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SOW – AID TO NAVIGATION TOWER REPLACEMENTS
CONSTRUCTION CONTRACT
FORT MALDEN RANGE TOWERS
Amherstburg, ON

MARITIME AND CIVIL INFRASTRUCTURE

Prepared by: LL

Approved by: BY

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TABLE OF CONTENTS

SECTION:	011100 GENERAL INSTRUCTIONS	3
SECTION:	013300 SUBMITTAL PROCEDURES	9
SECTION:	013530 HEALTH AND SAFETY REQUIREMENTS	10
SECTION:	013543 ENVIRONMENTAL PROCEDURES	12
SECTION:	014500 QUALITY CONTROL.....	16
SECTION:	016100 COMMON PRODUCT REQUIREMENTS	18
SECTION:	024116 DEMOLITION OF STRUCTURES.....	20
SECTION:	033000 CONCRETE WORK	23
SECTION:	133613 STEEL TOWERS	28
SECTION:	312310 EXCAVATION AND BACKFILL.....	31
APPENDIX A:	SITE LOCATION AND PHOTOGRAPHS	35
APPENDIX B:	SUMMARY OF SUBMITTALS	37
APPENDIX C:	SITE LAYOUT	39
APPENDIX D:	EXISTING DRAWINGS	41
APPENDIX E:	NEW DRAWINGS.....	43
APPENDIX F:	GEOTECHNICAL INVESTIGATION	45



SECTION: 011100 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, territorial or local application. In the case of any conflict or discrepancy, the more stringent requirements shall apply.
- .1 Meet or exceed requirements of:
 - .1 Contract documents;
 - .2 Specified standards, codes and referenced documents.

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:
 - .1 Mobilize to the sites in two phases to complete the required fieldwork;
 - .2 Remove and dispose of existing towers and their foundations;
 - .3 Install two [2] new foundations for new Aid to Navigation (ATON) towers;
 - .4 Install two [2] new ATON towers, including daymarks and other appurtenances, as per attached drawings;
 - .1 One 25ft [7.65m] self-support steel tower; and
 - .2 One 55ft [16.8m] self-support steel tower.
 - .5 Backfill and compact excavations;
 - .6 Restore the sites in their entirety; and
 - .7 Demobilize from the sites.
- .2 The following work will be undertaken by others and is hereby excluded:
 - .1 Supply of new towers;
 - .2 Supply of new day marks for installation on the new towers;
 - .3 Supply and installation of lanterns, batteries and solar panels onto new ATON towers; and
 - .4 Installation and configuration of temporary aid.



1.3 Submittals

- .1 Mandatory submittals and schedule for submission are detailed below and in Appendix B. The following identifies general requirements only. The relevant sections must be consulted for a complete listing of mandatory content.
- .2 Detailed Schedule:
 - .1 Deadline:
 - .1 No later than ten [10] working days following award.
 - .2 Deliverables:
 - .1 The contractor must furnish a high level schedule outlining the major construction milestones. Schedule must clearly define the anticipated start and finish of the project.
 - .1 The contractor must be prepared to stand down for a minimum 1 week after installation of the first tower to accommodate CCG adjustment of the temporary aid.
 - .2 See section 0111000 – 1.8 for additional scheduling requirements.
- .3 Proof of Qualifications:
 - .1 Deadline:
 - .1 No more than ten (10) working days following award.
 - .2 Deliverables:
 - .3 Contractor must furnish listing of all subcontractors within ten (10) working days following award. (Section 011100 1.4)
- .4 Construction Plan:
 - .1 Deadline:
 - .1 No less than ten [10] working days prior to beginning fieldwork.
 - .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 Project Specific Safety Program (Section 013530);
 - .2 Project Environmental Protection Plan (Section 013543);



- .3 Detailed Demolition Plan (Section 024116);
 - .4 Foundation Construction Plan (Section 033000);
 - .5 Tower Erection Plan (Section 133613); and
 - .6 Detailed Excavation Plan (Section 312310).
- .5 Mill Test Certificates
- .1 Deadline:
 - .1 Upon receipt of metal purchased.
 - .2 Deliverables:
 - .1 The contractor must furnish proof that all metal received for the project is in compliance with CSA and ASTM International standards.
- .6 As-built and QA/QC:
- .1 Deadline:
 - .1 No more than twenty eight [28] calendar days after construction.
 - .2 Deliverables:
 - .1 The following documents must be forwarded upon completion of the contract:
 - .1 Set of red-lined as-built drawings (Section 033000 & 133613);
 - .2 Drawing or sketch, for each tower, indicating the position of the constructed pier relative to the former installation, detail:
 - .1 Height of former foundation, ground level to top of foundation;
 - .2 Difference in elevation from top of former foundation to top of new foundation;
 - .3 Height of new foundation, ground level to top of foundation;
 - .4 Distance from the center of the new foundation to the center of the former foundation.
- 1.4 Contractor Qualifications
- .1 The work must be carried out under the supervision and responsibility of a sole specialized Contractor, capable of performing installations of structural towers.
 - .2 The Contractor must designate the following key project members, including any subcontractors. The project members must have completed projects of similar scope and complexity to the work



described herein.

- .1 Project Manager: Contact information for the main point of contact for the project must be provided by the contractor.
- .2 Site Forman: Contact information for the main point of contact at site must be provided by the contractor.
- .3 The contractor must provide a detailed list of all subcontractors being used to complete the work described herein.
- .4 Requests to amend the project team, following contract award, must be forwarded in writing. Coast Guard reserves the right to reject any proposal to amend the project team.

1.5 Site Location

- .1 The sites are located in the Amherstburg, Ontario area as follows:
 - .1 Fort Malden Range towers;
 - .1 Location: Sandwich St N, Amherstburg, Ontario;
 - .2 LL667 (front tower) coordinates: 42° 6'51.00"N, 83° 6'42.90"W;
 - .3 LL668 (rear tower) coordinates: 42° 6'47.20"N, 83° 6'41.50"W;
 - .4 The sites are surrounded by private properties that must be restored after construction of the towers.

1.6 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.

1.7 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 sites are accessible by standard vehicle.
 - .1 An agreement with the property owners will be in place for the duration of the project to allow the contractor and Coast Guard access to park vehicles and other equipment on the private properties surrounding the towers.
 - .2 Contractor is responsible for making any additional access/parking arrangements deemed



necessary.

1.8 Completion, Scheduling and Planning of the Works

- .1 Work may commence as early as practical following Coast Guard's acceptance and approval of mandatory submissions.
- .2 Two (2) phases of fieldwork must be scheduled by the Contractor
 - .1 Phase 1 may commence as early as practical following Coast Guard's acceptance and approval of mandatory submissions and the setup of the temporary aid by Coast Guard.
 - .1 Phase 1 fieldwork must include the demolition of the existing front tower and the installation of the new foundation and tower.
 - .2 Contractor will be expected to stand down at the end of Phase 1 for a minimum of one week. During this time, CCG staff will commission the new front tower and reposition the temporary aid.
 - .3 Phase 1 must be completed on or before July 31, 2020.
 - .3 Phase 2 fieldwork may commence as early as practical after CCG commissioning following Phase 1.
 - .1 Phase 2 fieldwork must include the demolition of the existing rear tower and foundation and the installation of the new foundation and tower.
 - .4 The choice of beginning with Phase 1 or Phase 2 shall be at the contractor's discretion. This decision must be submitted with the Construction Plan.
 - .5 Due to operational constraints, all fieldwork must be completed on or before September 30, 2020.

1.9 Coast Guard Staging Location

- .1 Items itemized as supplied by, or salvaged to Coast Guard must be collected or delivered by the Contractor to the following staging location. The Contractor will be responsible for all transportation costs between the project site and the identified staging location. Material drop off or access to stored goods outside of regular operating hours shall be at the discretion of Coast Guard and may be subject to cost recovery:
 - .1 Staging location: CCG Base – Amherstburg
370 Dalhousie Street
Amherstburg, ON, N9V 1X3.
 - .2 Advise Coast Guard at least three [3] working days prior to shipping



- .1 For Delivery, contact CCG Base Amherstburg. Contact to be provided after award
 - .2 Shipping/Receiving hours: Monday through Friday, 9:00AM to 3:00PM.
- 1.10 Temporary Facilities
- .1 Contractor must provide sanitary facilities for work force in accordance with governing regulations and ordinances.
 - .2 Arrange, pay for, and maintain temporary electrical power supply as required for construction, and 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 and Certificates
- .1 Contractor must provide authorities having jurisdiction with all information requested.
 - .2 Contractor must pay fees and obtain certificates and permits required.
 - .3 Contractor must furnish certificates and permits upon request of Coast Guard.
- 1.12 Protection of Existing Work
- .1 Care must 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 must 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.
- 1.14 Required Submissions
- .1 A summary of the minimum mandatory submissions required can be found in Appendix B. This summary is not an exhaustive list of all submissions required for the duration of the project.
 - .2 Additional submissions may be required after award.



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 For each phase of the project, work must not progress until all mandatory submittals required before the start of that phase have been received, reviewed and accepted by Coast Guard.
- .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 three [3] working days, or as stipulated in the specifications, for Coast Guard to review the submission.
- .3 The Contractor's Engineer must 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 Scope

- .1 The Contractor shall be responsible to develop, implement and enforce a safety program which addresses all elements of the work.

1.2 References

- .1 Work under this section must 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, 2015
 - .3 Ontario Occupational Health and Safety Act and Regulations, 2009
 - .4 Any and all other Provincial/Territorial Regulations and Policies; Worker's Compensation Board Policies; Local municipal regulations; pertaining to safety of the contractors workers

1.3 Submittals

- .1 Project Specific Safety Program

- .1 Deadline:

- .1 With Construction Plan

- .2 Deliverables:

- .1 Safety Program Document, include:

- .1 A listing of all activities specific to this phase of 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; and
 - .4 Material Safety Data Sheets for hazardous products to be utilized in the execution of the works.

- .2 Proof that a Notice of Project has been filed with the Ontario Ministry of Labour.



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- .3 Contractor must submit completed Field Level Hazard Assessment (FLHA) forms to CCG upon request.



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 must be undertaken in strict conformance with all listed references, In the case of any conflict or discrepancy the more stringent requirements shall apply.

- .1 Canadian General Standards Board (CGSB)
- .2 Transportation of Dangerous Goods
- .3 Canadian Council of Ministers of the Environment (CCME) Documentation
- .4 Canadian Environmental Protection Act

1.3 Submittals

- .1 Contractor must submit an Environmental Protection Plan

- .1 Deadline:

- .1 With Construction Plan

- .2 Deliverables:

- .1 Submit a plan addressing procedures to be implemented to mitigate any negative impact on the environment. Detail:

- .1 Equipment features (age, spill containment);
- .2 Staging, refueling, and cleaning areas;
- .3 Clean-up and/or containment procedures (including concrete/grout);
- .4 Waste disposal methods and sites; and
- .5 Sedimentation control measures.

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.
- .2 Stockpiled excavated materials must be skirted using filter fabric to control run-off of fines during rain and to prevent excavation of soils below stockpiles.

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 is 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 once approved to do so by Coast Guard.

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 discourage run-off.
 - .2 Water pumped from excavation must be adequately treated to ensure that water returning to the watercourse contains minimal fines. Procedures anticipated for preventing the pumping of fines must be identified in the environmental protection plan, and may include the



following:

- .1 The use of filter bags;
- .2 Straw bale check dams or silt fence;
- .3 Discharge through naturally occurring vegetation.
- .3 The means for controlling silt run-off shall be dependent on the site and the quantity of water pumped, and shall be to the discretion of the CCG site staff.
- .4 Sediment control measures must be inspected and improved/cleaned/replaced as necessary.

3.6 Pollution Control

- .1 The paint on the existing towers has been determined to be lead-based therefore care should be taken to minimize exposure of paint dust or chips to the surrounding environment.
- .2 Provide methods, means, and facilities to prevent the contamination of soil, water, and atmosphere from the discharge of pollutants produced by construction operations.
- .3 Vehicles, machinery, and equipment must be in good repair, equipped with emission controls as applicable and operated within regulatory requirements.
- .4 Abide by local noise by-laws.
- .5 Avoid unnecessary idling of vehicles or heavy machinery.
- .6 Limit use of equipment around the shoreline where possible.
- .7 Implement and maintain dust and particulate control measures in accordance with provincial requirements:
 - .1 All bulk material haul equipment must be appropriately tarped. Watertight vehicles must be used to haul wet materials
 - .8 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.
 - .9 The contractor must 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 must 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 must be maintained on site throughout the construction period and must be readily accessible at



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all times.

- .2 Any uncontrolled release of a known contaminant (spills, fire/smoke) must 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.
- .3 Provincial Authority: Ontario Spills Action Centre 1-800-268-6060.

3.7 Traffic

- .1 Minimize soil compaction by driving, parking vehicles, and walking, etc. on existing paved roadways/laneways. If soil is impacted by compaction, compensate by restoring areas with new soil, as required.
- .1 Avoid the use of heavy machinery in areas of sensitive slopes. Avoid using machinery on land during wet weather.



SECTION: 014500 QUALITY CONTROL

PART 1 - GENERAL

1.1 Inspection

- .1 Coast Guard or its representative must have access to the work at all times. If parts of the work are prepared off-site or in a shop, access must 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 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 Coast Guard will require an opportunity to take samples/inspect:
 - .1 Subgrade verification: Coast Guard will procure services of a Geotechnical Engineer to verify that ground conditions match those identified in the attached geotechnical report. Contractor must be prepared for up to one day of downtime, per site, while the investigations take place.
 - .2 Concrete forms and reinforcement installation: Contractor must make the sites available to Coast Guard after formwork and reinforcement have been put in place for verification.
 - .3 Concrete testing: Contractor must arrange for concrete testing to take place when concrete is being poured on site. The results of the tests must be shared with Coast Guard.
 - .4 Tower install and demolition: Coast Guard shall witness the erection of the new towers as well as the demolition of the existing towers.
 - .5 Final completion: Coast Guard will conduct a final inspection of the sites upon completion.

1.2 Procedures

- .1 Provide 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 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.

1.6 Acceptance of Work

- .1 Coast Guard will make acceptance visits of work executed by the Contractor at critical milestones identified in this section.
- .2 The Contractor must inform Coast Guard at least five [5] working days before these inspection visits.
- .3 All work must 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 must be responsible for all costs incurred for subsequent inspections.
- .4 Care is to be taken to minimize destruction to Crown and private property and appropriate remedies must be employed where such damage occurs at Contractor's expense.



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 must 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 Coast Guard in writing of any conflict between these specifications and manufacturer's instructions; 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 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 Coast Guard. Substitutions will be considered by 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,



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- .3 Alternative materials to those specified which are brought to the attention of and considered by Coast Guard as equivalent to the material specified will result in a credit to the Contract amount.
 - .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: 024116 DEMOLITION OF STRUCTURES

PART 1 - GENERAL

1.1 Scope of Work

- .1 Work under this section consists of the provision of all labour, materials, and equipment necessary to complete the following activities:
 - .1 Removal and disposal of existing range towers, including daymarks;
 - .1 Existing lights, solar panels and batteries must be salvaged to Coast Guard.
 - .2 Removal of existing foundations in their entirety;
 - .3 Disposal of all wastes to a licensed waste disposal facility.

1.2 References

- .1 Work under this section must 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 2015
 - .3 Ontario Occupational Health and Safety Act and Regulations, 2016
 - .4 CSA S350-[M1980(R1998)], Code of Practice for Safety in Demolition of Structures.

1.3 Submittals

- .1 Contractor is to provide a Demolition Plan.
 - .1 Deadline:
 - .1 With Construction Plan.
 - .2 Deliverables:
 - .1 Pictures of both sites before the commencement of any fieldwork;
 - .2 Method of demolition including all associated tasks and schedule;
 - .3 Methods for protecting the site from demolition debris; and
 - .4 The ultimate disposal location of all waste materials and debris.
 - .1 Include documentation detailing regulatory approval for waste disposal facility and transporter.



- .2 Work under this section must not proceed until written approval of the demolition plan has been received from the Coast Guard.
- .3 Submit copies of certified receipts from the disposal sites for all material removed from the work site upon request.

1.4 Existing Conditions

- .1 Photos of the site are provided in Appendix A.
- .2 Drawings for the existing towers are provided in Appendix D.

PART 2 - PRODUCTS

2.1 General

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

2.2 Backfill

- .1 Either 10 mm (3/4") clear crush stone (gravel) or granular B per OPSS 1001.

2.3 Topsoil

- .1 Topsoil must be fertile loam, free of roots, vegetation or other debris which would restrict the proper placement and grading of the material. Topsoil must not contain stones or clods in excess of 20 mm (1"). Topsoil must be free of any contaminant that would inhibit the growth of vegetation.

PART 3 - EXECUTION

3.1 General

- .1 Work under this section, for each phase of fieldwork, must only begin after the temporary aid has been confirmed to be operational by CCG.
- .2 Work under this section must be continuous and proceed without interruption unless otherwise approved by Coast Guard.
- .3 Towers may not be felled.
- .4 Contractor must ensure that demolition is undertaken safely. If at any period during demolition the safety of the Contractor's staff cannot be maintained, take preventative measures, stop work and immediately notify Coast Guard.
- .5 Contractor must ensure that demolition work does not adversely affect adjacent watercourses, groundwater, wildlife, properties or contribute to excess air and noise pollution.



- .6 If safety of structure being demolished appears to be endangered, take preventative measures, stop work and immediately notify Coast Guard.
- .7 At end of each day, leave work in safe and stable condition.

3.2 Protection

- .1 Pictures of the site condition must be taken by Contractor and submitted to Coast Guard before demolition can begin.
 - .1 The pictures will be used as a reference for restoration of the site post construction.
- .2 Prevent movement, settlement or damage of adjacent structures/vegetation.
- .3 Implement effective controls to catch/collect all tower debris during demolition, specifically paint.
- .4 Implement effective controls to prevent injury to workers and mariners.

3.3 Preparation

- .1 Erect warning signs and barricades as applicable.
- .2 Ensure all environmental protection/mitigation measures are in place.
- .3 Ensure all items identified for salvage have been removed and stored.

3.4 Demolition

- .1 Remove and dispose of LL667 Fort Malden Front Range tower;
- .2 Remove and dispose of LL668 Fort Malden Rear Range tower; and
- .3 Demolish existing concrete foundations in their entirety.

3.5 Backfill

- .1 Backfill to be placed in uniform lifts to a maximum depth of 200 mm (8") and compacted to 95% SPMDD.

3.6 Disposal

- .1 All material is to be disposed of off-site at a licensed disposal/recycling facility.

3.7 Restoration

- .1 The site in its entirety must be restored to an equal or greater condition after completion of construction.



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 two [2] reinforced concrete tower foundations, as per attached drawings.

1.2 References

.1 Work under this section must 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 NRCC-CNRC National Building Code of Canada 2015

.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 S269.3 Concrete Formwork

.8 ACI Specification 306 Cold Weather Concreting (if relevant)

1.3 Existing Conditions

.1 A geotechnical investigation has been completed for multiple sites in the area. The relevant sections of the report must be consulted for the sites subject to this contract. A copy of the report is included in Appendix F.

.2 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 Before commencing work under this section, the Contractor must:

.1 Establish the location of all buried services that may interfere with the execution of work; and

.2 Hire and arrange for a surveyor to conduct a field survey.

.1 The purpose will be to ensure that the new towers are installed in the correct positions and face the required direction.



- .1 Refer to site plan in Appendix C for proposed tower locations.
 - .2 It shall be the contractor's responsibility to establish markers in addition to those provided by the surveyor such that references will not be obstructed or altered by excavation or construction activities and can then be used to accurately verify the proper location of each tower.
- 1.4 Submittals
- .1 Submittals must be forwarded to Coast Guard in accordance with the provisions of Section 013300.
 - .1 Foundation Construction Plan
 - .1 Deadline:
 - .1 With Construction Plan
 - .2 Deliverables:
 - .1 Provide high level summary of mix properties and admixtures to demonstrate compliance with Coast Guard criteria and foundation design;
 - .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 hot or cold temperatures where reasonably anticipated during the construction period.
 - .2 As-built Drawings / QC Control documentation
 - .1 Deadline:
 - .1 28 calendar days following installation (Section 011100)
 - .2 Deliverables:
 - .1 The surveyor's report must be forwarded to Coast Guard for records.
 - .2 Red-lined drawings showing all changes from the sealed design drawings (if any).
 - .3 Those documents identified within the following section and any additional documents



assembled in accordance with the Contractors established quality control program.

1.5 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 must be remedied to the satisfaction of the Coast Guard, by the Contractor at their expense. Work must not progress until inspections have been completed and the Contractor has been provided with written notice to proceed with the works.
 - .1 Subgrade-verification, upon completion of the excavation and prior to the placement of formwork and reinforcement.
 - .2 Installation of formwork and falsework
 - .3 Throughout concrete placement
- .2 Coast Guard will retain the services of a Geotechnical Consultant to:
 - .1 Verify exposed subgrade
 - .3 Contractor must arrange for a third party firm to complete sampling of plastic concrete and provide the results to Coast Guard. Testing must consist of, at minimum, a test for slump, air entrainment and strength (3 cylinders: one [1] 7 day and two [2] 28 day).

PART 2 - MATERIALS

2.1 General

- .1 All material must conform to specifications referenced in CAN/CSA-A23.1-19.

2.2 Formwork

- .1 Must be in accordance with Can/CSA S269.3.

2.3 Concrete

- .1 Concrete supplier must 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 Alternatively pre-proportioned or bagged concrete to be approved by Coast Guard.
- .3 The use of calcium chloride as an admixture is not permitted

2.4 Water



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

2.5 Reinforcement

- .1 Reinforcing steel must be as mandated in CAN CSA A23.1

PART 3 - EXECUTION

3.1 General

- .1 Concrete must be placed, finished, and cured in accordance with the attached foundation drawings.
 - .1 Ensure that the top of the concrete is no less than 150 mm (6 in.) above the surrounding grade, unless otherwise approved.

3.2 Preparation

- .1 Preparation must not commence until bearing surfaces have been verified and approved by a Geotechnical Engineer.
- .2 Remove all loose and deleterious material.
- .3 Construct forms and reinforcement in accordance with the engineer's specifications.
- .4 Surfaces must be heated as necessary to account for climatic conditions at the time of the pour.

3.3 Placement

- .1 Concrete placement must not commence until formwork and reinforcement have been inspected by Coast Guard.
- .2 Contractor must 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 must 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 All exposed 90° edges must be chamfered.
- .6 Cut control joints where specified.



- .7 Contractor must provide samples as required during placement operation for the performance of quality assurance testing.
- .8 Concrete must 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 Must 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.

3.5 Grout

- .1 Supply and install load bearing grout between the top of the completed foundation and the tower bases/anchor plates.
- .2 Edges of grout must be chamfered.

3.6 Inspection

- .1 Concrete testing to CAN/CSA-A23.2 by testing laboratory must be arranged by Contractor. Concrete pours to be witnessed by Coast Guard representative.



SECTION: 133613 STEEL TOWERS

PART 1 - GENERAL

1.1 Scope of Work

.1 Work under this section includes the supply of all labor, material, and equipment required to complete the following:

.1 Install of two (2) new self-support towers including all appurtenances, as per supplied drawings. Appurtenances must include but are not necessarily limited to:

.1 Fall arrest system and anti-climb system.

.2 The following work will be undertaken by others and is hereby excluded:

.1 Supply of fall arrest system and anti-climb system.

1.2 References

.1 NRC-CNRC National Building Code of Canada.

.2 Canada Labour Code Part II – January 2008

.3 CSA S37-18 - Antenna Towers and Antenna Supporting Structures

.4 CAN/CSA-W47.1 - Certification of Companies for Fusion Welding of Steel Structures

.5 CAN/CSA W59 - Welded Steel Construction (Metal-Arc Welding)

.6 CSA Z259.2.4-15 – Fall Arresters and Vertical Rigid Rails

.7 ASTM A780 / A780M – 09(2015) - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings

.8 CAN/CSA-G164-M92 (R2003) - Hot Dip Galvanizing of Irregularly Shaped Articles

1.3 Submittals

.1 Submittals must be forwarded to Coast Guard in accordance with the provisions of section 013300.

.2 Tower Erection Plan

.1 Deadline:

.1 With Construction Plan (Section 011100)

.2 Deliverables:



- .1 A construction plan of adequate detail to clearly show Coast Guard that the work will be undertaken in a competent and safe manner. Plan must clearly demonstrate procedures and methods to be employed to:
 - .1 Place new towers on new foundations;
 - .2 Ensure structural integrity during hoisting incomplete structures;
 - .3 Monitor that Turn of Nut has been completed;
 - .4 Field remedies to address any damage to the coating system incurred during erection;
- .2 Coast Guard reserves the right to request additional documentation verifying the suitability of the proposed labour and equipment anticipated to be employed in the erection of the tower. Certification required may include:
 - .1 Hoisting equipment type, capacity and associated certification;
 - .2 Stamped drawing for erection plan.
- .3 As-built Drawings / QC Control documentation
 - .1 Deadline:
 - .1 28 calendar days following installation (Section 011100)
 - .2 Deliverables:
 - .1 Red-lined drawings showing all changes from the sealed design drawings (if any).
 - .2 Those documents identified within the following section and any additional documents assembled in accordance with the Contractors established quality control program.
- 1.4 Quality Assurance
 - .1 Coast Guards 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 must be remedied to the satisfaction of Coast Guard, by the Contractor at their expense. Work must not progress until inspections have been completed and the Contractor has been provided with written notice to proceed with the works.
 - .1 Throughout tower erection; and
 - .2 Upon completion of the work.



PART 2 - PRODUCTS

2.1 General

- .1 Structural steel must conform to CSA Standard G40.21, Grade 300W, or better. All materials used in the tower is to be new and in conformance with requirements of CSA S37-18.

2.2 Fall arrest system

- .1 Fall arrest system will be supplied with the towers.

PART 3 - EXECUTION

3.1 Handling of Material and Transportation

- .1 The towers will be stored at the staging location until such time as the Contractor is ready to transport them to the site.
- .2 The Contractor must take all necessary precautions to avoid damage to the tower members or to tower coating during transport, unloading and erection. All components or damaged members must be replaced to the satisfaction of Coast Guard at the expense of the Contractor.
- .3 It is the responsibility of the Contractor to ensure that the tower sections, particularly the joints are protected from bending and alignment damage.
- .4 Storage of materials on the site will be the responsibility of the Contractor.

3.2 Tower Installation

- .1 Upon completion of erection, the tower must be inspected for damage. Any damaged or missing items, including nuts, bolts, etc., must be replaced at the contractor's expense. The tightness of all bolts must be rechecked at this time.
- .2 Each anchor bolt must have one [1] heavy hex levelling nut below tower base and two [2] heavy hex nuts above base.
 - .1 Heavy flat washers must be placed between heavy hex nuts and tower base.
- .3 Contractor must tighten the first nut using turn of nut method associated to the length of bolt provided. The second nuts must be snug tight to lock into place the two nuts.
- .4 Non-shrink, gassing, cementitious grout must be placed between top of foundation and tower base.
 - .1 Sika M-Bed Standard or equal.



SECTION: 312310 EXCAVATION AND BACKFILL

PART 1 - GENERAL

1.1 General

- .1 Work under this section includes the supply of all labour, material and equipment required to complete the following:
 - .1 Excavating for the installation of the new tower foundations, including:
 - .1 Stripping and stockpiling of existing topsoil or granular materials to expose subgrade;
 - .2 Backfilling of the excavation, including:
 - .1 Supply of all required materials;
 - .2 Supply of imported granular materials (if necessary); and
 - .3 Placement and/or compaction of granular material.
 - .2 Disposal of excavated material (if required); and
 - .3 The restoration of all disturbed areas within the work site.

1.2 References

- .1 Work under this section must 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
 - .3 Ontario Occupational Health and Safety Act and Regulations
 - .4 CAN/CSA-A23.1-19 Concrete Materials and Methods of Concrete Construction
 - .5 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 Submittals

- .1 Submittals must be forwarded to Coast Guard in accordance with the provisions of section 013300.
- .2 Excavation Plan
 - .1 Deadline:
 - .1 With Construction Plan



.2 Deliverables:

.1 The Excavation Plan must outline the Contractor's planned excavation and backfill procedures and should detail the following.

- .1 Proposed side slopes and control measures;
- .2 Dewatering measures, if necessary;
- .3 Measures to be taken to prevent exposed soils from freezing;
- .4 Stockpile locations and methods for controlling erosion;
- .5 Backfill equipment types and procedures. Contractor must provide methods for undertaking backfill placement in cold weather, if reasonably anticipated;
- .6 Include shop drawings of any shoring or bracing required. Drawings must be stamped by a licensed professional engineer;

.2 The Excavation must also outline a plan for restoring the sites post construction.

1.4 Existing Conditions

- .1 A geotechnical investigation has been completed at this site and a copy of the report is included in Appendix F.
- .2 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 All work of this section must be witnessed by coast Guard or its representative unless permission is received in writing otherwise.

1.5 Quality Assurance

- .1 Coast Guard's minimum inspection requirements are detailed herein.
 - .2 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.
 - .3 All deficiencies in the works identified at the time of inspection must be remedied to the satisfaction of Coast Guard, at the Contractor's expense. Work must not progress until inspections have been completed and the Contractor has been provided with written notice to proceed with the works.
- .1 Subgrade verification: Coast Guard will arrange for a Geotechnical Engineer to inspect the sub-grade upon completion of any excavating where a design bearing surface is to be



achieved. The Engineer must indicate in writing that the sub-grade surface conditions are acceptable.

- .1 The Contractor must inform Coast Guard no less than five [5] working days prior to beginning any excavation and foundation installation cannot proceed without a Geotechnical Engineer's approval.

PART 2 - PRODUCTS

2.1 General

- .1 All materials described in this section must be supplied by the Contractor.
- .1 Granular materials must be as per approved design drawings.

2.2 Backfill

- .1 Backfill may consist of stockpiled native (excavated) materials and must not be frozen.
- .2 Imported materials may be either 19mm [3/4"] clear crush stone (gravel) or granular B per OPSS 1001

2.3 Topsoil

- .1 Topsoil must be fertile loam, free of roots, vegetation or other debris which would restrict the proper placement and grading of the material. Topsoil must not contain stones or clods in excess of 20 mm (1"). Topsoil must be free of any contaminant that would inhibit the growth of vegetation.

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.
- .2 Install any features required to protect existing infrastructure.

3.2 Excavation

- .1 Strip topsoil over areas impacted by new construction and stockpile materials on-site;
- .2 Side slopes must be maintained around the perimeter of the excavation in accordance with provincial legislation;
- .3 Take all reasonable precautions to minimize the disturbance of the existing vegetation;
- .4 Install measures as detailed in Construction Plan to prevent excavation from freezing.



3.3 Backfill

- .1 Ensure that surrounding soil is unfrozen or take measures to thaw frozen materials;
- .2 Backfill to be placed in uniform lifts to a maximum depth of 200 mm (8 in) and compacted to 95% SPMDD.

3.4 Restoration

- .1 Restore all disturbed areas within work sites and along haul routes. Fill and grade all ruts. Ensure positive drainage away from completed and existing foundations.
- .2 Excavated materials shall be used given the following priority:
 - .1 Backfill around new foundation;
 - .2 Removed from site.



APPENDIX A: SITE LOCATION AND PHOTOGRAPHS

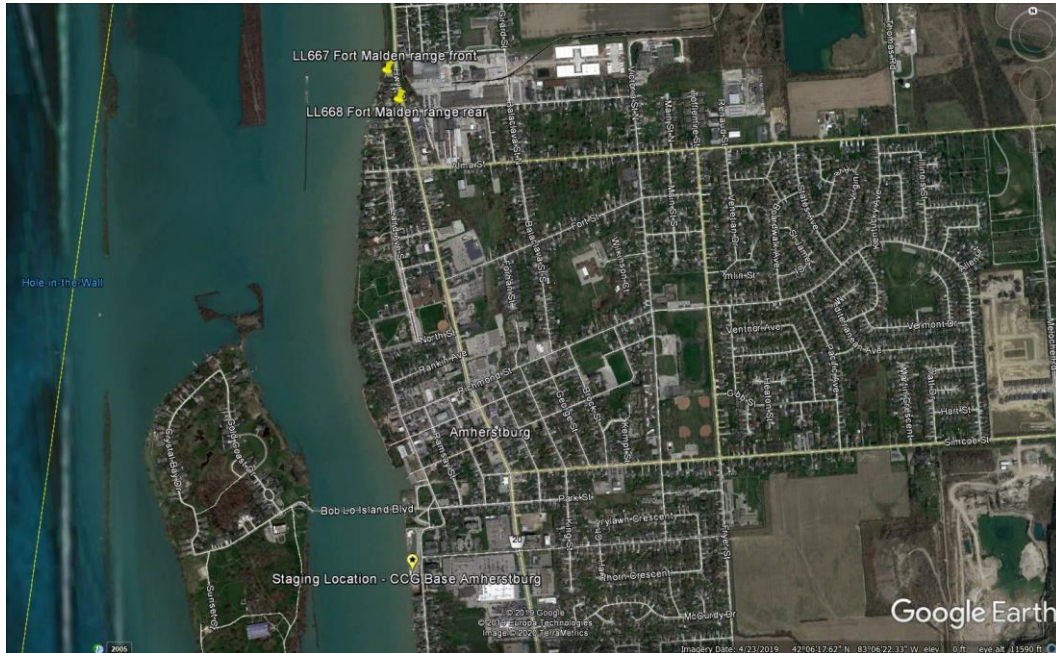


Figure 1: Overview – Project Sites
Amherstburg, ON

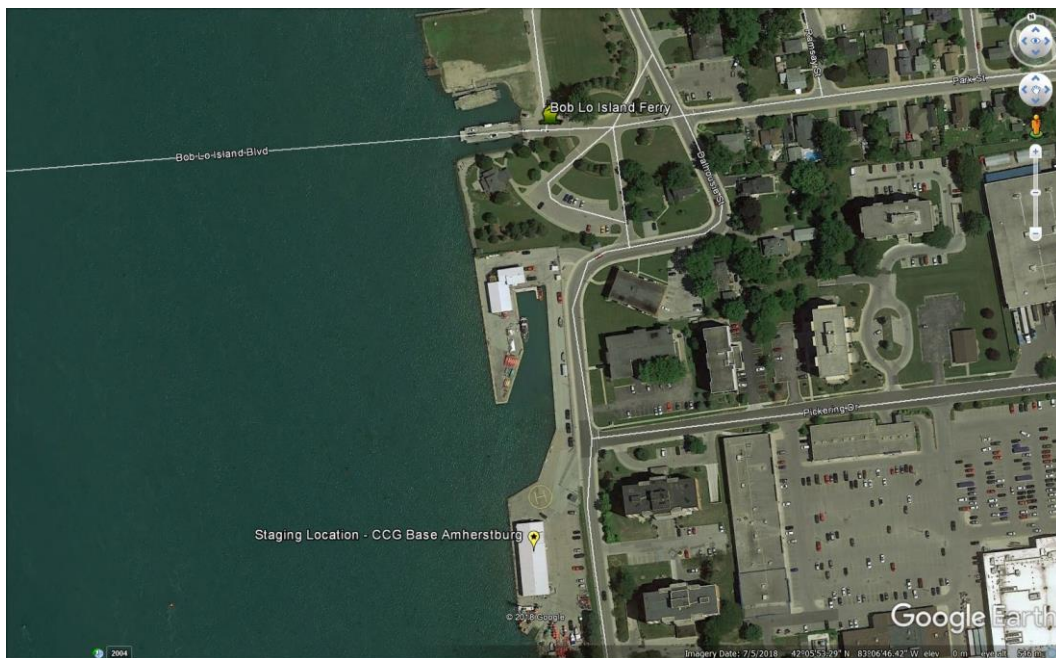


Figure 2: Staging Location
CCG Base Amherstburg



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Figure 3: Fort Malden Range Towers



Figure 4: LL667 (front tower)
Coordinates: 42° 6'51.00"N, 83° 6'42.90"W

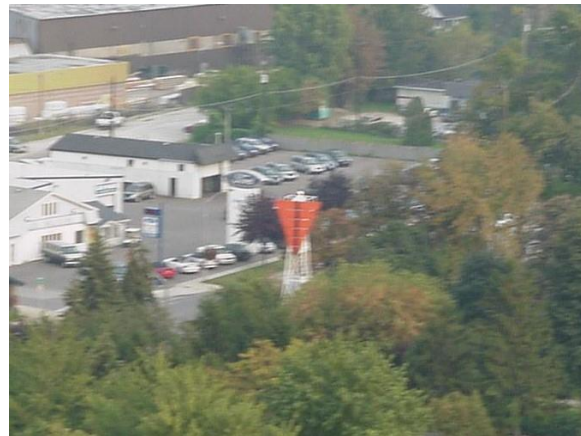


Figure 5: LL668 (rear tower)
Coordinates: 42° 6'47.20"N, 83° 6'41.50"W



APPENDIX B: SUMMARY OF SUBMITTALS

Following Contract Award

Deadline	Submission Description	Section(s)
10 working days following award	Detailed schedule	011100 – 1.3.2
	List of all subcontractors	011100 – 1.4.2.3
10 working days prior to beginning fabrication	Construction Plan	
	a) Project Specific Safety Program	013530 – 1.3.1
	b) Project Environmental Protection Plan	013543 – 1.3.1
	c) Detailed Demolition Plan	024116 – 1.3.1
	d) Foundation Construction Plan	033000 – 1.4.1.1
	e) Tower Erection Plan	133613 – 1.3.2
	f) Excavation Plan	312310 – 1.3.2
28 calendar days after construction	As-built and QA/QC documents	033000 & 133613
	Surveyor's Report	033000 – 1.4.1.2.2.1
Upon Coast Guard request	Mill Test Certificates	011100 – 1.3.5
	Product specifications and/or samples	016100 – 1.5
	Copies of certified receipts from the disposal sites	024116 – 1.3.3
	Completed Field Level Hazard Assessment forms	013530 – 1.3.1.2.3



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APPENDIX C: SITE LAYOUT



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APPENDIX D: EXISTING DRAWINGS



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APPENDIX E: NEW DRAWINGS



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APPENDIX F: GEOTECHNICAL INVESTIGATION