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## **MCTS TRAILER INSTALLATION**

### **CCG GROS CAP MCTS**

**PRINCE, ON**

MARITIME AND CIVIL INFRASTRUCTURE

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Approved by:

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## TABLE OF CONTENTS

SECTION:	011000 GENERAL INSTRUCTIONS .....	1
SECTION:	013300 SUBMITTAL PROCEDURES .....	5
SECTION:	013530 HEALTH AND SAFETY REQUIREMENTS .....	6
SECTION:	013543 ENVIRONMENTAL PROCEDURES .....	7
SECTION:	014500 QUALITY CONTROL.....	10
SECTION:	016100 COMMON PRODUCT REQUIREMENTS .....	10
SECTION:	033000 CONCRETE WORK .....	12
SECTION:	133423 PREFABRICATED BUILDING .....	18
SECTION:	260500 ELECTRICAL .....	20
SECTION:	260527 GROUNDING .....	22
SECTION:	310000 EARTHWORK.....	25
SECTION:	338119 CABLE WAVE GUIDE BRIDGE .....	27
APPENDIX A:	SITE LOCATION .....	29
APPENDIX B:	PHOTOS.....	31
APPENDIX C:	DRAWINGS.....	33
APPENDIX D:	GEOTECHNICAL INVESTIGATION.....	53
APPENDIX E:	SUMMARY OF SUBMITTALS.....	82



## **SECTION: 011000 GENERAL INSTRUCTIONS**

### **PART 1 - GENERAL**

#### **1.1 Minimum Standards**

- .1 Perform work in accordance with National Building Code of Canada (NBC) and any other code of provincial or local application. In the case of any conflict or discrepancy, the more stringent requirements shall apply.
- .2 Meet or exceed requirements of:
  - .1 Contract documents;
  - .2 Specified standards, codes and referenced documents, most recent edition

#### **1.2 Description of Work**

- .1 Work under this Contract includes but is not limited to the provision of all labour, materials, and equipment required to completely install one (1) MCTS trailer complete with all appurtenances identified herein, including:
  - .1 Transportation of prefabricated trailer from CCG Base – Parry Sound to project site.
  - .2 Installation of the new equipment trailer, including:
    - .1 Installation of new concrete slab foundations for the trailer and a separate slab for the diesel generator;
    - .2 Connecting utilities (power/phone) to the new trailer; and,
    - .3 Modifications to the site's grounding system.
  - .3 Supply and installation of new waveguide bridge, posts, and foundations.

#### **1.3 Work Location**

- .1 Work is to be completed at the Coast Guard Gros Cap MCTS Site. Appendix A: Site Location gives site location details and includes some photos of the existing site. Site coordinates are 46°32'16.53"N - 84°34'54.53"W.
  - .1 Before tendering, Contractors should familiarize themselves with the location, scope of work, site restrictions, and temporary measures (including snow clearing) required for completing the work as specified.
  - .2 Contractor should note that this work is to be performed on the site of an existing operational tower where radio frequency transmission and reception is occurring.



#### 1.4 Submittals

- .1 Mandatory submittals and schedule for submission are detailed below and in Appendix E. The following identifies general requirements only. The relevant sections must be consulted for a complete listing of mandatory content. The summary of submissions provided in this section is not an exhaustive list of all submissions required for the duration of the project. Additional submissions may be required after award.
- .2 Detailed Schedule:
  - .1 Deadline: No later than ten (10) working days following award.
  - .2 Deliverables:
    - .1 The contractor shall furnish a high-level schedule outlining the major construction milestones. Schedule shall clearly define the anticipated start and finish of the project.
- .3 Construction Plan:
  - .1 Deadline:
    - .1 No less than 10 working days prior to mobilization.
  - .2 Deliverables:
    - .1 A Construction Plan of sufficient detail to demonstrate that the Contractor has considered all the challenges of the project and is prepared to undertake the works in a competent and professional manner in accordance with all legislation, including:
      - .1 Contractor Qualifications (Section 011100 cl. 1.5), to include:
        - .1 Core Project member contact information (site foreman and project manager);
        - .2 Complete listing of all Subcontractors.
      - .2 Project specific safety program (Section 013530);
      - .3 Project environmental protection plan (Section 013543);
      - .4 Concrete construction plan (Section 033000);
      - .5 Grounding (Section 260527).
- .4 Supplemental Material
  - .1 Deadline:
    - .1 21 calendar days following acceptance of the works
  - .2 Deliverables:
    - .1 As-built drawings;



.2 Concrete test results.

### 1.5 Contractor Qualifications

- .1 The work must be carried out under the supervision and responsibility of a sole specialized Contractor.
- .2 The Contractor must have experience in performing similar work.
- .3 All electrical work shall be undertaken by a licensed electrician.

### 1.6 Site Location

- .1 The location of the site is as follows:
  - .1 Lat./Long.: 46°32'16.53"N - 84°34'54.53"W
  - .2 The closest settlement is Prince, ON.

### 1.7 Existing Conditions

- .1 Bidders must make their own estimate of the difficulties associated with all phases of the works.
- .2 The Contractor must include in their costs all expenses related to the difficulties of working at the sites.
- .3 A copy of a recent geotechnical subsurface investigation has been included in Appendix D.
- .4 Pictures of the site have been included in Appendix B

### 1.8 Contractor's Access to Site

- .1 Contractor is responsible for transportation of all labour, materials, and equipment to and from the sites, including any and all material furnished or itemized for salvage by Coast Guard.
- .2 The site is accessible by truck, via gravel road.
  - .1 The road is not serviced in the winter. The successful bidder will be responsible for arranging and paying for any snow plowing required.

### 1.9 Coast Guard Depot

- .1 Items identified to be supplied by or returned to Coast Guard shall be collected by the Contractor from the following depot. The Contractor shall be responsible for all transportation costs between the project site and the identified depot.
  - .1 CCG Base – Parry Sound, ON. - 28 Waubeek St., Parry Sound, ON P2A 1B9
  - .2 Advise Coast Guard at least five (5) days prior to pick-up/delivery
    - .1 For Delivery or Pickup, contact will be provided upon award. Shipping/Receiving hours Monday through Friday are 9:00AM to 3:00PM.



#### 1.10 Temporary Facilities

- .1 Existing communications building can be used for electrical power, and small dry storage.
- .2 If additional facilities are required, provide sanitary facilities for work force in accordance with governing regulations and ordinances. Arrange, pay for, and maintain temporary water supply as required, in accordance with governing regulations and ordinances.
- .3 Maintain emergency spills kit on-site at all times.

#### 1.11 Fees, Permits, Certificates and Information

- .1 Contractor shall provide authorities having jurisdiction with all information requested.
  - .1 Contractor shall provide copies to Coast Guard of any documentation submitted to other authorities related to the work described in this document.
  - .2 Contractor shall pay fees and obtain certificates and permits required.
  - .3 Contractor shall furnish certificates and permits when requested.

#### 1.12 Protection of Existing Work

- .1 Care shall be taken to safeguard any existing structures and/or equipment. Upon completion of the work, all rejected materials, materials declared surplus by Coast Guard, and debris shall be removed from the site.

#### 1.13 Reference Documents

- .1 The most recent publication or edition of any document referenced in this specification should be used unless the referencing clause states that this clause does not apply.

### **PART 2 - EXECUTION**

#### 2.1 Deadline

- .1 All aspects of the project must be completed before March 31<sup>st</sup>, 2017.



## **SECTION: 013300 SUBMITTAL PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 General**

- .1 This section specifies general requirements and procedures for the Contractor's submissions of documents to Coast Guard for review.
- .2 Do not proceed with the work until Coast Guard has reviewed submitted documents or samples.
- .3 Where items or information is not produced in SI Metric units, converted values are acceptable.
- .4 Contractor's responsibility for errors and omissions in submission is not relieved by Coast Guard's review of the submitted documents.
- .5 Notify Coast Guard, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .6 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Coast Guard's review of submission, unless Coast Guard gives written acceptance of specific deviations.
- .7 Make any changes to submissions that Coast Guard may require consistent with Contract Documents and resubmit as directed by Coast Guard.
- .8 Provide Coast Guard with a written notice, when resubmitting, of any revisions other than those requested by Coast Guard.

#### **1.2 Submission Requirements**

- .1 Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.
- .2 Allow five (5) working days, or as stipulated in the specifications, for Coast Guard to review the submission.
- .3 The Contractor's Engineer shall stamp and sign any submissions requiring a Professional Engineer's seal certifying his approval of samples, verification of field measurements, and compliance with Contract Documents.



## **SECTION: 013530 HEALTH AND SAFETY REQUIREMENTS**

### **PART 1 - GENERAL**

#### 1.1 General

- .1 Observe construction safety measures of National Building Code 2005, Part 8, Provincial Government, Worker's/Workmen's Compensation Board and municipal authority provided that in any case of conflict or discrepancy the more stringent requirements shall apply.
- .2 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labeling and provision of material safety data sheets acceptable to Labour Canada and Health and Welfare Canada.
- .3 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations, and Quebec Safety Code for the construction industry (latest revision).
- .4 Deliver copies of WHMIS data sheets to Coast Guard on delivery of materials.
- .5 The Contractor shall implement a safety program which shall address all elements of the work.

#### 1.2 Contract Submittals

- .1 Within 10 days of award of Contract, submit to Coast Guard two copies of Contractor's and Sub-Contractor's Project specific safety program including:
  - .1 A listing of all activities specific to the project and their Health & Safety risks or hazards.
  - .2 Detailed descriptions of how the activities are to be carried out as well as methods for mitigating hazards and risks.
  - .3 A listing of personnel responsible for health and safety measures, and Emergency procedures.
  - .4 Material Safety Data Sheets for hazardous products to be utilized in the execution of the works.





## **SECTION: 013543 ENVIRONMENTAL PROCEDURES**

### **PART 1 - GENERAL**

#### 1.1 Scope of Work

- .1 The Contractor must implement and enforce the following procedures throughout the duration of the work to mitigate potential negative impacts on the surrounding environment.

#### 1.2 References

- .1 Work under this section shall be undertaken in strict conformance with all listed references, In the case of any conflict or discrepancy the more stringent requirements shall apply.
- .2 Canadian General Standards Board (CGSB)
- .3 Transportation of Dangerous Goods
- .4 Canadian Council of Ministers of the Environment (CCME) Documentation
- .5 Canadian Environmental Protection Act

#### 1.3 Submittals

- .1 Project Environmental Protection Program
  - .1 Deadline: With Construction Plan
  - .2 Deliverables:
    - .1 Equipment features (age, spill containment)
    - .2 Staging, refueling, and cleaning areas
    - .3 Concrete wash-out and/or containment procedures.
    - .4 Waste disposal methods and sites

### **PART 2 - PRODUCTS**

#### 2.1 General

- .1 Avoid use of hazardous products. Use environmentally friendly products where practical.



## **PART 3 - EXECUTION**

### **3.1 Construction Area**

- .1 Confine construction activities to as small an area as practical.
- .2 Establish material storage, cleaning, and refueling areas where impacts to the surrounding environment will be negligible or readily mitigated.

### **3.2 Stockpiling of materials**

- .1 Materials must be stockpiled as far from the shoreline as practical. Tarps must be used to control dust and run-off.

### **3.3 Disposal of Wastes**

- .1 Clean-up the site at the end of each working day.
- .2 All waste material to be disposed of in a legal manner at a site approved by local authorities. Transporter/hauler must be appropriately licensed.
  - .1 Recycle or reuse materials where possible
- .3 Fires and burning of rubbish on site not permitted.
- .4 Do not bury rubbish and waste materials on site.

### **3.4 Clearing and Grubbing**

- .1 Only clear vegetation that interferes with construction.

### **3.5 Drainage**

- .1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
  - .1 Suspend works during periods of heavy rainfall and add temporary covers to encourage run-off
- .2 Control disposal or runoff of water containing suspended materials or other harmful substances by constructing appropriate control measures (sand bags/silt fence)
  - .1 Sediment control measures shall be inspected and improved/cleaned/replaced as necessary.

### **3.6 Pollution Control**

- .1 Provide methods, means, and facilities to prevent the contamination of soil, water, and atmosphere from the discharge of pollutants produced by construction operations.



- .2 Vehicles, machinery, and equipment shall be in good repair, equipped with emission controls as applicable and operated within regulatory requirements.
- .3 Abide by local noise by-laws.
- .4 Avoid unnecessary idling of vehicles or heavy machinery
- .5 Limit use of equipment around the shoreline where possible
- .6 Implement and maintain dust and particulate control measures in accordance with provincial requirements
- .1 All bulk material haul equipment shall be appropriately tarped. Watertight vehicles shall be used to haul wet materials
- .7 Designate a cleaning area for tools to limit water use and runoff. Do not allow deleterious materials to enter waterways. Ensure emptied containers are sealed and stored safely for disposal.
- .8 The Contractor shall take all necessary precautions to guard against the release of any noxious substance or pollutant to the environment. In the event of any spill the Contractor shall take immediate action to contain the release and mitigate any impact.
  - .1 Materials and equipment to intercept, contain, and clean-up any spill or other release shall be maintained on site throughout the construction period and must be readily accessible at all times
  - .2 Any uncontrolled release of a known contaminant (spills, fire/smoke) shall be reported to appropriate Provincial Authority and Coast Guard. Spills of deleterious substances to be immediately contained and cleaned up in accordance with provincial regulatory requirements.
    - .1 Provincial Authority: Ontario Spills Action Centre 1-800-268-6060



## **SECTION: 014500 QUALITY CONTROL**

### **PART 1 - GENERAL**

#### **1.1 Inspection**

- .1 Canadian Coast Guard or its representative shall have access to the work at all times. If parts of the work are prepared off-site or in a shop, access shall be given to such work throughout the duration of the project.
- .2 In the event the work must be submitted to special testing, inspection or approvals prescribed by Canadian Coast Guard in these specifications or provided for in work-site regulations, the request for inspection must be made without unreasonable delay.
- .3 The below list identifies key milestones where the Canadian Coast Guard will require an opportunity to take samples/inspect:
  - .1 Subgrade verification: Coast Guard representative shall inspect sub-grade upon completion of any excavation where a design bearing surface is to be achieved.
  - .2 Concrete testing: The contractor will be responsible to test concrete for air, slump and strength during the pour.
  - .3 Final completion: The Coast guard will conduct a final inspection upon completion.

#### **1.2 Procedures**

- .1 Provide Canadian Coast Guard with advance notice whenever testing is required in accordance with these specifications, so that all parties involved can be present.
- .2 Provide necessary manpower and installations for obtaining and handling samples and material on site.
- .3 Provide access to site if the site is of remote nature whereby the contractor is responsible for providing access to the site

#### **1.3 Rejected Work**

- .1 Remove defective work, whether incorporated into the work or not, which has been rejected by Canadian Coast Guard as failing to comply with the contract documents. Replace or re-execute in accordance with the Contract Documents.

#### **1.4 Tests and Mixture Formulas**

- .1 Supply test reports and required mixture formulas.

#### **1.5 Factory Tests**

- .1 Submit test certificates as prescribed in the relevant section of the specifications.



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## 1.6 Acceptance of Work

- .1 Canadian Coast Guard will make acceptance visits of work executed by the Contractor at critical milestones identified in the following sections.
- .2 The Contractor shall inform Canadian Coast Guard at least five (5) working days before these inspection visits.
- .3 All work shall be completed in compliance with the specifications before requesting the visit for inspection. If the work is not completed or deemed non-compliant, the Contractor shall be responsible for all costs incurred for subsequent inspections.



## **SECTION: 016100 COMMON PRODUCT REQUIREMENTS**

### **PART 1 - General**

#### **1.1 General**

- .1 Secure Coast Guard approval of all products to be incorporated into the works. Work shall not commence until product data and/or samples have received Coast Guard approval.
- .2 Supply and/or fabricate material and equipment of prescribed quality, with performance conforming to established standards.
- .3 Use new material and equipment unless otherwise specified.
- .4 Ensure replacements parts may be readily procured.
- .5 Use products from one manufacturer for material and equipment of same type or classification, unless otherwise specified.

#### **1.2 Manufacturer's Instructions**

- .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.
- .2 Notify Canadian Coast Guard in writing of any conflict between these specifications and manufacturer's instructions; Canadian Coast Guard will designate which document is to be followed.

#### **1.3 Compliance**

- .1 When material or equipment is specified by standard or performance specifications, upon request of Canadian Coast Guard, obtain an independent testing laboratory report from the manufacturer, stating that material or equipment meets or exceeds specified requirements.

#### **1.4 Substitution**

- .1 Where specific products have been specified, proposals for substitution may only be submitted after award of contract. Such requests must include statements of respective costs of items originally specified and the proposed substitution.
- .2 No substitutions will be permitted without prior written approval of Canadian Coast Guard. Substitutions will be considered by Canadian Coast Guard only when:
  - .1 Materials specified in Contract Documents, are not available; or,
  - .2 Delivery date of materials selected from those materials specified would unduly delay completion of contract; or,
  - .3 Alternative materials to those specified which are brought to the attention of and considered by Canadian Coast Guard as equivalent to the material specified will result in a credit to the Contract amount.



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- .3 Should the proposed substitution be accepted either in whole or in part, the Contractor must assume full responsibility and costs when such substitution affects other work on the project including any and all design or drawing changes required as a result of substitution.

#### 1.5 Submittals

- .1 Provide product specifications and/or samples upon request from Coast Guard.



## **SECTION: 033000 CONCRETE WORK**

### **PART 1 - GENERAL**

#### **1.1 Scope of Work**

- .1 Work of this section includes the supply of all labour, material, and equipment, necessary to complete the following:
  - .1 Installation of the wave guide bridge foundations (Qty: 3);
  - .2 Installation of concrete slab foundation for prefabricated trailer and separate slab for diesel generator.
- .2 Work includes any and all provisions necessary to ensure that the anticipated performance of the placed concrete will be obtained if work is undertaken in either hot or cold weather.

#### **1.2 References**

- .1 Work under this section shall be undertaken in strict conformance with all listed references, In the case of any conflict or discrepancy the more stringent requirements shall apply.
  - .1 Canada Labour Code Part II - January 2008
  - .2 NRC-CNRC National Building Code of Canada 2010
  - .3 Ontario Occupational Health and Safety Act and Regulations
  - .4 CAN/CSA-A23.1-04 Concrete Materials and Methods of Concrete Construction
  - .5 CAN/CSA A23.2-04 Methods of Test and Standard Practices for Concrete
  - .6 CAN/CSA A23.3-04 Design of Concrete Structures
  - .7 CAN/CSA-G30.18 Billet Steel Bars for Concrete Reinforcement
  - .8 CAN/CSA S269.3 Concrete Formwork
  - .9 ACI Specification 306 Cold Weather Concreting

#### **1.3 Submittals**

- .1 Submittals shall be forwarded to Coast Guard in accordance with the provisions of section 013300.
  - .1 Foundation Construction Plan:
    - .1 Deadline:
      - .1 Furnish with Construction Plan (Section 011100)





.2 Deliverables:

- .1 Provide a high level summary of mix properties and admixtures to demonstrate compliance with Coast Guard Criteria;
- .2 Concrete placing plan, identifying the location of the source of ready mix concrete, the haul route and any other relevant information required to demonstrate a plan for getting the concrete into the forms in the required amount of time;
- .3 Finishing procedures;
- .4 Curing methods and schedule;
- .5 Clean-up procedures; and,
- .6 Mitigation measures to account for cold temperatures where reasonably anticipated during the construction period.

1.4 Quality Assurance

- .1 Coast Guard's minimum inspection requirements are detailed below. The Contractor shall be responsible to notify Coast Guard of the date and time that the works may be inspected. Notice must be provided no less than five (5) working days in advance to permit scheduling of quality assurance testing. All deficiencies in the works identified at the time of inspection shall be remedied to the satisfaction of Coast Guard, by the Contractor at their expense. Work shall not progress until inspections have been completed and the Contractor has been provided with written notice to proceed with the works.
  - .1 Coast Guard representative shall inspect sub-grade upon completion of any excavation where a design bearing surface is to be achieved. If sub-grade is deemed unsuitable, Coast Guard representative shall advise repair requirements.
  - .2 Upon completion of formwork and placement of reinforcement.
  - .3 During execution of concrete placement.
- .2 The Contractor shall be responsible to arrange for concrete testing on site the day of the pour. This shall include at minimum a test for slump, air entrainment and strength (3 cylinders, one [1] 7 day, and two [2] 28 day).

**PART 2 - PRODUCTS**

2.1 General

- .1 All materials shall conform to specifications referenced in CAN/CSA-A23.1-04. Concrete supplier shall be a holder of valid "Certificate of Ready Mixed/Mobile Mix Concrete Production Facilities" as issued by the 'Ready Mixed Concrete Association of Ontario' (RMCAO)

2.2 Concrete



.1 Concrete shall be Ready Mix Concrete possessing the following characteristics:

- .1 Exposure: F1;
- .2 Minimum compressive strength of 30MPa at 28 days;
- .3 Air entrainment: 5-8%;
- .4 Slump: 75mm ± 25mm;
- .5 Nominal aggregate size: 19mm.

### 2.3 Water

.1 Water utilized for the production concrete must be potable, unless otherwise approved in writing by Coast Guard.

### 2.4 Reinforcement

- .1 Shall be as detailed the drawings in the Appendix C
- .2 Concrete cover shall be as mandated in CAN CSA A23.1, Table 17.
- .3 Bar supports shall be as mandated in CAN CSA A23.1, 6.6.7.2.
- .4 Reinforcing bars to CSA-G30.18, Grade 400

## **PART 3 - EXECUTION**

### 3.1 General

.1 Concrete must be placed, finished, and cured in accordance with the Contractor's submitted construction plan.

### 3.2 Preparation

- .1 Preparation shall not commence until bearing surfaces have been inspected by Coast Guard.
- .2 Remove all loose and deleterious material.
- .3 Place reinforcement in accordance with contract drawings (Appendix C).
- .4 Surfaces to be heated as necessary to account for climatic conditions at the time of the pour.

### 3.3 Placement

- .1 Concrete placement shall not commence until formwork and reinforcement have been inspected by Coast Guard.
- .2 Contractor shall place finish and cure concrete as per CAN CSA A23.1 making all adjustments necessary to account for climatic conditions anticipated during the curing period.



- .3 Concrete shall be placed in one continuous pour.
  - .1 The development of cold joints shall be avoided. Alternately, cold joints must be previously approved in writing by CCG.
- .4 Finish exposed concrete surfaces to provide a lightly brushed non-skid surface, unless otherwise specified in the submitted design.
- .5 Saw-Cut control joints where specified.
- .6 Contractor shall provide samples as required during placement operation for the performance of quality assurance testing.
- .7 Concrete shall be finished so as to slope gently away from the center of the slab. No water shall pond on the finished surface.

### 3.4 Curing

- .1 Shall be undertaken in accordance with CAN CSA A23.1 and the Contractor's approved Construction Plan.
  - .1 Curing regimen employed must take into account local climatic conditions reasonably anticipated to occur during the curing period of 4 to 5 days.

### 3.5 Inspection

- .1 Concrete pour(s) to be witnessed by Coast Guard representative. Concrete testing to CAN/CSA-A23.2 by testing laboratory is the responsibility of the contractor. Contractor shall provide samples as required during concreting operation for test purposes.



## **SECTION: 133423 PREFABRICATED BUILDING**

### **PART 1 - GENERAL**

#### 1.1 Scope of Work

- .1 Work in this section includes the supply of all labour, material and equipment necessary to:
  - .1 Transport the new equipment trailer from Coast Guard Depot to the Gros Cap project site; and,
  - .2 Anchor the new equipment building to the concrete foundation installed by Contractor.

#### 1.2 Submittals

- .1 Copies of any permits and/or licenses that are required to transport the trailer must be submitted to CCG staff upon request.

### **PART 2 - PRODUCTS**

#### 2.1 Anchors

- .1 Anchor Rods: 16 mm [5/8"], threaded stainless steel
  - .1 Threaded rod must be installed with an embedment depth of no less than 200 mm [8"]
  - .2 Must conform to ASTM A193, Grade B7 (high strength carbon steel anchor).
- .2 Anchor Fasteners: each anchor rod must be outfitted with the following:
  - .1 Two (2) heavy hex nuts and one (1) flat washer.
    - .1 Nuts must conform to ASTM A194, Grade 2H.
    - .2 Washers must conform to ASTM F436.
    - .3 All hardware must be galvanized to ASTM A153.
  - .3 Adhesive: Hilti Hit HY-200, or Hilti Hit Ice if weather conditions require. Refer to manufacturer's instructions
  - .4 Details of tower anchorage installation can be found in Appendix C, Drawings.

#### 2.2 Base grout:

- .1 Non-shrink, gassing, cementitious grout.
  - .1 Sika M-Bed, or approved equal.



## **PART 3 - EXECUTION**

### **3.1 Lifting**

- .1 The trailer has an estimated mass (unfactored ) of 12 metric tons as shown in the drawings in Appendix C
- .2 Coast Guard will supply 6 lifting lugs for the trailer at the time of trailer pick-up.
  - .1 Upon completion of trailer installation, all lifting equipment supplied by Coast Guard is to be returned by Contractor to Coast Guard depot.
- .3 Building must be loaded and unloaded by crane.
  - .1 Contractor shall provide a mobile crane and adequate spreading equipment to protect the trailer from slings when loading the trailer at the Parry Sound Base and unloading the trailer at site.
- .4 Contractor is responsible for supplying all other equipment and material required to lift and place prefabricated trailer.
- .5 Contractor is responsible for coordinating the pick-up of the trailer at CCG base Parry Sound, which includes hoisting requirements.

### **3.2 Transportation:**

- .1 The trailer must be hauled to site by a licensed transportation company, experienced in the transportation of oversized loads. Hauler shall employ all reasonable means to prevent damage to the trailer.

### **3.3 Installation:**

- .1 Place trailer onto pad. Orientate trailer as indicated in Appendix C.
- .2 Ensure that the trailer is level and shimmed 25mm [1"] to allow for grout as indicated in Appendix C.
- .3 Install anchors bolts and supplied anchor assemblies as detailed in Appendix C.
- .4 Dry-pack grout along entire perimeter of channel section frame.



## **SECTION: 260500 ELECTRICAL**

### **PART 1 - GENERAL**

#### 1.1 Scope of Work

- .1 Work under this section includes all labour, material, and equipment, employed to:
  - .1 Provide service to the new trailer, including but not limited to:
    - .1 Hydro;
    - .2 Phone; and,
    - .3 Coordinate and schedule outages with the local utilities as needed to complete the works.

#### 1.2 References

- .1 Work under this section shall be undertaken in strict conformance with all listed references. In the case of any conflict or discrepancy the more stringent requirements shall apply.
  - .1 Canada Labour Code Part II - January
  - .2 NRC-CNRC National Building Code of Canada
  - .3 CAN/CSA C22.1 Canadian Electrical Code, Part 1

#### 1.3 Certification

- .1 All electrical work must be carried out by an electrician licensed by ESA.
- .2 Electrical contractor must be a member of ESA's "Authorized Contractor Program" (ACP).

### **PART 2 - PRODUCTS**

#### 2.1 General

- .1 All materials supplied in this section are to be supplied by the Contractor.

### **PART 3 - EXECUTION**

#### 3.1 Servicing - Hydro

- .1 Excavate (approximately 0.3m) to expose conduit, locate and route the feed lines up (both existing line and load conductors) through the existing conduit. Cables are to be terminated within the main panel of the new trailer.
- .2 Contractor shall coordinate and schedule outages with the local utility as needed to complete the works.
- .3 Contractor shall schedule electrical safety inspections as required.



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- .4 Three separate 3" conduits shall be run from concrete slab for trailer to the concrete slab for the generator to accommodate generator installation by others.

### 3.2 Telephone

- .1 Installation of voice and data lines is to be coordinated with Bell Telephone.
  - .1 Contractor is responsible for connecting the current data and voice lines to the new trailer.
  - .2 Contractor is responsible for the coordination with Bell telephone
  - .3 Contractor shall excavate and backfill a service trench as needed.
    - .1 Trench shall be backfilled with native/excavated materials and imported sand bedding.
      - .1 Prior to backfilling a layer of sand shall be placed below and above the cable.
      - .2 Prior to backfilling utility marking tape shall be installed above the complete length of the buried cable.



## **SECTION: 260527 GROUNDING**

### **PART 1 - GENERAL**

#### **1.1 Scope of Work**

- .1 Work in this section consists of supply and installation of ground system comprising: copper-clad steel ground rods, bonding, conductors. Conductors shall be exothermic (cadweld) or irreversible mechanical compression lugs.

#### **1.2 References**

- .1 Canada Labour Code Part II – January 2008
- .2 Ontario Occupational Health and Safety Act and Regulations for Construction Projects – 2011
- .3 National Building Code of Canada – 2010
- .4 CAN/CSA S37-13 Antennas, Towers, and Antenna-Supporting Structures
- .5 CAN/CSA C22.1-15 Canadian Electrical Code
- .6 Ontario Provincial Standard Specification – OPSS 1010 Material Specification for Aggregates – Base, Sub-base, Select Sub-grade, and Backfill Material
- .7 Ontario Provincial Standard Specification – OPSS 1004 Material Specification for Aggregates – Miscellaneous

#### **1.3 Disposal of Wastes**

- .1 All excess materials shall be disposed of in a legal manner by Contractor.

#### **1.4 Submittals**

- .1 Submittals shall be forwarded to Coast Guard in accordance with the provisions of section 013300.
- .2 Construction procedures
  - .1 Deadline: with construction plan
  - .2 Deliverables
    - .1 As-built drawings showing ground system details shall to be submitted upon project completion.





### 1.5 Existing conditions

- .1 The existing grounding may not be reused.
- .2 Before commencing work under this section the Contractor must establish the location of all buried services which may interfere with the execution of the work.

## **PART 2 - PRODUCTS**

### 2.1 Materials

- .1 Ground rods shall be 19mm (3/4 in) diameter copper-clad steel, 3m (10 ft) in length.
- .2 Buried ground cable shall be 4/0 AWG stranded tinned copper conductor.
- .3 Exposed ground cable shall be 1/2" galvanized aircraft cable.
- .4 Ground cable/rod connections shall be made with exothermic connectors.

### 2.2 Quality Control

- .1 Grounding work shall be undertaken to industry standards for Telecommunication Tower Sites and any deviation from these industry standards shall be made known to Coast Guard.

## **PART 3 - EXECUTION**

### 3.1 General

- .1 Contractor shall field verify all dimensions and details before proceeding with work.
- .2 Safeguard existing antennas, transmission lines, and other tower attachments, as well as the tower members and connections; do not alter or otherwise impair the performance of any of these items during the course of work without written approval of Coast Guard.
- .3 Ensure buildings, generator, and fencing are not disturbed by excavation and backfill activities.
- .4 Any areas requiring excavation shall be investigated by Contractor to ensure they are free of any underground utilities. If the location of underground utilities interferes with the installation of grounding system, notify Coast Guard.
- .5 In areas where topsoil is present, strip 152 mm (6 in) topsoil and stockpile. Upon completion of backfilling, spread topsoil evenly over affected areas.

### 3.2 Site Grounding Installation - General

- .1 Approximate locations and quantities of ground rods are indicated in Appendix C: Drawings. Contractor shall field verify all ground rod and cable installation locations to ensure there is sufficient access for drilling/excavation equipment.
- .2 All ground cables will be buried 610 mm (24 in) below grade.



.3 All trenches shall be backfilled to 152 mm (6 in) below grade with imported Granular 'A' fill. Backfill in 6 inch lifts and compact to 95% standard proctor.

.1 Top 152 mm (6 in) of backfill in compound area shall be 19 mm (5/8 in) clear stone.

.2 Top 152 mm (6 in) of backfill in non-compound, areas shall be stripped topsoil. Import additional topsoil as required.

### 3.3 Site Grounding Installation - Waveguide Ground

.1 Supply and install 4/0 AWG tinned copper cable on each side of waveguide piers to existing ground system. Connect piers to ground with aircraft cable.

### 3.4 Site Grounding Installation – Cable Entry Port Grounding

.1 Supply and install 4/0 AWG tinned copper cable from copper bus bar to existing ground system.



## **SECTION: 310000 EARTHWORK**

### **PART 1 - GENERAL**

#### 1.1 General

- .1 Work of this section includes the supply of all labour, material and equipment required to complete:
  - .1 The excavation for the installation wave guide post foundations (Qty: 3);
  - .2 The excavation for the installation of the trailer and diesel generator slabs as identified in Appendix C;
  - .3 The excavation of buried ground electrode system as identified in Appendix C;
  - .4 The excavation of buried telephone service lines as needed;
  - .5 The restoration of all disturbed areas along haul routes and within the work site.

#### 1.2 References

- .1 Work under this section shall be undertaken in strict conformance with all listed references, In the case of any conflict or discrepancy the more stringent requirements shall apply.
  - .1 Canada Labour Code Part II – January;
  - .2 Ontario Occupational Health and Safety Act and Regulations;
  - .3 Any and all other Provincial/Territorial Regulations and Policies; Worker's Compensation Board Policies; Local municipal regulations; pertaining to work of this section.

#### 1.3 Existing Conditions

- .1 Before commencing work under this section the Contractor must establish the location of all buried services that may interfere with the execution of the work.
- .2 All work of this section shall be witnessed by Coast Guard or its representative.
- .3 A recent geotechnical investigation has been included in Appendix D for reference.

### **PART 2 - PRODUCTS**

#### 2.1 General

- .1 All materials described in this section shall be supplied by Contractor.

#### 2.2 Backfill

- .1 Backfill under the slab shall be Granular A as per the appended drawings in Appendix C.



- .2 Backfill for trenches shall be sand as per OPSS 1001.

## **PART 3 - EXECUTION**

### **3.1 Site Preparation**

- .1 Prior to commencing excavation, document the condition of all existing structures, landscaping, roadways, and other adjacent facilities anticipated to be impacted by the work.

### **3.2 Excavation**

- .1 Excavate the area defined in Appendix C to a depth as indicated in the drawings
- .2 If in some locations the foundation bears on bedrock, a 200mm cushion of Granular A shall be installed. Should this affect the final elevation of the trailer please consult with CCG site representative.
- .3 Excavation shall be undertaken in such a manner as to avoid any and all damage to the existing tower and tower foundations.
- .4 Take all reasonable precautions to minimize the disturbance of the existing vegetation.

### **3.3 Foundation**

- .1 Foundation shall be installed as per drawings in Appendix C.

### **3.4 Restoration**

- .1 Restore all disturbed areas within work area and a long haul routes. Fill and grade all ruts. Ensure positive drainage away from completed and existing foundations
- .2 Spread spoils from drilling in a manner so as not to hinder site drainage.



## **SECTION: 338119 CABLE WAVE GUIDE BRIDGE**

### **PART 1 - GENERAL**

#### 1.1 Scope of Work

- .1 Work under this section includes the supply of all labour, material, and equipment required to complete:
  - .1 The supply and install of the new wave-guide bridge as per drawings in Appendix C.

#### 1.2 References

- .1 Work under this section shall be undertaken in strict conformance with all listed references. In the case of any conflict or discrepancy the more stringent requirements shall apply.
  - .1 Canada Labour Code Part II ;
  - .2 NRC-CNRC National Building Code of Canada; and,
  - .3 CAN/CSA G164 - Hot Dip Galvanizing of Irregularly Shaped Articles.

#### 1.3 Related Sections

- .1 Section 033000, Concrete
- .2 Section 310000, Earthwork and Foundations

#### 1.4 Submittals

- .1 Shop Drawings
  - .1 Deadline: with Construction Plan
  - .2 Deliverables: Drawings must clearly indicate the make-up of all components used in the construction of the wave-guide tray and shall be in conformance with the following specification. They shall at minimum indicate the following:
    - .1 Cable mounting arrangement and method;
    - .2 Member and connection details; and
    - .3 Schedule of materials and finishes.

### **PART 2 - PRODUCTS**

#### 2.1 General

- .1 All materials described in this section shall be supplied by the Contractor



## 2.2 Steel

- .1 Structural steel must conform to CSA Standard G40.21, Grade 300W, or better.
- .2 All mounts, mount hardware, and line hangers must be heavy-duty hot dip galvanized or stainless steel.
- .3 All materials, structural steel, pipe and fittings, including bolts, nuts and washers shall be hot dip galvanized to the requirement of the National Building Code, CAN/CSA S16.1, and CSA-G164 and as otherwise specified therein.

## 2.3 Fasteners

- .1 Bolts must be hot-dip galvanized with hexagonal heads and be supplied with hexagonal nuts. The unthreaded part of the bolt must be long enough for full bearing of the adjoining parts and enough washers must be placed on each bolt under the nut to prevent the nut from reaching the end of the bolt threads when tightened.

## 2.4 Base grout:

- .1 Non-shrink, gassing, cementitious grout;
  - .1 Sika M-Bed, or approved equal.

# **PART 3 - EXECUTION**

## 3.1 Installation

- .1 Install new wave-guide system in its entirety as per the appended drawings.
- .2 Base plates shall be installed on leveling nuts to allow for adjustment of waveguide tray height
- .3 Grout between all waveguide bridge base plates and prepared concrete foundation.
- .4 Bridge shall be installed such that run-off is directed toward the tower base.



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Coast Guard

Garde côtière  
canadienne



## APPENDIX A: SITE LOCATION

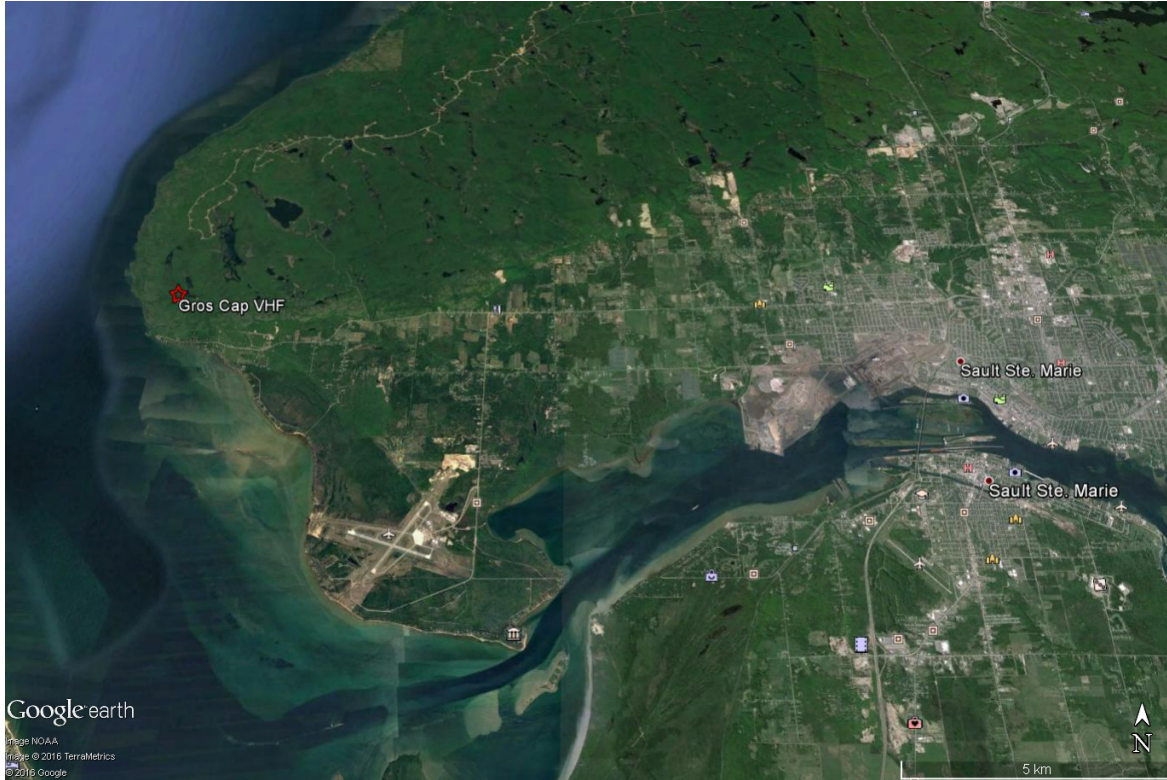


Fisheries and Oceans  
Canada

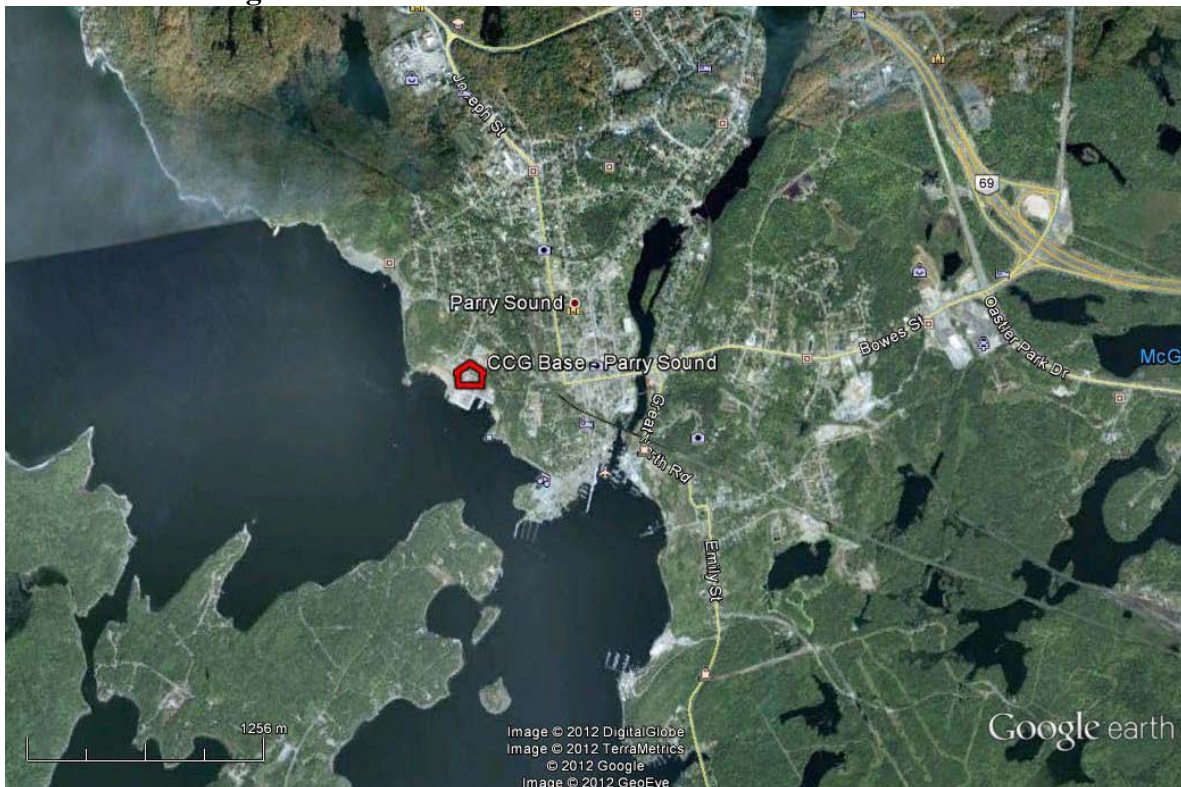
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Coast Guard

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**Figure 1: Site Location 46°32'16.53"N - 84°34'54.53"W**



**Figure 2: CCG Base Parry Sound Location 45°20'39"N 80°2'34"W**





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## APPENDIX B: PHOTOS



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**Figure 3: Existing Waveguide Bridge**



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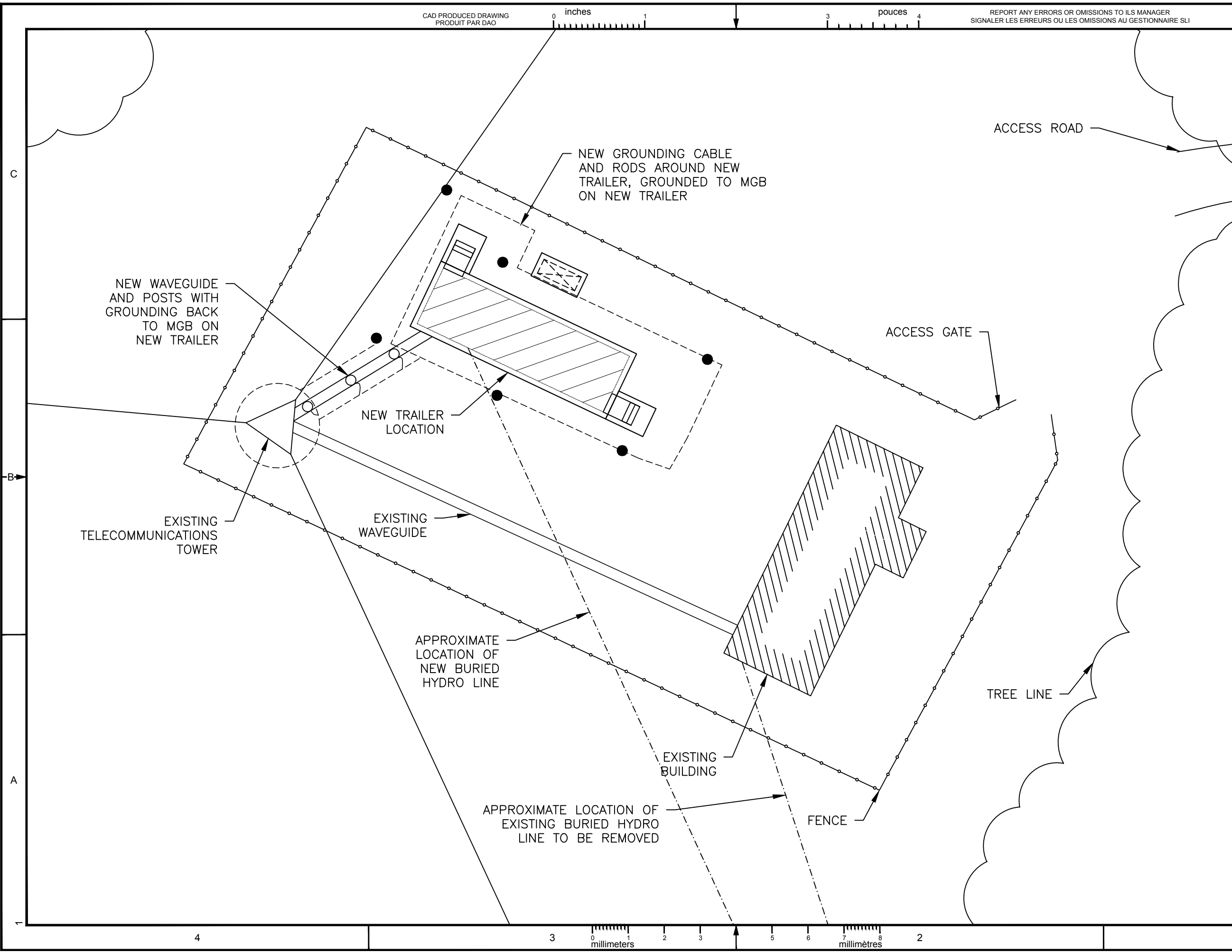


## APPENDIX C: DRAWINGS

Vendor / Sous-traitant

**NOTES:**

1. ALL DIMENSIONS AND LOCATIONS ARE APPROXIMATE.
2. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.



0	DESCRIPTION	BY	yyyy-mm-dd
rev	description	by	date

Asset - Actif  
**GROS CAP MCTS**  
TRAILER REPLACEMENT PROJECT

Drawing - Dessin  
**SITE PLAN**

designed - conception	date
BH	2016-08-23
drawn - dessiné	date
BH	2016-08-23
checked - vérifié	date
BY	2016-08-23
approved - approuvé	date
BY	2016-08-23

CCG ref. no. - no. réf. GCC	scale - échelle
	NTS

drawing no. - no. dessin	sheet-feuille	rev
1	01/04	0

Vendor / Sous-traitant

**NOTES:**

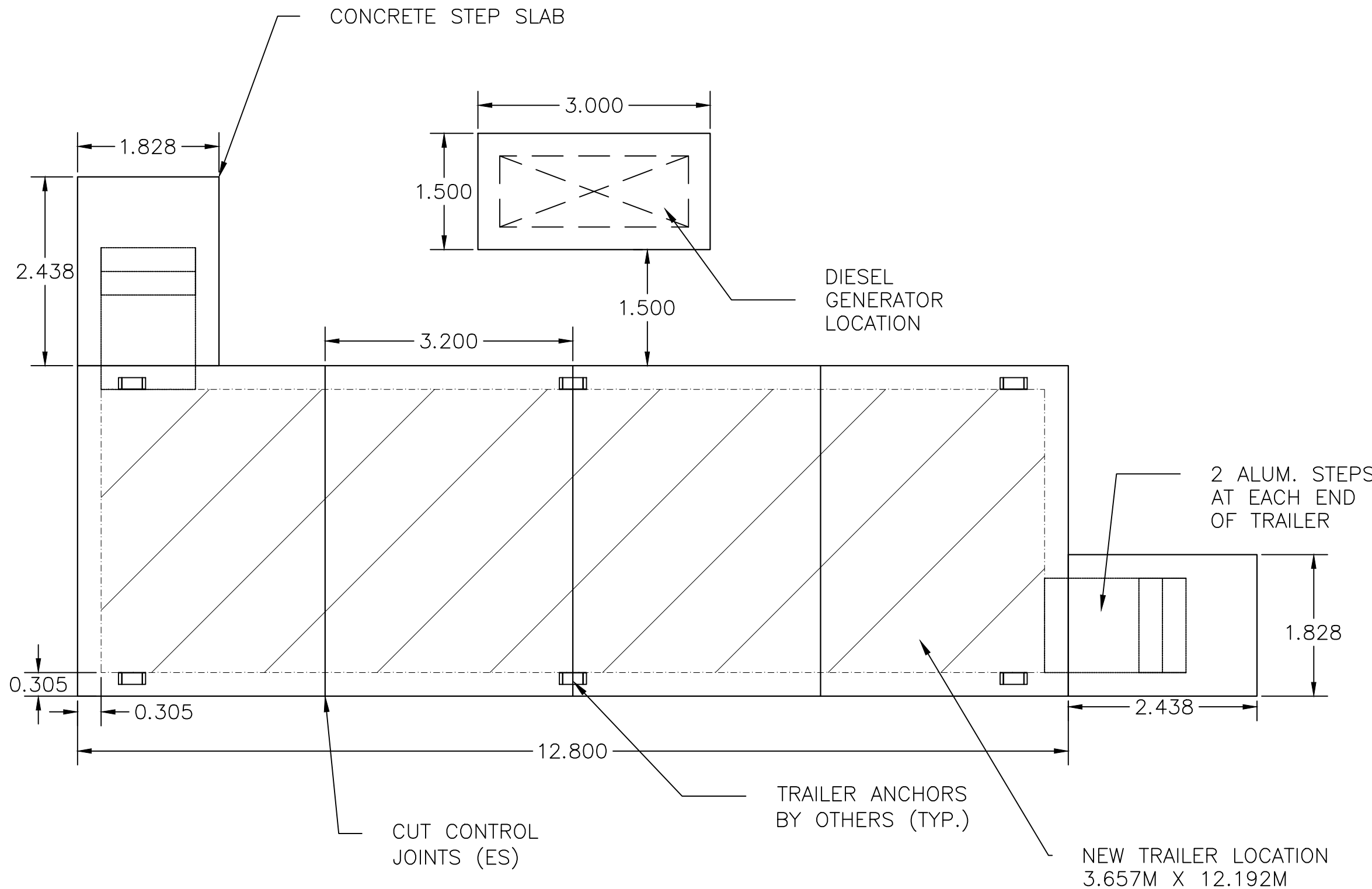
1. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.

C

B

A

2



0	DESCRIPTION	BY	yyyy-mm-dd
rev	description	by	date

Asset - Actif

**GROS CAP MCTS**  
TRAILER REPLACEMENT PROJECT

Drawing - Dessin

**CONCRETE SLAB**

designed - conception

BY 2016-08-23

drawn - dessiné

BH 2016-08-23

checked - vérifié

BY 2016-08-23

approved - approuvé

BY 2016-08-23

CCG ref. no. - no. réf. GCC

scale - échelle

NTS

drawing no. - no. dessin

sheet-feuille

rev 0

Vendor / Sous-traitant

**NOTES:**

1. MAINTAIN 76MM COVER OVER REBAR.
2. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
3. CLEAR COVER SHALL BE 8MM

C

B

A

S

9-15M @ 290MM O.C.  
1670MM

7-15M @ 280MM O.C.  
6550MM

6-15M @ 270MM O.C.  
2848MM

11-15M @ 280MM O.C.  
1348MM

3"  
conduits  
run  
below  
slabs

Diesel  
Generator

39-15M @ 300MM O.C.  
4112MM

9-15M @ 290MM O.C.  
12650MM

1-15M  
@  
290MM  
O.C.  
3010MM

Trailer

6-15M @  
290MM O.C.  
15090MM

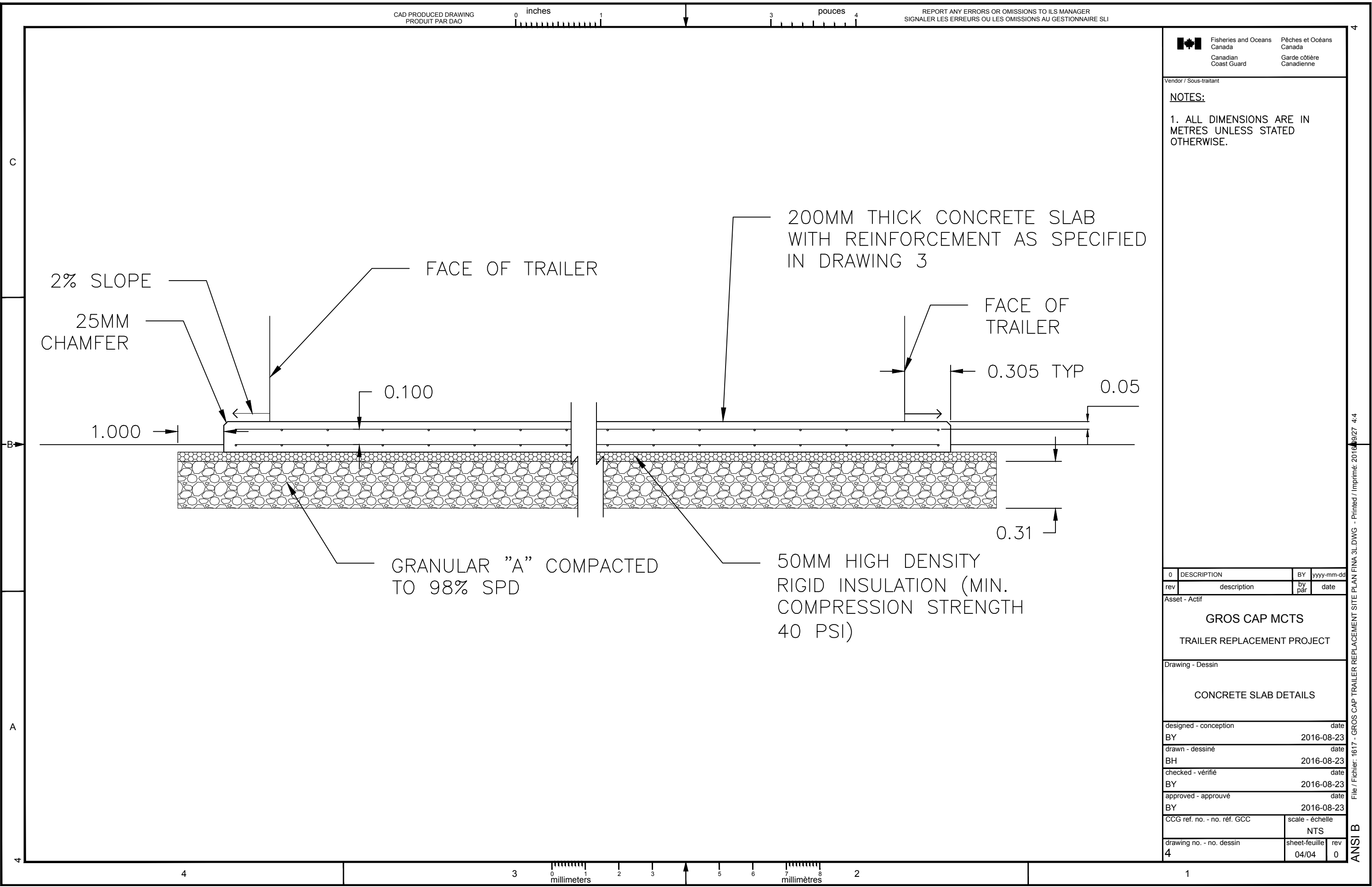
9-15M @ 290MM O.C.  
1670MM

0	DESCRIPTION	BY	yyyy-mm-dd
rev	description	by	date
Asset - Actif			
<b>GROS CAP MCTS</b>			
TRAILER REPLACEMENT PROJECT			
Drawing - Dessin			
REINFORCING PLAN			
designed - conception		date	
BY		2016-08-23	
drawn - dessiné		date	
BH		2016-08-23	
checked - vérifié		date	
BY		2016-08-23	
approved - approuvé		date	
BY		2016-08-23	
CCG ref. no. - no. réf. GCC		scale - échelle	
		NTS	
drawing no. - no. dessin	sheet-feuille	rev	
3	03/04	0	

Vendor / Sous-traitant

**NOTES:**

1. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.



0	DESCRIPTION	BY	yyyy-mm-dd
rev	description	by	date
Asset - Actif			
<b>GROS CAP MCTS</b>			
TRAILER REPLACEMENT PROJECT			
Drawing - Dessin			
<b>CONCRETE SLAB DETAILS</b>			
designed - conception			date
BY			2016-08-23
drawn - dessiné			date
BH			2016-08-23
checked - vérifié			date
BY			2016-08-23
approved - approuvé			date
BY			2016-08-23
CCG ref. no. - no. réf. GCC		scale - échelle	
		NTS	
drawing no. - no. dessin	sheet-feuille	rev	
4	04/04	0	

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ANSI B





**GENERAL NOTES:**

- UNLESS NOTED, USE ONLY THE LATEST ISSUES OF ANY APPLICABLE CODES, STANDARDS OR REGULATIONS MENTIONED IN THE FOLLOWING NOTES.
- UNLESS NOTED, ALL DESIGN AND CONSTRUCTION SHALL CONFORM TO THE APPLICABLE PROVINCIAL/NATIONAL BUILDING CODE. DESIGN IS IN ACCORDANCE WITH THE NATIONAL BUILDING CODE OF CANADA 1995.
- ALL WORKMANSHIP SHALL BE IN ACCORDANCE WITH CSA STANDARDS.
- VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE CANADIAN COAST GUARD TECHNICAL AUTHORITY BEFORE PROCEEDING WITH THE WORK.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SAFEGUARD ALL STRUCTURES AFFECTED BY THIS CONSTRUCTION. THE CONSTRUCTION LOAD SHALL NOT EXCEED DESIGN LIVE LOADS OF THE STRUCTURE.
- MAKE ADEQUATE PROVISIONS FOR CONSTRUCTION STRESSES AND FOR SUFFICIENT TEMPORARY BRACING AND SHORING TO KEEP THE STRUCTURE PLUMB AND LEVEL DURING ALL PHASES OF THE WORK.
- ALL DESIGN LOADINGS INDICATED ON THESE DRAWINGS ARE SPECIFIED (UNFACTORED SERVICE) LOADINGS UNLESS OTHERWISE INDICATED.
- ALL STRUCTURAL MEMBERS SHOWN ARE NEW.
- STRUCTURAL DRAWINGS MUST BE READ IN CONJUNCTION WITH ARCHITECTURAL, ELECTRICAL AND MECHANICAL DRAWINGS.
- CO-ORDINATE WORK WITH MECHANICAL, ELECTRICAL AND ARCHITECTURAL TRADES. REFER TO MECHANICAL, ELECTRICAL AND ARCHITECTURAL DRAWINGS FOR DIMENSIONS NOT PROVIDED ON STRUCTURAL DRAWINGS.
- ALL DIMENSIONS SHOWN ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE. IN SOME INSTANCES, MEMBER SIZES ARE PROVIDED IN IMPERIAL UNITS WITHIN PARENTHESES.
- DO NOT SCALE DRAWINGS.

**STRUCTURAL NOTES:**

- STEEL DESIGN, FABRICATION, AND ERECTION: CAN/CSA-S16.1 AND CSA-S136
- ALL STRUCTURAL STEEL IS TO BE NEW AND SHALL CONFORM TO:  
 CSA G40.21M, GRADE 300W FOR ANGLES AND PLATES;  
 CSA G40.21M, GRADE 350W, CLASS C FOR HSS.
- ALL BOLTS ARE TO BE HIGH STRENGTH STEEL CONFORMING TO ASTM A307, GRADE C, UNO.
- ALL U-BOLTS, ANCHOR BOLTS AND THREADED BARS SHALL CONFORM TO ASTM A307, GRADE C, UNO. PROVIDE A325 DOUBLE NUTS UNLESS NOTED OTHERWISE.
- INSTALLATION OF ADHESIVE AND MECHANICAL CONCRETE ANCHORS SHALL CONFORM WITH MANUFACTURER'S PRINTED INSTRUCTIONS.
- WELDED STEEL CONSTRUCTION (METAL ARC WELDING) SHALL CONFORM TO CSA W59-M AND IS TO BE UNFURNISHED BY A FABRICATOR CERTIFIED TO CSA STANDARD W47.1 FOR DIVISION 1 OR 2.1. ALL WELDING TO USE E60XX ELECTRODES.
- ALL EXTERIOR STRUCTURAL STEEL IS TO BE HOT-DIP GALVANIZED IN ACCORDANCE WITH CSA STANDARD G184, UNLESS NOTED OTHERWISE.
- REPAIR DAMAGED OR FIELD CUT AREAS OF GALVANIZED SURFACES WITH TWO COATS OF ZINC RICH PAINT. WHEN PAINTING IS REQUIRED, PREPARE GALVANIZED SURFACE TO REQUIREMENTS OF CS59 85-GP-18M.
- PROVIDE A LAYER OF NON-SHRINK GROUT BELOW CHANNEL, TO ENSURE LEVEL BEARING OF EXTERIOR PERMETER CHANNELS ON CONCRETE FOUNDATION SLAB. INSTALL TRAILER WHEN GROUT IS WET (NOT CURED).
- STEEL FABRICATOR IS RESPONSIBLE TO ENSURE THAT STRUCTURAL COMPONENTS AND WELDS ARE NOT OVERSTRESSED DURING FABRICATION AND CONSTRUCTION.

**GROUT:**

- NON-SHRINK GROUT: PREMIXED CEMENTITIOUS COMPOUND, NON-METALLIC AGGREGATES, 50 MPa, COMPRESSIVE STRENGTH AT 28 DAYS.

**CORES & OPENINGS:**

- CORES OR OPENINGS ARE NOT PERMITTED UNLESS NOTED ON DRAWINGS OR APPROVED BY THE CANADIAN COAST GUARD TECHNICAL AUTHORITY IN WRITING.
- DO NOT CUT OR CORE IN ANY NEW OR EXISTING STRUCTURAL MEMBERS OTHER THAN WHERE SHOWN ON STRUCTURAL DRAWINGS.
- DO NOT CUT ANY REINF. STEEL OR EMBEDDED SERVICES IN CONCRETE.
- DO NOT CUT OR DAMAGE EMBEDDED SERVICES IN EXISTING CONCRETE OR FOUNDATION STRUCTURE. LOCATE ALL SERVICES PRIOR TO DRILLING, CORING OR CUTTING.
- MAINTAIN FIRE RATINGS WHEN PENETRATING FLOORS, CEILINGS, WALLS AND PARTITIONS. FIRESTOP AND SEAL ALL NEW OPENINGS USING UL-C APPROVED SEALANT SYSTEM IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTRUCTIONS.

**QUALITY CONTROL:**

- WHEN REQUESTED, PROVIDE 3 COPIES OF FABRICATION AND ERECTION DRAWINGS PRIOR TO FABRICATION. ALLOW UP TO 1 WEEK FOR REVIEW BY THE CANADIAN COAST GUARD TECHNICAL AUTHORITY.
- IN ADDITION TO CONTRACTOR'S QUALITY CONTROL PROGRAM, INDEPENDENT TESTING AND INSPECTION MAY BE PERFORMED BY THE CANADIAN COAST GUARD TECHNICAL AUTHORITY.

**WOOD:**

- ALL WORK TO BE IN ACCORDANCE WITH THE NATIONAL BUILDING CODE OF CANADA.
- DESIGN IS IN ACCORDANCE WITH CSA 086-01 ENGINEERING DESIGN IN WOOD.
- ALL WORKMANSHIP SHALL BE IN ACCORDANCE WITH CSA STANDARDS.
- ALL WOOD TO BE GRADE SPRUCE-PIKE-FR (S-P-F) No. 1/No. 2 MINIMUM, UNLESS NOTED OTHERWISE. WOOD FRAMING MEMBERS ARE SOLID SAWN LUMBER. LUMBER PRODUCTS SHALL BE MANUFACTURED IN ACCORDANCE WITH THE NATIONAL LUMBER GRADING AUTHORITY (NLGA) STANDARD GRADING RULES FOR CANADIAN LUMBER.
- NO NOTCHING OF STRUCTURAL WOOD-FRAMING MEMBERS IS PERMITTED, EXCEPT WHERE NOTED ON THE DRAWINGS.
- PROVIDE FULL DEPTH BLOCKING AT MIDSPAN FOR JOISTS AND AT MIDHEIGHT FOR WALL STUDS.
- NO SPLICES ARE PERMITTED IN JOISTS OR STUD MEMBERS.
- ALL WOOD FASTENERS, JOIST HANGERS, BRACKETS AND CONNECTION HARDWARE SHALL BE GALVANIZED OR ZINC PLATED.
- ALL PLYWOOD SHEATHING SHALL CONFORM TO CSA STANDARD 0121, (E2001) DOUGLAS FIR PLYWOOD.
- ALL PLYWOOD SHEATHING SHALL BE THE TYPE, SIZE, ORIENTATION AND FASTENED AS PER THE DETAILED DRAWINGS. FOR ADDITIONAL REQUIREMENTS REFER TO SECTIONS 9.23.14 TO 9.23.17 OF PART 9, NBC 1998.
- NAILS SHALL CONFORM TO THE REQUIREMENTS OF CSA B111 (R1998), WIRE NAILS, SPIKES AND STAPLES; USE SMOOTH COMMON NAILS, UNLESS NOTED OTHERWISE.

**NAIL SIZE**

NAIL SIZE	MINIMUM EDGE DISTANCE	MINIMUM END DISTANCE	MINIMUM MINIMUM (PERF/PARA.)
64 (2.5") LG.	13mm	39mm	26mm/52mm
3.25mm DIA.			
76 (3") LG.	15mm	44mm	30mm/59mm
3.66mm DIA.			
89 (3.5") LG.	17mm	49mm	33mm/65mm
4.06mm DIA.			
102 (4") LG.	20mm	59mm	39mm/79mm
4.88mm DIA.			

**\*\* MINIMUM SPACING PERPENDICULAR TO GRAIN OF WOOD AND PARALLEL TO GRAIN OF WOOD.**

12. ALL SCREWS AND LAG BOLTS SHALL BE IN ACCORDANCE WITH CSA B34 MISCELLANEOUS BOLTS AND SCREWS.

13. PRE-DRILL HOLES IN WOOD MEMBERS TO CREATE SMALLER DIAMETER LEAD HOLES TO PROTECT WOOD FROM SPLITTING DURING THE INSTALLATION OF LARGE SCREWS AND LAG BOLTS.

14. ALL STEEL BOLTS AND THREADED RODS SHALL BE IN ACCORDANCE WITH ASTM A307. ALL STEEL THREADED ROD CONNECTORS SHALL BE COMPLETE WITH WASHERS AND DOUBLE NUTS. LENGTH OF THREADED RODS SHALL INCLUDE SUFFICIENT LENGTH FOR ATTACHMENT OF DOUBLE NUTS.

15. PROVIDE WASHERS WITH SIZES IN ACCORDANCE WITH TABLE 10.2.2.4.1 OF CSA 086-01.

**LIFTING/TRANSPORTATION:**

- LIFTING POINTS FOR THE TRAILER ASSEMBLY IS LIMITED TO ENDS OF THREE HSS 102 DIAMETER MEMBERS FRAMED INTO CHANNEL FRAME OF CHASSIS, LOCATED AT HOLD-DOWN BRACKET LOCATIONS.
- TRAILER SHIPPING WEIGHT IS ESTIMATED AT 12 TONNES (UNFACTORED). SEE NOTE 3.
- TRAILER BACKS AND ELECTRICAL EQUIPMENT ARE ASSUMED TO BE INSTALLED ON SITE AND NOT INCLUDED IN THE ASSUMED TRAILER SHIPPING WEIGHT. ICE GUARD COMPONENTS ARE NOT TO BE SHIPPED WITHIN TRAILER, AS NOT INCLUDED IN SHIPPING WEIGHT.
- TRAILER ASSEMBLY SHALL BE LIFTED SIMULTANEOUSLY AT THE SIX LIFTING POINTS. DURING HOISTING OPERATIONS, A SPREADER BEAM AND FRAME ASSEMBLY (BY OTHERS) IS REQUIRED TO LIFT THE TRAILER ASSEMBLY TO ENSURE THAT LOADS ARE APPLIED TO THE STEEL CHASSIS AT THE LIFT POINTS ONLY.
- NO DIRECT LOADS OR CONTACT FROM THE LIFTING DEVICES IS PERMITTED ON WOOD-FRAME CONSTRUCTION OR EXTERIOR METAL SIDING.
- DURING TRANSPORTATION, ENSURE THAT ALL ELEMENTS ARE SECURED.
- THE LIMITATION AND RESTRICTIONS OF THE MINISTRY OF TRANSPORTATION ONTARIO UNDER ANNUAL PERMITS IS APPLICABLE. ENSURE THAT MAXIMUM WIDTH 3.7m AND MAXIMUM HEIGHT OF 4.26m (COMBINED VEHICLE AND PAYLOAD) ARE NOT EXCEEDED.

Fisheries and Oceans Canada  
 Pêches et Océans Canada

Coast Guard  
 Garde Côtière

CENTRAL & ARCTIC REGION  
 REGIONAL DU CENTRE ET DE L'ARCTIQUE

Technical Services  
 Services Techniques

MORRISON  
 HERSFIELD

235 YORKLAND BLVD., SUITE 600  
 TORONTO, ON M2B 1T1  
 TEL: 416-499-3110  
 FAX: 416-499-9536

**Notes**

Revision	Date	By	Description
1	04-04-06	T.K.H.	ISSUED FOR TENDER



Project title  
 FACILITIES ENGINEERING AND CONSTRUCTION  
 FACILITES INGENIERIE ET CONSTRUCTION

Drawing title  
 TELECOMMUNICATIONS TRAILER

GENERAL NOTES AND STRUCTURAL NOTES

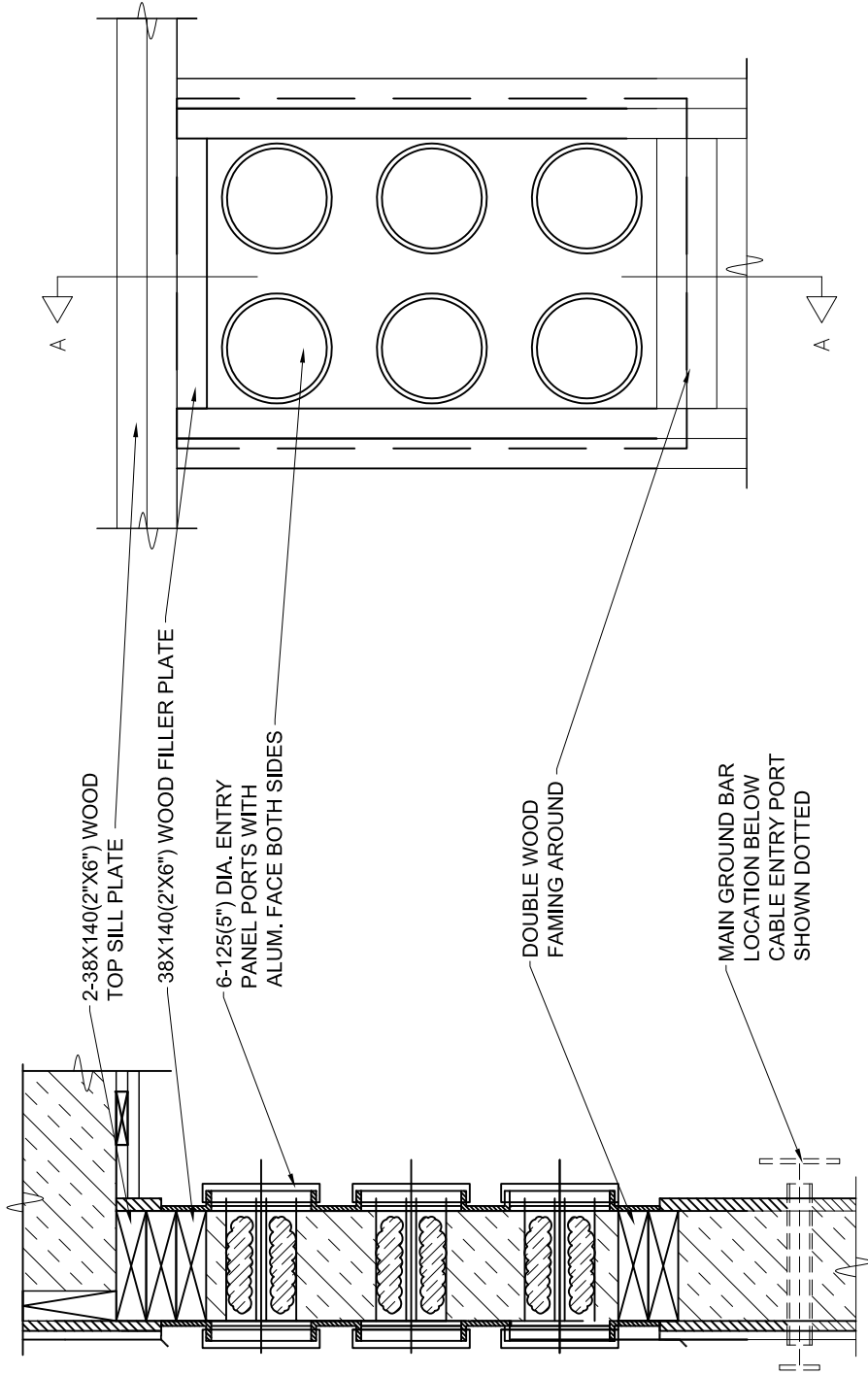
date - date	drawn - dessiné	checked - vérifié	approved
APR. 06, 2004	J.C.	T.K.H.	

scale - échelle  
 AS SHOWN

reference - référence  
 S3


drawing no. - no du dessin  
 3046-53


sheet no. - no de la feuille  
 1



CABLE ENTRY FRAMING DETAIL

SECTION A-A


 Fisheries and Oceans  
 Canada  
 Canadian Coast Guard  
 Central & Arctic Region


 Pêches et Océans  
 Canada  
 Garde côtière canadienne  
 Région du centre et de l'Arctique

Maritime and Civil Infrastructure (MCI), Integrated Technical Services  
 520 Esplanade St., Sarnia, ON N7T 8B1

**GROS CAP MCTS TRAILER (3657X12192)**  
**CABLE ENTRY PORT**  
**GROS CAP, ONTARIO**

FILE No.:	EWT 8055-119	SCALE:	N.T.S.	DWG No.	A-10
Rv.	DATE	DESCRIPTION	DRAWN APPD		
0	30-04-12	DRAWING INITIATED.	R.C.S.		

Anchorage weldment supplied by Coast Guard

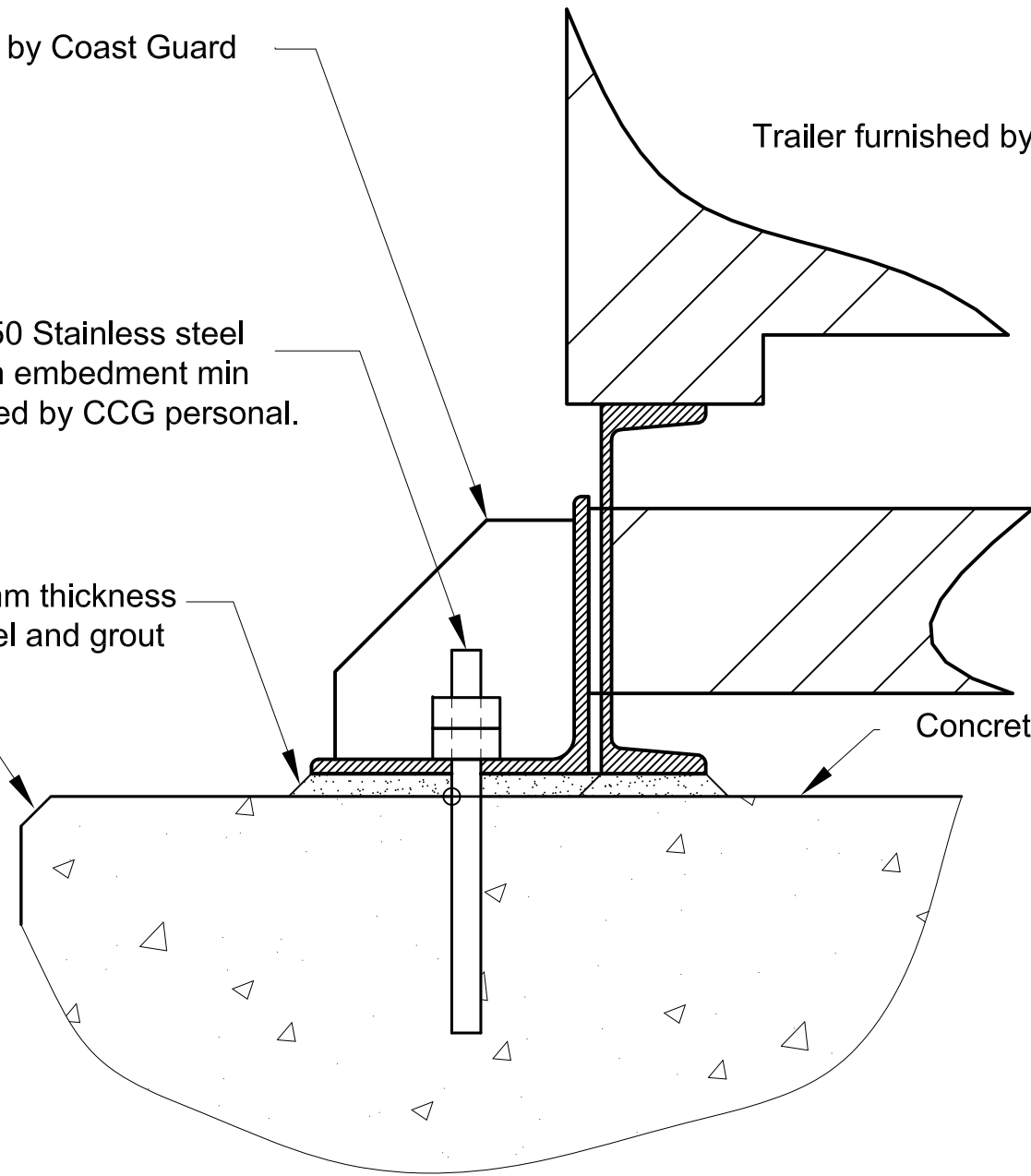
Trailer furnished by Coast Guard

2 x 16mmØ. HILTI HY150 Stainless steel adhesive anchor 130mm embedment min  
Nuts and Washer Installed by CCG personal.

25mm thickness  
Level and grout

25mm Chamfer  
all around

Concrete slab on grade



Anchorage Detail



Fisheries and Oceans  
Canada

Pêches et Océans  
Canada

**Canadian Coast Guard**  
Central & Arctic Region

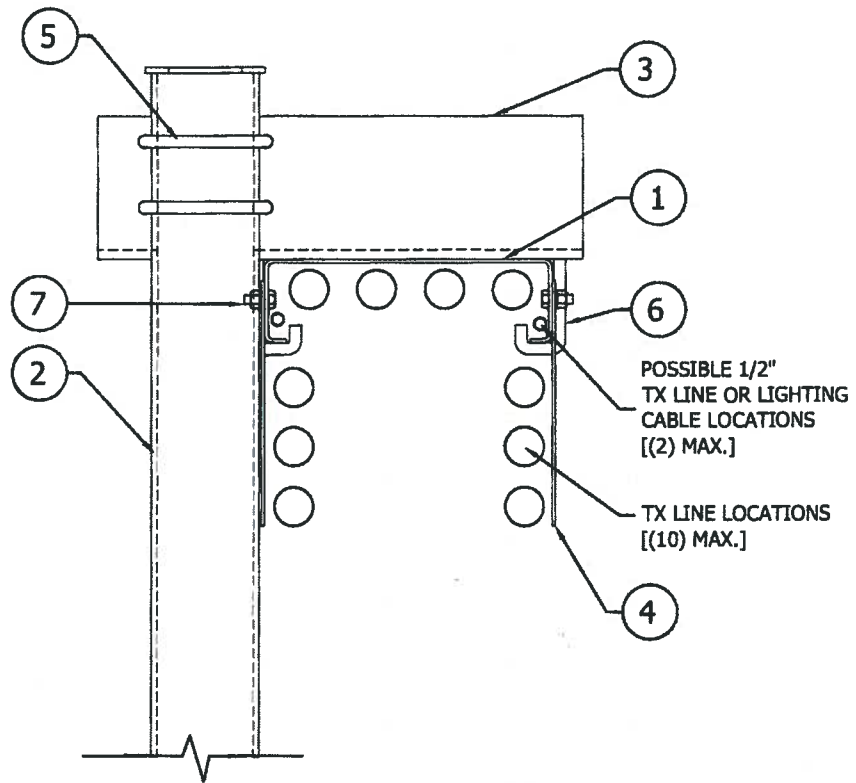
**Garde côtière canadienne**  
Région du centre et de l'Arctique

Maritime and Civil Infrastructure (MCI), Integrated Technical Services  
520 Exmouth St., Sarnia, ON N7T 8B1

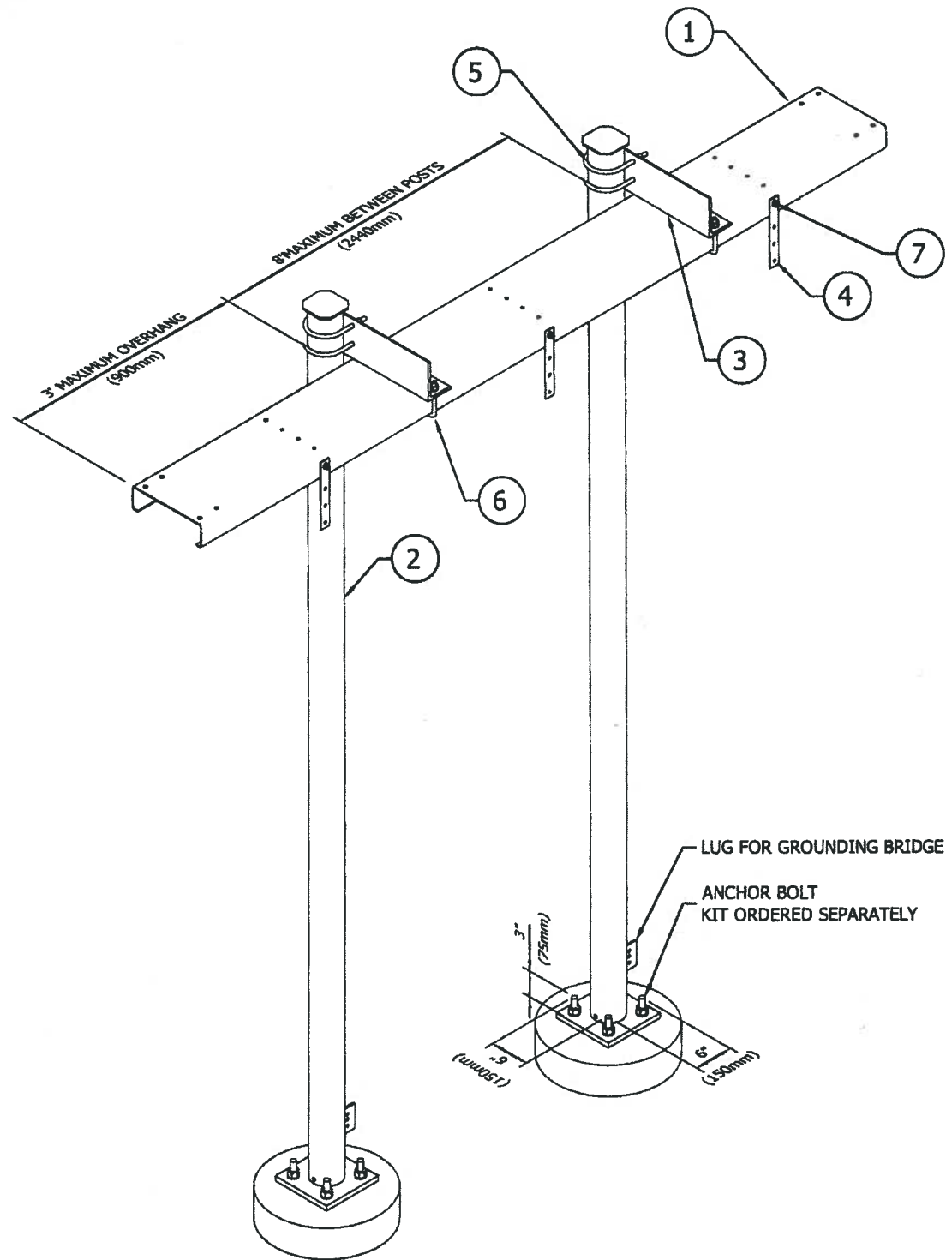
**CAPE CROKER MCTS  
TELECOMMUNICATION BUILDING  
ANCHORAGE DETAIL**

FILE No.:		SCALE:	DWG No.	
EWT- 8055-248		N.T.S.	C-03	
Rv.	DATE	DESCRIPTION	DRAWN	APP'D
O	15/06/2012	DRAWING INITIATED.	R.C.S.	

BILL OF MATERIAL KIT #STB001-S				
ITEM	QTY.	PART NO.	DESCRIPTION	Wt./lb
1	1	91171B	SAMSON CHANNEL 12"@5/32"x10'	115#
2	2	91166F2	HSS 4 1/2"ODx11' WELD'T	226#
3	2	TX001A	BRACE ARM L 6x4x3/8"	40#
4	6	91171C	PL. 1 1/2"x1/8"	6#
5	4	110260	1/2" U-BOLTS @ 5 1/16"c/c	
6	4	111041	1/2" SQUARE J-BOLTS	
7	6	110459	3/8" x 1" GR.5 BOLT ASSY	
TOTAL				390#




END VIEW



NOTE:

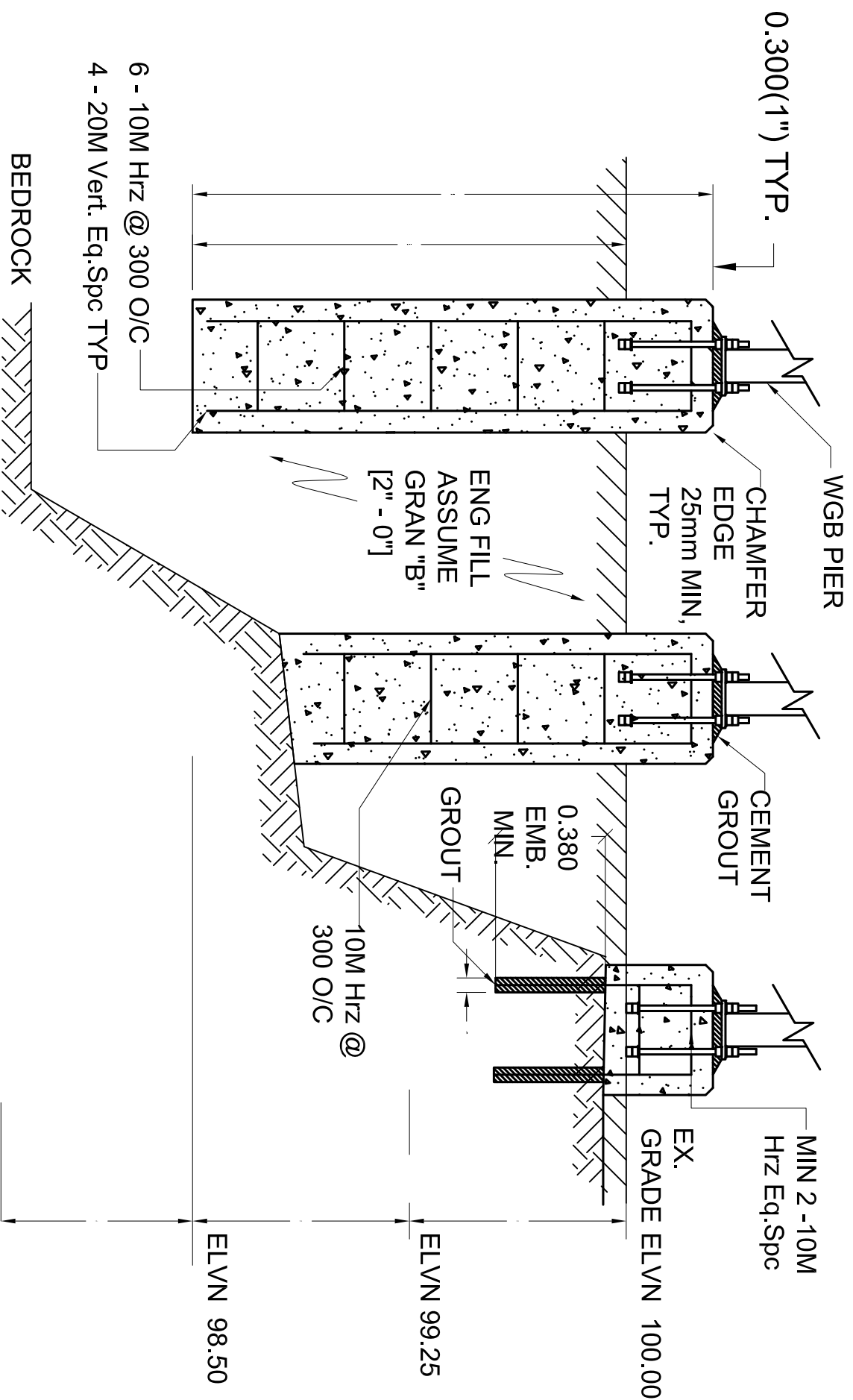
WHEN DETERMINING END OVERHANG, CONSIDER LOCATION OF EXISTING TOWER AND BUILDING FOUNDATION.

	Fisheries and Oceans Canada	Pêches et Océans Canada
	Canadian Coast Guard Central & Arctic Region	Garde côtière canadienne Région du centre et de l'Arctique
	Maritime and Civil Infrastructure (MCI), Integrated Technical Services 520 Exmouth St., Samia, ON N7T 8B1	

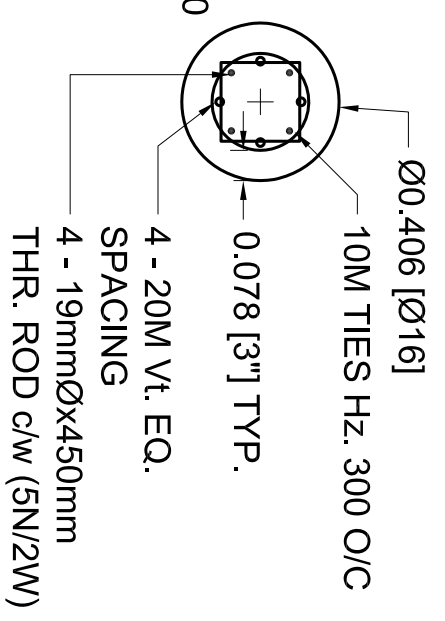
## WAVE GUIDE DRAWING TYPICAL DETAILS POST AND WAVE GUIDE TRAY

FILE No.: EWT 8055 -000		SCALE: N.T.S.	DWG No. T-01	
Rv.	DATE	DESCRIPTION	DRAWN	APP'D
O	19-06-12	DRAWING INITIATED.	R.C.S.	

# PROFILE VIEW



# PLAN VIEW



Notes:

Piers shall be cast to a depth of 1.5m below ex. grade (Type A). Where bedrock is encountered at an elevation of less than 1.5m the configuration of the pier shall be amended to Type B or C depending upon the depth to bedrock.

Reinforcement: Deformed bars as per CSA G30.18 M92, Fy 400 Mpa.  
Fabrication, placement, cover, and support as per CSA A23.

Grout: SIKKA MBED or equal  
Concrete: Quikrete 5000 or equal HES

# CABLEWAY GUIDE PIERS

Fisheries and Oceans Canada  
**Canadian Coast Guard**  
 Central & Arctic Region  
 Maritime and Civil Infrastructure (MCI), Integrated Technical Services  
 520 Exmouth St., Sarnia, ON N7T 8B1

Pêches et Océans Canada  
**Garde côtière canadienne**  
 Région du centre et de l'Arctique

## CAPE CROKER TRAILER WAVE GUIDE POST FOUNDATIONS TYPICAL DETAILS TYPES

FILE No.:	EWT 8055-248	SCALE:	N.T.S.	DWG No.:	T-03
Rv.	DATE	DESCRIPTION	DRAWN	APP'D	
O	30-08-12	DRAWING INITIATED.	R.C.S.		



Fisheries and Oceans  
Canada

Pêches et Océans  
Canada

Canadian  
Coast Guard

Garde côtière  
canadienne



## APPENDIX D: GEOTECHNICAL INVESTIGATION

**Geotechnical Investigation Report  
Proposed Replacement of Existing Equipment Building  
Gros Cap MCTS Site, near Sault Ste Marie, Ontario**

**Prepared for Fisheries and Oceans Canada**



**ENGINEERING SOLUTIONS**

INSPEC-SOL INC., 651 Colby Drive, Waterloo (Ontario) N2V 1C2 ♦ Tel.: 519 725-9328 ♦ Fax: 519 725-1158 ♦ QMS ISO 9001 : 2008

Reference No. T050145-A1

March 20, 2012

Mr. Blair Young, P.Eng.  
Project Engineer  
Maritime and Civil Infrastructure  
Central and Arctic Region Coast Guard  
Fisheries and Oceans Canada  
520 Exmouth Street  
Sarnia, Ontario N7T 8B1

Re: Geotechnical Investigation Report  
Proposed Replacement of Existing Equipment Building  
Gros Cap MCTS Site, near Sault Ste Marie, Ontario

---

Dear Mr. Young;

In accordance with your request, Inspec-Sol has conducted a geotechnical investigation at the above-noted site and is pleased to present our report.

We trust that this information meets with your approval. Please do not hesitate to contact us, should any questions arise.

Yours very truly,

INSPEC-SOL INC.

A handwritten signature in black ink, appearing to read 'B. Polan', is written over a light blue horizontal line.

Bruce Polan, M.A.Sc., P. Eng.  
Associate/ Branch Manager Waterloo

ak/BP/cr/1



**TABLE OF CONTENTS**

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>1</b>
<b>2.0</b>	<b>PROJECT DESCRIPTION .....</b>	<b>1</b>
<b>3.0</b>	<b>FIELD AND LABORATORY WORK PROCEDURES .....</b>	<b>2</b>
<b>4.0</b>	<b>GEOLOGY AND SUBSURFACE CONDITIONS.....</b>	<b>3</b>
<b>5.0</b>	<b>DISCUSSION AND RECOMMENDATIONS .....</b>	<b>4</b>
<b>5.1</b>	<b><i>General</i>.....</b>	<b>4</b>
<b>5.2</b>	<b><i>Foundation Design Parameters</i> .....</b>	<b>5</b>
<b>5.2.1</b>	<b><i>Concrete Foundation Slab</i>.....</b>	<b>5</b>
<b>5.3</b>	<b><i>Seismic Site Class</i>.....</b>	<b>6</b>
<b>5.4</b>	<b><i>Excavations and Groundwater Control</i>.....</b>	<b>6</b>
<b>5.5</b>	<b><i>Trench Backfilling</i>.....</b>	<b>7</b>
<b>5.6</b>	<b><i>Corrosion Potential</i>.....</b>	<b>8</b>
<b>6.0</b>	<b>LIMITATIONS OF THE INVESTIGATION .....</b>	<b>9</b>

**FIGURE**

Figure 1	Site Plan
Figure 2	Test Pit Location Plan

**APPENDICES**

Appendix A	Test Pit Stratigraphy Log
Appendix B	Soil Analytical Laboratory Test Results

## 1.0 INTRODUCTION

Inspec-Sol Inc., (Inspec-Sol) has been retained by the Department of Fisheries and Oceans Canada (DFO) to conduct a geotechnical investigation for the Proposed Replacement of Existing Equipment Building located at Gros Cap MCTS Site (Site), near Sault Ste Marie, Ontario. A site plan provided by DFO is attached as Figure 1.

The authorization for the geotechnical investigation was provided through the DFO Purchase Order No. F2563-110097 dated February 13, 2012.

The purpose of the geotechnical investigation was to determine the subsurface soil and groundwater conditions in close proximity of the proposed replacement structure. This report contains a description and findings of our geotechnical investigation, as well as professional opinions and recommendations regarding subsurface conditions and the design and construction of the foundation for the new equipment building.

## 2.0 PROJECT DESCRIPTION

The Site is located in west of Sault Ste Marie, Ontario, and is accessible through a gravel road off North Gros Cap Road. At present the facility comprises an existing equipment building structure and a VHF steel truss tower. The Site is secured by a chain-link fence with a gated entrance at its northeastern limits through a gravel access road. The area surrounding the property is generally covered with bushes and small trees.

Based on the information provided by DFO and Canadian Coast Guard (CCG), Central and Arctic Region, it is understood that DFO/CCG is planning to replace the existing equipment building. Inspec-Sol has reviewed the following documents provided with the request for quotation (RFQ):

- Framing Plans, Sections and Details (Drawing 3046-S1, dated April 6, 2004); and
- General Notes and Structural Notes (Drawing 3046-S3), provided in Appendix C (Drawings *reference only*) of the RFQ information.

Based on review of the above drawings, it is our understanding that the proposed building replacement structure will comprise of a Telecommunications Trailer with dimensions of 12.9 metres (m) x 4.35 m, supported by C-channels (C200), on either conventional shallow footings, or a concrete slab. The replacement structure will be located to the northwest of the existing building.

### **3.0 FIELD AND LABORATORY WORK PROCEDURES**

The scope of work (SOW) for the geotechnical investigation was described in our proposal #PW-439 dated February 8, 2012, and comprised of excavation of two test pits to a maximum depth of 3.0 m below the existing ground surface (bgs) or excavation refusal, whichever comes earlier, using a track-mount excavator.

Inspec-Sol obtained underground utility clearance in the general Site area through Ontario 1 Call (ONICALL). Lajoie Brothers, an excavating subcontractor advanced the two test pits TP-1 and TP-2 on March 2, 2012 to depths of 3.10 m and 2.44 m bgs, respectively using a track-mount excavator (CAT 307), under the full-time supervision of an Inspec-Sol representative. DFO also had their representative present at site at the time of the test pit excavations. The Test Pit stratigraphy logs are attached as Appendix A. The approximate test pit locations are shown on the Test Pit Location Plan provided as Figure 2.

Soil strata in each test pit location were observed in the field for type, texture, and colour. Soil samples of the strata encountered, were obtained at various depths. The samples were sealed in clean plastic containers and transferred to the Inspec-Sol laboratory at Waterloo, where they were re-examined to verify the accuracy of the initial soil descriptions. Both test pits were backfilled with the excavated on-site soils upon completion. Groundwater observations were made in the test pits as excavation proceeded, and no groundwater was observed. The existing ground surface elevations at the test pit locations were not measured.

The geotechnical laboratory work program consisted of moisture content analyses on all collected soil samples. The moisture content test results are provided on the respective test pit log at the corresponding sample depths. One soil sample was analyzed for chemical properties to determine the potential for corrosion of buried steel structures and potential of sulphate

attack on below-grade concrete structures. The soil sample was submitted under chain-of-custody to ALS, an accredited analytical laboratory. The analytical test results are discussed in Section 5.6 and the laboratory test result sheets are provided in Appendix B.

#### **4.0 GEOLOGY AND SUBSURFACE CONDITIONS**

The Site is located in the rugged high hills of the Gros Cap Batholith (Robertson and Card 1972). The Gros Cap Batholith is a large granitic highland. In the Township of Prince and the northern part of the City of Sault Ste Marie, the highland displays a distinctive escarpment that extends from Gros Cap across to the Garden River Indian Reservation. The quaternary geology of the Sault Ste Marie area (Ministry of Northern Development and Mines Map P.31-4) indicates that the Site geology consists of early to late Precambrian age comprising granite, volcanic, metasedimentary and metavolcanic rocks, which is identified as unsubdivided and includes a discontinuous thin drift cover.

According to the Quaternary Geology of Southern Ontario (Ministry of Northern Development and Mines Map 2556), the bedrock in the area is comprised of Precambrian, undifferentiated igneous and metamorphic rock, exposed at surface or covered by discontinuous thin layer of drift.

Details of the subsurface conditions encountered at the Site are summarized in this Section. It should be noted that the subsurface conditions are only confirmed at the test pit locations and may vary at other locations. The boundaries between the various strata, as shown on the Test Pit Stratigraphy Logs are based on our observation at the time of test pit excavation, and represent an inferred transition between the various strata, rather than a precise plane of geological change. Bedrock was not encountered within the excavation depths of TP-1 and TP-2, however, bedrock outcrops are located close to the site as shown on the Site Plan. For a detailed review of the soil stratigraphy, the reader should refer to the attached test pit logs.

At the ground surface of each test pit, sand and gravel topsoil mixed with organics and roots was encountered to a depth of 750 mm and 600 mm, respectively, in TP-1 and TP-2. The surficial topsoil in both test pit locations is underlain by native sand and gravel deposits, with

some roots, which extends to 1.2 m bgs. The upper sand and gravel layer is further underlain by a coarse-grained sand and gravel containing cobbles and boulders, which extends to the termination depths of about 3.1 m bgs and 2.44 m bgs in TP-1 and TP-2, respectively.

The laboratory moisture contents of the selected native sand and gravel soil samples range from 4 percent (%) to 15 %, which indicate moist conditions.

Groundwater observations were made as the test pit excavation proceeded. Both test pits TP-1 and TP-2 were found dry upon completion. The excavation side walls of both test pits were noted to be stable upon completion.

The excavated test pits were backfilled with the excavation spoil pile, and compacted with the excavator track. During test pit excavation operations, a copper grounding cable was encountered at about 0.6 m bgs in test pit TP-2. The cable was slightly damaged, and was replaced at its original location in the presence of the DFO site representative, subsequent to completion of test pit excavation and prior to proceeding backfilling operations. It is understood that repairs to the grounding cable will be carried out by DFO at a later date.

## **5.0 DISCUSSION AND RECOMMENDATIONS**

### **5.1 *General***

The purpose of this geotechnical investigation was to determine the subsurface soil and groundwater conditions at the proposed equipment building replacement and to provide geotechnical design and construction recommendations for the proposed building structure, and associated underground utility trenches such as buried cable, if any.

DFO/CGC provided example structural drawings in Appendix C of the RFQ (Drawings 3046-S1 and 3046-S3) from 2004 of the Telecommunication Trailer, and it is understood that the proposed building will be similar to that shown on these drawings. Based on our understanding of the proposed structure and these drawings, the building will have dimensions of 12.9 metres (m) x 4.35 m, and will have a plywood subfloor and plywood exterior sheathing. The trailer will be supported on C-channels, placed on concrete pier footings or a concrete slab.

Based on our understanding of the project, discussed in Section 2.0, and the subsurface soil and groundwater conditions encountered at the test pit locations, the following geotechnical design and construction recommendations are provided for the proposed replacement structure. We would be pleased to review these recommendations once further details of the foundation design are available.

## ***5.2 Foundation Design Parameters***

Based on the 2004 drawings, it appears that the trailer will be supported on or above the existing ground surface, on concrete piers or a slab-on-grade. If support piers or footings are used, they should extend to 2.0 m below grade for proper frost cover. The foundation subgrade can be considered suitable for a nominal design bearing pressure at service limit states of 150 kPa, and ultimate limit states of 225 kPa.

### ***5.2.1 Concrete Foundation Slab***

If the c-channels are to be supported on a concrete slab, the slab should be designed for unheated conditions, and be reinforced to tolerate frost heave. The concrete slab should be supported on a minimum 300 mm thick layer of Granular 'A' base conforming to OPSS granular 'A' requirements compacted to at least 100 percent SPMDD. The slab should be slightly raised above existing grade to encourage drainage away from the slab. Consideration can also be given to providing insulation for frost protection, and we can assist with this issue if requested.

The upper 0.6 to 0.75 m of soil at the site consists of sand and gravel topsoil, and we recommend removal of this material from beneath the building footprint. The subgrade should be verified by the geotechnical engineer to determine its suitability. Once the subgrade has been approved, it should be compacted with a heavy smooth-drum roller compactor, to at least 98 percent of its standard Proctor maximum dry density (SPMDD). Grade adjustments, if required, should be made using on-site approved granular soils, or imported granular material such as OPSS granular 'B'. The engineered fill material used for preparation of foundation subgrade should be placed in thin lifts not exceeding 200 mm and thoroughly compacted using a heavy vibratory roller to a minimum of 98 percent SPMDD. The moisture contents of the fill material should be maintained within 2 percent of optimum.

### **5.3 Seismic Site Class**

The 2006 Ontario Building Code (2006 OBC) requires the assignment of a Seismic Site Class for calculations of earthquake design forces and the structural design based on a two percent probability of exceedance in 50 years. According to the 2006 OBC, the Seismic Site Class is a function of soil profile, and is based on the average properties of the subsoil strata to a depth of 30 m below the ground surface. The 2006 OBC provides the following three methods to obtain the average properties for the top 30 m of the subsoil strata:

- Average shear wave velocity;
- Average Standard Penetration Test (SPT) values (uncorrected for overburden); or
- Average undrained shear strength.

Based on the results of this geotechnical investigation, the test pits extend to a maximum depth of 3.1 m bgs only and the subsurface profile below this depth is not known (shallow bedrock expected). For a preliminary design purposes, based on the criteria listed in Table 4.1.8.4.A. of the 2006 OBC and our knowledge of the regional geology, a Seismic Site Class 'D' can conservatively be used.

### **5.4 Excavations and Groundwater Control**

Excavations must be carried out in accordance with the Occupational Health and Safety Act and Regulations for Construction Projects. These regulations designate four broad classifications of soils to stipulate appropriate measures for excavation safety. The undisturbed cohesive and cohesionless soil deposits found at this Site are considered generally as a Type 3 soil.

Where workmen must enter a trench or excavation carried deeper than 1.2 m, the trench or excavation must be suitably sloped and/or braced in accordance with the regulation requirements. The regulation stipulates maximum slopes of excavation by soil type as follows:



### Maximum Slope Inclinations

<i>Soil Type</i>	<i>Base of Slope</i>	<i>Maximum Slope Inclination</i>
1	Within 1.2 metres of bottom of trench	1 horizontal to 1 vertical
2	Within 1.2 metres of bottom of trench	1 horizontal to 1 vertical
3	From bottom of trench	1 horizontal to 1 vertical
4	From bottom of trench	3 horizontal to 1 vertical

The native sand and gravel deposits encountered at the test pit locations can be classified as Type 3 when properly dewatered in their undisturbed state in accordance with the OHSAA regulations. Groundwater was not encountered in the test pits.

Minimum support system requirements for steeper excavations are stipulated in Sections 235 through 238 and 241 of the Act and Regulations and include provisions for timbering, shoring and moveable trench boxes.

Perched groundwater seepage, if encountered, should be controlled by conventional sump pump methods. Surface water should be directed away from open excavations. Spoil piles should be kept a minimum of 1.0 m away from the top of any excavation to prevent excess loading on excavation sidewalls.

#### **5.5 Trench Backfilling**

Backfilling of excavation trenches (subgrade for building foundation and/or utility trenches) can be accomplished by reusing the excavated soils or similar fill material provided the moisture content is maintained within 2 percent of optimum. Backfill materials used for site grading or backfilling purposes should be placed in thin lifts not exceeding 200 mm and thoroughly compacted using a heavy vibratory roller to a minimum of 95 percent SPMDD. Cobbles and boulders in excess of 150 mm diameter should be excluded from the soils used as backfill material.

### 5.6 Corrosion Potential

Analytical testing was carried out on one soil sample recovered from 1.8 m bgs in order to determine corrosion potential of the subsurface soils. The sand and gravel soil sample was tested for pH, resistivity, sulphides, sulphate, chloride and redox potential. The test results are summarized in the following table. The detailed laboratory analytical report is provided in Appendix C.

<i>Sample ID</i>	<i>TP-2 (S-3)'</i>
Depth (m bgs)	1.8
pH	5.91
Moisture (%)	6
Redox Potential (mV)	355
Resistivity (ohm-cm)	108000
Chloride (mg/kg)	<20 (detection limit)
Sulphide (mg/kg)	<0.20 (detection limit)
Sulphate (mg/kg)	<20 (detection limit)

Based on these results, the soil is considered to be non-corrosive. Note that the above value for resistivity was performed by the analytical lab and should not be used for design of grounding systems. Inspec-Sol can provide resistivity values using a 4-pin resistivity box if required.

Table 3 of the Canadian Standards Association (CSA) document A23.1-04/A23.2-04 'Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete' divides the degree of exposure into the following three classes:

<i>Degree (Class) of Exposure</i>	<i>Water Soluble (SO<sub>4</sub>) in Soil Sample (%)</i>
Very Severe (S-1)	> 2.0
Severe (S-2)	0.20 – 2.0
Moderate (S-3)	0.10 – 0.20

A review of the analytical test results shows the sulfate content in the tested samples was found to be less than 0.00002 percent, which was the detection limit of the test. In view of the test results, the degree of exposure of the subsurface concrete structures to sulphate attack is low.

## **6.0 LIMITATIONS OF THE INVESTIGATION**

This report is intended solely for Fisheries and Oceans Canada, Canadian Coast Guard and other party/parties explicitly identified in the report, and is prohibited for use by others without Inspec-Sol's prior written consent. This report is considered Inspec-Sol's professional work product and shall remain the sole property of Inspec-Sol. Any unauthorized reuse, redistribution of or reliance on the report shall be at the Client and recipient's sole risk, without liability to Inspec-Sol. Client shall defend, indemnify and hold Inspec-Sol harmless from any liability arising from or related to Client's unauthorized distribution of the report. No portion of this report may be used as a separate entity; it is to be read in its entirety and shall include all supporting drawings and appendices.

The recommendations made in this report are in accordance with our present understanding of the project, the current site use, ground surface elevations and conditions, and are based on the work scope approved by the Client and described in the report. The services were performed in a manner consistent with that level of care and skill ordinarily exercised by members of geotechnical engineering professions currently practicing under similar conditions in the same locality. No other representations, and no warranties or representations of any kind, either expressed or implied, are made. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties.

All details of design and construction are rarely known at the time of completion of a geotechnical study. The recommendations and comments made in the study report are based on our subsurface investigation and resulting understanding of the project, as defined at the time of the study. We should be retained to review our recommendations when the drawings and specifications are complete. Without this review, Inspec-Sol will not be liable for any misunderstanding of our recommendations or their application and adaptation into the final design.

By issuing this report, Inspec-Sol is the geotechnical engineer of record. It is recommended that Inspec-Sol be retained during construction of all foundations and during earthwork operations to confirm the conditions of the subsoil are actually similar to those observed during

our study. The intent of this requirement is to verify that conditions encountered during construction are consistent with the findings in the report and that inherent knowledge developed as part of our study is correctly carried forward to the construction phases.


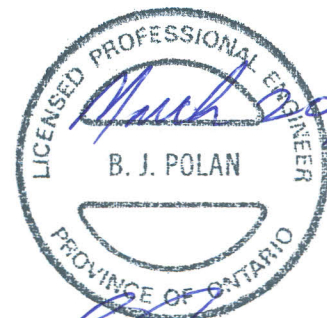
It is important to emphasize that a soil investigation is, in fact, a random sampling of a site and the comments included in this report are based on the results obtained at the test location only [Test Pits TP-1 and TP-2]. The subsurface conditions confirmed at the two (2) test pit locations may vary at other locations. The subsurface conditions can also be significantly modified by the construction activities on site (ex. excavation, dewatering and drainage, blasting, pile driving, etc.). These conditions can also be modified by exposure of soils or bedrock to humidity, dry periods or frost. Soil and groundwater conditions between and beyond the test locations may differ both horizontally and vertically from those encountered at the test locations and conditions may become apparent during construction which could not be detected or anticipated at the time of our investigation. Should any conditions at the site be encountered which differ from those found at the test locations, we request that we be notified immediately in order to permit a reassessment of our recommendations. If changed conditions are identified during construction, no matter how minor, the recommendations in this report shall be considered invalid until sufficient review and written assessment of said conditions by Inspec-Sol is completed.

We trust that this report meets with your present requirements. Please do not hesitate to contact us should any questions arise.

Yours truly,  
INSPEC-SOL INC.



Abdul Hafeez Khan, P.Eng



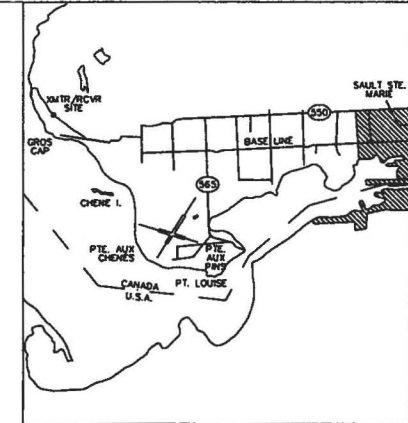
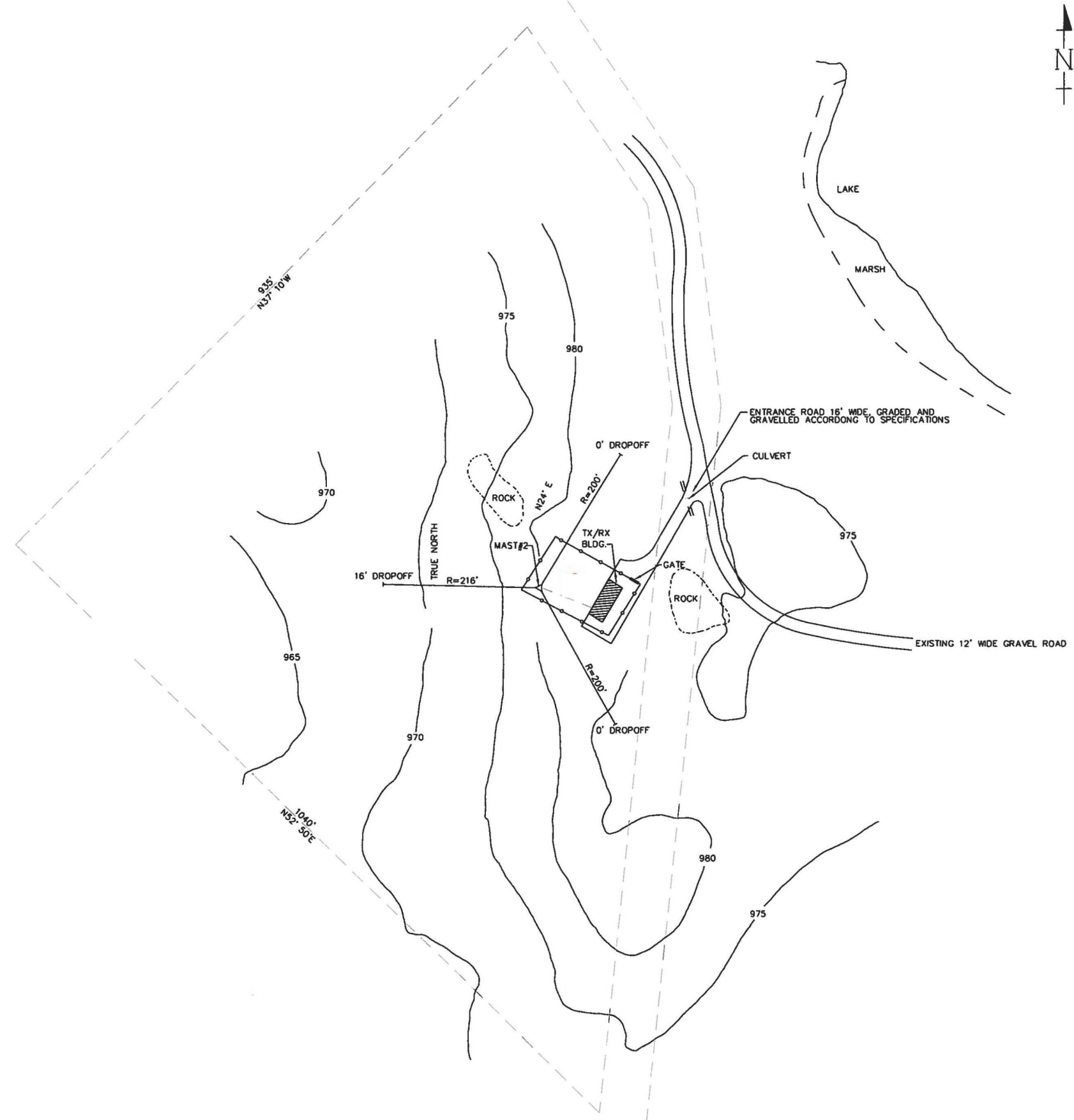
Bruce Polan, M.A.Sc., P.Eng.

**FIGURE**

I:\Technical\Drawings\Drawings\20-Gros Cap\2000\pppl.dwg, 1/2007 11:42:46 AM, SX223E\_X3545C

CM120-001-PP

T050145-A1



KEY PLAN  
SCALE = 1:120,000

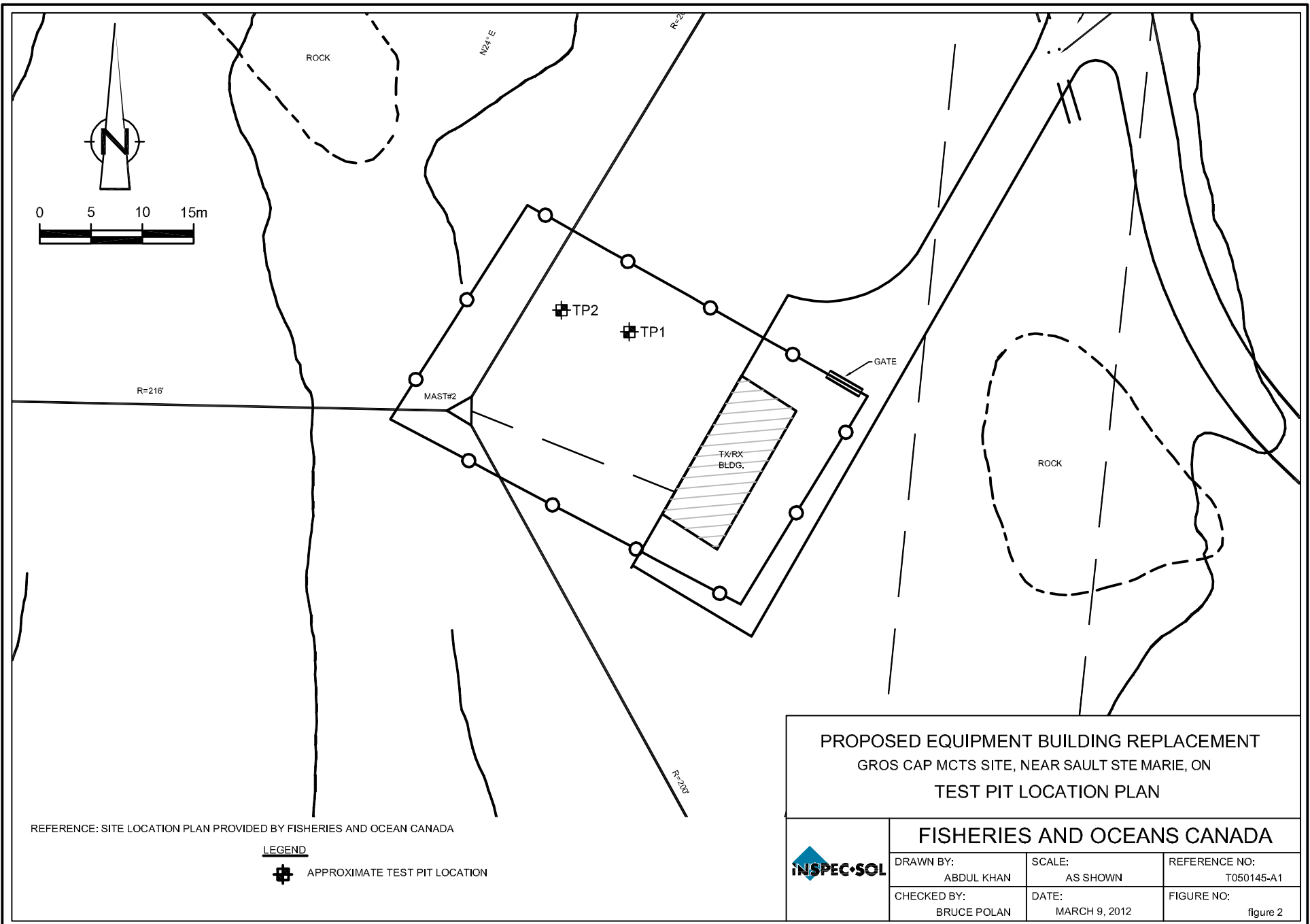
Fisheries and Oceans Canada  
 Pêches et Océans Canada  
 Coast Guard  
 Gardié Côtiers

Inclusion Diagram  
 Circuits & Information Systems  
 20' x Front St  
 8' x 10' x 10'

**NOTES:**  
 4. ALL ANTENNA & POLE GUYS 120' A PART. SEE ADVANCED TOWER LTD. DWG. #22-883.  
 5. FOR CONCRETE BASE & GUY ANCHORAGE DETAILS SEE ADVANCED TOWER LTD. INSTALLATION NOTES.  
 6. SITE IS SITUATED IN THE WEST HALF OF THE SOUTHEAST QUARTER OF SECTION THIRTY TOWNSHIP OF PRINCE, DISTRICT OF ALDAMA, PROVINCE OF ONTARIO.  
 7. ELEVATIONS ARE TRUE ELEVATIONS ABOVE SEA LEVEL.  
 8. GEOGRAPHICAL COORDINATES:  
 LATITUDE: 46° 32' 10"  
 LONGITUDE: 84° 35' 00"  
 9. ICE BRIDGE USED TO SUPPORT RF CABLES BETWEEN TX/RX BUILDINGS & MAST #2 TOWER.  
 10. NEW FENCE AROUND COMPOUND ADDED FALL OF 2006.

F. MAST 1.5 & 10' TOWER REDUCED	SR	06-18-07
E. MAST #2 REDUCED	SR	06-18-07
D. 10' x 10' MASTING ADDED	PP	06-18-07
drawing - design	by	date
<b>GROS CAP MARINE PERIPHERAL PLOT PLAN</b>		
drawn - design	date	
P. PONTICELLI	11-28-79	
checked - review	date	
LM	11-27-79	
approved - approval	date	
LM	11-27-79	
reference - reference	scale - ratio	
	1"=50'	
drawing no. - no. of sheets	sheet - total	
CM120-001-PP	1/1	

FIGURE : 1 SITE PLAN



**PROPOSED EQUIPMENT BUILDING REPLACEMENT  
GROS CAP MCTS SITE, NEAR SAULT STE MARIE, ON  
TEST PIT LOCATION PLAN**

	<b>FISHERIES AND OCEANS CANADA</b>	
	DRAWN BY: ABDUL KHAN	SCALE: AS SHOWN
CHECKED BY: BRUCE POLAN	DATE: MARCH 9, 2012	FIGURE NO: figure 2

## **APPENDIX A**

### Test Pit Stratigraphy Log



**TEST PIT STRATIGRAPHY LOG**

<b>Project Name:</b> Geotechnical Investigation - Replacement of Existing Equipment Building		<b>Test Pit Designation:</b> TP-1	
<b>Project Number:</b> T050145-A1	<b>Ground Surface Elevation (m):</b> N/M	<b>Date Started:</b> 2-Mar-12	
<b>Client:</b> Fisheries and Oceans Canada	<b>Test Pit Method:</b> Open Excavation	<b>Date Completed:</b> 2-Mar-12	
<b>Excavating Contractor:</b> Lajoie Brothers	<b>Operator:</b> Jim Lajoie	<b>Equipment:</b> CAT 307 Tracked Excavator	
<b>Location:</b> Gros Cap MCTS Site near Sault Ste Marie, Ontario		<b>Inspec-Sol Supervisor:</b> Rob Fewchuk (CRA)	

Depth		Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	Moisture Content (%)	Location: (refer to test pit location map)
From (m)	To (m)					Geologic Profile
0.00	0.75	TOPSOIL: dark brown, with sand and gravel, some roots, trace silt, moist	S-1	0.6	32	
0.75	1.20	SAND AND GRAVEL: Rust brown, coarse-grained, trace topsoil, trace roots, moist				
1.20	3.10	COARSE SAND AND GRAVEL: brown, trace silt, with cobbles and boulders, moist	S-2	1.2	15	
			S-3	1.8	4	
			S-4	2.4	6	
	3.10	End of Test Pit at 3.10 m below ground surface. Test pit dry upon completion. Excavation sides stable. Backfilled with excavation spoil pile.	S-5	3.1	7	





m - denotes "metres"

N/M - denotes "Not Measured"

**TEST PIT STRATIGRAPHY LOG**

<b>Project Name:</b> Geotechnical Investigation - Replacement of Existing Equipment Building		<b>Test Pit Designation:</b> TP-2	
<b>Project Number:</b> T050145-A1	<b>Ground Surface Elevation (m):</b> N/M	<b>Date Started:</b> 2-Mar-12	
<b>Client:</b> Fisheries and Oceans Canada	<b>Test Pit Method:</b> Open Excavation	<b>Date Completed:</b> 2-Mar-12	
<b>Excavating Contractor:</b> Lajoie Brothers	<b>Operator:</b> Jim Lajoie	<b>Equipment:</b> CAT 307 Tracked Excavator	
<b>Location:</b> Gros Cap MCTS Site near Sault Ste Marie, Ontario		<b>Inspec-Sol Supervisor:</b> Rob Fewchuk (CRA)	

Depth		Soil Symbol, Primary Component, Secondary Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Moisture Content, Supplementary Descriptors	Sample No.	Sample Interval	Moisture Content (%)	Location: (refer to test pit location map)  Geologic Profile
From (m)	To (m)					
0.00	0.60	TOPSOIL: dark brown, with sand and gravel, some roots, trace silt, moist				
0.60	1.20	encountered copper grounding wire at about 0.6 m bgs SAND AND GRAVEL: rust brown, trace topsoil, trace roots, moist	S-1	0.6	8	
1.20	2.44	COARSE SAND AND GRAVEL: brown, with cobbles and boulders, moist	S-2	1.2	13	
			S-3	1.8	7	
			S-4	2.4	7	
	2.44	End of Test Pit at 2.44 m below ground surface. Test pit dry upon completion. Excavation sides stable. The grounding wire was slightly damaged, and was replaced at its original location for later repair by DFO. Backfilled with				



m - denotes "metres"

N/M - denotes "Not Measured"

## **APPENDIX B**

### Soil Analytical Laboratory Test Results



INSPEC-SOL INC.  
ATTN: ABDUL KHAN  
651 COLBY DRIVE  
WATERLOO ON N2V 1G2

Date Received: 09-MAR-12  
Report Date: 16-MAR-12 13:14 (MT)  
Version: FINAL

Client Phone: 519-725-9328

## Certificate of Analysis

**Lab Work Order #:** L1122398  
**Project P.O. #:** NOT SUBMITTED  
**Job Reference:** T050145-A1  
**C of C Numbers:** 118109  
**Legal Site Desc:**

Wayne Smith, C.CHEM., C.E.T.  
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047  
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1122398-1 TP-2 (6 FEET BGS) Sampled By: CLIENT on 09-MAR-12 Matrix: SOIL							
<b>Physical Tests</b>							
% Moisture	6.49		0.10	%	09-MAR-12	09-MAR-12	R2335815
pH	5.91		0.10	pH units	12-MAR-12	12-MAR-12	R2336290
Redox Potential	355		-1000	mV	12-MAR-12	12-MAR-12	R2336305
Resistivity	108000		100	ohm cm	12-MAR-12	12-MAR-12	R2336302
<b>Leachable Anions &amp; Nutrients</b>							
Chloride	<20		20	mg/kg	13-MAR-12	13-MAR-12	R2337492
Sulphide	<0.20		0.20	mg/kg	14-MAR-12	14-MAR-12	R2338286
<b>Anions and Nutrients</b>							
Sulphate	<20		20	mg/kg	13-MAR-12	13-MAR-12	R2337492

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## Reference Information

**Test Method References:**

ALS Test Code	Matrix	Test Description	Method Reference**
CL-WT	Soil	Chloride in Soil	EPA 300.0
MOISTURE-WT	Soil	% Moisture	Gravimetric: Oven Dried
PH-WT	Soil	pH	MOEE E3137A
Soil samples are mixed in the deionized water and the supernatant is analyzed directly by the pH meter.			
REDOX-POTENTIAL-WT	Soil	Redox Potential	APHA 2580
RESISTIVITY-WT	Soil	Resistivity	MOEE E3137A
SO4-WT	Soil	Sulphate	EPA 300.0
SULPHIDE-WT	Soil	Sulphide	APHA 4500S2D

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

**Chain of Custody Numbers:**

118109

**GLOSSARY OF REPORT TERMS**

*Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.*

*mg/kg - milligrams per kilogram based on dry weight of sample*

*mg/kg wwt - milligrams per kilogram based on wet weight of sample*

*mg/kg lwt - milligrams per kilogram based on lipid weight of sample*

*mg/L - unit of concentration based on volume, parts per million.*

*< - Less than.*

*D.L. - The reporting limit.*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*



### Quality Control Report

Workorder: L1122398

Report Date: 16-MAR-12

Page 1 of 3

Client: INSPEC-SOL INC.  
 651 COLBY DRIVE  
 WATERLOO ON N2V 1C2

Contact: ABDUL KHAN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>CL-WT</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R2337492</b>							
<b>WG1440690-3</b>	<b>DUP</b>	<b>L1122398-1</b>						
Chloride		<20	<20	RPD-NA	mg/kg	N/A	30	13-MAR-12
<b>WG1440690-2</b>	<b>LCS</b>							
Chloride			100.3		%		70-130	13-MAR-12
<b>WG1440690-1</b>	<b>MB</b>							
Chloride			<20		mg/kg		20	13-MAR-12
<b>MOISTURE-WT</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R2335815</b>							
<b>WG1440645-3</b>	<b>DUP</b>	<b>L1122369-8</b>						
% Moisture		19.5	20.2		%	3.6	30	09-MAR-12
<b>WG1440645-2</b>	<b>LCS</b>							
% Moisture			94.9		%		70-130	09-MAR-12
<b>WG1440645-1</b>	<b>MB</b>							
% Moisture			<0.10		%		0.1	09-MAR-12
<b>PH-WT</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R2336290</b>							
<b>WG1441280-1</b>	<b>CVS</b>							
pH			99.6		%		80-120	12-MAR-12
<b>WG1440929-1</b>	<b>DUP</b>	<b>L1122398-1</b>						
pH		5.91	5.99		pH units	1.96	20	12-MAR-12
<b>REDOX-POTENTIAL-WT</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R2336305</b>							
<b>WG1440695-1</b>	<b>DUP</b>	<b>L1122398-1</b>						
Redox Potential		355	352		mV	0.85	25	12-MAR-12
<b>RESISTIVITY-WT</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R2336302</b>							
<b>WG1441264-1</b>	<b>CVS</b>							
Resistivity			101.7		%		70-130	12-MAR-12
<b>WG1441264-3</b>	<b>DUP</b>	<b>L1122492-1</b>						
Resistivity		2880	3180		ohm cm	10	25	12-MAR-12
<b>SO4-WT</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R2337492</b>							
<b>WG1440690-3</b>	<b>DUP</b>	<b>L1122398-1</b>						
Sulphate		<20	<20	RPD-NA	mg/kg	N/A	30	13-MAR-12
<b>WG1440690-2</b>	<b>LCS</b>							
Sulphate			99.1		%		60-140	13-MAR-12



### Quality Control Report

Workorder: L1122398

Report Date: 16-MAR-12

Page 2 of 3

Client: INSPEC-SOL INC.  
 651 COLBY DRIVE  
 WATERLOO ON N2V 1C2

Contact: ABDUL KHAN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>SO4-WT</b>	<b>Soil</b>							
Batch	R2337492							
<b>WG1440690-1</b>	<b>MB</b>							
Sulphate			<20		mg/kg		20	13-MAR-12
<b>SULPHIDE-WT</b>	<b>Soil</b>							
Batch	R2338286							
<b>WG1443714-1</b>	<b>CVS</b>							
Sulphide			87.8		%		50-120	14-MAR-12
<b>WG1443710-2</b>	<b>DUP</b>	<b>L1123195-2</b>						
Sulphide		<0.20	<0.20	RPD-NA	mg/kg	N/A	20	14-MAR-12
<b>WG1443710-1</b>	<b>MB</b>							
Sulphide			<0.20		mg/kg		0.2	14-MAR-12



# Quality Control Report

Workorder: L1122398

Report Date: 16-MAR-12

Client: INSPEC-SOL INC.  
651 COLBY DRIVE  
WATERLOO ON N2V 1C2  
Contact: ABDUL KHAN

Page 3 of 3

## Legend:

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Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

## Sample Parameter Qualifier Definitions:

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Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

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## Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

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The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

60 NORTHLAND ROAD, UNIT 1  
WATERLOO, ON N2V 2B8

Phone: (519) 886-6910

Fax: (519) 886-9047

Toll Free: 1-800-668-9878



CHAIN OF CUSTODY / ANALYTICAL SERVICES REQUEST FORM Page 1 of 1

Note: all TAT Quoted material is in business days which exclude statutory holidays and weekends. TAT samples received past 3:00 pm or Saturday/Sunday begin the next day.

Specify date required

Service requested

2 day TAT (50%)

5 day (regular)

Next day TAT (100%)

3-4 day (25%)

Same day TAT (200%)

COMPANY NAME Inspec-Sol

OFFICE Waterloo

PROJECT MANAGER Abdul Khan

PROJECT # T050145-A1

PHONE \_\_\_\_\_ FAX \_\_\_\_\_

ACCOUNT # \_\_\_\_\_

QUOTATION # \_\_\_\_\_ PO # \_\_\_\_\_

SAMPLING INFORMATION

Sample Date/Time \_\_\_\_\_ TYPE \_\_\_\_\_ MATRIX \_\_\_\_\_

Date (dd-mm-yy) \_\_\_\_\_ Time (24hr) (hh:mm) \_\_\_\_\_  
COMP \_\_\_\_\_ GRAB \_\_\_\_\_ WATER \_\_\_\_\_ SOIL \_\_\_\_\_ OTHER \_\_\_\_\_

Date (dd-mm-yy) --- Time (24hr) (hh:mm) ---  
COMP \_\_\_\_\_ GRAB X WATER \_\_\_\_\_ SOIL X OTHER \_\_\_\_\_

CRITERIA

Criteria on report YES \_\_\_ NO \_\_\_

Reg 153/04  Reg 511/09   
Table 1 2 3 4 5 6 7 8 9

TCLP \_\_\_\_\_ MISA \_\_\_\_\_ PWQO \_\_\_\_\_  
ODWS \_\_\_\_\_ OTHER \_\_\_\_\_

REPORT FORMAT/DISTRIBUTION

EMAIL \_\_\_\_\_ FAX \_\_\_\_\_ BOTH \_\_\_\_\_

SELECT: PDF \_\_\_\_\_ DIGITAL \_\_\_\_\_ BOTH \_\_\_\_\_

EMAIL 1 \_\_\_\_\_

EMAIL 2 \_\_\_\_\_

SAMPLE DESCRIPTION TO APPEAR ON REPORT

TP-2 (6 feet bgs)

NUMBER OF CONTAINERS

ANALYSIS REQUEST

Chloride  
Sulphate  
Sulphide  
Redox Potential  
Resistivity

PLEASE INDICATE FILTERED, PRESERVED OR BOTH  
<---- (F, P, F/P)

SUBMISSION #:  
L112358

ENTERED BY:  
RH

DATE/TIME ENTERED:  
9-MAR-12

BIN #:  
713

COMMENTS

LAB ID

1



\* L 1 1 2 2 3 9 8 - C O F C \*

SPECIAL INSTRUCTIONS/COMMENTS

THE QUESTIONS BELOW MUST BE ANSWERED FOR WATER SAMPLES ( CHECK Yes OR No )

SAMPLE CONDITION

Are any samples taken from a regulated DW System? Yes  No   
If yes, an authorized drinking water COC MUST be used for this submission.  
Is the water sampled intended to be potable for human consumption? Yes  No

FROZEN  MEAN  
COLD  TEMP  
COOLING INITIATED  19.6  
AMBIENT

SAMPLED BY: \_\_\_\_\_ DATE & TIME \_\_\_\_\_

RECEIVED BY: N. Krebs DATE & TIME 3/8/12

RECEIVED AT LAB BY: Austin Paterson DATE & TIME 09/03/12 13:37

RELINQUISHED BY: N. Krebs DATE & TIME 3/9/12

Notes

OBSERVATIONS: Yes  No   
If yes add SIF SIF INIT AP

1. Quote number must be provided to ensure proper pricing 2. TAT may vary dependent on complexity of analysis and lab workload at time of submission. 3. Any known or suspected hazards relating to a sample must be noted on the chain of custody in comments section. Please contact the lab to confirm TATs.



Fisheries and Oceans  
Canada

Pêches et Océans  
Canada

Canadian  
Coast Guard

Garde côtière  
canadienne



## APPENDIX E: SUMMARY OF SUBMITTALS

Submission Description	Section(s)	Required Date
Work Schedule	011100 – 1.4.2	10 days after award
Construction Plan	011100 – 1.4.3	10 days before site mobilization
Supplemental Material	011100 – 1.4.4	21 days after acceptance of the works
Project Specific Safety Program (Can be merged with Project Construction Plan)	013530 – 1.2.1	With Construction Plan
Environmental Protection Plan	013543 – 1.3.1	With Construction Plan
Foundation Construction Plan	033000 – 1.3.1	With Construction Plan
Grounding Construction Procedures	260527 – 1.4.2	With Construction Plan