

THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 36-2014

FERRY ROAD - RIVERBEND COMBINED SEWER RELIEF CONTRACT NO.3

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 FERRY ROAD - RIVERBEND COMBINED SEWER RELIEF CONTRACT NO.3

B2. SUBMISSION DEADLINE

- B2.1 The Submission Deadline is 12:00 noon Winnipeg time, February 11, 2014.
- B2.2 Bids determined by the Manager of Materials to have been received later than the Submission Deadline will not be accepted and will be returned upon request.
- B2.3 The Contract Administrator or the Manager of Materials may extend the Submission Deadline by issuing an addendum at any time prior to the time and date specified in B2.1.

B3. SITE INVESTIGATION

B3.1 Further to C3.1, the Bidder may view the Site without making an appointment.

B4. ENQUIRIES

- B4.1 All enquiries shall be directed to the Contract Administrator identified in D3.1.
- B4.2 If the Bidder finds errors, discrepancies or omissions in the Bid Opportunity, or is unsure of the meaning or intent of any provision therein, the Bidder shall notify the Contract Administrator of the error, discrepancy or omission, or request a clarification as to the meaning or intent of the provision at least five (5) Business Days prior to the Submission Deadline.
- B4.3 Responses to enquiries which, in the sole judgment of the Contract Administrator, require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator to all Bidders by issuing an addendum.
- B4.4 Responses to enquiries which, in the sole judgment of the Contract Administrator, do not require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator only to the Bidder who made the enquiry.
- B4.5 The Bidder shall not be entitled to rely on any response or interpretation received pursuant to B4 unless that response or interpretation is provided by the Contract Administrator in writing.

B5. ADDENDA

- B5.1 The Contract Administrator may, at any time prior to the Submission Deadline, issue addenda correcting errors, discrepancies or omissions in the Bid Opportunity, or clarifying the meaning or intent of any provision therein.
- B5.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.
- B5.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <u>http://www.winnipeg.ca/matmgt/bidopp.asp</u>
- B5.2.2 The Bidder is responsible for ensuring that he/she has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.
- B5.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

B6. SUBSTITUTES

- B6.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.
- B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.
- B6.4 The Bidder shall ensure that any and all requests for approval of a substitute:
 - (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
 - (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
 - (c) identify any anticipated cost or time savings that may be associated with the substitute;
 - (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance;
 - (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule and the dates specified in the Supplemental Conditions for Substantial Performance and Total Performance.
- B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his/her sole discretion grant approval for the use of a substitute as an "approved equal" or as an "approved alternative", or may refuse to grant approval of the substitute.
- B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, only to the Bidder who requested approval of the substitute.
- B6.6.1 The Bidder requesting and obtaining the approval of a substitute shall be entirely responsible for disseminating information regarding the approval to any person or persons he/she wishes to inform.
- B6.7 If the Contract Administrator approves a substitute as an "approved equal", any Bidder may use the approved equal in place of the specified item.
- B6.8 If the Contract Administrator approves a substitute as an "approved alternative", any Bidder bidding that approved alternative may base his/her Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B15.
- B6.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.
- B6.10 Notwithstanding B6.2 to B6.9, and in accordance with B7.6 deviations inconsistent with the Bid Opportunity document shall be evaluated in accordance with B15.1(a).

B7. BID COMPONENTS

B7.1 The Bid shall consist of the following components:

- (a) Form A: Bid;
- (b) Form B: Prices;
- (c) Bid Security
 - Form G1: Bid Bond and Agreement to Bond, or Form G2: Irrevocable Standby Letter of Credit and Undertaking, or a certified cheque or draft;
- B7.2 Further to B7.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B6.
- B7.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely, to constitute a responsive Bid.
- B7.4 The Bid shall be submitted enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address.
- B7.4.1 Samples or other components of the Bid which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid.
- B7.5 Bidders are advised not to include any information/literature except as requested in accordance with B7.1.
- B7.6 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, will be evaluated in accordance with B15.1(a).
- B7.7 Bids submitted by facsimile transmission (fax) or internet electronic mail (e-mail) will not be accepted.
- B7.8 Bids shall be submitted to:

The City of Winnipeg Corporate Finance Department Materials Management Division 185 King Street, Main Floor Winnipeg MB R3B 1J1

B8. BID

- B8.1 The Bidder shall complete Form A: Bid, making all required entries.
- B8.2 Paragraph 2 of Form A: Bid shall be completed in accordance with the following requirements:
 - (a) if the Bidder is a sole proprietor carrying on business in his/her own name, his/her name shall be inserted;
 - (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
 - (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
 - (d) if the Bidder is carrying on business under a name other than his/her own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.
- B8.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.
- B8.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.
- B8.4 Paragraph 12 of Form A: Bid shall be signed in accordance with the following requirements:

- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, it shall be signed by the Bidder;
- (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
- (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, should be affixed;
- (d) if the Bidder is carrying on business under a name other than his/her own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.
- B8.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.
- B8.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

B9. PRICES

- B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.
- B9.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.
- B9.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.
- B9.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

B10. QUALIFICATION

- B10.1 The Bidder shall:
 - (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba; and
 - (b) be financially capable of carrying out the terms of the Contract; and
 - (c) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract.
- B10.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:
 - (a) be responsible and not be suspended, debarred or in default of any obligations to the City. A list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <u>http://www.winnipeg.ca/matmgt/debar.stm</u>
- B10.3 The Bidder and/or any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:
 - (a) have successfully carried out work similar in nature, scope and value to the Work; and
 - (b) be fully capable of performing the Work required to be in strict accordance with the terms and provisions of the Contract; and
 - (c) have a written workplace safety and health program if required pursuant to The Workplace Safety and Health Act (Manitoba);

- (d) Upon request of the Contract Administrator, obtain Security Clearances in accordance with PART F .
- B10.4 Further to B10.3(c), the Bidder shall, within five (5) Business Days of a request by the Contract Administrator, provide proof satisfactory to the Contract Administrator that the Bidder/Subcontractor has a workplace safety and health program meeting the requirements of The Workplace Safety and Health Act (Manitoba), by providing:
 - (a) a copy of their valid Manitoba COR certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Certificate of Recognition (COR) Program administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY[™] COR[™] Program; or
 - (b) a copy of their valid Manitoba SECOR[™] certificate and Letter of Good Standing (or Manitoba equivalency) as issued under the Small Employer Certificate of Recognition Program (SECOR[™]) administered by the Construction Safety Association of Manitoba or by the Manitoba Heavy Construction Association's WORKSAFELY[™] COR[™] Program; or
 - (c) a report or letter to that effect from an independent reviewer acceptable to the City. (A list of acceptable reviewers and the review template are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <u>http://www.winnipeg.ca/matmgt/</u>).
- B10.5 The Bidder shall submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.
- B10.6 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B11. BID SECURITY

- B11.1 The Bidder shall provide bid security in the form of:
 - (a) a bid bond, in the amount of at least ten percent (10%) of the Total Bid Price, and agreement to bond of a company registered to conduct the business of a surety in Manitoba, in the form included in the Bid Submission (Form G1: Bid Bond and Agreement to Bond); or
 - (b) an irrevocable standby letter of credit, in the amount of at least ten percent (10%) of the Total Bid Price, and undertaking issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form included in the Bid Submission (Form G2: Irrevocable Standby Letter of Credit and Undertaking); or
 - (c) a certified cheque or draft payable to "The City of Winnipeg", in the amount of at least fifty percent (50%) of the Total Bid Price, drawn on a bank or other financial institution registered to conduct business in Manitoba.
- B11.1.1 If the Bidder submits alternative bids, the bid security shall be in the amount of the specified percentage of the highest Total Bid Price submitted.
- B11.1.2 All signatures on bid securities shall be original.
- B11.1.3 The Bidder shall sign the Bid Bond.
- B11.1.4 The Surety shall sign and affix its corporate seal on the Bid Bond and the Agreement to Bond.
- B11.2 The bid security of the successful Bidder and the next two lowest evaluated responsive and responsible Bidders will be released by the City when a Contract for the Work has been duly executed by the successful Bidder and the performance security furnished as provided herein. The bid securities of all other Bidders will be released when a Contract is awarded.

- B11.2.1 Where the bid security provided by the successful Bidder is in the form of a certified cheque or draft pursuant to B11.1(c), it will be deposited and retained by the City as the performance security and no further submission is required.
- B11.2.2 The City will not pay any interest on certified cheques or drafts furnished as bid security or subsequently retained as performance security.
- B11.3 The bid securities of all Bidders will be released by the City as soon as practicable following notification by the Contract Administrator to the Bidders that no award of Contract will be made pursuant to the Bid Opportunity.

B12. OPENING OF BIDS AND RELEASE OF INFORMATION

- B12.1 Bids will be opened publicly, after the Submission Deadline has elapsed, in the office of the Corporate Finance Department, Materials Management Division, or in such other office as may be designated by the Manager of Materials.
- B12.1.1 Bidders or their representatives may attend.
- B12.1.2 Bids determined by the Manager of Materials, or his/her designate, to not include the bid security specified in B11 will not be read out.
- B12.2 Following the Submission Deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/
- B12.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/
- B12.4 The Bidder is advised that any information contained in any Bid may be released if required by City policy or procedures, by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law.

B13. IRREVOCABLE BID

- B13.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid.
- B13.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work until a Contract for the Work has been duly executed and the performance security furnished as herein provided, but any Bid shall be deemed to have lapsed unless accepted within the time period specified in Paragraph 11 of Form A: Bid.

B14. WITHDRAWAL OF BIDS

- B14.1 A Bidder may withdraw his/her Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.
- B14.1.1 Notwithstanding C23.3, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.
- B14.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid, and only such person, has authority to give notice of withdrawal.
- B14.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:

- (a) retain the Bid until after the Submission Deadline has elapsed;
- (b) open the Bid to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 12 of Form A: Bid; and
- (c) if the notice has been given by any one of the persons specified in B14.1.3(b), declare the Bid withdrawn.
- B14.2 A Bidder who withdraws his/her Bid after the Submission Deadline but before his/her Bid has been released or has lapsed as provided for in B13.2 shall be liable for such damages as are imposed upon the Bidder by law and subject to such sanctions as the Chief Administrative Officer considers appropriate in the circumstances. The City, in such event, shall be entitled to all rights and remedies available to it at law, including the right to retain the Bidder's bid security.

B15. EVALUATION OF BIDS

- B15.1 Award of the Contract shall be based on the following bid evaluation criteria:
 - (a) compliance by the Bidder with the requirements of the Bid Opportunity, or acceptable deviation there from (pass/fail);
 - (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B10 (pass/fail);
 - (c) Total Bid Price;
 - (d) economic analysis of any approved alternative pursuant to B6.
- B15.2 Further to B15.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities, if the interests of the City so require.
- B15.3 Further to B15.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his/her Bid or in other information required to be submitted, that he/she is responsible and qualified.
- B15.4 Further to B15.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.
- B15.4.1 Further to B15.1(a), in the event that a unit price is not provided on Form B: Prices, the City will determine the unit price by dividing the Amount (extended price) by the approximate quantity, for the purposes of evaluation and payment.

B16. AWARD OF CONTRACT

- B16.1 The City will give notice of the award of the Contract or will give notice that no award will be made.
- B16.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be responsible and qualified, and the Bids are determined to be responsive.
- B16.2.1 Without limiting the generality of B16.2, the City will have no obligation to award a Contract where:
 - (a) the prices exceed the available City funds for the Work;
 - (b) the prices are materially in excess of the prices received for similar work in the past;
 - (c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with its own forces;
 - (d) only one Bid is received; or
 - (e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.

- B16.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B15.
- B16.3.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his/her Bid upon written request to the Contract Administrator.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for Construction* (Revision 2006 12 15) are applicable to the Work of the Contract.
- C0.1.1 The General Conditions for Construction are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/gen_cond.stm
- C0.2 A reference in the Bid Opportunity to a section, clause or subclause with the prefix "**C**" designates a section, clause or subclause in the *General Conditions for Construction*.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

D1.1 In addition to the *General Conditions for Construction*, these Supplemental Conditions are applicable to the Work of the Contract.

D2. SCOPE OF WORK

- D2.1 The Work to be done under the Contract shall consist of land drainage sewers in accordance with the applicable Specifications and Drawings
- D2.2 The major components of the Work are as follows:
 - (a) Construction of land drainage sewers ranging in size from 375mm to 600mm diameter by installation in an open trench and by trenchless methods.
 - (b) Abandonment of existing catchbasin connections to combined sewer.
 - (c) Installation of new catchbasins and connections to the land drainage sewer.
 - (d) Surface restoration and related works.

D3. CONTRACT ADMINISTRATOR

D3.1 The Contract Administrator is Tetra Tech WEI Inc., represented by:

Gord Steiss Project Coordinator Telephone No. 204-954-6800 Facsimile No.204 988-0546 Email.gsteiss@tetratech.com

- D3.2 At the pre-construction meeting, Gord Steiss will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.
- D3.3 Bids Submissions must be submitted to the address in B7.8

D4. CONTRACTOR'S SUPERVISOR

D4.1 At the pre-construction meeting, the Contractor shall identify his/her designated supervisor and any additional personnel representing the Contractor and their respective roles and responsibilities for the Work.

D5. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON DISCLOSURE

- D5.1 The Contract, all deliverables produced or developed, and information provided to or acquired by the Contractor are the property of the City and shall not be appropriated for the Contractors own use, or for the use of any third party.
- D5.2 The Contractor shall not make any public announcements or press releases regarding the Contract, without the prior written authorization of the Contract Administrator.
- D5.3 The following shall be confidential and shall not be disclosed by the Contractor to the media or any member of the public without the prior written authorization of the Contract Administrator;
 - (a) information provided to the Contractor by the City or acquired by the Contractor during the course of the Work;
 - (b) the Contract, all deliverables produced or developed; and

- (c) any statement of fact or opinion regarding any aspect of the Contract.
- D5.4 A Contractor who violates any provision of D5 may be determined to be in breach of Contract.

D6. NOTICES

- D6.1 Except as provided for in C23.2.2, all notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the Contractor shall be sent to the address or facsimile number identified by the Contractor in Paragraph 2 of Form A: Bid.
- D6.2 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications to the City, except as expressly otherwise required in D6.3, D6.4 or elsewhere in the Contract, shall be sent to the attention of the Contract Administrator at the facsimile number identified in D3.1.
- D6.3 Notwithstanding C21, all notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer at the following facsimile number:

The City of Winnipeg Chief Financial Officer

Facsimile No.: 204 949-1174

D6.4 All notices, requests, nominations, proposals, consents, approvals, statements, authorizations, documents or other communications required to be submitted or returned to the City Solicitor shall be sent to the following facsimile number:

The City of Winnipeg Legal Services Department Attn: Director of Legal Services

Facsimile No.: 204 947-9155

D7. FURNISHING OF DOCUMENTS

D7.1 Upon award of the Contract, the Contractor will be provided with five (5) complete sets of the Bid Opportunity. If the Contractor requires additional sets of the Bid Opportunity, they will be supplied to him/her at cost.

SUBMISSIONS

D8. AUTHORITY TO CARRY ON BUSINESS

D8.1 The Contractor shall be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Contractor does not carry on business in Manitoba, in the jurisdiction where the Contractor does carry on business, throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

D9. SAFE WORK PLAN

- D9.1 The Contractor shall provide the Contract Administrator with a Safe Work Plan at least five (5) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.
- D9.2 The Safe Work Plan should be prepared and submitted in the format shown in the City's template which is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/Safety/default.stm

D10. INSURANCE

D10.1 The Contractor shall provide and maintain the following insurance coverage:

- (a) commercial general liability insurance, in the amount of at least two million dollars (\$2,000,000.00) inclusive, with The City of Winnipeg added as an additional insured, with a cross-liability clause, such liability policy to also contain contractual liability, unlicensed motor vehicle liability, non-owned automobile liability, broad form property damage cover and products and completed operations, to remain in place at all times during the performance of the Work and throughout the warranty period;
- (b) if applicable, Automobile Liability Insurance covering all motor vehicles, owned and operated and used or to be used by the Contractor directly or indirectly in the performance of the Work. The Limit of Liability shall not be less than \$2,000,000 inclusive for loss or damage including personal injuries and death resulting from any one accident or occurrence.
- (c) an all risks Installation Floater carrying adequate limits to cover all machinery, equipment supplies and/or materials intended to enter into and form part of any installation.
- D10.2 Deductibles shall be borne by the Contractor.
- D10.3 The Contractor shall provide the City Solicitor with a certificate(s) of insurance, in a form satisfactory to the City Solicitor, at least two (2) Business Days prior to the commencement of any Work but in no event later than the date specified in C4.1 for the return of the executed Contract.
- D10.4 The Contractor shall not cancel, materially alter, or cause each policy to lapse without providing at least thirty (30) Calendar Days prior written notice to the Contract Administrator.

D11. PERFORMANCE SECURITY

- D11.1 The Contractor shall provide and maintain performance security until the expiration of the warranty period in the form of:
 - (a) a performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to these Supplemental Conditions (Form H1: Performance Bond), in the amount of fifty percent (50%) of the Contract Price; or
 - (b) an irrevocable standby letter of credit issued by a bank or other financial institution registered to conduct business in Manitoba and drawn on a branch located in Winnipeg, in the form attached to these Supplemental Conditions (Form H2: Irrevocable Standby Letter of Credit), in the amount of fifty percent (50%) of the Contract Price; or
 - (c) a certified cheque or draft payable to "The City of Winnipeg", drawn on a bank or other financial institution registered to conduct business in Manitoba, in the amount of fifty percent (50%) of the Contract Price.
- D11.1.1 Where the performance security is in the form of a certified cheque or draft, it will be deposited by the City. The City will not pay any interest on certified cheques or drafts furnished as performance security.
- D11.2 If the bid security provided in his/her Bid was not a certified cheque or draft pursuant to B11.1(c), the Contractor shall provide the City Solicitor with the required performance security within seven (7) Calendar Days of notification of the award of the Contract by way of letter of intent and prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.

D12. SUBCONTRACTOR LIST

D12.1 The Contractor shall provide the Contract Administrator with a complete list of the Subcontractors whom the Contractor proposes to engage (Form J: Subcontractor List) at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in the General Conditions for the return of the executed Contract.

D13. DETAIL WORK SCHEDULE

- D13.1 The Contractor shall provide the Contract Administrator with a detailed work schedule at least two (2) Business Days prior to the commencement of any Work on the Site but in no event later than the date specified in C4.1 for the return of the executed Contract.
- D13.2 The detailed work schedule shall consist of the following:
 - (a) a critical path method (C.P.M.) schedule for the Work; and
 - (b) a Gantt chart for the Work based on the C.P.M. schedule;

all acceptable to the Contract Administrator.

- D13.3 Further to D13.2(a), the C.P.M. schedule shall clearly identify the start and completion dates of all of the following activities/tasks making up the Work as well as showing those activities/tasks on the critical path:
 - (a) Commencement Date.
 - (b) Installation of Land Drainage Sewers on a street by street basis.
 - (c) Surface restoration.
 - (d) Substantial Performance.
 - (e) Total Performance.
- D13.4 Further to D13.2(b), the Gantt chart shall show the time on a weekly basis, required to carry out the Work of each trade, or specification division. The time shall be on the horizontal axis, and the type of trade shall be on the vertical axis.

SCHEDULE OF WORK

D14. COMMENCEMENT

- D14.1 The Contractor shall not commence any Work until he/she is in receipt of a letter of intent from the Award Authority authorizing the commencement of the Work.
- D14.2 The Contractor shall not commence any Work on the Site until:
 - (a) the Contract Administrator has confirmed receipt and approval of:
 - (i) evidence of authority to carry on business specified in D8;
 - (ii) evidence of the workers compensation coverage specified in C6.15;
 - (iii) the Safe Work Plan specified in D9;
 - (iv) evidence of the insurance specified in D10;
 - (v) the performance security specified in D11; and
 - (vi) the Subcontractor list specified in D12.
 - (vii) the detailed work schedule specified in D13
 - (b) the Contractor has attended a pre-construction meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a pre-construction meeting.
- D14.3 The Contractor shall commence the Work on the Site within seven (7) Working Days of receipt of the letter of intent.

D15. WORKING DAYS

D15.1 Further to C1.1(gg), the Contract Administrator's determination of whether or not atmospheric and Site conditions are such that a Working Day is deemed to have elapsed may be based at

one time on one type of work while at another time a Working Day may be based on another type of work. When more than one type of major work is involved, the quantity of equipment that must be able to work in order to meet the requirements of a Working Day may vary considerably from that specified in the General Conditions.

- D15.2 In the event that incidental work is behind schedule which, in the opinion of the Contract Administrator, should have been or could have been carried out by the Contractor in conjunction with or immediately following work of a major type, the City hereby reserves the right to charge Working Days on the incidental work until such time as it is up to schedule.
- D15.3 When the major type of work involves restoration of the site to the condition it was prior to rainfall, Working Days shall not be charged.
- D15.4 The Contract Administrator will furnish the Contractor with a bi-weekly record for each major type of work and Working Days charged. This record will be provided at regular site meetings.

D16. SPRINGTIME WORKING CONDITIONS

- D16.1 Further to D15.1, the operation of machinery for the construction of sewers on existing streets in fair or poor condition during the spring thaw and drying period has the potential to cause considerable damage to these streets. If the Work has commenced and is underway, but in the opinion of the Contract Administrator the working conditions are detrimental to pavements or other infrastructure, the works shall be temporarily stopped and deferred to a later time of year.
- D16.2 No Working Days will be charged during the temporary work stoppage period.
- D16.3 No demobilization, remobilization or standby equipment costs may be charged due to the temporary work stoppage period.
- D16.4 The Contract Administrator will monitor the working conditions during the temporary stoppage and provide notice to the Contractor that site conditions are suitable to resume work. The Contractor shall resume work within seven (7) days of receipt of notice, after which time Working Days shall be charged.

D17. CRITICAL STAGES

- D17.1 The Contractor shall achieve critical stages of the Work in accordance with the following requirements:
 - (a) For sewer installation by open trench methods, complete this portion of the work by April 1, 2014 to utilize frozen ground conditions to minimize the risk of trench wall failure and resultant damage to pavements and other infrastructure.

D18. SUBSTANTIAL PERFORMANCE

- D18.1 The Contractor shall achieve Substantial Performance within Seventy Five (75) consecutive Working Days of the commencement of the Work as specified in D14.
- D18.2 When the Contractor considers the Work to be substantially performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Substantial Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.
- D18.3 The date on which the Work has been certified by the Contract Administrator as being substantially performed to the requirements of the Contract through the issue of a certificate of Substantial Performance is the date on which Substantial Performance has been achieved.

D19. TOTAL PERFORMANCE

- D19.1 The Contractor shall achieve Total Performance within Ninety (90) consecutive Working Days of the commencement of the Work as specified in D14.
- D19.2 When the Contractor or the Contract Administrator considers the Work to be totally performed, the Contractor shall arrange, attend and assist in the inspection of the Work with the Contract Administrator for purposes of verifying Total Performance. Any defects or deficiencies in the Work noted during that inspection shall be remedied by the Contractor at the earliest possible instance and the Contract Administrator notified so that the Work can be re-inspected.
- D19.3 The date on which the Work has been certified by the Contract Administrator as being totally performed to the requirements of the Contract through the issue of a certificate of Total Performance is the date on which Total Performance has been achieved.

D20. LIQUIDATED DAMAGES

- D20.1 If the Contractor fails to achieve Substantial Performance or Total Performance in accordance with the Contract by the day fixed herein for same, the Contractor shall pay the City the following amounts per Working Day for each and every Working Day following the days fixed herein for same during which such failure continues:
 - (a) Substantial Performance two thousand dollars (\$2,000.00);
 - (b) Total Performance one thousand dollars (\$1,000.00).
- D20.2 The amount specified for liquidated damages in D20.1 is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve Substantial Performance or Total Performance by the day fixed herein for same.
- D20.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D21. SCHEDULED MAINTENANCE

- D21.1 The Contractor shall perform the following scheduled maintenance in the manner and within the time periods required by the Specifications:
 - (a) Maintenance of temporary cold mix asphalt patches as specified in E4 and temporary sacrificial concrete slabs as specified in E8;
 - (b) Sodding as specified in CW 3510;
- D21.2 Determination of Substantial Performance and Total Performance shall be exclusive of scheduled maintenance identified herein. All scheduled maintenance shall be completed prior to the expiration of the warranty period. Where the scheduled maintenance cannot be completed during the warranty period, the warranty period shall be extended for such period of time as it takes the Contractor to complete the scheduled maintenance.

CONTROL OF WORK

D22. JOB MEETINGS

D22.1 Regular bi-weekly job meetings will be held at the Site. These meetings shall be attended by a minimum of one representative of the Contract Administrator, one representative of the City and one representative of the Contractor. Each representative shall be a responsible person capable of expressing the position of the Contract Administrator, the City and the Contractor respectively on any matter discussed at the meeting including the Work schedule and the need to make any revisions to the Work schedule. The progress of the Work will be reviewed at each of these meetings.

D22.2 The Contract Administrator reserves the right to cancel any job meeting or call additional job meetings whenever he/she deems it necessary.

D23. PRIME CONTRACTOR – THE WORKPLACE SAFETY AND HEALTH ACT (MANITOBA)

D23.1 Further to C6.24, the Contractor shall be the Prime Contractor and shall serve as, and have the duties of the Prime Contractor in accordance with The Workplace Safety and Health Act (Manitoba).

D24. TRAFFIC CONTROL AND MANAGEMENT

- D24.1 Further to Section 3.7 of CW 1130 of the Site Requirements the Contractor shall be responsible to redirect and maintain traffic with appropriate signing in accordance with The City of Winnipeg, "Manual of Temporary Traffic Control in Work Areas on City Streets" at all times during construction.
 - (a) Residential Streets: Maintain one lane of traffic at all times
 - (b) Intersecting street, private approach and lane access shall be maintained at all times.
- D24.2 The Contractor shall be responsible for all signage including but not limited to lane diversions, lane divisions, and general construction barricades.
- D24.3 Further to Section 3.6 of CW 1130 of the Site Requirements, the Contractor shall maintain safe pedestrian crossing at intersections at all times. If possible, only one pedestrian crossing at an intersection is to be blocked by construction at any one time. If more than one pedestrian crossing is blocked by construction at an intersection at the same time the Contractor shall provide flag persons to safely escort pedestrians across the intersection. The Contractor shall leave pedestrian crossing locations safe and free of equipment that may hamper pedestrians when no construction activities are being performed at a particular crossing location.

D25. WATER USED ON CITY OF WINNIPEG PROJECTS

D25.1 Charges incurred for the permits and water meters shall be paid for by the Contractor when taken out. The Contractor shall forward the invoice to the Contract Administrator for reimbursement. The billing for water usage sent to the Contractor shall be forwarded to the Contract Administrator for payment. The Bid Opportunity number shall be noted on each permit.

D26. CONFINED SPACE ENTRY

- D26.1 The Contractor's attention is drawn to the Province of Manitoba Workplace Safety and Health Act ("the Act"), and the Regulations and Guidelines there-under pertaining to Confined Entry Work, and in particular the requirements for conducting hazard/risk assessment and providing personal protective equipment (PPE).
- D26.2 The Contractor shall assist and provide Supplied Air Breathing Apparatus conforming to the requirements of the Act, Regulations and Guidelines for the use of the Contract Administrator where confined entry is required to allow for inspection of the Work.

MEASUREMENT AND PAYMENT

D27. PAYMENT

D27.1 Further to C12, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

WARRANTY

D28. WARRANTY

- D28.1 Notwithstanding C13.2, the Contract Administrator may permit the warranty period for a portion or portions of the Work to begin prior to the date of Total Performance if:
 - (a) a portion of the Work cannot be completed because of unseasonable weather or other conditions reasonably beyond the control of the Contractor but that portion does not prevent the balance of the Work from being put to its intended use.
- D28.1.1 In such case, the date specified by the Contract Administrator for the warranty period to begin shall be substituted for the date specified in C13.2 for the warranty period to begin.

FORM H1: PERFORMANCE BOND

(See D11)

KNOW ALL MEN BY THESE PRESENTS THAT

(hereinafter called the "Principal"), and

(hereinafter called the "Surety"), are held and firmly bound unto **THE CITY OF WINNIPEG** (hereinafter called the "Obligee"), in the sum of

_____ dollars (\$______)

of lawful money of Canada to be paid to the Obligee, or its successors or assigns, for the payment of which sum the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS the Principal has entered into a written contract with the Obligee for

BID OPPORTUNITY NO. 36-2014

FERRY ROAD - RIVERBEND COMBINED SEWER RELIEF CONTRACT NO.3

which is by reference made part hereof and is hereinafter referred to as the "Contract".

NOW THEREFORE the condition of the above obligation is such that if the Principal shall:

- (a) carry out and perform the Contract and every part thereof in the manner and within the times set forth in the Contract and in accordance with the terms and conditions specified in the Contract;
- (b) perform the Work in a good, proper, workmanlike manner;
- (c) make all the payments whether to the Obligee or to others as therein provided;
- (d) in every other respect comply with the conditions and perform the covenants contained in the Contract; and
- (e) indemnify and save harmless the Obligee against and from all loss, costs, damages, claims, and demands of every description as set forth in the Contract, and from all penalties, assessments, claims, actions for loss, damages or compensation whether arising under "The Workers Compensation Act", or any other Act or otherwise arising out of or in any way connected with the performance or non-performance of the Contract or any part thereof during the term of the Contract and the warranty period provided for therein;

THEN THIS OBLIGATION SHALL BE VOID, but otherwise shall remain in full force and effect. The Surety shall not, however, be liable for a greater sum than the sum specified above.

AND IT IS HEREBY DECLARED AND AGREED that the Surety shall be liable as Principal, and that nothing of any kind or matter whatsoever that will not discharge the Principal shall operate as a discharge or release of liability of the Surety, any law or usage relating to the liability of Sureties to the contrary notwithstanding.

IN WITNESS WHEREOF the Principal and Surety have signed and sealed this bond the

_____ day of _____ , 20____ .

The City of Winnipeg Bid Opportunity No. 36-2014

SIGNED AND SEALED in the presence of:

(Witness as to Principal if no seal)

(Name of Principal)	
Per:	(Seal)
Per:	
(Name of Surety)	
By:(Attorney-in-Fact)	(Seal)

FORM H2: IRREVOCABLE STANDBY LETTER OF CREDIT (PERFORMANCE SECURITY) (See D11)

(Date)

The City of Winnipeg Legal Services Department 185 King Street, 3rd Floor Winnipeg MB R3B 1J1

RE: PERFORMANCE SECURITY - BID OPPORTUNITY NO. 36-2014

FERRY ROAD - RIVERBEND COMBINED SEWER RELIEF CONTRACT NO.3

Pursuant to the request of and for the account of our customer,

(Name of Contractor)

(Address of Contractor)

WE HEREBY ESTABLISH in your favour our irrevocable Standby Letter of Credit for a sum not exceeding in the aggregate

_ Canadian dollars.

This Standby Letter of Credit may be drawn on by you at any time and from time to time upon written demand for payment made upon us by you. It is understood that we are obligated under this Standby Letter of Credit for the payment of monies only and we hereby agree that we shall honour your demand for payment without inquiring whether you have a right as between yourself and our customer to make such demand and without recognizing any claim of our customer or objection by the customer to payment by us.

The amount of this Standby Letter of Credit may be reduced from time to time only by amounts drawn upon it by you or by formal notice in writing given to us by you if you desire such reduction or are willing that it be made.

Partial drawings are permitted.

We engage with you that all demands for payment made within the terms and currency of this Standby Letter of Credit will be duly honoured if presented to us at:

(Address)

and we confirm and hereby undertake to ensure that all demands for payment will be duly honoured by us.

All demands for payment shall specifically state that they are drawn under this Standby Letter of Credit.

.

Subject to the condition hereinafter set forth, this Standby Letter of Credit will expire on

(Date)

It is a condition of this Standby Letter of Credit that it shall be deemed to be automatically extended from year to year without amendment from the present or any future expiry date, unless at least 30 days prior to the present or any future expiry date, we notify you in writing that we elect not to consider this Standby Letter of Credit to be renewable for any additional period.

This Standby Letter of Credit may not be revoked or amended without your prior written approval.

This credit is subject to the Uniform Customs and Practice for Documentary Credit (2007 Revision), International Chamber of Commerce Publication Number 600.

(Name of bank or financial institution)

Per: ____

(Authorized Signing Officer)

Per:

(Authorized Signing Officer)

FORM J: SUBCONTRACTOR LIST (See D12)

FERRY ROAD - RIVERBEND COMBINED SEWER RELIEF CONTRACT NO.3

Name	Address

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS AND DRAWINGS

- E1.1 These Specifications shall apply to the Work.
- E1.2 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.
- E1.2.1 *The City of Winnipeg Standard Construction Specifications* is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <u>http://www.winnipeg.ca/matmgt/Spec/Default.stm</u>
- E1.2.2 The version in effect three (3) Business Days before the Submission Deadline shall apply.
- E1.2.3 Further to C2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.
- E1.3 The following are applicable to the Work:

	Drawing No.	Drawing	g Name/Title
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	Cover Sheet
C0301	Berry Street – 140m North of Portage Avenue to 260m North of Portage Avenue
C0302	Berry Street – 260m North of Portage Avenue to 150m South of Ness Avenue
C0303	Berry Street – 150m South of Ness Avenue to 30m South of Ness Avenue
C0304	Berry Street – 30m South of Ness Avenue to 67m North of Ness Avenue
C0305	Berry Street – 67m North of Ness Avenue to 187m North of Ness Avenue
C0306	Berry Street – 187m North of Ness Avenue to 96m South of Silver Avenue
C0307	Berry Street – 96m South of Silver Avenue to Silver Avenue
C0308	Brooklyn Street – 125m North of Portage Avenue to 245m North of Portage Avenue
C0309	Brooklyn Street – 245m North of Portage Avenue to 160m South of Ness Avenue
C0310	Brooklyn Street – 160m South of Ness Avenue to 40m South of Ness Avenue
C0311	Brooklyn Street – 40m South of Ness Avenue to 57m North of Ness Avenue
C0312	Brooklyn Street – 57m North of Ness Avenue to 177m North of Ness Avenue
C0313	Brooklyn Street – 177 North of Ness Avenue to 107m South of Silver Avenue
C0314	Brooklyn Street – 107m South of Silver Avenue to Silver Avenue

E2. SOILS INVESTIGATION REPORT

E2.1 Further to C3.1, Test Hole logs compiled during the design process are provided in Appendix A. Test Hole Logs are provided to supplement the Contractors evaluation of the Site conditions within the Work area. The information is considered accurate at the locations indicated and at the time of the investigation. However, considerable variations in soil conditions may exist between test holes and fluctuations in groundwater levels can be expected seasonally

GENERAL REQUIREMENTS

E3. OFFICE FACILITIES

- E3.1 The Contractor shall supply office facilities meeting the following requirements:
 - (a) The field office shall be conveniently located near the Site of the Work.
 - (b) The building shall have a minimum floor area of 20 square metres, with window area of 3 square metres and a door entrance with suitable lock satisfactory to the Contract Administrator.

- (c) The Building shall be suitable for all-weather use. It shall be capable of maintaining a temperature range between 16 C and 25 C.
- (d) The building shall be supplied with fluorescent lights and electrical wall outlets, add satisfactory to the Consultant.
- (e) The building shall be supplied with a high speed internet connection.
- (f) The building shall be furnished with one desk, one meeting table, one drafting table, one filing cabinet and six chairs, all satisfactory to the Contract Administrator.
- (g) One holding-tank type toilet shall be provided for the exclusive use of the Contract Administrator.
- (h) The field office shall be cleaned weekly immediately prior to the Job Site Meetings to the satisfaction of the Contract Administrator.
- (i) The provision of the field office with the aforementioned furnishings and equipment shall also include maintenance and removal of the field office, operating costs and any service installation costs.
- (j) The provision of the field office shall be incidental to the Works.

E4. EXCAVATION, BEDDING AND BACKFILL

- E4.1 Disposal of Unsuitable or Surplus Excavated Material
 - (a) The Contractor is responsible for arranging for a disposal site for all excavated material, including all associated works including transportation and payment of tipping fees. Disposal of all excavated material shall be considered incidental to the Works.
- E4.2 Foundation and Bedding
 - (a) Class A Bedding shall be used in all shafts with concrete pipe with Type 3 material for remainder of initial backfill.
 - (b) Class B Bedding with Type 3 material shall be used in all shafts with PVC piping.
 - (c) Class B Bedding with Sand material shall be used in all pipe installations in an Open Trench.
- E4.3 Backfilling and Surface Restoration
- E4.3.1 Initial backfilling of all excavations shall be carried out by the following methods:
 - (i) Class 3 backfill shall be used at all shafts for Trenchless installations.
 - (ii) Class 3 backfill shall be used at Open Trenches. Class 2 backfill would also be acceptable but shall be undertaken at no additional cost. Class 2 and/or 3 backfill shall be placed and compacted in lifts not exceeding 500 mm.
 - (iii) For excavation under existing pavements or sidewalks the Contractor shall place and compact 300 mm of crushed granular material and 100 mm of cold mix asphalt to match the existing pavement grade.
 - (iv) The Contractor shall have personnel available for immediate repairs of settlement at shaft locations from the start of construction until final restoration is complete.
- E4.3.2 Final surface restoration shall be as follows:
 - (i) The excavation shall be jetted and tamped twice, as per CW 2030.
 - After the second jetting operation is completed, the excavation is to be subcut to 1.5 m below final surface elevation and recompacted in 300 mm lifts to the subgrade level using vibratory compaction methods in accordance with CW 2030 Class 2 Backfill.
 - (iii) Pavement shall be completed in accordance with CW 3310 or CW 3410, depending on type of existing pavement surface.
 - (iv) Boulevard restoration shall be completed in accordance with CW 3510.
- E4.3.3 Further to CW 2130:

- (a) Trenchless Installations and Catch Basin connections: All costs associated with backfilling and surface restorations shall be incidental to the Work.
- (b) Open Trench Installation: Backfilling of trenches shall be incidental to the Work, but final surface restoration including the construction of Partial Slab Patches, Curb, Sidewalk and boulevard topsoil and sod will be paid for at the Contract Unit Prices for these items of work.

E5. MAINTAIN EXISTING SEWER FLOWS, FLOW CONTROL, DIVERSIONS AND BYPASS PUMPING

E5.1 Maintaining Existing Sewer Flows, Flow Control, Diversions and Bypass Pumping required to complete the Works in the Contract shall be incidental to the Contract as per Clause 4.16.1 of CW 2130.

E6. TRENCHLESS EXCAVATION

- E6.1 Further to Clause 3.4.1 of CW 2130, all sewers to be installed by trenchless methods except as explicitly noted on the Drawings.
- E6.2 Selection of excavation equipment for installation of sewers by trenchless methods shall be the responsibility of the Contractor and shall be made based on expected soil conditions as detailed on the test hole logs. The Contractor shall make allowances in the choice of equipment to account for reasonable and minor deviations in ground conditions and shall have contingency plans for the removal of boulders and other minor changes in ground conditions.
- E6.3 Methods for dealing with and paying for Trenchless Excavation Obstructions are shown in Section E7 "Trenchless Excavation Obstructions".
 - (a) The notice shall provide details of the change in subsurface soil conditions or obstructions encountered, any proposed construction procedure revision that the Contractor intends to undertake, as well as any other relevant supporting information.
 - (b) The Contract Administrator shall review the notice as expeditiously as possible to assess whether the change in conditions and revised construction procedures amount to a Change in Work.

E7. TRENCHLESS EXCAVATION OBSTRUCTIONS

- E7.1 Contingency plans for removal of the obstructions encountered in trenchless excavations must be approved by the Contract Administrator as follows:
 - (a) Drill or excavate a shaft at the location of the obstruction, drilling, splitting or breaking the obstruction into smaller components if required, and removal of the obstruction.
- E7.2 Where the Contract Administrator deems that the obstruction encountered represents a Change in Work, it shall be valued in accordance with GC:7.4 (c) and the following supplemental requirements:
 - (a) The first four (4) hours of handling obstructions for each occurrence shall be the responsibility of the Contractor.
 - (b) Equipment rates for equipment required in support of the obstruction removal shall be compensated at the MHCA rental rates. Equipment not listed in the MHCA rate schedule shall have their rates established by the Contractor prior to the commencement of Work in accordance with the procedure documented in the MHCA rental guide for establishing equipment rental rates and shall be subject to the approval of the Contract Administrator.
 - (c) Standby equipment that cannot reasonably be deployed elsewhere during the duration of the obstruction removal shall be compensated at 50% of its established rate as noted in E7.2(b) above.

- (d) Labour rates and material costs associated with obstruction removal shall be compensated as per GC:7.4 (c) and 7.4.1 with the provision that any removal and replacement of pavements shall be compensated at the Contract Unit Price for such Work.
- E7.3 An Allowance has been provided in the Contract unit prices (Provisional Items) to cover costs associated with removal of trenchless excavation obstructions.

E8. TEMPORARY PAVEMENT RESTORATIONS

- E8.1 In high traffic areas and where indicated by the Contract Administrator, sacrificial concrete pavement shall be used instead of the cold mix asphalt temporary pavement repair indicated in E4.3.1. This type of repair is anticipated for, but may not be limited to, the following street:
 - (a) Berry Street access to back lanes.
- E8.2 Concrete Surface Restorations shall conform to CW 2130 and CW 3230 with the following exception:
 - (a) No tie bars, dowels or reinforcing steel shall be required.
 - (b) No flooding and jetting prior to the installation of temporary surface restoration is required.
- E8.3 Sacrificial concrete pavement shall be constructed on a 600mm thickness of cement stabilizing fill to CW 2160, which shall be measured and paid for at the Contract unit price per cubic meter for "Cement Stabilized Backfill Material" (Provisional Items).
- E8.4 Sacrificial concrete pavement shall be 150 mm thick non-reinforced concrete in general conformance with CW 3230, which shall be measured and paid for at the Contract unit price per square meter for "150mm Sacrificial Concrete Pavement" (Provisional Items).
- E8.5 All temporary pavement restorations must be completed and continuously maintained until final surface restoration can be completed.
- E8.6 Any temporary concrete or cement stabilized fill shall be completely removed and the remaining backfill shall be flooded, tamped and topped up prior to performing permanent pavement restorations in accordance with E4.

E9. EXPLORATION OF EXISTING SERVICES

- E9.1 As directly by the Contract Administrator, the Contractor shall perform exploratory excavations by soft dig methods or other methods suitable to the Contract Administrator to locate existing sewer and water services. It is not desired or necessary to explore each service location, and only a representative sample of services will be investigated on each street.
- E9.2 The exploration shall be done following all utility location surveys and prior to the installation of new sewers, and the information obtained will help determine if an alternate vertical or horizontal alignment of the proposed sewer may be beneficial to minimize conflicts with the existing services.
- E9.3 Exploration of existing services by soft dig method will be measured on an hourly basis and paid for at the Contract Unit Price for "Exploration of Existing Services". It is the intent to perform a minimum of 4 hours of soft dig exploration per session to minimize the number of times a soft dig contractor must be mobilized to site.
- E9.4 The Contractor is advised not to pre-order manhole risers until the exploration program is completed and the benefit of modifying the sewer and manhole depths has been assessed. The Contractor will be provided with sets of revised drawings if changes to the sewer depth are made.

E10. REPAIRS TO EXISTING SEWER OR WATER SERVICES

- E10.1 Replacement of existing sewer or water services that conflict with the proposed sewer installation may be necessary. To minimize the potential for damaging existing services, shafts should be located near service locations such that the service locations can be found by exploratory digging. The Contractor shall attempt to adjust the water service pipe without cutting into the pipe to reroute it around the new sewer.
- E10.2 The regrading of sewers or repair of damaged water service pipes shall be undertaken and paid for that the Contract unit prices described as follows:
 - (a) Regrading of Existing Sewer Service, 100 or 150 mm, paid on a per unit basis for regrading up to 1.5 m long and on a lineal meter basis for regrading sections of sewer service longer than 1.5 m. These works shall be done in accordance with CW 2130-R12.
 - (b) Repair of Existing Water Service, paid on a per unit basis in size classification of 'up to 25 mm' and 'greater than 25 mm to 50 mm' and done in general conformation with CW 2110-R11. Contrary to typical practice, the water service may be repaired by the installation of two couplings and a short piece of copper pipe.
- E10.3 The Contract Administrator must be notified immediately if a sewer or water service is damaged by the work, so that the home or building owner may be contacted and arrangements made for the provision of temporary servicing.
- E10.4 The Contract Administrator must be notified if any of the water service piping encountered is not copper.

E11. PROTECTION OF EXISTING TREES

- E11.1 The Contractor shall take the following precautionary steps to avoid damage from his construction activities to existing boulevard trees within and adjacent to the limits of construction:
 - (a) The Contractor shall not stockpile materials and soil or park vehicles and equipment on boulevards within 2 metres of any tree.
 - (b) Mature tree trunks shall be strapped with 25 x 150 x 2400 (1" x 6" x 8') wood planks. Smaller trees shall be similarly protected using appropriately sized wood planks.
 - (c) Excavations shall be carried out in such a manner so as to minimize damage to existing root systems. Roots over 50mm in diameter which must be cut to facilitate an excavation shall be neatly pruned with a saw prior to excavation and coated with an appropriate wound dressing to prevent infection.
 - (d) Work on Site shall be carried out in such a manner so as to minimize damage to existing tree branches. Where damage to tree branches does occur, the Contractor shall neatly prune the damaged branch.
 - (e) American elm trees are not to be pruned between April 1st and August 1st and Siberian elm trees between April 1st and July 1st of any year under provisions of The Dutch Elm Disease Act.
- E11.2 All damages to existing trees caused by the Contractor's construction activities shall be repaired to the requirements and satisfaction of the City of Winnipeg, Public Works Department, Urban Forestry Branch.
- E11.3 Notwithstanding GC:7, the City reserves the right to diminish all or any portion of the items of work listed in the Provisional Items and no claim shall be made for damages on the grounds of loss of anticipated profit or for any other reason.

E12. VIDEO INSPECTION OF COMBINED SEWERS

E12.1 Further to CW 2130, Clause 3.19 no payment shall be made for CCTV video inspection of combined sewers following catch basin lead abandonment.

E13. CATCHBASIN RECONNECTIONS AND RENEWALS

- E13.1 The design objective of the project is provide combined sewer relief through the installation of new land drainage sewers, and disconnection of catch basins and drainage inlets from the combined sewer system. The drawings and Form B quantities indicate the worst case scenario where the majority of catch basins and curb and gutter inlets are to be replaced. However, if existing catch basins and curb and gutter inlets are in good shape and generally compliant with current City of Winnipeg standards, or require only minor upgrading such as replacement of a damaged frame or cover, or replacement of a missing debris hood, then the existing catch basin or curb and gutter inlet will be repaired as necessary and reconnected to the new land drainage sewer system.
- E13.2 Reconnections of existing catch basins to the new land drainage sewer and miscellaneous repairs will be measured and paid for as provisional items.
- E13.3 The condition assessment of existing catch basins and curb and gutter inlets will occur following the commencement of construction. Since the reconnection of catch basins is not typically done until after the mainline pipe and manholes have been installed, the Contractor is advised not to pre-order catch basins for this project until this assessment has been completed.

E14. CATCHBASIN FRAMES AND COVERS

E14.1 All catch basins shall be supplied with AP-008 Barrier Curb and Gutter Inlet Frame and Box with AP-009 Barrier Curb and Gutter Inlet Cover unless otherwise directed by the Contract Administrator.

E15. PROVISIONAL ITEMS

- E15.1 The Provisional Items listed on Form B: Prices are part of the Contract.
- E15.2 The Contractor shall not perform Work included in the Provisional Items without prior authorization from the Contract Administrator. All Work included in the Provisional Items will be carried out within the construction areas shown on the Drawings.
- E15.3 Notwithstanding GC:7, the City reserves the right to diminish all or any portion of the items of work listed in the Provisional Items and no claim shall be made for damages on the grounds of loss of anticipated profit or for any other reason.

PART F - SECURITY CLEARANCE

F1. SECURITY CLEARANCE

- F1.1 Each individual proposed to perform the following portions of the Work:
 - (a) any Work on private property;
 - (b) any Work within City facilities other than:
 - (i) an underground structure such as a manhole;
 - (ii) in areas and at times normally open to the public;
 - (c) communicating with residents and homeowners in person or by telephone;
- F1.1.1 Each Individual shall be required to obtain a Criminal Record Search Certificate from the police service having jurisdiction at his/her place of residence. Or
 - (a) BackCheck, forms to be completed can be found on the website at: http://www.backcheck.net/; or
 - (b) Commissionaires (Manitoba Division), forms to be completed can be found on the website at: <u>http://www.commissionaires.mb.ca/</u>.
- F1.2 Prior to the commencement of any Work specified in F1.1, and during the term of the Contract if additional or replacement individuals are proposed to perform Work, the Contractor shall supply the Contract Administrator with a Criminal Record Search Certificate obtained not earlier than one (1) year prior to the Submission Deadline, or a certified true copy thereof, for each individual proposed to perform such Work.
- F1.3 Any individual for whom a Criminal Record Search Certificate is not provided, or for whom a Criminal Record Search Certificate indicates any convictions or pending charges related to property offences or crimes against another person will not be permitted to perform any Work specified in F1.1.
- F1.4 Any Criminal Record Search Certificate obtained thereby will be deemed valid for the duration of the Contract subject to a repeated records search as hereinafter specified.
- F1.5 Notwithstanding the foregoing, at any time during the term of the Contract, the City may, at its sole discretion and acting reasonably, require an updated criminal records search. Any individual who fails to provide a satisfactory Criminal Record Search Certificate as a result of a repeated criminal records search will not be permitted to continue to perform any Work specified in F1.1.





XVA-6UCITY OF WANNEES - WARDE A WARDE ADDIVIDUATION - 012/10001233.00 - FEBRIT ROAD AND RADINDED COM WORKS EX3341 AND GA/CAN/CAN/WES-FEEDENCK/FEBRIT ROAD TIST FALL CONTINUE ONT 1 & 20183 13:04:23 10:05

				APPENI	DIX A - T	EST H	OLE L	.OGS							
							ROJECT	" #	TEST HOLE NO.						
							113324	<u> </u>			12-14				
	LOCA	TION:	Brooklyn St. at	Ness Ave.				RE	VIEWED B	AOD					
C	ONTRAC	TOR:	Paddock Drillin	1g Ltd.				0		E: April 30), 2012				
-	MEI	HOD:	Acker MP8 - 1	25 mm SSA					DEPTH (m): 14.0					_
Ē	(m)	OL				ST	RENGT Su	TH		т	est Results				
PTH (r	ATION	. SYME		SOIL DESCRIPTION		QU	UNCON COMPF	IFINED RESSION		-	Moisture Co	ontent (%)			
DE	ELEV	SOIL				TV	TORVA	NE							
	ш				_	<u>үч</u>	POCKE	EIGHT							
0.00	235.00		0 - 0.15 m	CONCRETE		0	-	-	0.00	10.0 20	.0 30.0 2	10.0 SC).0 60.	.0 /0.0	
0.50	234.50		0.15 - 0.6 m	CLAY (Fill) - silty, sandy, some gravel - dark grey to black, stiff, moist, intermediate p	plasticity				0.50						
1.00	234.00		0.6 - 1.2 m	CLAY - silty - mottled brown and grey, stiff, moist, high pla	asticity	PP =	78	kPa	1.00			•			
1.50	233.50		1.2 - 1.8 m	SILT - some sand - tan, compact, moist					1.50		$\langle -$				
2.00	233.00		1.8 - 4.6 m	CLAY - silty - brown					2.00			\square			
2.50	232.50			- firm, moist - high plasticity		TV = PP =	39 29	kPa kPa	2.50						
3.00	232.00			- some till inclusions, some sand, some grave	el				3.00			4			
3.50	231.50			below 3.0 m					3.50						
4.00	231.00								4.00						
4.50	230.50								4.50						
5.00	230.00		4.6 - 11.3 m	SILT (Till) - some sand, some cobbles - trace gravel					5.00	•					
5.50	229.50			- tan, compact, moist					5.50						
6.00	229.00			- light grey, dense, dry below 5.8 m					6.00						
6.50	228.50			- cobbly, bouldery below 6.1 m					6.50						
7.00	228.00								7.00						
7.50	227.50								7.50	•					
8.00	227.00								8.00 -						
8.50	226.50								8.50 -						
9.00	226.00								9.00	•					
9.50	225.50								9.50 -						
10.00	225.00								10.00			<u> </u>			
10.50	224.50								10.50						
11.00	224.00			- auger refusal, HQ coring below 11.3 m					11.00						
11.50	223.50		11.3 - 14.0 m	LIMESTONE (Bedrock) - yellowish white					11.50						
12.00	223.00			 - R3 medium strong - very close to moderately close spacing (0.04 	4 - 0.36 m)				12.00						
12.50	222.50			- Class 2 gapped aperature - class 1 filling					12.50						
13.00	222.00			- good quality RQD (82%)					13.00						
13.50	221.50								13.50						
14.00	221.00			- thin clay seam (< 5 mm thick) at 14.0 m					14.00						
14.50	220.50		14.0 m	END OF TEST HOLE AT 14.0 m IN LIMESTC BEDROCK Notes: 1. Squeezing below 3.0 m in clay 2. Auger refusal at 11.3 m, switched to HQ co 3. Test hole backfilled with auger cuttings, cap with concrete core and coldpatch.	DNE pring. pped				14.50						
										Tetra	Tech Doc	. ID N	0.		
									100	012030)0-REP-T	0001-	00		

					A - I	EST HC		.OGS							
			DYREGROV ROBINSON INC. CONSULTING GEOTECHNICAL ENGINEERS			PRC	DJECT	#			TEST	HOLE	NO.		
	PRO.	JECT:	Ferry Road LDS				10024	L	OGGED	BY: RB		.2 20			
00		TION:	Century St. at Ness Ave. Paddock Drilling Ltd.					RE\		BY: AOD	16, 201	2			
00	MET	HOD:	Acker MP8 - 125 mm SSA, HQ Core Barrel					DRILL	DEPTH (m): 13.7	10, 201	-			
					~	UNDRAI	NED S	HEAR H			Test Re	sults			
Ê	(m) Z	BOL			TER	511	Su								
TH (TIO	SYM	SOIL DESCRIPTION		ME	QU U		FINED			Mo	sture Cont	ent (%)		
DEP	-EVA	OIL			EZC	TV T	ORVA	NE							
	Ш	S		i	Ч	PP P	OCKE	T PEN.							
0.00	235.04		0 - 0.76 m CLAY (Fill) - silty, trace sand, trace grav	/el		γU	NIIW	EIGHT	0.00	10.0	20.0 3	0.0 40.	.0 50.0	0 60.0	7
0.50	234.54		- black - stiff. moist, high plasticity						0.50						
1.00	224.04		0.76 - 1.7 m SILT						1 00						
1.00	234.04		- loose, moist						1.00						
1.50	233.54		1.7 - 9.1 m CLAY - silty						1.50						
2.00	233.04		- brown - stiff moist high plasticity			TV =	61	kPa	2.00						
2.50	232.54		Sun, molst, nigh pidsdolty			PP =	37	kPa	2.50						
3.00	232.04		- mottled brown and grey, trace silt inclu	isions					3.00				\rightarrow		
3.50	231.54		below 3.0 m						3.50		_			$\setminus \mid$	
4 00	231.04					TV =	52 32	kPa kPa	4.00						
4.00	201.04						52	KF a	-						
4.50	230.54					Qu = TV =	61 55	kPa kPa	4.50						
5.00	230.04					PP = V =	92 17.3	kPa kN/m³	5.00				11		
5.50	229.54					• TV -	40	kDe.	5.50				-+		
6.00	229.04		- grey, firm, trace sand, trace gravel bel	ow 6.1 m		IV = PP =	42 27	кРа kPa	6.00				_		
6.50	228.54								6.50						
7 00	228 04								7.00						
7.50	007.54		- some till inclusions, wet, trace cobbles	below 7.2 m		0	00		7.50						
7.50	227.04		\checkmark			Qu = TV =	26 42	кРа kPa	7.50						
8.00	227.04					PΡ = Υ =	36 15.6	kPa kN/m³	8.00						
8.50	226.54		8.5 - 11.4 m SILT (Till) - clayey, some sand, trace gr	avel		·			8.50						
9.00	226.04		- loose, wet, intermediate plasticity						9.00		-/				
9.50	225.54		- trace clay, low plasticity below 9.1 m						9.50						
0.00	225.04								10.00	/	•				
0.50	224 54								10.50						
11.00				alaw 11.0											
1.00	224.04		- auger rerusal on boulder, HQ coring b	30W I I.U M					11.00						
1.50	223.54		11.4 - 13.7 m LIMESTONE (Bedrock) - yellowish white						11.50						
2.00	223.04		- R3 medium strong - extremely close to moderately close st	pacing	\exists				12.00						
12.50	222.54		(0.01 - 0.27 m)						12.50						
3.00	222.04		- class ∠ gapped aperature - class 1 filling						13.00						
3.50	221.54		- fair quality RQD (52%)						13.50		_				
4 00	221 04		13.7 m END OF TEST HOLE AT 13.7 m IN LIN BEDROCK	IESTONE					14,00						
1.00	0+		Notes:												
			 Standpipe piezometer with Casagran 	de tip											
			installed to 12.2 m. 3. Water level measured at 8.01 m belo	w ground surface											
			on June 12, 2012. 4. Test hole backfilled with sand to 11.4	m bentonite											
			chips to 10.1 m and auger cuttings to g	ound surface.											
			Piezometer protected with a flushmound	cover.											

APPENDIX A - TEST HOLE LOGS

LOCATION: Berry SLit Shee Are. PROJECT IN: Classes SAMPLE TYPE Bracks Milling Lid. METHOD: ACKER MPR 125mm dia SSA ELEVATION (m): 234835 SAMPLE TYPE Bracks Milling Lid. METHOD: ACKER MPR 125mm dia SSA Dents conversion Classes BACKFILL TYPE BRACKFILL TYPE BRACKFIL	LOCATION: Berry St. at Silver Alee. PROJECTION: 123499 SMMPLE TYPE Orke Image: Second Stress St	PRC)JECT:	Ferry	Road and Riverbend - (Contracts 1 & 2	CLIENT: Te	ra Tech		TES	THC	DLE NO: 12-42							
CONTRACIONE Paddock Unling Ltd METHOD: ACKER MER 125mm dia SSA ELEVATION (m): 244.85 SAMPLE TYPE IGRAM ISERITIANTE CONF SAMCHILL TYPE ISERITIANTE CONF ISERITIANTE SOIL DESCRIPTION ISERITIANTE SOIL DESCRIPTION ISERITIANTE SOIL DESCRIPTION ISERITIANTE ISERITIANTE ISERITIANTE CLAY (FIII) sity: grey, stiff, moist, infermediate plasticity ISERITIANTE ISERITIANTE CLAY (FIII) sity: grey, stiff, moist, infermediate plasticity ISERITIANTE ISERITIANTE CLAY (FIII) sity: grey, stiff, moist, infermediate plasticity ISERITIANTE ISERITIANTE SOIL DESCRIPTION ISERITIANTE ISERITIANTE ISERITIANTE SOIL DESCRIPTION ISERITIANTE ISERITIANTE ISERITIANTE ISERITIANTE ISERITIANTE ISERITIANTE ISERITIANTE ISERITIANTE<	CONTRACTOR: Paddoc Juning Ld METHQD: ACKER MRP 125mm dia SSA ELEVATION 244.85 SAMPLE TYPE EXAMPLE SCIL Diversion Bulk Non Control Control Wig Big EXAMPLE SCIL DESCREPTION Diversion Bulk Diversion Diversion D	LOC	LOCATION: Berry St. at Silver Ave.									PROJECT NO.: 123499							
JAMER LET IF YE Lobes Jack in Sould Ask Determined in Sould Determined in Sould <td>SIMPLE TYPE BERTOWIE CRAVEL SOUCH Do RECOMING Do RECOMING Do RECOMING BOCKTILLTYPE BERTOWIE CRAVEL SOUCH COUNTIESS SOUCH COUNTIESS SOUCH BOCKTILLTYPE BERTOWIE CRAVEL SOUCH COUNTIESS SOUCH COUNTIESS SOUCH BOCKTILLTYPE BERTOWIE CRAVEL SOUCH COUNTIESS SOUCH COUNTIESS SOUCH COUNTIESS SOUCH COUNTIESS SOUCH December 1000000000000000000000000000000000000</td> <td>CON</td> <td></td> <td>IOR: H</td> <td>Paddock Drilling Ltd.</td> <td></td> <td></td> <td>lia. SSA</td> <td></td> <td>ELE</td> <td></td> <td>ION (m): 234.835</td>	SIMPLE TYPE BERTOWIE CRAVEL SOUCH Do RECOMING Do RECOMING Do RECOMING BOCKTILLTYPE BERTOWIE CRAVEL SOUCH COUNTIESS SOUCH COUNTIESS SOUCH BOCKTILLTYPE BERTOWIE CRAVEL SOUCH COUNTIESS SOUCH COUNTIESS SOUCH BOCKTILLTYPE BERTOWIE CRAVEL SOUCH COUNTIESS SOUCH COUNTIESS SOUCH COUNTIESS SOUCH COUNTIESS SOUCH December 1000000000000000000000000000000000000	CON		IOR: H	Paddock Drilling Ltd.			lia. SSA		ELE		ION (m): 234.835							
Image: Solution in the second seco	Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description Image: Solid Description	BAC	KFILL	TYPE	BENTONITE					TTING	S S								
CLAY (Fill) - siny, grey stiff, moist, intermediate plasticity	Part of the first and the first model plasticity 01 CLAY (Fill) - sity, grey, stift, molet, intermediate plasticity 01 - notice forwand grey - stift, molet, high plasticity - stift, molet, high plasticity - stift, molet, high plasticity - trace sit inclusions, trace grown inclusions - case - trace sit inclusions, trace sand, trace gravel below 2.7 m - trace till inclusions, trace sand, trace gravel below 2.7 m - trace till inclusions, trace sand, trace gravel - case - trace till inclusions, trace gravel - trace till inclusions - trac	ELEVATION (m)	DEPTH (m)	SOIL SYMBOL			ESCRIPTIO	N		SAMPLE TYPE	SAMPLE #	 ◆ SPT N blows/300mm ◆ 10 20 30 40 50 60 70 ■ Unit Weight kN/m³ 12 14 16 18 20 22 24 ↓↓ M/C (%) PL ↓↓ M							
234 1 CLAY - sitty - motide brown and grey - suff, high plasticity - suff, high plasticity - diff, motide brown, that high plasticity -233 -23 -23	CLAY = silty	-	Ē	\otimes	CLAY (Fill) -silty, gre	ey, stiff, moist, intern	nediate plasticit	y		~	G1	•							
END OF TEST HOLE AT 6.1 m IN SILT TILL Notes: 1. No sloughing or seepage observed. 2. Test hole backfilled with auger cuttings. DYREGROV ROBINSON INC.	Fe MARK GG Image: Completion depth; 6.1 m END OF TEST HOLE AT 6.1 m IN SILT TILL Notes: 1. No sloughing or seepage observed. 1. No sloughing or seepage observed. 2. Test hole backfilled with auger cuttings. Image: Completion depth; 6.10 m DYREGROV ROBINSON INC. LOGGED BY: CR COMPLETION DEPTH; 6.10 m REVIEWED BY: AOD COMPLETION DATE: 29/10/12 PROJECT ENGINEER: Alv Dyregrov Page 1 of 1	-234 -233 -232 -231 -230	-1-1-3		CLAY - silty - mottled brown and - stiff, moist, high pla - trace silt inclusions - firm below 2.4 m - trace till inclusions SILT (Till) - sandy, s - tan, compact, dry t	grey asticity s, trace gysum inclus , trace sand, trace gr ome clay, trace grav	sions ravel below 2.7	m			G1 G2 G3 G4								
Consulting Geotechnical Engineers	The second secon	I GEOTECH PLOTS -NEW ALT1 RIVERBEND LDS TEST HOLE LOGS.GPJ DRI.GDT 10/12/12		EGR	END OF TEST HOL Notes: 1. No sloughing or s 2. Test hole backfille	E AT 6.1 m IN SILT eepage observed. d with auger cutting	TILL s.	LOGGED BY: CR REVIEWED BY: AOD)	COM	G5 PLE PLE	● E E E E E E E E E E E E E E E E E E E							
	IFOT									TUOLE									
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PRO.	JECT:	Ferry	Road and Riverbend -	Contracts 1 & 2	CLIENI: I	etra lech			IES	THOLE	NO: 12-4	3							
		: Berry	/ St. Approx. 100 m So	uth of Silver Ave.							10.: 1234	/ /							
CON		IUR: I				i dia. SSA					I (M): 235	.003							
SAIVI			GRAB																
BACI		TYPE	BENTONITE	GRAVEL	SLOUGH		JROU		CUTTING	5	SAND								
Ê		_				ш		+ Torvane (S	iu) kPa +		◆ SPT N blows/300mm								
Z	E)	MBC				T	: #	10 20 30 40	<u>50 60 7</u>	0 10	20 30 40	50 60 70							
ATIO	H H	SΥ	S	OIL DESCRIPT	ION	Ц Ц	I II	▲ Unconfined Con	np. (Su) kPa	▲	Unit Weigl	nt kN/m³							
Ц М	DEF	5				AMF	SA	10 20 30 40	50 60 7	0 12	14 16 18	20 22 24							
		Ň				လ	2	△ Pocket Pen.	(Su) kPa ∆			%) PL							
-	E		CONCRETE (180 n	nm)				10 20 30 40	<u>50 60 7</u>	<u>0 10</u>	20 30 40	50 60 70							
Ē	E	$\widetilde{\mathcal{T}}$	CLAY (Fill) - silty	high placticity, trace			G6 G7				,								
Ē	E		CLAY - silty	nigh plasticity, trace	organics						/								
-234	-1		- mottled brown and	d grey, stiff, moist, h	igh plasticity														
Ē	E		SILI				G8												
Ē	E		CLAY - silty																
-233	-2		- mottled brown and	d grey, stiff, moist, h	igh plasticity	/	G9												
Ē			CLAY - silty	ome fine sand		/ [<u>``</u>							
Ē	E		- trace sand				G10) 				. T							
-232	E		 mottled brown and stiff, moist, high pl 	d grey lasticity															
-	3 -		- trace gypsum inclu	usions		Ш	-												
Ē	E		- trace till inclusions	s, trace gravel below	/ 3.0 m		T11		+	·· <u>A</u> ·····									
E ood	E						-												
-231	-4						G12	2											
Ē	E		SILT (Till) - sandy,	some clay, trace to	some gravel														
Ē	E	04040	- tan, compact, moi	st	0		G13	3			r i i i i i								
-230	-5	04040	- very dense, dry be	elow 4.6 m			G14	•											
Ē	Ē	0,40,40																	
Ē	F	0,0,0																	
-229	È.						C 1 5	-											
	-6	MAN					GIS					<u> </u>							
			END OF TEST HOI Notes: 1. No sloughing or s 2. Test hole backfill	LE AT 6.1 m IN SIL ⁻ seepage observed. ed with auger cutting	T TILL gs.														
	יחע					LOGGED BY	: CR		COM	PLETIO	N DEPTH: (6.10 m							
	TICI Dingui	EUN tina (DOIN INC.		REVIEWED E	BY: A	AOD	COM	PLETION	N DATE: 29	0/10/12							
	JIISUI	ango				PROJECT EN	VGIN	EER: Alv Dyregro	V			Page 1 of 1							

	PRO.	JECT:	Ferry	Road and Riverbend - (Contracts 1 & 2	CLIENT: T	etra Tech			TES	THO	DLE NO: 12-44
1	_OCA	ATION	I: Berry	y St. Approx. 200 m Sou	th of Silver Ave.					PRC)JE(CT NO.: 123499
(CON	TRAC	TOR:	Paddock Drilling	METHOD: ACKI	ER MP8 125mm	n dia. SSA	-		ELE	VAT	FION (m): 234.901
Ë	SAME			GRAB			DON			RECO	OVER	
	E E	(FILL		BENTONITE	└.]GRAVEL	IIIISLOUGH	<u>[.</u>	GROUT	Mcn		s #	 SAND SPT N blows/300mm ◆ 10 20 30 40 50 60 70
	ELEVATION	DEPTH (r	SOIL SYME		SOIL D	ESCRIPTIO	ON			SAMPLE TY	SAMPLE	■ Unit Weight kN/m ³ ■ 12 14 16 18 20 22 24 LL M/C (%) PL 10 20 30 40 50 60 70
Ē		-		ASPHALT (40 mm) (CLAY (Fill) - silty_tra	OVER CONCRETE	: (115 mm)				-/=	G16	•
	234	- - - - - - - - - - - - - - - - - - -		- dark greyish black, CLAY - silty - mottled brown and - stiff, moist, high pla	stiff, moist, high pl grey asticity, trace silt inc	asticity					G17	
	233	-2		- firm below 2.0 m							G18	•
	231	-3		- trace till inclusions,	trace sand , trace	gravel below 3	3.0 m				G19	•
	230	5		SILT (Till) - sandy, tr - tan - very dense, dry - some cobbles belo	race gravel w 4.7 m						G20	•
	229	6		- boulder at 5.8 m								
CH PLOTS -NEW ALT1 RIVERBEND LDS TEST HOLE LOGS.GPJ DRI.GDT 10/12/12				END OF TEST HOL NOTES: 1. Auger refusal at 4 2. No sloughing or s 3. Test hole backfille	E AT 6.1 m IN SILT	Γ TILL I to advance to gs.) 6.1 m (nc) refusal)				
EOTEC	D	YR	EGR	ROV ROBINS	ON INC.			BY: CR		COM		TION DEPTH: 6.10 m
BH GI	Co	nsu	ting (Geotechnical Engir	neers		PROJECT	ENGINEER: A	Alv Dyregrov			Page 1 of 1



PRO.	JECT:	Ferry	Road and Riverbend - Co	ontracts 1 & 2	CLIENT: Tel	ra Tech			TESTH	DLE NO: 12-46
LOCA	ATION	I: Berry	St. at Ness Ave.	-					PROJE	CT NO.: 123499
CON		TOR: F	Paddock Drilling	METHOD: ACKE	ER MP8 125mm (lia. SSA			ELEVAT	FION (m): 235.562
BACK										
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL	ASPHALT (65 mm) or	VIL DESCRIPTI	ION 150 mm)	SAMPLE TYPE	SAMPLE #	+ Torvane (Su) k 10 20 30 40 50 ▲ Unconfined Comp. (* 10 20 30 40 50 △ Pocket Pen. (Su) 10 20 30 40 50 	Pa + <u>60</u> 70 Su) kPa ▲ <u>60</u> 70 kPa △ <u>60</u> 70 ⋮ ⋮	◆ SPT N blows/300mm ◆ 10 20 30 40 50 60 70 ■ Unit Weight kN/m ³ ■ 12 14 16 18 20 22 24 LL M/C (%) PL 10 20 30 40 50 60 70 ⋮ ⋮ ⋮ ⋮ ⋮ ⋮ ⋮ ⋮
-235	-		CLAY (Fill) - silty, trac	e sand	lasticity					
			CLAY - sitly - dark grey, stiff, mois - mottled brown and c	t, high plasticity lark grey, trace silt	t inclusions, trac	xe	G29			
-	-2		gypsum inclusions be	low 1.2 m			T31	▲ +	<u>A</u>	
-233	3		 tirm below 2.3 m trace till inclusions. t 	race sand, trace o	ravel below 3.0	m	G32			
-232			SILT (Till) - sandy, trace gravel				G35 G33			•
-231	 - - - - - - - - - - - - -	00000000000000000000000000000000000000	 tan, very dense, dry some cobbles, trace 	boulders below 4	.7 m		G34			•
-230		20000000000000000000000000000000000000					_			
21 DRI:GDT 10/12/12	7	00000000000000000000000000000000000000					G36 G37 G38			
H PLOTS -NEW ALT1 RIVERBEND LDS TEST HOLE LUGS (9		<u>1 FA FX P</u>	END OF TEST HOLE NOTES: 1. Auger refusal at 5.8 2. No soil recovery be 3. No sloughing or se 4. Test hole backfilled	AT 7.6 m IN SILT a. Bullit bit used etween 4.7 and 6.1 epage observed. with auger cutting	TILL to advance to 7 m. gs.	7.6 m (no r	efus	al)		
	YR	EGR	OV ROBINSC	ON INC.			CR		COMPLE	TION DEPTH: 7.62 m
ຶ່ Cc	nsul	ting G	eotechnical Engine	eers		PROJECT EN	VGIN	EER: Alv Dyrearov		Page 1 of

PRO.	JECT:	Ferry	Road and Riverbend -	Contracts 1 & 2	CLIENT: T	etra Tech		TE	STHC	DLE NO: 12-47	
LOC	ATION	I: Berry	/ St. Approx. 100 m So	uth of Ness Ave.	1			PF	ROJEC	CT NO.: 123499	
CON	TRAC	TOR: I	Paddock Drilling	METHOD: ACK	ER MP8 125mm	i dia. SSA		EL	EVAT	TON (m): 235.754	
SAM	PLE T	YPE	GRAB	SHELBY TUBE	SPLIT SPC	DON 📃	BULK		COVER	Y CORE	
BACI	<u> KFILL</u>	TYPE	BENTONITE	GRAVEL	SLOUGH		GROUT		IGS	SAND	
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL		SOIL D	ESCRIPTIC	N		SAMDI E TVDE	SAMPLE I YPE SAMPLE #	 ◆ SPT N blows/300mm ◆ 10 20 30 40 50 60 70 ■ Unit Weight kN/m³ ■ 12 14 16 18 20 22 24 ↓↓ M/C (%) PL 	
-	-		ASPHALT (40 mm)	over CONCRETE (165 mm)					<u>10 20 30 40 50 60 70</u>	
-235	- - - - - - - - - - - - - - - - - - -		CLAY (Fill) - silty, tr - dark grey and blac SILT - tan - compact - dry	ace sand sk, stiff, moist, high p	plasticity				G39 G40		
-234 - - - - - - - -	-2		- mottled brown and - stiff, moist, high pl - trace till inclusions	l dark grey asticity , trace gysum inclus	sions				G41)	
-233	-3								G42	•	
-232	4	00000000000000000000000000000000000000	- tan - compact to very de - some cobbles belo	ense, moist bw 3.7 m	ciay				G43	•	
231	5								G44 G47	Ę	
- 230									G45		
	<u>-0</u>		END OF TEST HOL NOTES: 1. No sloughing or s 2. Test hole backfille	LE AT 6.1 m IN SILT seepage observed. ed with auger cutting	Γ TILL gs.						
D	YR	EGR	OV ROBINS	SON INC.		LOGGED B	Y: CR			TION DEPTH: 6.10 m	
C	onsul	ting C	Geotechnical Engi	neers		PROJECT E	ENGINEER: Alv Dyrear	GINEER: Alv Dyregrov Page 1			

APPENDIX A - TEST HOLE LOGS

PRO.	IECT:	Ferry	Road and Riverbend -	Contracts 1 & 2	CLIENT: Te	tra Tech			TESTH	OLE NO: 12	-48	
LOCA	TION	I: Berry	/ St. Approx. 200 m So	uth of Ness Ave.					PROJE	CT NO.: 123	3499	
CON	[RAC	TOR: I	Paddock Drilling	METHOD: ACK	ER MP8 125mm	dia. SSA			ELEVA	TION (m): 2	35.408	
SAM	PLE T	YPE	GRAB		SPLIT SPOO		BULK		IO RECOVER		RE	
BACH	FILL	TYPE	BENTONITE	GRAVEL	SLOUGH		GROU		UTTINGS	SAI	ND	
lion (m)	(m) H1	YMBOL	S		ION	E TYPE	PLE #	+ Torvane (Su)	kPa + 50 60 70 . (Su) kPa ▲	◆ SPT N b 10 20 30	lows/300mm 40 50 60 eight kN/m ³	◆ 70
ELEVA ⁻	DEP1	SOIL S	Ū			SAMPL	SAM	10 20 30 40 5 △ Pocket Pen. (S 10 20 30 40 5	50 60 70 u)kPa∆ 50 60 70		<u>18 20 22</u> ₩C (%) PL <u>40 50 60</u>	<u>24</u>
-235	_		ASPHALT (65 mm)	over CONCRETE ((150 mm)		C 40					÷
235	-		- CLAY (Fill) - silty, tr	ace sand	nlasticity		G48	S			T	
-234			- black and dark grey CLAY - silty - mottled dark grey - stiff, moist, high pl - trace silt inlcusions	and black asticity s, trace gypsum inlo	cusions		G49) 			•	
-233	-2		- firm, trace till inclu	sions below 2.3 m			T50	,	▲ ·+····2	181	,	
-232	-3						Gol					
-	-		SILT (Till) - sandy, s	some clay, some gra	avel, cobbles							
-	-		- very dense, dry				G52	2		•		
-231	-4 	10000000000000000000000000000000000000										
-230	-		- grain size analysis	at 5.5 m			G53 G54	3		•		
-	6		END OF TEST HOL Notes: 1. No sloughing or s 2. Test hole backfille	LE AT 6.1 m IN SIL seepage observed. ed with auger cutting	T TILL gs.		G55	S				
D	YR	EGR	OV ROBINS	SON INC.	ŀ	LOGGED BY:	: CR		COMPLI	ETION DEPTH	l: 6.10 m	
Co	nsul	ting (Geotechnical Engi	neers	-	PROJECT EN	IGIN	EER: Alv Dyregrov		LIIUN DATE.	Page 1	of 1

APPENDIX A - TEST HOLE LOGS

PROJE	ECT:	Ferry	Road and Riverbend - C	ontracts 1 & 2	CLIENT: Tetra	Tech				TESTI	HOLE	NO: 1	2-49	
LOCAT	ION	: Broo	klyn St. at Silver Ave.							PROJ	ECT N	0.: 12	23499	
CONT		TOR: I	Paddock Drilling	METHOD: ACK	ER MP8 125mm dia	. SSA				ELEV	ATION	(m): 2	234.27	8
BACKE	- []	TYPE	BENTONITE					т І	<u>ич</u> Иси		RI			
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL	SC	DIL DESCRIPT	TION	SAMPLE TYPE	SAMPLE #	+ Torvana 10 20 30 △ Pocket Po	2 (Su) kF 40 50 en. (Su)	Pa + 6070 kPa ∆	10 12	SPT N 20 30 ■ Unit V 14 16	blows/30 40 50 Veight kN 18 20	0mm ♦) 60 70 I/m³ ■) 22 24 PL
-234 <u>-</u>			CONCRETE (150 mi	m)				10 20 30	<u>40 50</u>	<u>60 70</u>	<u>10</u>	<u>20 30</u>	40 50	<u>60 70</u>
			CLAY (Fill) - silty, tra	ce sand	plasticity		050							
-233	-1		CLAY - silty - mottled brown and - stiff, moist, high pla - trace gypsum inclus \CLAY AND SILT - ta	grey sticity sions, trace silt inc n, firm, moist, inte	lusions rmediate plasticity		G58 G58 G59							
-232	2		CLAY - silty - mottled brown - stiff, moist, high pla - trace gypsum inclus - trace till inclusions b	sticity sions, trace silt inc pelow 1.8 m	lusions		T60		+				•	•
-231	-3		- firm below 3.0 m										/	/
230	-4						G62						•	
	-5						G63							
-228	-7		SILT (Till) - sandy, tra - grey - compact, moist	ace clay, trace gra	ivel		G64 G65 G66							
		ra a B	END OF TEST HOLI Notes: 1. No sloughing or se 2. Test hole backfilled	E AT 7.6 m IN SIL eepage observed. d with auger cuttin	T TILL gs.		L	1			-1			
DY	R	E GR tina (ON INC.	LO RE	GGED BY: VIEWED B	: CR 3Y: /	AOD		COMP	_ETION _ETION	I DEPT I DATE	H: 7.62 : 30/10	2 m /12

	PRO.	IECT:	Ferry	Road and Riverbend - C	Contracts 1 & 2	CLIENT: Te	tra Tech		TESTH	OLE NO: 12-50
	LOCA	TION	I: Brool	klyn St. Approx. 100 m S	South of Silver Ave.				PROJE	CT NO.: 123499
	CON	FRAC	TOR: F	Paddock Drilling	METHOD: ACKE	R MP8 125mm	dia. SSA		ELEVA	TION (m):
	SAME		YPE	GRAB		SPLIT SPO			RECOVER	
	BACK	FILL	TYPE	BENTONITE	GRAVEL	SLOUGH	GROU		TTINGS	SAND
	ELEVATION (m)	DEPTH (m)	SOIL SYMBOL		SOIL DI	ESCRIPTIC	N		SAMPLE TYPE SAMPLE #	◆ SPT N blows/300mm ◆ 10 20 30 40 50 60 70 ■ Unit Weight kN/m ³ ■ 12 14 16 18 20 22 24 LL M/C (%) PL 10 20 30 40 50 60 70
ľ		_	××××	CONCRETE (150 m	m)				7	
		-		CLAY (Fill) - silty	/ stiff moist high p	lasticity			CGZ	
		-	\square	CLAY - silty	y, oun, molot, nigh p	laotiony			Go/	
				 mottled brown and stiff, moist, high pla trace silt inclusions 	dark grey isticity , trace gypsum inclu	usions			G68	
		-2								
									G69	1
				- trace sand, trace g	ravel below 3.4 m				G70	, ,
		5		- trace till inclusions	below 5.3 m				G 71	•
1 171 10		-							G72	
- האויפה ו		-7		SILT (Till) - sandy, s - tan - very dense, dry	ome clay, trace gra	vel			S72	•
50.0				END OF TEST HOU	FAT 7.3 m IN SILT	ТШ				
				Notes: 1. No sloughing or se 2. Test hole backfille	eepage observed. d with auger cutting	S.				
5								<u></u>	001001	
	D	YR	EGR	OV ROBINS	ON INC.		LUGGED BY: CR			ETION DEPTH: 7.32 m FTION DATE: 30/10/12
	Co	nsul	ting C	eotechnical Engin	eers		PROJECT ENGIN	IEER: Alv Dyregrov		Page 1 of 1





3H GEOTECH PLOTS -NEW ALT1 RIVERBEND LDS TEST HOLE LOGS.GPJ DRI.GDT 10/12/12



3H GEOTECH PLOTS -NEW ALT1 RIVERBEND LDS TEST HOLE LOGS.GPJ DRI.GDT 10/12/12

APPENDIX A - TEST HOLE LOGS

PRO.	JECT:	Ferry	Road and Riverbend - (Contracts 1 & 2	CLIENT: Tet	ra Tech				1	[ESTH	IOLE	NO: [·]	12-53		
LOCA	TION	I: Broo	klyn St. Approx. 200 m S	South of Ness Ave.						F	PROJECT NO.: 123499					
CON	TRAC	TOR: I	Paddock Drilling	METHOD: ACKE	ER MP8 125mm d	lia. SSA				1 E	ELEVA	TION	(m):	235.4	16	
SAMI			GRAB					IT		јио к Іситт		RY				
(m) NOIT	(m) HT	SYMBOL	S					10	+ Torvane (Su) 10 20 30 40 5		i) kPa + 50 60 70		◆ SPT N blows/300m 10 20 30 40 50 0 ■ Unit Weight kN/m) <u>70</u>
	DEP	SOIL	CONCRETE (160 m	TE (160 mm)		SAMP	SAN	△ Pocket Pen. (Su 10 20 30 40 56		(Su) kF 506	(Su) kPa ∆ 50 60 70		LL M/C (%) F 10 20 30 40 50 f			
-235			CLAY (Fill) - silty - black and dark brow	wn, stiff, moist, high	plasticity						· · · · · · · · · · · · · · · · · · ·					
-234	-1		CLAY - silty - mottled brown and - stiff, moist, high pla - trace silt inclusions	grey isticity , trace gypsum inclu	usions	•	G88 G89	3								
-233			- trace till inclusions	below 2.4 m			G90	D		·····						
-231	4	608080808080808080808080808080808080808	SILT (Till) - sandy, s - tan - very dense, dry	ome gravel, cobble	s, trace clay		G92	2				•	/			
-230							G94 G95	5				•				
			END OF TEST HOL Notes: 1. No sloughing or s 2. Test hole backfille	E AT 6.1 m IN SILT eepage observed. d with auger cutting	TILL js.											
D	YRI	EGR		ON INC.		OGGED BY		AOD			COMPL	ETION	I DEP	ГН: 6. <u>: 30/</u> г	10 m 10/12	

				APPEN	DIX A - TEST HOLE	LOG	S								
PRO.	IECT:	Ferry	Road and Riverbend - (Contracts 1 & 2	CLIENT: Tetra T	ech			TESTH	OLE NO: 1	2-54				
LOCA	TION	: King	Edward St. Approx. 200) m South of Ness Av	ve.				PROJE	CT NO.: 12	23499				
CON	FRAC	TOR: I	Paddock Drilling	METHOD: ACK	ER MP8 125mm dia. S	SSA			ELEVATION (m): 235.341						
SAM	LE T	YPE	GRAB	SHELBY TUBE	SPLIT SPOON	E	BULK	N) RECOVER	RY C	ORE				
BACK	(FILL ⁻	TYPE	BENTONITE	GRAVEL	SLOUGH		GROU	т 🛛 🛛 С	JTTINGS	S	AND				
(m) NOI	H (m)	MBOL				TYPE	LE #	+ Torvane (Su) 10 20 30 40 5	kPa + 0 60 70	♦ SPT N 10 20 30	blows/300)mm ♦ 60 70			
ELEVAT	DEPT	SOIL SY	50	JIL DESCRIPT	ION	SAMPLE	SAMP	▲ Unconfined Comp. 10 20 30 40 5 △ Pocket Pen. (Si 10 20 20 40 5	(Su) kPa ▲ <u>) 60 70</u> J) kPa ∆		Veight kN/ <u>18 20</u> M/C (%)	m ³ ■ <u>22 24</u> PL 			
-235			CONCRETE (255 m	ım)					<u>) 60 70</u>	10 20 30	40 50	<u> </u>			
200	_		CLAY (Fill) - silty	. Come an eine bink			G96			T					
È	-		- black and dark gre	y, firm, moist, high	plasticity	_/ [_									
Ē	_ 1		- tan, moist				G97		••••	-					
-234	-									\					
E	_		- mottled brown and	dark grey					· · · · ; · · · ; · · · ·		\	;;			
F	-		- stiff, moist, high pla	sticity							λ				
Ē	-2	\square	- trace slit inclusions	, trace gypsum inc	lusions										
-233 E	_										÷ /:				
-	-						0.00								
Ē	_						G98				/				
-	-3								····}···{···						
- 202	-	\square													
Ē	-		(mana dill in altra in ma	(;;;		./				
E	-		- trace till inclusions,	trace sand, trace (gravel below 3.7 m					/					
-231	-4						G99								
-	-														
E	-	\bigvee				Ш	1								
-	-5						T10		k ∕∆						
-230	-						-		•••••						
E	-	og	SILT (Till) - sandy s	ome gravel trace (lav										
-	-	00000	- tan	onio gravol, traco c	Juy		D 40								
E	-6	o Qo Qo	- very dense, dry				510								
			END OF TEST HOL Notes: 1. No sloughing or s 2. Test hole backfille	E AT 6.1 m IN SIL ⁻ eepage observed. d with auger cutting	T TILL gs.										

	LOGGED BY: CR	COMPLETION DEPTH: 6.10 m
DTREGROV ROBINSON INC.	REVIEWED BY: AOD	COMPLETION DATE: 30/10/12
Consulting Geotechnical Engineers	PROJECT ENGINEER: Alv Dyregrov	Page 1 of 1

PENDIX A - TEST HOLE LOGS

PRO	JECT	Ferry	Road and Riverbend - (Contracts 1 & 2	CLIENT: Tet	ra Tech			TESTH	DLE NO: 1	2-55			
LOC	ATION	I: Quee	en St. Approx. 300 m Sc	outh of Silver Ave.					PROJE	CT NO.: 1	23499			
CON		IOR: I	Paddock Drilling	METHOD: ACK		ia. SSA								
BAC	KFILI	TYPF	BENTONITE					 T		. <u> </u>	AND			
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL	ASPHALT (50 mm)		TON (190 mm)	SAMPLE TYPE	SAMPLE #	+ Torvane (S 10 20 30 40 ▲ Unconfined Corr 10 20 30 40 △ Pocket Pen. (1) 10 20 30 40 	J) kPa + 50 60 70 p. (Su) kPa ▲ 50 60 70 Su) kPa Δ 50 60 70 	◆ SPT N 10 20 30 ■ Unit 1 12 14 16 LL 10 20 30 ⋮ ⋮ ⋮	l blows/300r 0 40 50 Weight kN/rr 6 18 20 M/C (%) 0 40 50 	nm ♦ 60 70 n ³ ■ 22 24 PL = 60 70 : :		
			CLAY (Fill) - silty - black and dark gre	y, stiff, moist, high	plasticity									
			CLAY - silty - mottled brown and - stiff, moist, high pla - trace gypsum inclu	grey asticity sions, trace silt inc	lusions		G102 G103							
			SILT - tan, moist				G105	5		K				
	-3		CLAY - silty - mottled brown and - stiff, moist, high pla - trace gypsum inclu	grey asticity isions, trace silt inc	lusions		T106		+ \D			•		
	-4		- trace till inclusions	below 4.0 m			G107				•			
S TEST HOLE LOGS.GPJ DRI.GDT 10/12/12	6		- greyish brown, firm	n, trace gravel belor	w 6.1 m		G108 G105 G111							
BEND LD	-9		SILT (Till) - sandy, s $_{-}$ tan, compact, mois	ome gravel, trace o st	clay		G110		· · · ·	Ø				
1 PLOTS -NEW ALT1 RIVER			END OF TEST HOL Notes: 1. Trace seepage fro 2. No sloughing obs 3. Test hole backfille	E AT 9.1 m IN SILT om silt layer at 2.3 erved. ed with auger cuttin	「TILL m. gs.									
							LOGGED BY: CR COMPLET				ETION DEPTH: 9.14 m			
	onsul	tina C	Geotechnical Engir	neers	ł		BY: A	OD	COMPLE	TION DATE	: 30/10/1	$\frac{2}{10^{f^1}}$		
āl 🛄					11	KUJEUTEN	זעווטי	_∟к. ни ругедЮ	v		raye	; I UL I		

PROJEC LOCATI CONTR SAMPL BACKFI	CT: ION: RACT E TY ILL T	Ferry King OR: F PE YPF	Road and Riverbend - (Edward St. at Silver Av Paddock Drilling	Contracts 1 & 2 e.	CLIENT: Tetra	Tech			TESTHO	DLE NO:	12-56	
LOCATI CONTR SAMPL BACKFI	ion: Ract E ty ILL t	King OR: F PE YPF	Edward St. at Silver Av Paddock Drilling	e.								
CONTR SAMPL BACKFI	E TY	OR: F PE YPF	Paddock Drilling						PROJE	CT NO.: 1	23499	
BACKFI	LE TY	PE YPF		METHOD: ACK	ER MP8 125mm dia.	SSA			ELEVAT	<u>ION (m):</u>	234.08	6
BACKFI		YPF	GRAB		SPLIT SPOON	BU	JLK		RECOVER	Y [[](CORE	
		·· -	BENTONITE	GRAVEL	SLOUGH	GF	ROU		TTINGS		SAND	
ELEVATION (m	DEPTH (m)	SOIL SYMBOL	S	OIL DESCRIPT	ION	SAMPLE TYPE	SAMPLE #	+ Torvane (Su) k 10 20 30 40 50 ▲ Unconfined Comp. (10 20 30 40 50 △ Pocket Pen. (Su) 10 20 30 40 50	Pa + <u>60</u> 70 Su) kPa ▲ <u>60</u> 70 kPa △ <u>60</u> 70	◆ SPT <u>10 20 3</u> ■ Unit <u>12 14 7</u> <u>LL</u> <u>LL</u> <u>LL</u>	N blows/30 <u>30</u> 40 5 : Weight kl <u>16</u> 18 2 <u>M/C (%)</u> <u>30</u> 40 5	00mm ◆ 0 60 70 $V/m^3 \blacksquare$ 0 22 24 PL PL 0 60 70
			ASPHALT (50 mm)	over CONCRETE	(150 mm)				80 70		<u>30 40 5</u>	0 60 70
-233 -1	1		CLAY (Fill) - silty - black and dark gre CLAY AND SILT - grey, stiff, moist, m inclusions CLAY - silty - mottled brown and - stiff, moist, high pla	y, stiff, moist, high redium to high plas dark grey asticity	plasticity ticity, trace silt		6112 6113	3				
-232 -2	2 3		- sun, morst, mgn pa	s, trace gypsum inc	lusions		6114	4 				
-230	4		- trace till inclusions	below 3.7 m			6116	S	+ 2		•	,
-228	6		- grey below 5.5 m - soft, trace sand, tra	ace gravel below 6	.1 m		6117	7	· · · · · · · · · · · · · · · · · · ·		•	
	7						6118	3		•		
			END OF TEST HOL Notes: 1. No sloughing or s 2. Test hole backfille	E AT 7.6 m IN CL/ eepage observed. d with auger cuttin	ΑY gs.							
DY	'RF	GR	OV ROBINS		LOC	GED BY:	CR		COMPLE	TION DEP	TH: 7.6	2 m
Con	sulti	ing G	ieotechnical Engir	neers	PR	JECT FN	r: A GINI	EER: Alv Dyrearov			⊑: 31/10 Pa	ni∠ ae 1 of 1

APPENDIX A -	TEST HOLE LOGS

PRO.	JECT:	Ferry	Road and Riverbend -	Contracts 1 & 2	CLIENT: T	etra Tech		TEST	IOLE NO: 12-57				
		: KING	Edward St. Approx. 10 Paddock Drilling		Ve.	dia SSA			<u>CINU: 123499</u>				
SAM	PIFT	YPF				ON BULK							
BAC	KFILL	TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT		TTINGS	SAND				
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL	-	SOIL D	DESCRIPTIC	DN		SAMPLE TYPE SAMPLE #	◆ SPT N blows/300mm ◆ 10 20 30 40 50 60 70 ■ Unit Weight kN/m ³ ■ 12 14 16 18 20 22 24 LL M/C (%) PL 10 20 30 40 50 60 70				
-234	F	××××	ASPHALT (40 mm)	over CONCRETE (150 mm)								
-233	- - - - - - - - - - - - - - - - - - -		CLAY (Fill) - silty - black and dark gre CLAY - silty - mottled brown and - stiff, moist, high pl - trace silt inclusions	ey, stiff, moist, high p I grey asticity s, trace gysum inclu	plasticity			G11	8 9				
-232	-2							G 12	20				
- 231	-3												
-230	-4		- trace till inclusions	, trace sand, trace ς	gravel below 4.	0 m		G 12	2				
- 	5												
228	6		- grey, firm below 5.	8 m									
227	- 7 7 							G12	23				
226	8		SILT (Till) - sandy, s - tan - very dense, dry	some clay, trace gra	avel			G12 G12	24 ●				
225	9								27				
		<u>ns (18 Full</u>	END OF TEST HOL Notes: 1. SPT terminated a 2. No sloughing or s 3. Test hole backfille	E AT 9.4 m IN SILT at 9.4 m. Refused or seepage observed. ed with auger cutting	F TILL n suspected co gs.	bble.							
	VP	FCP				LOGGED BY: CR		COMPL	ETION DEPTH: 9.37 m				
	Consulting Geotechnical Engineers						JD ER: Alv Dvrearov	COMPLETION DATE: 31/10/12 COMPLETION DATE: 31/10/12 Page 1 of 1					





3H GEOTECH PLOTS -NEW ALT1 RIVERBEND LDS TEST HOLE LOGS.GPJ DRI.GDT 10/12/12

PRO	JECT:	Ferry	Road and Riverbend - C	Contracts 1 & 2	CLIENT: Tetra T	ech					TES	THO	LE N	IO: 1	2-60			
LOC	ATION	I: King	Edward St. Approx. 200	m South of Silver A	Ave.						PRC	DJEC	T NC).: 12	23499			
CON	TRAC	TOR: I	Paddock Drilling	METHOD: ACK	ER MP8 125mm dia. S	SSA				_	ELE	VATI	ON ((m): 1	234.3	58		
SAM	PLE T	YPE	GRAB	SHELBY TUBE	SPLIT SPOON	B	ULK				D RECC	VERY			ORE			
BAC	KFILL	TYPE	BENTONITE	GRAVEL	SLOUGH	G	ROU	T		C	JTTING	S		S	AND			
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL	SC	DIL DESCRIPT	TION	SAMPLE TYPE	SAMPLE #	10 ▲ Uni 10 	+ Torvar 20 30 confined 20 30 Pocket I	ne (Su) I <u>40 5(</u> Comp. <u>40 5(</u> Pen. (Su	kPa + <u>) 60 7</u> (Su) kPa) <u>60 7</u> I) kPa ∆	7 <u>0</u> a A 7 <u>0</u>	◆ SPT N blows/30 10 20 30 40 51 ■ Unit Weight kN 12 14 16 18 20 LL M/C (%) 10 20 30 40 51			800mm 50 60 N/m³ 1 20 22 PL	1 ♦) 70 2 24	
- 024	-		ASPHALT (50 mm) of	over CONCRETE	(150 mm)			10	20 30	40 50	<u>) 60 7</u>	7 <u>0</u>	10	<u>20 30</u>	<u>40</u>	50 <u>60</u>) 70	
-234			CLAY - silty - black to dark grey - stiff, moist, high pla - mottled brown and gypsum inlcusions b	sticity dark grey, trace si elow 1.1 m	It inclusions, trace		G140 G147									N.	· · · · · · · · · · · · · · · · · · ·	
-231							G148	· · · · · · · · · · · · · · · · · · ·								•		
-229	5		- trace till inclusions,	trace sand below	4.6 m		T150				• • + ▲•	<u> </u>	1					
			- grain size analysis	at 5.8 m			G151								,			
			SILT (Till) - sandy, se	ome gravel, trace	clay		G152	2					• • • • • • • • • • • • • • • • • • •		· · · · .			
			- grey, compact, moi END OF TEST HOL Notes: 1. No sloughing or so 2. Test hole backfille	st E AT 7.6 m IN SIL eepage observed. d with auger cuttin	gs.							I						
	DYREGROV ROBINSON INC.						CR				CON			DEPT	H: 7.6	2 m		
	Consulting Geotechnical Engineers					REVIEWED BY: AOD						COMPLETION DATE: 31/10/12						

				APPENI	DIX A - TEST H	OLE LOG	S			
PRO.	JECT:	: Ferry	Road and Riverbend -	Contracts 1 & 2	CLIENT: Tet	ra Tech			TESTH	OLE NO: 12-61
LOCA	ATION	I: King	Edward St. Approx. 10	0 m South of Cilver A	Ness Ave.				PROJE	CT NO.: 123499
CON	TRAC	TOR: I	Paddock Drilling	METHOD: ACKE	ER MP8 125mm c	lia. SSA			ELEVA	TION (m): 235.068
SAM	PLE T	YPE	GRAB	SHELBY TUBE	SPLIT SPOO		BULK		RECOVER	
BAC	(FILL	TYPE	BENTONITE	GRAVEL	SLOUGH		GROU	т Иси	TTINGS	SAND
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL	S	OIL DESCRIPT	ION	SAMPI E TYPE	SAMPLE #	+ Torvane (Su) k 10 20 30 40 50 ▲ Unconfined Comp. (10 20 30 40 50 △ Pocket Pen. (Su)	Pa + 60 70 Su) kPa ▲ 60 70 kPa △	 ◆ SPT N blows/300mm ◆ 10 20 30 40 50 60 70 ■ Unit Weight kN/m³ 12 14 16 18 20 22 24 LL M/C (%) PL
_	E		ASPHALT (75 mm)	over CONCRETE (75 mm)			<u>10 20 30 40 50</u>	<u>60 70</u>	<u>10 20 30 40 50 60 70</u>
-	F		SILT - some sand, t	an, moist	,					
-234			CLAY - silty - mottled brown and - stiff, moist, high pl - trace silt inclusions inclusions	l dark grey asticity s, trace gypsum incl	usions, trace till		G153	 		
-232	-3						G158	5		_
- - - - - - 230	5		- trace sand, trace g	gravel below 4.0 m			G157			
-229	6		- firm below 5.2 m				G158	3	· · · · · · · · · · · · · · · · · · ·	•
			END OF TEST HOL Notes: 1. No sloughing or s 2. Test hole backfille	E AT 6.1 m IN CLA seepage observed. ed with auger cutting	Y gs.	OGGED BY	·· CB		COMPLE	TION DEPTH: 6 10 m
D	YR	EGR	OV ROBINS	ON INC.		LUGGED BY	ECR BY: A	NOD		ETION DEPTH: 6.10 m ETION DATE: 31/10/12
Co	onsu	lting C	Beotechnical Engi	neers	·	PROJECT EI	NGIN	EER: Alv Dyregrov		Page 1 of 1

AFFENDIA A - LEST HULE LUGS



PRO.	JECT:	Ferry	Road and Riverbend -	Contracts 1 & 2	CLIENT: Tetra	Tech			TESTH	TESTHOLE NO: 12-63					
LOCA		: Quee	en St. Approx. 200 m S	outh of Silver Ave.					PROJE	CT NO.: 123	499				
CON		IOR: I			ER MP8 125mm dia	. SSA	ע וו וכ	Г.		.TION (m): 23	3.952				
BACk		TYPF	BENTONITE				GROU	<u> </u>	ACUTTINGS		D				
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL	S	OIL DESCRIPT	TION	SAMPI F TYPF	SAMPLE #	+ Torvane (10 20 30 44 ▲ Unconfined Co 10 20 30 44 △ Pocket Per 10 20 30 44	(Su) kPa + 50 60 70 mp. (Su) kPa ▲ 50 60 70 (Su) kPa △ (Su) kPa △ 50 60 70	◆ SPT N blc 10 20 30 4 ■ Unit Wei 12 14 16 1 LL M/C 10 20 30 4	$3000 \text{ m} + \frac{10}{50} \frac{50}{60} \frac{60}{70}$ $3000 \text{ m} + \frac{10}{50} \frac{10}{22} \frac{24}{24}$ $3000 \text{ m} + \frac{10}{50} \frac{10}{60} \frac{10}{70}$				
	-	××××	ASPHALT (100 mm	n) over CONCRETE	(150 mm)										
	-		- black, stiff, moist,	high plasticity			G16	4							
-232	1	$\widetilde{}$	CLAY - silty, mottle plasticity - thin silt lense (75 n - trace silt inlcusion	d brown and dark g mm thick) at 1.4 m s, trace gypsum inc	rey, stiff, moist, hig lusions below 1.5 ו	n	G16	5							
-231	-3						G16	6							
-230	-4		- trace black sand in	nclusions below 4.1	m		G16	7							
	-5						G16	9			•				
-227	7		- grey, firm, trace g	ravel below 6.4 m			G17 G17	0			•				
225	9		END OF TEST HOI Notes: 1. No sloughing or s 2. Test hole backfill	LE AT 9.1 m IN CL/ seepage observed. ed with auger cuttin	ΑΥ Igs.										
D	YR I	E GR tina (SON INC.	LO RE	GGED BY VIEWED I	: CR BY: A	R AOD	COMPL COMPL	COMPLETION DEPTH: 9.14 m COMPLETION DATE: 01/11/12					

PRO.	JECT:	Ferry	Road and Riverbend - Co	ontracts 1 & 2	CLIENT: T	etra Tech	TESTHOLE NO: 12-64						
LOCA	ATION	l: Quee	en St. at Ness Ave.	-				PROJECT NO.: 123499					
CON	TRAC	TOR: I	Paddock Drilling	METHOD: ACK	ER MP8 125mm	dia. SSA		ELEV	ATION (m): 233.934				
SAM	PLE T	YPE	GRAB		SPLIT SPO			RECOV					
BACH	KFILL	TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	∐CU	TTINGS	SAND				
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL		SOIL DESCRIPTION									
-	Ē	xxxx	ASPHALT (75 mm) or	ver CONCRETE ((125 mm)								
-233	1		CLAY (Fill) - silty, son CLAY - silty - grey - stiff, moist, high plas	ne sand, black, sti ticity	iff, moist, high	olasticity, hydrocarbon	<u>i odor</u>	∫ — G1 — G1	172 9 173 9				
-232	-2		- mottled dark brown a m	mottled dark brown and grey, trace silt inclusions, trace gypsum inclusions below 2.0									
-230	-3												
-229								G					
-228	6		- firm, trace till inclusio	ons, trace gravel b	below 6.4 m				76♥				
226								G	177 178.				
225	9	0000000 000000000000000000000000000000	SILT (Till) - sandy, so - grey - very dense, dry	me gravel, trace c	blay			G7 \$1	179. • 180 •				
223	-10 	20000000000000000000000000000000000000						Gŕ	181 • 182 •				
		<u> </u>	END OF TEST HOLE Notes: 1. Refusal on suspect 2. No sloughing or se 3. Test hole backfilled	AT AUGER REF ed bedrock. epage observed. with auger cutting	USAL AT 11.3 gs.	m IN SILT TILL							
	VD	FCP				LOGGED BY: CR		COMF	LETION DEPTH: 11.28 m				
	onsul	tina C	Geotechnical Engine	ers		REVIEWED BY: AOD	UV DVrearov	COMF	2LETION DATE: 01/11/12 Page 1 of 1				
			J			TT NUJEUT ENUTIVEER, P		1	raue i Ul 1				

APPENDIX A - TEST HOLE LOGS

PRO.	JECT	: Ferry	Road and Riverbend - C	Contracts 1 & 2	CLIENT: Te	etra Tech				TESTH	OLE NO:	12-65		
LOCA	ATION	I: Que	en St. Approx. 100 m So	uth of Ness Ave.						PROJECT NO.: 123499				
CON	TRAC	TOR:	Paddock Drilling	METHOD: ACKE	R MP8 125mm	dia. SSA				ELEVA	TION (m):	234.445		
SAME	PLE T	YPE	GRAB	SHELBY TUBE	SPLIT SPO	ON 📃 E	BULK			O RECOVE	RY 🔲 (CORE		
BACK	FILL	TYPE	BENTONITE	GRAVEL	SLOUGH		GROUT		CI	JTTINGS		SAND		
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL	SC	DIL DESCRIPTI	SAMPLE TYPE	SAMPLE #	+ Torvane (Su 10 20 30 40 ▲ Unconfined Comp 10 20 30 40 △ Pocket Pen. (S 10 20 30 40		kPa +) 60 70 (Su) kPa ▲) 60 70)) kPa △) 60 70	◆ SPT 10 20 3 ■ Unit 12 14 1 LL 10 20 3	N blows/300mm ◀ 30 40 50 60 : Weight kN/m ³ ■ 16 18 20 22 M/C (%) PL 30 40 50 60	70 70 24 70		
-	-	~~~~	ASPHALT (50 mm)	over CONCRETE (165 mm)					: :	: :		÷	
-234	-		CLAY (Fill) - silty, bla	ack and dark grey, s	stiff, moist, high	ו 								
232	3		CLAY - silty - mottled brown and - stiff, moist, high pla - trace silt inclusions	dark grey ticity , trace gypsum incli	usions		G18 G18 G18 G18 G18	5		+				
	0		END OF TEST HOL Notes: 1. No sloughing or se 2. Test hole backfille	E AT 6.1 m IN CLA eepage observed. d with auger cutting	Y js.			<u></u>	<u> </u>					
מ	YR	EGR	OV RORING		F	LOGGED BY	: CR			COMPLI	ETION DEP	TH: 6.10 m		
		ltina (Geotechnical Engin	eers	F				hu Dura mai	COMPLI	ETION DAT	E: UI/11/12	of	
			-- -		FRUJEUI E	NIIDN	EEK: A	iv Dyregrov			rage I	υII		

PENDIX A - TEST HOLE LOGS

PRO.	JECT	Ferry	Road and Riverbend - (Contracts 1 & 2	CLIENT: Tetr	a Tech			TESTH	TESTHOLE NO: 12-66					
LOC		I: Quee	en St. Approx. 200 m Sc	outh of Ness Ave.					PROJE	CT NO.:	123499				
CON		IOR: I	Paddock Drilling		ER MP8 125mm d	a. SSA				IION (m):	234.53	/			
BACI							GROU	<u> </u>			SAND				
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL	S	SOIL DESCRIPTION					u) kPa + <u>50</u> 60 70 p. (Su) kPa ▲ <u>50</u> 60 70 (Su) kPa △	◆ SPT 10 20 ■ Un 12 14	N blows/30 30 40 50 it Weight kN 16 18 20 M/C (%)	0mm ♦ 0 60 70 /m ³ ■ 0 22 24 PL PL 0 00 70			
-	-		ASPHALT (75 mm)	over CONCRETE	(185 mm)			10 20 30 40	50 60 70	10 20	<u>30 40 50</u>	<u>60 70</u>			
-234 -233 -232 -231 -230			CLAY (Fill) - silty - black and dark gre CLAY - silty, grey, si - mottled brown and gysum inclusions be	y, stiff, moist, high tiff, moist, high pla dark grey, trace si low 0.9 m	plasticity sticity It inclusions, trac		G194 G194 G197 G197 G197 G197	9	+						
229	6		- grey, trace till inclu	sions below 5.2 m			G19	5			•				
			END OF TEST HOL Notes: 1. No sloughing or s 2. Test hole backfille	E AT 7.6 m IN CL/ eepage observed. d with auger cuttir	ΑY Igs.										
	YR	EGR	OV ROBINS			OGGED BY	': CR		COMPL	ETION DEF	PTH: 7.62	m			
	onsu	lting (Geotechnical Engir	neers			dit: <i>F</i> NGIN				i⊏: UI/TI/ Par	ne 1 ∩f 1			

	APPENDIX A - TEST HOLE LOGS												
PROJ	ECT:	Ferry	Road and Riverbend -	Contracts 1 & 2	CLIENT: T	etra Tech		TESTHOLE NO: 12-67					
LOCA	TION	: Quee	en St. Approx. 300 m So	outh of Ness Ave.				PRC	DJECT NO.: 123499				
CONT	[RAC	TOR: F	Paddock Drilling	METHOD: ACI	KER MP8 125mm	n dia. SSA		ELE	VATION (m): 234.321				
SAMF	PLE T	YPE	GRAB	SHELBY TUBE	SPLIT SPC	DON BU) RECO					
BACK	FILL	TYPE	BENTONITE	GRAVEL	SLOUGH	GR	OUT CL	JTTING	S SAND				
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL		SAMPLE TYPE									
-234	-		ASPHALT (75 mm)	over CONCRETE	(190 mm)								
-233			SAND (Fill) - some g CLAY - silty - mottled brown and - stiff, moist, high pla - trace silt inclusions - trace till inclusions	gravel, brown, moi I dark grey asticity S below 1.8 m	ist				5197 •				
-231			- firm below 4.3 m						5199 •				
-229			SILT (Till) - sandy, s - tan, very dense, dr	some clay, some g 'y	ravel				5201 • 5202 •				
	 YRI	EGR	END OF TEST HOL Notes: 1. Trace seepage b 2. No sloughing obs 3. Test hole backfille	E AT 6.6 m IN SII elow 0.3 m from sa erved. ed with auger cutti	_T TILL and fill layer. ngs.	LOGGED BY:	CR		I I				
	nsul	tina C	Geotechnical Engi	neers				COM	IPLETION DATE: 02/11/12				
5 		<u> </u>				TEROJECT ENG	AND AN	1	raye i Ul I				

BH GEOTECH PLOTS -NEW ALT1 RIVERBEND LDS TEST HOLE LOGS.GPJ DRI.GDT 10/12/12

APPENDIX A - TEST HOLE LOGS

PROJF	CT:	Ferrv	Road and Riverbend - Co	ontracts 1 & 2	CLIENT: Tetra	Tech			TESTH	OLE NO: 12	2-68			
LOCAT	ION:	Quee	en St. Approx. 400 m Sou	uth of Ness Ave.	h of Ness Ave.					PROJECT NO.: 123499				
CONTR	RACT	OR: F	Paddock Drilling	METHOD: ACKE	ER MP8 125mm dia	. SSA			ELEVA	TION (m): 2	34.833			
SAMPL	ΕΤ	/PE	GRAB	SHELBY TUBE	SPLIT SPOON	E	BULK		RECOVER	RY CC	RE			
BACKF	ILL]	INDE .	BENTONITE	GRAVEL	SLOUGH		GROL	т 🛛 си	TTINGS	SA	ND			
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL	SC	DIL DESCRIPT	ION	SAMPI F TYPF	SAMPLE #	+ Torvane (Su) kl 10 20 30 40 50 ▲ Unconfined Comp. (\$ 10 20 30 40 50 △ Pocket Pen. (Su) 10 20 30 40 50	Pa + <u>60</u> 70 Su) kPa ▲ <u>60</u> 70 kPa △ <u>60</u> 70	◆ SPT N t 10 20 30 ■ Unit W 12 14 16 LL 1 10 20 30	blows/300mm \blacklozenge 40 50 60 7(eight kN/m ³ \blacksquare 18 20 22 24 M(C (%) PL \blacksquare 40 50 60 7(
F			ASPHALT (75 mm) o	ver CONCRETE (265 mm)					<u>10 20 30</u>	40 50 60 70			
-234 -233 -232 -231 -230	-1 -2 -3 -4		SAND (Fill) - some gr CLAY - silty - black - stiff, moist, high plas - trace organics - mottled brown and c - trace silt inclusions - trace till inclusions	ravel, moist sticity dark grey below 1. below 1.4 m	4 m gravel, tan, mois		320 320 320 320 720 720	3 5 5 7 8						
EOTECH PLOTS -NEW ALT1 RIVERBEND LDS TEST HOLE LOGS.GPJ DRI.GDT 10/12/12	6 /RE	GR	END OF TEST HOLE Notes: 1. No sloughing or se 2. Test hole backfilled	E AT 6.1 m IN CLA repage observed. I with auger cutting	Y js. LC RI		: CR		COMPLE	TION DEPTH	t: 6.10 m Ω2/11/12			
	ix E nsult	ing C	Geotechnical Engine	eers	N INC. REVIEWED BY: AOI PROJECT ENGINEE				COMPLE	IPLETION DATE: 02/11/12 Page 1 of 1				

PRO.	JECT	Ferry	Road and Riverbend -	Гесh		TESTHOLE NO: 12-69								
LOCA	ATION	I: King	Edward St. Approx. 30	00 m South of Ness A	ve.			PRC)JE(CT NC).: 12	3499		
CON	TRAC	TOR: I	Paddock Drilling	METHOD: ACK	ER MP8 125mm dia.	SSA		ELE	VAT	TON (<u>m): 2</u>	35.4	74	
SAM	PLE T	YPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK		RECO	VER	Y		RE		
BACK	FILL	TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	Дсит	TTING	S		SA	ND		
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL		SOIL DESCRIPTION								210ws/3 40 5 /eight k 18 2 M/C (%) 40 5	300mm 50 60 5 KN/m³ 20 22 5 PL −−− 50 60 5	<u>70</u> 24
-	-		ASPHALT (100 mn	n) over CONCRETE	(250 mm)									
-235			CLAY - silty - mottled brown and - stiff, moist, high p - trace silt inclusion	d dark grey lasticity s, trace till inlcusior	ns, trace gysum inclu	usions below 1.8 m			G210 G211					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Ē	-3									····;···				÷···
-231			SILT (Till) - sandy, - tan - dry, dense becom - very dense, some - light grey below 5	some gravel, trace ing very dense with cobbles below 4.6 .2 m	clay i depth m				6212 6213	•			•	
	YR	EGR	END OF TEST HO Notes: 1. No sloughing or 2. Test hole backfill	LE AT 6.1 m IN SIL seepage observed. ed with auger cuttin	T TILL Igs.	GED BY: CR TEWED BY: AOD		COM	IPLE	TION I	DEPTH DATE:	<u>H: 6.1</u> 02/1	10 m 1/12	
		ltina (ieotechnical Engi	neers	REV				IPLE		JATE:	02/1	1/12	
	n isul	un ig c			PRC	JECT ENGINEER: AIV D	vregrov					P	age 1 d	ut 1

PRO.	JECT:	Ferry	Road and Riverbend - Co	ontracts 1 & 2	CLIENT: T	etra Tech		TESTH	HOLE NO: 12-70
LOC	ATION	: King	Edward St. Approx. 350	m South of Silver Ave	Э.			PROJE	ECT NO.: 123499
CON	TRAC	TOR: F	Paddock Drilling	METHOD: ACKEI	R MP8 125mm	dia. SSA		ELEVA	ATION (m): 234.58
SAM	PLE T	YPE	GRAB	SHELBY TUBE	SPLIT SPO			RECOVE	
BACH	KFILL	TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CU	TTINGS	SAND
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL		SOIL DE	ESCRIPTIC	DN		SAMPLE TYPE SAMPLE #	 ◆ SPT N blows/300mm ◆ 10 20 30 40 50 60 70 ■ Unit Weight kN/m³ 12 14 16 18 20 22 24 LL M/C (%) PL
	-		ASPHALT (50 mm) or	ver CONCRETE (1	40 mm)				10 20 30 40 50 60 70
-234	- - - - - - - - - - - - - - - - - - -		CLAY (Fill) - silty - trace sand, trace gra - black - stiff, moist, high plas CLAY - silty - mottled brown and c	avel sticity lark grey				G21	15
-232	-2		 stiff, moist, high plas trace silt inclusions, 	trace till inclusions,	trace gysum	inclusions		G 21	6
-231								3 21	17
229								G 21	8
	- - - - - - - - - - - -	00000000000000000000000000000000000000	SILT (Till) - sandy, so - grey - loose, moist	me gravel, trace cla	ay			G21	
	8		- very dense, dry belo	w 7.9 m				G22 G22	-] . [
225	9							522	24
	<u>F</u>	<u>14(1)4(1)4</u>	END OF TEST HOLE Notes: 1. SPT terminated at 2. No sloughing or se 3. Test hole backfilled	AT 9.6 m IN SILT 9.6 m. Refused on epage observed. with auger cuttings	TILL suspected co s.	bble.		V	1 : : : : : : :
	VP					LOGGED BY: CR		COMPL	ETION DEPTH: 9.56 m
		tina (ers		REVIEWED BY: AOD		COMPL	ETION DATE: 02/11/12
<u></u>		····				FRUJEUTENGINEER	. AIV DYLEGIOV	1	Page I OF I

	DECT: Form Pood and Diverbond Contracts 1 & 2 CLIENT: Tetra Tech																			
PRO.	JECT:	Ferry	Road and Riverbend -	Contracts 1 & 2	CLIENT: T	etra Tech							TE	STH	OLE	NO:	12-7	1		
LOC	ATION	I: Kens	sington St. at Silver Ave	<u>)</u> .									PR	OJE	CT N	10.: 1	12349	99		
CON	TRAC	TOR:	Paddock Drilling	METHOD: ACKE	ER MP8 125mm	i dia. SSA	-					_	EL	EVA	TION	l (m):	233	.483		
SAM	PLE T	YPE	GRAB		SPLIT SPO	ION	BL	JLK) REC	OVEF	RY					
BACI		TYPE	BENTONITE	GRAVEL	IIIISLOUGH										SAND					
(m) N	(E)	BOL				# #					+ Torvane (S			+ ◆ SPT N blows/300mm ◆ 0 70 10 20 30 40 50 60					70	
VATIO	EPTH	L SYM	S	OIL DESCRIPT	ION								ed Comp. (Su) kPa ▲				■ Unit Weight kN/m ³ ■ 0 12 14 16 18 20 22			
		SOI					SAI	S	1	△ Poc	ket Pe	n. (Su)) kPa∠ 60	2 70	10		M/C ((%)	PL 	70
-	F		ASPHALT (65 mm)	over CONCRETE (190 mm)						:									:
-233	F		CLAY (Fill) - silty, so ∖plasticity	ו ר		3225														
Ē	F		CLAY AND SILT - b	prown		/ [1220								Ī				
Ē	-1 - firm, moist, intermediate plasticity																			
-232	E						3227								•		ļ			
Ē	Ē		CLAY - silty																	
-	-2		- stiff, moist, high pla	a grey asticity				-228												
-231	E		- trace silt inclusions	s, trace gypsum incl	usions			5220												
F	E			below 1.0 m																
Ē																				
E	Ē																			
E ²³⁰	E																			
E	E																			
E	-4																			
-229	Ē							3229										9		
E	Ē						\prod													
È	-5							1230						. 25					:	
-228	F																			
Ē	F		- firm below 5.5 m																	
	6							G231)	
			END OF TEST HOL	E AT 6.1 m IN CLA	Y			~												
			1. No sloughing or s	seepage observed.																
			2. Test hole backfille	ed with auger cutting	js.															
!																				
!																				
						100055 5		05						MD: -				1.40		
D	YR	EGR	OV ROBINS	SON INC.				$\frac{CR}{\gamma \cdot \Lambda}$									1H: (6.10 i 5/11/1	n 2	
Co	onsul	Consulting Geotechnical Engineers									Dyreg	rov				ורוש י	<u> </u>	Page	2 2 1 (of 1

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APPENDIX A - TEST HOLE LOGS

PRO.	JECT:	Ferrv	Road and Riverbend - (Contracts 1 & 2	CLIENT: T	etra Tech		TES	THO	DLE NO	: 12-7	12	
LOC	ATION	I: Kens	sington St. Approx. 100	m South of Silver Ave	<u>)</u>			PRC)JE(CT NO.:	1234	99	
CON	TRAC	TOR:	Paddock Drilling	METHOD: ACKE	ER MP8 125mm	dia. SSA		ELE	VAT	ION (m): 233	3.377	
SAM	PLE T	YPE	GRAB		SPLIT SPC			RECC	VER	Y		E	
BAC	(FILL	TYPE T	BENTONITE	GRAVEL	SLOUGH	GROU	T CL	ITTING	S		SAN)	
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL		SOIL D	ESCRIPTIC	DN		SAMPLE TYPE	SAMPLE #	◆ SF <u>10 20</u> ■ U <u>12 14</u> LL <u>-</u> 10 20	2T N blo 30 4 Init Weig 16 1 M/C 30 4	ws/300 0 50 ght kN/r 8 20 (%) 0 50	mm ♦ <u>60</u> 70 m ³ ■ <u>22</u> 24 PL – 60,70
-233	E		ASPHALT (50 mm)	over CONCRETE (2	205 mm)								
Ē	E		CLAY (Fill) - silty - black, stiff, moist, ł	nigh plasticity					G232	9			
-	È,												
-232	1 -		SILT - tan, loose, m	oist				-⁄ 🗖	G233				
-	Ē		- mottled brown and	dark grey					5234	· · · · · · · · · · · · · · · · · · ·			
Ē	Ē		- stiff, moist, high pla	asticity 3, trace gypsum incl ⁱ	usions								
	-2											<u>}</u> .	
231	E		- trace gravel below	2.4 m					G235	<u>.</u>		è	
-	F		- trace graver below	2.7 111									
-	-3												
-230	F												
-	F												•••••••••••••••••••••••••••••••••••••••
Ē	-4												
-229	E		- arev. firm below 4.	3 m							·		
Ē	E		g , ,						G236	.	· ·	•	
Ē	-5												
-228	Ē												
-	F								G237		···		
-	E_6												
H PLOTS -NEW ALT1 RIVERBEND LDS TEST HOLE LOGS GPJ DRI GDT 10/12/12			END OF TEST HOL Notes: 1. No sloughing or s 2. Test hole backfille	E AT 6.1 m IN CLA eepage observed. d with auger cutting	Y gs.						<u> </u>	<u></u>	
	YR	EGR				LOGGED BY: CR	0.0	CON	1PLE	TION DE	PTH:	6.10 i	m
	onsul	ting	Geotechnical Engir	neers		PROJECT ENGINE	UD FR: Alv Dvrearov	COM	1PLE	TION DA	NIE: 0	6/11/1 Page	12 e. 1. of 1
ч — ——							······································	1					

APPENDIX A - TEST HOLE LOGS	

		Earra	Dood and Diverband	optracts 1 º 0		Toch			ТГОТІ	
PRO.		: Ferry	Road and Riverbend - Co	ontracts 1 & 2		Tecn				IULE NU: 12-73
			Daddack Drilling		ED MD0 125mm dia	664				TION (m): 222 471
		VDE						,		
SAIVI										
BACK		TIPE	BENTONITE	GRAVEL	SLOUGH		T			<u>SAND</u>
Ê		ے				ш		+ Torvan	e (Su) kPa +	♦ SPT N blows/300mm ♦
z	E	BC				₹	# 田	10 20 30	40 50 60 70	10 20 30 40 50 60 70
E	Η	X کلا	SC	IL DESCRIPT	ION		<u>اط</u>	Unconfined (Comp. (Su) kPa 🔺	Unit Weight kN/m ³
	ШЦ					MP	AN	10 20 30	40 50 60 70	12 14 16 18 20 22 24
		S				22		△ Pocket P	en. (Su) kPa ∆	LL M/C (%) PL
-					(205 mm)			10 20 30	40 50 60 70	10 20 30 40 50 60 70
-233	Ē	\times	CLAY (Fill) - silty trac	ce gravel black s	tiff moist high		.			
Ē			plasticity	so gravel, slaek, e	in, molot, mgn		523	38		L
Ē			SILT - tan, loose, wet	:						
Ē	-1									
-232 E			CLAY - silty, trace gra	avel			G23	39		
E	E		- mottled brown and o	dark grey						
Ē	-2		- stiff, moist, high plas	sticity	lusions					
-231	Ē		adde gypsuin inclus							
Ē	Ē									
E	È						G24	10		
Ę	-3					htt	-			
-230	-						T24	1	· · · A · + · · <u>A</u> · · · · ·	•
-						μı				
F	E_1									·
E										
-229 -	-						G24	12		: : : : ¶: : :
Ē	Ē									
E	-5		- grey, firm, trace till i	nclusions below 4	.9 m					
-228										
Ę	E									
Ē	Ē						524	13		•
Ē	-6								• • • • • • • • • • • • • • • • • • • •	
227 1	-									
Ē	-7									
-226	F									
;[_						524	14		
			END OF TEST HOLE Notes: 1. Trace seepage bel 2. No sloughing obse 3. Test hole backfilled	AT 7.6 m IN CL/ ow 0.5 m from sil rved. I with auger cuttin	ΑΥ t layer. gs.					
								2	COMP	
D	YR	EGR	ROV ROBINS	ON INC.	I LU RF	VIEWED F	. сн 3Y: 4	x AOD	COMPL	ETION DEPTH: 7.02 m ETION DATE: 06/11/12
Co	nsu	lting (Geotechnical Engine	eers	PR	OJECT EN	JGIN	VEER: Alv Dvre	grov	Page 1 of 1

				APPEN	NDIX A - TEST HO	LE LOGS				
PRO.	JECT:	Ferry	Road and Riverbend -	Contracts 1 & 2	CLIENT: Tetra	Tech		TESTH	OLE NO: 12-74	
LOC	ATION	I: Kens	sington St. Approx. 300	m South of Silver Av	/e.			PROJE	CT NO.: 123499	
CON	TRAC	TOR: I	Paddock Drilling	METHOD: ACK	CER MP8 125mm dia	a. SSA		ELEVA	TION (m): 233.53	
SAM	PLE T	YPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO	RECOVER	RY CORE	
BACI	KFILL	TYPE	BENTONITE	GRAVEL	∭SLOUGH	GROUT	CU	TTINGS	SAND	
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL		SOIL	DESCRIPTION			SAMPLE TYPE SAMPLE #	◆ SPT N blows/300 10 20 30 40 50 ■ Unit Weight kN/ 12 14 16 18 20 ↓↓ M/C (%) ↓0 20 20 40 50	0mm ♦ 60 70 m ³ ■ 22 24 PL €0 70
-	E		ASPHALT (50 mm)	over CONCRETE	(205 mm)					60 70
-233			CLAY (Fill) - silty, tr	ace gravel, black,	stiff, moist, high pla	asticity		G24	5 2 2	
È	E		SILI - tan, loose, m	loist				G24(б	
-232	-1		- mottled brown and - stiff, moist, high pl - trace gypsum inclu	d dark grey asticity usions, trace silt ind	clusions			G 24		
-231	E									\
	E							524	8	
Ē	-3									
Ē										
-230	E									
È	E									
Ē	-4							G24	9	•
-229	Ē		- grey, firm below 4	.3 m						
E	Ē									
E	-5									·····
-	Ę									
- 220	Ē							G25	0	
E	Ē									
F	-6									···
227	Ē									
<u> </u>	Ē									···
ICD I	-7		- trace till inclusions	below 7.0 m				G25		
226	È									
4 PLOTS - NEW ALT1 RIVERBEND LDS TEST HOLE LOGSGP	<u>E</u>		END OF TEST HOI Notes: 1. No sloughing or s 2. Test hole backfill	LE AT 7.6 m IN CL seepage observed. ed with auger cuttir	AY ngs.				<u> : : : : :</u>	<u>. :</u>
	VP	FCP			LC	GGED BY: CR		COMPL	ETION DEPTH: 7.62	m
		tina (neers	R	EVIEWED BY: AOD		COMPLI	ETION DATE: 06/11/	12
<u>ما</u>					PI	KUJEUTENGINEER:	AIV DYREGROV	1	Pag	eroti

PRO.	JECT:	Ferry	Road and Riverbend - C	Contracts 1 & 2	CLIENT: Te	tra Tech			TESTH	OLE NO: 12-75
LOC	ATION	I: Kens	ington St. at Ness Ave.						PROJE	CT NO.: 123499
CON		TOR: I	Paddock Drilling	METHOD: ACI	KER MP8 125mm	dia. SSA				TION (m): 233.53
BACI			GRAB							
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL	SC	DIL DESCRIP	TION		SAMPLE #	+ Torvane (Su) 10 20 30 40 § ▲ Unconfined Comp 10 20 30 40 § △ Pocket Pen. (S	i kPa + 50 60 70 . (Su) kPa ▲ 50 60 70	
					(220 mm)			10 20 30 40 5	<u>50 60 70</u>	10 20 30 40 50 60 70
-233	- - - - - - - - -		CLAY (Fill) - silty, so plasticity CLAY - silty, black, s SILT - some sand	tiff, moist, high pl	stiff, moist, high		G25 G25 G25	2		2
-232			 tan, loose, moist to CLAY - silty mottled brown and stiff, moist, high pla 	wet dark grey sticity					· · · · · · · · · · · · · · · · · · ·	
-231	-2		- trace silt inclusions	, trace gypsum in	clusions		G25	5		
-230	-3									
-229			- grey, firm, trace till	inclusions, trace	gravel below 4.8	m	G25	7 6 ▲ 2	\$+	•
-228 	6				-		⊥ ■G25	8		, ,
-227	7		- soft below 6.4 m				0.05			
-226							520			
-225	9						G26	•	······	
			END OF TEST HOLD Notes: 1. No sloughing or se 2. Test hole backfiller	E AT 9.1 m IN CL eepage observed d with auger cutti	_AY I. ngs.					
D	YR	EGR		ON INC.	-		/: CR		COMPL	ETION DEPTH: 9.14 m
C	onsul	lting C	Geotechnical Engin	eers	_	REVIEWED	dit: <i>F</i> NGIN	IEER: Alv Dyregrov		Page 1 of 1

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ADDENIDIY A TEST HOLELOGS	
AFFENDINA - TEST HOLE LOGS	

	IFCT.	Farme	Deed and Diverband C			atra Taab							тг	CTI		- NC). 14	77					
		Ferry	Road and Riverbend - Co	DITACIS I & Z	CLIENT: I	etra Tech									PROJECT NO · 123/100								
CON		TOR I	Soll St. Applox. Too III St Paddock Drilling		D MDg 125mm	A22 cib							FI	FV/		N (n	$\frac{12}{12}$	3499 22 50	7				
SAM		YPF	GRAB			1 UIA. 337)ON	ν ⊟Β	ШК				7.NC		OVF	RY	<u>га (п</u> Г)RF	//				
BAC		TYPE	BENTONITE	GRAVE			<u> </u>	ROU	т		 	Zcu		GS									
عمط س		J						#	10	+ Tor	vane (00	:Pa +	70	1	◆ S	PT N	blows/3	00mm	ı ♦			
NO	<u>Е</u> Т	МВ					≿	Щ	1.0	20 3	<u>0 41</u>	<u>) 50</u>	60	<u>70</u>	- ·	0 2	5 50	-10 (
AT/	L L	l S	SO	IL DESCRIPT	ION		JPLE	MP	▲ Ur 10	20 3	ed Co an 40	omp. (Su) kl	Pa▲ 70	1	2 1	Unit W 4 16	/eight k	N/m³∎	a 24			
Ш	B						SAN	Ś		Dealer		(0)		•				M/C (%)	<u> </u>				
ш									10	20 3	<u>0 40</u>) <u>50</u>	<u>60</u>	70	1	0 2	0 30	40 5	60 60) 70			
-	E		CONCRETE (215 mm	n) Effects a bischer ander	- ('-')		_																
-233	E		- silt lense (75 mm thi	ck) at 0.46 m	sticity, trace of	ganics		G261 G262	,														
Ē	E		- mottled brown and c	lark grey, trace sil	t inclusions, tra	ace				į							$\overline{\ }$						
Ē	-1		gypsum inclusions be	low 0.55 m				-263															
-232	Ę																						
Ē	Ē																	/	\ \				
È	-2							226/															
È	Ē							5204											T				
-231 -	Ē									·		· · · ·											
E	Ē														••••••								
E	-3												••••		••••••								
-230	Ē							T265		•••••••		····+		: 	••••••			. <mark>.</mark>	•	••••			
E	Ē						+++			·		••••	••••		••••••			••••••		••••			
E	-4									·		· · · · .	••••		• • • • • •			•••		••••			
-	Ē							G266	; ;	·		· · · ·	••••					•••	e e				
- 229	È									·		· · · ·	••••							••••			
Ē	-5		- grev. trace till inclusi	ons below 4.9 m						·		· · · · :	••••					· · · · · ·					
Ē	Ē		3 - , ,							•••••••		••••	••••										
-228	E									· · · · · ·		· · · · ·	••••		•••					••••			
Ē	È							G267	· · · · · ·										•				
	-6		END OF TEST HOLE Notes: 1. No sloughing or se 2. Test hole backfilled	AT 6.1 m IN CLA epage observed. with auger cutting	.Y gs.	LOGGED) BY:	CR						MPL	ETIC	<u>DN D</u>	EPTI	<u>+:</u> 6.1	0 m				
	YR	EGR	OV ROBINSO	DN INC.		REVIEW	ED B	Y: A	OD				CC	MPL	ETIC	DN D	ATE:	07/1	1/12				
	Consulting Geotechnical Engineers						PROJECT ENGINEER: Alv Dyregrov Page 1 o									of 1							

				APPEN	DIX A - TEST HO	DLE LOGS							
PRO.	JECT	: Ferry	Road and Riverbend -	Contracts 1 & 2	CLIENT: Tetr	a Tech		TES	STH	OLE NO: 12-	.77		
LOCA	ATIOI	N: Madi	ison St. Approx. 200 m	South of Silver Ave.	·			PRO	DJE	CT NO.: 123	499		
CON	TRAC	CTOR:	Paddock Drilling	METHOD: ACK	ER <u>MP</u> 8 125mm di	a. SSA		ELE	VAT	TION (m): 23	3.243		
SAM	PLE 1	YPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK		RECC	OVER		₹E		
BAC	(FILL	TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT		TTING	iS	SAN	ID		
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL		SOIL D	ESCRIPTION	I		SAMPLE TYPE	SAMPLE #	◆ SPT N blo 10 20 30	ows/300mm ♦ 40 50 60 7/ hight kN/m³ ■ 18 20 22 2 (C (%) PL	<u>0</u>	
-233	E		CONCRETE (190 m	nm)						10 20 30	40 50 60 7	<u>0</u>	
E	Ē		CLAY (Fill) - silty						G268	3			
E	Ē		CLAY - silty	nign plasticity				~					
	-1		- mottled brown and	l dark grey									
F ²³²	Ē		- stiff, moist, high plasticity						G269	•	•		
Ē	-		- trace gypsum inclu	usions, trace silt inc	lusions below 1.5	m							
Ē	Ē												
-231	-2										· · · · · · · · · · · · · · · · · · ·		
-	Ē								2270				
Ē	Ē								0270	· · · · · · · · · · · · · · · · · · ·			
-230	-3											: : • • •	
Ē	È											: : · · ·	
È	E											: : • • •	
-	-4		- trace sand, trace g	gravel below 3.7 m								: :	
-229 E											1		
-	Ē								G271		T		
Ē	Ē											-	
-228	-5												
Ē	Ē												
-	Ē												
	-6		- grey, firm below 5.8 m						2272	,			
F-227	Ē								0212		Ĩ		
Ē	Ē											• • •	
Ē	È.		- soft below 6.8 m										
-226	-7												
Ē	È								6273	₽		:	
	–		END OF TEST HOL Notes: 1. No sloughing or s 2. Test hole backfille	LE AT 7.6 m IN CLA seepage observed. ed with auger cuttin	ιΥ gs.					L	<u></u> ;		
		ECC			L	DGGED BY: CR		CON	<i>I</i> PLE	TION DEPTH:	: 7.62 m		
		EGN Itipa (OIN INC.	R	EVIEWED BY: AOD		CON	/PLE	TION DATE: (07/11/12	_	
Karakan Sanata Sanat								Page 1 of 1					

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APPENDIX A - TEST HOLE LOGS

PROJECT: Ferry Road and Riverbend - Contracts 1 & 2 CLIENT: Tetra Tech TESTHOLE NO: 12-78															
LOCATION: Madison St. Approx. 300 m South of Silver Ave.									PROJECT NO.: 123499						
CONTRACTOR: Paddock Drilling METHOD: ACKER M					R MP8 125mm dia. S	mm dia. SSA									
BACKFILL TYPE BENTONITE				GRAVEL			ROU	<u>г</u> и							
ELEVATION (m)	DEPTH (m)	SOIL SYMBOL	S	DIL DESCRIPTI	ION	SAMPLE TYPE	SAMPLE #	+ Torvane (Su 10 20 30 40 ▲ Unconfined Comp 10 20 30 40 △ Pocket Pen. (3 10 20 30 40	i) kPa + 50 60 70 b. (Su) kPa ▲ 50 60 70 Su) kPa \triangle 50 60 70	◆ SPT 10 20 3 ■ Unit 12 14	N blows/30 <u>30</u> 40 50 t Weight kN <u>16</u> 18 20 <u>M/C (%)</u> <u>30</u> 40 50	$\begin{array}{c} 00mm \blacklozenge \\ \hline 0 & 60 & 70 \\ \hline 1/m^3 \blacksquare \\ \hline 0 & 22 & 24 \\ \hline - 1 \\ \hline 0 & 60 & 70 \end{array}$			
-	E	××××	CONCRETE (190 m	m)		_									
-232	1		CLAY (Fill) - silty - dark grey - stiff, moist, high pla	asticity			G274	4			•				
-	E		SAND (Fill) - some g	gravel, brown, moist			G27:	5	·						
-231	2		CLAY - silty, trace sa - mottled brown and - stiff, moist, high pla - trace silt inclusions	and dark grey asticity , trace gypsum inclu	usions		G276	6				•			
-230	-3														
-229 	-4		- grey, firm below 4.0	0 m			G277	7							
-228	5						G278	8 ▲ △ 9							
-227	6														
-226	-7 						G280	0							
			END OF TEST HOL Notes: 1. No sloughing or s 2. Test hole backfille	E AT 7.6 m IN CLA eepage observed. d with auger cutting	Y js.	GED BY:	CR		COMPLI	TION DEP	TH: 7.62	2 m			
					REVI	EWEDE	BY: A	AOD	COMPLI	ETION DAT	E: 07/11	/12			
	ກາວຟໄ	JEULELI II ILAI ELIQI		IFCT EN	IGINI	EEB. Alv Dyrearov	Dana 1 of 1								

BH GEOTECH PLOTS -NEW ALT1 RIVERBEND LDS TEST HOLE LOGS.GPJ DRI.GDT 10/12/12
APPENDIX A -	TEST HOLE LOGS

