurance and Permits	L.S.	1.00		\$55,500
A4	4	Traffic Control & Detour Route Signing	L.S.	1.00		\$ 27,700
A5	5	Portable Variable Message Signs (Temporary)	ea.	1.00	\$ 4900	\$ 4900
A6	6	Protection Of Existing Utilities And Services	L.S.	1.00		\$ 11550
A7	7	Heavy-Duty Silt Fence Barriers	m	200.00	\$ 37	\$ 7400
PART A - GENERAL WORKS SUBTOTAL						\$ 117,050
PART B - REMOVALS						
B1	8	Clearing And Grubbing				
		a) Brush	ha	0.0155	\$150,000	\$ 2,325
		b) Limbing	m ²	50.00	\$ 40	\$ 2,000
		c) Trees Greater Than or Equal to 300mm in Diameter	ea.	1.00	\$ 1170	\$ 1170
B2	9	Remove And Dispose of Asphalt, Full Depth, Including Sawcutting	m ²	10,310.00	\$ 3	\$ 30,930
B3	10	Mill and Dispose of Asphalt Pavement to a Depth of 50mm, Between Simcoe and Alma, Including Sawcutting	m ²	8,490.00	\$ 5	\$ 42,450
B4	11	Removal Of Existing Culvert Pipes	m	60.00	\$ 77	\$ 4,620

Item No.	Spec. No.	Item	Unit	Estimated Quantity	Unit Price	Estimated Total
B5	12	Strip Topsoil And Stockpile On-Site	m ²	3,510.00	\$ 4	\$ 14040
B6	13	Relocation of Rural Mailboxes	ea.	2	\$ 142	\$ 284
B7	14	Remove, Store And Re-Install Signs To New Post	ea.	11.00	\$ 153	\$ 1683
B8	15	Removal of Existing Driveways	m ²	123.00	\$ 20	\$ 2460

PART B - REMOVALS SUBTOTAL

\$ 101962

PART C - ROADWORKS & GRADING

C1	16	Earth Excavation (Grading)	m ³	10,720.00	\$ 14	\$ 150080
C2	17	150mm Diameter Subdrain	m	2,600.00	\$ 16	\$ 41600
C3	18	Granular "A" (450mm)	t	29,080.00	\$ 19	\$ 552520
C4	19	Supply And Place Hot Mix Asphalt				
		a) HMA - HL-3 Surface Course (50mm)	t	3,450.00	\$ 90	\$ 310500
		b) HMA - HL-4 Base Course (100mm)	t	4,410.00	\$ 90	\$ 396900
C5	20	Driveway Restoration				
		a) Asphalt	m ²	265.00	\$ 44	\$ 11660
		b) Concrete	m ²	41.00	\$ 49	\$ 2009
		c) Granular	m ²	70.00	\$ 5	\$ 350
C6	21	Tack Coat	m ²	45,224.00	\$0.50	\$ 22612
C7	22	Lap Joint	m	77.00	\$ 49	\$ 3773
C8	23	Catch Basin and Culvert End Treatments				
		a) 300mm Thick Rip Rap (150mm Nominal Size) c/w Geotextile	m ²	100.00	\$ 61	\$ 6100
		b) Smooth Run River Stone	m ²	30.00	\$ 82	\$ 2460

Item No.	Spec. No.	Item	Unit	Estimated Quantity	Unit Price	Estimated Total
C9	24	Placement of Topsoil, from Stockpiles	m ²	3,510.00	\$ 4	\$ 14040
C10	25	Seed And Cover	m ²	3,510.00	\$ 4	\$ 14040
C11	OPSS 721	Steel Beam Guide Rail End Treatment, Sequential Kinking Terminal System (OPSD 922.180)	ea.	4.00	\$ 3118	\$ 12472
C12	OPSS 721	Steel Beam Guide Rail with Channel (OPSD 912.140)	m	110.50	\$ 130	\$ 14365
C13	OPSS 721	Steel Beam Base Plates Over Existing Concrete Culvert	L.S.	1.00	\$ 5652	\$ 5652
C14	26	Bicycle Railing over Culvert	m	62.40	\$ 375	\$ 23400
C15	27	Road Signs	ea.	29.00	\$ 351	\$ 10179
C16	28	Adjust Existing Watermain Valve Boxes	ea.	12.00	\$ 284	\$ 3408
C17	29	Adjust Existing Gas Valves	ea.	5.00	\$ 284	\$ 1420
PART C – ROADWORKS & GRADING SUBTOTAL						\$ 1599540

PART D – STORM SEWERS

D1	30	Supply And Install Precast Maintenance Holes				
		a) 1500mm Dia. (OPSD 701.011)	ea.	4.00	\$ 6060	\$ 24240
		b) 1800mm Dia. (OPSD 701.012)	ea.	9.00	\$ 6657	\$ 59913
D2	31	Supply And Install 600mm X 600 mm Precast Ditch Inlet Catch Basins	ea.	26.00	\$ 2570	\$ 66820
D3	32	Supply And Install 250mm Dia. PVC Ditch Inlet Catch Basin Leads	m	368	\$ 158	\$ 58144
D4	33	Supply And Install Storm Sewer Pipe				
		a) 450mm Dia.	m	135.00	\$ 229	\$ 30915
		b) 750mm Dia.	m	44.70	\$ 960	\$ 42912
		c) 825mm Dia.	m	222.70	\$ 600	\$ 133620

Item No.	Spec. No.	Item	Unit	Estimated Quantity	Unit Price	Estimated Total
		d) 900mm Dia.	m	315.00	\$600	\$189000
		e) 975mm Dia.	m	552.00	\$765	\$422280
D5	34	Installation of HDPE Culvert Pipe				
		a) 450mm Dia.	m	43.00	\$291	\$12513
		b) 750mm Dia.	m	23.00	\$458	\$10534
		c) 900mm Dia.	m	18.50	\$602	\$11137
D6	35	Rock Excavation And Removal	m ³	1,272.00	\$97	\$123384
D7	OPSS 421	900mm Concrete Headwall (OPSD 804.030)	ea.	1.00	\$6633	\$6633
D8	OPSS 407	Supply & Install Ditch Inlet Catch Basin Grate 850mm X 850mm (OPSD 403.010)	ea.	1.00	\$1339	\$1339
D9	36	CCTV Inspection of Storm Sewer				
		a) At Substantial Completion	L.S.	1.00		\$3216
		b) At End of 1-Year Maintenance Period	L.S.	1.00		\$3216
PART E – STORM SEWERS						\$1199816

PART E – MULTI-USE TRAIL & PEDESTRIAN BRIDGE						
E1	16	Earth Excavation	m ³	1,025.00	\$14	\$14350
E2	18	Granular "A" (300mm)	t	3,905.00	\$21	\$82005
E3	19	Supply And Place Hot Mix Asphalt				
		a) HMA - HL-3 Surface Course (40mm) – Simcoe to Libro Centre	t	165.00	\$109	\$17985
		b) HMA - HL-3 Surface Course (50mm) – Simcoe to Alma, includes 0.5m buffer	t	545.00	\$109	\$59405

Item No.	Spec. No.	Item	Unit	Estimated Quantity	Unit Price	Estimated Total
		c) HMA - HL-4 Base Course (50mm) – Libro Centre to Alma, includes 0.5m buffer	t	745.00	\$ 109	\$ 81 205
E4	21	Tack Coat	m ²	4,920.00	\$ 1	\$ 4 920
E5	37	Mechanically Stabilized Earth Wall at Pedestrian Bridge	L.S.	1.00		\$ 106 770
E6	38	Pre-Engineered Pedestrian Bridge and Abutments	L.S.	1.00		\$ 36 531
E7	38a	Concrete Sidewalk Landing Areas	m ²	75.00	\$ 49	\$ 3 675
E8	38b	Tactile Walking Surface Indicators (OPSD 310.039)	ea.	6.00	\$ 292	\$ 1 752
PART E – MULTI-USE TRAIL & PEDESTRIAN BRIDGE SUBTOTAL						\$ 408 598

PART F – STREETLIGHTING						
F1	39	Permits, inspections and Hydro Connections. Mobilization / Excavation Near Utilities	L.S.	1.00		\$ 780
F2	40	Removal of Existing Electrical Equipment and Materials Ref.: OPSS 610				
		a) Existing luminaires, fixtures, brackets, arms, and all pole mounted accessories	ea.	15.00	\$ 341	\$ 5 115
		b) Tree Protection	L.S.	1.00		\$ 390
		c) Temporary measures	L.S.	1.00		\$ 390
F3	41	Supply and Install Electrical Chambers (Handwells)				
		a) Concrete Round, 460mm DIA. Ref.: OPSD 2112.02	ea.	1.00	\$ 974	\$ 974
F4	42	Supply and Install Duct, by Directional Bore				
		a) Rigid PVC, 1-50mm DIA. Ref.: OPSD 2101.01, 2101.02, 2101.05	m	25.00	\$ 34	\$ 850

Item No.	Spec. No.	Item	Unit	Estimated Quantity	Unit Price	Estimated Total
F5	42	Supply and Install Duct, by Open Cut Ref.: OPSD 2101.01, 2101.02, 2101.05	m	1,200.00	\$ 27	\$ 32400
F6	43	Supply and Install Street Lighting Cable, in Duct				
		a) RWU90, 1-1/C, #6 AWG	m	3,750.00	\$ 2	\$ 7500
F7	44	Supply and Install Power Cables, In Duct Ref.: OPSS 604				
		a) RW90, 1-1/C, #2 AWG	m	7.00	\$ 5	\$ 35
F8	45	Supply and Install Street Lighting Cable Riser in Poles Ref.: OPSS 604				
		a) RW90, 1-1/C, #12 AWG	m	350.00	\$ 1	\$ 350
		b) New Poles (Inline fuses in handholes) 10A type KTK fuses & fuse-holders	ea.	22.00	\$ 44	\$ 968
		c) Existing Poles (Inline fuses in handholes) 10A type KTK fuses & fuse-holders	ea.	47.00	\$ 44	\$ 2068
F9	46	Supply and Install Ground Cable, In Duct Ref.: OPSS 609				
		a) RW90 1-1/C, #6 AWG	m	1,090.00	\$ 2	\$ 2180
F10	47	Supply and Install Ground Cable, Riser In Poles Ref.: OPSS 609				
		a) RW90 1-1/C, #12 AWG	m	40.00	\$ 1	\$ 40
F11	48	Supply and Install Ground Electrodes Ref.: OPSS 609				
		a) Copper Clad 3/4" (19MM) DIA	ea.	6.00	\$ 63	\$ 378

Item No.	Spec. No.	Item	Unit	Estimated Quantity	Unit Price	Estimated Total
F12	49	Supply and Install Concrete Poles, Direct Buried Ref.: OPSS 615				
		a) Round Concrete Pole (Class 'A') 9.14m (7.6m above grade)	ea.	22.00	\$ 1364	\$ 30008
F13	50	Supply and Install Luminair Arm Brackets, On Poles Ref.: OPSS 617				
		a) 4' Arm	ea.	22.00	\$ 117	\$ 2574
		b) 6' Arm	ea.	8.00	\$ 141	\$ 1128
		c) 8' Arm	ea.	8.00	\$ 142	\$ 1136
		d) 10' Arm	ea.	21.00	\$ 190	\$ 3990
F14	51	Supply and Install Luminairs, On Arm Brackets Ref.: OPSS 617				
		a) L1 Light Fixture on Existing Pole Including Connections and in-line fuses	ea.	27.00	\$ 537	\$ 14499
		b) L2 Light Fixture on Existing Pole Including Connections and in-line fuses	ea.	10.00	\$ 349	\$ 3490
		c) L1 Light Fixture on New Pole Including Connections and in-line fuses	ea.	22.00	\$ 537	\$ 11814
PART F – STREETLIGHTING SUBTOTAL						\$ 123057

PART G – PROVISIONAL ITEMS AND ALLOWANCES

G1	40	Dust Control (<i>Provisional</i>)				
		a) Water for Dust Control	m ³	500.00	\$ 4	\$ 2000
		b) Brine Solution for Dust Control	m ³	100.00	\$ 41	\$ 4100
G2	41	Unit Rates (c/w operators) (<i>Provisional</i>)				
		a) Tractor Sweeper	hr.	10.00	\$ 62	\$ 620

Item No.	Spec. No.	Item	Unit	Estimated Quantity	Unit Price	Estimated Total
		b) Vacuum Sweeper	hr.	10.00	\$ 84	\$ 840
		c) Cold Miller (300mm to 1200mm Cutter)	hr.	10.00	\$ 252	\$ 2520
		d) Cold Miller (1500mm to 1800mm Cutter)	hr.	10.00	\$ 504	\$ 5040
		e) Asphalt Paver, 1400mm to 2600mm Paving Width	hr.	10.00	\$ 101	\$ 1010
		f) Asphalt Paver, 2000mm to 3000mm Paving Width	hr.	10.00	\$ 112	\$ 1120
		g) Asphalt Paver, 2400mm to 4200mm Paving Width	hr.	10.00	\$ 140	\$ 1400
		h) Asphalt MTV (Material Transfer Vehicle)	hr.	10.00	\$ 252	\$ 2520
		i) Skid Steer Loader w/bucket	hr.	10.00	\$ 76	\$ 760
		j) Excavator, 26 - 32 tonne w/bucket	hr.	10.00	\$ 154	\$ 1540
		k) Excavator, 18 - 25 tonne w/bucket	hr.	10.00	\$ 215	\$ 2150
		l) Excavator, 3 - 8 tonne w/bucket	hr.	10.00	\$ 190	\$ 1900
		m) Water Truck w/sprayer	hr.	10.00	\$ 62	\$ 620
		n) Triaxle Dump Truck	hr.	10.00	\$ 75	\$ 750
		o) Rubber Tire Backhoe	hr.	10.00	\$ 105	\$ 1050
		p) Colas Sprayer Truck	hr.	10.00	\$ 84	\$ 840
		q) Jackhammer and Compressor	hr.	10.00	\$ 39	\$ 390
		r) Rubber Tire Roller	hr.	10.00	\$ 84	\$ 840
		s) Steel Roller - 1500kg to 4500kg	hr.	10.00	\$ 87	\$ 870
		t) Milling attachment for Skid Steer loader	hr.	10.00	\$ 56	\$ 560
		u) Hoe-Pack Attachment	hr.	10.00	\$ 11	\$ 110
		v) Hydraulic Breaker Attachment, 26 - 32 tonne	hr.	10.00	\$ 81	\$ 810

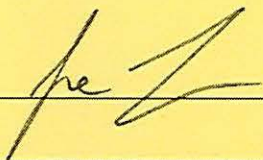
Item No.	Spec. No.	Item	Unit	Estimated Quantity	Unit Price	Estimated Total
		w) Equipment Float w/ Tractor	hr.	10.00	\$ 87	\$ 870
		x) Foreperson and Pickup	hr.	10.00	\$ 90	\$ 900
		y) Labourer	hr.	10.00	\$ 65	\$ 650
		z) Flagperson	hr.	10.00	\$ 60	\$ 600
		aa) Pickup Truck (3/4 ton)	hr.	10.00	\$ 20	\$ 200
G3	OPSS 510	Asphalt & Concrete Sawcutting (<200mm thickness) <i>(Provisional)</i>	m	20.00	\$ 11	\$ 220
G4	42	Hand-Laid Asphalt Placement, HL-4 Base Course <i>(Provisional)</i>	t	15.00	\$ 101	\$ 1515
G5	30	Supply And Install Precast Maintenance Hole, 1200mm Dia. (OPSD 701.010) <i>(Provisional)</i>	ea.	4.00	\$ 1945	\$ 7780
G6	33	Supply and Install Storm Sewer Pipe <i>(Provisional)</i>				
		a) 375mm Dia.	m	109.00	\$ 111	\$ 12099
		b) 750mm Dia.	m	19.00	\$ 196	\$ 3724
		c) 1050mm Dia.	m	168.00	\$ 330	\$ 55440
G7	43	Visually Expose Existing Utilities By Hydro-Vac <i>(Provisional)</i>	hr.	40.00	\$ 154	\$ 6160
G8	44	Additional Earth Excavation <i>(Provisional)</i>	m ³	900.00	\$ 14	\$ 12600
G9	45	Granular 'B' Type II <i>(Provisional)</i>	t	1,350.00	\$ 16	\$ 21600
G10	Dwg. R7	CSP Catch Water Basin, Town of Amherstburg Detail <i>(Provisional)</i>	ea.	1.00	\$ 959	\$ 959
G11	46	Materials Testing And Inspection <i>(Allowance)</i>	L.S.	1.00		20,000.00
G12	47	Contingency <i>(Provisional)</i>	L.S.	1.00		200,000.00
PART G - PROVISIONAL ITEMS AND ALLOWANCES SUBTOTAL						\$ 379677

PART A SUBTOTAL	\$ <u>117,050</u>
PART B SUBTOTAL	\$ <u>101,962</u>
PART C SUBTOTAL	\$ <u>1,599,540</u>
PART D SUBTOTAL	\$ <u>1,199,816.</u>
PART E SUBTOTAL	\$ <u>408,598</u>
PART F SUBTOTAL	\$ <u>123,057</u>
PART G SUBTOTAL	\$ <u>379,677</u>
HST 13%	\$ <u>510,861</u>
TOTAL TENDER PRICE	\$ <u>4 440 561</u>

Note: The Town reserves the right to delete items of work from the Contract after awarding the contract.

SIGNATURE OF PERSON AUTHORIZED TO ACT ON BEHALF OF PROPONENT:

CORPORATE SEAL:



(Please affix Corporate Seal)

If a corporate seal does not exist, please acknowledge the following:

"The signature of the person applied to this tender document is authorized to act on behalf of the proponent and is legally able to bind the company."

_____ *Signatory Initials*

REFERENCES

Provide a minimum of three (3) separate references for related projects successfully completed by the contractor. Note that the references may be contacted.

Reference No.1

Company Name: Town of Tecumseh

Address: 917 Lesperance Road, Tecumseh ON

Contact Name & Title: Nicole Giza Dillon's, Phil Bartnik - Tecumseh.

Telephone Number: 519-735-2184 Email: _____

Description of Project: Shawnee Arbor Area Improvements - Phs 2.

Date of Project: 2016

Reference No.2

Company Name: Town of LaSalle

Address: 5950 Malden Road, LaSalle ON

Contact Name & Title: Peter Marra | Engineer

Telephone Number: 519-969-7770 Email: pmarra@town.lasalle.on.ca

Description of Project: Todd Lane Reconstruction Phs 1 & 2.

Reconstruction of Todd Lane from Malden Rd to Tenth St and
from Tenth to Canada St, including 1200mm dia storm sewer and
water mains

Date of Project: 2015

REFERENCES- (cont'd)

Reference No.3

Company Name: City of Windsor

Address: 400 City Hall Square East, Windsor ON

Contact Name & Title: MR. PATRICK WINTERS / ENGINEER

Telephone Number: 519-255-6272 Email: p.winters@city.windsor.on.ca.

Description of Project: St Rose Ave Rehab - ROAD, SEWER,
WM, & STREETLIGHT REHAB

Date of Project: 2014

**Provide any attachments in this regard immediately following this sheet*

**ACKNOWLEDGEMENT OF TENDER DOCUMENTS AND ADDENDA
RECEIVED BY CONTRACTOR**

I/We, the undersigned, hereby acknowledge and confirm on behalf of _____

Joe Lepera Infrastructures Inc

That I/We have received all of the documents noted in the Table of Contents contained in this document and have been provided with all of the details required to permit me/us to submit a bid on Request for Tender.

1. I/We declare that this bid is made without any connection, knowledge, comparison of figures or arrangements with any other company, firm or person submitting a Tender for the supply of the same goods and services.
2. I/We declare that I/We have carefully read this document and have satisfied ourselves as to the nature of the goods and services required and do hereby make our bid to the Corporation of the Town of Amherstburg for the goods and services described herein.
3. I/We acknowledge that we have received the following addendum to this Request for Tender and that it is my/our responsibility to ensure that all addenda issued by the Corporation of the Town of Amherstburg has been received.

Receipt of Addendum No: 1 to 3.

Witness (if applicable)

[Signature]

Signature

[Signature]

Dated:

May 18/17

Name & Position (please print)

Joe Lepera, President

AGREEMENT

THIS AGREEMENT made in quintuplicate this 23rd day of May, 2017.

BETWEEN THE CORPORATION OF THE TOWN OF AMHERSTBURG

(hereinafter called the Corporation) of the first part.

AND

J&J Lepera Infrastructures Inc.

(hereinafter called the Contractor) of the second part.

WHEREAS the Corporation is desirous that certain works should be designed for the implementation of:

Meloche Road Reconstruction

In the Town of Amherstburg and has accepted a Quotation by the Contractor for this purpose.

NOW THIS AGREEMENT WITNESSES AS FOLLOWS:

The Contractor hereby covenants and agrees to provide and supply at his expense, all and every kind of labour and materials for, and to undertake and complete in strict accordance with his Tender submitted to the Town on the:

18th day of May, 2017

And the Agreement Documents (consisting of the contents and requirements for this Tender, including all modifications thereof and incorporated in the said documents before their execution) prepared by the Town of Amherstburg and all of which said documents are annexed hereto and form part of this Agreement to the same extent as fully embodied herein, the construction of the above noted works for the sum of:

Three Million, Nine Hundred and Twenty Nine Thousand, Seven Hundred Dollars
(\$ 3,929,700) excluding H.S.T.

The Contractor hereby covenants and agrees with the Corporation in the following manner:

(1) To execute and perform the whole of the work herein mentioned in a workmanlike manner, in strict accordance with the provisions of this Agreement, including the said Specifications, General Conditions and the Plans (where applicable) therein referred to. The Contractor shall,

in the execution and performance of the said work perform, observe, fulfill and abide by all the covenants, agreements, stipulations, provisions and conditions mentioned and contained in this Agreement.

(2) The Contractor will indemnify and save harmless the Town, its officers, partners, agents, employees and Council members from and against all claims, demands, losses, damages, costs, expenses, actions and suits that may arise, directly or indirectly from its performance of the contract or by reason of any matter or thing done, permitted or omitted to be done by the Contractor, its sub-contractors or their agents or employees with respect to the contract.

(3) To pay to the Corporation, on demand, all loss, costs, damages or expenses incurred by the Corporation or any of its officers, servants or agents in consequence of any such action, suit, claim, lien, execution or demand, and any monies paid or payable by the Corporation or any of its officers, servants or agents in settlement or in discharge thereof, or on account thereof. If in default of said monies so paid or payable by the Corporation, its officers, servants or agents, including any monies payable by the Contractor under any of the terms and conditions of the Contract, these said monies may be deducted from any monies of the Contractor then remaining in possession of the Corporation on account of this or any other Contract, or may be recovered from the Contractor or the Surety named in the Bond hereto attached in any court of competent jurisdiction and monies paid at their request.

The Corporation covenants with the Contractor that if the said work, including all extras in connection therewith, shall be duly and properly executed as aforesaid, the Corporation will pay the Contractor the Contract price mentioned in said tender (which are to apply to all extras of the character specified in the schedule of rates forming part of said Tender). Payment shall be made in the manner, subject to drawbacks and liquidated damages mentioned in the said General Conditions, upon estimates or certificates signed by the Engineer, issued in accordance with the conditions incorporated with and made part of this Agreement.

No monies shall become due or be payable under this Agreement unless and until an estimate or certificate therefore shall have been signed by the said Engineer, the possession of which is hereby made a condition precedent to the right of the Agreement to be paid or to maintain any action for such money or for any part thereof, the Corporation shall not be liable or compelled to pay for any extras or additional work not included in this Agreement, except only in the manner and as provided for herein. The Corporation shall not be liable or compelled to grant or insure any estimate or certificate for work rejected or condemned by the said Engineer or to pay any money therefore until the work so rejected or condemned has been replaced by new material and workmanship to the written satisfaction of the said Engineer. It is hereby expressly provided that the granting of any estimate or certificate, or the payment of any monies thereunder, shall not be construed as an acceptance of any bad or defective work or material, to which the same relates, or as an admission of liability to pay any money in respect thereof, and shall not in any manner lessen the liability of the Contractor to replace such work or material, although the condition of the same may not have been known to, or discovered by the said Engineer at the time such estimate or certificate was granted, or monies paid thereon.


AND it is understood and agreed between the parties hereto as follows:

That this Agreement, and the covenants and conditions herein, and in the said General Conditions contained shall extend to and be binding upon the heirs, executors, administrators, successors and assigns, of the said Contractor and the Corporation respectively. In this Agreement, and in the Contract, of which this Agreement forms a part, the words, "person", "plans", "shall", "may", "herein", "work", "Contract", "Contractor", "Inspector", "Engineer", and words used in the singular number of the masculine gender, shall have the meaning and effect given them in the General Conditions hereto annexed or in the Interpretation Act of the Revised Statutes of Ontario.

IN WITNESS WHEREOF the parties hereto have hereunto affixed their Corporate Seals, if any, duly attested by the signature of their proper officers in that behalf, respectively.



WITNESS AS TO SIGNATURE OF
CONTRACTOR



Contractor's Signature and Seal


JAJ LEPERA INFRASTRUCTURES INC.

Contractor's Name

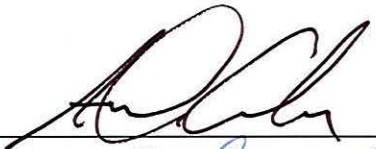
4405 SEVENTH CONCESSION ROAD, WINDSOR, ON

Contractor's address


CORPORATION OF THE TOWN OF AMHERSTBURG



WITNESS AS TO SIGNATURE OF
CORPORATION



Aldo DiCarlo, Mayor



Paula Parker, Clerk

GENERAL CONDITIONS

1. PAYMENTS

The Contractor shall be entitled to receive monthly payments at the rate of ninety percent (90%) of the value of the work actually done and materials in place, according to the estimate of the Engineer, less all stipulated forfeitures and deductions. These payments shall be made on progress certificates, which will be based on approximate estimates only, and must not be taken or construed as an acceptance of the work so estimated or as an admission that the Town is in any way liable to the Contractor in respect thereof. The ten percent (10%) holdback shall be released forty-five days after the Completion of the work or publication of Substantial Completion as defined by the Construction Lien Act, or as soon thereafter as practicable. A certificate for one hundred percent (100%) of the whole amount due under the contract, including extras (less forfeitures and deductions as aforesaid) will be issued payable to the Contractor. After provisions of the contract have been fully complied with, the Bond shall be returned to the Contractor.

A Statutory Declaration form must be submitted at completion of contract and prior to release of the final payment stipulated in the final progress certificate.

The Town shall not be liable for, or be held to pay, any money to the Contractor, except as provided above, and on making the completion payment aforesaid, the Town shall be released from all claim or liability to the Contractor for anything done or furnished for, or relating to, the work, except the claim against the Town for the remainder, if any there be, of the amounts kept or retained as provided above.

Payments to the Contractor will be made out of the funds under the control of the Town in their public capacity, and no member of the Town or officer of the Town is to be held personally liable or responsible to the Contractor under any circumstances whatsoever.

2. ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS)

All relevant and current as of the date of Tender Closing, Ontario Provincial Standard Specifications (OPSS) as referenced on the contract drawings or within the contract specifications, inferred to by the item description or industry use, and as may be referenced by other related Ontario Provincial Standard Specifications (OPSS) or Ontario Provincial Standard Drawings (OPSD) shall apply to this contract. OPSS "Municipal Oriented Specifications" will apply

It shall be the Contractor's responsibility to obtain current copies of the Ontario Provincial Standard Specifications (OPSS) indicated above, which shall form part of this Contract.

3. CONTRACT TIME

Work may proceed under a phased construction approach. The preferred phasing of the project is as follows:

Phase 1 - Lowes Sideroad to Simcoe Street, including works at Simcoe Street intersection

Phase 2 – Simcoe Street to Alma Street

Pending MNR approvals, the project phasing may be reversed so as to cause no undue delays to project completion.

The Contract, including both phases, shall be substantially performed by **November 1, 2017**.

Weather conditions will not constitute a basis for extension of the completion date unless, in the sole opinion of the Engineer, conditions have varied substantially from what is reasonably considered normal for the season(s) (i.e. in the event of abnormal inclement weather).

4. SCHEDULE OF WORK

Upon being awarded the contract, the Contractor shall forthwith supply to the Engineer for approval a copy of a detailed planned Schedule of Work, showing clearly that the work will be completed within the stipulated time. The schedule of work shall indicate proposed progress in 2 week periods for at least the following work:

- mobilization and site preparation
- excavation of existing granulars and asphalt
- installation of new storm sewers including precast maintenance holes and ditch inlet catch basins
- a multi-use paved trail
- prefabricated pedestrian bridge w/ cast-in-place concrete abutments and precast retaining walls
- Final grading
- Asphalt pavement placement with bike lanes

5. ENGINEER'S FIELD OFFICE

A separate field office for the Engineer will not be required for this contract. Construction meetings shall be held at the Town's Public Works Department.

6. WINTER WORK

No additional payment will be considered for the protection of the Work as required by the relevant OPSS for cold weather or Winter Conditions. The Contractor is encouraged to schedule their work to avoid placing concrete, asphalt or other temperature sensitive materials in cold weather and to avoid freezing of granular material during the operations employing these materials.

Where the Contractor's schedule shows work involving temperature sensitive materials during a time frame where cold weather conditions may potentially or can be reasonably expected to occur, the price in the schedule of unit prices shall be deemed to include the necessary cold weather provisions and no additional costs will be considered.

7. TEMPORARY WATER AND POWER

The Contractor shall make their own arrangements for the supply of temporary power. Water shall be supplied by the Town which shall be metered but not charged to the Contractor.

8. TRAFFIC PROTECTION PLAN

The Contractor shall prepare a traffic protection plan including all signage at the site in accordance with the latest revision of the Ontario Traffic Manual Book 7 Temporary Conditions. The Contractor shall have the plan available on site at all times for inspection by the Town or Ministry of Labour.

9. TRAFFIC CONTROL

The Contractor shall provide all necessary lights, signs, and barricades to protect the public. All work shall be carried out in accordance with the requirements of the Occupational Health and Safety Act, and the latest amendments thereto. If traffic control is required on this project, signing is to comply with the M.T.O. Manual of Uniform Traffic Control Devices (MUTCD) for Roadway Work.

The Contractor shall exercise all due care and attention in working within the road allowances. The Contractor shall comply to all current safety regulations, and with signing requirements according to Division 5, Temporary Conditions, of the M.T.O. Manual of Uniform Traffic Control Devices. The Contractor shall provide sufficient flag persons while working within the allowances to ensure safety to workers and the public in general.

The Ontario Traffic Manual Book 7 Temporary Conditions shall be utilized to apply traffic control devices in temporary construction, maintenance and utility work zones, to ensure worker safety, motorist safety, and motorist mobility. The plan is to be prepared and submitted prior to construction illustrating the appropriate signing and channelization required for any roadway work operations.

10. EMERGENCY TELEPHONE NUMBER

The Contractor shall have a representative from his staff on call, 24 hours a day, and seven days a week. The representative should be familiar with the project, and be able to handle any emergency that may arise during the course of the project.

11. PRIVATE PROPERTY

The Contractor shall assume full responsibility for crossing or making use of private property. Before the Contractor or any of his sub-contractors shall make use of any private property for any purpose, he shall first submit to the Engineer a copy of a written agreement granting permission by the Owner.

12. PEDESTRIAN AND VEHICULAR ACCESS

The Contractor shall be required to provide for pedestrian and vehicular access to private homes, business premises and through the construction work to streets where and as directed by the Town. This may require the provision of adequate temporary board walks, steps or ramps where necessary to allow pedestrian and/or vehicular access to new houses and business premises temporarily cut off from normal traffic due to new construction.

13. FIRST AID EQUIPMENT

The Contractor shall provide and maintain the necessary First Aid items and equipment as called for under the First Aid Regulations of the Worker's Compensation Act.

14. SITE MEETINGS

Site meetings shall be held at regular intervals as required.

15. DUST AND MUD CONTROL

The Contractor will be responsible for dust control as deemed necessary by the Owner during construction by watering and calcium application as directed by the Engineer. Clean-up of mud tracking off site shall similarly be the Contractor's responsibility.

16. DISPOSAL OF MATERIALS

The Contractor shall dispose of all waste and/or surplus materials in a disposal area selected by the Contractor in accordance with O.P.S.S. 180. The site shall be located off the Municipal right-of-way. The Contractor shall be responsible for all work involved in disposing the waste or excess material including trucking, access roads, leveling, and all haulage and/or dumping fees applicable.

The Contractor shall identify the disposal area and provide a release from the disposal area owner upon completion of the work.

Where any materials are designated to be salvaged, the Contractor can consult the appropriate special provisions for direction.

17. EXISTING CONDITIONS

The Contractor shall clean up and restore all disturbed areas to condition equal to or better than existing conditions using materials equal to or better than existing materials. This includes the removal and disposal of all layout materials, string lines, batter boards and other such materials.

The Contractor shall maintain flow in all existing sewers, drains, ditches, watercourses, house and inlet connections as applicable.

Sanitary sewers shall not be used for the discharge of water from excavations or dewatering operations.

18. DAMAGE BY VEHICLES AND OTHER EQUIPMENT

If at any time, in the opinion of the Engineer, damage is being or is likely to be done to any highway or any improvement thereon, other than such portions as are part of the work, by the Contractor's vehicles or other equipment, whether licensed or unlicensed, the Contractor shall, on the direction of the Engineer and at the Contractor's own expense make changes in or substitutions for such vehicles or other equipment or shall alter loading or shall in some manner remove the cause of such damage to the satisfaction of the Engineer.

19. MEASUREMENT AND PAYMENT

Unless otherwise noted in the Schedule of Unit Prices, no measurement of quantities will be made for the General Work and no direct payment will be made for any of the General Work. The cost of such work shall be deemed to be reasonably distributed within the overall cost of the work.

Payment for payable items shall be based upon the lump sum or unit price bid, as listed in the Schedule of Unit Prices, using actual "as-constructed" quantities (or plan quantities) as determined by the Engineer. In the event of conflict between the Schedule of Unit Prices and OPSS, the basis of payment indicated in the Schedule shall take precedence (as modified by "pay lines" or payment clauses indicated elsewhere in these documents, if applicable).

20. HOURS OF WORK

The Contractor must adhere to the following hours of work:

Monday to Friday, 7.am. – 8 p.m.

Saturday and Sunday, 9 a.m. – 8 p.m.

21. HEALTH AND SAFETY

The Contractor must submit a copy of their health and safety policy to the Town of Amherstburg prior to the start of construction. The Contractor must also review and be familiar with the Town of Amherstburg's health and safety policy.

STANDARD REQUIREMENTS

1. MATERIALS

All materials (except as specifically indicated in the Special Provisions) required on this Contract shall be supplied by the Contractor. All materials used shall meet Town of Amherstburg Standards. If not covered by the Town Standards then they shall be selected from the appropriate M.T.O. designated Sources List. It is the Contractor's responsibility to verify that all materials meet the Town of Amherstburg Standards.

The Contractor will be required to obtain a copy of the most up to date Town of Amherstburg Development Manual. A copy can be downloaded from the Town web site at <http://www.amherstburg.ca/devmanual>.

The Contractor shall be responsible for any theft of material or damage to the works until the date of Substantial Performance.

2. LIST OF DESIGNATED SUBSTANCES

In accordance with the Occupational Health and Safety Act, R.S.O. 1990, C. S.30, the Contractor is advised of the presence of the following Designated Substances.

The Contractor is advised that the Designated Substances silica (Ontario Regulation Number 521/92), lead (519/92) and arsenic (508/92) are generally present throughout the Working Area, occurring naturally or as a result of vehicle emissions. Exposure to these substances may occur as a result of activities by the Contractor such as sweeping, grinding, crushing, drilling, blasting, cutting, and abrasive blasting.

3. FIELD SAMPLING

The field sampling and testing shall be undertaken by the Engineer or person engaged by the Engineer for this purpose.

Any references to testing to be undertaken by the Contractor shall be revised to read by the Engineer.

4. ENVIRONMENTAL PROTECTION

The preservation, protection and restoration of the local environment will form part of the work of this Contract.

The Contractor shall maintain an environmentally safe work place. It is intended that the works proposed be executed in such a manner which, to the fullest possible extent,

minimizes any adverse effect on the cultural and natural environment of the project area. It is a responsibility of the Contractor that all his personnel be sufficiently instructed so that the work is carried out in a manner consistent with minimizing environmental insult.

Procedures for the interception and rapid cleanup and disposal of spillages that occur shall be submitted to the Engineer for review prior to starting work. All materials required for cleanup of fuel spillages shall be readily accessible on site.

Any spills apt to cause impairment to the natural environment must be immediately reported by the Contractor to the Ministry of Environment Spills Action Centre (800-268-6060) and the local MOE District Office (Windsor – 519-948-1464).

The Contractor shall also advise the Engineer and the Owner after notifying the MOE Spills Action Centre.

No direct measurement of quantities will be made for this work. The work will be administered as being part of the related environmental protection items or as part of the overall site work.

5. PROTECTION OF PUBLIC TRAFFIC

Open Excavations

The Contractor shall schedule the Work so that there will be no open excavation adjacent to a lane carrying traffic overnight and on non-working days except where a traffic barrier designed to restrain errant vehicles is located between the traffic and the excavation.

Location and Storage of Materials and Equipment

Materials shall not be stored within 3m of the traveled portion of any roadway except where a traffic barrier designed to restrain errant vehicles is provided.

Notwithstanding the foregoing, the Contractor shall, at the Contractor's expense, remove any vehicle, equipment or material, which, in the opinion of the Engineer, constitutes a traffic hazard or obstruction to maintenance operations.

Delivery and Trucking

The Contractor shall plan and schedule the routes of vehicles transporting all materials to, from or within the job, so that vehicular movements are accomplished with minimum interference and interruptions to traffic. This will necessitate vehicles to "slip-off" or "slip-on" in the direction of traffic, in order to merge with and thereby avoid crossing traffic lanes.

The Contractor shall obtain the Engineer's prior approval for the location of any "slip-off" or "slip-ons". The Engineer reserves the right to alter, reject or close same as considered necessary. The Contractor shall notify suppliers of materials and equipment of the above requirements.

Holiday Restrictions

The use of construction accesses, shoulder closures, lane closures, ramp closures, and the loading and unloading of materials and construction equipment onto and from the traveled portion of the highway shall not be carried out on the following Canadian Statutory/Civic Holidays:

- Victoria Day
- Canada Day
- August Civic Holiday
- Labour Day
- Thanksgiving Day

or after 3:00pm on days which precede holiday weekends.

Basis of Payment

OPSS 706 is amended in that payment for all costs associated with the number of lane closures and the number of days of speed control activities stipulated above is deemed to be included in the Traffic Control Signing item and no additional payment will be made.

Any additional Town of Amherstburg Police-assisted lane closures and speed control activities that result from the Contractor's chosen sequence and/or method of operation are deemed to be included in the Traffic Control Signing item and no additional payment will be made.

If a third party stipulates that additional Town of Amherstburg Police-assisted lane closures or speed control activities are required, the Owner will compensate the Contractor for the cost of the Town of Amherstburg Police services as Extra Work in accordance with OPSS 0100 – OPS General Conditions of Contract.

6. ONTARIO TRAFFIC MANUAL (OTM)

All references in the contract to the Manual of Uniform Traffic Control Devices (MUTCD), including all Parts and Divisions thereof, or MTO Traffic Control Manual for Roadway Work Operations, or Traffic Control Manual for Roadway Operations Field Editions are hereby deleted and replaced by the following books of the Ontario Traffic Manual (OTM):

Book 5 - Regulatory Signs;

Book 6 - Warning Signs;

Book 7 - Temporary Conditions (and Temporary Conditions Field Edition);
Book 11 - Pavement, Hazard and Delineation Markings;
Book 12 - Traffic Signals.

Any reference in the contract to OTM shall be deemed to be the Ontario Traffic Manual (Books 5, 6, 7, 11 & 12).

The Contractor shall comply with the applicable requirements of the above Ontario Traffic Control Manual book(s).

To order the above noted books, contact:

Publications Ontario
Ministry of Government Services
210 Wicksteed Ave
Toronto, ON M4G 2C3

Phone: 416-326-5300
Toll free within Canada: 800-668-9938
TTY toll free within Ontario: 800-268-7095
Billing and account inquiries: 416-326-5306
<http://www.publications.serviceontario.ca/ecom/>

7. EXISTING UTILITIES AND OTHER MUNICIPAL SERVICES

The Contractor's attention is drawn to the presence of underground utilities and municipal services such as telephone, electrical, cable, water, sanitary and storm. The locations of such, if indicated on the drawings represent to the best of the Owner and Engineer's knowledge, the approximate location of such utilities and services. The Contractor shall be responsible for all stakeouts as per GC7.01.16 as well as any inspection or test pits required and the inspection of any manholes, catch basins, sewers or vaults necessary to locate any utility. The Contractor shall be wholly responsible for the accuracy of the information gathered by their own forces.

OPSS 491, Construction Specification for Preservation, Protection and Reconstruction of Existing Facilities applies to all existing services.

Repair of any part of the existing watermain, storm or sanitary sewer system due to the Contractor's negligence shall be at the contractor's expense.

All repairs to any municipal service shall be approved by the Engineer or the Town. In line splices or connectors will not be allowed for any damaged water services. The contractor shall at their own expense replace the entire line from main stop to curb stop as directed by the Engineer. In line repairs will be allowed for sanitary and storm services but must only

contain one in line connector such as a "Fernco". All material, installation and testing practices must be as per the related Town Engineering, OPS and AWWA standards.

The work site is located directly adjacent to underground Bell telephone and Rogers lines, Hydro lines and Union Gas lines. The Contractor shall be aware of these lines at all times and shall utilize equipment and methodologies in the undertaking of the work that do not constitute a hazard, disruption to services, or safety violation under the Occupational Health and Safety Act.

The Town shall undertake any relocation of permanent utilities as required.

8. LANE CLOSURES

Single lane closures may occur temporarily for deliveries of materials or construction activities provided that qualified flag persons are present.

All temporary lane closures are to be approved by the Engineer at least 24 hours prior to the planned lane closure. No overnight, weekend, or holiday lane closures are permitted.

SPECIFICATIONS

1. MOBILIZATION AND DEMOBILIZATION

ITEM A1

SCOPE: Contractor shall mobilize to the site upon approval by the Town and the Contract Administrator. The Contractor shall not commence works until finalization of all necessary agreements and approvals.

Site mobilization shall include but not be limited to: site set up, staging areas, securing the construction perimeter, providing all safety measures such as temporary signs, barricades, rigid steel fencing, lighting, storage areas, access equipment for inspection, and other related material and equipment that is in compliance with Ontario Health and Safety Act regulations, which is deemed necessary for the work, that is required as part of this contract.

Contractor shall supply, install, and maintain all environmental protection and erosion/sediment control measures including, mats, shrouding of demolition work, silt fencing, and other measures as required in accordance with OPSS 182 and OPSS 805. Note that the environmental measures shall be submitted to the Contract Administrator and the local conservation authority for review and approval prior to the commencement of any construction work.

Once mobilized to the site, the Contractor shall be deemed the Constructor as defined in the Ontario Health and Safety Act and shall be responsible for the safety and safeguard of public, workers, equipment and property within the designated work area.

The Contractor shall conduct a pre and post site inspection with the Contract Administrator and a representative from the Town of Amherstburg prior to site mobilization and at the completion of the work to record the existing condition of the area under consideration that may be affected during the construction process.

The Contractor shall determine with the Contract Administrator and a representative from the Town of Amherstburg any required repairs to elements that were damaged during construction. Completing any identified repairs that occurred during the construction is the sole responsibility of the selected contractor.

At the completion of the work, the Contractor shall demobilize from site and restore the site to its original condition.

MEASUREMENT: No measurement will be made for this item as it is a Lump Sum item.

PAYMENT: Payment for this item shall be at the unit bid price and shall be full compensation for all equipment, labour and materials required to complete this work in every aspect.

Payment for mobilization and demobilization will be made as follows:

- 50% payable on first Progress Payment Certificate
- 50% payable on the Substantial Performance Payment Certificate

2. CONTRACTOR LAYOUT ITEM A2

SCOPE: Layout will be provided by the Contractor.

The Contractor shall be responsible for the true and proper setting out of the work and for the correctness of the position, elevation and alignment of all parts of the work in accordance with established Town procedures. Using qualified personnel and following accepted engineering practice, the Contractor shall layout, calculate, establish and maintain all lines and grades necessary for the construction of the work, and shall provide such information on the calculations, layout, lines and grades as the Contract Administrator may at any time require.

The Contractor shall provide horizontal and vertical control at uniform offsets, every 15 metres along all tangential sections and every 10 metres along any curvature sections of the work. For roadway construction the Contractor will provide Lines and Grades on both sides of the work being constructed.

The Contract Administrator shall provide basic horizontal and vertical control from which the location of the work may be determined. For horizontal and vertical control this shall comprise of either survey bars and ties sufficient to locate the centreline, or control points and their values sufficient to lay out the work. During the progress of the work the Contractor shall be responsible for notifying the Contract Administrator forthwith of any errors, omissions or inconsistencies in the geometric information and the controls provided by the Town.

The Contractor shall give the Contract Administrator 48 hours notice of the time and place where the Horizontal and Vertical control is required for their use in setting out the work.

All bars, benchmarks and other reference points provided by the Contract Administrator shall be located and identified by the Contract Administrator to the Contractor on the site at the start of the work, and shall be carefully preserved by the Contractor, and in the case of their movement, destruction or removal shall be replaced at the Contractor's expense.

Any work done without lines and levels, or to improperly set grade stakes or without the supervision of an inspector when an inspector is required to be in attendance by the provisions of the contract or by the order of the Contract Administrator, shall not be paid for. Such work may, at the discretion of the Contract Administrator, be ordered removed and replaced by correctly aligned and inspected work at no cost to the Town.

If requested by the Contractor in writing, the Contract Administrator will provide, if available, electronic data to assist the Contractor in laying out the works. The software format and version supplied to the Contractor will be the same version as that used by the Contract Administrator to create the files. The Contractor Administrator will not convert the electronic data between software platforms or versions of the same software platform. The Contractor, in requesting and utilizing any such electronic data, acknowledges and agrees that there may be discrepancies in whole or in part between the electronic data and the Contract Drawings and that it is the Contractor's sole responsibility to ensure that the electronic data is the same. In the event of any discrepancy between the Contract Drawings and the electronic data, the Contract Drawings shall take precedence and govern. Any discrepancies must be reported immediately to the Contract Administrator. Any use or manipulation of any part or parts of the electronic data by any party, including the Contractor, any subcontractor of the Contractor or any party or parties carrying on any work associated with the project on behalf of the Contractor, is at the sole risk and responsibility of the Contractor and neither the Contract Administrator nor the Town of Amherstburg shall be liable in any way to the Contractor based on such.

Any manipulation of any part or parts of the electronic data by any party, including a Contractor, proponent, or any party or parties carrying on any work associated with the project, is at the sole risk and responsibility of such party or parties.

The electronic data provided will normally include but may not be limited to:

- Existing topographic survey
- Survey control points and benchmarks
- Road alignments
- Location of the proposed works
- Road profiles
- Storm sewer layout and profiles

MEASUREMENT: No measurement will be made for this item as it is a Lump Sum item.

PAYMENT: Payment for this item shall be at the unit bid price and shall be full compensation for all equipment, labour and materials required to complete this work in every aspect.

3. CONTRACT BONDING, INSURANCE AND PERMITS

ITEM A3

SCOPE: This item shall include the supply of all required bonds and liability insurance as specified elsewhere in the contract documents.

MEASUREMENT: No measurement will be made for this item as it is a Lump Sum item. The lump sum price shall cover the Contractor's cost for provision of the Performance/Payment Bonds and Liability Insurance.

PAYMENT: Payment for Contract Bond and Insurance will be made as follows:

- 100% payable on first Payment Certificate

4. TRAFFIC CONTROL & DETOUR ROUTE SIGNING ITEM A4

GENERAL: This item shall conform to the Ministry of Transportation Ontario – Ontario Traffic Manual (OTM) titled “Book 7 Temporary Conditions,” and OPSS 706 & 740.

SCOPE: This work consists of all labour, equipment and materials required to design, supply, erect, maintain, modify and remove all signs, delineators, barricades, lanterns, flashing lights and traffic signals for the purposes of maintaining traffic flow during the phased construction as indicated on the contract drawings and in conformance with the Ministry of Transportation Ontario manual titles “Book 7 Temporary Conditions.”

A copy of this manual is available on-line from the Ministry of Transportation at no cost to all users. On-line access to the OPS Publications can be obtained from the MTO website or through links established with the Ontario Good Roads Association (OGRA), The Road Authority (TRA) and Ontario Provincial Standards (OPS) websites. Hard copy and CD version of the OPS publications are available through Publications Ontario which can be contacted by Toll Free Number 1-800-668-9938.

The Ministry of Labour, through the Occupational Health and Safety Act (OHSA) and regulations for Construction Projects, R.S.O. 1990 and R.S.O. 213/91 as amended from time to time, has the legal authority to regulate the safety of workers on construction sites. The OHSA and regulations take precedence over Book 7 in matters of worker safety.

The Contractor shall submit traffic control plan and traffic protection plan to the Contract Administrator at the prework meeting.

Prior to the commencement of the work the Contractor shall conform to the requirements of the Occupational Health and Safety Act and Regulations, the current Ontario Traffic Manual and the current Manual of Uniform Traffic Control Devices published by the Ministry of Transportation.

Flagging for traffic control on this Contract shall be provided by the Contractor according to the current “Manual of Uniform Traffic Control Devices”, Section A-5. The flag person shall utilize a “Stop and Slow” paddle conforming to the requirements of any above regulations and the OHSA and shall attend to his/her duties in an alert and courteous manner.

The Contractor must maintain access to all entrances to local homes and properties at all times throughout the contract.

The Contractor shall ensure that a detour route is maintained throughout the road closure and is clearly marked/delineated in two directions through the use of adequate and appropriate construction signs as required and placed in accordance with the latest edition of the Ontario Traffic Manual – Book 7.

Unless specified otherwise, the Contractor shall provide, erect, inspect, maintain, repair and replace (as necessary), all required construction, detour, advisory and warning signs in accordance with the Ontario Traffic Manual – Book 7.

The Contractor shall also barricade the work area in and around the work site to prevent vehicles or pedestrians from gaining access to the work area during the road closure. Barricades shall be preceded by warning signs and shall be sufficient to prevent an errant vehicle from entering any work area or excavation. Barricades shall not be placed in a manner that will restrict access to local entrances and/or mailboxes.

All signs shall be made of retro-reflective material.

No signs shall be placed on private property without written permission from the owner. All traffic control signs must be approved by the Contract Administrator.

The Contractor shall maintain a daily traffic control signing log book complete with photographs.

MEASUREMENT: No measurement will be made for this Lump Sum item.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

5. PORTABLE VARIABLE MESSAGE SIGNS (Temporary) ITEM A5

SCOPE: This specification covers the requirements for the use of Portable Variable Message Signs (PVMS) for traffic control signing prior construction and informational messages during construction.

Schedule

Portable Variable Message Signs (PVMS) shall be erected and operational one (1) week prior to road closures and commencement of construction activities.

PVMS shall be erected and operational prior to and during specific events held at the Libro Centre, as per direction from the Contract Administrator and/or Town.

Materials

Portable Variable Message Signs (PVMS) shall be, at a minimum, 1800 mm tall by 3383 mm wide.

Construction

The Contractor shall be responsible for set up and maintaining the continuous operation of the PVMS, as required, throughout the duration of PVMS use for the Contract. If a PVMS or communications failure occurs, the Contractor shall notify the Contract Administrator and take immediate action to correct the problem.

The Contractor shall be responsible for the following maintenance related items for any PVMS supplied:

- PVMS sign face is turned towards traffic and angled in a manner to ensure maximum visibility;
- solar panels are tilted and rotated to face south;
- all pixels and LEDs in the sign face remain operational;
- sign face is to be regularly cleaned from dirt,
- road salt or debris that may obstruct the visibility of the sign;
- batteries are replaced as needed to ensure that battery levels are maintained per the supplier's operational requirements; and
- modems and other remote communications equipment remain operational.

The Contractor shall conduct regular inspections on the supplied PVMS to ensure the aforementioned requirements are maintained throughout the duration of PVMS use for the Contract.

Messaging on Signs

Messaging on signs shall be as directed and approved by the Contract Administrator and the Town of Amherstburg.

Removal of Portable Variable Message Signs

The Contractor shall be responsible for the teardown and removal the PVMS from the site. The Contractor shall provide at least 2 business days advance notice to the Contract Administrator regarding the removal of the PVMS from the construction work zone.

MEASUREMENT: Measurement for this item shall be on a daily basis, per unit, operating on or near the construction site.

PAYMENT: Payment at the contract unit price shall be full compensation for all labour, equipment and materials necessary to carry out the installation, maintenance and removal of the PVMS. Repairs and or replacement of damaged materials occurring during the course of construction shall be deemed to be included in this item. No payment shall be made for PVMS not in operation on or near the construction site.

6. PROTECTION OF EXISTING UTILITIES AND SERVICES

ITEM A6

SCOPE: The scope of work includes, but is not necessarily limited to, the following:

- The completion of a locate survey to confirm location / presence of all utilities within the limits of Construction.
- The design, supply of materials, installation, maintenance during construction, and removal of any and all temporary support systems for existing utilities / services affected as a result of construction operations. The Contractor shall ensure that all temporary support systems (as required) are designed, implemented and maintained to the satisfaction of the Contract Administrator and the applicable authority.

The Contractor is fully and solely responsible for contacting all applicable utilities / service companies which may have utilities / services in the area to obtain locates for such utilities / services. The Contractor shall follow all guidelines, policies and other requirements as may be required by applicable utility / service companies in order to properly and safely remove, protect and reinstate all such utilities / services. The Contractor shall be solely and fully responsible for any and all costs associated with any damage to existing utilities / services or interruption to service.

The information provided below does not excuse the contractor from his duty to perform the necessary locates and contacting any agencies, which may have utilities in the area and providing for their removal, protection and reinstatement.

MEASUREMENT: No measurement will be made for this item as it is a Lump Sum item.

PAYMENT: Payment at the Contract lump sum price for this item shall be full compensation for all labour, materials and equipment required to complete the work. Contractor shall

bear all immediate, subsequent and consequential costs associated with change in the schedule, staging, and methodology of the work.

7. HEAVY-DUTY SILT FENCE BARRIERS

ITEM A7

GENERAL: OPSS 805 shall apply and govern except as amended or extended herein.

SCOPE: This special provision sets out the requirements for the installation, maintenance and removal of heavy duty silt fences to prevent sediment and runoff from entering the water way during construction.

As part of this item, the Contractor shall supply, place and remove a 600mm high silt fence around the site where required, to ensure all surface run-off is treated prior to entering any drain.

The Contractor shall supply and install a silt fence as per OPSD219.110. The Contractor is to review the plan and process with the Essex Regional Conservation Authority (ERCA), and provide a copy to the Contract Administrator.

This item shall include all work required to install, maintain and remove silt fences as well as to restore the surrounding lands after removal of these fences.

The fences shall be located at such a distance from the work area as to provide their function while not being expected to act as retaining walls for excavated material or debris.

Maintenance

The fences shall not be allowed to sag or fall. The fences shall be secured at the bottom to prevent separation between the fence and the ground that would allow water to move unhindered.

Sediment Removal

The work shall consist of the removal and management of accumulated sediment.

Sediment that is accumulated shall be removed in a manner that avoids escape to the downstream side of the control measure and avoids damage to the control measure.

Sediment shall be removed to the level of existing grade at the time of the control measure installation.

Sediment removed shall be managed as excess earth material.

Removal of Siltation Fences

Upon completion of the work, silt deposits behind the fencing shall be removed and disposed of to ensure it does not enter the watercourse. Fencing shall then be removed where directed by the Contract Administrator.

MEASUREMENT: Measurements for this item shall be made in linear metres of installed silt fence onsite.

PAYMENT: Payment will be made at the contract unit price per metre for the Silt Fences and as constructed, maintained and removed as follows:

- 50% when the fences are constructed;
- 25% for cleaning and maintaining during construction; and
- 25% for the satisfactory removal of the fences.

Payment at the contract unit price shall be full compensation for all labour, equipment and materials necessary to carry out the installation, maintenance and removal of silt fence barriers. Repairs and or replacement of damaged materials occurring during the course of construction shall be deemed to be included in this item.

8. CLEARING AND GRUBBING

ITEM B1

- a) **Brush**
- b) **Limbing**
- c) **Trees Greater Than or Equal to 300mm in Diameter**

GENERAL: OPSS 201 shall apply and govern except as amended or extended herein.

SCOPE: This specification covers the clearing and grubbing requirements for new installations such as storm sewers, pipe culverts and end sections, multi-use trails and ditches/swales.

All materials shall be disposed of properly, at the Contractor's expense.

Approximate locations of brush and trees to be cleared and limbed, are shown on the Contract Drawings.

The Contractor is to confirm all limits of clearing with Contract Administrator prior to the start of any removals.

No trees shall be cut unless designated by the Contract Administrator.

Payment shall be made "by each" basis for the clearing and grubbing of trees measuring equal to or greater than 300 mm diameter measured 1.0 m above original ground as designated on the Contract Drawings. If the tree has several stems that measure 300 mm or greater, it still shall be considered to be one tree.

Where noted on the Contract Drawings, trees and limbs measuring 100 mm in diameter shall be cut in the specified lengths and delivered to the adjacent property owner at no additional cost to the Owner.

If the property owner does not want the wood, then the Contractor is responsible for disposal of the wood.

MEASUREMENT: Measurements for this item shall be made in square metres (m²), hectares (ha), or each (ea) in accordance with the Contract Drawings and Specifications.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

9. REMOVE AND DISPOSE OF ASPHALT, FULL DEPTH, INCLUDING SAWCUTTING ITEM B2

GENERAL: OPSS 510 shall apply and govern except as amended or extended herein.

SCOPE: This work consists of all labour, equipment and materials for the removal and disposal of the total depth of asphalt pavement. Sawcutting shall also be included under this item and shall be done to the full depth of pavement material and mechanically guided to provide a straight clean cut. All materials shall be disposed of properly, at the Contractor's expense.

MEASUREMENT: Measurements for this item shall be made in square metres (m²) in accordance with the Contract Drawings and Specifications.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

**10. MILL AND DISPOSE OF ASPHALT PAVEMENT TO A DEPTH OF 50mm, BETWEEN SIMCOE AND ALMA, INCLUDING SAWCUTTING
ITEM B3**

GENERAL: OPSS 510 shall apply and govern except as amended or extended herein

SCOPE: Under this item, the Contractor shall complete the following:

- saw cut existing asphalt pavement to provide a straight clean vertical face at the limits of removal as shown on the Contract Drawings;
- remove partial depth the existing asphalt pavement structure to a depth of 50mm; and,
- remove and dispose of off-site all bituminous asphalt.

There will be no separate payment made for work such as sawcutting, loading, hauling and disposal of removed asphalt material and debris, all of which are deemed to be included in the work. All removed material becomes the property of the Contractor.

MEASUREMENT: Measurements for this item shall be of the plan area in square metres (m²) of asphalt pavement, regardless of depth, as measured on site by the Contract Administrator. Measurement for payment shall be rounded to the nearest 0.1 m².

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

**11. REMOVAL OF EXISTING CULVERT PIPES
ITEM B4**

GENERAL: The requirements of OPSS 510 shall apply except as amended or extended herein.

SCOPE: This work consists of all labour, equipment and materials required for removal, transportation and disposal of existing ditch culvert pipes as identified in the Contract Drawings.

The Contractor shall remove the existing culvert pipes as shown on the Contract drawings or as directed by the Contract Administrator. The Contractor shall be responsible for all other costs associated with disposal of unsalvageable materials including loading, hauling and tipping costs.

MEASUREMENT: Measurement for this item shall be per lineal metre of pipe removed.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

12. STRIP TOPSOIL AND STOCKPILE ON-SITE

ITEM B5

GENERAL: The requirements of OPSS 206 and 802 shall apply except as amended or extended herein.

SCOPE: The Contractor shall strip organic material within the limits specified on the Contract Drawings. The organic material shall be stockpiled at locations onsite as directed by the Contract Administrator.

MEASUREMENT: Measurement for this item shall be per square metre (m²) of topsoil stripped and stockpiled.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

13. RELOCATION OF RURAL MAILBOXES

ITEM B6

SCOPE: This work consists of all labour, equipment, and materials to relocate any resident mailboxes which may require temporary removal and installation through the duration of this project, as indicated and approved by the Contract Administrator and Canada Post. Coordination with Canada post will be required in order to determine a suitable location for residents' mailboxes.

The Contractor may use the Town's temporary stands for temporary relocation use during the duration of the construction works.

Upon contractor completion of the installation of the permanent mailboxes, the contractor is to return the temporary stands to the Town.

MEASUREMENT: Measurement for this item shall be per resident's mailbox that has been relocated and permanently installed to the satisfaction of the Contract Administrator and Canada Post.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials, including supports, required to complete the work in every respect.

**14. REMOVE, STORE AND RE-INSTALL SIGNS TO NEW POST
ITEM B7**

SCOPE: This work consists of all labour, equipment, and materials to remove any signage which may require temporary removal through the duration of this project. Signage requiring temporary removal shall be approved by the Engineer for their removal or placement to temporary stands if required.

MEASUREMENT: Measurement for this item shall be per sign location specified for removal, storage and re-installation.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

**15. REMOVAL OF EXISTING DRIVEWAYS
ITEM B8**

GENERAL: OPSS 510 shall apply and govern except as amended or extended herein.

SCOPE: This work consists of all labour, equipment and materials required to saw-cut, remove, load, haul and dispose of concrete or asphalt pavement driveways, various thickness (reinforced or not reinforced), including the removal of any excavated material up to a depth of 50mm and any saw-cutting required, or as directed by the Contract Administrator.

Driveways shall be removed to a saw-cut or control joint to ensure a neat and straight edge as directed by the Contract Administrator. Any saw-cutting required shall be included in the unit price bid for this item.

The Contractor will be required to saw-cut to full depth all existing driveways to ensure a neat and straight edge. Any damaged edges shall be repaired by re-cutting and paid at the Contractor's expense.

The Contractor shall make every effort to prevent damage to the portion of the driveway which is to remain in place. Any damage to driveways that are scheduled to remain shall be repaired at the Contractor's expense.

Temporary granular driveway ramps shall be provided during construction for pedestrian and vehicular access to private homes and business and through construction work to streets, where directed by the Contract Administrator. The work shall include the supply and installation of temporary ramping and wooden boardwalks at driveway entrances or at sidewalk ramp locations to allow pedestrians and/or vehicular access to houses and business premises temporarily cut off from normal traffic due to new construction. The unit

price bid shall include the removal and disposal of all temporary ramping prior to final asphalt placement.

MEASUREMENT: Measurement for this item shall be per square metre (m²) of material removed, regardless of thickness or number of layers.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

16. EARTH EXCAVATION (GRADING)

ITEM C1

ITEM E1

GENERAL: OPSS 206 and 504 shall apply and govern except as amended or extended herein.

SCOPE: This work consists of all labour, equipment and materials required to carry out all earth excavation and disposal, including ditch grading, grading and proof-rolling for road, bike lane, multi-use trail and driveway reconstruction. The Contractor shall excavate all materials down to subgrade within the limits shown on the Contract Drawings.

The subgrade shall be proof-rolled prior to placing the granular base material to determine the presence of any soft or loosened areas. Where the Contract Administrator determines that the depth of excavation required for the construction of the roadway should be increased beyond that specified on the Contract Drawings due to soft, loose or unsuitable material, the Contractor shall sub-excavate unsuitable material to the depth and/or extend below the subgrade as directed by the Contract Administrator.

The Contractor shall dispose of all excavated material off-site, at his expense. If arrangements are made between the Contractor and private property owners accepting any excavated material, the Contractor shall provide a written authorization from those private property owners indicating that they will not hold the Town of Amherstburg responsible or liable for any damages. Excavated rubble shall be hauled to an approved disposal site at no additional cost to the Owner.

MEASUREMENT: Measurement for this item shall be per cubic metre (m³) excavated. Excavation quantity will be limited to theoretical dimensions provided in the Contract Documents and Drawings unless otherwise approved in writing by the Contract Administrator.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment, material and tipping fees required to complete the work in every aspect. Contractor shall bear all

immediate, subsequent and consequential costs associated with change in the schedule, staging, and methodology of the work.

17. 150mm DIAMETER SUBDRAIN

ITEM C2

GENERAL: OPSS 128, 405 and 504 shall apply and govern except as amended or extended herein.

SCOPE: This work consists of all labour, equipment and materials required to supply and install roadway subdrains as set out on the Contract Drawings, including proper connection to the ditch inlet catch basins.

Connect continuous perforated subdrain pipe, complete with filter sock, into each catch basin at the level specified on the Contract Drawings. Ensure the invert of the subdrains is at or above the invert elevation of the catch basin lead. Imbed the pipe in a prepared trench at subgrade level and surround with a minimum of 150mm of 19mm clear stone for drainage. The remaining backfill shall be Granular 'A'. Make connections to the ditch inlet catch basins to ensure no irregularities occur on the inside face of the catch basin, or outlet to ditches where no ditch inlet catch basins are present. The provision of clear stone shall be included in the unit price bid for this item, Granular 'A' or 'B' is unacceptable. This item shall include all fittings, tees, connections and terminations required to complete the work.

MEASUREMENT: Measurement for this item shall be per lineal metre of subdrain supplied and installed, measured in a horizontal plane from inside catch basin face to inside catch basin face.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

18. GRANULAR "A"

ITEM C3

ITEM E2

GENERAL: OPSS 128, 314 and 501 shall apply and govern except as amended or extended herein.

SCOPE: This work consists of all labour, equipment and materials required to supply, haul, place and compact Granular 'A' material for the road, curb and gutter, driveways and concrete sidewalks, including the application of water to aid in compaction.

Road base including bicycle lanes:

- i. Granular 'A' for road base shall be supplied and installed to the line and grade shown on the Contract Drawings. The granular material shall be supplied, placed and compacted (to 100% standard proctor maximum dry density) in lifts no greater than 300mm.
- ii. Temporary "over-building" with Granular 'A' may be required in order to provide a sufficient base to protect the subgrade from damage resulting from construction traffic.
- iii. A frost taper of 1.5H:1V through the granular base layers shall be incorporated into the work at all pavement tie-ins.
- iv. Granular 'A' placement is to immediately follow and proceed in conjunction with the excavation operation.

Multi-use trail:

- i. Granular 'A' bedding shall be used under the multi-use trail. The granular material shall be supplied, placed and compacted (to 100% standard proctor maximum dry density) in lifts no greater than 300mm.
- ii. Temporary "over-building" with Granular 'A' may be required in order to provide a sufficient base to protect the subgrade from damage resulting from construction traffic.

Concrete and Asphalt Driveways:

- i. Granular 'A' bedding shall be used under all concrete and asphalt driveways. The granular material shall be supplied, placed and compacted (to 98% maximum dry density) in lifts no greater than 300mm.
- ii. All new concrete and asphalt driveways shall be placed on a minimum of 150mm and 300mm, respectively, of compacted Granular 'A'.

Materials:

Granular 'A' material shall conform to OPSS 1010 and shall not contain any recycled material (i.e., recycled concrete material, etc.). In no case shall any materials be placed in the roadbed until it has been tested.

The Contractor shall be responsible for arranging for and carrying out quality assurance testing of granular material and for obtaining, delivery and testing samples for field compaction during placement.

The testing work shall include:

- Granular gradation samples and tests (unless the pit can provide adequate documented evidence of current or recent material-tests).
- Standard or modified Proctor tests to establish compaction targets.
- Nuclear density compaction testing during placement.

Non-conforming material that has been incorporated into the Work shall be removed and replaced with conforming material, or subjected to a payment reduction, as determined by the Contract Administrator.

MEASUREMENT: Measurement for this item shall be per tonne of Granular 'A' material supplied, placed and compacted for roadway, curb and gutter, sidewalks and driveways, calculated from weight tickets received on the job site.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

The cost of any additional QA grade checks on the recertified area shall be the responsibility of the Contractor. All grading carried out by the Contractor as a result of QA grade checks to ensure tolerances shall be carried out at no additional charge to the Owner.

19. SUPPLY AND PLACE HOT MIX ASPHALT

ITEM C4

- a) **HMA - HL-3 Surface Course (50mm)**
- b) **HMA - HL-4 Base Course (100mm)**

ITEM E3

- a) **HMA - HL-3 Surface Course (40mm), Simcoe to Libro Centre**
- b) **HMA - HL-3 Surface Course (50mm), Simcoe to Alma, including 0.5m buffer**
- c) **HMA - HL-4 Base Course (50mm), Libro Centre to Alma, including 0.5m buffer**

GENERAL: Hot mix asphalt (HMA) shall be completed in accordance with OPSS 310 and OPSS 1150 except as indicated otherwise in this section.

SCOPE: This work consists of all labour, equipment and materials required to supply, haul, place and compact hot mix asphalt material for the road, bike lanes and multi-use trail as specified on the Contract Drawings.

Asphalt cement shall be PGAC 58 28 as per OPSS 1101. The use of recycled asphalt in the final product shall not exceed 15 percent, in accordance with the Town of Amherstburg Development Manual (May 2009, Section 1.2.11).

Mix Designs:

The unit price tendered for hot mix asphalt shall include the cost of supply of PG58-28 asphalt cement and shall also include the haulage of the asphalt cement from refinery or depot to the Contractor's plant, unless noted otherwise in the Special Provisions.

The asphalt cement content shall be within Ministry guidelines for the type of mix specified. Asphalt cement shall be PGAC 58 28 as per OPSS 1101. The use of recycled asphalt in the final product shall not exceed 15 percent, in accordance with the Town of Amherstburg Development Manual (May 2009, Section 1.2.11). The Contractor shall be required to submit mix designs for hot mix asphalt to be incorporated into Municipal projects. The new asphalt mix shall be designed by a recognized and approved geotechnical firm from aggregate stockpiles having sufficient quantity to produce the tonnage of asphalt required to complete the work.

The mix design shall be subject to review and approval by the Contract Administrator or designate and must be submitted before the Contractor begins asphalt placement.

Asphalt Cement:

The Town of Amherstburg will adjust the payment to the Contractor based on changes to the Ministry of Transportation's performance graded asphalt cement price index unless the Contractor opts out by notifying The Town of Amherstburg in writing. This letter indicating you are opting out shall be included with tender documentation the day the tender closes. Once the contractor has opted out of payment adjustments based on the index, the Contractor will not be permitted to opt back in. The price index will be published monthly in the MTO Contract Bulletin and displayed on MTO website (www.raqs.mto.gov.on.ca). **The AC price index in effect for bidding in this tender will be the posted AC index for April 2017.** The actual price index will be used to calculate the amount of the payment adjustment per tonne of asphalt cement accepted into the work. The price index will be based on the price, excluding taxes, FOB the depots in the Toronto area, of asphalt cement grade PG 58-28 or equivalent. One index will be used to establish and calculate the payment adjustment for all grades.

A payment adjustment per tonne of asphalt cement will be established for each month in which paving occurs. When the price index differential is less than \$20.00/tonne, there will be no payment adjustment for that month. Payment adjustments due to changes in the price index are independent of any other payment adjustments made to the hot mix tender items.

The payment adjustment per tonne will apply to the quantity of asphalt cement in the hot mix accepted into the work during the month for which it is established. The payment adjustment for the month will be calculated by the following means:

1. When AC Prices are Rising by more than a \$20.00/tonne difference: the payment adjustment to be paid to the Contractor is the result of subtracting the price index in effect when the tender was submitted from the price index in effect when paving took place, minus the \$20.00 float, multiplied by the number of tonnes of PGAC incorporated in the mix(s) as determined by the job mix formula. If the answer is negative, no adjustment is made.
2. When AC Prices are Falling by more than \$20.00/tonne difference: the payment adjustment made in favour of the Owner is the result of subtracting the price index in effect when paving took place, plus \$20.00 from the price index when the tender was submitted, multiplied by the number of tonnes of PGAC incorporated in the mix(s) as determined by the job mix formula.

The quantity of new asphalt cement includes all grades of asphalt cement supplied by the Contractor with and without polymer modifiers. For each month in which a payment adjustment has been established, the quantity will be calculated using the hot mix quantity accepted into the Work and its corresponding asphalt cement content as required by the job mix formula.

For mixes which contain reclaimed asphalt pavement, the increase due the contractor or the rebate due the owner will be calculated as if virgin hot mix asphalt has been supplied. This fairly reflects the increasing value of the Contractor's RAP pile when AC prices are increasing and the opposite when they are declining.

Example 1 — AC Prices Increasing

- PGAC 64-28 specified, 3,000 tonnes of HL3 @5.2% AC (156.0 tonnes AC)
- The Price index on April 5th, 2015 on tender closing is \$332.90(actual)/tonne (PG 58-28)
- The applicable Price Index as published on August 31st effective for the August 17th-24th 2015 actual paving dates is \$475 (fictional)/tonne (PG 58-28)
- Payment adjustment to be paid to the Contractor:
 $(\$475 - \$20) - \$332.90 \times 156 \text{ tonnes AC} = \$122.10 \times 156 \text{ tonnes AC} = \$19,047.60$

Example 2— AC Prices Decreasing

- PGAC 58-28 specified, 4,500 tonnes of HL8 @ 4.6% AC (207.0 tonnes AC)
- The Price index on July 5th, 2015 on tender closing is \$500(fictional)/tonne (PG 58-28)
- The applicable Price Index as published on October 31st effective for the October 11th - 18th, 2015 actual paving dates is \$470 (fictional)/tonne (PG 58-28)
- Payment for hot mix items reduced by:
 $\$500 - (\$470 + \$20) \times 207 \text{ tonnes AC} = \$10 \times 207 \text{ tonnes AC} = \$2,070$

Notes:

- Contractors should bid the hot mix asphalt item using the cost of the PGAC specified. The AC Price Index is only a tool for qualifying hot mix prices and is not intended as a standard AC price to be incorporated into the contract bid.
- The payment adjustment calculated using this formula is full compensation for any and all PGAC grades specified.
- If the AC index has not changed more than \$20.00 per tonne up or down, no adjustment is required. Only the amount of the change that is greater than \$20.00 is used to calculate payment adjustments.
- Partial or complete road section deletions may be required because of AC escalation to the total contract. This deletion adjustment will be within the 10% of the final approved tendered amount.
- The escalation agreement clause is void for any work completed after the contract completion date.

Reclaimed Asphalt Pavement:

Reclaimed asphalt pavement can be utilized to a maximum 15% content provided the gradation of material and the asphalt mix design conforms to the OPS Specifications. The unit price for all asphalt quantities in the Contract shall reflect material composition of the Contractor's choice. The Town of Amherstburg will pay the asphalt quantities at the unit price bid in the Form of Tender.

Trial Areas:

The Town of Amherstburg reserves the right to require trial areas at the start of the work of each type of asphalt mix used on the Contract. A trial area shall be at least 300m long and one lane wide. The Town of Amherstburg will determine the location of the trial area.

The Contractor will demonstrate his ability to produce the asphalt mix, place and compact the mix using spreading and pneumatic equipment that meets the Contract Specifications. The finished asphalt mat shall meet the surface, geometric, compaction, material and gradation, asphalt extraction and all other applicable specification requirements of this Contract.

If necessary, subsequent trial areas will be required until the finished asphalt product meets all the applicable Contract Specifications.

All costs associated with the trial areas and subsequent trial areas shall be at the Contractor's expense.

Placing of Mixture:

All asphalt work laid on the job site will need to be placed with a Material Transfer Vehicle (MTV) if the plant is more than 75km travel distance to the job site and paving prior to June

1st and after August 31st. The cost of MTV will be included in the unit price bid for this item.

No asphalt shall be placed on a wet or damp surface or one which is not properly broomed to remove loose gravel, etc. The pavers shall be operated at whatever speed is necessary to match the output of the plant to ensure continuous operation of the pavers but conditional on consistent and satisfactory mat being laid and compacted.

The Contractor shall **not be permitted to remove the main paver or any other related equipment** from the Municipal road to complete driveways, intersections, entrances, etc. until the through lane(s) is complete for the length of the Contract, or if the Contract requires more than one day to complete, the Contractor may complete entrances, intersections, etc. up to the end of the previous day's paving.

Any surplus asphalt spilled in front of the tracks of the asphalt paver or in the oncoming traffic lane as a result of the unloading of trucks shall be promptly removed so as not to cause a change in road grade or inconvenience to the public. Asphalt spilled in the oncoming traffic lane shall be thoroughly broomed and swept to completely remove all excess asphalt before the next truck may be unloaded.

Pavers used shall be equipped with automatic longitudinal and transverse grade and slope controls capable of being operated from either side of the paver. The longitudinal grade control shall be adjustable for mat thickness in small increments, without the necessity of stopping the paver. The paver shall be equipped to operate from a 3 m ski. Where the ski is a flexible unit, it shall be equipped with a spring-tensioned wire extending between brackets fitted on and slightly above each end of the ski. The sensing grid shall ride on the wire, not on the ski.

The Contractor may elect to hand rake the centerline joint or place an attachment to the screed of the paver to remove excess asphalt. If the Contractor elects to hand rake the centerline joint, the excess asphalt shall be spread across the fresh asphalt mat over a minimum distance of 2.0 metres from centerline. Any surplus asphalt removed to provide a centerline joint by mechanical means should be completely removed. Either method must ensure a neat and acceptable centerline joint to the Contract Administrator.

All string lines used for pavement alignment will need to be recovered and removed from all roadways. All costs associated with this shall be included in the unit price bid for this item.

Specified Geometrics and Cross-Section:

OPSS 310.07.02.14 shall be amended as follows: Areas not meeting the specified surface appearance specifications shall be removed and replaced with acceptable mix of the same type as directed by the Contract Administrator. The removal and replacement of the asphalt in the defective areas shall be at the Contractor's sole expense.

Surface & Binder Course:

The surface asphalt courses shall be a minimum lift of 35mm and a maximum of 50mm. The base course will be considered a leveling course and may be placed in varying thickness to correct roadway cross-falls.

On surface course construction, the paver shall operate for an appropriate time in each lane so that at the end of the day's paving, both lanes shall be completed within approximately 40 metres.

The Contractor shall be required to supply and apply a uniform application of colas or other approved bonding agent to the exposed vertical edge of the centerline joint prior to asphalt paving the following day if the length of the open joint exceeds 40 metres.

The exposed centerline joint shall be limited to 40 metres or less if the work is not to be completed within two (2) working days. Extenuating or unusual circumstances might arise that will have the centerline joint exceeding 40 metres, as described above. If this occurs, the Contractor shall place additional signage to warn motorists of the uneven pavement.

Surface Tolerances:

OPSS 310.07.02.13 is amended as follows: Areas exceeding the specified surface tolerance shall be removed and replaced with acceptable mix of the same type as directed by the Contract Administrator. The removal and replacement of the asphalt in the defective areas shall be at the Contractor's sole expense.

Payment for Testing:

The Contract Administrator will require documentary evidence to the effect the materials supplied by the Contractor will comply with the terms of the Specifications. Such evidence must be in the form of a certified copy of a laboratory report from a recognized testing company acceptable to the Contract Administrator. No costs in connection with these tests shall be borne by the Town of Amherstburg.

All aggregates to be incorporated into the proposed mix shall be initially tested and approved by the Town prior to the placement of the mix on the roads. Failure of any aggregate on initial testing will require subsequent testing. The subsequent testing shall be at Contractor's responsibility.

The Town of Amherstburg may, at any time during the paving activity complete whatever tests are deemed necessary to ensure compliance with current Specifications.

Hot Mix Asphalt Plant – Air Pollution & Dust Nuisance:

All asphalt plant operations shall comply with Municipal regulations and by-laws governing the area in which the plant is located.

The Contractor shall select the plant location and shall control the plant operations, with due regard to the prevailing winds and surrounding area to minimize plant exhaust damage and nuisance. The provisions of Section 106-1, Form M 100 shall apply.

Notwithstanding the foregoing where, in the Contract Administrator's opinion, serious property damage and/or nuisance is being caused or likely to be caused by asphalt plant operations, the Contractor shall, when so ordered in writing by the Contract Administrator, provide, install and use such plant exhaust washing or filtering equipment as is necessary to eliminate all serious property damage and/or nuisance.

The exhaust washing or filtering equipment shall be effectively operating before the expiration of the time specified in the Contract Administrator's written order; otherwise, all plant operations shall be terminated.

All costs related directly or indirectly to these requirements shall be included in the unit price bid for this item and no separate payment will be made.

Supply of Coarse Aggregate HL-4:

The Contractor shall furnish coarse aggregate for HL-4 from Ministry of Transportation Approved Aggregate Sources. The Contractor will provide a list of all aggregate sources for testing.

The Town's approval of a source is indicative of the quality and gradation of the material of the samples tested and shall not be construed to guarantee that sufficient quantities of acceptable materials are available, when required, to complete the job.

The Contractor shall select from the list of sources, the source or sources that are capable of providing correctly graded materials of the quantities and at the times required to satisfy the Contract requirements.

Asphalt Padding & Asphalt Base Course Padding:

The Contractor shall place HL-4 asphalt padding by machine and hand as site conditions warrant on Municipal Contracts. The depth and width shall vary and shall be field determined at the time of placement (maximum lifts of 50mm) to correct roadway cross-falls.

The unit price bid per tonne, shall be compensation for padding, etc. as requested by the Town of Amherstburg.

In addition, the base course of asphalt shall be adjusted accordingly to correct drop-offs at the edge of pavement and provide cross-fall correction in areas designated by the Town during construction. All work related to temporary base course ramping, including milling

and removals prior to placement of surface course asphalt, shall be considered part of this item.

All paving operations costs to be included in this item.

Surplus Unacceptable Material:

Any hot mix asphalt deemed unsuitable for placement in the Contract shall be hauled away by the Contractor to a suitable dumpsite and disposed. This shall include asphalt placed at the end of each day's work as a "ramp down" from the new grade to the existing road surface. The cold asphalt joint, when removed the following day, shall not be allowed to remain on the job site for more than a normal working day.

Brooming & Sweeping of Intersections:

It shall be the responsibility of the Contractor to thoroughly broom and sweep all paved intersections located within the limits of the asphalt project to remove loose gravel, dirt, etc. All costs associated with brooming or sweeping shall be included in the unit price bid per tonne of asphalt.

Compaction Equipment:

Notwithstanding the current MTO requirements under Section 310.03.02 for asphalt rollers, specifically pneumatic-tired rollers, the weight of this equipment shall be limited to a minimum of 15 tonnes or sufficient mass to provide a finished asphalt surface meeting OPS Specifications for compaction with no visible impression whatsoever left by the individual tires of the pneumatic roller.

Temporary Ramps for Milled Work:

The Contractor shall be required to place asphalt as a temporary ramp down where milling is necessary to provide a transverse joint. The Contractor shall be permitted to use the on-site pulverized asphalt if the project is to receive the new asphalt within seven (7) calendar days of milling, providing the asphalt ramp is not removed by burning. In all cases, burning the asphalt to remove the ramp shall be strictly prohibited. In situations where the Contractor is unable to complete the work within the time stipulated above, the ramp shall be either cold or hot mix asphalt. The ramp down shall extend over a minimum distance of 1.3 metres and shall be properly signed to alert oncoming traffic of the pavement condition change. This requirement shall be typical for all milled areas where a transverse joint is required, unless stated otherwise.

The Contractor shall attempt to complete projects where milling has resulted in placing a temporary ramp within fifteen (15) working days.

Pre-marking centerlines, edge lines, bicycle lanes and Stop Bars:

The Contractor shall be required to pre-mark the centerlines, lane lines, bicycle lanes and stop bars on all surface courses of asphalt. If the roadway is to be open to traffic between base course and surface course application of asphalt, pre-marking shall be required on base course asphalt.

The Contractor shall use an approved reflectorized 3M (or equivalent) tape product meeting the requirements contained in the Ministry of Transportation's "Ontario Traffic Manual".

Each pre-marking strip shall be a minimum of 0.1m in length and have a maximum spacing between tape pre-markings of 30m. The tape shall be rolled into the asphalt mat or installed according to the manufacturer's recommendations.

The cost for all labour, equipment and materials necessary to complete the work should be included in the applicable unit price bids for hot mix asphalt.

MEASUREMENT: Measurement for this item shall be per tonnes of asphalt supplied, placed and compacted, calculated from weight tickets received on the job site.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

20. DRIVEWAY RESTORATION

ITEM C5

- a) Asphalt**
- b) Concrete**
- c) Granular**

GENERAL: OPSS 206, 310, 311, 314, 350, 351 and 501 shall apply and govern except as amended or extended herein.

SCOPE: This work consists of all labour, equipment and materials required to excavate to the required depth and re-grade driveway areas to new grades.

Where directed by the Engineer, the Contractor shall excavate to required depth and re-grade driveway areas to new grades. All driveways to be re-graded shall be determined in the field after the placement of the concrete curb and sidewalk. Excavation of granular driveways is included in this item. All granular material shall be compacted to 100% maximum dry density.

Construction of new driveways shall be as noted below.

Residential Asphalt Driveway:
300mm Granular 'A'

90mm HL-4 Surface Course**Residential Concrete Driveway:**

150mm Granular 'A'

150mm 32 MPa Concrete

Gravel Driveway:

150mm Granular 'A'

50mm of 19mm (3/4") Clear Stone

Note: All Granular 'A' noted above shall be paid for under the granular item (C3).

The surface on which asphalt is to be placed shall be thoroughly cleaned. Loose and broken material shall be removed from locations designated in the Contract Documents. Removals shall be according to OPSS 510.

Sound concrete or asphalt surfaces that are to remain shall be uniformly sprayed with emulsified asphalt at the rate of 0.5 kg/m². The emulsified asphalt shall form a continuous film over the surface and shall be allowed to dry until it reaches the required state of tackiness before the resurfacing course is laid.

MEASUREMENT: Measurement for this item shall be per square metre (m²) of driveways provided and installed, measured in a horizontal plane.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

21. TACK COAT**ITEM C6****ITEM E4**

GENERAL: These items shall conform to OPSS 310 except as amended herein.

SCOPE: This work consists of all labour, equipment and materials required to place tack coat on asphalt horizontal surfaces and joint vertical surfaces.

Tack coat is required on the surface of the asphalt base course prior to placement of the asphalt surface course. Tack shall be applied to vertical surfaces at which joints are made, with a thin uniform and continuous coating.

MEASUREMENT: Measurement for this item shall be per square metre (m²) of tack coat provided and installed, measured in a horizontal plane.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect, including sweeping the existing surface, and supply and placement of the tack coat.

22. LAP JOINT ITEM C7

SCOPE: At all locations where new asphalt ties into existing, the Contractor shall mill the existing surface course asphalt for a 300 mm width by 50mm depth and tack coat the milled surface prior to placing the surface course asphalt. For disposal of all materials refer to OPSS 510.

MEASUREMENT: Measurement for this item shall be per linear metre of milled joint, measured in a horizontal plane.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

23. CATCH BASIN AND CULVERT END TREATMENTS ITEM C8

- a) 300mm THICK RIP RAP (150mm NOMINAL SIZE) c/w GEOTEXTILE**
- b) SMOOTH RUN RIVER STONE**

GENERAL: These items shall conform to OPSS 511 except as amended herein.

SCOPE: The work administered under this item includes the ditch culvert end treatments.

Geotextile shall be free of folds, tears and wrinkles.

Smooth river stone shall be rounded natural stone with a nominal stone size of 300 mm. Maximum stone size shall be 1.5 times the nominal stone size. 80 % of the stones (by mass) shall have a diameter of at least 60 % of the nominal stone size and the minimum river stone size is to be 50mm in diameter.

Materials placed on geotextile shall not be dropped from a height of not more than 1.0 m above ground. The material should be loosely placed and not compacted. The material shall not be placed over undisturbed existing native material.

MEASUREMENT: Measurement for this item shall be per square metre (m²) of rip rap and smooth run river stone supplied and installed.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

24. PLACEMENT OF TOPSOIL, FROM STOCKPILES

ITEM C9

GENERAL: These items shall conform to OPSS 802 except as amended herein.

SCOPE: This work consists of all labour, equipment required to haul and place stockpiled topsoil from the site to locations as shown on the Contract Drawings or as directed by the Contract Administrator.

The work shall include the following at a minimum:

- Placement of topsoil from stockpiles on all new and/or disturbed slopes at a depth of 100 mm as directed by the Contract Administrator.
- Harrowing of side slopes and fill areas

MEASUREMENT: Measurement for this item shall be per square metre (m²) of topsoil placed from stockpile.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

25. SEED AND COVER

ITEM C10

GENERAL: This item shall be completed in accordance with OPSS.MUNI 804 except as indicated otherwise in this section.

SCOPE: The Contractor shall supply all labour, materials and equipment associated with applying seed, fertilizer and cover. Following placement of topsoil, seed and cover shall be applied to all disturbed and regraded areas (including roadway front slopes up to the top of subgrade elevation) as noted on the Contract Drawings.

Permanent seed mix shall be "Standard Roadside Mix" as per OPSS.MUNI 804, Table 1. The permanent seed mix shall be supplemented with an annual nurse crop seed in accordance with OPSS.MUNI 804. Seed and fertilizer shall be applied on a well-worked seedbed at a rate as specified by OPSS.MUNI 804, Table 2.

Cover shall be in accordance with OPSS.MUNI 804 and shall be applied as a separate operation immediately following the application of seed and fertilizer.

The Contractor shall water all seeded areas.

The Contractor shall maintain seeded area from start of installation until final acceptance including protection against erosion prior to substantial growth.

The Contractor shall water all seeded areas as required to establish good growth for a minimum of one (1) month following the placement of seed and cover.

Contractor to cut grass within the seeded areas to 40mm when it reaches height of 65mm and remove clippings which will smother grassed area.

Maintain seeded areas to be weed free.

Acceptance

Seeded and sodded areas will be accepted at final inspection provided that:

- Areas are properly established.
- Areas are free of bare or dead spots and without weeds.

Areas seeded in the Fall will be accepted in the following Spring, one month after start of growing season provided acceptance conditions are fulfilled.

MEASUREMENT: Payment shall be based on actual area (m²) of seed and cover placed and measured in square metres on site by the Contract Administrator and Town of Amherstburg.

PAYMENT: Payment for this item shall be at the unit bid price and shall be full compensation for all equipment, labour and materials required to complete this work in every respect. The watering of seed and cover to establish growth shall be included in the unit price for these items. Payment will be made to 80% of the Contract unit rate upon installation, and the remaining 20% will be paid after the seed is established to the satisfaction of the town of Amherstburg.

26. BICYCLE RAILING OVER CULVERT ITEM C14

GENERAL: The provisions of OPSS.MUNI 908 shall apply for this item except as amended herein.

SCOPE: Bicycle railing shall be supplied and installed over the existing concrete culvert, behind the proposed steel beam guiderail. The bicycle railing is to be mounted to the existing concrete using anchorage assemblies and materials as recommended by the supplier.

Minimum rail height shall be 1.37 m measured from the far edge of the bicycle lane.

Bicycle railing and components shall be hot dipped galvanized.

MEASUREMENT: Measurement for this item shall be per lineal metre of bicycle railing installed.

PAYMENT: Payment for this item shall include full compensation for all labour, equipment, and materials required to supply and install the bicycle railing including anchorage assemblies, anchorage supplies, and other materials required for installation.

27. SUPPLY AND INSTALL ROAD SIGNS

ITEM C15

The Contractor shall supply and install on 100 mm x 100 mm pressure treated wooden posts the road signs specified on the Contract Drawings.

Each sign location represents a single post where the signs shall be placed. The posts shall be embedded into the ground a minimum of 1.2 metres.

Signs shall be manufactured and mounted in accordance with Town of Amherstburg regulations and the Ontario Traffic Manual, Book 5 and 6.

MEASUREMENT: Measurement for this item shall be per sign installed at each specified location.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

28. ADJUST EXISTING WATERMAIN VALVE BOXES

ITEM C16

GENERAL: OPSS 408 shall apply and govern except as amended or extended herein.

SCOPE: This work consists of all labour, equipment and materials for the adjustment of existing appurtenances and/or structures to proposed final grade. The Contractor is advised that existing watermain valves are to remain in place within the limits of road reconstruction. These valves are screw-type or auger-type, cast-iron, valve boxes and may

require adjustment to match to proposed grade. This can include removal, adjustment and replacement of the existing valve box with lid in order to match to proposed grade and provide proper valve operation. The top of the valve box must be set flush with the finished grade or the proposed finished grade of the road. See Drawing W4 - Typical Valve Setting detail from Town's Development Manual.

MEASUREMENT: Measurement for this item shall be made per each unit adjusted.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

29. ADJUST EXISTING GAS VALVES

ITEM C17

GENERAL: OPSS 408 shall apply and govern except as amended or extended herein.

SCOPE: This work consists of all labour, equipment and materials for the adjustment of existing gas valves to proposed final grade. The Contractor is advised that existing gas valves, are to remain in place within the limits of reconstruction.

Gas valve adjustments are to be coordinated with Union Gas. The Contractor may be required to provide equipment and labour to assist in adjusting the existing gas valves to the proposed finished grade.

MEASUREMENT: Measurement for this item shall be made per each unit adjusted.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

30. SUPPLY AND INSTALL PRECAST MAINTENANCE HOLES

ITEM D1

- a) 1500mm Dia.
- b) 1800mm Dia.

ITEM G2 - 1200mm Dia. (PROVISIONAL)

GENERAL: OPSS Form 128, 402, 407, 491, and 492 shall apply and govern except as amended or extended herein.

SCOPE: This work consists of all labor, equipment and material required to supply and install pre-cast concrete maintenance holes as per OPSD's 701.010, 701.011, and 701.012, in

conjunction with the storm sewer pipe and shall include cast iron frames and covers, ladder rungs, excavations, connections, parging, de-watering, bedding, backfilling and riser grade adjustments.

The maintenance hole precast base shall be placed on a 150 minimum layer of uniformly compacted 19mm clear stone and then backfilled with Granular "B", Type II uniformly compacted to 98% Standard Proctor maximum dry density. The width of the excavation shall allow the use of mechanical compaction equipment. All bedding and backfill material shall be included as part of this item.

All storm maintenance holes shall be made as watertight as possible. All barrel joints concrete shall be made watertight and parging shall be applied to the interior and exterior. Parging shall be applied to the interior and exterior of all lift rings. All barrel joints/lift rings shall be parged inside and out in accordance with the Town of Amherstburg Development Manual (May 2009, Section 1.4.2.6).

MEASUREMENT: Measurement for this item shall be made per each unit supplied and installed complete.

PAYMENT: Payment for this item shall be made on an each basis as set out in the Schedule of Quantities and shall be compensation in full for all labor, equipment and materials required to complete the work in every respect.

31. SUPPLY AND INSTALL 600mm x 600 mm PRECAST DITCH INLET CATCH BASINS ITEM D2

GENERAL: OPSS 128, 402, 404, 407, 501 and 504 shall apply and govern except as amended or extended herein.

SCOPE: This work consists of all labour, equipment and materials required to supply and install precast concrete ditch inlet 600mm x 600mm as per OPSD 705.030.

In accordance with the Contract Drawings, the ditch inlet catch basins shall be complete with galvanized grating and stainless steel fasteners, as per OPSD 403.010 with a 6:1 slope. The top of catch basins shall be set at invert elevations as stated in the Contract Drawings.

The Contractor is to make specific notations of all holes required for outlet, inlet for all pipes and subdrains and shall consider the work to properly reconnect all pipes to the new basins to be incidental to and include in his unit bid price the cost to complete this work. All catch basin leads shall be properly connected to the catch basins, and concrete riser adjustments made to final grade.

The Contractor is to allow for all ditch inlet catch basins to still function properly prior to being set to final grade. This work shall be incidental to the installation of ditch inlet catch basins and no additional payment will be made.

The precast ditch inlet catch basin unit shall be placed on a 150 mm minimum layer of uniformly compacted 19mm clear stone and then backfilled with Granular "B", Type II uniformly compacted to 98% Standard Proctor Maximum Dry Density. Excavation shall be 300mm around the exterior of the catch basins. All granular materials for levelling, setting and backfilling shall be included in the unit price.

All pipe leads are to be parged on both the inside and outside of the ditch inlet catch basins.

MEASUREMENT: Measurement for this item shall be made per each unit supplied and installed complete.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect

32. SUPPLY AND INSTALL 250 dia. PVC DITCH INLET CATCH BASIN LEADS ITEM D3

GENERAL: OPSS 128, 401, 410, 517, and 518 shall apply and govern except as amended or extended herein.

SCOPE: This work consists of all labour, equipment and materials required to install new 250mm diameter catch basin leads with fittings as per the Contract Drawings. The Contractor shall connect catch basin leads to new storm sewer pipe as per OPSD 705.010.

All bedding, clearance and cover materials shall consist of Granular 'A' (OPSS 1010) compacted to 95% of SPMDD in accordance with OPSS 802 requirements. Dimensions of bedding, clearance and cover are found on the CLASS "B" BEDDING DETAILS in the Contract Drawings.

Granular material meeting the gradation specifications for sewer stone (equivalent to HL4 coarse aggregate per OPSS 1150) may also be used as bedding and cover material with a non-woven geotextile used as a separation fabric between this material and the native soils. The non-woven geotextile shall have a minimum overlap of 300 mm and care taken to prevent separation of the geotextile at the seams.

Care should be exercised to avoid compaction methods that may damage the pipe. The placement and thickness of the granular bedding must also meet the pipe manufacturer's specifications.

All trenches constructed within the limits of the road will be backfilled with full depth Granular 'B' Type II material placed in maximum 300mm lifts and compacted to 98% Standard Proctor Maximum Dry Density.

In all cases, the upper portion of the trench to a depth of at least 1.2 metres below the top of the proposed pavement surface shall receive a frost-taper at 1.5H:1V, and receive Granular "B" Type II (OPSS 1010) replacement fill compacted to 98% of its Standard Proctor maximum dry density.

The unit price bid for this item shall include the cost to connect main line sewer and complete all connections where required.

Catch basin leads shall be PVC DR 35 pipe.

MEASUREMENT: Measurement for this item shall be on a linear metre basis measured in a horizontal plane along the centerline of the pipe placed.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

33. SUPPLY AND INSTALL STORM SEWER PIPE

ITEM D4

- a) 450mm Dia.
- b) 750mm Dia.
- c) 825mm Dia.
- d) 900mm Dia.
- e) 975mm Dia.

ITEM G3

- a) 375mm Dia. (PROVISIONAL)
- b) 750mm Dia. (PROVISIONAL)
- c) 1050mm Dia. (PROVISIONAL)

GENERAL: OPSS Form 128, 401, 410, 517, 518, 1820, 1840 and 1841 shall apply & govern except as amended or extended herein.

SCOPE: The work consists of all labour, equipment and materials required to install specified diameter sewer pipe, including all required pipe service connections, fittings, excavations, de-watering, bedding, and backfilling in a prepared trench as indicated on the contract drawings.

The Contractor may choose to use the following types of material for sewer pipe:

- Reinforced circular concrete pipe (450mm dia. and over) shall conform to CSA A257.2.
- High Density Polyethylene pipe (300mm to 900mm in dia.) shall conform to CSA B182.8 with the CSA logo; 320 kPa stiffness; 6m lengths; bell and gasket joints. Armtec Boss 2000 HDPE pipe or approved equivalent.

The Contractor is to conform to Provincial Regulations for adequate side slope construction for trenching operations. Refer to Geotechnical Investigation Report No.: SWW167208 from Amec Foster Wheeler found in **Appendix D** for soil types.

Open cut excavations may require a granular drainage blanket on the side slopes in order to limit the effects of piping erosion. This work shall be included in the item unit price.

All fittings are to be sealed in place.

All storm sewers to be bedded in accordance with applicable OPSD's. Bedding and cover material to be Granular "A" material as per OPSS 1010 and shall consist of 150mm depth, compacted to a minimum of 95% standard proctor maximum dry density. Surrounding and cover materials shall be Granular "A" material as per OPSS 1010 to a minimum thickness of 300mm, compacted to 98% standard proctor maximum dry density with due consideration for compaction into the sewer haunches.

Granular material meeting the gradation specifications for sewer stone (equivalent to HL4 coarse aggregate per OPSS 1150) may also be used as bedding and cover material with a non-woven geotextile used as a separation fabric between this material and the native soils. The non-woven geotextile shall have a minimum overlap of 300 mm and care taken to prevent separation of the geotextile at the seams.

Care should be exercised to avoid compaction methods that may damage the pipe. The placement and thickness of the granular bedding must also meet the pipe manufacturer's specifications.

All trenches constructed within the limits of the road will be backfilled with full depth Granular 'B' Type II material placed in maximum 300mm lifts and compacted to 98% Standard Proctor Maximum Dry Density.

For sections of sewer pipe to cross existing watermains, a minimum of 0.5m vertical separation between watermain and sewer pipe is to be maintain. The watermain is to be backfilled with sand if disturbed. Refer to Town's Watermain Installation procedures for complete backfill details.

In all cases, the upper portion of the trench to a depth of at least 1.2 metres below the top of the proposed pavement surface shall receive a frost-taper at 1.5H:1V, and receive Granular "B" Type II (OPSS 1010) replacement fill compacted to 98% of its Standard Proctor maximum dry density.

General trench backfill placed in non-sensitive settlement areas (landscaped areas) may consist of the native site soil if compacted to at least 95% of its Standard Proctor maximum dry density.

Construct all utility supports as required by the respective utility companies. Where proposed sewer pipe is to cross existing watermain, the Contractor shall provide any supports necessary in order to protect the existing watermain. Supports required as a result of this construction are to be included in the cost of this item.

MEASUREMENT: Measurement for this item shall be on a linear metre basis measured in a horizontal plane along the centerline of the pipe placed.

PAYMENT: Payment shall be as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials to complete the work in every respect, including excavation, trenching, and backfill.

34. INSTALLATION OF HDPE CULVERT PIPE

ITEM D5

- a) 450mm Dia.
- b) 750mm Dia.
- c) 900mm Dia.

GENERAL: These items shall conform to OPSS 421 and 1840 except as amended herein.

SCOPE: This work consists of all labour, equipment and materials required to install HDPE culvert pipe as shown on the Contract Drawings or as directed by the Contract Administrator.

The existing upstream and downstream inverts shall be maintained or unless otherwise directed by the Contract Administrator.

Pipe material shall be Armtec Boss 2000 HDPE pipe, 320kPa stiffness; certified to CSA B182.8 with the CSA logo; 6m lengths; bell and gasket joints or approved equivalent.

Pipe embedment and back fill shall be as per OPSD 802.010. Pipe bedding shall be Granular 'A' and shall be included in item price. The pipe cover and backfill shall be Granular 'A' and shall be included under this item.

MEASUREMENT: Measurement for this item shall be per lineal metre of HDPE culvert pipe installed.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

35. ROCK EXCAVATION AND REMOVAL ITEM D6

GENERAL: OPSS 403 shall apply and govern except as amended or extended herein.

SCOPE: This specification covers the rock excavation requirements for the installation of storm pipe sewers, pipe culverts and end sections, maintenance holes and ditch inlet catch basins in open cut.

The use of explosives shall not be permitted.

All materials shall be disposed of properly, at the Contractor's expense.

Approximate locations of bedrock are shown on the profile located in the Contract Drawings.

MEASUREMENT: Measurements for this item shall be made in cubic metres in accordance with the Contract Drawings and Specifications.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

36. CCTV INSPECTION OF STORM SEWER ITEM D7

- a) At Substantial Completion**
- b) At End of 1-Year Maintenance Period**

GENERAL: OPSS 409, shall apply & govern except as amended or extended herein.

SCOPE: The work consists of all labour, equipment and materials required to perform CCTV inspections of the storm sewers upon completion of the storm sewer works, and at the conclusion of the one-year maintenance period.

Final acceptance of the storm sewer installation will be contingent upon the Contract Administrator's acceptance of the required CCTV reports, digital report files and digital video files.

CCTV inspections for all sizes of pipe shall be undertaken using pan and tilt equipment capable of providing a clear view of lateral connections and deficiencies. The video record

shall provide an on-screen display of the chainage in metres from the centre of the initial maintenance hole. Acceptance of the work for final payment and for commencement of the maintenance guarantee period will take place only after the Contract Administrator has accepted and approved the inspection report.

MEASUREMENT: No measurement will be made for this item as it is a Lump Sum item.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

37. MECHANICALLY STABILIZED EARTH WALL AT PEDESTRIAN BRIDGE ITEM E5

This item shall conform to OPSS SSP 599S23 unless otherwise indicated.

This specification is for the design, supply, fabrication and construction of mechanically stabilized earth (MSE) retaining walls with precast concrete facing panels. MSE retaining walls shall include, but not be limited to, excavation for the wall, concrete leveling pads, precast concrete panels, compacted granular backfill, soil reinforcement, perforated drain pipe complete with filter fabric sock, surface drains, cast-in-place concrete wall coping, traffic barrier, pedestrian railing, permanent safety railing or fence, hardware and all associated materials.

MSE retaining walls shall be designed and constructed in accordance with the provisions contained herein and as determined by the Town and Contract Administrator.

The Contractor shall supply all necessary materials. All components of the MSE wall system shall be supplied from one MSE supplier.

Design Requirements

Location, layout, geometry control, global stability and allowable bearing capacity requirements shall be as specified in the contract documents. The Contractor's design responsibility shall include internal stability and all elements for a complete MSE wall system.

The most stringent requirements of the current version of the following standards shall be met:

- CAN/CSA S6 – Canadian Highway Bridge Design Code
- AASHTO LRFD Bridge Design Specifications

The design life for all MSE wall components shall be 100 years.

The MSE wall shall be designed to accommodate cast-in-place concrete bridge abutment spread footings and their associated loads as determined by the pre-engineered bridge fabricator (see Item E6).

Highway and bridge surface drainage shall be controlled and channeled away from the back of the MSE walls and mechanically stabilized earth mass.

Weeping drains consisting of perforated 150 mm diameter pipe complete with filter sock shall be provided near the front and the back bottom corner of the mechanically stabilized earth mass. The weeping drains shall be day lighted or connected for positive drainage. A water level within the mechanically stabilized earth mass shall be assumed to be at the invert level of the weeping drains.

All obstacles, such as pedestrian and bicycle railing, sign supports, and lighting posts, mounted on top of the barriers shall meet set-back and clearance requirements specified in the Roadside Safety Manual. The MSE wall design shall account for all load effects from such accessories.

Water carrying appurtenances, such as catch basins, drainage inlets/outlets, culverts etc., shall preferably be placed away from, or close to the end of the soil reinforcement zone, and provisions shall be made to mitigate the detrimental effects of potential leakage.

Obstructions such as foundation piles and associated casings, or casings for future pile installations in the soil reinforcement zone, shall be accommodated with appropriate arrangement of soil reinforcing around such obstructions. For those MSE wall systems that lend themselves to splaying of the soil reinforcement, the splay angle shall not exceed 20° from the perpendicular of the facing panel. For other MSE wall systems, coverage ratios of soil reinforcement shall be specifically developed for each project.

The existing 300mm dia. watermain shown on the Contract Drawings is based on the most available information and the accuracy of the position of such utilities is not guaranteed. Before starting work, the Contractor shall ascertain the exact location of the watermain and other utilities within the vicinity of the MSE wall installation and protect all existing utilities against damage during installation. The Contractor shall assume all liability for damages to existing utilities.

Pedestrian railing and permanent safety railing or fence may be mounted on top of MSE wall coping.

Minimum precast concrete panel thickness shall be 140 mm, excluding any additional thickness required for aesthetic surface treatment. Minimum cover to reinforcing steel shall be 50 mm on both the front and back faces.

Precast concrete panels shall be designed to accommodate a differential settlement of 100 mm in 10 metres of length along the wall. The spacing between adjacent panels shall be designed to be 20 mm nominal.

Joints between panels should have a lip and recess (ship lap) configuration so that joint material is protected and overall aesthetics is enhanced. Butt joints may also be used if the Contractor can provide a backing board with sufficient strength and durability to meet 100 years life expectancy requirement.

Acute corners less than 70° inside panels shall not be allowed.

Special corner units shall be used when interior angle between adjacent panels is 130° or less.

The top of the cast-in-place concrete wall coping shall be smooth and have no steps or abrupt changes in height.

MSE wall panels shall be fully supported by compacted backfill without voids on the non-exposed side.

For stepped leveling pads, the maximum elevation difference between adjacent steps shall not exceed 1250 mm. The minimum length of each stepped section shall be 1500 mm.

Where staged construction is required and large differential settlement is expected between stages, appropriately located full height vertical slip joints shall be provided.

Soils Information

The soil bearing capacity under the existing culvert retaining walls is:

- SLS: 165 kPa
- ULS: 240 kPa

The soil bearing capacity at the underside of the existing culvert is:

- SLS: 30 kPa
- ULS: 90 kPa

All MSE Wall installations are to take place outside of the Big Creek Drain.

Submissions and Contract Administrator Review

Design notes and shop drawings shall be stamped, signed and sealed by a professional engineer, registered to practice in the Province of Ontario.

Design notes shall be presented in a legible and logical format, and shall be sufficiently detailed to allow a technical review of design concepts and assumptions used in the design.

Where necessary, the design package shall be accompanied by properties of materials used together with the appropriate test certificates.

Shop drawings shall be legible and of adequate quality to be reproduced. Each drawing shall have sufficient blank space for the Contract Administrator's acceptance stamp.

As a minimum, shop drawings shall contain:

- Contract name and number on each drawing.
- Design criteria and materials lists.
- Wall layout plan and elevation complete with dimensions and elevations, and typical wall cross-sections.
- All component and connection details.
- Site drainage and drainage details.

Two copies of the design notes and five copies of the shop drawings shall be submitted to the Contract Administrator for review and acceptance at least three weeks in advance of scheduled fabrication.

The design notes and shop drawings will be reviewed by the Contract Administrator solely to ascertain conformance with codes and specifications. Responsibility of the final design remains solely with the Contractor. The Contract Administrator's acceptance of the shop drawings shall not be construed as relieving the Contractor from his responsibility for errors or omissions in the calculations and drawings or for the proper completion of the work in accordance with the Contract.

After the Contract Administrator's review, the Contractor shall revise the drawings and calculations as required to the satisfaction of the Contract Administrator without any additional cost to the Department.

Prior to commencing fabrication, all shop drawings shall be clearly signed by the Department's Contract Administrator as verification that the Contract Administrator has completed his review and accepted the Shop Drawings.

The Contractor shall incorporate as-built conditions and re-submit the revised design notes and shop drawings for records at the completion of construction.

Concrete Materials

Concrete shall be according to OPSS 1350 with the following exceptions:

- a) Air void system parameters shall be a minimum of 3% air content and the average spacing factor obtained on a minimum of two cores per structure shall be no more than 0.200 mm maximum with no individual test result greater than 0.230 mm.
- b) Concrete shall conform to requirements for scaling resistance. The average maximum scaling mass loss shall be 0.8 kg/m².

Concrete Reinforcing Materials

Steel reinforcement shall be according to OPSS 1440.

Soil Reinforcing Materials

Geosynthetic reinforcing shall meet AASHTO LRFD Bridge Design Specifications Clause 11.10.6.4.3b. The requirements "for applications involving severe consequences of poor performance or failure" shall apply. Results of product specific durability studies carried out to determine the product-specific long term strength reduction factor (RF) shall be submitted for the Contract Administrator's review and approval. These studies shall be used to estimate the short term and long term effects of the environment factors on the strength and deformational characteristics of the geosynthetic reinforcement throughout the specified design life.

Geosynthetic reinforcing materials shall satisfy the requirements of the following tests:

- GG 1-87 "Standard Test Method for Geogrid Rib Tensile Strength"
- GG 2-87 "Standard Test Method for Geogrid Rib Junction Strength"
- GG 3-90 "Standard Test Method for Tensile Creep Testing of Geogrids"
- GG 4-05 "Standard Practice for Determination of the Long Term Creep Design Strengths of Geogrids"

Geosynthetic reinforcing materials shall contain stabilizers or inhibitors to prevent degradation of properties due to ultraviolet light exposure.

Safety Rail Materials

Safety rail shall be according to OPSS 908. Minimum safety rail height shall be 1.37 m to accommodate cyclists.

Backfill Materials

The structural backfill shall be crushed aggregate material meeting the requirements of the MSE Wall supplier and loading conditions.

Sealer Materials

Sealer shall be applied to the exposed concrete surfaces of the precast concrete panels and the cast-in-place wall coping in accordance with MSE wall supplier's instructions.

Geotextile Filter Fabric

Non-Woven geotextile filter fabric shall be in accordance with the following table of minimum average roll value properties:

Non-Woven Geotextile Filter Fabric	
Specifications and Physical Properties	
Grab Strength	650 N
Elongation (Failure)	50%
Puncture Strength	275 N
Burst Strength	2.1 MPa
Trapezoidal Tear	250 N
Minimum Fabric Lap to be 300 mm	

Construction

The Contractor shall employ qualified personnel experienced in constructing MSE walls to complete this work. The MSE wall shall be installed in accordance with the supplier's recommendation. The supplier of the MSE wall system shall provide a qualified representative on site to advise the erection crew regarding construction procedures. The representative shall be present for a minimum of 25% of the time throughout the construction of all phases of MSE wall as determined by the wall supplier.

The construction of the MSE wall system shall conform to the details on the approved shop drawings.

Conformance Criteria

The Contractor shall provide formalized documentation, sealed and signed by the engineer, who is responsible for each of the following construction phases and prior to commencement of each subsequent construction activity:

- Foundation base preparation
- On-site delivery of all components
- Alignment of precast wall panels as per contract requirements
- Backfill material gradations and compaction requirements

Excavation

Excavation shall be done to establish grades to within reasonably close conformity to the design grades and limits shown on the drawings and shop drawings. The foundation subgrade shall be proof rolled to identify any soft spots. Soft material shall be removed and replaced with compacted granular material to the satisfaction of the geotechnical consultant. Temporary excavation support as required shall be the responsibility of the Contractor.

In addition, the Contractor shall establish the locations and extents of all underground services in the work area prior to commencement of work. All underground service locations shall be clearly marked and protected during the course of construction. All

damages to existing services resulting from the Contractor's operations shall be repaired at the Contractor's expense.

Backfill

Backfill shall include the supply, placing and compaction required for construction of the MSE walls. Backfill placement shall closely follow erection of each course of panels. Backfill shall be placed in such a manner as to avoid any damage or disturbances of the wall materials or misalignment of the face panels. All wall materials that are damaged during backfill placement shall be removed and replaced at the Contractor's expense. Any misalignment or distortion of the face panels due to placement of backfill shall be corrected by the Contractor at his expense.

A minimum 300 mm wide strip of filter fabric shall be installed behind all face panel joints. An adhesive shall be used to hold the fabric securely against the panels.

MSE Wall backfill must accommodate cast-in-place concrete bridge abutment spread footings and their associated loads as determined by the pre-engineered bridge fabricator (see Item E6).

No equipment shall be allowed to run directly on the soil reinforcement. Backfill compaction shall be performed in such a manner that the compactor shall move in a direction parallel to the wall panels and work toward the end of the soil reinforcement away from the wall facing. Only hand operated power tampers and vibrators shall be used for compaction within 1000 mm of the wall panels. The Contractor shall slope the last level of backfill material away from the wall panels, at the completion of each day's work to direct potential run-off away from the wall face. In addition, the Contractor shall not permit any surface runoff from adjacent areas to enter the wall construction site.

Precast Panel Tolerance

Precast concrete panel manufacturing tolerances shall be as described in CSA A23.4. The tolerance after installation shall be:

1. The flatness tolerance of wall surfaces measured in any direction shall not exceed 10 mm/m
2. The offset of adjacent panel edges at joints shall not exceed 10 mm
3. The variation for minimal joint gap shall not exceed 1.5 mm/m
4. The overall vertical tolerance of the completed wall (top and bottom) shall not exceed 13 mm/3 m of wall height.

Should any panels be out of tolerance, the backfill shall be removed and the panels reset to the proper tolerance.

To facilitate construction of the concrete coping (pre-cast or cast-in-place), nominal-sized, pre-formed holes in the precast panel are permitted providing the holes are located a minimum of 100 mm above the coping soffit.

Material Storage

The Contractor's lay-down area shall be level graded to ensure the panels are safely and uniformly supported on timber bearing blocks. Precast concrete panels shall be stacked on timber planks or pallets and separated by timber blocks as required by the precast design engineer. Soil reinforcing material and connectors shall be stored clear of the ground. All materials shall be covered and protected from rain, snow, dirt and ultraviolet light. The precast panels shall be stored such that the uniform color of the panels is maintained and protected from staining or discoloration.

MEASUREMENT: Measurement for payment for the design and construction of mechanically stabilized earth wall will be by lump sum.

PAYMENT: Payment will be made at the unit price bid for this item, and will be full compensation for design and construction including, but not limited to such items as all excavation, backfill and compaction below the MSE walls where required; all excavation, leveling pad construction, backfill and compaction within and beyond the MSE wall zone necessary for construction of the MSE wall; the supply and installation of precast concrete panels complete with epoxy coated reinforcing steel; pre-cast/cast-in-place concrete coping complete with epoxy coated reinforcing steel; soil reinforcement; sealer; drains; traffic barriers; the supply and installation of galvanized steel safety railing including anchor bolts and clear stone swale at the top of the MSE wall; and all labour, material, equipment, tools and incidentals necessary to complete the Work.

All costs associated with the design of the MSE wall will be considered incidental to the Work, and no separate or additional payment will be made.

38. PRE-ENGINEERED PEDESTRIAN BRIDGE AND ABUTMENTS ITEM E6

These specifications are for a fully engineered clear span bridge of steel construction and shall be regarded as minimum standards for design and construction. This item shall include the design and construction of cast-in-place concrete abutment spread footings incorporated with a Mechanically Stabilized Earth (MSE) retaining wall system (see Item E5).

The structure shall be constructed in accordance with the applicable standards (CAN/CSA-S6-06, CAN/CSA-A23.1-04, and CAN/CSA-A23.2-04 including all amendments) and shall be erected in accordance with the approved plans and specifications.

The Contractor shall supply one set of structural design drawings for the foundation and structure stamped by a Professional Engineer registered in the Province of Ontario

Each bidder is required to identify their intended bridge supplier as part of the bid submittal. Qualified suppliers must have at least 5 years' experience fabricating these type structures.

Pre-approved Manufacturers:

Iron Bridge Fabrication
5960 Road 119
Brunner, ON, N0K 1C0
(519) 595-6830

Eagle Bridge Inc.
250 Shirley Avenue
Kitchener, ON N2B 2E1
(519) 743-4353

Algonquin Bridge
1471 Snow Valley Road
Minesing ON L0L 1Y3
(705) 733-9555

Suppliers other than those listed above may be used provided the Contract Administrator evaluates the proposed supplier and approves the supplier 5 days prior to bid.

The contractor must provide the following documentation, for any proposed supplier who is not pre-approved, at least 10 days prior to bid:

- Product Literature
- All documentation to insure the proposed substitution will be in compliance with these specifications. This shall include:
 - Representative design calculations
 - Representative drawings
 - Splicing and erection procedures
 - Warranty information
 - Inspection and Maintenance procedures
 - AISC Shop Certification
 - Welder Qualifications
- Proposed suppliers must have at least five (5) years' experience designing and fabricating these type structures and a minimum of five (5) successful bridge projects, of similar construction, each of which has been in service at least three (3) years. List the location, bridge size, owner, and a contact for reference for each project.

The Contract Administrator will evaluate and verify the accuracy of the submittal prior to bid. If the Contract Administrator determines that the qualifying criteria have not been met, the contractor's proposed supplier shall be rejected. The Contract Administrator's ruling shall be final.

General Features

Bridge span shall be 16.0m (straight line dimension) and shall be as measured from each end of the bridge structure. Bridge width shall be 2.4m and shall be as measured from the inside face of structural elements at deck level.

The elevation of the highest point on the deck shall be no higher than the pavement centerline (93.170). Under no circumstances shall any component of the pedestrian bridge be lower than the culvert soffit elevation (92.62 m) within the culvert opening area.

The bridge manufacturer shall determine the distance from the top of the deck to the top and bottom truss members based upon structural and/or shipping requirements.

The top of the top chord shall not be less than 1.37 m above the deck (measured from the high point of the riding surface).

Vertical safety rails or pickets shall be placed on the structure to a minimum height of 1.37 m above the deck surface. The pickets shall be spaced so as to prevent a 100mm (4") sphere from passing through the truss. Pickets may be placed on the inside or outside of the structure at the bridge fabricators option. The top of the vertical pickets shall have a continuous cap angle or some other means to prevent bridge users from cutting or scraping their hands.

The picket safety system shall be designed as per CAN/CSA-S6-06.

The design must meet the requirements specified in the proposal documents to the satisfaction of the Contract Administrator and the requirements of the CAN/CSA –S6 – 06 and any other municipal requirements. The Contractor will be responsible for all permits and inspections.

The bridge, foundation structures, approach slabs and all other components of the work shall be designed in accordance with the requirements of CAN/CSA-S6-06, CAN/CSA-A23.1-04, and CAN/CSA-A23.2-04 including all amendments. The designer shall consider the worst case scenarios under maximum loading. These requirements and external loads shall be identified in the detailed design.

Abutments

The abutment design shall consist of cast in place concrete abutment spread footings incorporated with a Mechanically Stabilized Earth (MSE) retaining wall system (see Item E6).

The bridge abutments shall be constructed at the same elevation on both ends of the bridge.

The soil bearing capacity under the existing culvert retaining walls is:

- SLS: 165 kPa
- ULS: 240 kPa

The soil bearing capacity at the underside of the existing culvert is:

- SLS: 30 kPa
- ULS: 90 kPa

Concrete shall be obtained from a licensed commercial source and shall be in accordance with current CSA Standard A23.1 – 04 and A23.2 – 04, having an Exposure Classification of C1 and shall have a minimum compressive strength of 35 MPA at 28 days.

The contractor shall be responsible for all testing and any associated costs incurred as per Item G11.

Steel reinforcement for the concrete abutment wall shall be used on all concrete walls, abutments, and piers. There shall not be any exposed metal in the concrete structure.

The MSE Wall backfill material properties shall be confirmed with the MSE designer and supplier.

Loading

The pedestrian bridge shall be designed as a 2.4m wide pedestrian bridge with a 58kN maintenance vehicle.

The Designer shall consider the worst effects of unbalanced snow and wind loads as described in the CAN/CSA-S6-06.

All other loading shall be as per CAN/CSA-S6-06

Materials

Unpainted Weathering Steel

Bridges which are not to be painted shall be fabricated from high strength, low alloy, atmospheric corrosion resistant ASTM A847 cold-formed welded square and rectangular tubing and/or ASTM A588, or ASTM A242, ASTM A606 plate and structural steel shapes ($F_y = 345$ MPa or 50 ksi). The minimum corrosion index of atmospheric corrosion resistant steel, as determined in accordance with ASTM G101, shall be 6.0.

Decking

Bridge decking shall be nominal 50mm x 250 mm pressure treated wood.

At time of installation, planks are to be placed tight together with no gaps. Every plank must be attached with at least one fastener at each end.

All fasteners to be zinc plated. Self-tapping screws or hex-head bolts, with a steel plank hold down, are to be used at the ends of planks.

Self-tapping screws or carriage bolts are to be used as interior connection fasteners when required. Power actuated fasteners will not be allowed.

Attachments at the ends of the planks may be modified as required when obstructions, such as interior safety system elements, prevent installation of the specified hold down system.

Performance Specifications

The pedestrian crossing structure shall be designed and constructed for a 25 year life design. The structure shall be corrosion free and maintenance free for its design life. All design shall be done by a Professional Engineer licenced to practice, in the Province of Ontario.

Submissions

Submittal Drawings

Schematic drawings and diagrams shall be submitted to the Contract Administrator. Submittal drawings shall be unique drawings, prepared to illustrate the specific portion of the work to be done. All relative design information such as member sizes, bridge reactions, and general notes shall be clearly specified on the drawings. Drawings shall have cross referenced details and sheet numbers. All drawings shall be signed and sealed by a Professional Engineer who is licensed to practice in Ontario.

Structural Calculations

Structural calculations for the bridge superstructure shall be submitted by the bridge manufacturer and reviewed by the approving engineer. All calculations shall be signed and sealed by a Professional Engineer who is licensed to practice in Ontario. The calculations shall include all design information necessary to determine the structural adequacy of the bridge. The calculations shall include the following:

- All AISC allowable stress checks for axial, bending and shear forces in the critical member of each truss member type (i.e. top chord, bottom chord, floor beam, vertical, etc.).
- Checks for the critical connection failure modes for each truss member type (i.e. vertical, diagonal, floor beam, etc.). Special attention shall be given to all welded tube on tube connections
- All bolted splice connections.
- Main truss deflection checks.
- U-Frame stiffness checks (used to determine K factors for out-of-plane buckling of the top chord) for all half through or "pony" truss bridges.
- Deck design.

The analysis and design of triangulated truss bridges shall account for moments induced in members due to joint fixity where applicable. Moments due to both truss deflection and joint eccentricity must be considered.

Delivery and Erection

Delivery is made to a location nearest the site which is easily accessible to normal over-the-road tractor/trailer equipment. All trucks delivering bridge materials will need to be unloaded at the time of arrival.

The manufacturer will provide detailed, written instruction in the proper lifting procedures and splicing procedures (if required). The method and sequence of erection shall be the responsibility of the Contractor.

The bridge manufacturer shall provide written inspection and maintenance procedures to be followed by the bridge owner.

Bearings

Bridge bearings shall consist of a steel setting or slide plate placed on the abutment or grout pad. The bridge bearing plate which is welded to the bridge structure shall bear on this setting plate. One end of the bridge will be fixed by fully tightening the nuts on the anchor bolts at that end. The opposite end will have finger tight only nuts to allow movement under thermal expansion or contraction.

The bridge bearings shall sit in a recessed pocket on the concrete abutment. Minimum 28-day strength for the abutment concrete shall be 35 MPa. The bearing seat width (depth) and step height (from bottom of bearing to top-of-deck) shall be determined by the bridge manufacturer.

Bridges with dead load reactions of 65 kN or more (at each bearing location) shall have teflon on teflon or stainless steel on teflon slide bearings placed between the bridge bearing plate and the setting plate. The top slide plate shall be large enough to cover the lower teflon slide surface at both temperature extremes.

Foundations

The bridge manufacturer shall determine the number, diameter, minimum grade and finish of all anchor bolts. The anchor bolts shall be designed to resist all horizontal and uplift forces to be transferred by the superstructure to the supporting foundations.

Engineering design of the bridge supporting foundations (abutment, pier, bracket and/or footings), including design of anchor bolt embedments, shall be included in this item. The contractor shall provide all materials for (including anchor bolts) and construction of the bridge supporting foundations. The contractor shall install the anchor bolts in accordance with the manufacturer's anchor bolt spacing dimensions.

Warranty

Contractor shall provide written warranty stating that the bridge is warranted against defects in material and workmanship for a period of two years, and for five years against structural defects from the date of Final Certificate of Completion

MEASUREMENT: Progress measurements shall be made at key milestone points in this item's completion, such as:

- Installation of Abutments
- Material Delivery on Site
- Installation of Bridge and Assembly
- Installation of decking, rails, approaches, and other appurtenances

PAYMENT: Partial completion payments for this item shall be at the unit bid price at each milestone stage and shall be full compensation for all equipment, labour and materials required to complete this work in every aspect.

38a. CONCRETE SIDEWALK LANDING AREAS

ITEM E7

GENERAL: OPSS 351 and 1350 shall apply and govern except as amended or extended herein.

SCOPE: Sidewalk work consists of all labour, equipment and materials required to install concrete sidewalk landing areas as shown on the Contract Drawings, or as directed by the Engineer. This work includes expansion joint material, formwork, concrete, finishing and surface sealing.

Sidewalks are to be constructed as per Town's Standards with a thickness of 200 mm. Granular 'A' bedding shall be used under all sidewalks, unless otherwise directed by the Engineer. Granular 'A' bedding shall be compacted to 100% Standard Proctor Density.

Contractor shall supply test certificates in accordance with the appropriate specifications for concrete and provide mix designs for concrete at least two weeks prior to use.

Portland Cement Concrete shall be produced in accordance with CSA-A23. Concrete shall comply with the requirements of OPSS 1350 and the following specific requirements:

Cement Type:	Portland Cement
Class of Concrete:	32 MPa at 28 days
Class of Exposure:	C-2
Course of Aggregate:	19 mm nominal max. size
Air Content:	6.5% + 1.5%
Slump at point of discharge:	80 mm +/- 30mm
Maximum water/cementing materials ratio:	0.45

All sidewalk abutting retaining curb and existing buildings shall have expansion joint filler to ASTM D1751. Work around poles, valves, etc. shall be to OPSD 310.040.

The Contractor shall be responsible for the protection of the concrete surfaces against vandalism or temperature changes that may occur during the curing period. Any deficiencies, graffiti, etc., will be removed and replaced at the Contractor's expense.

MEASUREMENT: Measurement for sidewalk restoration shall be per square metre of sidewalk and sidewalk through driveways provided and installed, measured in a horizontal plane.

38b. TACTILE WALKING SURFACE INDICATOR PLATES

ITEM E8

GENERAL: These items shall conform to OPSS 351 except as amended herein.

SCOPE AND SPECIFICS: This work consists of all labour, equipment and materials required to place tactile walking surface indicator plates at concrete sidewalk landing areas as indicated in the Contract Drawings.

Gray cast iron tactile walking surface indicator plates shall be as specified in the Contract Documents. Castings shall be according to ASTM A 48M, Class 35B, and shall be bare and not coated with paint or other coatings or substances. Castings shall be sound, free from pouring faults, cracks, blowholes, and other defects.

The surface of each new cast iron plate on both the tops of the truncated domes and the field between the truncated domes shall have a minimum wet and dry static coefficient of friction of 0.8 according to ASTM C 1028.

The initials or trademark of the manufacturer, year of manufacture, and country of manufacture shall be distinctly cast and legible in raised letters on the top side of each plate.

Tactile walking surface indicator plates shall be set into wet prepared concrete at each concrete sidewalk landing area as specified in the Contract Documents and according to the plate manufacturer's installation instructions. Plate alignment and configuration shall be adjusted to suit each location as per the Contract Drawings. Plates shall be cleaned after installation.

MEASUREMENT: Measurement for this item shall be per location at each sidewalk landing area.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

39. PERMITS AND HYDRO CONNECTIONS

ITEM F1

GENERAL: OPSS 601 shall apply and govern except as amended or extended herein.

SCOPE: The Contractor shall obtain any necessary inspections and permits as required by the local power utility and/or the Electrical Safety Authority (ESA). The Contractor shall obtain permits for all work and shall file applications for inspection with the local power utility and/or Electrical Safety Authority as required and arrange for the local power utility and/or Electrical Safety Authority inspectors to review work at the appropriate stages, arrange for de-energizing and re-energizing of the streetlight cable and provide acceptance/inspection certificates upon completion of work. The Contractor shall pay all fees related to permits, applications and inspections for the necessary completion of the Contract as outlined.

The Contractor is responsible for all locates.

The Contractor is responsible to obtain a road occupancy permit from the Town of Amherstburg prior to commencing any work.

MEASUREMENT: No measurement will be made for this item as it is a Lump Sum item.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

Invoices/receipts must be submitted for payment. The Contractor will be reimbursed for the actual cost only (no mark up invoices will be allowed). Any additional amount of cash allowance remaining after disbursement of invoices/receipts will revert to the Town.

40. REMOVAL OF EXISTING ELECTRICAL EQUIPMENT AND MATERIALS

ITEM F2

- a) Existing luminaires, fixtures, brackets, arms, and all pole mounted accessories**
- b) Tree Protection**
- c) Temporary measures**

GENERAL: OPSS 401, 492 510 and 610 shall apply and govern except as amended or extended herein.

SCOPE: The Contractor shall remove existing luminaires, arms, brackets and all accessories as noted on contract drawings in accordance with referenced OPSS standard, Electrical Safety Authority (ESA) and local power utility requirements.

Existing electrical systems required to continue in-service shall remain functional during construction operations until new or modified systems are operational.

Prior to removing luminaires, all lamps and glass shall be removed.

All disposed materials shall be removed in accordance with OPSS 510 – Construction Specification for Removal. Backfill and compact existing holes with Granular A Material in accordance with OPSS 401.

The Contractor shall provide protection for existing trees as required by Town of Amherstburg Bylaws. Tree protection must be installed as per Town's requirements for all existing trees less than 400mm in diameter within 2m of the vicinity of work and around all trees greater than 400mm in diameter within 3m of the vicinity of work.

Site restoration shall be according to OPSS 492.

MEASUREMENT: Measurement for this item shall be made as per the tender form.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

41. SUPPLY AND INSTALL ELECTRICAL CHAMBERS (HANDWELLS)

ITEM F3

a) Concrete Round, 460mm DIA.

GENERAL: OPSS 602 and 2401, OPSD-2112.02, and MTOD-2117.02 shall apply and govern except as amended or extended herein.

SCOPE: The Contractor shall supply and install new electrical chambers (handwells) at locations indicated on the contract drawings and as per OPSD standards.

Electrical Chambers shall be supplied as follows:

- | | |
|---------------|----------------|
| (a) Size: | 460 mm DIA |
| Type: | Round Concrete |
| Manufacturer: | N/A |
| Cat. No.: | N/A |
| Details: | OPSD 2112.02 |
| Notes: | N/A |

MEASUREMENT: Measurement for this item shall be made per each unit supplied and installed complete.

PAYMENT: The unit price shall include all labour, equipment and materials required to install each electrical chamber, including all hardware, and adjustments required. The unit price shall be fixed regardless of installation methods and/or site conditions. Extra charges for shale, utility conflicts, locate delay errors will not be considered.

42. SUPPLY AND INSTALL DUCT

ITEM F4 – BY DIRECTIONAL BORE

- a) Rigid PVC, 1-50mm DIA.

ITEM F5 – BY OPEN CUT

GENERAL: OPSS 603 and OPSD-2101.01, 2101.02, 2101.05, 2103.02, and 2103.05 shall apply and govern except as amended or extended herein.

SCOPE: The Contractor shall supply and install duct by open cut or by direction bore as specified on the Contract drawings.

The conduits shall be located to a depth of 0.8m minimum below boulevard grade, and 1.0m below travelled portion of roadway. Duct joints shall be made with the use of sleeves which permit a smooth joint between ducts. All joints shall be made waterproof by means of couplers and sealants. Any unused ducts shall be plugged with plastic plugs for future use. Ducts shall have standard "bell" ends.

For duct crossing at roadway, driveway or sidewalk, the Contractor shall supply and install High Density Polyethylene conduit meeting CSA Standard C22.2 No. 211.2 by directional bore method. Minimum conduit depth shall be 1.0m below final grade. The unit price shall include cost of road crossing, boulevard and sidewalk repairs where applicable.

The contractor shall adhere to the Town's minimum cover standards for underground plant of 0.8m below boulevard grade, 1.0m below travelled portion of roadway throughout the scope of work areas.

The Contractor shall supply and place through each duct sufficient #10 annealed fish wire or equivalent strength polyline for purposes of pulling in the necessary cable for street lighting. The Contractor shall leave extra fish wire in duct for future cable pulling.

The Contractor shall restore in kind or better all areas disturbed during this installation. All disturbed turf areas shall be restored with topsoil and sod and watered for 14 days after final restoration.

Duct supplied shall be as follows:

- (a) Size: 1-50 mm DIA.
 Type: Rigid PVC, CSA C22.2 No. 211.2
 Manufacturer: IPEX (or Approved Equal)
 Cat. No.: 032120 / 032121

MEASUREMENT: Measurement for this item shall be made per lineal metre supplied and installed complete.

PAYMENT: The unit price for these items shall include all labour, equipment, and materials required to complete the work as specified including excavation, pavement removal, backfilling and all fittings.

43. SUPPLY AND INSTALL STREET LIGHTING CABLE, IN DUCT

ITEM F6

a) RWU90, 1-1/C, #6 AWG.

GENERAL: OPSS 604 shall apply and govern except as amended or extended herein.

SCOPE: The Contractor shall supply and install cables in ducts in the locations as indicated on the Contract Drawings and as per the local utility's Standards.

The Contractor shall prove that the lighting system operates effectively by energizing each circuit from a portable 120 VAC generator for a sufficient period of time to bring each luminaire connected to that circuit to full brilliance. The Contractor will be responsible to coordinate with the local utility to connect the street lighting circuit.

Street light cable supplied shall be as follows:

- (a) Size: 1C#6 AWG, (Number as indicated on Drawings)
 Type: RWU90 (-40°C), XLPE, Insulated (Black, Red & White) stranded copper (Cu), 600V 90°C, CSA C22.2 No. 38
 Manufacturer: Nexans (or Approved Equal)
 Cat. No.: N/A
 Notes: 1. Cables must be rated and marked for outdoor usage

The unit price shall include all single conductor AWG type RWU90 cables, all labour, equipment and materials required to complete the work specified regardless of size and type of duct that the cable is to be installed in, and shall also include all cable connections, cable testing, coiled cables, slack cables, waste cables and all vertical runs of cable from pedestals to pole handholes. In addition, the unit price shall include any coordination with local utility.

MEASUREMENT: Measurement for this item shall be made per lineal metre supplied and installed complete.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

44. SUPPLY AND INSTALL POWER CABLES, IN DUCT

ITEM F7

a) RW90, 1-1/C, #2 AWG

GENERAL: OPSS 604 shall apply and govern except as amended or extended herein.

SCOPE: The Contractor shall supply and install cables in ducts in the locations as indicated on the Contract Drawings and as per local utility standards Standards.

The Contractor shall prove that cabling has been installed properly by load testing each circuit at the load from a portable 120 VAC generator for a sufficient period of time. Load for each circuit shall be tested to 10A, 120V, 60Hz AC. The Contractor will be responsible to coordinate with local utility to connect all power circuits.

Cabling from Transformer to Power Supplies:

- | | |
|---------------|---|
| (a) Size: | 1C#2 AWG, (Number as indicated on Drawings) |
| Type: | RWU90 (-40°C), XLPE, Insulated (Black, Red & White) stranded copper (Cu), 600V 90°C, CSA C22.2 No. 38 |
| Manufacturer: | Nexans (or Approved Equal) |
| Cat. No.: | N/A |
| Notes: | 1. Cables must be rated and marked for outdoor usage |

The unit price shall include all single conductor AWG type RWU90 cables, all labour, equipment and materials required to complete the work specified regardless of size and type of duct that the cable is to be installed in, and shall also include all cable connections, cable testing, coiled cables, slack cables, waste cables and all vertical runs of cable from pedestals to pole handholes. In addition, the unit price shall include any coordination with local utility.

MEASUREMENT: Measurement for this item shall be made per lineal metre supplied and installed complete.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

45. SUPPLY AND INSTALL STREET LIGHTING CABLE, RISER IN POLES**ITEM F8**

- a) **RW90, 1-1/C, #12 AWG**
- b) **New Poles (Inline fuses in handholes) 10A type KTK fuses & fuse-holders**
- c) **Existing Poles (Inline fuses in handholes) 10A type KTK fuses & fuse-holders**

GENERAL: OPSS 604 shall apply and govern except as amended or extended herein.

SCOPE: The Contractor shall supply and install riser cables in poles as indicated on Contract drawings.

Street light riser cable supplied shall be as follows:

- | | |
|---------------|---|
| (a) Size: | 1/C, #12 AWG (number as indicated on drawings) |
| Type: | RW90 (-40°C), XLPE, Insulated (Black & White) stranded copper (Cu), 600V 90°C, CSA C22.2 No. 38 |
| Manufacturer: | Nexans (or Approved Equal) |
| Cat. No.: | N/A |
| Notes: | 1. Cables must be rated and marked for outdoor usage |

The unit price shall include protective boots, 10A type KTK fuses, fuse-holders, and all single conductor AWG type RW90 cables, all labour, equipment and materials required to complete the work specified regardless of size and type of duct that the cable is to be installed in, and shall also include all cable connections, cable testing, coiled cables, slack cables and waste cables. In addition, the unit price shall include any coordination with local utility.

MEASUREMENT: Measurement for this item shall be made per lineal metre supplied and installed complete.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

46. SUPPLY AND INSTALL GROUND CABLE, IN DUCT**ITEM F9**

- a) **RW90 1-1/C, #6 AWG**

GENERAL: OPSS 609 shall apply and govern except as amended or extended herein.

SCOPE: The Contractor shall supply and install ground cables in the locations as indicated on the Contract Drawings, including all earth excavation, backfill, installation of ground wire in

ducts or trenches regardless of the type and size of ground wire, all connections, and testing required.

Poles with ground rods are to be connected to the grounding system by a #6 AWG, Bare, Copper (Cu) ground cable (Green).

Ground cable shall be supplied as follows:

- | | | |
|-----|---------------|--|
| (a) | Size: | 1-1/C, #6 AWG |
| | Type: | RWU90 (-40°C), XLPE, Insulated (Green) stranded copper (Cu), 600V 90°C, CSA C22.2 No. 38 |
| | Manufacturer: | Nexans (or Approved Equal) |
| | Cat. No.: | N/A |
| | Notes: | 1. Cables must be rated and marked for outdoor usage |

MEASUREMENT: Measurement for this item shall be made per lineal metre supplied and installed complete.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

47. SUPPLY AND INSTALL GROUND CABLE, RISER IN POLES ITEM F10

a) RW90 1-1/C, #12 AWG

GENERAL: OPSS 609 shall apply and govern except as amended or extended herein.

SCOPE: The Contractor shall supply and install ground riser cables in the poles as indicated on the Contract Drawings. Ground cable shall be installed from the fixture to the ground lug in each pole.

Ground riser cable shall be supplied as follows:

- | | | |
|-----|---------------|---|
| (a) | Size: | 1-1/C, #12 AWG |
| | Type: | RW90 (-40°C), XLPE, Insulated (Green) stranded copper (Cu), 600V 90°C, CSA C22.2 No. 38 |
| | Manufacturer: | Nexans (or Approved Equal) |
| | Cat. No.: | N/A |
| | Notes: | 1. Cables must be rated and marked for outdoor usage |

MEASUREMENT: Measurement for this item shall be made per lineal metre supplied and installed complete.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

48. SUPPLY AND INSTALL GROUND ELECTRODES

ITEM F11

a) Copper Clad 3/4" (19MM) DIA.

GENERAL: OPSS 609 shall apply and govern except as amended or extended herein.

SCOPE: The Contractor shall supply and install ground rods in locations as indicated on the Contract Drawings and details including all earth excavation, backfill, all connections, and testing required.

Ground wire shall be secured to ground rods by means of a thermit weld connection.

Ground electrode(s) shall be supplied as follows:

- | | | |
|-----|---------------|--|
| (a) | Size: | 3/4" (19mm) DIA. x 10' (3000mm) Length |
| | Type: | Rod (Copper Clad) |
| | Manufacturer: | ERICO 'ERITECH' (or Approved Equal) |
| | Cat. No.: | 613412 |
| | Details: | N/A |
| | Notes: | 1. Thermit weld connections to be provided |

MEASUREMENT: Measurement for this item shall be made per each unit supplied and installed complete.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

49. SUPPLY AND INSTALL CONCRETE POLES, DIRECT BURIED

ITEM F12

a) Round Concrete Pole (Class 'A'), 9.14m (7.6m above grade)

GENERAL: OPSS 615 and Town of Amherstburg design standards shall apply and govern except as amended or extended herein.

SCOPE: The Contractor shall supply and install new poles at locations indicated on the Contract drawings and as per Town's design standards which can be found on their website.

Pole holes are to be augered or excavated using a non-destructive hydro-vac system. Poles are to be installed without luminaries or arms attached.

Poles supplied shall be as follows:

- | | | | |
|----|-----|------------------|--|
| i) | (a) | Size: | 9.14m (7.6m above grade) |
| | | Type: | Round Concrete (Class 'A') |
| | | Colour / Finish: | Grey / Mold |
| | | Manufacturer: | StressCrete |
| | | Cat. No.: | E-300-APR-G-MOO S/F 120 (or Approved Equal) |
| | | Details: | OPSD 2225.020 |
| | | Notes: | 1. Poles to include Burndy ground lug in handholes |

OR

- ii) Equivalent Approved by Town.

The unit price shall include all labour, equipment and materials required to install each direct buried concrete, including all hardware, and adjustments required. The unit price shall be fixed regardless of installation methods and/or site conditions. Extra charges for shale, utility conflicts, locate delay errors will not be considered.

The contractor shall confirm with pole manufacturer that selected pole has sufficient strength to restrict the loading of arms and fixtures. A letter from the manufacturer shall be submitted along with Pole Shop Drawings verifying the above. No extras will be considered resulting in failure by the contractor to verify this requirement with the pole manufacturer. Any additional requirements shall be brought to the attention of the engineer and included in base bid price.

The Town of Amherstburg will provide pole numbers to be affixed on street lighting poles. Numbers shall be affixed to the poles by the Contractor in accordance with Town Standards. Existing pole numbers on drawings are place holders only.

MEASUREMENT: Measurement for this item shall be made per each unit supplied and installed complete.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

50. SUPPLY AND INSTALL LUMINAIRE ARM BRACKETS, ON POLES**ITEM F13**

- a) 4' Arm
- b) 6' Arm
- c) 8' Arm
- d) 10' Arm

GENERAL: OPSS 617 shall apply and govern except as amended or extended herein.

SCOPE: The Contractor shall supply and install new elliptical brackets at locations indicated on the Contract drawings.

It is the Contractor's responsibility to meet the qualifications outlined by EUSA/ ESA for all work conducted near utility equipment.

Luminaire arm brackets supplied shall be as follows:

- (a) Size: Varies as per drawing chart
- Type: Aluminum
- Colour / Finish: Standard
- Manufacturer: Dynapole or approved equal
- Cat. No.: Refer to drawing chart
- Notes: N/A

The unit price shall include each bracket and all labour and equipment pertaining to the installation, mounting and adjustments of the street lighting equipment to achieve operational status. The Contractor should note that any existing illumination must be maintained at all times. Extra charges for coordination time/conflicts, delays and errors will not be considered.

MEASUREMENT: Measurement for this item shall be made per each unit supplied and installed complete.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

51. SUPPLY AND INSTALL LUMINAIRES, ON ARM BRACKETS**ITEM F14**

- a) **L1 Light Fixture on Existing Pole Including Connections and in-line fuses**
- b) **L2 Light Fixture on Existing Pole Including Connections and in-line fuses**
- c) **L1 Light Fixture on New Pole Including Connections and in-line**

GENERAL: OPSS 617 shall apply and govern except as amended or extended herein.

SCOPE: The Contractor shall supply and install new luminaires at locations indicated on the Contract drawings and shall be mounted on poles / arm brackets as indicated on the Contract drawings.

a) Lighting Type L1 – Roadway:

- i) (a) Size: LED Roadway Lighting (LRL)
- Series: NXT
- Cat. No.: NXT-36S-0-7-3LB-7-GY-4-UL-2H
- Voltage: 120V
- Colour / Finish: Grey
- Details: OPSD 2225.020
- Notes:
 1. Luminaires to include electronic photocell
 2. Fixtures to include surge suppression (replaceable)
 3. For fixture installed on existing hydro poles, install new inline fuses in accordance with ESA, Local Utility and drawing details

OR

- ii) Equivalent Approved by Town prior to bid closing.

b) Lighting Type L2 – Pedestrian Pathway

- i) (b) Size: LED Roadway Lighting (LRL)
- Series: NXT-LITE
- Cat. No.: LO-NXT-LITE-16S-5-7-2ES-5-GY-4-UL-4-S
- Voltage: 120V
- Colour / Finish: Grey
- Details: OPSD 2225.020
- Notes:
 1. Luminaires to include electronic photocell
 2. Fixtures to include surge suppression (replaceable)
 3. For fixture installed on existing hydro poles, install new inline fuses in accordance with ESA, Local Utility and drawing details.

OR

- ii) Equivalent Approved by Town prior to bid closing.

The unit price shall include luminaire, photocell, fuse, wattage sticker, riser wires from the pole hand hole to the luminaire, and all labour and equipment pertaining to the installation, mounting, wiring and adjustments of the street lighting equipment to achieve operational status. The Contractor should note that the existing illumination must be maintained at all times. Extra charges for coordination time/conflicts, delays and errors will not be considered.

MEASUREMENT: Measurement for this item shall be made per each unit supplied and installed complete.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

52. DUST CONTROL (PROVISIONAL)

ITEM G1

b) Water for Dust Control

c) Brine Solution for Dust Control

GENERAL: OPSS 506 shall apply and govern except as amended or extended herein.

SCOPE: At all times during construction and until final completion and acceptance of the work, the Contractor shall prevent the formation of airborne dust nuisance by application of water or, at the request of the Contract Administrator, a Brine Solution to treat the site of the work in such a manner that will confine dust particles to the immediate surface of the work.

The Contractor shall perform such treatment within two (2) hours after notification by the Contract Administrator.

Water and Brine Solution used for dust control shall be furnished and applied by means of tanks equipped with suitable sprinkling devices and in the quantities ordered.

Application rates shall be as per Manufacturer's recommendations.

MEASUREMENT: Measurement shall be by volume in cubic metres of water or Brine Solution used.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

The Contractor is not entitled to payment for Provisional Items, except for additional work required or requested, approved by the Contract Administrator and completed in

accordance with the Contract Documents and then only to the extent of such additional work.

**53. ROAD WORKS TIME AND MATERIAL UNIT RATES (PROVISIONAL)
ITEM G2**

SCOPE: This specification covers equipment compensation for work on a Time and Material Basis. The Contractor's rate shall represent the cost of owning and operating the equipment and shall be made up of direct and indirect costs such as fuel, oil, lubrication, field repairs, overhaul, depreciation, financing, storage, insurance, overhead, and profit.

The item rates shall be hourly, unless otherwise stated, and are to include the cost of the operator.

Rates shall be based on equipment specifications for standard models, including all necessary attachments to perform the work.

MEASUREMENT: Measurement for this item shall be on an hourly basis, as recorded by the Engineer and supported by Time and Material Log submitted by the Contractor.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

The Contractor is not entitled to payment for Provisional Items, except for additional work required or requested, approved by the Contract Administrator and completed in accordance with the Contract Documents and then only to the extent of such additional work.

**54. HAND-LAID ASPHALT PLACEMENT, HL-4 BASE COURSE (PROVISIONAL)
ITEM G4**

SCOPE: This item shall be used if determined necessary by the Contract Administrator, in asphalt replacement areas that are not large enough for the asphalt to be laid by machine paver.

The specification for the type of asphalt to be hand-laid shall be as specified in SP 19, Item C4, Supply and Place Hot Mix Asphalt b) HMA - HL-4 Base Course.

MEASUREMENT: Measurement for this item shall be per tonne of HMA - HL-4 Base Course material supplied, hand placed and compacted for roadway, bike path, driveway or trail, calculated from weight tickets received on the job site.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

The cost of any additional QA grade checks on the recertified area shall be the responsibility of the Contractor. All grading carried out by the Contractor as a result of QA grade checks to ensure tolerances shall be carried out at no additional charge to the Owner.

The Contractor is not entitled to payment for Provisional Items, except for additional work required or requested, approved by the Contract Administrator and completed in accordance with the Contract Documents and then only to the extent of such additional work.

**55. VISUALLY EXPOSE EXISTING UTILITIES BY HYDRO-VAC (PROVISIONAL)
ITEM G7**

SCOPE: The location of existing underground conduits, watermains, sewers, gas mains/lines and other utilities and structures is not necessarily shown on the Contract Drawings, and, where shown, the accuracy of the location of such utilities and structures is not guaranteed. Before starting works, the Contractor shall investigate the exact locations of such utilities and structures, and shall be liable for damages to them as a result of any act or omission, whether or not the result of negligence, by those for whom the Contractor is responsible.

The Contractor shall be responsible to expeditiously and visually expose existing utilities where a potential conflict may arise and require support and/or protection, or where location needs to be confirmed. There will be no payment for any delays encountered where a conflict is encountered, and should have reasonably been anticipated and not exposed prior to identification.

MEASUREMENT: Measurement will be made for this item on an hourly rate and shall include all associated hydro excavation costs, including locate requests, dumping/tipping fees and water supply.

PAYMENT: Payment for this item shall be made on the appropriate unit price bid in the Schedule of Quantities and shall be compensation in full for all labour, materials and equipment to complete the work as specified herein.

The Contractor is not entitled to payment for Provisional Items, except for additional work required or requested, approved by the Contract Administrator and completed in accordance with the Contract Documents and then only to the extent of such additional work.

56. ADDITIONAL EARTH EXCAVATION (PROVISIONAL)**ITEM G8**

GENERAL: OPSS 206 and 504 shall apply and govern except as amended or extended herein.

SCOPE: This work consists of all labour, equipment and materials required to carry out additional earth excavations to soft or loose subgrade within the roadway. The Contractor shall proof-roll the subgrade and sub-excavate any soft or loosened subgrade areas. Additional Granular 'B' Type II material required to backfill the excavation will be paid under Provisional Item G9.

Where the Engineer determines that the depth of excavation required for the construction of the roadway should be increased beyond that specified on the Contract Drawings, the Contractor shall sub-excavate unsuitable material to the depth and/or extent below the subgrade as directed by the Contract Administrator.

The Contractor shall dispose of all excavated material off-site, at his expense. If arrangements are made between the Contractor and private property owners accepting any excavated material, the Contractor shall provide a written authorization from those private property owners indicating that they will not hold the Town responsible or liable for any damages. Excavated rubble (concrete, sewer pipe, etc.), with the exception of bedrock, shall be hauled to an approved disposal site at no additional cost to the Owner.

MEASUREMENT: Measurement for this item shall be per cubic metre of additional earth excavation required, as measured in the field.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

The Contractor is not entitled to payment for Provisional Items, except for additional work required or requested, approved by the Contract Administrator and completed in accordance with the Contract Documents and then only to the extent of such additional work.

57. GRANULAR 'B' TYPE II (PROVISIONAL)**ITEM G9**

GENERAL: OPSS 128, 314 and 501 shall apply & govern except as amended or extended herein.

SCOPE: This work consists of all labour, equipment and materials required to supply, haul, place and compact Granular 'B' material for areas identified under Item G8, Additional Earth Excavation, including the application of water to aid in compaction.

In areas of excavated loose or soft subgrade within the roadway, the Contractor shall place additional Granular 'B' Type II material. Granular 'B' Type II material shall be supplied, placed and compacted (to 98% Standard Proctor Maximum Dry Density) in lifts no greater than 300mm.

Materials

Granular B shall not contain any recycled material (i.e., recycled concrete material, etc.).

The Contractor shall be responsible for arranging for and carrying out quality control testing of granular material and for obtaining, delivering and testing material samples prior to their placement.

The Contractor testing work shall include:

- Granular gradation samples and tests (unless the pit can provide adequate documented evidence of current or recent material-tests).
- Standard or modified Proctor tests to establish compaction targets.
- Nuclear density compaction testing during placement.

Non-conforming material that has been incorporated into the Work shall be removed and replaced with conforming material, or subjected to a payment reduction, as determined by the Contract Administrator.

MEASUREMENT: Measurement for this item shall be per tonne of Granular 'B' material supplied, placed and compacted for roadway, curb and gutter, sidewalks and driveways, calculated from weight tickets received on the job site.

PAYMENT: Payment for this item shall be made at the unit price bid as set out in the Schedule of Quantities and shall be compensation in full for all labour, equipment and materials required to complete the work in every respect.

The cost of any additional QA grade checks on the recertified area shall be the responsibility of the Contractor. All grading carried out by the Contractor as a result of QA grade checks to ensure tolerances shall be carried out at no additional charge to the Owner.

The Contractor is not entitled to payment for Provisional Items, except for additional work required or requested, approved by the Contract Administrator and completed in accordance with the Contract Documents and then only to the extent of such additional work.

**58. MATERIALS TESTING AND INSPECTION (ALLOWANCE)
ITEM G11**

SCOPE: This item is intended to cover expenditures required for material testing during the execution of the Contract.

The amount of the Material Testing Allowance shown in the Form of Tender shall be included in the Total Tender Price.

Payment will be made only work authorized by the Contract Administrator, which is completed in accordance with the instructions of the Contract Administrator.

The Contractor will not be entitled to payment of any or all of the material testing allowances unless the work is authorized, in writing by the Contract Administrator. Field Staff are not authorized to allow work under this item.

The Contractor shall provide the Contract Administrator with a minimum of three days' notice prior to requiring material testing. If material testing cannot be completed on that day the Contractor shall provide at least 24 hours notice to the Contract Administrator and testing company. If sufficient notice is not provided, the Contractor shall pay for any costs incurred where material testing could not be completed due to Contractor delays.

**59. CONTINGENCY (PROVISIONAL)
ITEM G12**

GENERAL: OPS General Conditions of Contract.

SCOPE: Extra work is work which is required, but not described in this document or on the Contract Drawings. No work shall be regarded as extra work unless it is approved in writing by the Town and with the agreed price and method of payment for it specified on the said approval, provided the said price is not otherwise determined by the quote. All notification claims for extra work shall be made to the Town before the extra work is started.

The Contingency is an allowance which is for the sole benefit of the Corporation. While the Corporation shall, as required by the Contract Documents, pay the Contractor for all work performed, the Corporation has no obligation to pay any Contingency to the Contractor.

The amount of the Contingency Allowance shown in the Form of Tender shall be included in the Total Contract Bid.

APPENDIX A

**TOWN OF AMHERSTBURG
ACCESSIBLE CUSTOMER SERVICE STANDARDS POLICY**

Accessible Customer Service Standards Policy

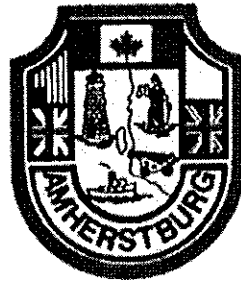
Disruption of Services

If there is a disruption in a particular facility or service used to allow a person with a disability to access goods or services, the Town will give notice of the disruption to the public by posting the reason for the disruption, the anticipated duration of the disruption, and alternative facilities or services that may be available. This posting will be in a conspicuous place on the premises of the Town of Amherstburg, the Town website and/or by other reasonable methods in the circumstances.

If the Town anticipates a disruption, the Town will provide a reasonable amount of advance notice of the disruption. If the disruption is unexpected, notice will be provided as soon as possible.

Training

The Town will ensure that all persons to whom the *Accessible Customer Service Standards Policy* applies to receive training as required. The amount and format of training given will be tailored to suit each person's interactions with the public and his or her involvement in the development of policies, procedures and practices pertaining to the provision of goods and services. This training includes, but is not limited to, the Town's policies, procedures and practices pertaining to the provision of goods and services to customers with disabilities and how to assist customers with disabilities in accessing the Town's goods and services. The Town will keep records of this training.



Feedback

Feedback from the public is welcomed as it may identify areas that require change and encourage service improvements.

Feedback or complaints may be given by telephone, in person, in writing, or in electronic format or through other methods.

Information about the Town's feedback policy and process is posted on the Town's website (www.amherstburg.ca).

If a complaint is received regarding the accessibility of the Town's goods and services, it will be reviewed by the relevant division or department. These will be reviewed for the purpose of resolving the issue and to improve the Town's understanding of the Town of Amherstburg customer's needs.

Feedback will be responded to within three (3) business days of its receipt by the Town.

Availability of Documents

This policy will be made available upon request in a format that takes into account the person's disability to any person to whom it provides goods or services as well as on the Town of Amherstburg website.

Town of Amherstburg

Accessible Customer Service Standards Policy



Town of Amherstburg
271 Sandwich Street S.
Amherstburg, Ontario
N9V 2A5

Phone: 519-736-0012

Fax: 519-736-5403

Email:

accessibility@amherstburg.ca



Town of Amherstburg Accessible Customer Service Policy— Background and Purpose

The Accessibility for Ontarians with Disabilities Act, 2005 (AODA) is a Provincial Act with the purpose of developing, implementing and enforcing standards that enhance the ability of persons with disabilities to access the goods and services that are available to others. Accessibility Standards for Customer Service is the first standard to be passed as a regulation and become law in Ontario. Under this standard designated private and public sector organizations must develop certain policies, procedures and practices pertaining to customer service to persons with disabilities.

What is Accessible Customer Service?

Persons with disabilities may require assistance or accommodation in the way that goods and services are provided to them. The type of accommodation provided may vary depending on the customer's unique needs.

Accessible Customer Service Policy Statement

The Town of Amherstburg is committed to providing quality goods and services that are accessible to all persons that we serve.

Exclusions

This Accessible Customer Service Standards Policy shall not apply during any period where Council has declared a "State of Emergency" as defined under the **Emergency Management Act**.

GENERAL PRINCIPLES

The Provision of Goods and Services to Persons with Disabilities

The Town of Amherstburg will use reasonable efforts to ensure that the Town's goods and services are provided in a manner that:

- Respects the dignity and independence of persons with disabilities;
- Provides goods and services to persons with disabilities in an integrated manner with those who do not have disabilities unless an alternative measure is necessary and
- Provides an opportunity equal to that of persons without disabilities to obtain, use or benefit from the Town's goods and services.

When communicating with a person with a disability, the Town will do so in a manner that takes into account the person's disability.

Assistive Devices, Service Animals and Support Persons

Persons with disabilities may use assistive devices, support persons or service animals to assist them in accessing the Town's goods and services.

The Town will allow people to use their personal assistive device to access services. The Town will also ensure that staff is familiar with how to use or how to access information on the use of the assistive devices which are available in their respective area of responsibility.

If a person with a disability is accompanied by a service animal, the Town will permit the person to enter the premises with the animal and keep it with him or her, unless the animal is otherwise excluded by law from the premises. If the service animal is excluded by law from the premises, the Town will look to other avail-

able measures to enable the person with a disability to obtain, use or benefit from the Town's goods and services.

If it is not readily apparent that the animal is a service animal, the Town may ask the person with a disability for a letter from a physician or nurse confirming that the person requires the animal for reasons relating to his or her disability. The Town may also, or instead, ask for a valid identification card signed by the Attorney General of Canada or a certificate of training from a recognized guide dog or service animal training school.

It is the responsibility of the person with a disability to ensure that his or her service animal is kept in control at all times.

If a person with a disability is accompanied by a support person, they are permitted to enter the premises together and are not prevented from having access to each other while on the premises.

The Town may require a person with a disability to be accompanied by a support person while on Town premises in situations where it is necessary to protect the health or safety of the person with a disability or the health and safety of others on the premises.

Where fees for goods and services are advertised or promoted by the Town of Amherstburg, it will provide advance notice of the amount payable, if any, in respect of the support person.



APPENDIX C

CONTRACT DRAWINGS

APPENDIX D

GEOTECHNICAL REPORT



**GEOTECHNICAL INVESTIGATION REPORT
MELOCHE ROAD SEWER AND ROAD
RECONSTRUCTION/REHABILITATION
BETWEEN ALMA STREET AND LOWES SIDEROAD
AMHERSTBURG, ONTARIO**

Submitted to:

The Town of Amherstburg
271 Sandwich Street South
Amherstburg, Ontario N9V 2A5
Attn: Mr. Todd Hewitt, C.E.T.

Submitted by:

Amec Foster Wheeler Environment and Infrastructure
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April 28, 2017

Amec Foster Wheeler Project No.: SWW167208

Distribution:

- The Town of Amherstburg - 1 Hard Copy, 1 Digital Copy
- HRYCAY Consulting Engineers Inc. – 1 Digital Copy
- Amec Foster Wheeler Environment & Infrastructure - 1 Copy

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Appendix E	Subdrain Pipe Connection and Outlet Details

1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (“Amec Foster Wheeler”) was retained by the Town of Amherstburg to conduct a geotechnical investigation for the sewer and road reconstruction/rehabilitation of Meloche Road between Alma Street and Lowes Sideroad located in the Town of Amherstburg, Ontario.

The project area is shown on the Key Plan, Figure 1. From the information provided, Amec Foster Wheeler understands that the project is approximately 6.5 km long and will include road reconstruction with standard width lanes for vehicle traffic between Alma Street and Lowes Sideroad, new storm sewer from Simcoe Street to Lowes Sideroad, bike paths on both sides of Meloche Road between Alma Street and Lowes Sideroad, a multi-use asphalt trail from Simcoe Street to Lowes Sideroad and updated street lighting from Simcoe Street to Lowes Sideroad. The purpose of this investigation was to provide subsurface soil and groundwater information, and to provide geotechnical recommendations pertaining to the project.

The scope of the fieldwork for this geotechnical investigation included advancement of a total of eighteen (18) boreholes located on either side of the centre line of the existing roadway. The boreholes were advanced to a depth of 1.5 m to 5.0 m (5.0 feet to 16.5 feet) below the existing ground surface. A field work was carried out to assess the present road condition on Meloche Road between Alma Street and Simcoe Street in accordance with MTO manual.

This report contains the findings of Amec Foster Wheeler’s geotechnical investigation, together with recommendations and comments. The recommendations and comments are based on factual information and intended only for use by design engineers. The number of boreholes may not be sufficient to determine all of the factors that may affect construction methods and costs. Subsurface and groundwater conditions between and beyond the boreholes may differ 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 site investigation.

The anticipated construction conditions are also discussed, but only to the extent that they may influence the design decisions. The feasible construction methods, however, express our opinion and are not intended to direct contractors on how they carry out construction. Contractors should also be aware that the data and their interpretation presented in this report may not be sufficient to assess all factors that may have effect upon construction.

This report has been prepared with the assumption that the design will be in accordance with good engineering practices, applicable regulations of jurisdictional authorities, and applicable standards and regulations. Further, the recommendations and opinions in this report are applicable only to the proposed project for the geotechnical purposes. Limited environmental consideration was included as part of the scope for this geotechnical investigation and a letter report is included in an appendix of this report. The limitations of this report, as discussed in detail in Appendix A, constitute an integral part of this report.

There should be an ongoing liaison with Amec Foster Wheeler during both the design and construction phases of this project to ensure that the recommendations in this report have been interpreted and implemented. Also, any further clarification and/or elaboration that is needed concerning the geotechnical aspects of this project, Amec Foster Wheeler should be contacted immediately.

2.0 SITE DESCRIPTION AND GEOLOGICAL BACKGROUND

2.1 Site Description

The site is located on Meloche Road between Alma Street and Lowes Sideroad in the Town of Amherstburg. The existing road structure consists of asphalt and crushed granular fill. Meloche Road is a two lane rural road with a speed limit of 50 to 60 km/hr. There is a significant change in elevation from Alma Street to Lowes Sideroad. During our field investigation, the traffic volumes observed were very low. The surrounding land uses include residential, agricultural, commercial and industrial. Based on visual observations the existing asphalt condition between Alma Street and Simcoe Street is in relatively good condition with minor amounts of transverse, longitudinal and edge of pavement cracking. The asphalt between Simcoe Street and Lowes Sideroad shows severe distress in the form of alligator cracking, potholes, transverse and longitudinal cracking. There has been some asphalt repair along the south bound lane.

2.2 Geologic Background

The site is located within a geological feature known as Essex Clay Plain, which is a rather extensive clay plain with little relief and poor natural drainage. The plain is underlain by a relatively thick deposit of glaciolacustrine silty clay to clayey silt till. Occasional embedded pockets and lenses of sand and silt are present within the plain. The clay deposit is underlain by limestone bedrock of the Middle Devonian Detroit River Group at a depth of approximately 8.0 to 12.0 m, based on available drift thickness mapping (Ontario Geological Survey, Preliminary Map P.3255, 1994). During our investigation the boreholes were terminated at depths between 1.5 m and 4.3 m due to auger and spoon refusal.

The general low permeability characteristics of the clay deposit render this deposit as an "aquitard" where the groundwater is stored in the soil pores and moves extremely slowly. In this region the prevalent groundwater table is located between the brown and grey silty clay soils located about 3.5 to 4.3 m below the road surface. Significant fluctuations in the groundwater elevations can occur locally, depending on the prevalent weather and precipitation conditions.

3.0 INVESTIGATIVE PROGRAM

3.1 Field Work

As indicated, the scope of the geotechnical fieldwork included the advancement of eighteen (18) sampled boreholes, designated as BH1 to BH18, inclusive. The boreholes were advanced to a depth of 1.5 m to 5.0 m below the existing ground surface in the roadway. The locations and depths of the boreholes were determined by Amec Foster Wheeler. The boreholes were advanced within the travelled portion of the road, through the existing asphalt where underground utilities allowed.

The locations of the boreholes are shown on Figures 2A to 2D. The coordinates of the boreholes are shown on the Record of Borehole sheets attached in Appendix B. The coordinates at the borehole locations were recorded in the field using a hand-held GPS device with a horizontal accuracy of ± 3 m.

The borehole drilling program for the investigation was carried out on June 14 and June 15, 2016. The boreholes were advanced using a self-propelled drill equipped with solid or hollow stem augers and conventional soil sampling tools. Soil samples were taken at frequent intervals of depth following the Standard Penetration Test (ASTM D1586) procedure.

The drilling was conducted under the full-time supervision of Amec Foster Wheeler's engineering staff who directed the drilling and sampling operation, and logged the boreholes.

After completion of the borehole, the augers were extracted, the borehole was inspected for groundwater and caving, then backfilled using bentonite grout.

All samples were field logged, placed in airtight containers, and transported to Amec Foster Wheeler's Windsor laboratory for further examination and testing.

A field work was carried out to assess the present road conditions of Meloche Road between Alma Street and Simcoe Street on July 20, 2016 in accordance with MTO manual and described in Section 5.7.1 later in details.

3.2 Laboratory Testing

Natural moisture content tests were carried out in accordance with ASTM D2216 on all of the recovered soil samples. Grain size distribution analysis and Atterberg limits test were completed on one (1) selected soil sample in accordance with ASTM D422 and ASTM D4318, respectively. A sample of the granular base material was taken and tested in accordance with ASTM C136 and ASTM D698. The test results are included in Appendix C.

4.0 SUBSURFACE CONDITIONS

4.1 Subsurface Soil Conditions

The soil descriptions presented here are based on visual and tactile examinations augmented with field tests and select laboratory tests. Details of the subsurface soil conditions at the borehole locations are given on the Record of Borehole sheets attached in Appendix B. The results of laboratory testing carried out on recovered soil samples are also shown on the borehole log sheets. The stratigraphic boundaries shown on the borehole logs are inferred from non-continuous samples and observations during drilling, and therefore should be considered as approximate and not as precise planes of geologic change. The subsurface conditions may vary between and beyond the boreholes. The following brief descriptions are presented based on soil conditions encountered in the boreholes.

Existing Pavement Structure - Asphalt and Granular Base Materials

The boreholes advanced along Meloche Road (BH1 to BH18) penetrated a surface layer of asphalt overlying a layer of crushed granular fill.

The existing thicknesses of asphalt and granular fill materials encountered at the borehole locations are tabulated below:

Table 1: Existing Pavement Structure

Section of Road Investigated	Borehole No.	Pavement Structure	
		Asphalt Thickness (mm)	Granular Base Thickness (mm)
Meloche Road (Between Alma Street and Simcoe Street)	BH1	230	480
	BH2	200	560
	BH3	200	460
	BH4	200	460
	BH5	200	405
	BH6	200	610
	BH7	200	510
	BH8	200	510
Meloche Road (Between Simcoe Street and Lowes Sideroad)	BH9	150	355
	BH10	100	435
	BH11	75	230
	BH12	100	230
	BH13	125	530
	BH14	100	405
	BH15	100	430
	BH16	100	305
	BH17	100	585
	BH18	100	355

Existing Fill Materials

Underlying the pavement structure described above, a layer of fill materials was encountered in boreholes BH1 to BH6, inclusive. The depth of the fill materials was extended to 1.1 m to 1.4 m below existing grade at the test locations. The fill materials were generally consisted of silty clay or silty sand with organics. The measured "N" values from Standard Penetration Test obtained in the fill materials were 4 blows to 9 blows per 0.3 m penetration. The moisture content of the tested fill samples was 12 per cent to 25 per cent.

Silty Clay

Underlying the fill materials described above, the boreholes penetrated an extensive stratum of silty clay. This stratum generally divides into three general zones, the 'weathered' zone, the 'crust' and the grey zone.

The upper zone encountered was the weathered zone. Soils in the weathered zone are subjected to freeze-thaw cycles, and changes in moisture content caused by seasonal weather variations. This zone is characterized by frequent fissures and fractures, with a mottled brown and grey appearance. Boreholes BH1, BH2, BH3, BH5, BH6, BH13 and BH16 were terminated in the weathered zone. In general, the weathered zone extends to a depth of approximately 2.1 m to 2.9 m at the test locations, where penetrated. The measured "N" values from Standard Penetration Test obtained in the weathered zone ranged from 3 blows to 14 blows per 0.3 m penetration, indicating a firm to stiff consistency. The moisture content of the tested samples ranged from 11 per cent to 30 per cent.

Below the weathered zone is the 'crust'. The crust is generally characterized by a brown colour, and fissures throughout. Boreholes BH4, BH7 to BH 12, BH14, and BH 15 were terminated in the crust. The crust extends to a depth of 3.5 m to 4.3 m below existing grade at the test locations, where penetrated. The measured "N" values from Standard Penetration Test obtained in the brown silty clay ranged from 8 blows to 58 blows per 0.3 m penetration, indicating a stiff to hard consistency. The moisture content of the brown silty clay samples ranged from 8 per cent to 18 per cent.

Underlying the crust is the grey zone. This zone of the silty clay stratum is generally characterized by increased natural moisture contents, and virtually no fissures. Boreholes BH17 and BH18 were terminated at a depth of 5.0 m below ground surface within the grey zone. The measured "N" values within the grey zone were between 17 blows and 22 blows per 0.3 m penetration. Based on the "N" values in the grey silty clay stratum, the silty clay is considered to have a very stiff consistency. The moisture content of the tested silty clay samples varied from 10 per cent to 13 per cent.

Grain size distribution analysis and Atterberg limits test were carried out on select recovered silty clay sample obtained from borehole BH14. The results of these tests are listed in Table 2 below, and included on the borehole log sheets, and attached in Appendix C.

Table 2: Results of Grain Size Analysis and Atterberg Limits Test

Borehole No. / Sample No.	Sample Depth (m)	Grain Size Distribution				Atterberg Limits			USCS Modified Group Symbol
		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	
BH14/Sa 4	3.1 – 3.6	2.1	26.1	49.5	22.3	24.0	15.3	8.7	CL

4.2 Groundwater Conditions

Groundwater level observations and measurements in the boreholes, and in-situ moisture contents of recovered soil samples are presented on the Record of Borehole sheets.

Boreholes were left open and measured as dry for the relatively brief period between withdrawal of the augers and backfilling of the boreholes. Due to the low permeability of the clayey soil at the site, insufficient time had passed to allow stabilization of groundwater levels in the open boreholes.

Typically, the grey colour of the soils noted approximately at depths of 3.5 m to 4.3 m is indicative of a permanent saturated condition, and therefore, fluctuation of the long-term groundwater should be anticipated near this depth levels. However, during and after local precipitation events, groundwater that is 'perched' above the long-term levels may accumulate in the fills and weathered mottled/brown silty clays above the relatively more impervious grey silty clay. In addition, significant amounts of groundwater may be present within the layers/pockets of granular soils known to occur randomly within the overburden soils and within any fill materials around the existing utilities that may be present. The interface of the soil and bedrock may also be a conduit for groundwater to migrate.

Perched groundwater may rise to the ground surface following precipitation and snowmelt. In the absence of an active, engineered drainage system, the design should assume possible temporary groundwater levels rising to the ground surface.

4.3 Analytical Laboratory Testing

A select soil sample obtained from borehole BH18 was sent to Paracel Laboratories Ltd. in Ottawa, Ontario for determination of pH, electrical resistivity, chloride content and sulphate content and analytical testing is being in progress. The method of analytical testing used for the soil specimens will be indicated in the analytical laboratory report presented in Appendix D.

The results of the analytical testing will be discussed in Section 5.11 later.

5.0 DISCUSSION AND RECOMMENDATIONS

5.1 General

Amec Foster Wheeler understands the Town of Amherstburg is planning full road reconstruction of Meloche Road between Simcoe Street and Lowes Sideroad, with new asphalt bike lanes for the entire length of Meloche Road from Alma Street to Lowes Sideroad and new storm sewer and an asphalt multi-use trail from Simcoe Street to Lowes Sideroad. In addition, the Town of Amherstburg has requested optional rehabilitation recommendations for the pavement section between Alma Street and Simcoe Street.

The boreholes were advanced between 1.5 m to 5.0 m depth below the road surface within the travelled portion of the road alternating sides from the centre line where buried and overhead utilities would allowed.

5.2 Design Soil Parameters

Based on the subsurface conditions encountered in the boreholes and the results of the laboratory testing, the following table summarizes the recommended soil parameters for design. The recommended unfactored parameters were derived based on limited testing and semi-empirical correlations.

Table 3: Unfactored Design Soil Parameters

Soil	Bulk Unit Weight (kN/m ³)	Bouyant Unit Weight (kN/m ³)	Drained Angle of Internal Friction, Phi (degrees)	Undrained Cohesion, C _u (kPa)
Undisturbed Very Stiff Native Silty Clay	21.5	11.5	30	100 - 150
Undisturbed Stiff Native Silty Clay	21.0	11.0	30	50 - 100
Undisturbed Firm Native Silty Clay	20.5	10.5	30	25 - 50

5.3 General Recommendations for Excavations and Sewer Trenching

Excavations can be made with conventional equipment and open cut methods and are suitable above the water table. Excavations must be carried out in accordance with current Ontario Regulation 213/91 of the Occupational Health and Safety Act (OHSA) as amended. These regulations designate four broad classifications of soils to stipulate appropriate measures for excavation safety. The firm to stiff and very stiff silty clay is classified as Type 3 and 2 soils, respectively. Excavations within Type 2 and Type 3 soils may be carried out with unsupported side-slopes not steeper than 1V:1H. If the open excavation is precluded due to space limitations, a trench liner box can be used with a vertical excavation in accordance with Ontario Regulation 213/91 as amended.

5.4 Groundwater Control

Groundwater inflow into excavations in the clayey soils is expected to be low above the water table; however, significant 'perched' groundwater may be present within the fill materials. This would especially be true during and after local precipitation events. In this case, the inflow into excavations may become significant.

The soils identified are sensitive to disturbance by water. Groundwater and surface water run-off should be removed from excavations by means of pumping from strategically placed open sumps located within the excavation bottom but outside the zone of influence of any structures.

5.5 Pipe Bedding, Cover and Backfill

5.5.1 Standard Requirements

The bedding and backfill material should meet the manufacturer's specifications as well as the applicable Ontario Provincial Standard Specifications (OPSS) standards.

Applicable OPSS standards may include:

- OPSS 410 "Construction Specification for Sewer Pipe in Open Cuts";
- OPSS 514 "Construction Specification for Trenching, Backfilling, and Compacting";
- OPSS 517 "Construction Specification for Dewatering of Pipeline, Utility, and Associated Structure Excavation"; and
- OPSS 518 "Construction Specification for Control of Water".

5.5.2 Pipe Bedding and Cover

The depth of the pipe bedding should be a minimum of 150 mm; the pipe cover should be completed to at least 300 mm above the pipe crown. All bedding, clearance and cover materials should consist of Granular 'A' (OPSS 1010) compacted to 95 per cent Standard Proctor Maximum Dry Density (SPMDD) in accordance with the OPSS 802 requirements. Granular material meeting the gradation specifications for sewer stone (equivalent to HL4 coarse aggregate per OPSS 1150) may also be used as bedding and cover material, however we strongly recommend that a non-woven geotextile be used as a separation fabric between this material and the native soils. It is further recommended that, where used, the geotextile have a minimum overlap of 300 mm and the seams should be stitched to prevent separation of the geotextile at the seams.

Care should be exercised to avoid compaction methods that may damage the pipe. The placement and thickness of the granular bedding should also meet the pipe manufacturer's specifications.

5.5.3 Backfilling

The project area is located within a major deposit of native silty clay. Therefore, the backfill material from 300 mm above the top of pipe to the pavement subgrade level can consist of native

or imported brown silty clay, and placed in lifts not exceeding 300 mm and compacted to 98 per cent of SPMDD.

A sample of the existing granular base materials was taken and tested to determine the suitability of reusing as general trench backfill. Excavated granular material should meet the requirements of select subgrade material in OPSS 1010. Depending upon the test results, the granular soils may be suitable for use as general backfill material. The results of the testing can be found in Appendix C.

If imported granular soils, such as Granular 'A' (OPSS 1010) are used as general trench backfill, the material should be placed in lifts not exceeding 300 mm and compacted to 98 per cent of SPMDD. In the areas where the trench excavation coincides with the roadway, it is good practice to backfill the trench (below the road structure) with excavated, native inorganic material, at least within the upper frost zone (1.2 m below grade), to provide compatibility with similar native soils. If this technique is not undertaken, then frequent problems could arise with yearly differential frost heaving movements between the trench backfill and the adjacent native soils.

5.6 Pavement Design

5.6.1 Asphalt Pavement and Bike Lanes

We understand that road and sewer construction will necessitate new pavement construction for the entire width and length of the roadway sections investigated as indicated in Section 5.1 earlier. In addition, a 2.0 m wide bike lane will be constructed on either side of the road. The section of Meloche Road from the main entrance of the Libro Centre south to Lowes Sideroad will be categorized as a "Collector Road" and the section from the main entrance of the Libro Centre north to Alma Street will be categorized as an "Arterial Road". We recommend the following pavement sections as a minimum for use for the reconstruction of Meloche Road, in accordance with the Town of Amherstburg Development Manual (May 2009, Section 1.2.9):

Table 4: Pavement and Bike Lane Design

Layer	Material	Recommended Minimum Thickness Collector Road (mm)	Recommended Minimum Thickness Arterial Road (mm)
Asphaltic Concrete	OPSS 1150 HL3 Surface	40	50
	OPSS 1150 HL4 Base	60	100
Granular Base	OPSS 1010 Granular 'A'	450	450

The sub-grade material should be sloped so as to promote drainage and prevent the build-up and stagnation of pore water within the granular base. The Contractor should be prepared to conduct

proof-rolling of the subgrade soils. Any soft spots revealed by the proof-rolling should be sub-excavated and replaced with approved granular backfill such as Granular 'B', Type I or Type II (OPSS 1010). All organic and deleterious fill materials encountered at the subgrade level are not suitable for supporting the new pavement structure and should be removed prior to placing approved granular backfill materials.

The sub-base layer should be hydraulically connected to catch basins, using filtered subdrains. Drainage details are discussed in Section 5.8 later.

All granular materials should be compacted to 100 per cent SPMDD. The asphalt base course and surface course should be compacted between 92 per cent and 96.5 per cent of their respective Maximum Relative Densities obtained from the mix design.

If the construction is not carried out during dry weather conditions, it may be necessary to increase the recommended thicknesses of the pavement structure. Further the granular thickness may not be sufficient to support construction traffic prior to the asphaltic concrete placement, and additional granular material may be required to support this traffic.

We note that the minimum pavement section above is not based on a detailed design, which would account for future growth of traffic and performance throughout its life cycle. Pavement performance and the 'life cycle' is dependent on the traffic load, quality of construction, frost protection, moisture of the base, sub-base and subgrade materials, maintenance of the asphalt during the life cycle, quality of materials etc.

If re-use of the existing granular base and sub-base materials is to be considered, it should be separated from other deleterious materials, stockpiled for sampling and tested to verify compliance with OPSS specifications.

5.6.2 Multi-Use Asphalt Trail

A 3.0 m wide multi-use trail is to be constructed along the east side of Meloche Road between Alma Street to Lowes Sideroad. The proposed trail will be constructed adjacent to the new bike lane and up to 5.6 m east of the bike lane at various locations along the project and will be used for pedestrian traffic. All organic and deleterious fill materials encountered are not suitable for supporting the new pavement structure and should be removed prior to placing approved granular backfill materials. We recommend a pavement structure of 40 mm thick HL3 surface course and 50 mm thick HL4 base course over a 300 mm thick Granular 'A' base where the multi-use trail is separate from the bike lane. For constructability purposes where the multi-use trail is adjacent to the bike lane (in the area of the arterial road), it is recommended that the HL3 surface course be increased to 50 mm to allow the contractor to place the surface asphalt for the bike lane and multi-use trail at the same time. The granular materials should be compacted to 100 per cent SPMDD.

5.7 Pavement Rehabilitation

5.7.1 General

It is understood that a consideration is being given to rehabilitate the pavement of Meloche Road in lieu of full reconstruction of the road between Alma Street and Simcoe Street where no sewer will be constructed. To assess the present condition of the road, a field work was carried out on 20 July, 2016. The results of the field work, associated analysis and remedial options for rehabilitation are described in the following sections.

5.7.2 Field Work

An assessment of the section of Meloche road between Alma Street in the north and Simcoe Street in the south was carried out in accordance with the guidelines laid out in the Ministry of Transportation’s manual SP-024 “*Manual for Condition Rating of Flexible Pavements*” (“MTO SP-024”). This work consisted of a digital video photography of the roadway at a speed of approximately 20 km/h. This video was returned to Amec Foster Wheeler’s Windsor office for review and analysis. The description of the condition of the roadway is in accordance with MTO SP-024.

In general, the condition of Meloche Road, between Alma Street and Simcoe Street can be described as follows in Table 5:

Table 5: Meloche Road between Alma Street and Simcoe Street - Distress Summary

Distress (Crack) Type	Northbound Lane		Southbound Lane	
	Severity*	Density*	Severity*	Density*
Longitudinal Wheel Track	Slight	Few	Moderate	Few
Centre Line	Slight	Frequent	Slight	Frequent
Pavement Edge	Moderate	Intermittent	Moderate	Extensive
Transverse	Moderate	Intermittent	Moderate to Severe	Frequent
Longitudinal Meander and Midlane	-	-	Slight	Few

*Terms used for description of severity and density of pavement distress are taken from MTO SP-024. Reference should be made to this document for definitions of the terms used. The manual is available through the MTO Research Library Online Catalogue (<http://www.mto.gov.on.ca/english/publications/mto-research-library-online-catalogue.shtml>).

In addition to the above, it was noted that many of the cracks (typically transverse, but also pavement edge) exhibited slight to moderate map cracking (large blocks) or alligator cracking (smaller, denser blocks). Concurrently with the above survey, the surveyor drove the road in both the northbound and southbound directions at posted speed.

5.7.3 Analysis

Once the field data is assembled, reference is made to the Ministry of Transportation's Pavement Design and Rehabilitation Manual, (the "Manual"). The current version is the second edition, published in 2013. In order to convert the data presented in the table above, the Manual assigns weighting values to each distress type, severity descriptor and density descriptor. These values are combined and compared to standard numbers based on the pavement type to arrive at a Distress Manifestation Index ("DMI") for each section of roadway. The DMI varies between 0 and 10 with 0 being the worst case and 10 being the best. Based on the table above, the Meloche Road between Alma Street and Simcoe Street would be ascribed a DMI value of 9.2 and 9.6 for the southbound and northbound lanes, respectively.

In addition, a Ride Condition Rating ("RCR") is assigned, based on the driving experience, with respect to the comfort level of the ride. For the RCR, a maximum value of 10 would be classified as a 'Very smooth ride.' and the minimum value of 0 would be '...very uncomfortable...' and potentially dangerous to drive. The section of Meloche Road under consideration was assigned an RCR of 8 for both directions.

Finally, the numbers above are combined to calculate the Pavement Condition Index ("PCI"). This scale varies from 0 to 100, with 0 being worst case and 100 being best case. In general this combination is made based on an RCR determined by electronic means. However, given the limited scope, reference is made to the first edition of the manual (1990) for the formula used to combine DMI with a 'subjective' value of RCR to arrive at PCI. In the case of the section of Meloche Road under discussion, the PCI values would be 85.1 and 88.1, respectively, for the southbound and northbound lanes.

Table 5.1.7 of the Manual provides minimum values of PCI for classification of various roadway designations. For arterial roads, as is understood that this section of Meloche Road will be classified, a PCI value between 65 and 75 is considered 'good', a value between 56 and 64 is considered 'fair' and a value between 5 and 55 is considered 'poor'. Based on this, both directions of this section of Meloche Road could be considered to be in 'good' condition.

5.7.4 Remedial Options

Given the generally good condition of this section of Meloche Road at this time, no consideration has been given to replacement, in whole or part, of the existing pavement structure. The remedial options for rehabilitation are discussed in the following:

Option A – Leave As-Is

This section of roadway, while it contains some cracking, has been classified as being in 'good' condition. As such, the 'leave as-is' option should be considered viable. It is noted however, that the appearance and progression of visible signs of distress does not happen on a linear timeline. As distress accumulates within a roadway, the rate of appearance of distress will tend to accelerate, other factors remaining equal. Nevertheless, a minimum of 2 - 4 years of additional

service life may be anticipated for this section of roadway, however after that time, re-evaluation and maintenance and/or repair would be likely required.

Option B - Local Repair in Accordance with MTO SP-024 Recommendations.

MTO SP-024 provides repair recommendations for each distress type, based on the severity and density of each distress type. Based on the results summarized in Table 5, the following would be recommended:

- Rout & Seal - Longitudinal wheel track cracking and transverse and pavement edge cracking where alligator cracking is not present. Also, centreline cracking where cracks exceed 6 mm in width.
- Manual Chip Seal where alligator cracking is present.

Carrying out these localized repairs will prevent water infiltration and provide some improvement to the ride condition. If such repairs are carried out this season, it is anticipated that 1 - 3 years can be added to the service life of the road, and is the recommended option.

A regular plan of assessment, maintenance and repair has the potential to add additional service life beyond that detailed above.

5.8 Drainage for Roadway

Effective drainage is an important aspect in the life expectancy and performance of any pavement structure for both full reconstruction and partial rehabilitation. Without an active engineered drainage system any rehabilitation or full reconstruction that is performed will have a much lower service life than expected and repairs will be required more frequently. In this regard, it is recommended that the subgrade be properly shaped and graded to provide adequate cross fall. Any water which finds its way into the drainage layer and granular base would then be directed to continuous subdrains which should be installed along both sides of the road either at the edge of the pavement or just below the granular shoulder or curbs. The drains should be placed just below the subgrade level, completely surrounded by an approved granular material and connected to roadside catch basins and storm sewers. It is strongly recommended that adequate pavement drainage be provided both laterally and longitudinally along the length of the roadway in order to obtain the maximum service life of the pavement.

To meet the design requirements for the pavement life, the finished road surface should be well drained at all times. This can be accomplished by installing 150 mm diameter full-length perforated subdrain pipes along both sides of the road, below the roadbed level, to ensure effective drainage in accordance with OPSD 216.021. The subdrain pipes should be surrounded by a minimum drainage zone of 20 mm size clear stone of minimum 150 mm thickness and wrapped in suitable non-woven geotextile to provide separation from the surrounding soil.

Alternatively, if the existing ditches are used for drainage as per OPSD 206.050 rather than a storm sewer system, it is critical that the water levels within the ditches are kept below the bottom of the subdrain outlets. The subdrain should be installed beneath the granular base at the subgrade level and the subdrain pipes should be surrounded by a minimum drainage zone of 20 mm size clear stone of minimum 150 mm thickness and wrapped in suitable knitted sock geotextile with an FOS of 500 μm according to OPSS 1860 to provide separation from the surrounding soil.

A minimum slope of 3 percent should be maintained for the subgrade and minimum slope of 2 per cent should be maintained across the paved sections to ensure proper surface drainage.

5.9 Earth Pressures

A distinction should be made between short-term earth pressures on temporary (during construction) retaining structures, and long-term retaining structures against compacted backfill.

As a preliminary guideline, the temporary shoring structures should be verified for conventional uniform earth pressures of at least 0.35 P_z , (P_z , in kPa, is the overburden pressure corresponding to the depth 'z' of excavation below the ground surface). For the in-situ soils a unit weight of 22 kN/m^3 should be used. Surcharges at the ground surface should be added in accordance with applicable soil mechanics methods such as described in Canadian Foundation Engineering Manual (CFEM).

For permanent structures, unfactored earth pressure coefficients and associated unit weights are presented in Table 6.

Table 6: Soil Parameters for Earth Pressure Calculations

Backfill Type	Coefficient of Earth Pressure at Active Case	Coefficient of Earth Pressure at Passive Case	Coefficient of Earth Pressure at Rest Case	Design Bulk Unit Weight (kN/m^3)	Friction Angle (degrees)
Select Crushed Limestone (Granular 'A') (*)	0.27 to 0.30	3.3 to 3.7	0.43 to 0.46	22	33 to 35
Well Graded Sand (Granular 'B', Type I) (*)	0.31 to 0.35	2.9 to 3.2	0.47 to 0.52	21	29 to 32
Silty Clay Fill (**)	0.33 to 0.45	2.2 to 3.0	0.50 to 0.62	20.5	22 to 30

(*) All granular compacted to at least 98% SPMDD

(**) Compacted to at least 95% SPMDD

The design earth pressures in compacted backfill should be augmented with the dynamic effects of the compaction efforts, which typically are taken as a uniform 12 kPa pressure over the entire

depth below grade where the calculated earth pressure based on the above earth pressure factors is less than 12 kPa.

Surcharges at the ground surface should be considered in all cases.

For the calculation of the long-term earth pressures, consideration should be given to using the submerged weight where the soil is below the groundwater table unless a permanent dewatering system is installed.

The above coefficients apply to simple cases of retaining structures (wall not higher than typically 4.5 m, horizontal ground surface of the backfill, etc). In case of more complex conditions, Coulomb based methods should be used as indicated in the CFEM.

5.10 Frost Depth

Amec Foster Wheeler recommends a depth of 1.2 m for frost protection as per OPSD 3090.101.

5.11 Corrosion Potential

As indicated earlier, analytical testing was carried out on select soil sample obtained from Borehole BH 18 Sa 2.

The test results indicate that concrete in contact with the tested soil would have a negligible degree of exposure to sulphate attack based on CSA-A23.1.

Based on the measured resistivity, pH etc., the tested soil samples would be considered noncorrosive to buried metallic elements in accordance with ANSI/AWWA C105/A21.5-05, Appendix A, Table A.1 A.

The above results and recommendations should be reviewed by a corrosion specialist.

5.12 General Construction Provisions

The subgrade soils identified in this report are sensitive to disturbance from exposure to weathering and/or construction traffic (vehicular and pedestrian). Once the excavations have been completed to design elevations, the Geotechnical Consultant should immediately inspect the subgrade soils. Upon approval, the subgrade soil should be protected from further exposure. Disturbance by weathering or construction traffic may compromise the bearing resistances of the soils and necessitate further excavation. It is recommended that after excavation to the design grade and approval of the subgrade, granular base be poured. If, however, the excavation is to remain open for an extended period of time, an appropriate protective cover should be placed to minimize disturbance to and preserve the integrity of the subgrade soils.

5.13 Environmental Analysis and Reporting

As part of the geotechnical investigation, Amec Foster Wheeler staff collected soil samples for laboratory analysis from six boreholes (designated as BH9, BH11, BH12, BH14, BH17 & BH18) for environmental purposes. The soil samples were submitted for laboratory analysis of O.Reg. 153/04 metals and inorganics, volatile organic compounds (VOC), petroleum hydrocarbons (PHCs) and polycyclic aromatic hydrocarbon (PAHs). The laboratory analysis was compared to the Full Depth Background Site Condition Standards (Table 1 SCS) as well as the Table 7 Generic Site Condition Standards for Shallow Soils (Table 7 SCS).

Two of the soil samples (BH12 SS1 and BH17 SS1) had electrical conductivity (EC) concentrations that exceeded Table 7 SCS. The soil samples had parameter concentrations below Table 7 SCS for the remainder of the parameters analyzed. Exceedances above Table 1 SCS included EC, sodium adsorption ratio (SAR) and molybdenum in three or more of the borehole locations. O.Reg. 153/04 excludes EC and SAR as contamination for "highways", which includes Meloche Road. Therefore, EC and SAR are not considered to be issues of environmental concern for the Site. Additionally, the molybdenum exceedance (above the background Table 1 SCS) is considered to be naturally occurring in Essex County, and therefore is also not considered to be an issue of environmental concern for the Site.

Based on the findings of Amec Foster Wheeler's Environmental Subsurface Investigation at the time of report preparation, no further environmental site assessment work is warranted at this time. A copy of the Environmental Subsurface Investigation letter report is provided in Appendix D.

6.0 CLOSURE

The limitations of this report, as indicated, discussed in detail in Appendix A, constitute an integral part of this report. We recommend the Geotechnical Consultant be retained to review drawings and the intended methods of construction prior to implementation in order to assure conformance with the geotechnical restrictions and assumptions.

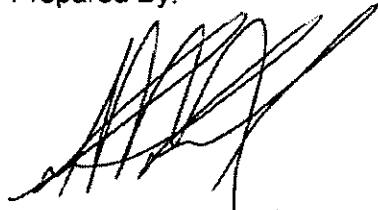
Mr. Shane MacLeod, P.Geo., has prepared the report, Mr. Chris Barris, P.Eng., has prepared the pavement rehabilitation section in Section 5.7 and Mr. Nazmur Rahman, P.Eng., has reviewed the report.

We trust this report is complete within the terms of our reference. However, should questions arise concerning this report, do not hesitate to contact us.

Sincerely,

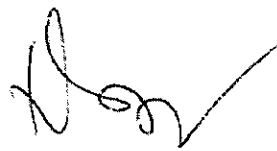
Amec Foster Wheeler Environment & Infrastructure
a Division of Amec Foster Wheeler Americas Limited

Prepared By:

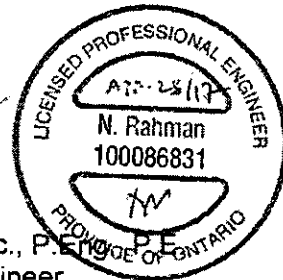


Shane MacLeod, P.Geo.
Geoscientist

Reviewed By:



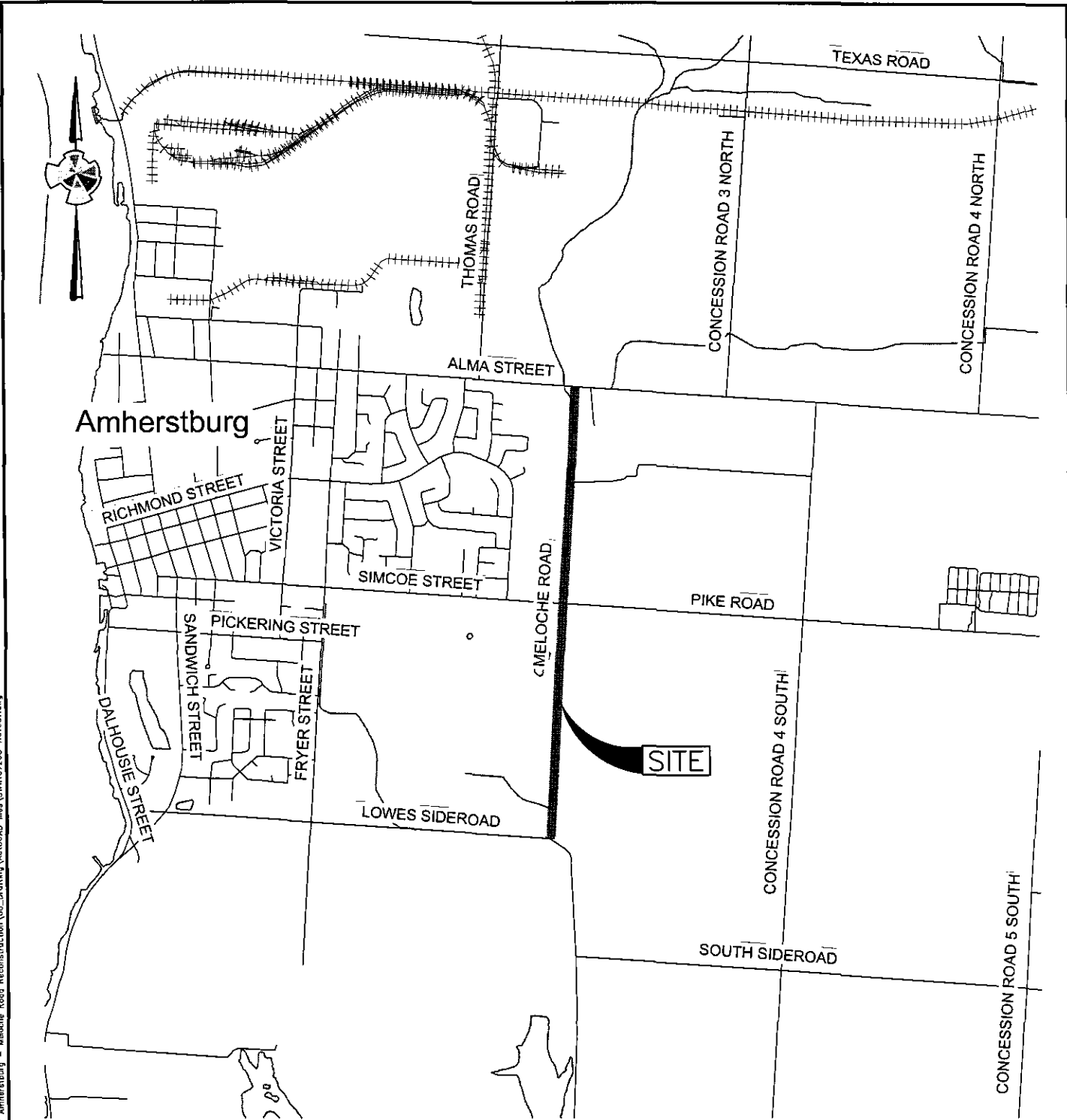
Nazmur Rahman, M.A.Sc., P.Eng.
Senior Geotechnical Engineer



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FIGURES

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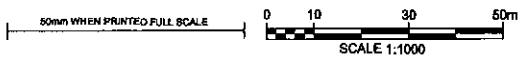
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 REPORT No. SWW167208. ALL LOCATIONS ARE APPROXIMATE.

REFERENCES:
 CANMAP STREETFILES V2008.4.

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Amec Foster Wheeler Environment & Infrastructure 11865 COUNTY ROAD 42 TECUMSEH, ONTARIO N8N 2M1 519-735-2499				DATUM: NAD83	PROJECTION: UTM Zone 17	DATE: JUNE 16, 2016
				DWN BY: SJL	REV. No: 0	PROJECT No: SWW167208
				CHK'D BY: SM	SCALE: 1:30000	FIGURE No: 1



LEGEND:
 BOREHOLE LOCATION



CLIENT: THE TOWN OF AMHERSTBURG
 271 SANDWICH STREET SOUTH
 AMHERSTBURG, ONTARIO, N9V 2A5

DWN BY: SJL
CHK'D BY: SM
DATUM: NAD83
PROJECTION: UTM Zone 17
SCALE: 1:1000

PROJECT: GEOTECHNICAL INVESTIGATION
 MELOCHE ROAD RECONSTRUCTION BETWEEN
 ALMA STREET AND LOWES SIDEROAD
 AMHERSTBURG, ONTARIO

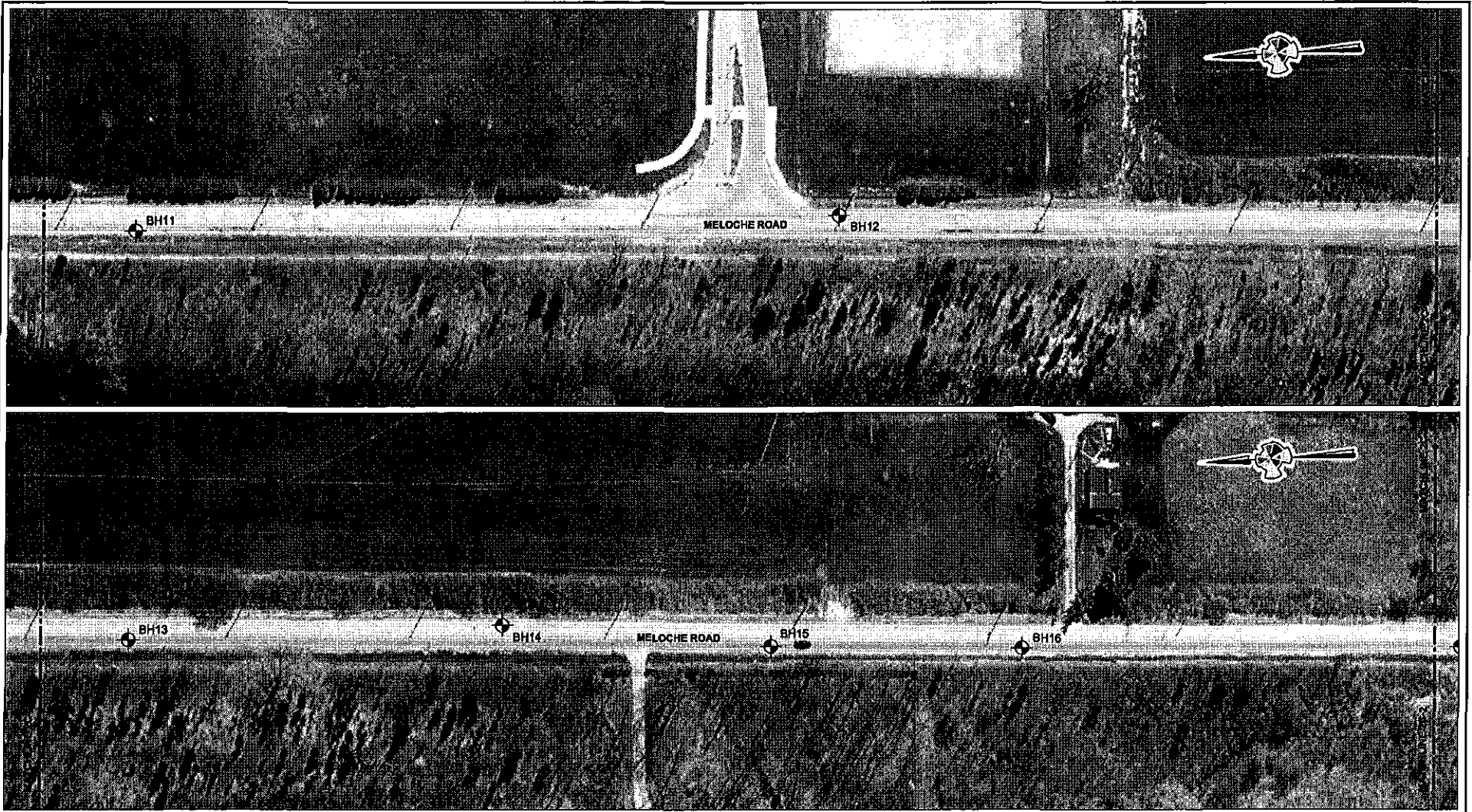
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REFERENCES:
 2015 AERIAL PHOTOGRAPHS BY THE COUNTY OF ESSEX; CANMAP STREETFILES V2009.4.

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 N9N 2M1
 519-735-2499




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 BOREHOLE LOCATION

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CLIENT: **THE TOWN OF AMHERSTBURG**
 271 SANDWICH STREET SOUTH
 AMHERSTBURG, ONTARIO, N9V 2A5

DWN BY: SJL
 CHKD BY: SM
 DATUM: NAD83
 PROJECTION: UTM Zone 17
 SCALE: 1:1000

PROJECT: **GEOTECHNICAL INVESTIGATION
 MELOCHE ROAD RECONSTRUCTION BETWEEN
 ALMA STREET AND LOWES SIDEROAD
 AMHERSTBURG, ONTARIO**

DATE: JUNE 16, 2016
 PROJECT No: SWW167208
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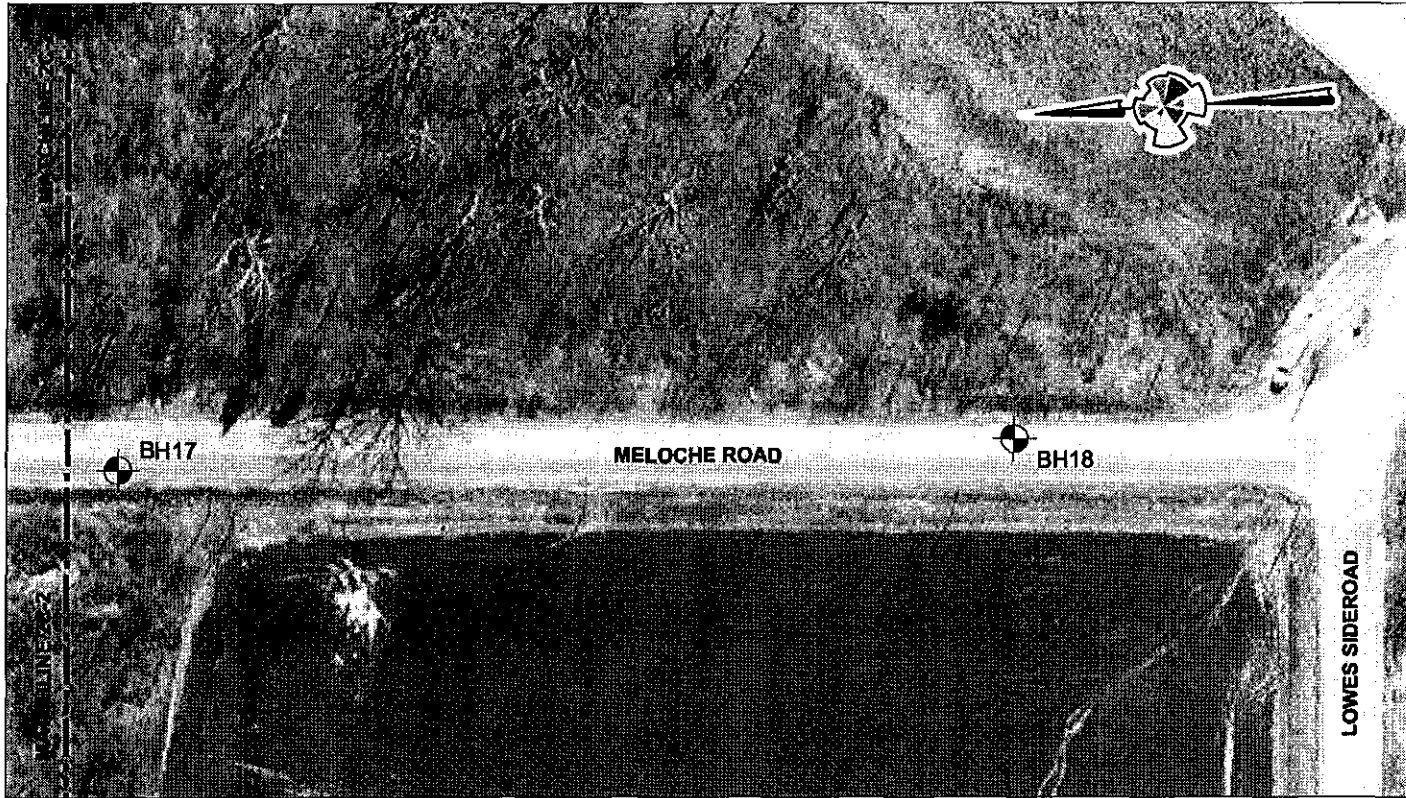
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BOREHOLE LOCATION PLAN

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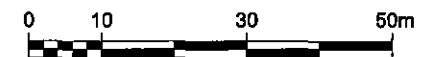
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ALL LOCATIONS ARE APPROXIMATE.

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Amec Foster Wheeler Environment & Infrastructure 11865 COUNTY ROAD 42 TECUMSEH, ONTARIO N8N 2M1 519-735-2499		CHK'D BY: SM		PROJECT No: SWW167208
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APPENDIX A
REPORT LIMITATIONS

REPORT LIMITATIONS

The conclusions and recommendations given in this report are based on information determined at the testhole locations. The information contained herein in no way reflects on the environmental aspects of the Project, unless otherwise stated. Subsurface and groundwater conditions between and beyond the testholes may differ from those encountered at the testhole locations, and conditions may become apparent during construction, which could not be detected or anticipated at the time of the site investigation. It is recommended practice that the Geotechnical Engineer be retained during the construction to confirm that the subsurface conditions across the site do not deviate materially from those encountered in the testholes.

The design recommendations given in this 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, we recommend that we be retained during the final design stage to verify that the design is consistent with our recommendations, and that assumptions made in our analysis are valid.

The comments made in this report relating to potential construction problems and possible methods of construction are intended only for the guidance of the designer. The number of testholes may not be sufficient to determine all the factors that may affect construction methods and costs. For example, the thickness of surficial topsoil or fill layers may vary markedly and unpredictably. The contractors bidding on this project or undertaking the construction should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the subsurface conditions may affect their work. This work has been undertaken in accordance with normally accepted geotechnical engineering practices. No other warranty is expressed or implied.

The benchmark and elevations mentioned in this report were obtained strictly for use by this office in the geotechnical design of the project, and should not be used by any other party 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. Amec Foster Wheeler Environment & Infrastructure accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

APPENDIX B

**EXPLANATION OF RECORD OF BOREHOLE SHEETS AND
RECORD OF BOREHOLE SHEETS BH1 TO BH18**

GENERAL REPORT NOTES

DEFINITIONS OF PENETRATION RESISTANCE

Standard penetration resistance 'N' – The number of blows required to advance a standard split spoon sampler 30 cm into the subsoil, driven by means of a 63.5 kg hammer falling freely a distance of 76 cm.

Dynamic penetration resistance – The number of blows required to advance a 50 mm, 60 degree cone, fitted to the end of drill rods, 30 cm into the subsoil, the driving energy being 474.5 Joules per blow.

SAMPLE TYPE ABBREVIATIONS USED IN BOREHOLE LOGS

S.S.	Split spoon	T.W.	Thinwall open	R.C.	Rock core
A.U.	Auger sample	T.P.	Thinwall piston	W.S.	Washed sample
P.H.	Sample pushed hydraulically			P.M.	Sample pushed manually

SOIL TEST SYMBOLS USED IN BOREHOLE LOGS

○	Standard penetration resistance	▼	Laboratory Vane	□	Unconfined compression
●	Dynamic penetration resistance	▲	Field Vane	■	Undrained shear strength
		X	Penetrometer	S	Sensitivity

NOTE

The soil conditions, profiles, comments, conclusions and recommendations found in this report are based upon the samples recovered during the fieldwork. Soils are heterogeneous materials and, consequently, variations (possibly extreme) may be encountered at site locations away from boreholes. During construction, competent, qualified inspection personnel should verify that no significant variations exist from the conditions described in this report.

EXPLANATION OF BOREHOLE LOG

This form describes some of the information provided on the borehole logs, which is based primarily on examination of the recovered samples, and the results of the field and laboratory tests. Additional description of the soil/rock encountered is given in the accompanying geotechnical report.

GENERAL INFORMATION

Project details, borehole number, location coordinates and type of drilling equipment used are given at the top of the borehole log.

SOIL LITHOLOGY

Elevation and Depth

This column gives the elevation and depth of inferred geologic layers. The elevation is referred to the datum shown in the Description column.

Lithology Plot

This column presents a graphic depiction of the soil and rock stratigraphy encountered within the borehole.

Description

This column gives a description of the soil strata, based on visual and tactile examination of the samples augmented with field and laboratory test results. Each stratum is described according to the *Modified Unified Soil Classification System*.

The compactness condition of cohesionless soils (SPT) and the consistency of cohesive soils (undrained shear strength) are defined as follows (*Ref. Canadian Foundation Engineering Manual*):

Compactness of	
<u>Cohesionless</u>	<u>SPT N-Value</u>
<u>Soils</u>	
Very loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	> 50

Consistency of	<u>Undrained Shear Strength</u>		
	<u>Cohesive Soils</u>	<u>kPa</u>	<u>psf</u>
Very soft		0 to 12	0 to 250
Soft		12 to 25	250 to 500
Firm		25 to 50	500 to 1000
Stiff		50 to 100	1000 to 2000
Very stiff		100 to 200	2000 to 4000
Hard		Over 200	Over 4000

Soil Sampling

Sample types are abbreviated as follows:

SS	Split Spoon	TW	Thin Wall Open (Pushed)	RC	Rock Core	GS	Grab Sample
AU	Auger Sample	TP	Thin Wall Piston (Pushed)	WS	Washed Sample	AR	Air Return Sample

Additional information provided in this section includes sample numbering, sample recovery and numerical testing results.

Field and Laboratory Testing

Results of field testing (e.g., SPT, pocket penetrometer, and vane testing) and laboratory testing (e.g., natural moisture content, and limits) executed on the recovered samples are plotted in this section.

Instrumentation Installation

Instrumentation installations (monitoring wells, piezometers, inclinometers, etc.) are plotted in this section. Water levels, if measured during fieldwork, are also plotted. These water levels may or may not be representative of the static groundwater level depending on the nature of soil stratum where the piezometer tips are located, the time elapsed from installation to reading and other applicable factors.

Comments

This column is used to describe non-standard situations or notes of interest.

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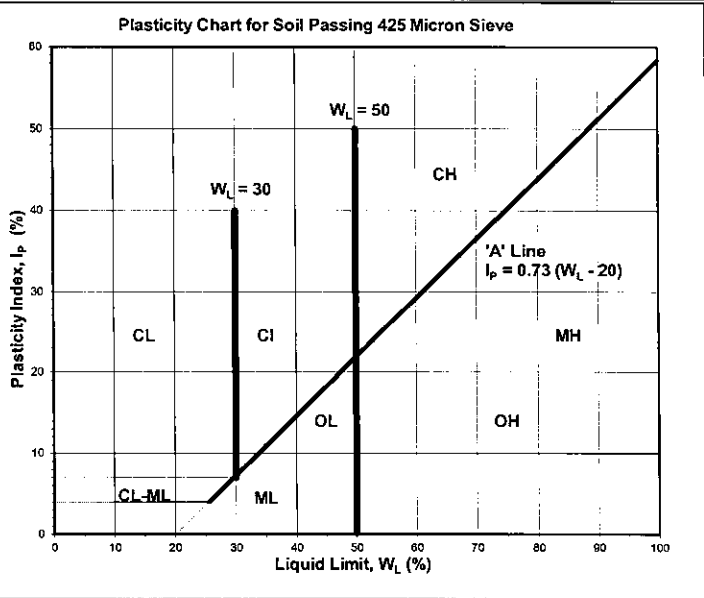


MODIFIED - UNIFIED CLASSIFICATION SYSTEM FOR SOILS


*The soil of each stratum is described using the Unified Soil Classification System (Technical Memorandum 36-357 prepared by Waterways Experiment Station, Vicksburg, Mississippi, Corps of Engineers, U.S Army, Vol. 1 March 1953.) modified slightly so that an inorganic clay of "medium plasticity" is recognized.

MAJOR DIVISION		GROUP SYMBOL	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA	
COARSE GRAINED SOILS (MORE THAN HALF BY WEIGHT LARGER THAN 75µm)	GRAVELS MORE THAN HALF THE COARSE FRACTION LARGER THAN 4.75mm	CLEAN GRAVELS (TRACE OR NO FINES)	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	$C_u = \frac{D_{60}}{D_{10}} > 4; C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS
		DIRTY GRAVELS (WITH SOME OR MORE FINES)	GM	SILTY GRAVELS, GRAVEL-SAND- SILT MIXTURES	ATTERBERG LIMITS BELOW 'A' LINE OR P.I MORE THAN 4
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES	ATTERBERG LIMITS BELOW 'A' LINE OR P.I MORE THAN 7
	SANDS MORE THAN HALF THE COARSE FRACTION SMALLER THAN 4.75mm	CLEAN SANDS (TRACE OR NO FINES)	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	$C_u = \frac{D_{60}}{D_{10}} > 6; C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$
			SP	POORLY GRADED SANDS, GRAVEL- SAND MIXTURES, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS
		DIRTY SANDS (WITH SOME OR MORE FINES)	SM	SILTY SANDS, SAND-SILT MIXTURES	ATTERBERG LIMITS BELOW 'A' LINE OR P.I MORE THAN 4
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES	ATTERBERG LIMITS BELOW 'A' LINE OR P.I MORE THAN 7
FINE-GRAINED SOILS (MORE THAN HALF BY WEIGHT SMALLER THAN 75µm)	SILTS BELOW 'A' LINE NEGLIGIBLE ORGANIC CONTENT	$W_L < 50\%$	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY SANDS OF SLIGHT PLASTICITY	CLASSIFICATION IS BASED UPON PLASTICITY CHART (SEE BELOW)
		$W_L < 50\%$	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS	
	CLAYS ABOVE 'A' LINE NEGLIGIBLE ORGANIC CONTENT	$W_L < 30\%$	CL	INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY OR SILTY CLAYS, LEAN CLAYS	
		$30\% < W_L < 50\%$	CI	INORGANIC CLAYS OF MEDIUM PLASTICITY, SILTY CLAYS	
		$W_L < 50\%$	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
	ORGANIC SILTS & CLAYS BELOW 'A' LINE	$W_L < 50\%$	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
		$W_L < 50\%$	OH	ORGANIC CLAYS OF HIGH PLASTICITY	
	HIGH ORGANIC SOILS		Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS	STRONG COLOUR OR ODOUR, AND OFTEN FIBROUS TEXTURE

SOIL COMPONENTS					
FRACTION	U.S STANDARD SIEVE SIZE	DEFINING RANGES OF PERCENTAGE BY WEIGHT OF MINOR COMPONENTS			
		PASSING	RETAINED	PERCENT	DESCRIPTOR
GRAVEL	COARSE	76 mm	19 mm	35-50	AND
				20-35	Y/EY
	FINE	19 mm	4.75 mm	10-20	SOME
SAND	COARSE	4.75 mm	2.00 mm	1-10	TRACE
	MEDIUM	2.00 mm	425 µm		
	FINE	425 µm	75 µm		
FINES (SILT OR CLAY BASED ON PLASTICITY)		75 µm			
OVERSIZED MATERIAL					
ROUNDED OR SUBROUNDED: COBBLES 76 mm TO 200 mm BOULDERS > 200 mm				NOT ROUNDED: ROCK FRAGMENTS > 76 mm ROCKS > 0.76 CUBIC METRE IN VOLUME	



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Note 1: Soils are classified and described according to their engineering properties and behaviour.
 Note 2: The modifying adjectives used to define the actual or estimated percentage range by weight of minor components are consistent with the Canadian Foundation Engineering Manual (4th Edition, Canadian Geotechnical Society, 2006.)

RECORD OF BOREHOLE No. BH1

Project Number: SWW167208 Drilling Method: Solid Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 14 Jun 2016 Date Completed: 14 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4664034, E327864 Reviewed by: SM Revision No.: 1



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Lithology Plot	LITHOLOGY PROFILE	SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING	LAB TESTING	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value			Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ○ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests)	Atterberg Limits W _p — W — W _L Plastic — Liquid × Passing 75 µm (%) ○ Moisture Content (%) * Unit Weight (kN/m ³)		
	Local Ground Surface Elevation: ASPHALT (230mm thick)										GR SA SI CL
	CRUSHED GRANULAR FILL (480mm thick) 0.2										
	FILL Silty clay, trace sand, organics 0.7 Stained	SS	1	79	6	1	○		○22		
	SILTY CLAY Trace sand Mottled brown and grey Soft 1.4	SS	2	71	3	2	○		○30		
	END OF BOREHOLE (no refusal) 2.1					3					
						4					
						5					
						6					
						7					

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≡ No freestanding groundwater observed in open borehole upon completion of drilling.

Borehole details, as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretive assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Borehole Log'.

RECORD OF BOREHOLE No. BH2

Project Number: SWW167208 Drilling Method: Solid Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 14 Jun 2016 Date Completed: 14 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4663907, E327861 Reviewed by: SM Revision No.: 1



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LITHOLOGY PROFILE	SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING	LAB TESTING	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	DESCRIPTION	Sample Type	Sample Number	Recovery (%)			SPT 'N' Value	Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ◇ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests) 20 40 60 80		
Local Ground Surface Elevation:										
ASPHALT (200mm thick)										
CRUSHED GRANULAR FILL (560mm thick)	0.2									
FILL Silty clay, trace sand, organics Stained	0.8	SS	1	100	7	1	○	○23		
SILTY CLAY Trace sand, organics Mottled brown and grey Firm	1.4	SS	2	54	4		○	○19		
END OF BOREHOLE (no refusal)	2.0					2				
						3				
						4				
						5				
						6				

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||K No freestanding groundwater observed in open borehole upon completion of drilling.

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RECORD OF BOREHOLE No. BH3

Project Number: SWW167208 Drilling Method: Solid Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 14 Jun 2016 Date Completed: 14 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4663755, E327850 Reviewed by: SM Revision No.: 1



Lithology Plot	LITHOLOGY PROFILE		SOIL SAMPLING				FIELD TESTING		LAB TESTING				INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)	
	DESCRIPTION	DEPTH (m)	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	W _p	W	W _L	Plastic			Liquid
	Local Ground Surface Elevation: ASPHALT (200mm thick)														
	CRUSHED GRANULAR FILL (460mm thick)	0.2													
	FILL Silty clay, trace sand, organics Dark grey/black	0.7	SS	1	78	7	1								
	SILTY CLAY Trace sand Mottled brown and grey Soft	1.4	SS	2	46	3	2								
	END OF BOREHOLE (spoon refusal)	2.1													
							3								
							4								
							5								
							6								
							7								

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No freestanding groundwater observed in open borehole upon completion of drilling.

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RECORD OF BOREHOLE No. BH4

Project Number: SWW167208 Drilling Method: Solid Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 14 Jun 2016 Date Completed: 14 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4663600, E327841 Reviewed by: SM Revision No.: 1



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LITHOLOGY PROFILE		SOIL SAMPLING				FIELD TESTING		LAB TESTING				INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)	
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ◇ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests) 20 40 60 80	Atterberg Limits W _p — W — W _L Plastic — Liquid * Passing 75 µm (%) ○ Moisture Content (%) * Unit Weight (kNm ³) 20 40 60 80					
	Local Ground Surface Elevation: ASPHALT (200mm thick)													
	CRUSHED GRANULAR FILL (460mm thick)	0.2												
	FILL Silty clay, trace sand Stained Black	0.5												
	SILTY CLAY Trace sand, trace gravel, sand pockets/layers Brown Firm	1.1	SS	1a b	79	4	1	○		○21 ○18				
	Stiff Oxidized		SS	2	84	11	2	○		○12				
	END OF BOREHOLE (no refusal)	2.1												
							3							
							4							
							5							
							6							
							7							

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☑ No freestanding groundwater observed in open borehole upon completion of drilling.

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RECORD OF BOREHOLE No. BH5

Project Number: SWW167208 Drilling Method: Solid Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 14 Jun 2016 Date Completed: 14 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4663434, E327827 Reviewed by: SM Revision No.: 1



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Lithology Plot	LITHOLOGY PROFILE	SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING	LAB TESTING	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value			Penetration Testing ○ SPT ● DCPT	Atterberg Limits W _p W _L Plastic Liquid		
	Local Ground Surface Elevation: ASPHALT (200mm thick)										
	CRUSHED GRANULAR FILL (405mm thick) 0.2										
	FILL Silty clay, some sand, organics 0.6	SS	1	84	8	1	○	○ ₂₁			
	SILTY CLAY Trace gravel, sand pockets/layers Mottled brown and grey Firm 1.4	SS	2	100	4	2	○	○ ₁₃			
	END OF BOREHOLE (no refusal) 2.1										
						3					
						4					
						5					
						6					
						7					

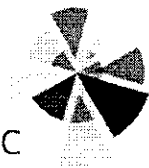
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□ No freestanding groundwater observed in open borehole upon completion of drilling.

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RECORD OF BOREHOLE No. BH6

Project Number: SWW167208 Drilling Method: Solid Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 14 Jun 2016 Date Completed: 14 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4663304, E327822 Reviewed by: SM Revision No.: 1



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Lithology Plot	LITHOLOGY PROFILE		SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING		LAB TESTING				INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	Penetration Testing ○ SPT ● DCPT			MTO Vane* Nilcon Vane* △ Intact ◇ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests)	Atterberg Limits W _p W _L W _p W _L Plastic Liquid	× Passing 75 µm (%) ○ Moisture Content (%) * Unit Weight (KN/m ³)	20	40	60		
	Local Ground Surface Elevation: ASPHALT (200mm thick)															
		CRUSHED GRANULAR FILL (610mm thick)	0.2													
		FILL Silty sand, some clay Black	0.8	SS	1	87	9	1	○				○12			
		SILTY CLAY Trace sand, trace gravel Mottled brown and grey Firm	1.4	SS	2	79	6	2	○				○20			
		END OF BOREHOLE (no refusal)	2.1													

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☑ No freestanding groundwater observed in open borehole upon completion of drilling.

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RECORD OF BOREHOLE No. BH7

Project Number: SWW167208 Drilling Method: Solid Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 14 Jun 2016 Date Completed: 14 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4663165, E327810 Reviewed by: SM Revision No.: 1



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Lithology Plot	LITHOLOGY PROFILE		SOIL SAMPLING				FIELD TESTING		LAB TESTING		INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ○ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests)	Atterberg Limits W _p W _L Plastic Liquid × Passing 75 µm (%) ○ Moisture Content (%) ▼ Unit Weight (KN/m ³)		
	Local Ground Surface Elevation: ASPHALT (200mm thick)											
	CRUSHED GRANULAR FILL (510mm thick)	0.2										
	SILTY CLAY Trace sand Mottled brown and grey Stiff	0.7	SS	1	79	9	1	○		○ 16		
	Brown		SS	2	100	12	2	○		○ 12		
	END OF BOREHOLE (no refusal)	2.1										

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☑ No freestanding groundwater observed in open borehole upon completion of drilling.

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RECORD OF BOREHOLE No. BH8

Project Number: SWW167208 Drilling Method: Solid Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 14 Jun 2016 Date Completed: 14 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4663008, E327805 Reviewed by: SM Revision No.: 1



Lithology Plot	LITHOLOGY PROFILE	SOIL SAMPLING				FIELD TESTING		LAB TESTING				INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)						
	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ◇ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests) 20 40 60 80	Atterberg Limits W _p W L W _u Plastic Liquid × Passing 75 µm (%) ○ Moisture Content (%) + Unit Weight (kN/m ³) 20 40 60 80				GR	SA	SI	CL			
	Local Ground Surface Elevation: ASPHALT (200mm thick)																		
	CRUSHED GRANULAR FILL (510mm thick) 0.2																		
	SILTY CLAY Trace sand and gravel Mottled brown and grey Firm Brown Very stiff Oxidized	SS	1	84	6	1													
	END OF BOREHOLE (no refusal) 2.1	SS	2	100	18	2													
						3													
						4													
						5													
						6													
						7													

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∇ No freestanding groundwater observed in open borehole upon completion of drilling.

Borehole details, as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretive assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Borehole Log'.

Page: 1 of 1

RECORD OF BOREHOLE No. BH9

Project Number: SWW167208 Drilling Method: Solid Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 14 Jun 2016 Date Completed: 14 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4662848, E327788 Reviewed by: SM Revision No.: 1



LITHOLOGY PROFILE		SOIL SAMPLING				FIELD TESTING		LAB TESTING		INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ○ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests) 20 40 60 80	Atterberg Limits W _p W _L Plastic Liquid × Passing 75 um (%) ○ Moisture Content (%) * Unit Weight (kNm ³) 20 40 60 80		
	Local Ground Surface Elevation: ASPHALT (150mm thick)										
	CRUSHED GRANULAR FILL (355mm thick) 0.2										
	SILTY CLAY Trace sand, trace gravel Brown Stiff 0.4										
	Oxidized	SS	1	100	8	1		○			
	Very stiff	SS	2	100	24	2		○	○ 10		
	END OF BOREHOLE (auger refusal, spoon refusal) 2.3	SS	3	100	25/29mm						-rock in tip of spoon
						3					
						4					
						5					
						6					
						7					

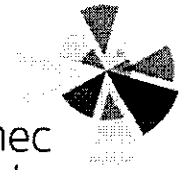
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∇ No freestanding groundwater observed in open borehole upon completion of drilling.

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RECORD OF BOREHOLE No. BH10

Project Number: SWW167208 Drilling Method: Solid Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 14 Jun 2016 Date Completed: 14 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4662681, E327782 Reviewed by: SM Revision No.: 1



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Lithology Plot	LITHOLOGY PROFILE		SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING	LAB TESTING	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' Value			Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ◇ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests) 20 40 60 80	Atterberg Limits W _c W L _c Plastic Liquid × Passing 75 µm (%) ○ Moisture Content (%) * Unit Weight (kN/m ³) 20 40 60 80		
	Local Ground Surface Elevation:											
	ASPHALT (100mm thick)											
	CRUSHED GRANULAR FILL (180mm thick)	0.1										
	SAND AND GRAVEL FILL (255mm thick)	0.3										
	SILTY CLAY Trace sand, trace gravel Brown	0.5										
	Oxidized Stiff		SS	1	100	13	1		○	○12		
			SS	2	0							
	END OF BOREHOLE (auger refusal, spoon refusal)	1.5										
							2					
							3					
							4					
							5					

-auger grinding >20 blows/25mm

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☑ No freestanding groundwater observed in open borehole upon completion of drilling.

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RECORD OF BOREHOLE No. BH11

Project Number: SWW167208 Drilling Method: Solid Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 14 Jun 2016 Date Completed: 14 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4662524, E327769 Reviewed by: SM Revision No.: 1



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LITHOLOGY PROFILE		SOIL SAMPLING				FIELD TESTING		LAB TESTING				INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)					
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* ▲ Intact ◊ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests)		Atterberg Limits W _p W _L W _U Plastic Liquid × Passing 75 um (%) ○ Moisture Content (%) * Unit Weight (kN/m ³)				GR	SA	SI	CL	
	Local Ground Surface Elevation:																	
	ASPHALT (75mm thick)																	
	CRUSHED GRANULAR FILL (230mm thick)																	
	SILTY CLAY Trace sand, organics Brown Very stiff																	
		SS	1	100	17	1			○		○ 16							
		SS	2	100	> 7/25mm						○ 8							
	END OF BOREHOLE (spoon refusal)					1.8												

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 Fax: 519-735-9669
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No freestanding groundwater observed in open borehole upon completion of drilling.

Borehole details, as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretive assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Borehole Log'.

RECORD OF BOREHOLE No. BH12

Project Number: SWW167208 Drilling Method: Solid Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: MeLoche Road Sewer and Road Reconstruction Date Started: 14 Jun 2016 Date Completed: 14 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4662330, E327758 Reviewed by: SM Revision No.: 1



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Lithology Plot	LITHOLOGY PROFILE		SOIL SAMPLING				FIELD TESTING		LAB TESTING				INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)			
	DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ◇ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests) 20 40 60 80		Atterberg Limits W _p W _L Plastic Liquid × Passing 75 µm (%) ○ Moisture Content (%) * Unit Weight (kN/m ³) 20 40 60 80				GR	SA	SI
	Local Ground Surface Elevation:																
	ASPHALT (100m thick)																
	CRUSHED GRANULAR FILL (230mm thick) 0.1																
	SILTY CLAY Trace sand, organics Mottled brown and grey Firm 0.3																
		Stiff	SS	1	100	7	1		○		○15						
		Weathered	SS	2	100	14	2		○		○13						
		Brown Very stiff															
		Fissured Oxidized	SS	3	100	18	3		○		○12						
		Hard	SS	4	100	29	4		○		○11						
		Hard	SS	5	100	58	4		○		○10						>50 blows/25mm
	END OF BOREHOLE (auger refusal, spoon refusal) 4.3																
							5										
							6										
							7										

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∇ No freestanding groundwater observed in open borehole upon completion of drilling.

Borehole details, as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretive assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying "Explanation of Borehole Log".

RECORD OF BOREHOLE No. BH14

Project Number: SWW167208 Drilling Method: 100 mm O.D. Hollow Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 15 Jun 2016 Date Completed: 15 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4662039, E327742 Reviewed by: SM Revision No.: 1



Lithology Plot	LITHOLOGY PROFILE		SOIL SAMPLING				FIELD TESTING		LAB TESTING				INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)				
	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ◇ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests)	Atterberg Limits W _p — W _L Plastic — Liquid		* Passing 75 µm (%) ○ Moisture Content (%) * Unit Weight (kNm ³)			GR	SA	SI	CL	
	Local Ground Surface Elevation:																	
	ASPHALT (100mm thick)																	
	CRUSHED GRANULAR FILL (405mm thick)	0.1																
	SILTY CLAY Trace sand, trace gravel Mottled brown and grey Firm	0.5																
	Stiff		SS	1	71	7	1	○			○18							
	Brown Very stiff		SS	2	87	8	2	○			○19							
	Sand pockets and layers		SS	3	100	20	3	○			○16							
			SS	4	100	21	3	○			○12							
			SS	5	100	29	4	○			○12							
			SS	6	100	23	4	○			○12							
	END OF BOREHOLE (no refusal)	5.0					5											
							6											
							7											

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☑ No freestanding groundwater observed in open borehole upon completion of drilling.

Borehole details, as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretive assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying "Explanation of Borehole Log".

RECORD OF BOREHOLE No. BH15

Project Number: SWW167208 Drilling Method: Solid Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 15 Jun 2016 Date Completed: 15 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4661965, E327735 Reviewed by: SM Revision No.: 1



Lithology Plot	LITHOLOGY PROFILE		SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING		LAB TESTING				INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	DESCRIPTION		Sample Type	Sample Number	Recovery (%)	SPT 'N' Value			Penetration Testing ○ SPT ● DCPT	MTO Vane* △ Intact ◊ Intact ▲ Remould ◆ Remould	Nilcon Vane* ○ Intact ◊ Intact ▲ Remould ◆ Remould	Atterberg Limits W _p — W — W _L	Plastic	Liquid		
	Local Ground Surface Elevation:															
	ASPHALT (100mm thick)															
	CRUSHED GRANULAR FILL (430mm thick)	0.1														
	SILTY CLAY Trace sand and gravel, organics Mottled brown and grey Firm	0.5	SS	1	83	7	1		○			○15				
	Brown Very stiff		SS	2	83	22			○			○12				
	END OF BOREHOLE (no refusal)	2.0					2									
							3									
							4									
							5									
							6									

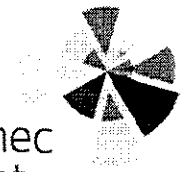
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☑ No freestanding groundwater observed in open borehole upon completion of drilling.

Borehole details, as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretive assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Borehole Log'.

RECORD OF BOREHOLE No. BH16

Project Number: SWW167208 Drilling Method: Solid Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 15 Jun 2016 Date Completed: 15 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4661896, E327733 Reviewed by: SM Revision No.: 1



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Lithology Plot	LITHOLOGY PROFILE		SOIL SAMPLING				FIELD TESTING		LAB TESTING				INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)	
	DESCRIPTION	Local Ground Surface Elevation:	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ◇ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests) 20 40 60 80	Atterberg Limits W _L W _P W _L Plastic Liquid * Passing 75 µm (%) ○ Moisture Content (%) * Unit Weight (kN/m ³) 20 40 60 80	GR	SA			SI
	ASPHALT (100mm thick)														
	CRUSHED GRANULAR FILL (305mm thick)	0.1													
	SILTY CLAY Trace sand Mottled brown and grey Stiff	0.4													
	Weathered		SS	1	89	8	1	○			○21				
			SS	2	100	13		○			○16				
	END OF BOREHOLE (no refusal)	2.0					2								
							3								
							4								
							5								
							6								

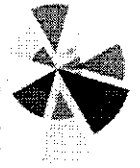
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∑ No freestanding groundwater observed in open borehole upon completion of drilling.

Borehole details, as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretive assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying "Explanation of Borehole Log".

RECORD OF BOREHOLE No. BH17

Project Number: SWW167208 Drilling Method: 100 mm O.D. Hollow Stem Augers
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 15 Jun 2016 Date Completed: 15 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4661776, E327723 Reviewed by: SM Revision No.: 1



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Lithology Plot	LITHOLOGY PROFILE	SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING	LAB TESTING	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value			Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ○ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests)	Atterberg Limits W _p W _L Plastic Liquid × Passing 75 µm (%) ○ Moisture Content (%) + Unit Weight (kN/m ³)		
	Local Ground Surface Elevation:										GR SA SI CL
	ASPHALT (100mm thick)										
	CRUSHED GRANULAR FILL (585mm thick) 0.1										
	SILTY CLAY 0.7 Some sand, organics Mottled brown and grey Stiff	SS	1	100	8	1	○	○11			
	Firm										
	Wood fibers	SS	2	100	4	2	○	○15			
		SS	3	89	4		○	○20			
	Brown Very stiff	SS	4	100	20	3	○	○10			
	Hard	SS	5	100	36	4	○	○9			
	Grey Very stiff	SS	6	89	17	5	○	○13			
	END OF BOREHOLE (no refusal) 5.0					5					
						6					
						7					

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☑ No freestanding groundwater observed in open borehole upon completion of drilling.

Borehole details, as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretive assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Borehole Log'.

RECORD OF BOREHOLE No. BH18

Project Number: SWW167208 Drilling Method: 100 mm O.D. Hollow Stem Augers
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 15 Jun 2016 Date Completed: 15 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4661653, E327718 Reviewed by: SM Revision No.: 1



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Lithology Plot	LITHOLOGY PROFILE		SOIL SAMPLING				FIELD TESTING		LAB TESTING				INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ◇ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests) 20 40 60 80	Atterberg Limits W _p W _L W _p — W _L Plastic Liquid * Passing 75 um (%) ○ Moisture Content (%) * Unit Weight (kNm ³)	GR	SA	SI		
	Local Ground Surface Elevation:													
	ASPHALT (100mm thick)													
	CRUSHED GRANULAR FILL (355mm thick) 0.1													
	SILTY CLAY 0.5 Trace sand, trace gravel Brown Stiff	SS	1	89	10	1	○		○10					
	Very stiff													
	Oxidized	SS	2	100	20	2	○		○12					
	Hard	SS	3	100	27	3	○		○12					
	Grey Very stiff	SS	4	100	34	4	○		○11					
		SS	5	100	21	4	○		○12					
		SS	6	100	22	5	○		○10					
	END OF BOREHOLE (no refusal) 5.0					5								
						6								
						7								

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No freestanding groundwater observed in open borehole upon completion of drilling.

Borehole details, as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretive assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying "Explanation of Borehole Log".

APPENDIX C
GEOTECHNICAL LABORATORY TEST RESULTS

Amec Foster Wheeler Environment & Infrastructure
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ATTERBERG LIMITS
ASTM D-4318 or LS-703 / 704

Project Number:	SWW167208	Sampled on:	17-Jun-2016	Sampled by:	SS
Project Client:	Town of Amherstburg	Received on:	20-Jun-2016	Received by:	JP
Project Name:	Meloche Road Reconstruction	Tested on:	20-Jun-2016	Tested by:	JP
Project Location:	Amherstburg				

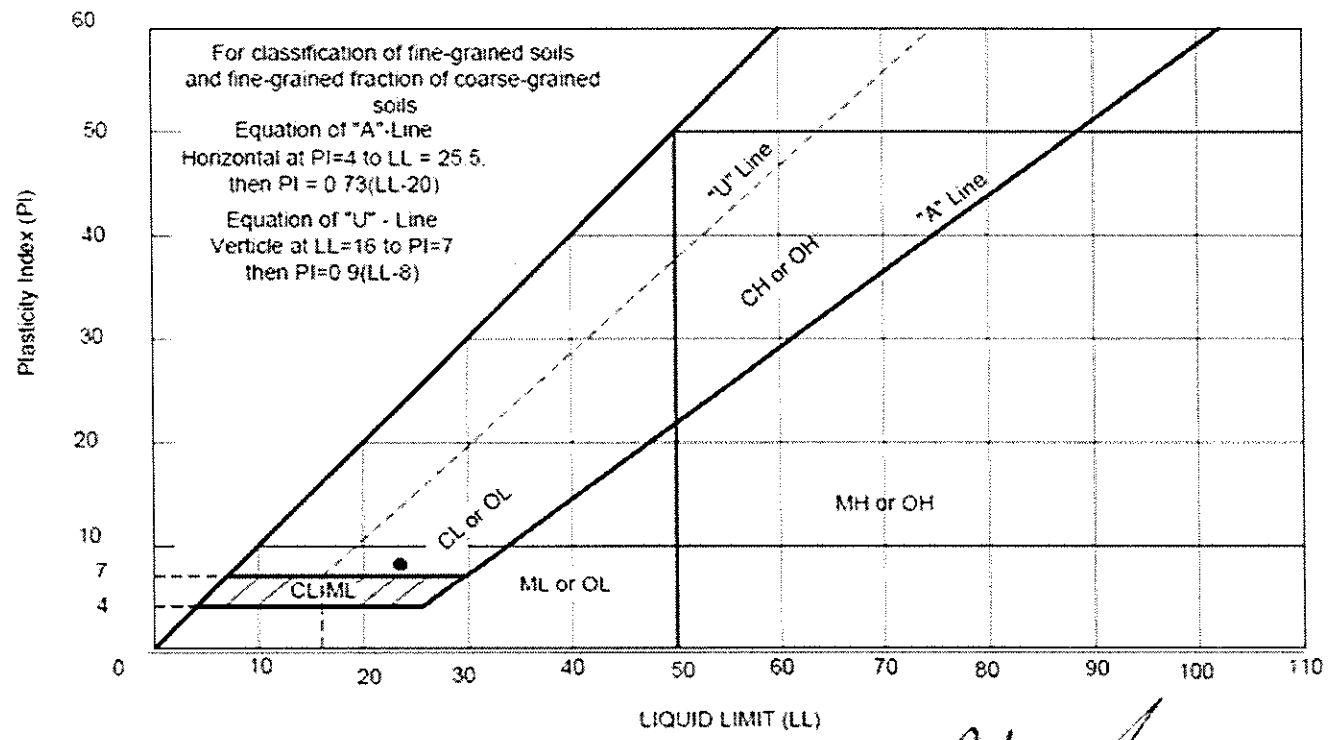
Test Results

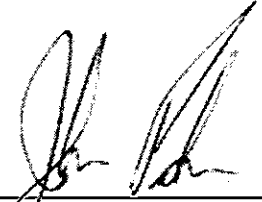
LAB NUMBER
BOREHOLE
SAMPLE
DEPTH (m)

346
14
4
3.05

PLASTIC LIMIT
LIQUID LIMIT
PLASTIC INDEX

15.3
24.0
8.7



Signed by: 
 Justin Palmer, Lab Supervisor, C. Tech.

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 Tecumseh, Ontario N8N 2M1

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Project Number: SWW167208
Project Client: Town of Amherstburg
Project Name: Meloche Road Reconstruction
Project Location: Amherstburg

**GRAIN SIZE DISTRIBUTION
 MTO LS 702 / ASTM D422**



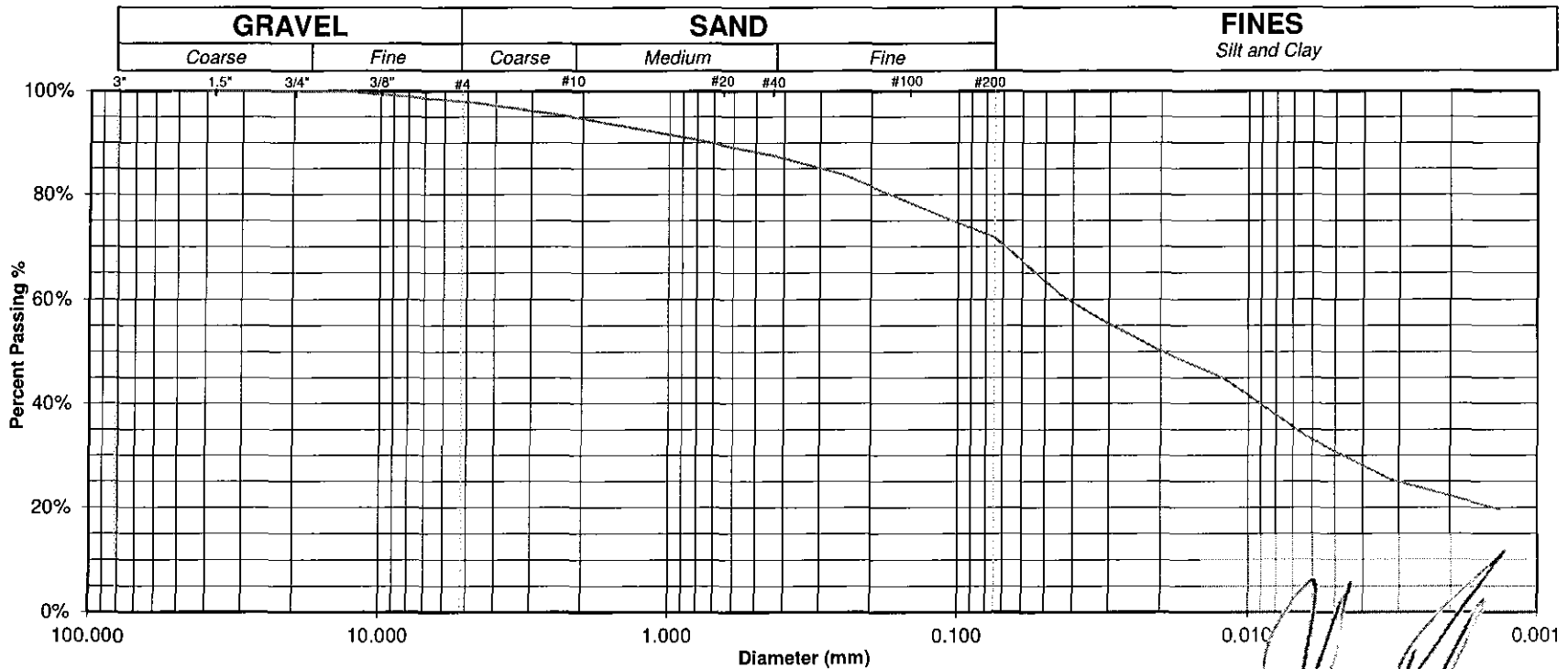
Sampled on: 17-Jun-2016
Received on: 20-Jun-2016
Tested on: 24-Jun-2016

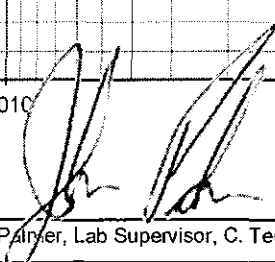
Sampled by: SS
Received by: JP
Tested by: JP

Test Results

Sample Location: **BH14, Sa. 4**
 Sample Identification: **347**

Gravel	Sand	Silt	Clay	Soil Classification
2.2%	26.1%	49.5%	22.3%	SANDY CLAYEY SILT, trace gravel



Signed by: 
 Justin Palmer, Lab Supervisor, C. Tech.



04 July 2016

SWW167208.1000

The Town of Amherstburg
271 Sandwich Street South
Amherstburg, Ontario
N9V 2A5

**ATTN: Mr. Todd Hewitt, C.E.T.
Manager of Engineering and Operations**

**Re: Environmental Subsurface Investigation
Meloche Road Reconstruction between Alma Street and Lowes Sideroad
Amherstburg, Ontario**

Dear Mr. Hewitt,

Amec Foster Wheeler Environment & Infrastructure ("Amec Foster Wheeler"), is pleased to provide Hycay Consulting Engineers Inc. on behalf of the Town of Amherstburg (the "Client") with this letter report for the Environmental Subsurface Investigation (ESI) associated with the proposed Meloche Road Reconstruction project between Alma Street and Lowes Sideroad in Amherstburg, Ontario (the "Site").

The purpose of the ESI was to assess soil conditions along Meloche Road to determine their re-usability. The ESI was completed in conjunction with a Geotechnical Investigation, completed under SWW167208, and provided under a separate cover.

SCOPE OF WORK

The scope of work for the ESI included the following tasks:

- Completing an environmental subsurface soil sampling program on six of the geotechnical boreholes to a maximum depth of 5.0 m (16.5 ft) to facilitate the collection of fill and/or soil samples; logging and field screening for evidence of environmental impact using visual, olfactory and sample headspace screening methods (where possible);

Amec Foster Wheeler Environment & Infrastructure,
a Division of Amec Foster Wheeler Americas Limited
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Canada N8N 2M1
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Fax (519) 735-9669
www.amec.com

Certificate of Analysis
Client: Amec Foster Wheeler (Windsor)
Client PO:

Report Date: 06-Jul-2016
Order Date: 30-Jun-2016
Project Description: SWW167208

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

- n/a: not applicable
- ND: Not Detected
- MDL: Method Detection Limit
- Source Result: Data used as source for matrix and duplicate samples
- %REC: Percent recovery.
- RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Certificate of Analysis
Client: Amec Foster Wheeler (Windsor)
Client PO:

Report Date: 06-Jul-2016
Order Date: 30-Jun-2016
Project Description: SWW167208

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	287	5	ug/g	190	96.9	78-113			
Sulphate	181	5	ug/g	84.2	96.6	78-111			

Certificate of Analysis
Client: Amec Foster Wheeler (Windsor)
Client PO:

Report Date: 06-Jul-2016
Order Date: 30-Jun-2016
Project Description: SWW167208

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	186	5	ug/g dry	190			2.3	20	
Sulphate	80.4	5	ug/g dry	84.2			4.6	20	
General Inorganics									
pH	7.66	0.05	pH Units	7.66			0.0	10	
Physical Characteristics									
% Solids	81.4	0.1	% by Wt.	77.5			4.9	25	

Certificate of Analysis
 Client: Amec Foster Wheeler (Windsor)
 Client PO:

Report Date: 06-Jul-2016
 Order Date: 30-Jun-2016
 Project Description: SWW167208

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	5	ug/g						
Sulphate	ND	5	ug/g						
General Inorganics									
Resistivity	ND	0.10	Ohm.m						

Certificate of Analysis

Client: Amec Foster Wheeler (Windsor)

Client PO:

Report Date: 06-Jul-2016

Order Date: 30-Jun-2016

Project Description: SWW167208

Client ID:	BH 18 Sa2 5-6.5 Feet	-	-	-
Sample Date:	15-Jun-16	-	-	-
Sample ID:	1627306-01	-	-	-
MDL/Units	Soil	-	-	-

Physical Characteristics

% Solids	0.1 % by Wt.	88.3	-	-	-
----------	--------------	------	---	---	---

General Inorganics

pH	0.05 pH Units	7.74	-	-	-
Resistivity	0.10 Ohm.m	17.9	-	-	-

Anions

Chloride	5 ug/g dry	190	-	-	-
Sulphate	5 ug/g dry	84	-	-	-

Certificate of Analysis
Client: **Amec Foster Wheeler (Windsor)**
Client PO:

Report Date: 06-Jul-2016
Order Date: 30-Jun-2016
Project Description: **SWW167208**

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC, water extraction	5-Jul-16	5-Jul-16
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	5-Jul-16	5-Jul-16
Resistivity	EPA 120.1 - probe, water extraction	5-Jul-16	5-Jul-16
Solids, %	Gravimetric, calculation	4-Jul-16	4-Jul-16

Certificate of Analysis

Amec Foster Wheeler (Windsor)

11865 County Road 42
Tecumseh, ON N8N 2M1
Attn: Shane MacLeod

Client PO:
Project: SWW167208
Custody: 23677

Report Date: 6-Jul-2016
Order Date: 30-Jun-2016

Order #: 1627306

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Parcel ID	Client ID
1627306-01	BH 18 Sa2 5-6.5 Feet

Approved By:



Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

APPENDIX D

**ANALYTICAL TEST RESULTS AND ENVIRONMENTAL SUBSURFACE INVESTIGATION
LETTER REPORT**



Proctor Work sheet

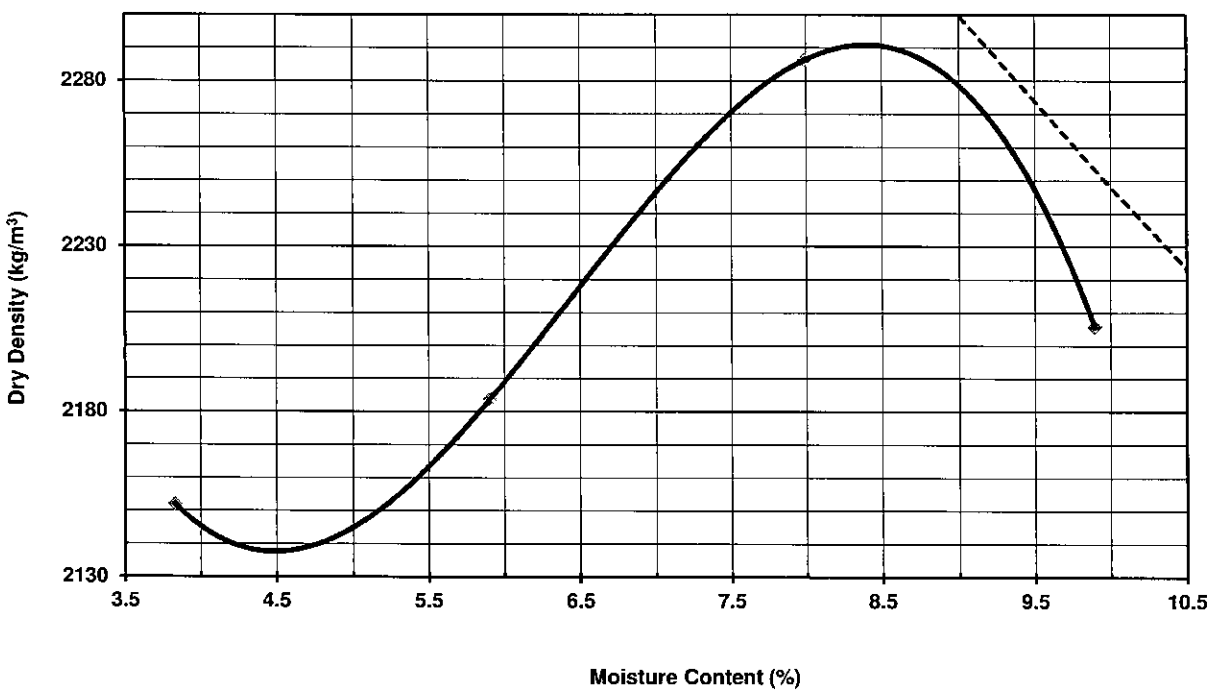
Project #	SWW167208	Client:	Town of Amherstburg	Lab #	345
Project Name	Meloche Road Reconstruction	Tested by:	J.R.	Started	June 24, 2016
		Reference Spec.	LS-706	Complete	June 27, 2016

Soil Description:	Date Sampled:
Granular 'A' Recycled	June 17, 2016
Sample Location:	Sampled by:
Meloche Rd.	SS

Test Results

Maximum Dry Density 2291 kg/m³ 143.0 pcf
 Optimum Moisture Content 8.4 %

Trial Number	1	2	3	4	5	6	7
Dry Density (kg / m ³)	2152	2184	2286	2206			
Moisture Content (%)	3.8	5.9	8.0	9.9			



Comments:

J.R.
 Laboratory Technician

Justin Palmer
 Justin Palmer, C. Tech.

- Submitting selected soil samples deemed representative of the environmental conditions for laboratory analyses of suspected environmental contaminants of concern including: O.Reg. 153/04 metals and inorganics, volatile organic compounds (VOC), petroleum hydrocarbons (PHCs), polycyclic aromatic hydrocarbons (PAHs);
- Comparing the analytical results reported for the soil samples to the appropriate generic Site Conditions Standards established under O.Reg. 153/04; and
- Preparing a factual letter report documenting the findings of the Environmental Subsurface Investigation.

An assessment of ground water was not requested as part of the ESI.

FIELD WORK

On June 14 and 15, 2016, as part of the geotechnical investigation, Amec Foster Wheeler staff collected soil samples from six of the borehole locations along Meloche Road between Pike Road and Lowes Sideroad. The boreholes sampled for environmental purposes were BH9, BH11, BH12, BH14, BH17 and BH18. The boreholes encountered a 100-150 mm thick layer of asphalt over 0.3 to 0.7 m of crushed granular fill and native silty clay. These environmental boreholes terminated at inferred bedrock at depths between 1.8 m and 5.0 m. The silty clay encountered at these boreholes was brown to grey and stiff to hard. Amec Foster Wheeler did not identify the presence of staining in any of the soil samples. The borehole logs are provided in Appendix A. The borehole locations are shown on Figures 2A to 2D.

The soil samples were examined, classified and logged according to soil type, moisture content, colour, consistency and presence of visible indicators of hydrocarbon impact. Soil samples were split into duplicate fractions upon recovery at the surface. The primary sample fractions were placed in 120 mL and/or 250 mL sample jars with Teflon-lined lids and subsequently stored in coolers on ice for potential future laboratory analysis. The duplicate sample fractions were placed in plastic containers for geotechnical laboratory testing purposes.

Vapour screening is one of several methods to select soil samples for laboratory analysis. Due to the small volume of available soil in the split spoon samplers, field vapour screening was not possible. The inability to conduct vapour screening did not significantly compromise the soil selection process.

All soil samples were collected in accordance with strict environmental sampling protocols to minimize loss of volatile organics and to ensure reliable and representative results. Disposable nitrile gloves were used and replaced between the handling of successive samples. All soil

sampling equipment (stainless steel trowels and spoons) was thoroughly decontaminated between soil sample locations to prevent potential cross-contamination.

The soil samples were submitted to Paracel Laboratories Ltd. In Ottawa, Ontario, for a standard laboratory turnaround. Paracel is an independent laboratory accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA).

APPLICABLE SITE CONDITION STANDARDS

Amec Foster Wheeler compared the bulk laboratory results to the Table 7 Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition for industrial/commercial/community (I/C/C) property use and coarse textured soils ("Table 7 SCS"). Additionally, the laboratory results were also compared to the Table 1 Background SCS ("Table 1 SCS") to determine if the material can be classified as "inert fill" for off-site re-use.

The Table 1 SCS and Table 7 SCS are documented in the Ministry of the Environment publication, *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*, dated 15 April 2011.

ANALYTICAL RESULTS

The analytical results for all soil/fill samples collected during the ESI are presented in Table 1 (metals and inorganics), Table 2 (VOC/PHC) and Table 3 (PAHs). The Certificate of Analysis are provided in Appendix B. Six selected soil samples were analyzed for O.Reg. 153/04 metals and inorganics, VOCs, PHCs and PAHs. All of the VOC, PHC and PAH parameters were below their applicable Table 1 SCS and Table 7 SCS.

The following metal and inorganic exceedances were identified at the Site, with the remainder of the metal and inorganic parameters analyzed reported below Table 1 SCS and Table 7 SCS.

Table 7 SCS Exceedances

- Electrical Conductivity (EC) concentrations of 1.97 mS/cm (BH12 SS1) and 1.66 (BH17 SS1) exceeded Table 7 SCS of 1.4 mS/cm

Table 1 SCS Exceedances

- Sodium Adsorption Ratio (SAR) concentrations of 5.02 & 5.70 (BH9 SS1 and its field duplicate Dup-S1), 2.42 (BH12 SS1) and 3.56 (BH17 SS1) exceeded Table 1 SCS of 2.4
- Electrical Conductivity (EC) concentrations of 1.26 & 1.39 (BH9 SS1 and its field duplicate Dup-S1), 0.894 (BH11 SS2), 1.97 mS/cm (BH12 SS1) and 1.66 (BH17 SS1) exceeded Table 1 SCS of 0.57 mS/cm
- Molybdenum concentrations ranged from 2.4 µg/g to 6.1 µg/g in all six of the soil samples (and the field duplicate), which exceed Table 1 SCS of 2 µg/g

EC & SAR

As referenced in Section 48 (3) of O.Reg. 153/04, parameters that exceed the applicable SCS solely because the substance has been used on a highway for the purpose of keeping the highway safe for traffic under conditions of snow or ice (or both), are deemed not to be exceeded for the purpose of Part XV.1 of the Act. The Highway Traffic Act (R.S.O., 1990, Chapter H.8) definition of a highway *includes a common and public highway, street, avenue, parkway, driveway, square, place, bridge, viaduct or trestle, any part of which is intended for or used by the general public for the passage of vehicles and includes the area between the lateral property lines thereof.*

As the Site is a roadway and salting is a common practice during winter months, any exceedances of EC and SAR are not considered to be contamination.

Molybdenum

Exceedances of molybdenum in Essex County have been identified to be naturally occurring and are the result of concentrations in regional bedrock formations that has been eroded, reworked, and deposited during the geologic past as a result of glacial action (MOECC discussions and Golder Associated Ltd. April 2010). As such, soils containing molybdenum concentrations above Table 1 SCS are not considered to be contamination, and are considered to be background concentrations.

CONCLUSIONS

O.Reg. 153/04 excludes EC and SAR as contamination for “highways”, which includes Meloche Road. Therefore, EC and SAR are not considered to be issues of environmental concern for the Site. Additionally, the molybdenum exceedance (above the background Table 1 SCS) is considered to be naturally occurring in Essex County, and therefore is also not considered to be an issue of environmental concern for the Site.

The remainder of the parameters analyzed as part of this environmental sampling program were below their applicable Table 7 SCS (as well as below the Background Table 1 SCS). Based on the findings of Amec Foster Wheeler’s Environmental Subsurface Investigation at the time of report preparation, no further environmental site assessment work is warranted at this time.

CLOSURE

This report was prepared for the exclusive use of the Town of Amherstburg and Hycay Consulting Engineers Inc. and is intended to provide a summary of the chemical characterization of the soil encountered at the six boreholes along Meloche Street between Pike Road and Lowes Sideroad in Amherstburg, Ontario on 14 & 15 June 2016, as indicated above. 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 the third party. Should additional parties require reliance on this report, written authorization from Amec Foster Wheeler will be required. With respect to third parties, Amec Foster Wheeler

has no liability or responsibility for losses of any kind whatsoever, including direct or consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

The analytical testing undertaken by Amec Foster Wheeler with respect to this report and any conclusions or recommendations made in this report reflect Amec Foster Wheeler's judgment based on the soil collected by Amec Foster Wheeler on the date(s) set out in this report and on information available at the time of preparation of this report. This report has been prepared for specific application to soil encountered at the six boreholes along Meloche Street between Pike Road and Lowes Sideroad in Amherstburg, Ontario on 14 & 15 June 2016, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to other material, which was unavailable for direct investigation, or chemical parameters, materials or analysis which were not addressed. Amec Foster Wheeler has used its professional judgment in analysing this information and formulating these conclusions.

Amec Foster Wheeler makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and change. Such interpretations and regulatory changes should be reviewed with legal counsel.

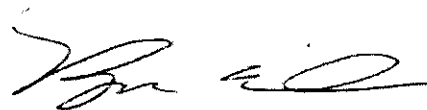
This Report is also subject to the further Standard Limitations attached to the end of this report.

We trust that the information presented in this report meets your current requirements. Should you have any questions, or concerns, please do not hesitate to contact the undersigned.

Yours truly,
AMEC Environment & Infrastructure,
a Division of AMEC Americas Limited



Cindy McKee, B.Sc., P.Geo., QP_{ESA}
Senior Environmental Geoscientist



Ryan Wilson, Ph.D., P.Geo., QP_{ESA}
Associate Hydrogeologist

The Town of Amherstburg
Environmental Subsurface Investigation
Meloche Road Reconstruction between Alma Street
And Lowes Sideroad, Amherstburg, Ontario
July 2016



Attachments:

Table 1:	Metals & Inorganics in Soil/Fill Material
Table 2:	VOC/PHCs in Soil/Fill Material
Table 3:	PAHs in Soil/Fill Material
Figure 1:	Key Plan
Figure 2A-2D:	Borehole Location Plan
Appendix A:	Borehole Logs (BH9, BH11, BH12, BH14, BH17, BH18)
Appendix B:	Certificates of Analysis
Appendix C:	Limitations



TABLES



Table 1: Metals and Inorganics in Soil/ Fill Materials
The Town of Amherstburg
Environmental Subsurface Investigation - Meloche Road Reconstruction, Amherstburg, Ontario
SWW167208.1000

Laboratory Identification # Amec Foster Wheeler Sample Identification # Metres Below Ground Date Collected Date Analyzed Certificate of Analysis					1625321-01 BH9 SS1 0.8-1.4 14-Jun-16	1625321-02 BH11 SS2 1.5-2.1 14-Jun-16	1625321-03 BH12 SS1 0.8-1.4 14-Jun-16	1625321-04 BH14 SS3 2.3-2.9 15-Jun-16	1625321-05 BH17 SS1 0.8-1.4 15-Jun-16	1625321-06 BH18 SS3 2.3-2.9 15-Jun-16	1625321-07 Dup-S1 0.8-1.4 14-Jun-16
Parameter	Table 1* Background Condition Standards Coarse (µg/g)	Table 7* Industrial/Commercial/ Community Land Use Coarse (µg/g)	RDL	Units	1625321	1625321	1625321	1625321	1625321	1625321	Field Duplicate of BH9 SS1
SAR	2.4	12	0.0100	unitless	5.02	0.99	2.42	1.05	3.56	0.89	5.70
Conductivity	0.57	1.4	5.00	mS/cm	1.26	0.894	1.97	0.48	1.66	0.457	1.39
Cyanide, Free	0.051	0.0051	0.03	µg/g	<	<	<	<	<	<	<
pH	NV	NV	0.050	unitless	7.40	7.62	7.32	7.72	7.36	7.69	7.53
Metals											
Boron, available	NV	2	0.5	µg/g	<	<	<	<	<	<	<
Chromium (VI)	0.66	8	0.2	µg/g	<	<	<	<	<	<	<
Mercury	0.27	3.9	0.1	µg/g	<	<	<	<	<	<	<
Antimony	1.3	40	1.0	µg/g	<	<	<	<	<	<	<
Arsenic	18	18	1.0	µg/g	7.3	7.3	11.0	6.8	11.8	7.7	9.7
Barium	220	670	1.0	µg/g	48.8	65.1	102	82.7	61.2	74.0	83.6
Beryllium	2.6	8	1.0	µg/g	<	<	<	<	<	<	<
Boron	36	120	1.0	µg/g	8.2	12.9	12.2	16.3	9.7	16.0	12.3
Cadmium	1.2	1.9	0.5	µg/g	<	<	<	<	<	<	<
Chromium	70	160	1.0	µg/g	15.0	15.0	29.3	18.1	18.5	17.0	20.6
Cobalt	21	80	1.0	µg/g	7.7	8.9	13.9	12.1	11.1	9.9	10.3
Copper	92	230	1.0	µg/g	19.1	21.2	26.9	23.6	22.8	22.7	27.4
Lead	120	120	1.0	µg/g	10.0	10.6	14.9	12.9	17.7	11.7	13.2
Molybdenum	2	40	1.0	µg/g	2.6	6.1	2.4	3.1	4.0	5.3	3.1
Nickel	82	270	1.0	µg/g	20.6	21.7	37.4	24.0	22.1	21.5	26.1
Selenium	1.5	5.5	1.0	µg/g	<	<	<	<	<	<	<
Silver	0.5	40	0.5	µg/g	<	<	<	<	<	<	<
Thallium	1	3.3	1.0	µg/g	<	<	<	<	<	<	<
Uranium	2.5	33	1.0	µg/g	<	<	<	<	<	<	<
Vanadium	86	86	1.0	µg/g	21.3	21.6	41.8	26.7	30.8	24.2	30.7
Zinc	290	340	1.0	µg/g	40.4	45.1	65.1	48.7	63.6	48.2	57.7

Notes:

RDL - laboratory report detection limit

µg/g - micrograms per gram

(-) Parameter Not Included in Analysis

NV - No Value

* Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act* - Full Depth Background Site Condition Standards

- Residential/Parkland/Institutional/Industrial/Commercial/ Community Property Use, Coarse Textured Soil, dated April 15, 2011

** Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act* - Generic Site Condition Standards (SCS)

for Shallow Soils in a Potable Ground Water Condition - Industrial/Commercial/ Community Property Use, Coarse Textured Soil, dated April 15, 2011

0.7	Concentration exceeds Table 1 SCS
0.7	Concentration exceeds Table 1 SCS and Table 7 SCS



Table 3: Polycyclic Aromatic Hydrocarbon Compounds in Soil/ Fill Materials
The Town of Amherstburg
Environmental Subsurface Investigation - Meloche Road Reconstruction, Amherstburg, Ontario
SWW167208.1000

Laboratory Identification # Amec Foster Wheeler Sample Identification # Metres Below Ground Date Collected Date Analyzed Certificate of Analysis Units				1625321-01 BH9 SS1 0.8-1.4 14-Jun-16 1625321 (µg/g)	1625321-02 BH11 SS2 1.5-2.1 14-Jun-16 1625321 (µg/g)	1625321-03 BH12 SS1 0.8-1.4 14-Jun-16 1625321 (µg/g)	1625321-04 BH14 SS3 2.3-2.9 15-Jun-16 1625321 (µg/g)	1625321-05 BH17 SS1 0.8-1.4 15-Jun-16 1625321 (µg/g)	1625321-06 BH18 SS3 2.3-2.9 15-Jun-16 1625321 (µg/g)	1625321-07 Dup-S1 0.8-1.4 14-Jun-16 1625321 (µg/g)
Parameter	Table 1* Background Condition Standards	Table 7* Industrial/Commercial/ Community Land Use	RDL							Field Duplicate of BH9 SS1
	Coarse (µg/g)	Coarse (µg/g)								
Acenaphthene	0.072	96	0.02	<	<	<	<	<	<	<
Acenaphthylene	0.093	0.15	0.02	<	<	<	<	<	<	<
Anthracene	0.16	0.67	0.02	<	<	<	<	<	<	<
Benzo(a)anthracene	0.36	0.96	0.02	<	<	<	<	<	<	<
Benzo(a)pyrene	0.3	0.3	0.02	<	<	<	<	<	<	<
Benzo(b)fluoranthene	0.47	0.96	0.02	<	<	<	<	<	<	<
Benzo(g,h,i)perylene	0.68	9.6	0.02	<	<	<	<	<	<	<
Benzo(k)fluoranthene	0.48	0.96	0.02	<	<	<	<	<	<	<
Chrysene	2.8	9.6	0.02	<	<	<	<	<	<	<
Dibenzo(a,h)anthracene	0.1	0.1	0.02	<	<	<	<	<	<	<
Fluoranthene	0.56	9.6	0.02	<	<	<	<	<	<	<
Fluorene	0.12	62	0.02	<	<	<	<	<	<	<
Indeno(1,2,3-cd)pyrene	0.23	0.76	0.02	<	<	<	<	<	<	<
1-Methylnaphthalene	0.59	76	0.02	<	<	<	<	<	<	<
2-Methylnaphthalene	0.59	76	0.02	<	<	<	<	<	<	<
Methylnaphthalene (1&2)	0.59	76	0.04	<	<	<	<	<	<	<
Naphthalene	0.09	9.6	0.01	<	<	<	<	<	<	<
Phenanthrene	0.69	12	0.02	<	<	<	<	<	<	<
Pyrene	1	96	0.02	<	<	<	<	<	<	<

Notes:

RDL - laboratory report detection limit

µg/g - micrograms per gram

(-) Parameter Not Included in Analysis

NV - No Value

* Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act* - Full Depth Background Site Condition Standards

- Residential/Parkland/Institutional/Industrial/Commercial/ Community Property Use, Coarse Textured Soil, dated April 15, 2011

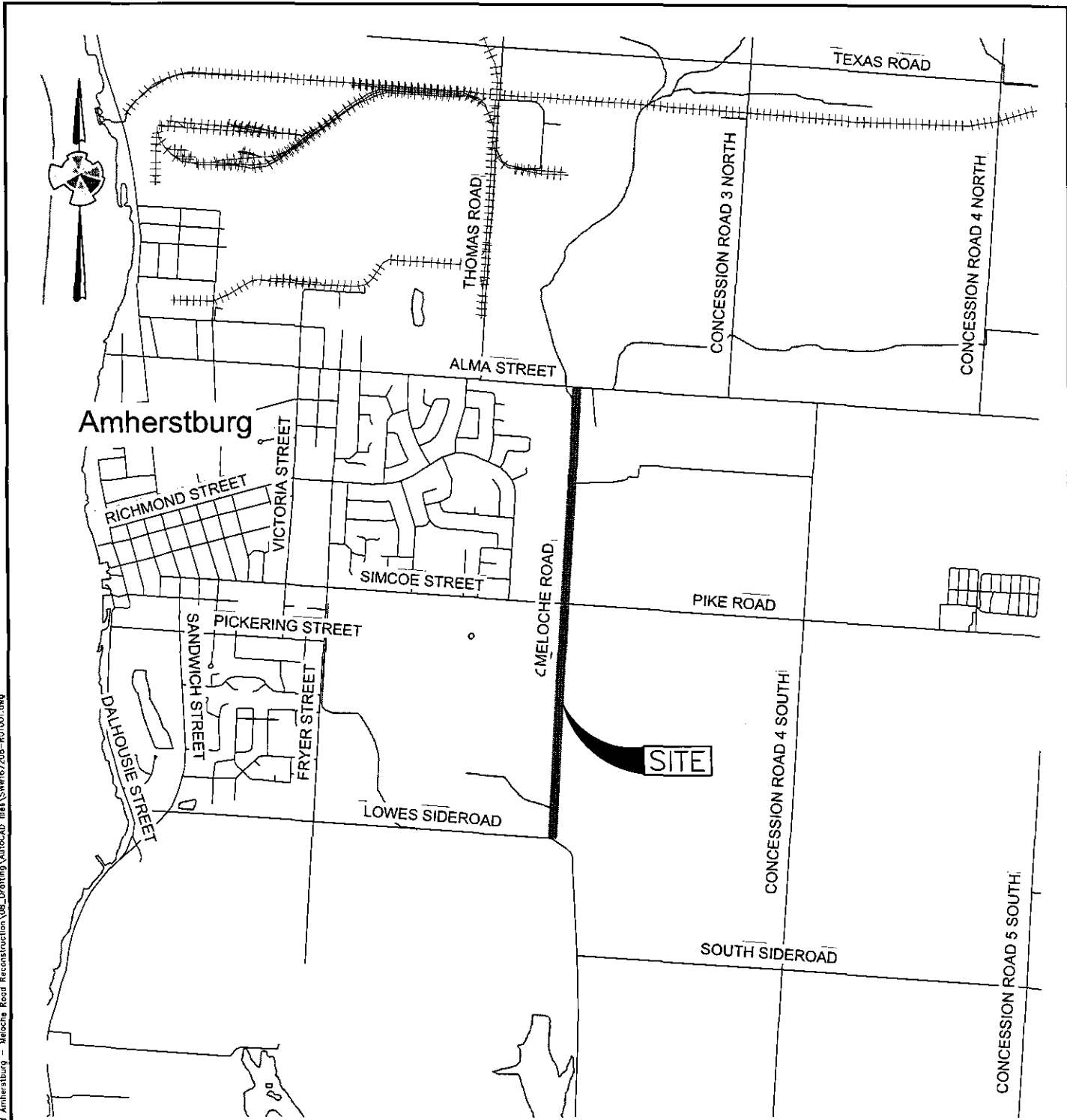
** Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act* - Generic Site Condition Standards (SCS)

for Shallow Soils in a Potable Ground Water Condition - Industrial/Commercial/ Community Property Use, Coarse Textured Soil, dated April 15, 2011

0.7	Concentration exceeds Table 1 SCS
0.7	Concentration exceeds Table 1 SCS and Table 7 SCS



FIGURES

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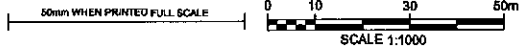
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REFERENCES:
 CANMAP STREETFILES V2008.4.

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Amec Foster Wheeler Environment & Infrastructure 11865 COUNTY ROAD 42 TECUMSEH, ONTARIO N8N 2M1 519-735-2499					
DATUM: NAD83 DWN BY: SJL CHK'D BY: SM		PROJECTION: UTM Zone 17 REV. No: 0 SCALE: 1:30000		DATE: JUNE 16, 2016 PROJECT No: SWW167208 FIGURE No: 1	



LEGEND:
 BOREHOLE LOCATION



NOTES:
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 ALL LOCATIONS ARE APPROXIMATE.

REFERENCES:
 2015 AERIAL PHOTOGRAPHS BY THE COUNTY OF ESSEX; CANMAP STREETFILES V2008.4.

CLIENT: **THE TOWN OF AMHERSTBURG**
 271 SANDWICH STREET SOUTH
 AMHERSTBURG, ONTARIO, N9V 2A5

Amec Foster Wheeler
 Environment & Infrastructure
 11885 COUNTY ROAD 42
 TECUMSEH, ONTARIO
 N9N 2M1
 519-735-2499



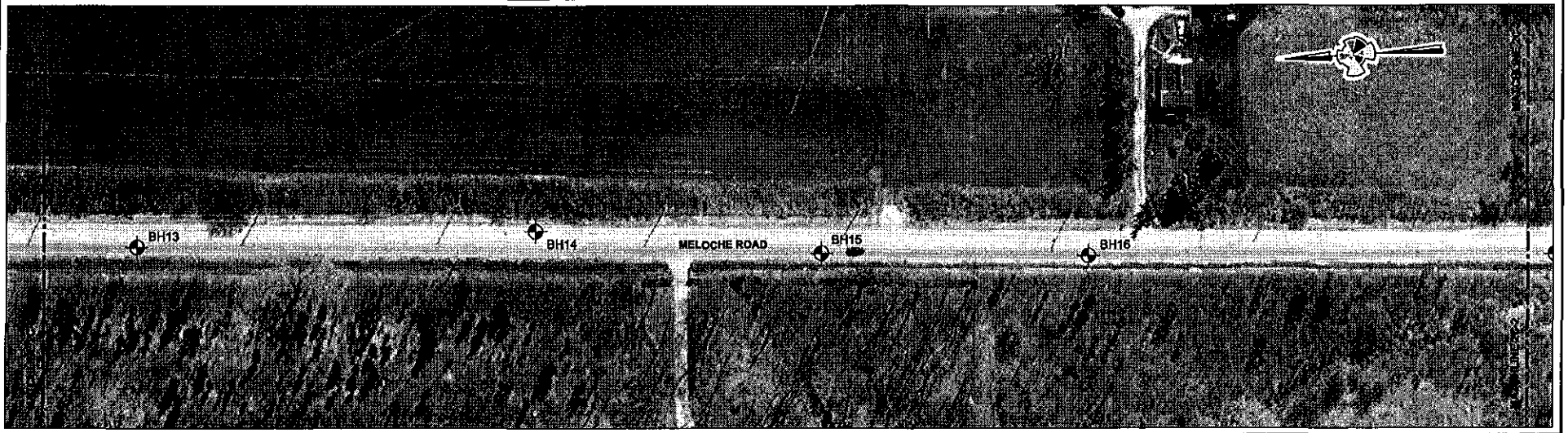
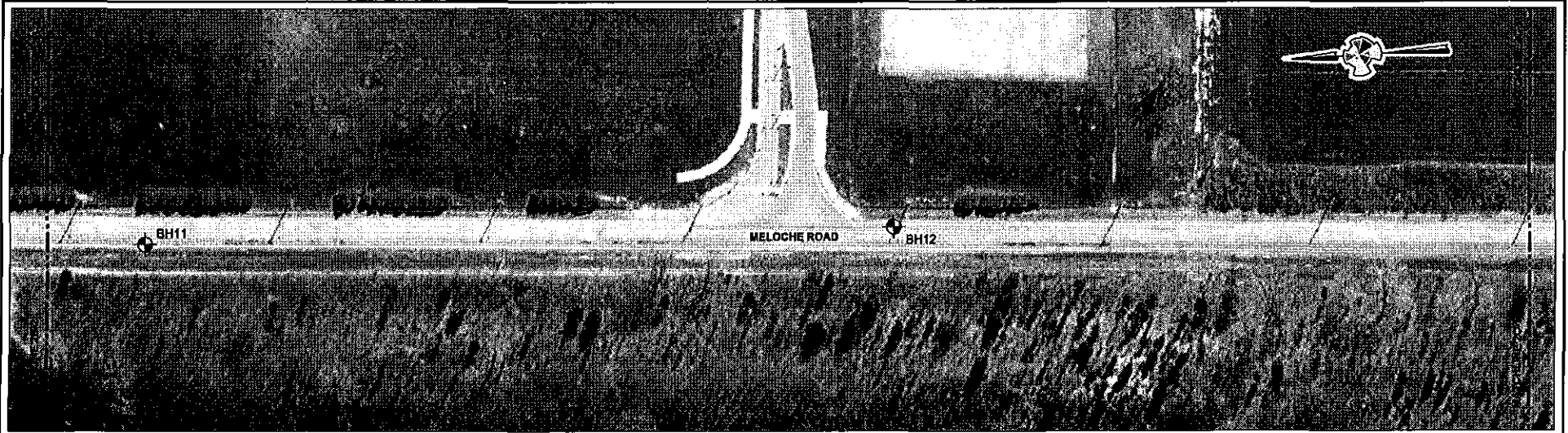
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 CHKD BY: SM
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 MELOCHE ROAD RECONSTRUCTION BETWEEN
 ALMA STREET AND LOWES SIDEROAD
 AMHERSTBURG, ONTARIO**

TITLE: **BOREHOLE LOCATION PLAN**

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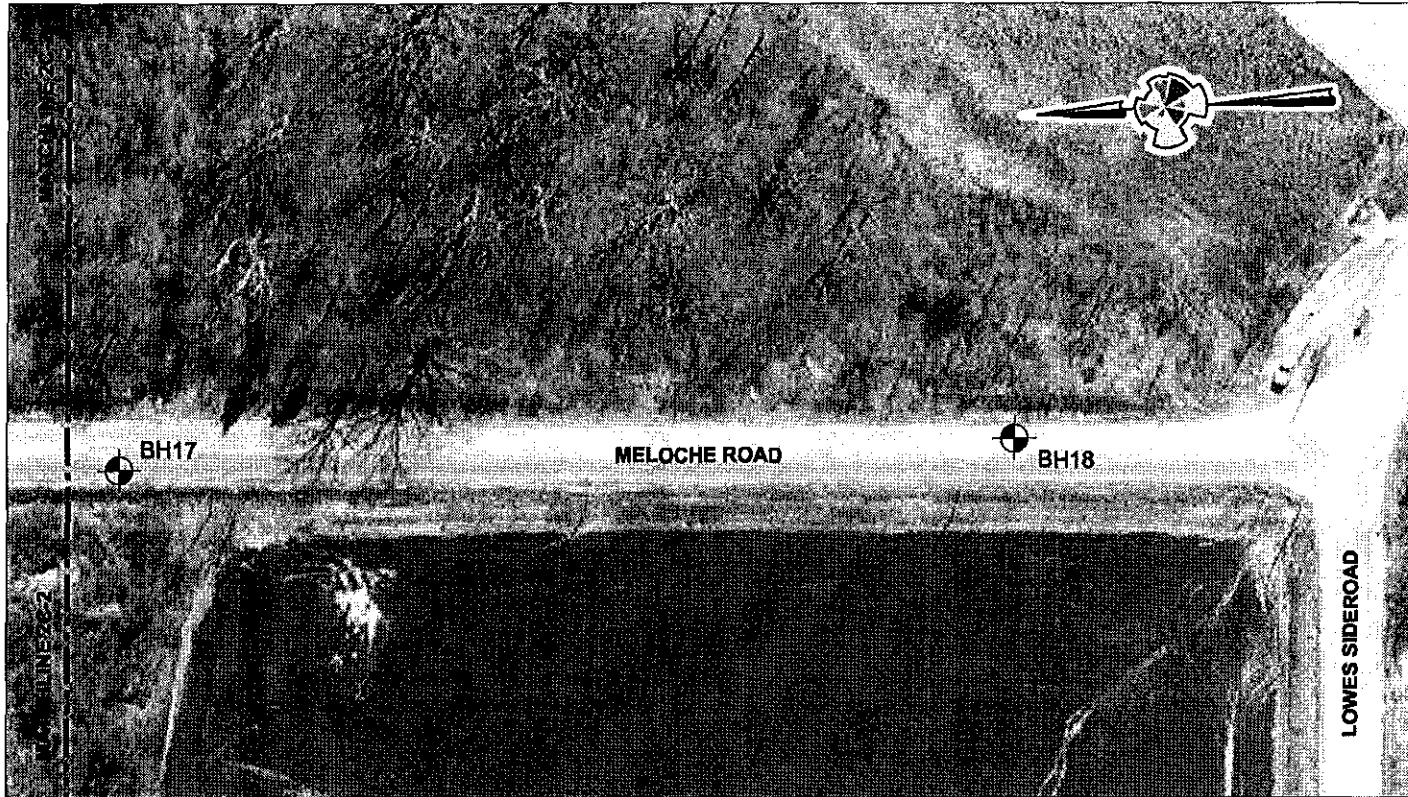
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NOTES:
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 ALL LOCATIONS ARE APPROXIMATE.
REFERENCES:
 2015 AERIAL PHOTOGRAPHS BY THE COUNTY OF ESSEX; CANMAP STREETFILES V2008.4.

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 TECUMSEH, ONTARIO
 N9N 2M1
 518-735-2499



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 BOREHOLE LOCATION

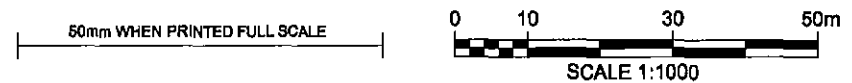
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Amec Foster Wheeler Environment & Infrastructure 11865 COUNTY ROAD 42 TECUMSEH, ONTARIO N8N 2M1 519-735-2499		CHK'D BY: SM		PROJECT No: SWW167208
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APPENDIX A
BOREHOLE LOGS
(BH9, BH11, BH12, BH14, BH17 & BH18)

RECORD OF BOREHOLE No. BH9

Project Number: SWW167208 Drilling Method: Solid Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 14 Jun 2016 Date Completed: 14 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4662848, E327788 Reviewed by: SM Revision No.: 1



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Lithology Plot	LITHOLOGY PROFILE	SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING	LAB TESTING	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value			Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ○ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests) 20 40 60 80	Atterberg Limits W _p W _L W _p W _L Plastic Liquid × Passing 75 µm (%) ○ Moisture Content (%) + Unit Weight (KN/m ³) 20 40 60 80		
	Local Ground Surface Elevation: ASPHALT (150mm thick)										
	CRUSHED GRANULAR FILL (355mm thick) 0.2										
	SILTY CLAY Trace sand, trace gravel Brown Stiff										
	Weathered	SS	1	100	8	1	○				
	Very stiff										
		SS	2	100	24	2	○	○10			
	END OF BOREHOLE (auger refusal, spoon refusal) 2.3	SS	3	100	25mm						-rock in tip of spoon
						3					
						4					
						5					
						6					
						7					

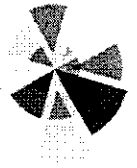
**Amec Foster Wheeler
Environment & Infrastructure**
 11865 County Road 42
 Tecumseh, ON N8N 2M1
 Tel: 519-735-2499
 Fax: 519-735-9669
 www.amecfw.com

☑ No freestanding groundwater observed in open borehole upon completion of drilling.

Borehole details, as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretive assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying "Explanation of Borehole Log".

RECORD OF BOREHOLE No. BH11

Project Number: SWW167208 Drilling Method: Solid Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 14 Jun 2016 Date Completed: 14 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4662524, E327769 Reviewed by: SM Revision No.: 1



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wheeler

LITHOLOGY PROFILE		SOIL SAMPLING				FIELD TESTING		LAB TESTING				INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)				
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ◊ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests)		Atterberg Limits W _p — W — W _L Plastic — Liquid × Passing 75 µm (%) ○ Moisture Content (%) * Unit Weight (kNm ³)				GR	SA	SI	CL
	Local Ground Surface Elevation:																
	ASPHALT (75mm thick)																
	CRUSHED GRANULAR FILL (230mm thick)	0.1															
	SILTY CLAY Trace sand, organics Brown Very stiff	0.3															
		SS	1	100	17	1			○			○ 16					
		SS	2	100	>17/25mm							○ 8					
	END OF BOREHOLE (spoon refusal)	1.8				2											
						3											
						4											
						5											
						6											

**Amec Foster Wheeler
Environment & Infrastructure**
 11865 County Road 42
 Tecumseh, ON N8N 2M1
 Tel: 519-735-2499
 Fax: 519-735-9669
 www.amecfw.com

No freestanding groundwater observed in open borehole upon completion of drilling.

Borehole details, as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretive assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Borehole Log'.

RECORD OF BOREHOLE No. BH12

Project Number: SWW167208 Drilling Method: Solid Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Mejoche Road Sewer and Road Reconstruction Date Started: 14 Jun 2016 Date Completed: 14 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4662330, E327758 Reviewed by: SM Revision No.: 1



Lithology Plot	LITHOLOGY PROFILE	SOIL SAMPLING				DEPTH (m)	ELEVATION (m)	FIELD TESTING	LAB TESTING	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value			Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ◇ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P, Penetrometer tests) 20 40 60 80	Atterberg Limits W _L W _P W _U Plastic Liquid × Passing 75 um (%) ○ Moisture Content (%) * Unit Weight (kN/m ³) 20 40 60 80		
	Local Ground Surface Elevation:										
	ASPHALT (100m thick)										
	CRUSHED GRANULAR FILL (230mm thick) 0,1										
	SILTY CLAY Trace sand, organics Mottled brown and grey Firm										
	Stiff	SS	1	100	7	1	○	○15			
	Weathered	SS	2	100	14	2	○	○13			
	Brown Very stiff										
	Fissured Oxidized	SS	3	100	18	3	○	○12			
	Hard	SS	4	100	29	4	○	○11			
	Hard	SS	5	100	58	4	○	○10			>50 blows/25mm
	END OF BOREHOLE (auger refusal, spoon refusal) 4.3										
						5					
						6					
						7					

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☑ No freestanding groundwater observed in open borehole upon completion of drilling.

Borehole details, as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretive assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Borehole Log'.

Page: 1 of 1

RECORD OF BOREHOLE No. BH14

Project Number: SWW167208 Drilling Method: 100 mm O.D. Hollow Stem Auger
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 15 Jun 2016 Date Completed: 15 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4662039, E327742 Reviewed by: SM Revision No.: 1



LITHOLOGY PROFILE		SOIL SAMPLING				FIELD TESTING		LAB TESTING		INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ○ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests) 20 40 60 80	Atterberg Limits W _p W _L Plastic Liquid * Passing 75 µm (%) ○ Moisture Content (%) * Unit Weight (KN/m ³) 20 40 60 80		
	Local Ground Surface Elevation:										
	ASPHALT (100mm thick)										
	CRUSHED GRANULAR FILL (405mm thick)	0.1									
	SILTY CLAY Trace sand, trace gravel Mottled brown and grey Firm	0.5									
	Stiff	SS	1	71	7	1		○	○18		
	Brown Very stiff	SS	2	87	8	2		○	○19		
	Sand pockets and layers	SS	3	100	20	3		○	○16		
		SS	4	100	21			○	○12		2.2 26.1 49.5 22.3
		SS	5	100	29	4		○	○12		
		SS	6	100	23			○	○12		
	END OF BOREHOLE (no refusal)	5.0				5					
						6					
						7					

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∇ No freestanding groundwater observed in open borehole upon completion of drilling.

Borehole details, as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretive assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Borehole Log'.

RECORD OF BOREHOLE No. BH17

Project Number: SWW167208 Drilling Method: 100 mm O.D. Hollow Stem Augers
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 15 Jun 2016 Date Completed: 15 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4661776, E327723 Reviewed by: SM Revision No.: 1



amec
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wheeler

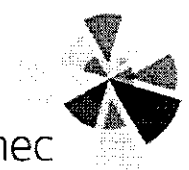
LITHOLOGY PROFILE		SOIL SAMPLING				FIELD TESTING		LAB TESTING				INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)					
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ◇ Intact ▲ Remould ◆ Remould ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests) 20 40 60 80		Atterberg Limits W _p W _L W _U Plastic Liquid * Passing 75 µm (%) ○ Moisture Content (%) * Unit Weight (kN/m ³) 20 40 60 80				GR	SA	SI	CL	
		Local Ground Surface Elevation: ASPHALT (100mm thick)																
	CRUSHED GRANULAR FILL (585mm thick) 0.1																	
	SILTY CLAY Some sand, organics Mottled brown and grey Stiff 0.7	SS	1	100	8	1	○			○11								
	Firm																	
	Wood fibers	SS	2	100	4	2	○			○15								
		SS	3	89	4		○			○20								
	Brown Very stiff	SS	4	100	20	3	○			○10								
	Hard	SS	5	100	36	4	○			○9								
	Grey Very stiff	SS	6	89	17		○			○13								
	END OF BOREHOLE (no refusal) 5.0					5												
						6												
						7												

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☒ No freestanding groundwater observed in open borehole upon completion of drilling.

Borehole details, as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretive assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying "Explanation of Borehole Log".

RECORD OF BOREHOLE No. BH18



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wheeler

Project Number: SWW167208 Drilling Method: 100 mm O.D. Hollow Stem Augers
 Project Client: Town of Amherstburg Drilling Machine: CME 55
 Project Name: Meloche Road Sewer and Road Reconstruction Date Started: 15 Jun 2016 Date Completed: 15 Jun 2016
 Project Location: Amherstburg, Ontario Logged by: SS Compiled by: SS
 Drilling Location: N4661653, E327718 Reviewed by: SM Revision No.: 1

Lithology Plot	LITHOLOGY PROFILE		SOIL SAMPLING				FIELD TESTING		LAB TESTING				INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)	
	DESCRIPTION	DEPTH (m)	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	W _p	W	W _L	Plastic			Liquid
	Local Ground Surface Elevation:														
	ASPHALT (100mm thick)														
	CRUSHED GRANULAR FILL (355mm thick)	0.1													
	SILTY CLAY Trace sand, trace gravel Brown Stiff	0.5													
	Very stiff		SS	1	89	10	1								
	Oxidized		SS	2	100	20	2								
	Hard		SS	3	100	27	3								
	Grey Very stiff		SS	4	100	34	4								
	END OF BOREHOLE (no refusal)	5.0	SS	5	100	21	5								
							6								
							7								

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No freestanding groundwater observed in open borehole upon completion of drilling.

Borehole details, as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretive assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying "Explanation of Borehole Log".



APPENDIX B
LABORATORY CERTIFICATES OF ANALYSIS

Certificate of Analysis

Amec Foster Wheeler (Windsor)

11865 County Road 42
Tecumseh, ON N8N 2M1
Attn: Cindy McKee

Client PO:
Project: SWW167208.1000
Custody: 23961

Report Date: 21-Jun-2016
Order Date: 16-Jun-2016

Order #: 1625321

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Parcel ID	Client ID
1625321-01	BH9 SS1
1625321-02	BH11 SS2
1625321-03	BH12 SS1
1625321-04	BH14 SS3
1625321-05	BH17 SS1
1625321-06	BH18 SS3
1625321-07	Dup-S1

Approved By:



Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis
Client: Amec Foster Wheeler (Windsor)
Client PO:

Report Date: 21-Jun-2016
Order Date: 16-Jun-2016
Project Description: SWW167208.1000

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	20-Jun-16	20-Jun-16
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	16-Jun-16	21-Jun-16
Conductivity	MOE E3138 - probe @25 °C, water ext	18-Jun-16	18-Jun-16
Cyanide, free	MOE E3015 - Auto Colour, water extraction	16-Jun-16	20-Jun-16
Mercury by CVAA	EPA 7471B - CVAA, digestion	17-Jun-16	17-Jun-16
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	16-Jun-16	17-Jun-16
PHC F1	CWS Tier 1 - P&T GC-FID	16-Jun-16	21-Jun-16
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	17-Jun-16	20-Jun-16
REG 153: Metals by ICP/OES, soil	based on MOE E3470, ICP-OES	17-Jun-16	17-Jun-16
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	16-Jun-16	21-Jun-16
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	16-Jun-16	21-Jun-16
SAR	Calculation	20-Jun-16	20-Jun-16
Solids, %	Gravimetric, calculation	16-Jun-16	16-Jun-16

Certificate of Analysis
Client: Amec Foster Wheeler (Windsor)
Client PO:

Report Date: 21-Jun-2016
Order Date: 16-Jun-2016

Project Description: SWW167208.1000

Client ID:	BH9 SS1	BH11 SS2	BH12 SS1	BH14 SS3
Sample Date:	14-Jun-16	14-Jun-16	14-Jun-16	15-Jun-16
Sample ID:	1625321-01	1625321-02	1625321-03	1625321-04
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	86.7	90.3	81.7	83.5
----------	--------------	------	------	------	------

General Inorganics

SAR	0.01 N/A	5.02	0.99	2.42	1.05
Conductivity	5 uS/cm	1260	894	1970	480
Cyanide, free	0.03 ug/g dry	<0.03	<0.03	<0.03	<0.03
pH	0.05 pH Units	7.40	7.62	7.32	7.72

Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	7.3	7.3	11.0	6.8
Barium	1.0 ug/g dry	48.8	65.1	102	82.7
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Boron	1.0 ug/g dry	8.2	12.9	12.2	16.3
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 ug/g dry	15.0	15.0	29.3	18.1
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	7.7	8.9	13.9	12.1
Copper	1.0 ug/g dry	19.1	21.2	26.9	23.6
Lead	1.0 ug/g dry	10.0	10.6	14.9	12.9
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	2.6	6.1	2.4	3.1
Nickel	1.0 ug/g dry	20.6	21.7	37.4	24.0
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	1.0 ug/g dry	21.3	21.6	41.8	26.7
Zinc	1.0 ug/g dry	40.4	45.1	65.1	48.7

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis
Client: Amec Foster Wheeler (Windsor)
Client PO:

Report Date: 21-Jun-2016
Order Date: 16-Jun-2016
Project Description: SWW167208.1000

	Client ID: Sample Date: Sample ID:	BH9 SS1 14-Jun-16 1625321-01 Soil	BH11 SS2 14-Jun-16 1625321-02 Soil	BH12 SS1 14-Jun-16 1625321-03 Soil	BH14 SS3 15-Jun-16 1625321-04 Soil
	MDL/Units				
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylene dibromide (dibromoethane)	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis
Client: Amec Foster Wheeler (Windsor)
Client PO:

Report Date: 21-Jun-2016
Order Date: 16-Jun-2016

Project Description: SWW167208.1000

	Client ID:	BH9 SS1	BH11 SS2	BH12 SS1	BH14 SS3
	Sample Date:	14-Jun-16	14-Jun-16	14-Jun-16	15-Jun-16
	Sample ID:	1625321-01	1625321-02	1625321-03	1625321-04
	MDL/Units	Soil	Soil	Soil	Soil
4-Bromofluorobenzene	Surrogate	89.9%	91.1%	91.6%	91.2%
Dibromofluoromethane	Surrogate	104%	104%	104%	104%
Toluene-d8	Surrogate	105%	104%	105%	105%

Hydrocarbons

	MDL/Units	BH9 SS1	BH11 SS2	BH12 SS1	BH14 SS3
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	<6

Semi-Volatiles

	MDL/Units	BH9 SS1	BH11 SS2	BH12 SS1	BH14 SS3
Acenaphthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Acenaphthylene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [a] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [a] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Chrysene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Fluorene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	<0.04	<0.04
Naphthalene	0.01 ug/g dry	<0.01	<0.01	<0.01	<0.01
Phenanthrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
2-Fluorobiphenyl	Surrogate	52.7%	53.9%	52.8%	50.3%
Terphenyl-d14	Surrogate	91.0%	81.5%	96.9%	69.5%

Certificate of Analysis
Client: Amec Foster Wheeler (Windsor)
Client PO:

Report Date: 21-Jun-2016
Order Date: 16-Jun-2016
Project Description: SWW167208.1000

	Client ID:	BH17 SS1	BH18 SS3	Dup-S1	-
	Sample Date:	15-Jun-16	15-Jun-16	14-Jun-16	-
	Sample ID:	1625321-05	1625321-06	1625321-07	-
	MDL/Units	Soil	Soil	Soil	-

Physical Characteristics

% Solids	0.1 % by Wt.	86.5	89.4	84.2	-
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General Inorganics

SAR	0.01 N/A	3.56	0.89	5.70	-
Conductivity	5 uS/cm	1660	457	1390	-
Cyanide, free	0.03 ug/g dry	<0.03	<0.03	<0.03	-
pH	0.05 pH Units	7.36	7.69	7.53	-

Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Arsenic	1.0 ug/g dry	11.8	7.7	9.7	-
Barium	1.0 ug/g dry	61.2	74.0	83.6	-
Beryllium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Boron	1.0 ug/g dry	9.7	16.0	12.3	-
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Chromium	1.0 ug/g dry	18.5	17.0	20.6	-
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	-
Cobalt	1.0 ug/g dry	11.1	9.9	10.3	-
Copper	1.0 ug/g dry	22.8	22.7	27.4	-
Lead	1.0 ug/g dry	17.7	11.7	13.2	-
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	-
Molybdenum	1.0 ug/g dry	4.0	5.3	3.1	-
Nickel	1.0 ug/g dry	22.1	21.5	26.1	-
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Silver	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Vanadium	1.0 ug/g dry	30.8	24.2	30.7	-
Zinc	1.0 ug/g dry	63.6	48.2	57.7	-

Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	-
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	-

Certificate of Analysis
Client: Amec Foster Wheeler (Windsor)
Client PO:

Report Date: 21-Jun-2016
Order Date: 16-Jun-2016

Project Description: SWW167208.1000

	Client ID:	BH17 SS1	BH18 SS3	Dup-S1	
	Sample Date:	15-Jun-16	15-Jun-16	14-Jun-16	
	Sample ID:	1625321-05	1625321-06	1625321-07	
	MDL/Units	Soil	Soil	Soil	
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Ethylene dibromide (dibromoethane)	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-

Certificate of Analysis
Client: Amec Foster Wheeler (Windsor)
Client PO:

Report Date: 21-Jun-2016
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	Client ID:	BH17 SS1	BH18 SS3	Dup-S1	-
	Sample Date:	15-Jun-16	15-Jun-16	14-Jun-16	-
	Sample ID:	1625321-05	1625321-06	1625321-07	-
	MDL/Units	Soil	Soil	Soil	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	-
4-Bromofluorobenzene	Surrogate	91.8%	90.6%	91.4%	-
Dibromofluoromethane	Surrogate	105%	105%	105%	-
Toluene-d8	Surrogate	105%	104%	103%	-

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	-
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	<8	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	-

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Acenaphthylene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Benzo [a] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Benzo [a] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Chrysene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Fluorene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	<0.04	-
Naphthalene	0.01 ug/g dry	<0.01	<0.01	<0.01	-
Phenanthrene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
2-Fluorobiphenyl	Surrogate	56.8%	55.8%	51.3%	-
Terphenyl-d14	Surrogate	100%	85.2%	92.9%	-

Certificate of Analysis
Client: Amec Foster Wheeler (Windsor)
Client PO:

Report Date: 21-Jun-2016
Order Date: 16-Jun-2016
Project Description: SWW167208.1000

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Conductivity	ND	5	uS/cm						
Cyanide, free	ND	0.03	ug/g						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	1.0	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	1.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	1.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	1.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	1.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.5	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	1.0	ug/g						
Zinc	ND	1.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	0.889		ug/g		66.7	50-140			
Surrogate: Terphenyl-d14	1.16		ug/g		87.1	50-140			
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						

Certificate of Analysis
Client: Amec Foster Wheeler (Windsor)
Client PO:

Report Date: 21-Jun-2016
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Project Description: SWW167208.1000

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane)	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	7.40		ug/g		92.5	50-140			
Surrogate: Dibromofluoromethane	7.47		ug/g		93.4	50-140			
Surrogate: Toluene-d8	8.42		ug/g		105	50-140			

Certificate of Analysis
Client: Amec Foster Wheeler (Windsor)
Client PO:

Report Date: 21-Jun-2016
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Project Description: SWW167208.1000

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	4.89	0.01	N/A	5.02			2.6	200	
Conductivity	1260	5	uS/cm	1260			0.4	6.2	
Cyanide, free	ND	0.03	ug/g dry	ND				35	
pH	7.66	0.05	pH Units	7.67			0.1	10	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND				30	
F3 PHCs (C16-C34)	68	8	ug/g dry	101			39.3	30	QR-01
F4 PHCs (C34-C50)	50	6	ug/g dry	60			18.1	30	
Metals									
Antimony	ND	1.0	ug/g dry	ND			0.0	30	
Arsenic	6.60	1.0	ug/g dry	7.33			10.4	30	
Barium	49.0	1.0	ug/g dry	48.8			0.4	30	
Beryllium	ND	1.0	ug/g dry	ND			0.0	30	
Boron, available	ND	0.5	ug/g dry	ND			0.0	35	
Boron	9.27	1.0	ug/g dry	8.21			12.1	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	14.3	1.0	ug/g dry	15.0			4.3	30	
Cobalt	7.38	1.0	ug/g dry	7.71			4.4	30	
Copper	19.0	1.0	ug/g dry	19.1			0.5	30	
Lead	10.3	1.0	ug/g dry	10.0			2.5	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	30	
Molybdenum	2.12	1.0	ug/g dry	2.57			19.5	30	
Nickel	21.3	1.0	ug/g dry	20.6			3.5	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.5	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND				30	
Vanadium	21.7	1.0	ug/g dry	21.3			1.8	30	
Zinc	39.0	1.0	ug/g dry	40.4			3.7	30	
Physical Characteristics									
% Solids	86.1	0.1	% by Wt.	86.7			0.7	25	
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	
Chlorobenzene	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Ethylene dibromide (dibromoethane)	ND	0.05	ug/g dry	ND				50	

Certificate of Analysis
Client: Amec Foster Wheeler (Windsor)
Client PO:

Report Date: 21-Jun-2016
Order Date: 16-Jun-2016
Project Description: SWW167208.1000

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND				50	
Trichloroethylene	ND	0.05	ug/g dry	ND				50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	ND	0.05	ug/g dry	ND				50	
Surrogate: 4-Bromofluorobenzene	5.48		ug/g dry	ND	93.2	50-140			
Surrogate: Dibromofluoromethane	5.74		ug/g dry	ND	97.7	50-140			
Surrogate: Toluene-d8	6.20		ug/g dry	ND	106	50-140			

Certificate of Analysis
Client: Amec Foster Wheeler (Windsor)
Client PO:

Report Date: 21-Jun-2016
Order Date: 16-Jun-2016

Project Description: SWW167208.1000

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Cyanide, free	0.239	0.03	ug/g	ND	79.6	70-130			
Hydrocarbons									
F1 PHCs (C6-C10)	187	7	ug/g	ND	93.5	80-120			
F2 PHCs (C10-C16)	95	4	ug/g	ND	88.0	60-140			
F3 PHCs (C16-C34)	218	8	ug/g	ND	98.1	60-140			
F4 PHCs (C34-C50)	160	6	ug/g	ND	108	60-140			
Metals									
Antimony	270		ug/L	6.40	106	70-130			
Arsenic	393		ug/L	147	98.6	70-130			
Barium	1310		ug/L	975	134	70-130			QM-07
Beryllium	250		ug/L	2.08	99.1	70-130			
Boron, available	3.07	0.5	ug/g	ND	61.4	70-122			QM-07
Boron	239		ug/L	ND	95.6	70-130			
Cadmium	246		ug/L	2.10	97.6	70-130			
Chromium (VI)	4.7	0.2	ug/g	ND	93.5	70-130			
Chromium	530		ug/L	300	92.1	70-130			
Cobalt	376		ug/L	154	88.6	70-130			
Copper	626		ug/L	383	97.5	70-130			
Lead	410		ug/L	201	83.7	70-130			
Mercury	1.42	0.1	ug/g	ND	95.0	70-130			
Molybdenum	276		ug/L	51.4	89.6	70-130			
Nickel	659		ug/L	412	98.7	70-130			
Selenium	239		ug/L	ND	95.7	70-130			
Silver	224		ug/L	0.20	89.4	70-130			
Thallium	242		ug/L	3.52	95.6	70-130			
Uranium	293		ug/L	ND	117	70-130			
Vanadium	698		ug/L	427	109	70-130			
Zinc	1010		ug/L	809	81.6	70-130			
Semi-Volatiles									
Acenaphthene	0.117	0.02	ug/g	ND	70.4	50-140			
Acenaphthylene	0.093	0.02	ug/g	ND	55.6	50-140			
Anthracene	0.123	0.02	ug/g	ND	73.6	50-140			
Benzo [a] anthracene	0.106	0.02	ug/g	ND	63.7	50-140			
Benzo [a] pyrene	0.120	0.02	ug/g	ND	71.8	50-140			
Benzo [b] fluoranthene	0.104	0.02	ug/g	ND	62.2	50-140			
Benzo [g,h,i] perylene	0.140	0.02	ug/g	ND	83.7	50-140			
Benzo [k] fluoranthene	0.113	0.02	ug/g	ND	67.8	50-140			
Chrysene	0.116	0.02	ug/g	ND	69.3	50-140			
Dibenzo [a,h] anthracene	0.133	0.02	ug/g	ND	79.7	50-140			
Fluoranthene	0.108	0.02	ug/g	ND	64.9	50-140			
Fluorene	0.129	0.02	ug/g	ND	77.4	50-140			
Indeno [1,2,3-cd] pyrene	0.120	0.02	ug/g	ND	72.0	50-140			
1-Methylnaphthalene	0.139	0.02	ug/g	ND	83.7	50-140			
2-Methylnaphthalene	0.142	0.02	ug/g	ND	85.0	50-140			
Naphthalene	0.115	0.01	ug/g	ND	68.8	50-140			
Phenanthrene	0.117	0.02	ug/g	ND	70.5	50-140			
Pyrene	0.119	0.02	ug/g	ND	71.2	50-140			
Surrogate: 2-Fluorobiphenyl	0.777		ug/g		58.3	50-140			
Volatiles									
Acetone	10.7	0.50	ug/g	ND	107	50-140			

Certificate of Analysis
Client: Amec Foster Wheeler (Windsor)
Client PO:

Report Date: 21-Jun-2016
Order Date: 16-Jun-2016
Project Description: SWW167208.1000

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzene	3.98	0.02	ug/g	ND	99.5	60-130			
Bromodichloromethane	4.29	0.05	ug/g	ND	107	60-130			
Bromofom	4.28	0.05	ug/g	ND	107	60-130			
Bromomethane	2.61	0.05	ug/g	ND	65.3	50-140			
Carbon Tetrachloride	4.03	0.05	ug/g	ND	101	60-130			
Chlorobenzene	3.74	0.05	ug/g	ND	93.4	60-130			
Chloroform	4.34	0.05	ug/g	ND	109	60-130			
Dibromochloromethane	4.11	0.05	ug/g	ND	103	60-130			
Dichlorodifluoromethane	2.44	0.05	ug/g	ND	61.1	50-140			
1,2-Dichlorobenzene	3.73	0.05	ug/g	ND	93.3	60-130			
1,3-Dichlorobenzene	4.00	0.05	ug/g	ND	100	60-130			
1,4-Dichlorobenzene	3.91	0.05	ug/g	ND	97.8	60-130			
1,1-Dichloroethane	4.60	0.05	ug/g	ND	115	60-130			
1,2-Dichloroethane	4.32	0.05	ug/g	ND	108	60-130			
1,1-Dichloroethylene	3.85	0.05	ug/g	ND	96.2	60-130			
cis-1,2-Dichloroethylene	3.58	0.05	ug/g	ND	89.5	60-130			
trans-1,2-Dichloroethylene	3.67	0.05	ug/g	ND	91.8	60-130			
1,2-Dichloropropane	4.12	0.05	ug/g	ND	103	60-130			
cis-1,3-Dichloropropylene	3.82	0.05	ug/g	ND	95.5	60-130			
trans-1,3-Dichloropropylene	3.92	0.05	ug/g	ND	97.9	60-130			
Ethylbenzene	3.44	0.05	ug/g	ND	86.1	60-130			
Ethylene dibromide (dibromoethane)	3.89	0.05	ug/g	ND	97.3	60-130			
Hexane	3.34	0.05	ug/g	ND	83.4	60-130			
Methyl Ethyl Ketone (2-Butanone)	10.4	0.50	ug/g	ND	104	50-140			
Methyl Isobutyl Ketone	10.8	0.50	ug/g	ND	108	50-140			
Methyl tert-butyl ether	11.4	0.05	ug/g	ND	114	50-140			
Methylene Chloride	4.13	0.05	ug/g	ND	103	60-130			
Styrene	3.55	0.05	ug/g	ND	88.7	60-130			
1,1,1,2-Tetrachloroethane	4.26	0.05	ug/g	ND	107	60-130			
1,1,2,2-Tetrachloroethane	3.65	0.05	ug/g	ND	91.3	60-130			
Tetrachloroethylene	3.45	0.05	ug/g	ND	86.3	60-130			
Toluene	3.84	0.05	ug/g	ND	96.1	60-130			
1,1,1-Trichloroethane	4.11	0.05	ug/g	ND	103	60-130			
1,1,2-Trichloroethane	4.05	0.05	ug/g	ND	101	60-130			
Trichloroethylene	3.95	0.05	ug/g	ND	98.7	60-130			
Trichlorofluoromethane	3.67	0.05	ug/g	ND	91.7	50-140			
Vinyl chloride	3.69	0.02	ug/g	ND	92.1	50-140			
m,p-Xylenes	7.34	0.05	ug/g	ND	91.7	60-130			
o-Xylene	3.56	0.05	ug/g	ND	89.1	60-130			

Certificate of Analysis

Client: Amec Foster Wheeler (Windsor)

Client PO:

Report Date: 21-Jun-2016

Order Date: 16-Jun-2016

Project Description: SWW167208.1000

Qualifier Notes:

QC Qualifiers :

QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.

Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

APPENDIX C
LIMITATIONS



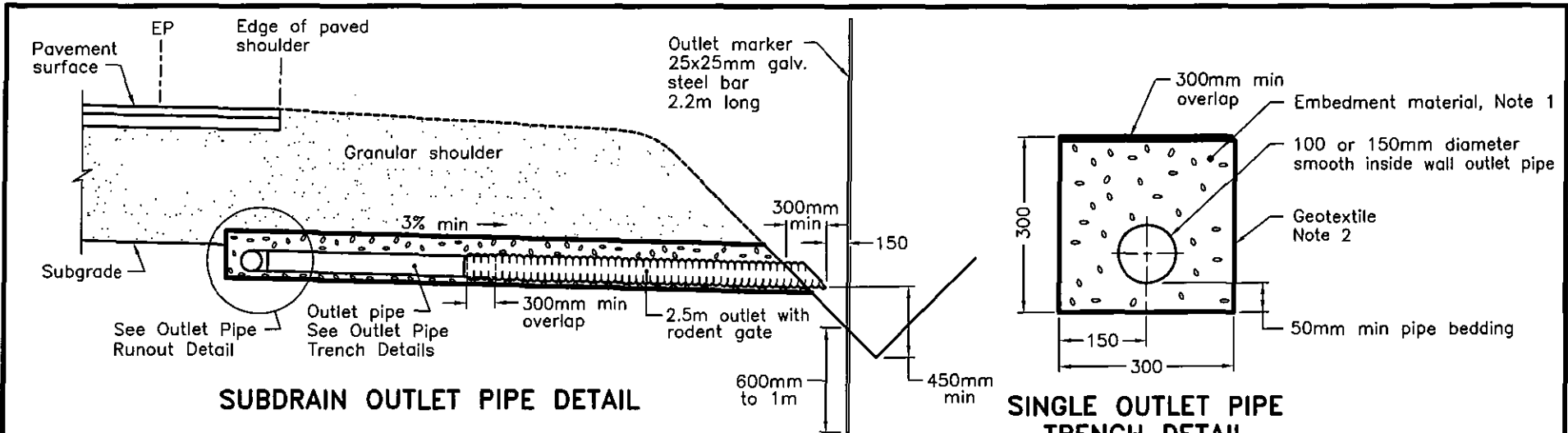
LIMITATIONS

The work performed in the preparation of this report and the conclusions presented are subject to the following:

- (a) The Terms and Conditions which form a part of our Professional Services Contract;
 - (b) The Scope of Services;
 - (c) Time and Budgetary limitations as described in our Contract; and,
 - (d) The Limitations stated herein.
2. No other warranties or representations, either expressed or implied, are made as to the professional services provided under the terms of our Contract, or the conclusions presented.
 3. The conclusions presented in this report were based, in part, on visual observations of the site and attendant structures. Our conclusions cannot and are not extended to include those portions of the site or structures, which were not reasonably available, in Amec Foster Wheeler's opinion, for direct observation.
 4. The environmental conditions at the site were assessed, within the limitations set out above, having due regard for applicable environmental regulations as of the date of the inspection. A review of compliance by past owners or occupants of the site with any applicable local, provincial or federal by-laws, orders-in-council, legislative enactments and regulations was not performed.
 5. The site history research included obtaining information from third parties and employees or agents of the owner. No attempt has been made to verify the accuracy of any information provided, unless specifically noted in our report.
 6. Where testing was performed, it was carried out in accordance with the terms of our contract providing for testing. Other substances, or different quantities of substances testing for, may be present on site and may be revealed by different or other testing not provided for in our contract.
 7. Because of the limitations referred to above, different environmental conditions from those stated in our report may exist. Should such different conditions be encountered, Amec Foster Wheeler must be notified in order that it may determine if modifications to the conclusions in the report are necessary.
 8. The utilization of Amec Foster Wheeler's services during the implementation of any remedial measures will allow Amec Foster Wheeler to observe compliance with the conclusions and recommendations contained in the report. Amec Foster Wheeler's involvement will also allow for changes to be made as necessary to suit field conditions as they are encountered.
 9. This report is for the sole use of the party to whom it is addressed unless expressly stated otherwise in the report or contract. Any use which any third party makes of the report, in whole or the part, or any reliance thereon or decisions made based on any information or conclusions in the report, is the sole responsibility of such third party. Amec Foster Wheeler accepts no responsibility whatsoever for damages or loss of any nature or kind suffered by any such third party as a result of actions taken or not taken or decisions made in reliance on the report or anything set out therein.
 10. This report is not to be given over to any third party for any purpose whatsoever without the written permission of Amec Foster Wheeler.
 11. Provided that the report is still reliable, and less than 12 months old, Amec Foster Wheeler will issue a third-party reliance letter to parties that the client identifies in writing, upon payment of the then current fee for such letters. All third parties relying on Amec Foster Wheeler's report, by such reliance agree to be bound by our proposal and Amec Foster Wheeler's standard reliance letter. Amec Foster Wheeler's standard reliance letter indicates that in no event shall Amec Foster Wheeler be liable for any damages, howsoever arising, relating to third-party reliance on Amec Foster Wheeler's report. No reliance by any party is permitted without such agreement.

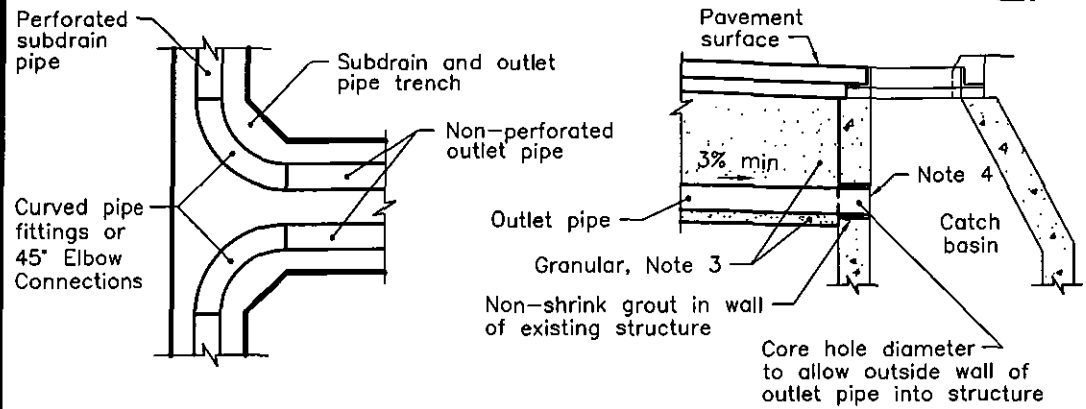
APPENDIX E

SUBDRAIN PIPE CONNECTION AND OUTLET DETAILS



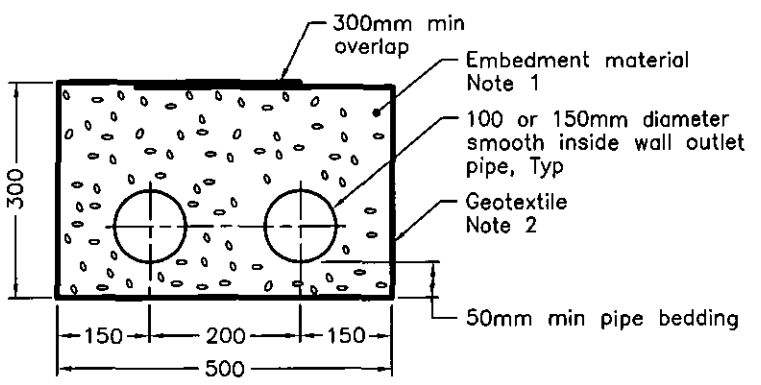
SUBDRAIN OUTLET PIPE DETAIL

SINGLE OUTLET PIPE TRENCH DETAIL



OUTLET PIPE RUNOUT DETAIL

OUTLET PIPE CONNECTION TO CATCH BASIN DETAIL

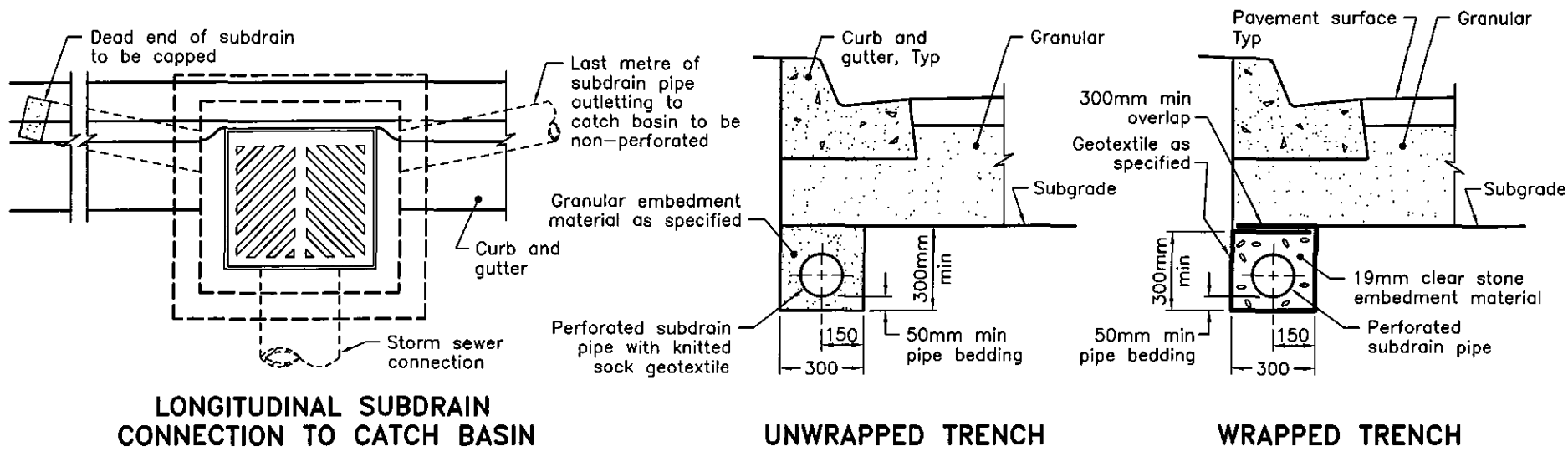


DUAL OUTLET PIPE TRENCH DETAIL

NOTES:

- 1 Embedment material shall be 19mm clear stone or granular as specified.
- 2 Outlet pipe and subdrain trench embedment material shall be wrapped with geotextile.
- 3 For catch basin connections, outlet pipe trenches backfilled with granular do not require geotextile wrap.
- 4 Install outlet pipe flush with inside face of catch basin.
- A Use compatible manufactured fittings for all connectors and couplings.
- B All dimensions are in millimetres unless otherwise shown

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2008	Rev 1	
SUBDRAIN PIPE CONNECTION AND OUTLET	RURAL		
OPSD 206.050			



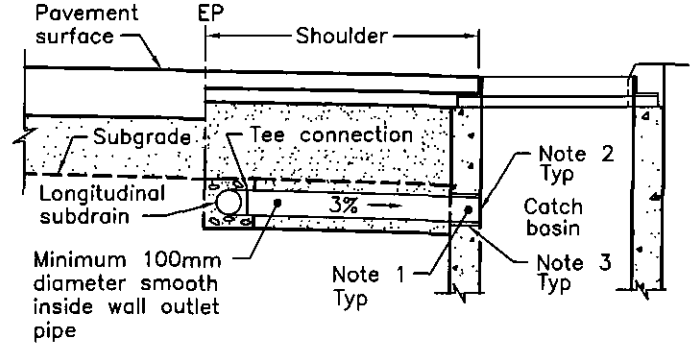
LONGITUDINAL SUBDRAIN CONNECTION TO CATCH BASIN

UNWRAPPED TRENCH


WRAPPED TRENCH

NOTES:

- 1 Core hole diameter to allow outlet pipe into structure.
- 2 Install outlet pipe flush with inside face of catch basin.
- 3 Annular space around pipe to be filled with non-shrink grout.
- A Use compatible manufactured fittings for all connectors, couplings, and caps.
- B Trench dimensions shown to accommodate 100 or 150mm diameter subdrain pipe.
- C Longitudinal subdrain pipe shall be installed parallel to the grade of the gutter.
- D All dimensions are in millimetres unless otherwise shown.



LATERAL SUBDRAIN OUTLET PIPE CONNECTION TO CATCH BASIN

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2008	Rev 2	
SUBDRAIN PIPE CONNECTION AND OUTLET			
URBAN	OPSD 216.021		