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SOW – TOWER REPLACEMENT

LL840 Meaford Breakwater

Meaford, ON

MARITIME AND CIVIL INFRASTRUCTURE

Prepared by: SG

Approved by: BY

Revision: 0

File: EWTM-8010-0840000

Rev Date: April 12, 2016



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SECTION: 011000 GENERAL

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.
- .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 Design a suitable foundation for the construction of the tower based on provided breakwater drawings and tower loadings.
 - .2 Mobilize to site;
 - .3 Demolish and remove existing tower and concrete base;
 - .4 Construct new foundation;
 - .5 Erect CCG (Canadian Coast Guard) supplied tower on this foundation;
 - .6 Commission CCG supplied lighting equipment;
 - .7 Restore all disturbed areas.
- .2 The following work will be undertaken by others and is hereby excluded:
 - .1 Supply of tower by CCG;
 - .2 Supply of lantern by CCG.

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.
 - .1 Detailed Schedule:
 - .1 Deadline: five (5) working days following award



.2 Deliverables: A project construction schedule identifying the project start date, the various stages of the project and the project completion date.

.2 Design Package:

.1 Deadline: twenty (20) working days following award

.2 Deliverables: Drawings stamped and signed by a qualified Professional Engineer registered in the Province of Ontario. Drawings to conform to all requirements outlined in Section 033000

.3 Construction Plan

.1 Deadline: Ten (10) working days prior to mobilization.

.2 Deliverables: 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 work in a competent, safe, and professional manner, in accordance with all required legislations. The construction plan shall include the following:

.1 Project specific safety program (Section 013530);

.2 Project environmental protection program (Section 013543);

.3 Proof of required vessel registration (Section 011000);

.4 Detailed demolition plan (Section 024116);

.5 Foundation construction plan (Section 033000);

.4 Quality Assurance

.1 Deadline: Thirty (30) calendar days following acceptance of the works

.2 Deliverables: Proof that the works have been completed as stated. This shall include the following:

.1 Waste disposal receipts (Section 024116);

.2 Concrete test results (033000);

.3 As-built drawings (033000).

1.4 Bidder Qualifications

.1 The work shall be carried out under the supervision and responsibility of a sole specialized Contractor.

.2 The Contractor shall demonstrate experience in the installation of aid to navigation structures or telecommunication structures.



- .1 Provide one (1) current reference, complete with appropriate contact information. This is for reference only and will not be evaluated with the bid.
- .3 The Contractor shall designate the following key project members ten (5) working days following award. The project members shall have completed projects of similar scope and complexity to the work described herein.
 - .1 Project Manager: The project manager shall have overall responsibility for the project completion and shall be the primary contact throughout the duration of the contract.
 - .2 Contractor's Engineer: The Contractor's Engineer shall be responsible for overseeing/stamping the work itemized below and must verify compliance with the contract specifications and all applicable codes.
 - .3 Requests to amend the project team, prior to mobilization, 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 location of the site is as follows:
 - .1 Lat./Long.: 44°36'43"N, 80°35'19"W
 - .2 The closest settlement is Meaford, ON.

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 site.

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 Site is accessible by water and by a small link to the mainland. The site is located on the end of a breakwater, in the community of Meaford, ON.
- .3 The Contractor is responsible for sourcing appropriate marine access to support all construction work. Contractors are also responsible for ensuring that all the requirements of Appendix D: Marine Access Requirements are met.
 - .1 Contractor shall provide proof of registration in the construction plan submittal.

1.8 Scheduling and Planning of the Works

- .1 Site work may commence immediately after contract award. Due to the climactic restrictions in working at this site during the winter, an appropriate schedule should be considered.
- .2 Foundation design shall occur as soon as possible following award.



- .3 The construction phase of the work must be clearly identified in the schedule. Outage time (the duration between the start of demolition and the completion of construction) must be minimized as much as reasonable. This phase of the work must be coordinated with CCG project authority in order to file appropriate notice to mariners.

1.9 Coast Guard Delivery Depot

- .1 Items required to be supplied by, or, salvaged to Coast Guard shall be collected or delivered by the Contractor to the following delivery depot. The Contractor shall be responsible for all transportation costs between the project site and the identified delivery depot.

- .1 Depot: CCG Base Parry Sound, 28 Waubeek Street, Parry Sound, ON, P2A 1B9

- .1 Approximate Distance to Site: 200 km

- .2 Advise Coast Guard as least three (3) working days prior to pick-up/delivery.

- .1 For Delivery or Pickup, contact Morley MacDonald, (705) 746-2196 Ext 214. Shipping/Receiving hours Monday through Friday are 9:00AM to 3:00PM.

1.10 Temporary Facilities

- .1 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, 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 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.

1.13 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. Additional submissions may be required after award.



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PART 2 - PRODUCTS

1.2 Not Used

PART 3 - EXECUTION

1.3 Not Used



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 submitted documents or samples have been reviewed 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 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 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 Scope

- .1 The Contractor shall be responsible to develop, implement and enforce a safety program which addresses all elements of the work.
- .1 Due to the specific requirements of the project the Contractor is required to include the following as minimum mandatory requirements of their submitted safety program.
 - .1 All persons working within the tower footprint shall be "Qualified" as defined in CAN-CSA S37-01

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
 - .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.



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- .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.

- .1 Canadian Environmental Protection Act

1.3 Related Sections

- .1 Not used.

1.4 Submittals

- .1 Contractor shall submit and 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;

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 shall be skirted using filter fabric to control run-off of fines during rain.

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 discourage run-off.
 - .2 Water pumped from excavation shall be adequately treated to ensure that water returning to the watercourse contains minimal fines. Procedures anticipated for preventing the pumping of fines shall 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 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.
 - .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.



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- .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 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. For this specific contract, being a design-build, the bidder is responsible for making the following verifications:
 - .1 Subgrade verification: CCG shall approve of bearing surface prior to pour.
 - .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. This will include the commissioning of the lantern equipment.

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 three (3) 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: 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 Demolition of the existing steel tower and steel clad concrete foundation;
 - .2 Disposal of all waste at a licensed waste disposal facility;
 - .3 Salvage of the existing navigational aid lantern and associated equipment (battery, solar panel etc.);
 - .4 Salvage existing day mark.

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
 - .2 Ontario Occupational Health and Safety Act and Regulations
 - .3 NRC-CNRC National Building Code of Canada
 - .4 CSA S350-[M1980(R1998)], Code of Practice for Safety in Demolition of Structures.

1.3 Submittals

- .1 Contractor is to provide demolition plan with the submitted construction plan (ref Section 011100). The submitted plan shall detail:
 - .1 Method of demolition including all associated tasks;
 - .2 Procedures to be implemented to protect adjacent waterway from waste materials resulting from demolition;
 - .3 The ultimate disposal location of all waste materials and debris.
 - .1 Include documentation detailing regulatory approval for waste disposal facility and transporter.
 - .4 Work under this section shall not proceed until written approval of the demolition plan has been received from the Coast Guard.
- .2 Submit copies of certified receipts from the disposal sites for all material removed from the work site upon request.



1.4 Existing Conditions

- .1 Contractor must ensure the existing climbing facilities are dismantled and demolished in a safe manner.
- .1 Photos of the existing tower are included in Appendix A.
- .2 The following are to be salvaged and transported by the Contractor to the identified Coast Guard Staging Area
 - .1 Existing navigational aid lantern system:
 - .1 Lantern, solar panel(s), and battery(s).
 - .2 Existing navigational daymark.

PART 2 - PRODUCTS

- 2.1 Not used.

PART 3 - EXECUTION

3.1 General

- .1 Work under this section shall be continuous and proceed without interruption unless otherwise approved by Coast Guard.

3.2 Protection

- .1 Prevent movement, settlement or damage of adjacent structures/vegetation.
- .2 Implement effective controls to catch/collect all tower debris during demolition, specifically paint
- .3 Implement effective controls to prevent injury to workers, mariners, motorists, and pedestrians.

3.3 Preparation

- .1 Erect warning signs and barricades.
- .2 Ensure all environmental protection/mitigation measures are in place.
- .3 Ensure facilities have been de-energized.

3.4 Demolition

- .1 Demolish existing steel structure including concrete foundations in its entirety.
- .2 Ensure that demolition does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.



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- .3 Ensure 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.

3.5 Disposal

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

3.6 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 design of the foundation. This design, although it has been included in this section (033000 Concrete Work), need not be constructed using reinforced concrete foundation. Alternate designs will be considered.
- .2 Work of this section includes the supply of all labour, material, and equipment, necessary to complete the installation of the tower foundation.

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
 - .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-G30.18 Billet Steel Bars for Concrete Reinforcement
 - .7 CAN/CSA S269.3 Concrete Formwork

1.3 System Description

- .1 The foundation system shall be suitable to adequately support the tower loads as detailed in Appendix C: Drawings. The foundation system shall also adequately resist environmental loads such as ice and/or erosion.
 - .1 Foundation loads for the tower are provided in the appended drawings
- .2 CCG staff will be required to access this aid in order to service the light. Staff will access by land. Design of foundation shall consider the requirement to access the tower.
- .3 Foundation location is critical as this is an aid to navigation. The new foundation should be installed as close as possible to the current location and preferably in the exact same location.

1.4 Performance Requirements

- .1 The foundation shall be designed to perform as would be reasonably expected for a life of 50 years.



1.5 Submittals

- .1 Submittals shall be forwarded to Coast Guard in accordance with the provisions of section 013530.
 - .1 Foundation Design Package
 - .1 Deadline: 20 working days following award.
 - .2 Deliverables: Foundation design package shall include drawing(s) showing plan and section views of the foundation.
 - .3 Drawing shall be sealed by an engineer licensed to practice in the province of Ontario
 - .2 Foundation Construction Plan:
 - .1 Deadline: Furnish with Construction Plan
 - .2 Deliverables:
 - .1 Provide high level summary of mix properties and admixtures to demonstrate compliance with Coast Guard Criteria and completed 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.
 - .3 As-built Submittal Package:
 - .1 Deadline: 30 days after acceptance of completed works
 - .2 Deliverables:
 - .1 As-built drawings
 - .2 Concrete test results

1.6 Quality Assurance

- .1 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 Formwork

- .1 Shall be in accordance with CAN CSA S269.3.

2.2 Concrete

- .1 Concrete shall possess the minimum characteristic detailed below, and as detailed in the submitted foundation design
 - .1 Plastic state,
 - .1 Plastic characteristics of the supplied mix may be modified when it is clearly demonstrated that any such amendment will have no detrimental impact on the hardened properties, long term durability or visual appearance of the cured mix.
 - .2 Hardened state
 - .1 Class of exposure: F-1
 - .2 Air Entrainment: Category 1
 - .3 Compressive strength: as determined by the engineer
 - .4 Creep and shrinkage to minimized as practical
 - .2 Use of pre-mixed products is not permitted.

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 in the submitted foundation design.
- .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

PART 3 - EXECUTION

3.1 General

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



3.2 Design Requirements

.1 Foundations

- .1 The Contractor's Engineer must design a suitable load bearing foundation for the new tower in consideration of provided drawings of the design of the breakwater. See appendix C
- .2 A foundation design based on "normal" soil conditions is unacceptable
- .3 Design shall account for CCG's need to access the site, and to climb up onto the tower.
- .4 Design shall account for loads as provided and any other loads that could be reasonably anticipated to affect the foundation. All loads shall be identified on the finalized drawings.
- .5 The drawings shall be signed and sealed by an engineer licensed to practice in the province of Ontario.
- .6 Design must anticipate settling and ensure the tower remains plumb for the duration of its life.
- .7 The drawings shall include references to all applicable standards. This being a design for a federal agency, the Canada labour code and National building code (most recent editions) shall be included.
- .8 The design shall clearly indicate in the notes all loads considered in the design of the structure.

3.3 Preparation

- .1 Preparation shall not commence until bearing surfaces have been inspected a Coast Guard representative.
- .2 Remove all loose and deleterious material
- .3 Place reinforcement in accordance with engineer's specifications.

3.4 Placement

- .1 Contractor shall place, finish and cure concrete as per CAN CSA A23.1 making all adjustment necessary to account for climatic conditions anticipated during the curing period.
- .2 Concrete shall be placed in one continuous pour.
 - .1 The development of cold joints must be previously approved in writing.
- .3 Finish exposed concrete surfaces to provide a lightly brushed non-skid surface, unless otherwise specified in the submitted foundation design.
- .4 Cut control joints where specified.
- .5 Contractor shall provide samples as required during placement operation for the performance of quality assurance testing.



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3.5 Curing

- .1 Shall be undertaken in accordance with CAN CSA A23.1.



SECTION: 133613 METAL TOWERS

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 Collect and transport of the new CCG supplied tower and the new CCG supplied lantern equipment to site.
 - .2 Installation of the tower onto the new foundation;
 - .3 Installation of the self-contained lantern.
- .2 Work of this section excludes:
 - .1 Fabrication of the tower to be complete by CCG;
 - .2 Supply of the self-contained lantern.

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
 - .2 Ontario Occupational Health and Safety Act and Regulations.
 - .3 NRC-CNRC National Building Code of Canada.
 - .4 CSA S37-01 - Antenna Towers and Antenna Supporting Structures
 - .5 CAN/CSA G164 - Hot Dip Galvanizing of Irregularly Shaped Articles
 - .6 CAN/CSA S16.1 - Limit States Design of Steel Structures
 - .7 CAN/CSA W47.1 - Certification of Companies for Fusion Welding of Steel Structures
 - .8 CAN/CSA W59 - Welded Steel Construction (Metal-Arc Welding)
 - .9 ANSI-ASC A14.3 -Ladders - Fixed - Safety Requirements

1.3 Related Sections

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



1.4 Submittals

- .1 No submittals are required under this section

PART 2 - PRODUCTS

2.1 Materials

.1 Coatings

.1 Galvanizing:

- .1 The tower as provided by CCG will be hot dip galvanized per CAN/CSA S16.1, and CSA-G164.

.2 Miscellaneous Materials

.1 Fall Arrest System

- .1 The tower will be supplied with a DBI SALA LAD-SAF flexible cable system. Fall arrest loading as required under the Canada Labour Code has been factored into the tower loading as provided in the drawings.

.3 Base grout:

.1 Non shrink, gassing, cementitious grout.

- .1 Sika M-Bed Standard, or equal.

PART 3 - EXECUTION

3.1 Erection

- .1 The CCG supplied tower shall be placed upon four (4) leveling nuts.
- .2 Tower shall be bolted down using double nuts on each of the four (4) anchor bolts
- .3 Once tower is adequately secured upon the leveling nuts, the underside of the tower baseplate shall be set in a continuous bed of grout. This can be either dry-packed or poured.
- .4 Contractor shall ensure that the tower is plumb.
- .5 A self-contained lantern (battery, solar panel, and light) will be pre-programmed and supplied by CCG staff. The contractor will be responsible for bolting this lantern to the top of the tower and to confirm proper operation.



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 of tower base foundation, including:
 - .1 Stripping and stockpiling of existing material
 - .2 Preparation of the bearing surface for concrete placement
 - .3 Backfill of material
 - .2 Work of this section excludes:
 - .1 Installation of foundation (see Section 033000 Concrete Work)

1.2 References

- .1 Work under this section shall be undertaken in strict conformance with all listed references, In the case of conflicts or discrepancies, 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 Any and all other Provincial/Territorial Regulations and Policies; Worker's Compensation
 - .5 Board Policies; Local municipal regulations; pertaining to work of this section.

1.3 Related Sections

- .1 Section 013543, Environmental Procedures
- .2 Section 033000, Concrete Work
- .3 Section 133613, Metal Towers

1.4 Submittals

- .1 Submittals shall be forwarded to Coast Guard in accordance with the provisions of section 013530.
- .2 Construction procedures



- .1 Deadline: with Construction Plan.
- .2 Deliverables:
 - .1 Written Plan: Excavation and backfill procedures detail:
 - .1 Proposed means for excavation of the breakwater
 - .2 Stockpile locations and any methods for preserving the integrity of the breakwater
 - .3 Method for replacing material

1.5 Existing conditions

- .1 Drawings of the breakwater have been provided in Appendix C. Labeled as, D 1/4
- .2 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.

1.6 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 three (3) 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 Bearing surfaces prior to placement of any concrete or the foundation.
 - .2 Work of this section shall be undertaken in the presence of Coast Guard or its designated representative.

PART 2 - PRODUCTS

2.1 General

- .1 All products used shall be supplied by the contractor and must maintain the visual appearance of the breakwater.

PART 3 - EXECUTION

3.1 Site Preparation

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

3.2 Excavation

- .1 Remove any material needed to install the new foundation. Stockpile materials on site.



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.2 Ensure that there is a suitable bearing surface for the installation of the foundation.

3.3 Backfill

.1 Replace disturbed material to restore the appearance and structure of the breakwater.



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APPENDIX A: SITE LOCATION AND PHOTOGRAPHS

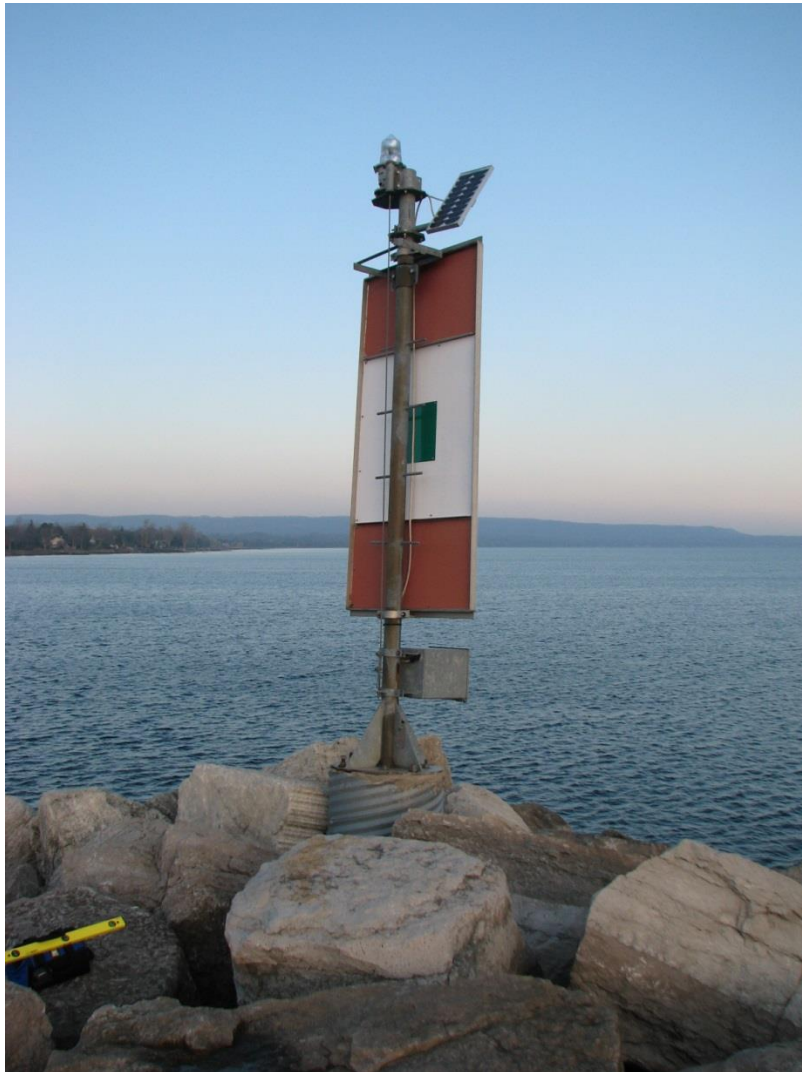


Figure 1: Existing AtoN Tower



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Figure 2: Existing Foundation



Figure 3: Location of Tower on Breakwater

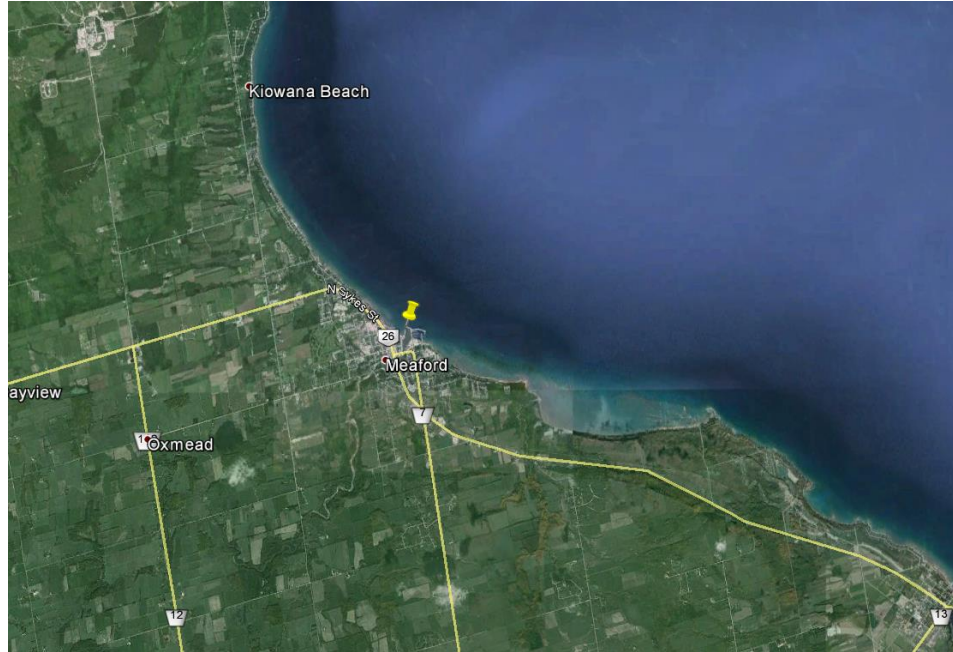


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Figures 3 and 4: Project Site Location – Meaford, ON

Lat/Long: 44°36'43"N, 80°35'19"W



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APPENDIX B – SUMMARY OF SUBMITTALS

Following Contract Award	
Submission Description	Section(s)
Deadline: 5 working days following award	
Project construction schedule Listing of key project members	<i>Ref: 011100</i>
Deadline: 20 working days following award	
Foundation Design Package	<i>Ref: 033000</i>
Deadline: 10 working days prior to mobilization	
Construction Plan – Final Submission	
a) Project specific safety plan	<i>Ref: 013530</i>
b) Project specific environmental protection plan	<i>013543</i>
c) Detailed demolition plan	<i>011000</i>
d) Proof of vessel registration	<i>024116</i>
e) Foundation construction plan	<i>033000</i>
Deadline: 30 calendar days following acceptance of the works	
Waste disposal receipts	<i>024116</i>
As-built drawings	<i>033000</i>
Concrete test results	<i>033000</i>



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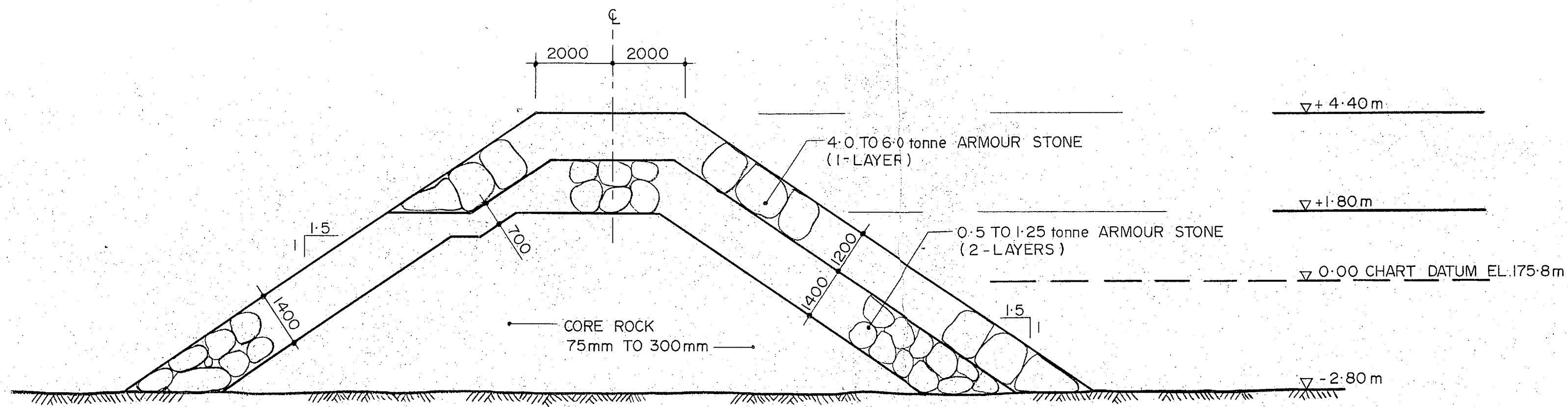
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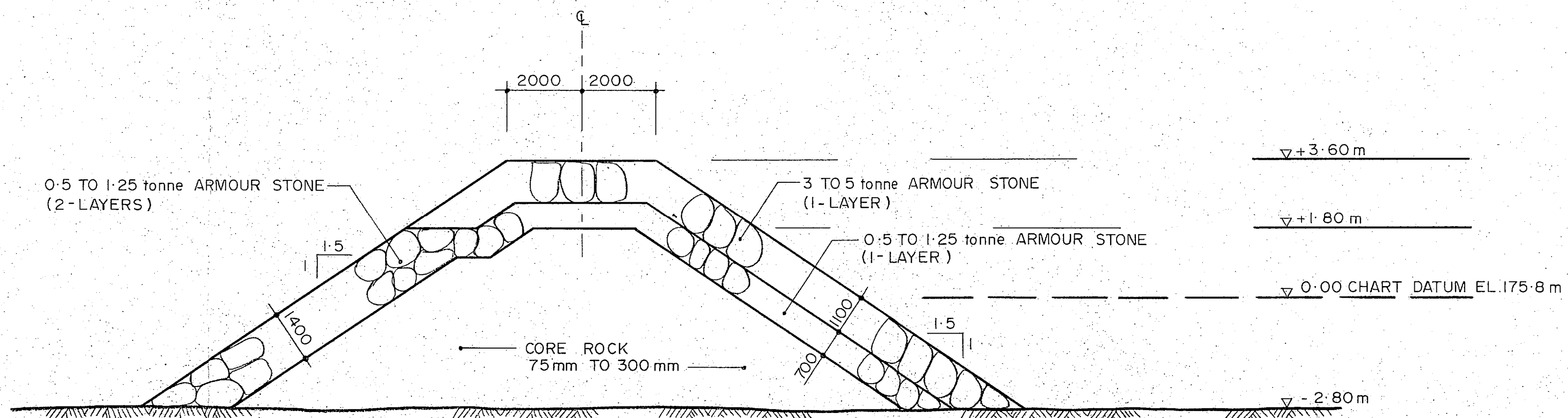
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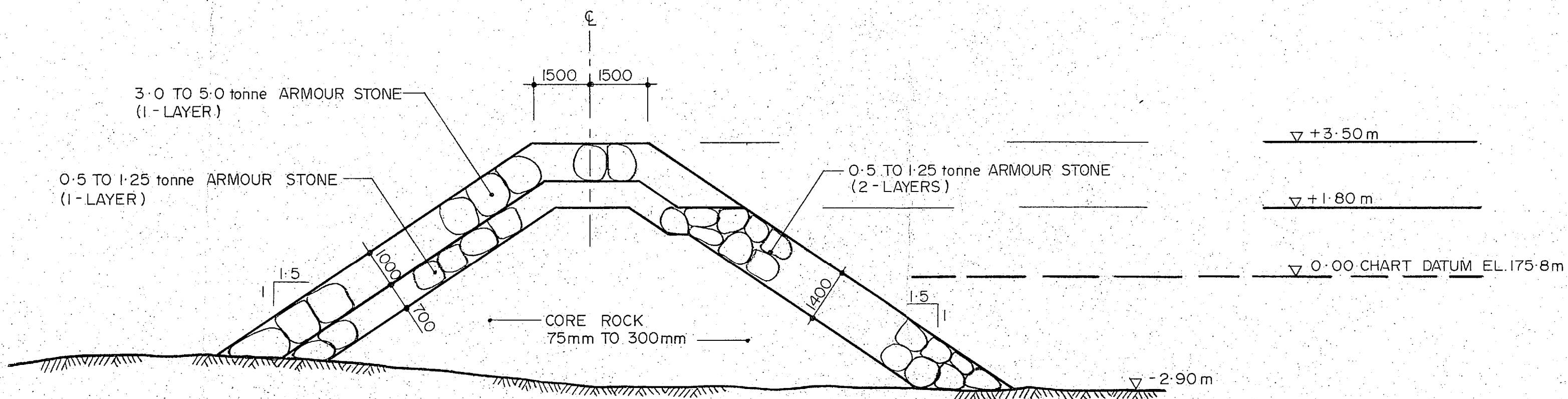
APPENDIX C – DRAWINGS



D
SECTION SCALE - 1:100



E
SECTION SCALE - 1:100



F
SECTION SCALE - 1:100

revisions _____ date _____

NOT FOR CONSTRUCTION

A detail no. / no. du détail
B drawing no. - where detail required / dessin no. - où détail exigé
C drawing no. - where detailed / dessin no. - où détaillé

project title / titre du projet
MEAFORD ONTARIO

BREAKWATER

drawing title / titre du dessin

SECTIONS

designed by / conçu par **R. RICHARDS**

drawn by / dessiné par **A. J. H.**

reviewed by / examiné par

approved by / approuvé par

project date / date du projet **1987-08-10**

project no. / no. du projet **627216**

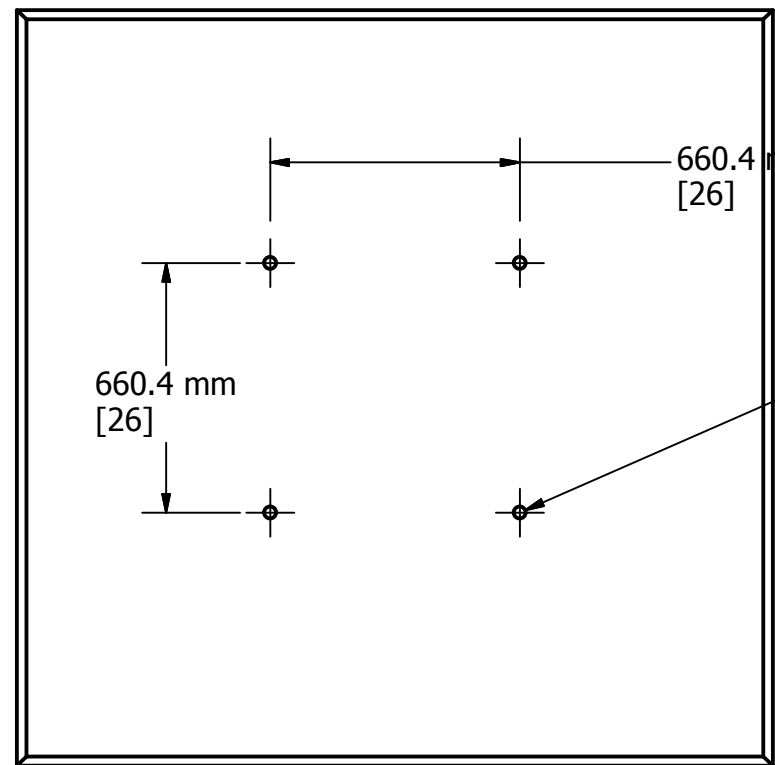
drawing no. / dessin no. **MT - 4.**

4

3

2

1



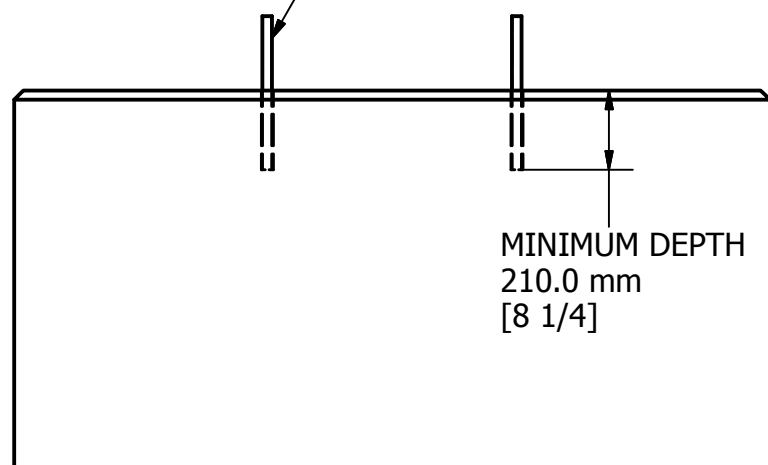
660.4 mm [26]

660.4 mm [26]

DRILL 4 HOLES
Ø31.8 mm
[1 1/4]
FOR ANCHOR RODS

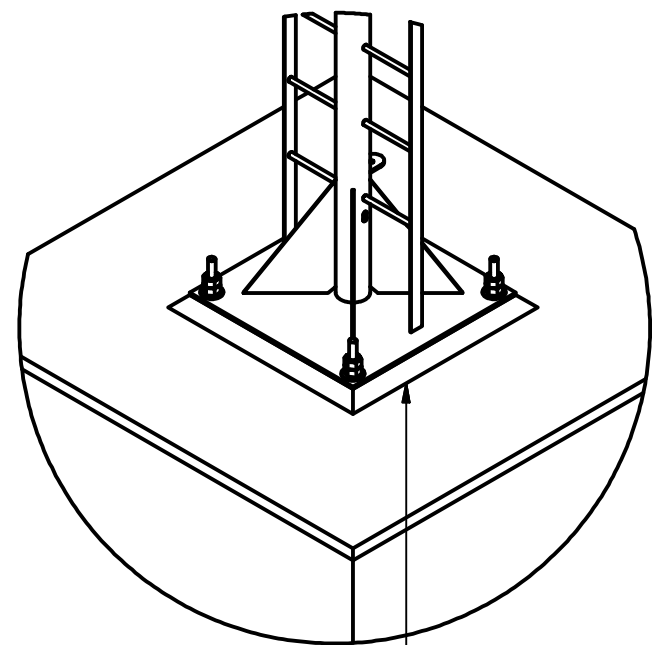
TYP EXISTING CONCRETE BASE

INSTALL ANCHOR RODS IN DRILLED HOLES
USING HILTI HIT-HY-150 ADHESIVE OR EQUAL



MINIMUM DEPTH
210.0 mm
[8 1/4]

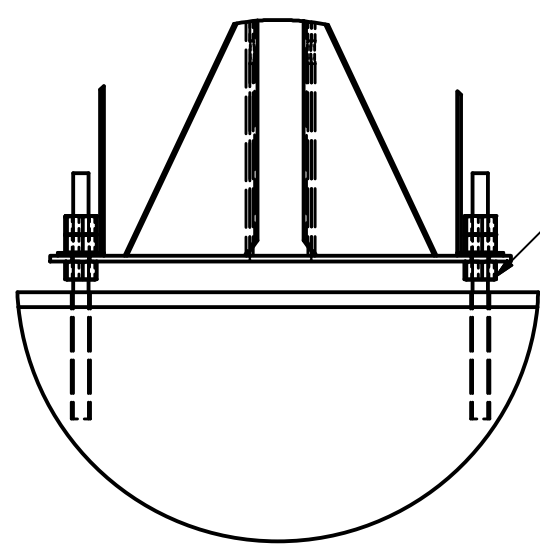
NOTE: IF DEPTH OF 210 MM CANNOT BE OBTAINED NOTIFY THE CCG



NOTE: ENSURE TOWER IS PLUMB
BEFORE APPLYING GROUT

NOTE: IF RODS ARE CUT AFTER INSTALL
SPRAY APPLY COLD GALVANIZE

INSTALL GROUT (SIKA M-BED STANDARD OR EQUAL)
BETWEEN TOWER BASE AND PIER
EITHER DRY-PACK OR FLOWABLE METHOD
MAY BE USED. FULL CONTACT WITH UNDERSIDE
OF THE PIER MUST BE OBTAINED



USE LEVELING NUTS
TO LEVEL THE TOWER

HARDWARE:
4 RODS - HAS-R 316 SS 1"X16"
4 WASHERS - 1" F436; COME IN
PACKAGE WITH ANCHOR RODS
4 LEVELING NUTS - COME IN
PACKAGE WITH ANCHOR RODS
8 NUTS - 1"-8 A194 GALVANIZED
HEAVY HEX NUT

ALL PIECES MUST BE GALVANIZED
TO ASTM A153

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 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

PIPEMAST INSTALL REFERENCE SHEET

FILE No.		SCALE:	DWG No.	
Rv.	DATE	DESCRIPTION	DRAWN	APP'D
0	5 APR 13	DRAWING INITIATED	E.G.	B.Y.

4

3

2

1

4

3

2

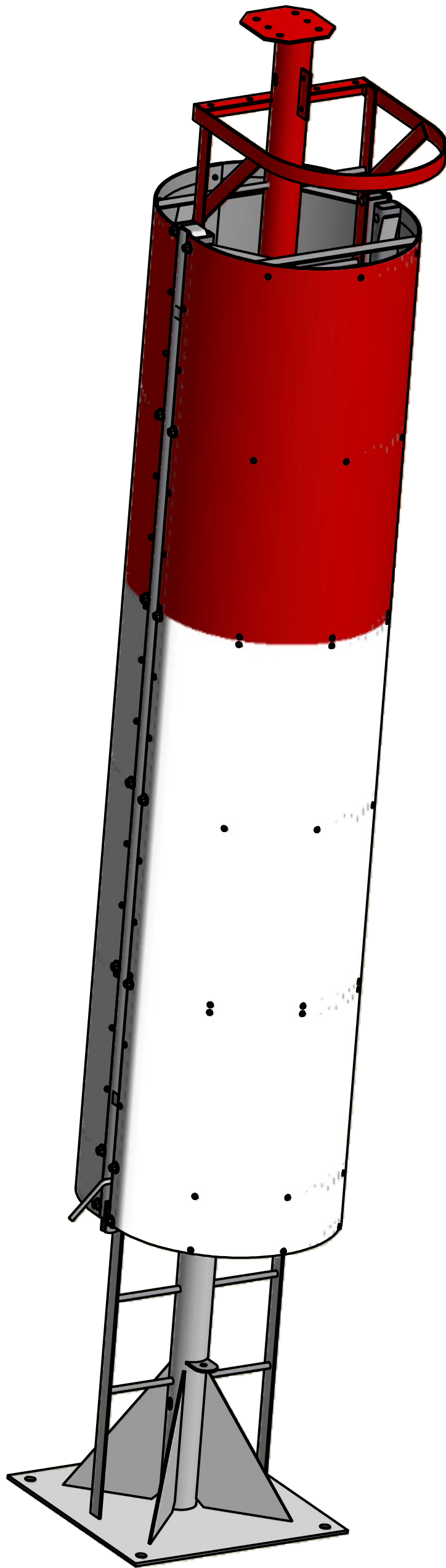
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B

B

A

A



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Canadian Coast Guard Centre de Recherche et de Développement	Garde côtière canadienne Direction du Centre et de l'Est
Architecture and Construction Infrastructure	Integrated Technical Services Outcomes

16 FT PIPEMAST ANTI-CLIMB

FILE No.		EWTM 8010-6-1	SCALE:	N.T.S.	DWG No.	
Rv.	DATE	DESCRIPTION	DRAWN	APP'D		
0	29 FEB 12	DRAWING INITIATED	A.J.E.	A.W.W.		
1	23 MAR 12	FOR PRODUCTION	A.J.E.	A.W.W.		
2	27 JUN 12	SHEET THICKNESS REDUCED	M.H.	B.Y.		
3	04 JAN 13	P1 MODIFIED AND S2 CREATED	M.H.	B.Y.		
4	11 JAN 13	FINAL DRAWING COMPLETED	E.J.G.	B.Y.		

4

3

2

1

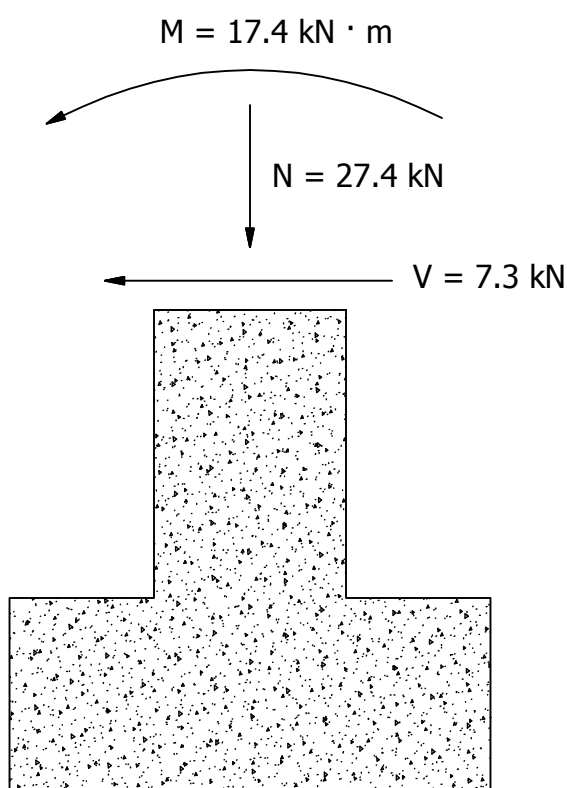
4

3

2

1

PARTS LIST				
PART NO.	QTY	PART	DESCRIPTION	DRAWING NO.
A1	1	DOOR OF ANTI-CLIMB	SEE ASSEMBLY	3
A2	1	BACK OF ANTI-CLIMB	SEE ASSEMBLY	4
S1	2	RIBBING SKELETON SUB-ASSEMBLY	SEE SUB-ASSEMBLY	5
S2	10	RIBBING SUB-ASSEMBLY	SEE SUB-ASSEMBLY	6
S3	2	TOP RIBBING SUB-ASSEMBLY	SEE SUB-ASSEMBLY	7
S4	2	BOTTOM RIBBING SUB-ASSEMBLY	SEE SUB-ASSEMBLY	8
S5	1	LATCH SUB-ASSEMBLY	6 X 57mm[1/4 X 2 1/4in] FLAT BAR	9
P1	4	MALE HINGE	SEE PART	10
P2	4	FEMALE HINGE	SEE PART	11
P3	14	STANDARD RIB BRACING	6 X 51mm[1/4 X 2in] FLAT BAR	12
P4	8	DIAGONAL RIB BRACING	6 X 51mm[1/4 X 2in] FLAT BAR	12
P5	2	SECONDARY RIB BRACING	6 X 51mm[1/4 X 2in] FLAT BAR	12
P6	14	RIB	6 X 51mm[1/4 X 2in] FLAT BAR	13
P7	1	LATCH HOOK	SEE PART	14
P8	1	HANDLE	16mm[5/8in] ROUND BAR	15
P9	2	SHEETING	6 X 1254 X 1245mm[1/8 X 49 3/8 X 49in] SHEET - RED	16
P10	2	SHEETING	6 X 1254 X 1219mm[1/8 X 49 3/8 X 48in] SHEET - WHITE	16
P11	2	SHEETING	6 X 1254 X 813mm[1/8 X 49 3/8 X 32in] SHEET - WHITE	16
P12	1	DOOR REST	6 X 51mm[1/4 X 2in] FLAT BAR	17
P13	2	HSS VERT	129in LONG 6 X 51 X 76mm[1/4 X 2 X 3in] RECTANGULAR TUBE	18
P14	2	HSS VERT WITH HOLE	129in LONG 6 X 51 X 76mm[1/4 X 2 X 3in] RECTANGULAR TUBE	19
P15	1	RUBBER STOPPER	SEE PART	20
P16	2	SQUARE STOPPER	SEE PART	21
P17	2	TALL RIB REINFORCEMENT	6 X 51mm[1/4 X 2in] FLAT BAR	22



16' PIPEMAST FOUNDATION LOADS

STRUCTURAL NOTES:

- WIND PRESSURE OF 600Pa WAS USED IN CALCULATING FACTORED LOAD COMBINATIONS. ICE THICKNESS OF 50mm WAS USED IN CALCULATING LOADING PER S37-01, ICE CLASS IV. ALL LOADS WERE FACTORED PER NBCC 2010
- ALUMINUM ALLOYS SHALL CONFORM TO THE 'ALUMINUM ASSOCIATION' PUBLICATION 'ALUMINUM STANDARD AND DATA' AND HAVE A MINIMUM YIELD STRENGTH OF 240 MPa, GRADE 6061-T6.
- ALL STRUCTURAL MEMBERS SHOWN ARE NEW.
- METAL AND ARC WELDING SHALL CONFORM TO CSA W59.2 AND IS TO BE UNDERTAKEN TO CSA W47.2 DIVISION 1, 2.1, OR 2.2.
- ENSURE THAT STRUCTURAL COMPONENTS AND WELDS ARE NOT OVER STRESSED DURING CONSTRUCTION.
- FASTENERS SHALL BE GALVANIZED STEEL BOLTS A325 OR GREATER.
- LARGE B/W/N REFERS TO A BOLT WASHER AND NUT ASSEMBLY CONSISTING OF 18-8 STAINLESS STEEL 1/2" X 4" ROUND HEAD CARRIAGE BOLT, 1/2" SMALL OD FLAT WASHER (1 1/4" OD) AND 1/2" NYLON INSERT LOCK NUT
- SMALL B/W/N # 1 REFERS TO A BOLT WASHER AND NUT ASSEMBLY CONSISTING OF 18-8 STAINLESS STEEL 3/8" X 1" HEX CAP SCREW, 3/8" SMALL OD FLAT WASHER (1" OD) AND 3/8" NYLON INSERT LOCK NUT
- SMALL B/W/N # 2 REFERS TO A BOLT WASHER AND NUT ASSEMBLY CONSISTING OF 18-8 STAINLESS STEEL 3/8" X 3/4" HEX CAP SCREW, 3/8" SMALL OD FLAT WASHER (1" OD) AND 3/8" NYLON INSERT LOCK NUT
- UNLISTED BOLTS ARE 18-8 STAINLESS STEEL WITH NYLON INSERT LOCK NUTS
- DRAWINGS NOT TO SCALE.

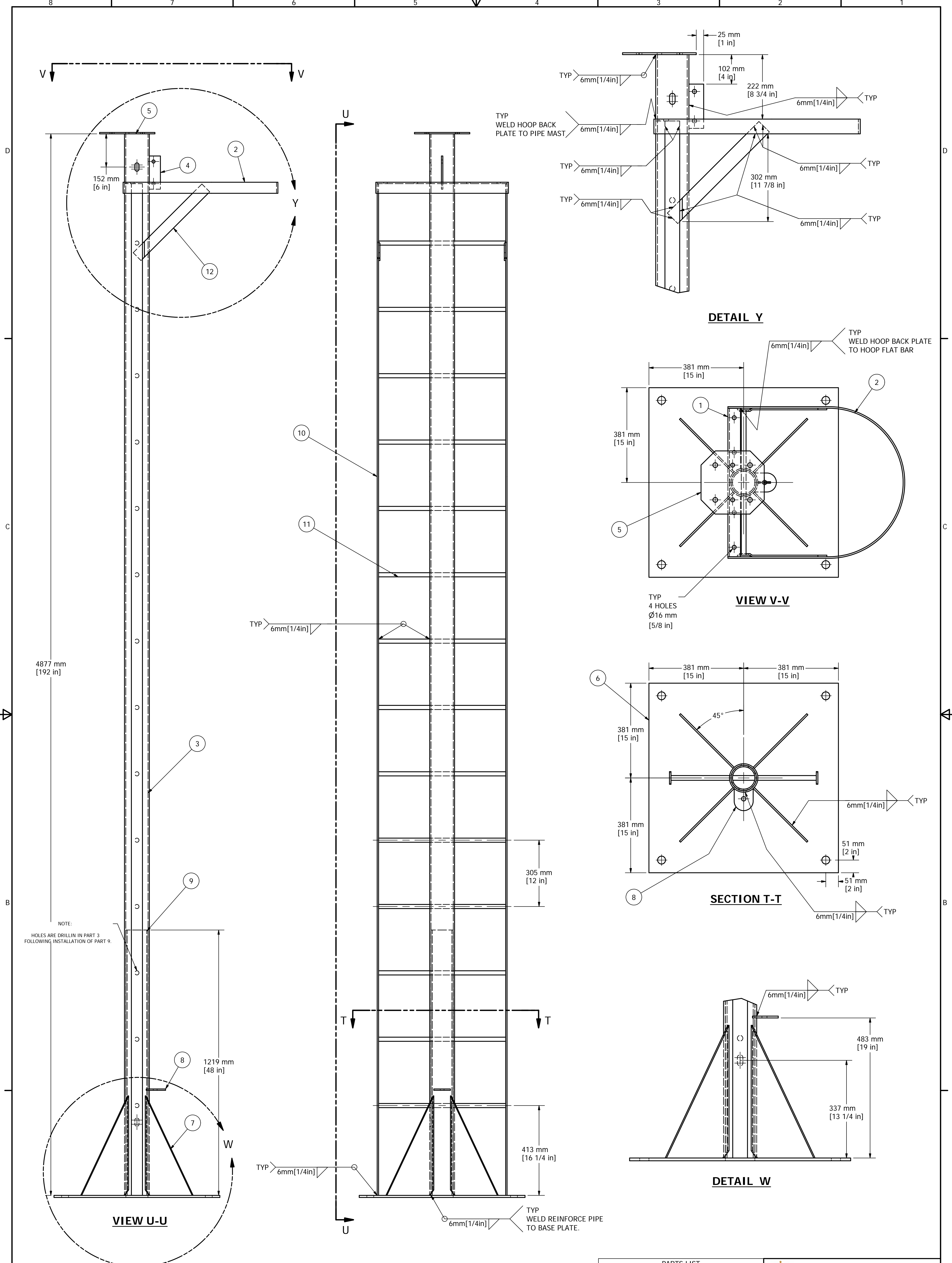
 is: eries and ceans Canada Canadian Coast Guard Centra arctic e: ion artile and Cl in rastructure out it: amia		é: es et céans Canada Garde côtière canadienne é: ion du centre et de rti: ue C: é: nte: rated ec: nica: er: ices		
16 FT PIPEMAST ANTI-CLIMB				
FILE No.	EWTM 8010-6-1	SCALE:	N.T.S.	
		DWG No.	0	
Rv.	DATE	DESCRIPTION	DRAWN	APP'D
0	29 FEB 12	DRAWING INITIATED	A.J.E.	A.W.W.
1	23 MAR 12	FOR PRODUCTION	A.J.E.	A.W.W.
2	27 JUN 12	SHEET THICKNESS REDUCED	M.H.	B.Y.
3	04 JAN 13	P1 MODIFIED AND S2 CREATED	M.H.	B.Y.
4	11 JAN 13	FINAL DRAWING COMPLETED	E.J.G.	B.Y.

4

3

2

1



STRUCTURAL NOTES:

1. STEEL DESIGN, FABRICATION, AND ERECTION: CAN/CSA-S16.1 AND CSA-S136, UNLESS OTHERWISE NOTED.
2. ALL STRUCTURAL MEMBERS SHOWN ARE NEW.
3. ALL STRUCTURAL STEEL IS TO BE NEW AND CONFORM TO: CSA G40.21M, GRADE 350W, UNLESS OTHERWISE NOTED.
5. WELDED STEEL CONSTRUCTION (METAL AND ARC WELDING) SHALL CONFORM TO CSA W59-M AND IS TO BE UNDERTAKEN BY A FABRICATOR CERTIFIED TO CSA STANDARD W47.1 FOR DIVISION 1 OR 2.1.
6. STEEL FABRICATOR IS RESPONSIBLE TO ENSURE THAT STRUCTURAL COMPONENTS AND WELDS ARE NOT OVER STRESSED DURING FABRICATION AND CONSTRUCTION.
7. HOT DIP GALVANIZING SHALL CONFORM TO CAN/CSA-G164.
8. DO NOT SCALE DRAWINGS.
9. ANCHORAGE BY OTHERS.

PARTS LIST		
ITEM	QTY	PART
1	1	Hoop Back Plate
2	1	Hoop Flat Bar 1
3	1	Pipe Mast 16'
4	1	Fall Arrest Bracket
5	1	Cap Plate
6	1	Base Plate
7	4	Gusset Plate
8	1	Fall Arrest Tension Bracket
9	1	Reinforce Pipe
10	2	Side Rails 16'
11	14	RungLong
12	2	Hoop Support Flat Bar

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16 ft PIPE MAST FABRICATION DETAILS				
FILE No.	EWTM-8010-6	SCALE:	DWG No. 1 of 5	
Rv.	DATE	DESCRIPTION	DRAWN	APP'D
0	03 MAR 12	DRAWING INITIATED	R.C.S.	R.C.S.
1	13 JAN 12	FOR PRODUCTION	A.J.E.	A.W.W.
2	13 MAR 12	PRODUCTION WITH LIMITATIONS	A.J.E.	A.W.W.
3	19 APR 12	ADDITION OF 16/20 PMST - REDLINES	A.J.E.	A.W.W.



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APPENDIX D – MARINE ACCESS REQUIREMENTS

.1 Marine Access

- .1 Vessel(s) employed in the performance of the contract shall be certified as required by the Canada Shipping Act 2001 and its applicable regulations including Marine Personnel Regulation.
 - .1 The bidder shall ensure that the vessel(s) proposed for the work meets all requirements of the Canada Shipping Act 2001 and the applicable Regulations under the Canada Shipping Act.
 - .2 Bidders shall provide copies of the following documentation to facilitate evaluation and award:
 - .1 Proof of vessel registration as a commercial vessel in accordance with the Canada Shipping Act 2001. Either one of two registrations will be accepted:
 - .1 Proof of commercial vessel registration in the Small Vessel Register (SVR) if less than 15 Gross Tons or;
 - .2 Proof of commercial vessel registration in the Canadian Register of Vessels (CRV) if more than 15 Gross Tons.
 - .3 NOTE: Pleasure Craft and Fishing Vessels are not acceptable for the performance of this work – it must be a commercially registered vessel.
 - .2 Where the vessel is registered in the SVR the bidder shall also provide the following:
 - .1 Copy of vessel certification and any limitations the vessel is operating under. Where the vessel is restricted, the operator shall ensure that the vessel can be used to safely perform the work in this specification;
 - .2 Copy of inspection according to the Small Vessel Compliance Program; Bidder shall submit proof of enrolment in the compliance program and;
 - .3 Either a copy of the initial inspection report or the most recent copy of an annual inspection report and;
 - .4 Copy of the crew certification that will be operating the vessel. Crewing and certification of crew shall be in accordance with the Marine Personnel Regulations, latest edition.
 - .3 Where the vessel is registered in the CRV the bidder shall also provide the following:
 - .1 Copy of the latest Annual Inspection Certificate endorsement and;

- .2 Copy of any restrictions that the vessel is operating under and the general sailing limitations of the vessel. Where the vessel is restricted, the operator shall ensure that the vessel can be used to safely perform the work in this specification;
 - .3 Copies of the crew certification that will be operating the vessel. Crewing and certification of crew shall be in accordance with the Marine Personnel Regulations, latest edition.
- .2 Vessels and crew found to be in contravention of the act will not be permitted to be engaged in any elements of the works identified herein. In the event that a vessel or crew is found non compliant a suitable replacement vessel and/or crew will be retained by the Contractor at their sole expense.