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Lake Nipissing – Multi-Site Project

Tower & Foundation Installations

MARITIME AND CIVIL INFRASTRUCTURE

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SECTION: 011100 GENERAL INSTRUCTIONS

PART 1 - GENERAL

1.1 Minimum Standards

- .1 Perform work in accordance with National Building Code of Canada (NBCC) 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 the provision of all labour, materials, and equipment required to:
 - .1 Mobilize to site with a work barge of appropriate size and certification;
 - .2 Install six [6] new aid to navigation (AtoN) foundations;
 - .3 Install two [2] new CCG supplied AtoN towers [8.2m & 4.9m];
 - .4 Reinstall one [1] existing CCG AtoN pipe mast tower [4.9m] onto a new foundation;
 - .5 Install three [3] new CCG supplied AtoN day beacon masts [2m] onto new foundation;
 - .6 Demolish and dispose of six [6] existing foundations;
 - .7 Return the existing five [5] AtoN towers c/w all lighting and signage equipment to CCG's Parry Sound base; and,
 - .8 Demobilize.
- .2 The following work will be undertaken by others and is hereby excluded:
 - .1 Supply of two [2] new AtoN towers;
 - .2 Supply of three [3] new AtoN day beacon masts;
 - .3 Design of foundations.

1.3 Submittals

- .1 Mandatory submittals and schedule for submission are detailed below and in Appendix B2. 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 shall furnish a high level schedule outlining the major construction milestones. Schedule shall clearly define the anticipated start and finish of the project.
- .3 Proof of Qualifications:
 - .1 Deadline:
 - .1 No later than ten [10] working days following award.
 - .2 Deliverables:
 - .1 Contractor shall furnish proof of vessel registration (Section 011100 – 1.7.3.1);
 - .2 The contractor shall provide a detailed list of all subcontractors being used to complete the work described herein (Section 011100 – 1.4).
- .4 Construction Plan:
 - .1 Deadline:
 - .1 No less than ten [10] working days prior to mobilization
 - .2 Deliverables:
 - .1 A Construction Plan of sufficient detail to demonstrate that the Contractor has considered all the challenges of the project and is prepared to undertake the works in a competent and professional manner in accordance with all legislation, including:
 - .1 Project specific safety program (Section 013530);
 - .2 Project environmental protection plan (Section 013543);
 - .3 Detailed demolition plan (Section 024116); and,
 - .4 Detailed construction plan (Section 033000 and Section 031500).
- .5 As-built and QA/QC:
 - .1 Deadline:
 - .1 No more than twenty-eight [28] calendar days after construction.
 - .2 Deliverables:
 - .1 The following documents shall be forwarded upon completion of the contract:



- .1 Set of red-lined as-built drawings; and,
- .2 Concrete test results (Section 033000 – 1.4.4).

1.4 Contractor Qualifications

- .1 The work shall be carried out under the supervision and responsibility of a sole specialized Contractor with experience in the construction of similar offshore structures by barge.
- .2 The Contractor shall designate a project manager or main point of contact for the contract.
- .3 The Contractor may retain subcontractors in accordance with their needs provided such subcontractors meet the requirements indicated below:
 - .1 Marine access provider and plant must comply with the requirements indicated in Appendix B4, Marine Access Requirements.
 - .2 Concrete shall be supplied by a Ready Mix Facility accredited by Ready Mixed Concrete Association of Ontario (RMCAO).

1.5 Site Location

- .1 The sites are located in Lake Nipissing (see Appendix B1 for map screenshots and photographs of the sites). The closest city is West Nipissing. The closest major city is North Bay.
- .2 Below is the list of sites:
 - .1 LL1436 Wigwam Point
 - .1 Coordinates: 46°14'35.00"N 79°56'58.50"W
 - .2 LL1437 Hay Rock
 - .1 Coordinates: 46°15'10.00"N 80°03'05.00"W
 - .3 LL1438 Hardwood Islands
 - .1 Coordinates: 46°16'50.00"N 80°01'40.50"W
 - .4 LL5440.003 DB-KA6
 - .1 Coordinates: 46°16'33.00"N 79°26'57.00"W
 - .5 LL5461 DB-C4 Burnt Island
 - .1 Coordinates: 46°13'3.78"N 79°53'39.00"W
 - .6 LL5463 DB-DA4 Dokis
 - .1 Coordinates: 46° 9'10.38"N 80° 1'48.18"W

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.
- .3 Photographs of the existing sites are included in Appendix B1.

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 water. The sites are located in Lake Nipissing.
- .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 B4 – Marine Access Requirements are met.
 - .1 Contractor shall provide proof of vessel registration in the 'proof of qualifications' submittal.

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 Work shall be completed no later than December 4th, 2020, unless otherwise negotiated and approved in writing.

1.9 Coast Guard Staging Location

- .1 Items itemized as supplied by, or salvaged to Coast Guard shall be collected or delivered by the Contractor to the following staging location. The Contractor shall be responsible for all transportation costs between the project site and the identified staging location. Material drop off



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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 – Parry Sound, 28 Waubeek St, Parry Sound, ON P2A 1B9.
- .2 Advise Coast Guard at least three [3] working days prior to pick-up/delivery
 - .1 For Delivery or Pickup, contact Technical Authority (identified upon approval)
 - .2 Shipping/Receiving hours: Monday through Friday, 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.



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.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 B2. This summary is not an exhaustive list of all submissions required for the duration of the project. Additional submissions may be required after award.

PART 2 - PRODUCTS

2.1 Not Used

PART 3 - EXECUTION

3.1 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.



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 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 - September 2019;
 - .2 NRC-CNRC National Building Code of Canada 2015;
 - .3 Ontario Occupational Health and Safety Act and Regulations, 2019; and,
 - .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 list of all activities specific to the project and their Health & Safety risks or hazards.
 - .2 Detailed descriptions of how the activities are to be carried out as well as methods for mitigating hazards and risks.
 - .3 A listing of personnel responsible for health and safety measures, and Emergency procedures.
 - .4 Material Safety Data Sheets for hazardous products to be utilized in the execution of the works.



SECTION: 013543 ENVIRONMENTAL PROCEDURES

PART 1 - GENERAL

1.1 Scope of Work

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

1.2 References

- .1 Work under this section shall be undertaken in strict conformance with all listed references, In the case of any conflict or discrepancy the more stringent requirements shall apply.

- .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;
- .5 De-watering plan.

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.
- .2 Prior to clearing or grubbing, inspect the target area for evidence of animal habitats and bird nests.
 - .1 If found, inform the project authority of the location of the dwelling or nest, and continue work without clearing or grubbing, if possible.
 - .2 If found, and if work is not possible without clearing vegetation, stop work and notify the project authority. The project authority will provide direction for mitigating the risk to the surrounding environment

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 covered. 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



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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 Canadian Coast Guard or its representative shall have access to the work at all times. If parts of the work are prepared off-site or in a shop, access shall be given to such work throughout the duration of the project.
- .2 In the event the work must be submitted to special testing, inspection or approvals prescribed by Canadian Coast Guard in these specifications or provided for in work-site regulations, the request for inspection must be made without unreasonable delay.
- .3 The below list identifies key milestones where the Canadian Coast Guard will require an opportunity to take samples/inspect:
 - .1 Location verification: CCG will confirm correct location for installation upon arrival of the barge at site. The contractor shall be required to provide access to the site at all times to CCG site staff.
 - .2 Foundation: CCG will witness rock drilling, foundation reinforcement (prior to concrete pour), concrete testing and concrete pour.
 - .3 Installation of tower: CCG shall witness the erection of the AtoN tower.

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 - 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 transportation of two [2] towers with all lighting equipment from the two [2] locations (LL1436 Wigwam Point and LL1437 Hay Rock) identified in 011100 1.5.2 to CCG's Parry Sound base;
 - .2 Demolition and disposal at a licensed waste disposal facility of six [6] existing reinforced concrete piers (See Appendix B1) located at the following locations:
 - .1 LL1436 Wigwam Point
 - .2 LL1437 Hay Rock
 - .3 LL1438 Hardwood Islands
 - .4 LL5440.003 DB-KA6
 - .5 LL5462 DB-C4 Burnt Island
 - .6 LL5463 DB-DA4 Dokis

1.2 Related Sections

- .1 Concrete Work, Section 033000
- .2 Concrete Accessories, Section 031500
- .3 Metal Towers, Section 133613

1.3 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 – September 2019;
 - .2 NRC-CNRC National Building Code of Canada 2015.
 - .3 Ontario Occupational Health and Safety Act and Regulations, 2019.
 - .4 CSA S350L-[M1980(R1998)], Code of Practice for Safety in Demolition of Structures.

1.4 Submittals



.1 Contractor to provide demolition plan.

.1 Deadline:

.1 With Construction Plan.

.2 Deliverables:

.1 Method of demolition including all associated tasks and schedule;

.2 Methods for protecting the site from demolition debris.

.3 The ultimate disposal location of all waste materials and debris.

.1 Include documentation detailing regulatory approval for waste disposal facility and transporter.

.3 Work under this section shall not proceed until written approval of the demolition plan has been received from the Coast Guard.

.4 Submit copies of certified receipts from the disposal sites for all material removed from the work site upon request.

1.5 Existing Conditions

.1 Existing piers are beyond their life expectancy, and multiple pieces of the reinforced concrete structures have failed. Contractor must ensure the towers are dismantled and demolished in a safe manner.

.1 Photos of the existing piers and towers are included in Appendix B1.

PART 2 - PART 2 - PRODUCTS

2.1 Not used.

PART 3 - PART 3 - EXECUTION

3.1 General

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

.2 It is preferred that pieces are lifted onto the barge in one piece to avoid environmental issues.

3.2 Protection

.1 Implement effective controls to catch/collect all tower debris during demolition, specifically paint.

.2 Implement effective controls to prevent injury to workers, and mariners.

3.3 Preparation



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- .1 Erect warning signs and barricades where 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 salvage old towers c/w all lighting equipment.
- .2 Demolish the existing reinforced concrete piers in their entirety.
- .3 Ensure that demolitions do not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
- .4 Ensure demolitions are 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.



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 activities:
 - .1 Install six [6] concrete foundations as per the attached drawings at the following project sites;
 - .1 LL1436 Wigwam Point [McIntosh Perry Design]
 - .2 LL1437 Hay Rock [STEM-Northern Class.*Assume 0m water depth]
 - .3 LL1438 Hardwood Islands [STEM-Northern Class.*Assume 0.305m water depth]
 - .4 LL5440.003 DB-KA6 [STEM-Northern Class.*Assume 0.305m water depth]
 - .5 LL5462 DB-C4 Burnt Island [STEM-Northern Class.*Assume .305m water depth]
 - .6 LL5463 DB-DA4 Dokis [STEM-Northern Class.*Assume 0m water depth]

1.2 Related Sections:

- .1 Demolition of Structures, Section 024116
- .2 Concrete Accessories, Section 031500
- .3 Metal Towers, Section 133613

1.3 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 – September 2019
 - .2 NRC-CNRC National Building Code of Canada 2015
 - .3 Ontario Occupational Health and Safety Act and Regulations, 2019
 - .4 ASTM A615-15 – Standard Specification for Deformed and Plain Carbon-Steel Bars for



Concrete reinforcement

- .5 CAN/CSA-A23.1-04 Concrete Materials and Methods of Concrete Construction
- .6 CAN/CSA A23.2-04 Methods of Test and Standard Practices for Concrete
- .7 CAN/CSA A23.3-04 Design of Concrete Structures
- .8 CAN/CSA-G30.18 Billet Steel Bars for Concrete Reinforcement
- .9 CAN/CSA S269.3 Concrete Formwork

1.4 Submittals

- .1 Submittals shall be forwarded to Coast Guard in accordance with the provisions of section 013300.
- .2 Construction Plan
 - .1 Deadline:
 - .1 No less than ten [10] working days prior to mobilization.
 - .2 Deliverables:
 - .1 Contractor shall provide a high level summary of mix properties and admixtures to demonstrate compliance with Coast Guard criteria.
 - .2 Concrete Placement 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 a timely manner;
 - .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 Mill Test Certificates

.1 For any works fabricated of steel, the Contractor shall provide Mill Test Certificates.

.2 Deadline:

.1 Upon receipt of metal purchased.

.3 Deliverables:

.1 The contractor shall furnish proof that all metal received for the project is in compliance with CSA and ASTM International standards.

1.5 Quality Assurance

.1 Coast Guard's minimum inspection requirements are detailed herein.

.2 Concrete placement shall not commence until formwork and reinforcement have been inspected by Coast Guard.

.1 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 shall be remedied to the satisfaction of Coast Guard, at the Contractors expense. Work shall not progress until inspections have been completed and the Contractor has been provided with written notice to proceed with



the works.

- .4 Concrete testing: The Contractor will be responsible to test concrete for air, slump and strength during the pour.
 - .1 The Contractor shall 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).
 - .2 Final completion: The Coast Guard will conduct final inspection upon completion.

PART 2 - PRODUCTS

2.1 General

- .1 All concrete materials shall conform to specifications referenced in CAN/CSA-A23.1-04
- .2 All materials for the supplied designs shall be as specified in drawings in Appendix B3

2.2 Concrete

- .1 Concrete supplier shall be a holder of a valid "Certificate of Ready Mixed/Mobile Mix Concrete Production Facilities" as issued by the Ready Mixed Concrete Association of Ontario (RMCAO).
- .2 Concrete must possess the minimum characteristics detailed in supplied Contract Drawings as well as the approved Final Design Drawings submitted by the Contractor
 - .1 The use of calcium chloride as an admixture is not permitted.

2.3 Reinforcement

- .1 Reinforcing steel is to be detailed as per the supplied Contract Drawings.

2.4 Water

- .1 Water used for the production of concrete must be potable, unless otherwise approved in writing by the CCG.



2.5 Anchor Bolts

- .1 Anchor bolts shall be as per Contract Drawings for the supplied designs
- .2 All anchor bolts are to conform to ASTM A36, ASTM A325, ASTM A193, Grade B7 high strength carbon steel ,or CSA G40.21.
- .3 The anchor rods are to be hot dip galvanized and sized as indicated in drawings provided.
- .4 Threads shall be long enough to accommodate two heavy hex nuts as well as a heavy flat washer.

PART 3 - EXECUTION

3.1 General

- .1 Concrete must be placed, finished, and cured in accordance with CSA A23.1 and the Contract Drawings.

3.2 Preparation

- .1 Remove all deleterious material.
- .2 Construct forms and reinforcement in accordance with the engineer's specifications.
- .3 All exposed 90° edges shall be chamfered.

3.3 Placement

- .1 Concrete placement shall not commence until formwork and reinforcement have been inspected by Coast Guard.
- .2 Contractor shall place, finish and cure concrete as per CAN CSA A23.1 making all adjustments necessary to account for climatic conditions anticipated during the curing period.
- .3 Concrete shall be placed in one continuous pour.
 - .1 The development of cold joints shall be avoided. Alternately, cold joints must be previously approved in writing by CCG.
- .4 Finish exposed concrete surfaces to provide a lightly brushed non-skid surface, unless otherwise specified in the submitted design.
- .5 Cut control joints where specified.
- .6 Contractor shall provide samples as required during placement operation for the performance of



quality assurance testing.

- .7 Concrete shall be finished so as to slope gently away from the center of the slab. No water shall pond on the finished surface.

3.4 Curing

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

3.5 Inspection

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

3.6 Clean up

- .1 Contractor must remove all forms and falsework not designated to be left in place.
- .2 Forms and falsework shall not be removed until the concrete has achieved suitable strength and the temporary work platform is no longer required.
- .3 All means used to anchor the falsework to the existing pier are to be removed and restored to the satisfaction of Coast Guard representative.



SECTION: 316813 ROCK FOUNDATION ANCHORS

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 activities:

- .1 Installation of six [6] drilled rock anchor foundations as per the Specification Drawings at the locations listed in section 03300:

1.2 Related Sections:

- .1 Demolition of Structures, Section 024116
- .2 Concrete Work, Section 033000
- .3 Concrete Accessories, Section 031500
- .4 Metal Towers, Section 133613

1.3 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 – September 2019
 - .2 NRC-CNRC National Building Code of Canada 2015
 - .3 Ontario Occupational Health and Safety Act and Regulations, 2019
 - .4 HIT-RE 500 V3 Epoxy Adhesive Anchoring System
 - .5 CAN/CSA G164 - Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .6 ASTM E488 Standard Test Methods for Strength of Anchors in Concrete Elements
 - .7 ASTM A36-14 - Standard Specification for Carbon Structural Steel
 - .8 ASTM A615-15 – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete reinforcement
 - .9 ASTM A615-15 – Standard Specification for Deformed and Plain Carbon-Steel Bars for



Concrete reinforcement

- .10 CAN/CSA-A23.1-04 Concrete Materials and Methods of Concrete Construction
- .11 CAN/CSA A23.2-04 Methods of Test and Standard Practices for Concrete
- .12 CAN/CSA A23.3-04 Design of Concrete Structures

1.4 Submittals

- .1 Submittals shall be forwarded to Coast Guard in accordance with the provisions of section 013530.
- .2 Drilling Plan:
 - .1 Deadline:
 - .1 Furnish with Construction Plan (Section 011100)
 - .2 Deliverables:
 - .1 Description of the equipment that will be utilized to install the drilled anchors;
 - .2 Description of the methods that will be implemented to stabilize the drilling equipment, and to ensure verticality of piles;
 - .3 Description of drilling methods;
 - .4 Description of how grouting will occur;
 - .5 Provide cut-sheets for the HILTI epoxy product to be used;
 - .6 Provide cut-sheets for the grout to be used; and,
 - .7 Describe how works will be undertaken to mitigate impacts on the surrounding watercourse.

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 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 Coast Guard is to confirm the correct location of the foundations.

PART 2 - PRODUCTS

2.1 Adhesive

- .1 HILTI HIT-RE 500 V3 Epoxy Adhesive Anchoring System

2.2 All-thread rod, accompanying washers & nuts

- .1 All-threaded rods shall be high strength carbon steel anchor as per the attached drawings.

2.3 Grout

- .1 Grout shall Sika M-Bed, or approved equivalent

PART 3 - EXECUTION

3.1 General

- .1 The installation shall be as per the Contract Drawings in Appendix B3 and Product Technical Guide Excerpt for HIT-RE 500 V3 Epoxy Adhesive Anchoring System

3.2 Installation

- .1 Refer to McIntoch Perry and STEM foundation specifications (Appendix B3).

3.3 Repair of Defective Work

- .1 Remove and replace misplaced or malfunctioning anchors. Fill empty anchor holes and patch failed anchor locations with high-strength non-shrink, nonmetallic grout. Anchors that fail to meet proof load or installation torque requirements shall be regarded as malfunctioning.

3.4 Field Quality Control

.1 General:

Coast Guards minimum inspection requirements are detailed below:

- .1 The Contractor shall be responsible to notify Coast Guard of the date and time that the



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works may be inspected.

- .1 Notice must be provided no less than three [3] working days in advance to permit scheduling of quality assurance testing
- .2 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.
- .3 Work shall not progress until inspections have been completed and the Contractor has been provided with written notice to proceed with the works
- .2 Inspections shall take place upon completion of the work to ensure towers are plumb and that the lights are operating correctly.



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 the following:
 - .1 Transportation of one [1] 16' pipe mast tower, one [1] 20' claymar tower, four [4] 5' to 8' pipe mast beacons and all associated hardware to site from the designated staging area;
 - .2 The installation of the seven [7] towers detailed in the appended Contract Drawings;
- .2 Work of this section excludes:
 - .1 Fabrication and Supply of the towers, by CCG.
 - .2 Supply of the navigational lantern and installation, by CCG.

1.2 Related Sections:

- .1 Demolition of Structures, Section 024116
- .2 Concrete Work, Section 033000
- .3 Rock Foundation Anchors, Section 316813

1.3 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 – September 2019
 - .2 NRC-CNRC National Building Code of Canada 2015.
 - .3 CSA S37-01 - Antenna Towers and Antenna Supporting Structures.
 - .4 CAN/CSA S16.1 - Limit States Design of Steel Structures.
 - .5 CAN/CSA G164 - Hot Dip Galvanizing of Irregularly Shaped Articles.

1.4 Submittals

- .1 No submittals required in this section

1.5 Quality Assurance

- .1 Coast Guard's minimum inspection requirements are detailed below:



- .1 The Contractor shall be responsible to notify Coast Guard of the date and time that the works may be inspected.
- .1 Notice must be provided no less than three [3] working days in advance to permit scheduling of quality assurance testing
- .2 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.
- .3 Work shall not progress until inspections have been completed and the Contractor has been provided with written notice to proceed with the works
- .2 Inspections shall take place upon completion of the work to ensure towers are plumb and that the lights are operating correctly.

PART 2 - PRODUCTS

2.1 Materials

- .1 Steel:
 - .1 The tower is structural grade steel 350W and 300W.
- .2 Coatings:
 - .1 Galvanizing:
 - .1 All materials, structural steel, pipe and fittings, including bolts, nuts and washers shall be hot dip galvanized to the requirement of the National Building Code, CAN/CSA S16.1, and CSA-G164 and as otherwise specified therein.

PART 3 - EXECUTION

3.1 Fabrication

- .1 Fabrication shall be completed by the Canadian Coast Guard. This includes everything shown on the drawing which comprises the tower.

3.2 Protective Coatings

- .1 Galvanizing:
 - .1 The tower and all hardware are hot dip galvanized. The contractor shall be prepared to make repairs to the coating as needed.

3.3 Handling of Material and Transportation

- .1 The Contractor shall 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 shall be replaced to the satisfaction of Coast Guard at the expense of the Contractor.



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.2 It is the responsibility of the Contractor to ensure that the tower sections, particularly the joints are protected from bending and alignment damage.

.3 The contractor will be asked to identify how he would like the tower packaged for shipping shortly after award. This will be coordinated by CCG.

3.4 Tower Installation

.1 Each anchor bolt shall have three [3] galvanized heavy hex nuts.

.1 Contractor shall place one leveling nut on each anchor bolt prior to installing the tower and use two hex nuts on top of the base plate to tighten and jam the tower base plate in place.

.2 The Contractor shall touch up in the field all areas of the towers where the galvanized finish has been scraped or chipped during erection using zinc-enriched or Galvicon paint, or an approved equal.

.3 The Contractor shall field paint all areas of the towers where the painted finish has been scraped or chipped during erection in the field.

.1 The Contractor shall be responsible for damage done by paint spraying or dripping on the Owner's or other's property.



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APPENDIX B1: SITE LOCATION AND PHOTOGRAPHS



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Site	Existing Tower/Beacon Height	Replacement Tower Height	New Foundation Design	Assumed Water Depth	Lit/Unlit
LL1436 Wigwam Point	8m	7.1m	McIntosh Perry	0m	Lit
LL1437 Hay Rock	7.4m	4.9m	STEM [Northern]	0m	Lit
LL1438 Hardwood Islands	4.9m	4.9m (Re-use existing tower)	STEM [Northern]	0.305m	Lit
LL5440.003 DB-KA6	2m	2m	STEM [Northern]	0.305m	Unlit
LL5462 DB-C4 Burnt Island	2m	2m	STEM [Northern]	0.305m	Unlit
LL5463 DB-DA4 Dokis	2m	2m	STEM [Northern]	0m	Unlit

Figure 1: Site Summary Table



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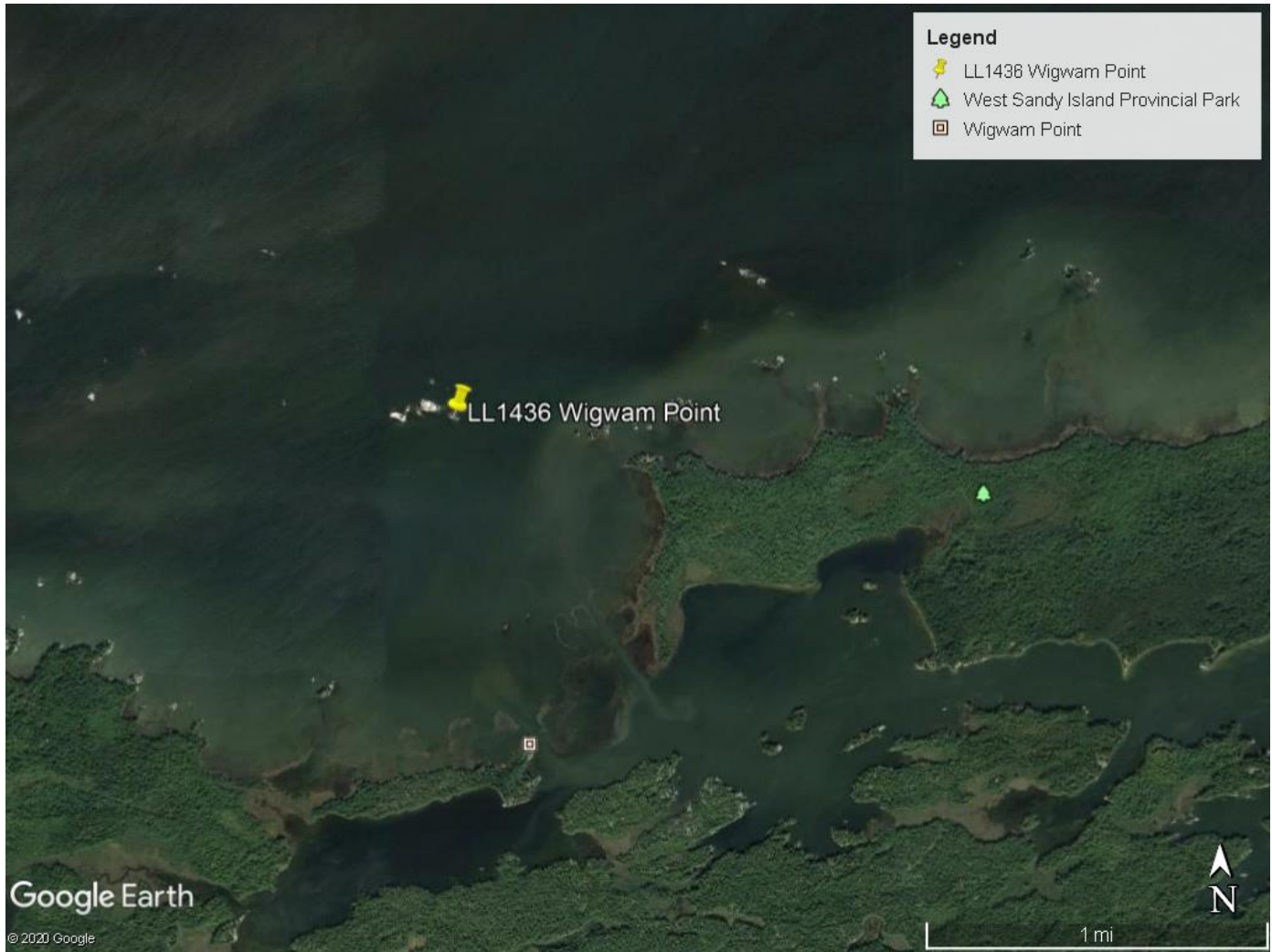


Figure 2: LL1436 Wigwam Point Tower Location
Coordinates: 46°14'35.00"N 79°56'58.50"W



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Figure 3: Existing LL1436 Wigwam Point Tower (to be removed)



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Figure 4: Existing LL1436 Wigwam Point Tower Foundation (to be removed)



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Figure 5: LL1437 Hay Rock Tower Location
Coordinates: 46°15'10.00"N 80°03'05.00"W



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Figure 6: Existing LL1437 Hay Rock Tower (to be removed)



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Figure 7: Existing LL1437 Hay Rock Tower Foundation (to be removed)



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Figure 8: LL1438 Hardwood Islands
Coordinates: 46°16'50.00"N 80°01'40.50"W



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Figure 9: Existing LL1436 Hardwood Islands Tower Foundation (to be removed)



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Figure 10: Existing LL1436 Hardwood Islands Tower Foundation (to be removed) – Photo 3



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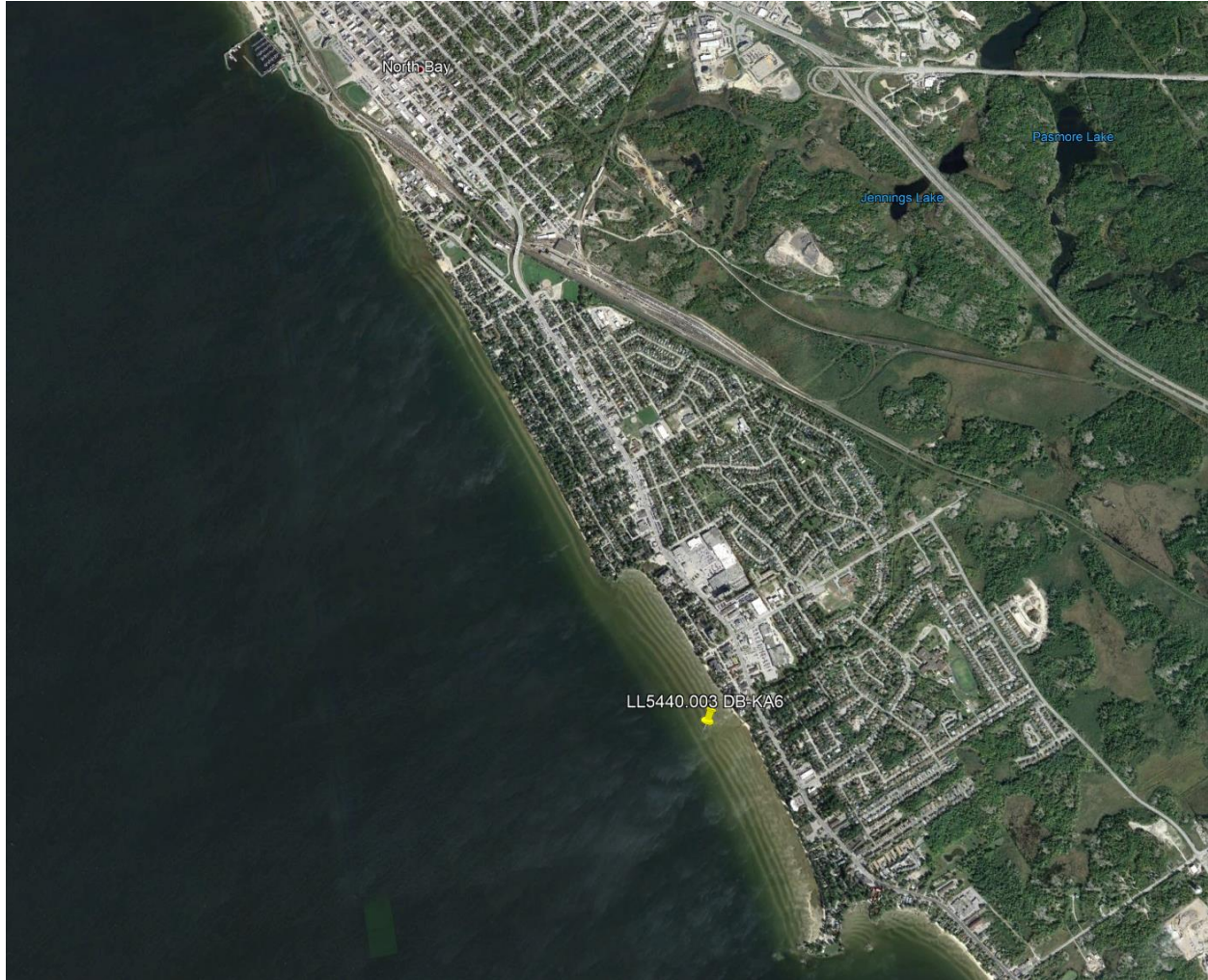


Figure 11: LL5440.003 DB-KA6 Coordinates: 46°16'33.00"N 79°26'57.00"W



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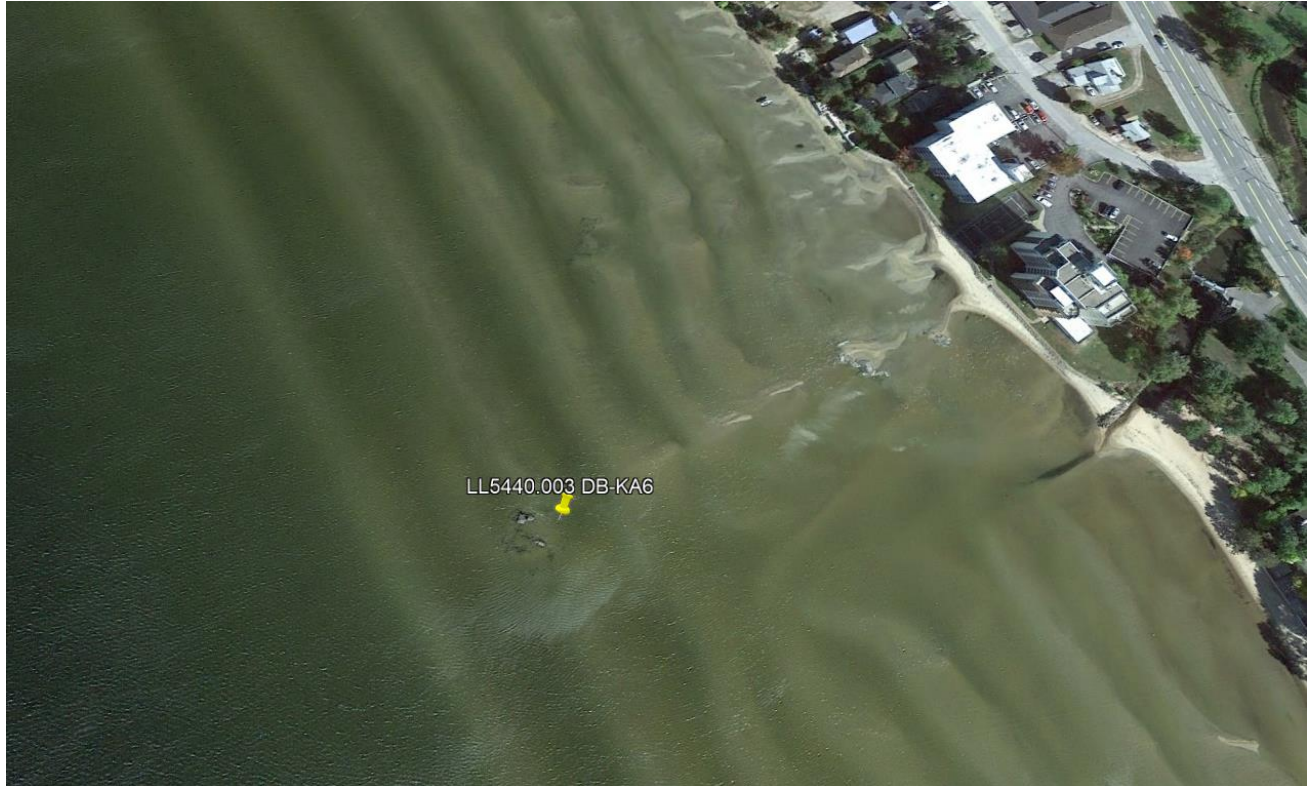


Figure 12: LL5440.003 DB-KA6 Location and Rock Formation



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Figure 13: LL5440.003 DB-KA6 Existing Day Beacon Location Post-Failure



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Figure 14: LL5440.003 DB-KA6 Failed Foundation and Day Beacon (To be removed)



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Figure 15: LL5462 DB-C4 Burnt Island Coordinates 46°13'3.78"N 79°53'39.00"W



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Figure 16: LL5462 DB-C4 Burnt Island: Existing Conditions



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Figure 17: LL5463 DB-DA4 Dokis: Coordinates: 46° 9'10.38"N 80° 1'48.18"W



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Figure 18: LL5463 DB-DA4 Dokis: Existing Conditions



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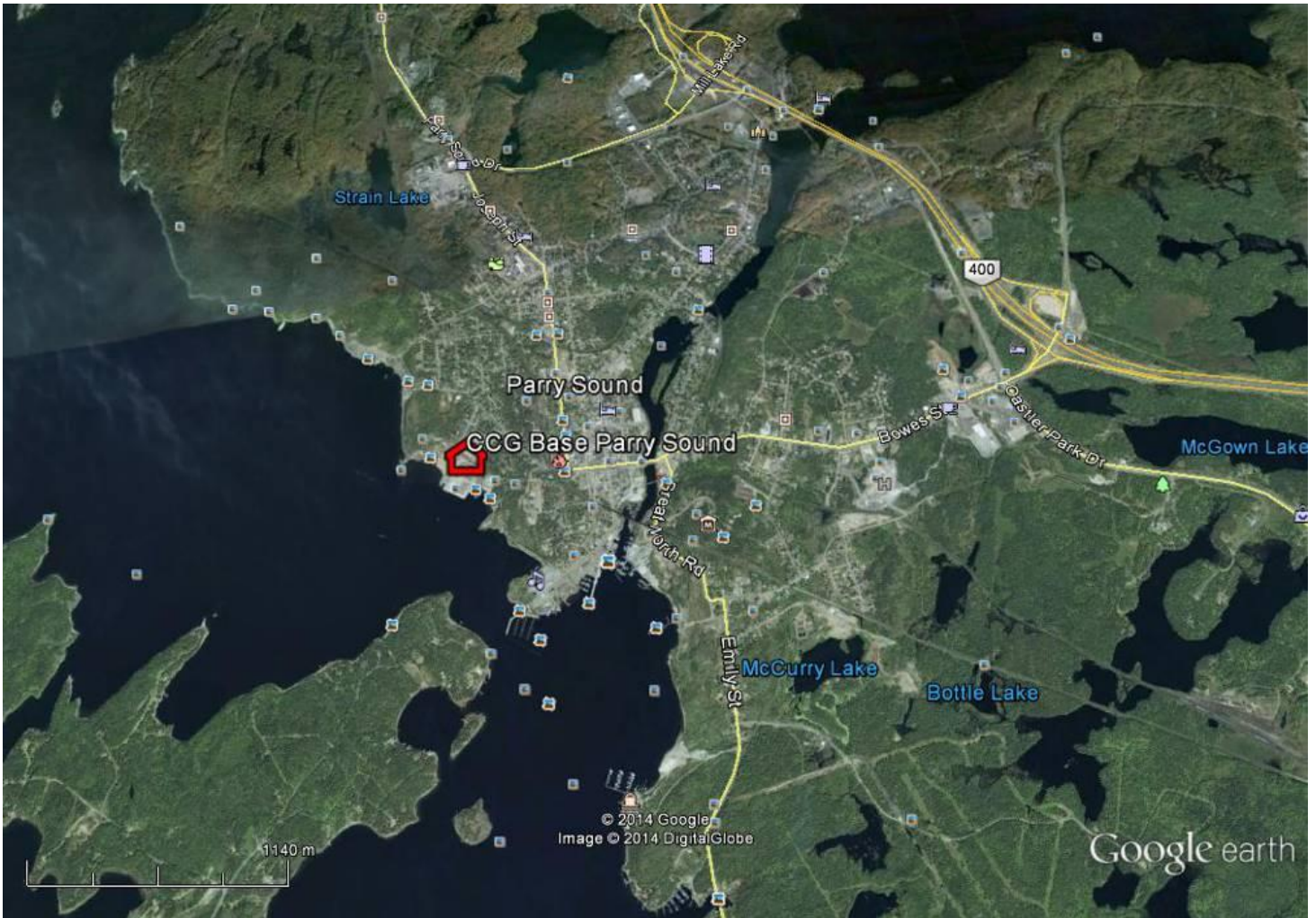


Figure 19: Coast Guard Staging Area
CCG Base Parry Sound
28 Waubeek St. Parry Sound, ON P2A 1B9
45°20'38.93"N - 80° 2'34.46"W



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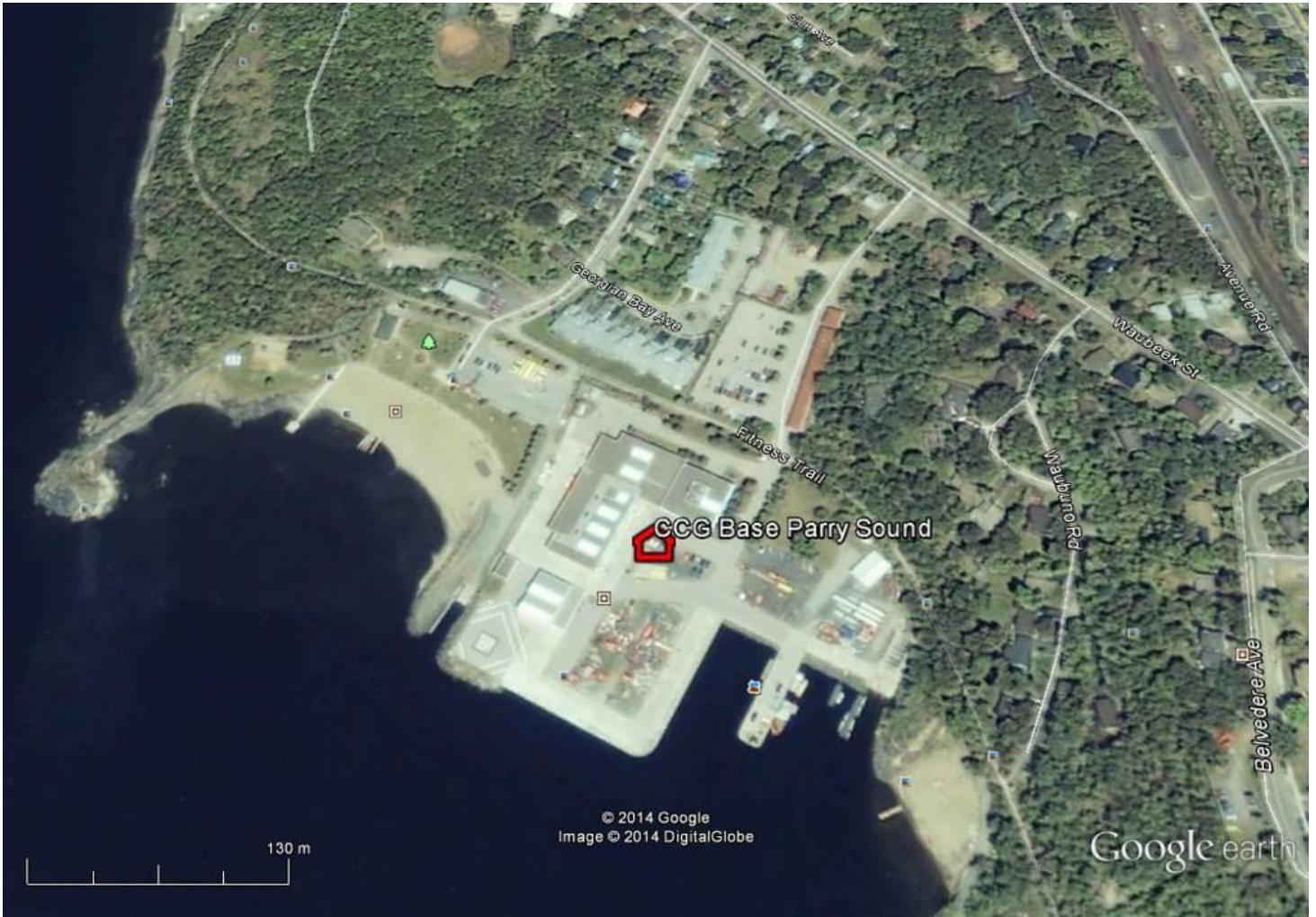


Figure 20: Coast Guard Staging Area



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APPENDIX B2 – SUMMARY OF SUBMITTALS



Following Contract Award													
Submission Description	Section(s)												
Deadline: 10 working days following award													
Detailed schedule: Proof of qualifications: <table style="width: 100%; border: none;"> <tr> <td style="padding-left: 20px;">a) Proof of Vessel Registration</td> <td style="text-align: right;">011000</td> </tr> <tr> <td style="padding-left: 20px;">b) Photo of Vessel</td> <td style="text-align: right;">011100</td> </tr> <tr> <td style="padding-left: 20px;">c) Proof of Qualifications</td> <td style="text-align: right;">011000</td> </tr> </table>		a) Proof of Vessel Registration	011000	b) Photo of Vessel	011100	c) Proof of Qualifications	011000						
a) Proof of Vessel Registration	011000												
b) Photo of Vessel	011100												
c) Proof of Qualifications	011000												
Deadline: 10 working days prior to mobilization													
Construction Plan <table style="width: 100%; border: none;"> <tr> <td style="padding-left: 20px;">a) Project specific safety plan</td> <td style="text-align: right;">011100</td> </tr> <tr> <td style="padding-left: 20px;">b) Project environmental protection program</td> <td style="text-align: right;">011100</td> </tr> <tr> <td style="padding-left: 20px;">c) Detailed demolition plan</td> <td style="text-align: right;">024116</td> </tr> <tr> <td style="padding-left: 20px;">d) Drilling Plan</td> <td style="text-align: right;">033000</td> </tr> <tr> <td style="padding-left: 20px;">e) Dewatering Plan</td> <td style="text-align: right;">033000</td> </tr> <tr> <td style="padding-left: 20px;">f) Concrete Placement Plan</td> <td style="text-align: right;">033000</td> </tr> </table>		a) Project specific safety plan	011100	b) Project environmental protection program	011100	c) Detailed demolition plan	024116	d) Drilling Plan	033000	e) Dewatering Plan	033000	f) Concrete Placement Plan	033000
a) Project specific safety plan	011100												
b) Project environmental protection program	011100												
c) Detailed demolition plan	024116												
d) Drilling Plan	033000												
e) Dewatering Plan	033000												
f) Concrete Placement Plan	033000												
Deadline: 21 calendar days following acceptance of the works													
Waste disposal receipts As-built drawings	024116 011100, 033000, and 031500												



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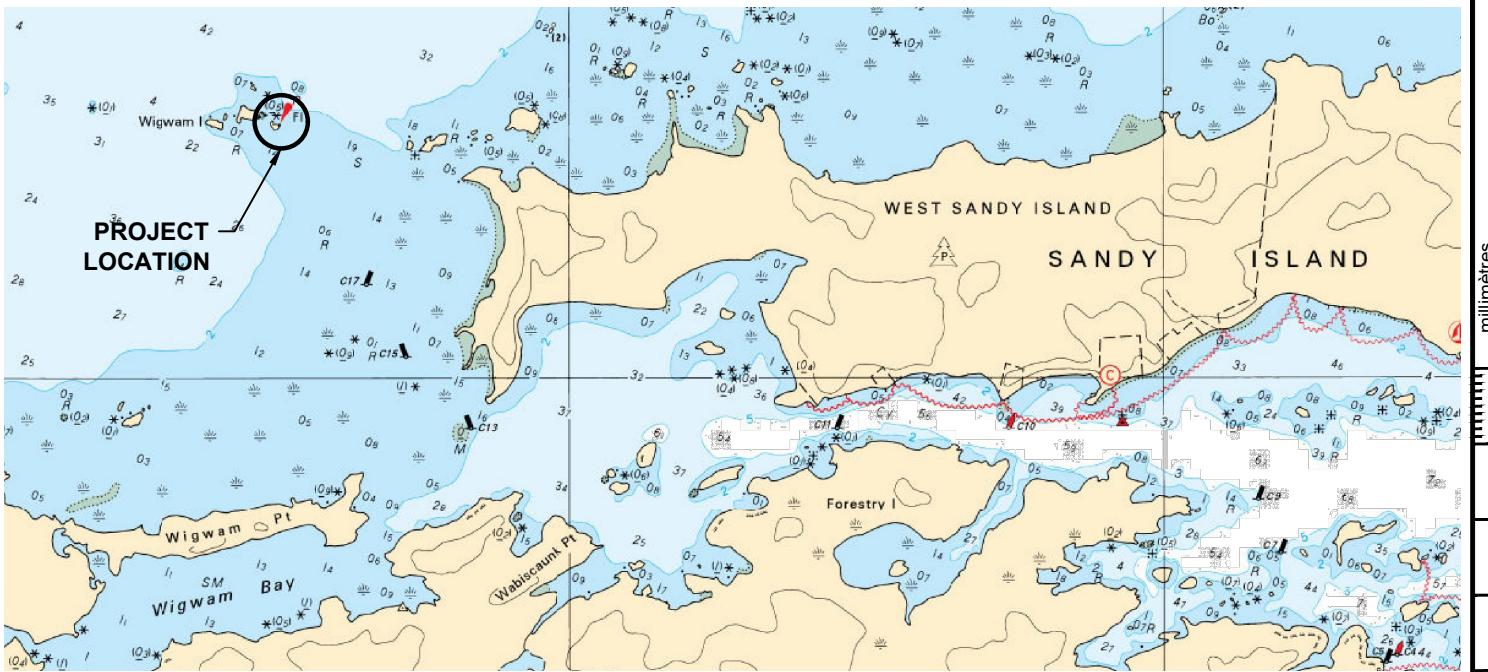
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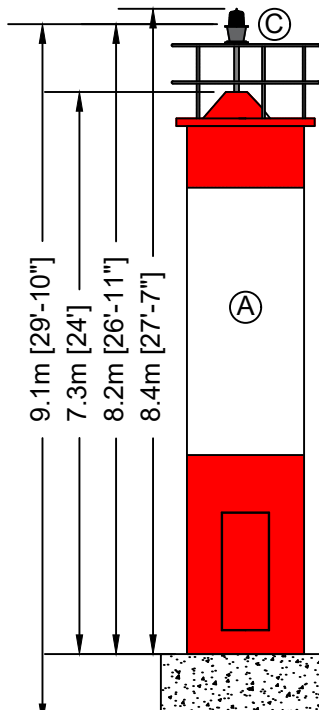


APPENDIX B3 – DRAWINGS

CHART 6037

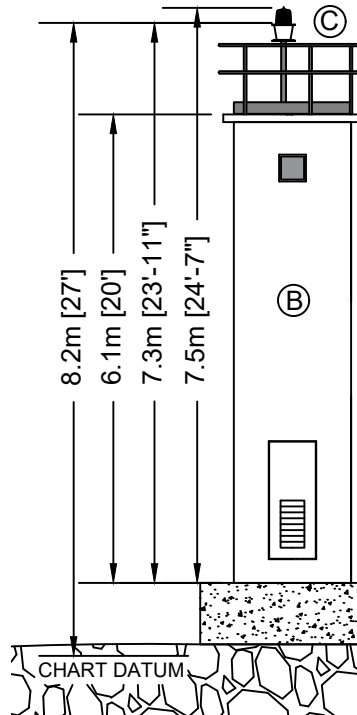


EXISTING AID



- A. EX. TOWER
24' HEIGHT
Remove & Dispose
- B. EX. CONCRETE
FOUNDATION
Remove & Dispose
- C. EX. SELF
CONTAINED
LANTERN
Salvage

PROPOSED AID



- A. NEW REINFORCED
CONCRETE
FOUNDATION
(2.4m X 2.4m X 0.8m)
- B. NEW CLAYMAR
TOWER
20' HEIGHT
Assemble & Install
- C. SALVAGED SELF
CONTAINED
LANTERN
Reinstall

NOTES:

1. NEW TOWER TO BE PLACED PRIOR TO REMOVAL OF EXISTING TOWER TO REDUCE DOWN TIME. THE LOCATION OF THE NEW TOWER WILL BE DECIDED BASED ON HOW FLAT THE ROCK IS AND BY THE PROXIMITY TO THE EXISTING TOWER.

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Asset - Actif	LL1436 WIGWAM POINT
Drawing - Dessin	PROPOSED REPLACEMENT

designed - conception	M. FINNISON	date	2020-03-02
approved - approuvé		date	YYYY-MM-DD
drawing no. - no. dessin	CM-1436000-1	sheet-feuille	01/01
		rev	0

GENERAL NOTES

- STRUCTURAL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS AND DOCUMENTS INCLUDED IN THIS CONTRACT.
- REPORT ANY DISCREPANCIES TO THE CONSULTANT BEFORE SUBMITTING THE TENDER PRICE. NO ALLOWANCE WILL BE MADE FOR DIFFICULTIES ENCOUNTERED OR EXPENSES INCURRED RESULTING FROM CONDITIONS CONSIDERED KNOWN AT THE TIME THE TENDERS ARE SUBMITTED. McINTOSH PERRY CONSULTING ENGINEER LTD. IS NOT RESPONSIBLE FOR ANY WORKS NOT DESIGNED BY McINTOSH PERRY CONSULTING ENGINEER LTD.
- CONTRACTOR IS RESPONSIBLE TO ARRANGE FOR THE TESTING OF CONCRETE BY INDEPENDENT INSPECTION AGENT AND SUBMIT PROMPTLY ALL REPORTS TO THE PROJECT ARCHITECT AND ENGINEER.
- STRUCTURAL DESIGN AND CONSTRUCTION SHALL CONFORM TO:
 - NATIONAL BUILDING CODE OF CANADA;
 - CONCRETE
 - DESIGN OF CONCRETE STRUCTURES FOR BUILDINGS - CAN/CSA-A23.3-M
 - CONCRETE MATERIALS & METHODS OF CONCRETE CONSTRUCTION/ METHODS OF TEST FOR CONCRETE CSA-A23.1-04 / A23.2-04
 - A23.3-04, DESIGN OF CONCRETE STRUCTURES

CONCRETE REINFORCEMENT NOTES

- PERFORM CONCRETE REINFORCING WORK AND FABRICATION IN ACCORDANCE WITH CAN/CSA-A23.1/A23.2 UNLESS SPECIFIED OTHERWISE IN THIS SECTION.
- REINFORCING STEEL SHALL BE GRADE 400R DEFORMED BILLET - STEEL (EXCEPT REINFORCING TO BE WELDED SHALL BE 400W) CONFORMING TO CAN/CSA - G30.18 AND FREE OF RUST, OIL OR ANY OTHER DELETERIOUS MATERIAL.
- PROVIDE ALL NECESSARY BAR SUPPORTS AND TIE IN ACCORDANCE WITH THE LATEST RSIO DETAILING MANUAL.

DESIGN LOADS

TOP DECK L.L. (SNOW): 2.4 KPa

WIND LOAD

MAXIMUM REFERENCES VELOCITY PRESSURE, $q=0.60$ KPa.

WIND LOADS CALCULATED PER NBC 2015.
BASE MOMENT INCLUDES ACROSS WIND LOADS DUE TO VORTEX SHEDDING.

ICE LOADS

25mm THICK WINDWARD FACE TO TOWER
25mm THICK BOTH SIDES OF DAYMARK, LADDER & PLATFORMS 0.25 KPa PER INCH OF THICKNESS.


TOWER WEIGHT

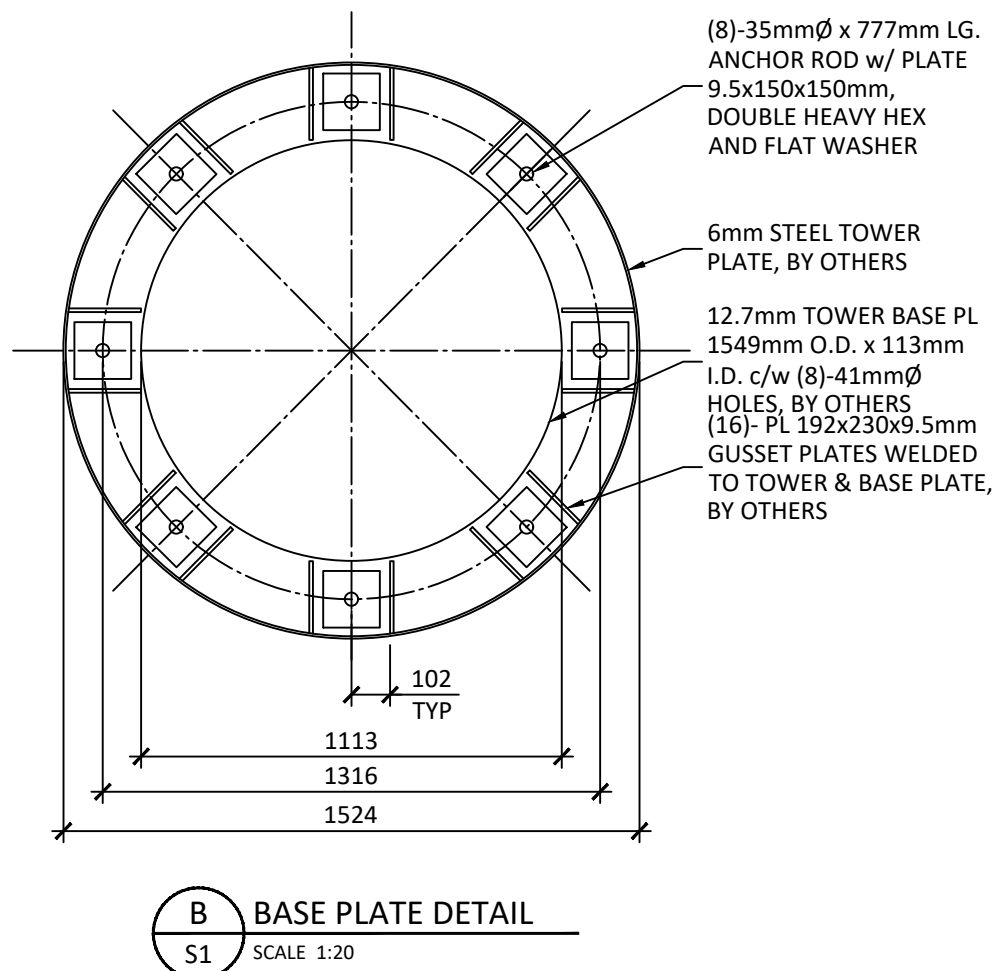
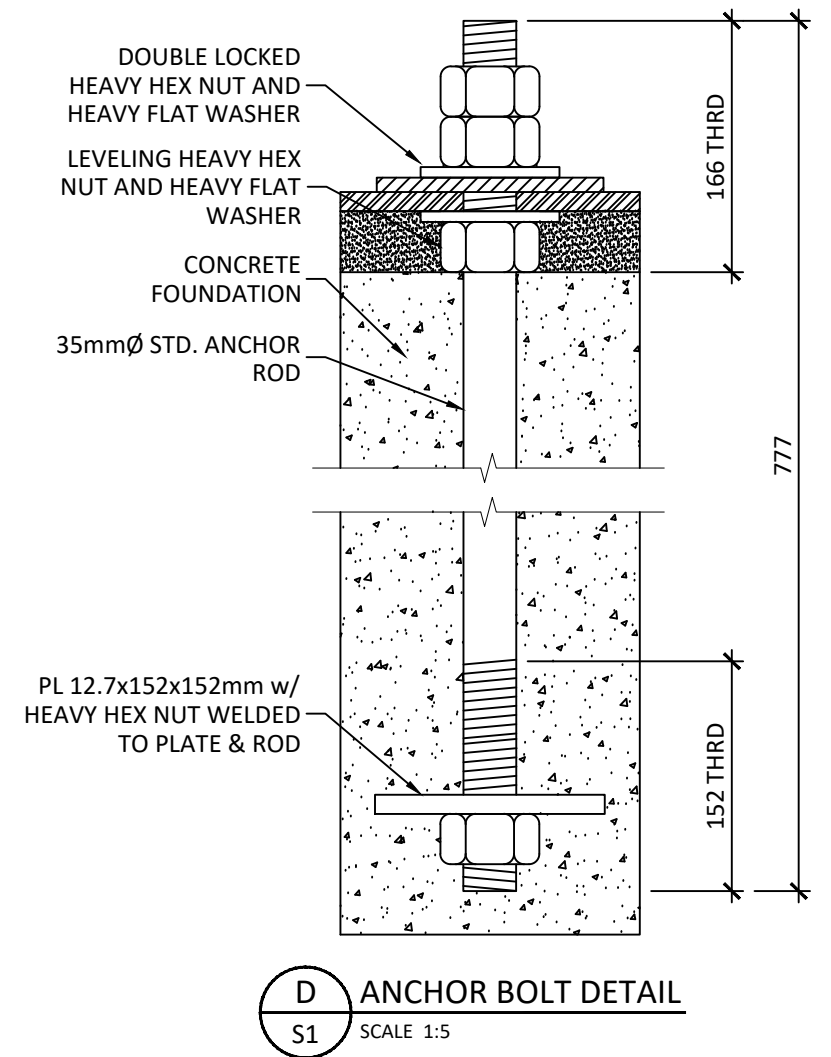
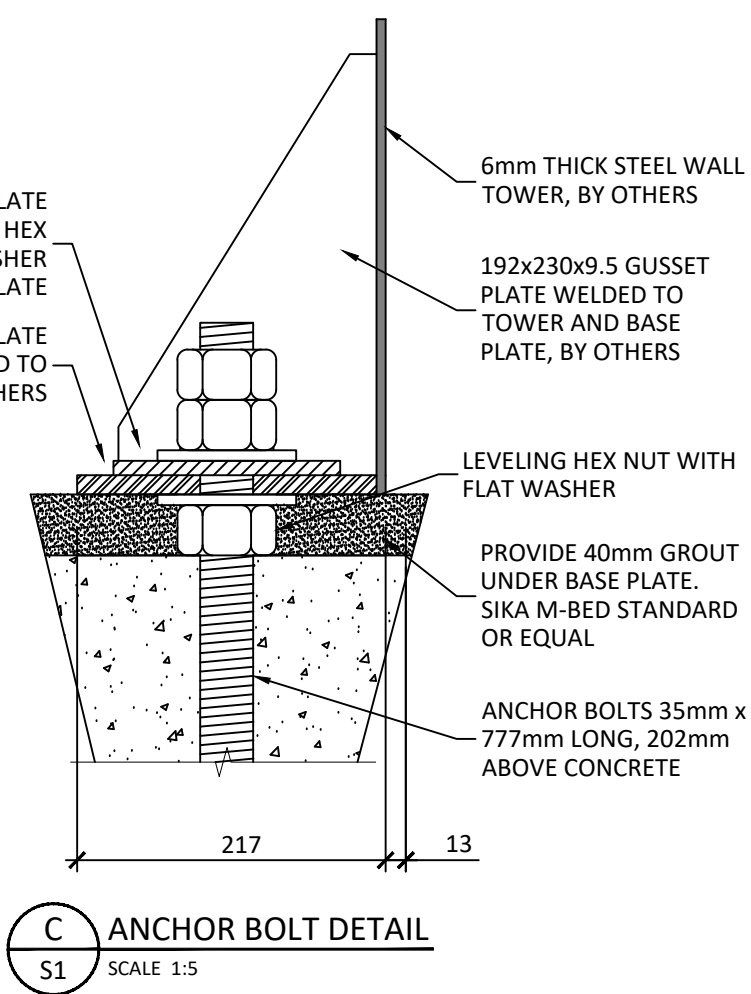
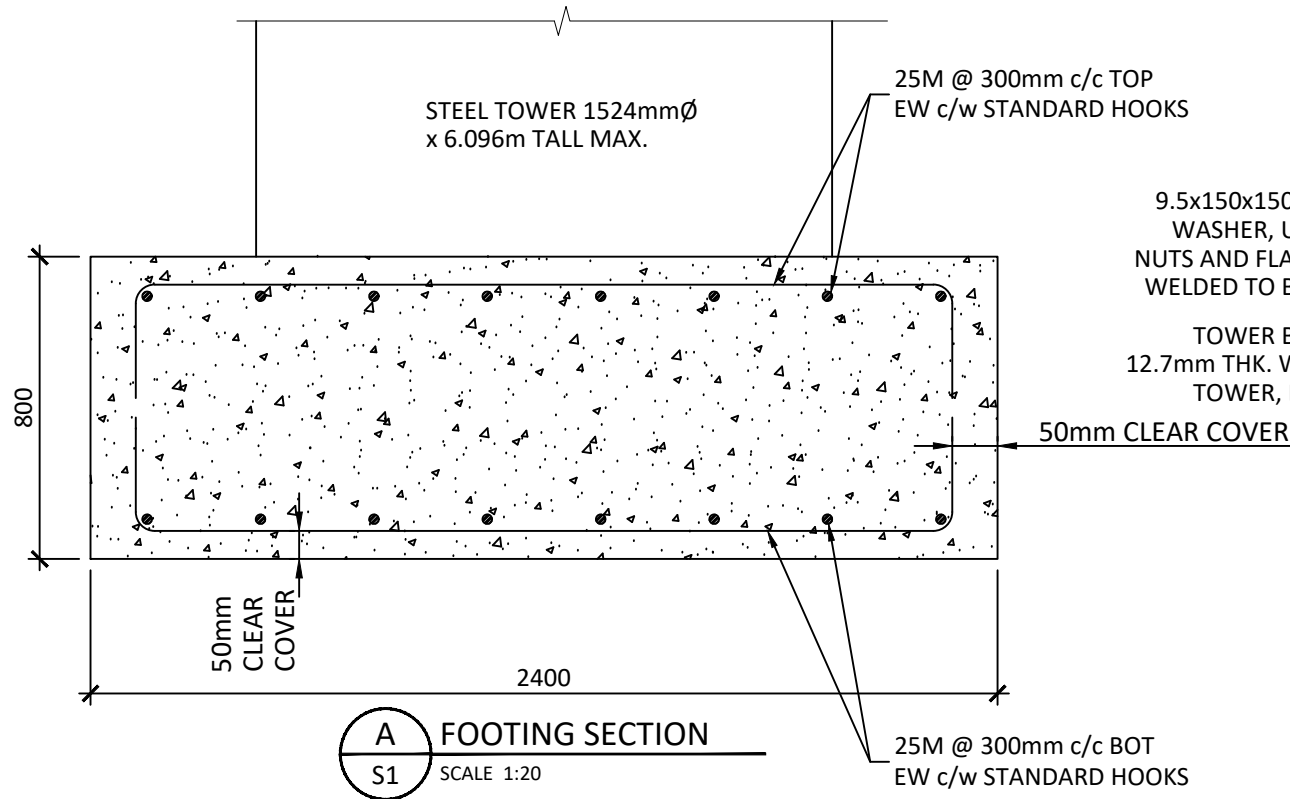
5530 LBS. (2508 kg) MAX

CONCRETE NOTES

- CONFORM TO CSA STANDARD A23.1. CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION A23.2. METHODS OF TEST FOR CONCRETE A23.3. DESIGN OF CONCRETE STRUCTURES IN DETAILING BENDS, PLACEMENT, SPACING, SPLICING AND PROTECTION OF REINFORCING.
- COMPRESSIVE STRENGTH OF CONCRETE AT 28 DAYS (UNLESS OTHERWISE NOTED):

LOCATION	STRENGTH	MAXIMUM AGGREGATE SIZE (mm)	EXPOSURE CLASS
FOOTINGS	25 MPa	19	F-2
- CEMENT:
PROVIDE PORTLAND CEMENT OF CANADIAN MANUFACTURE CONFORMING WITH CSA-A3001, NORMAL TYPE.
- AGGREGATES:
PROVIDE CLEAN, UNCOATED SAND AND COARSE AGGREGATES FROM APPROVED SOURCES WHICH CONFORM WITH CSA/CAN-A23.1/A23.2. NOMINAL SIZE OF COARSE AGGREGATES TO BE 19 mm (3/4").
- WATER:
CLEAN, AND FREE FROM INJURIOUS MATERIAL.
- EXPOSURE F-2:
CONCRETE SUBJECT TO FREQUENT CYCLES OF FREEZING AND THAWING IN UNSATURATED CONDITION-CONCRETE WITH MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 25 MPa, MAXIMUM WATER CEMENT RATIO OF 0.55. THIS CONCRETE SHALL BE AIR ENTRAINED 3% TO 6% FOR 19 mm MAXIMUM SIZE AGGREGATE AND 3% TO 8% FOR 10 mm MAXIMUM SIZE AGGREGATE.
- AIR ENTRAINMENT:
AS PER ASTM C260
- UNLESS OFFICIALLY APPROVED OTHERWISE, SLUMPS SHALL BE CONSISTENT AT 75 mm \pm 20 mm (3" \pm 3/4"). GREATER SLUMPS ARE NOT ACCEPTABLE AND THE LOADS SHALL BE REJECTED.
- DO NOT INCORPORATE FLY-ASH OR SLAG INTO CONCRETE MIX DESIGNS WITHOUT PRIOR APPROVAL IN WRITING.
- PERFORM CAST-IN-PLACE CONCRETE WORK IN ACCORDANCE WITH CSA-A23.1/A23.2 UNLESS SPECIFIED OTHERWISE IN THIS SECTION.
- ALL CONCRETE SHALL BE CONSOLIDATED WITH INTERNAL VIBRATOR, AND FINISH TO ARCHITECT'S REQUIREMENTS.
- ALL CONCRETE SURFACE MUST BE CURED FOR MINIMUM 3 DAY AT MINIMUM 10°C. CURING AS PER CAN/CSA A-23.1/A23.2.
- IMMEDIATELY AFTER PLACEMENT, PROTECT CONCRETE FROM PRE-MATURE DRYING, EXCESSIVE HOT OR COLD TEMPERATURES AND MECHANICAL DAMAGE.
- CONFORM TO CAN/CSA-A23.1/A23.2 WHEN CONCRETING DURING HOT WEATHER.
- CONFORM TO CAN/CSA-A23.1/A23.2 WHEN CONCRETING DURING COLD WEATHER.
- REPAIR OR REPLACE CONCRETE WITH EXCESSIVE HONEYCOMBING AND OTHER DEFECTS.
- THE VERTICAL HEIGHT OF FREE FALL CONCRETE SHALL NOT EXCEED 1800 UNLESS OFFICIALLY APPROVED OTHERWISE.

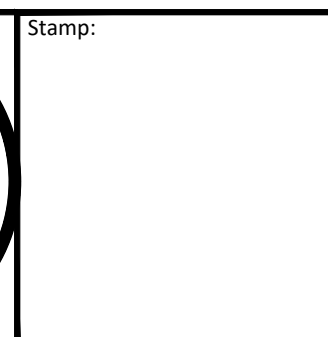
Stamp:	Stamp:	McINTOSH PERRY 115 Walgreen Road, RR 3 Carp, ON K0A 1L0 Tel: 613-836-2184 Fax: 613-836-3742 www.mcintoshperry.com	Client: CANADIAN COAST GUARD		
			Project: LAKE NIPISSING - NAVIGATION AID FOUNDATION DESIGN		
		Title: GENERAL NOTES			
Drawn by: MS	Scale: AS NOTED	2	Issued for Final Review	09DEC2019	Drawing Number: S1
Checked By: MZ	Date: 15NOV2019	1	Issued for Review	15NOV2019	
Project Number: CM-19-0531-00		No.	Revision / Issue	Date	



FOUNDATION LOADS (UNFACTORED) - NORMAL OPEN EXPOSURE					
TOWER HEIGHT	GRAVITY LOADS		BASE SHEAR	BASE MOMENT	MAXIMUM ANCHOR ROAD LOAD
	DL	LL			
6.096m	24.3 kN	21.9 kN	28.7 kN	97.0 kN-m	37.5 kN

ANCHOR RODS
ANCHOR RODS TO CONFORM TO ASTM A307

SOIL BEARING CAPACITY
SLS: 250 kPa
ULS: 375 kPa

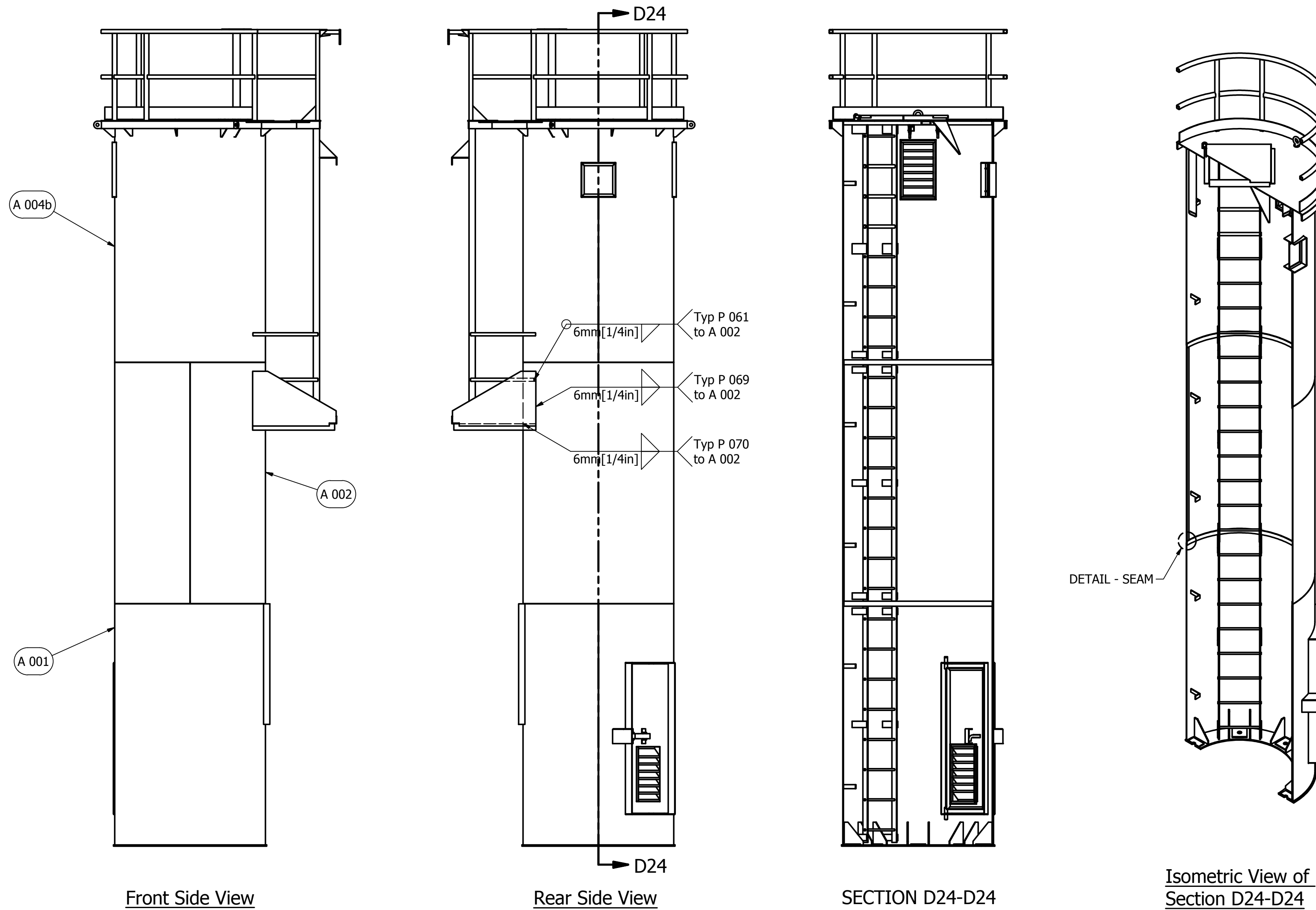
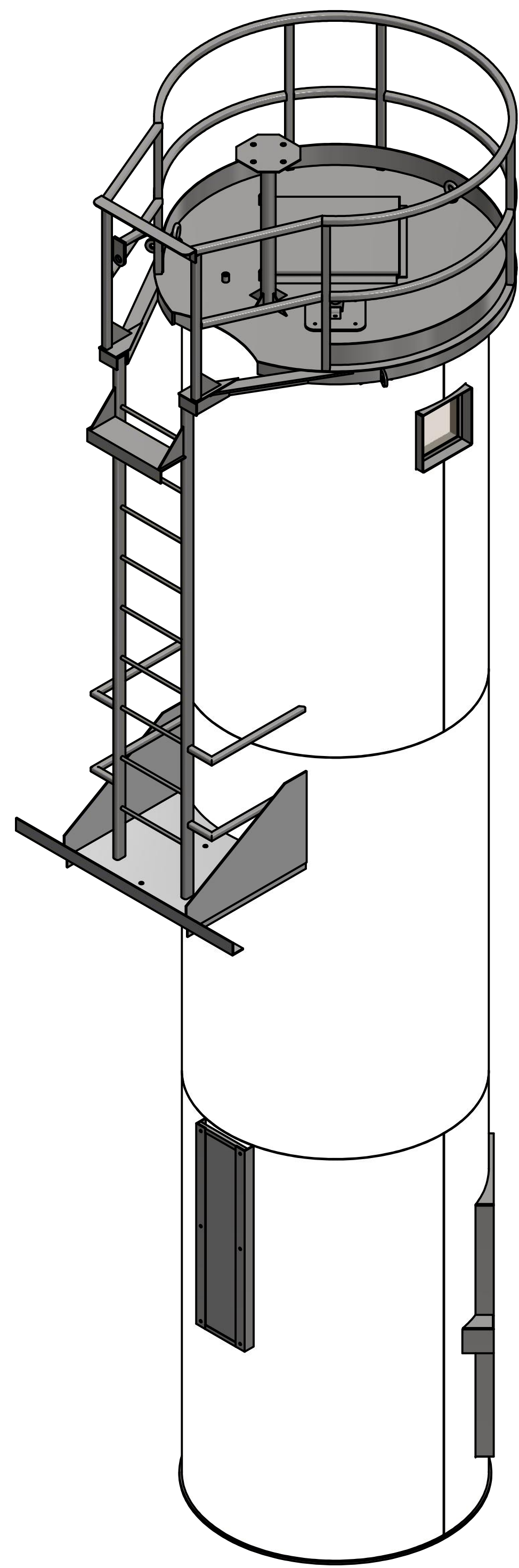


McINTOSH PERRY
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www.mcintoshperry.com

Drawn by: MS
Checked By: MZ
Project Number: CM-19-0531-00

Scale:
Date: 15NOV2019

Client: CANADIAN COAST GUARD			
Project: LAKE NIPISSING - NAVIGATION AID FOUNDATION DESIGN			
Title: SECTION AND DETAILS			
2	Issued for Final Review	09DEC2019	Drawing Number: S2
1	Issued for Review	15NOV2019	
No.	Revision / Issue	Date	

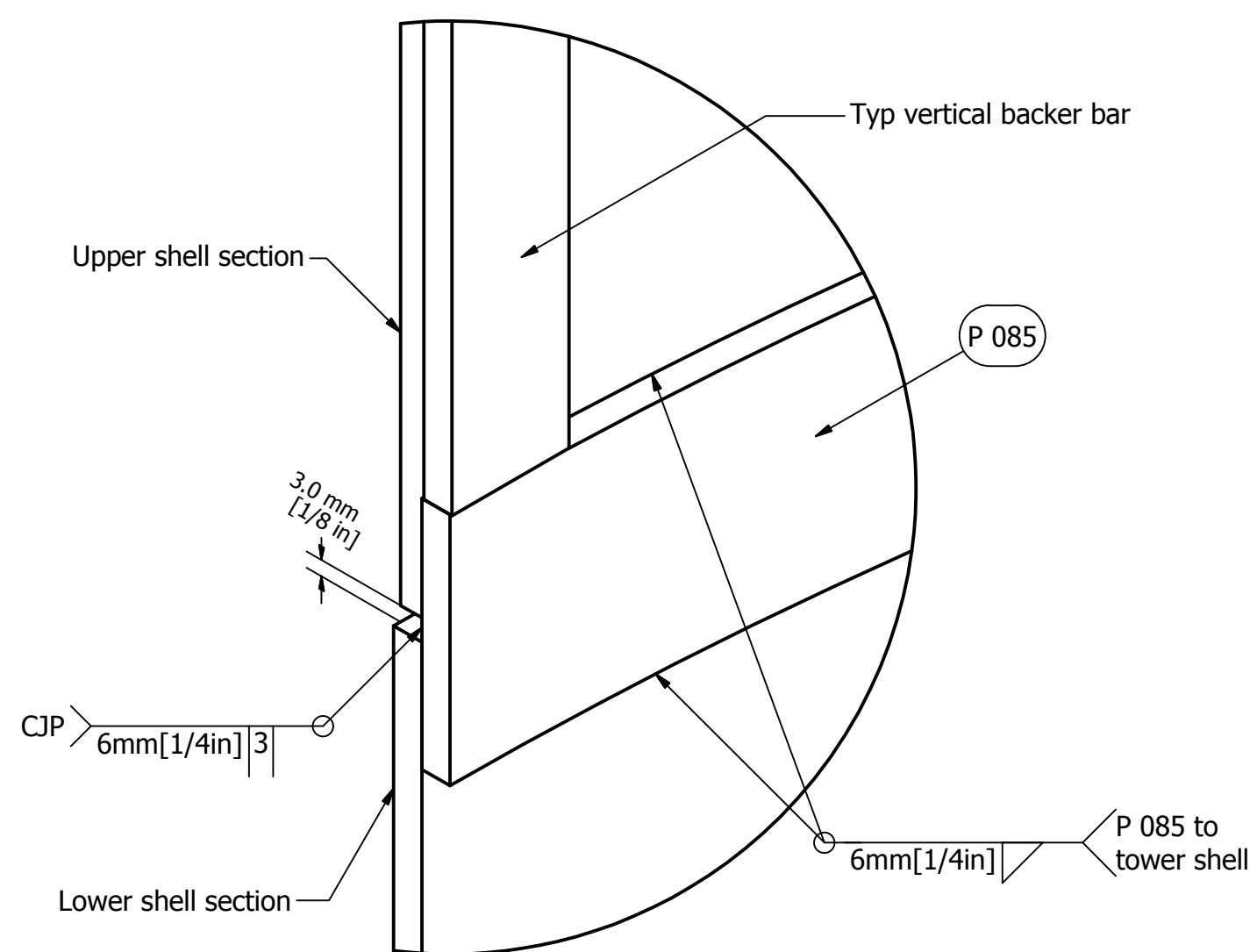


Front Side View

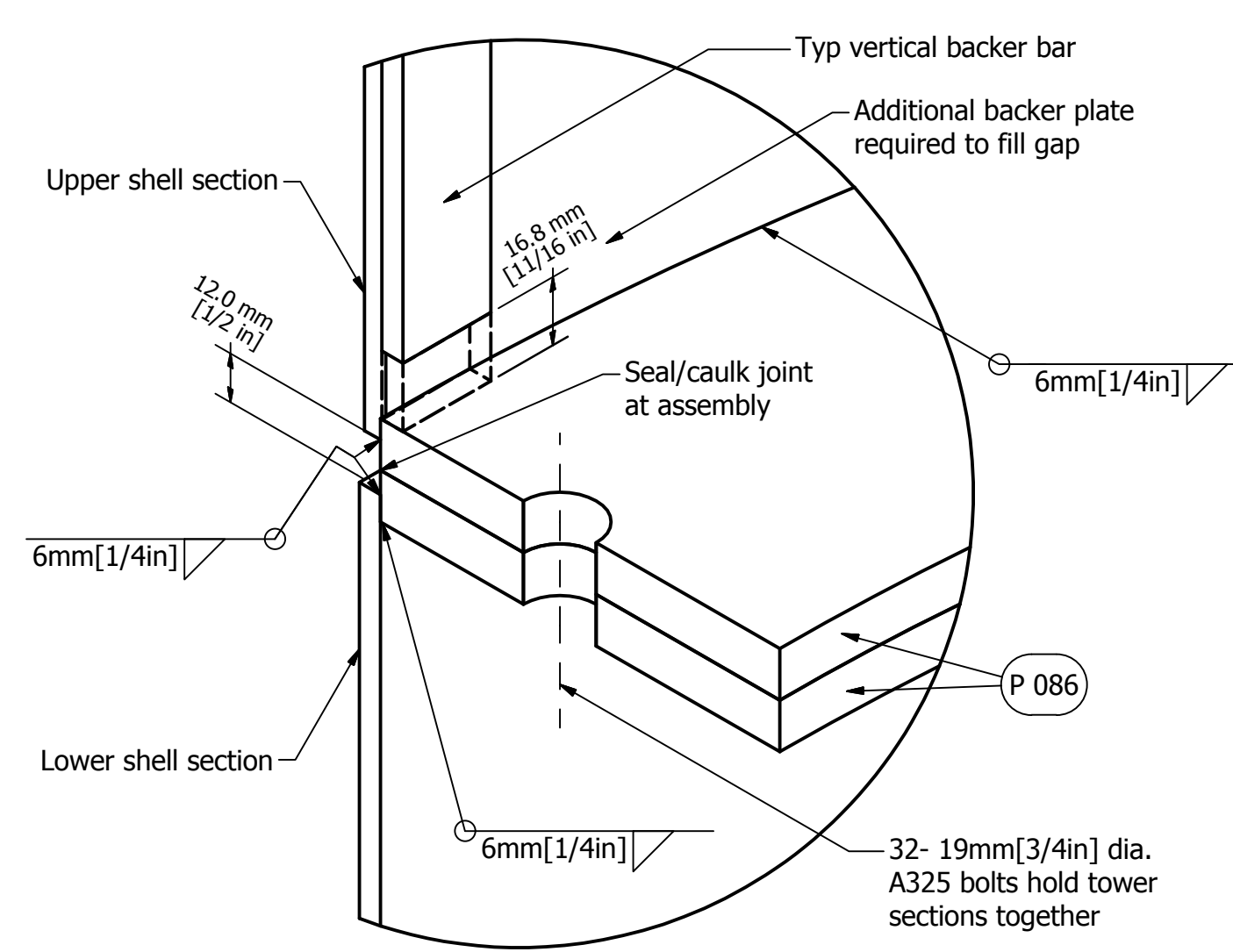
Rear Side View

SECTION D24-D24

Isometric View of Section D24-D24



DETAIL - SEAM
Typ Section Seam Detail



Optional Splice Ring Detail

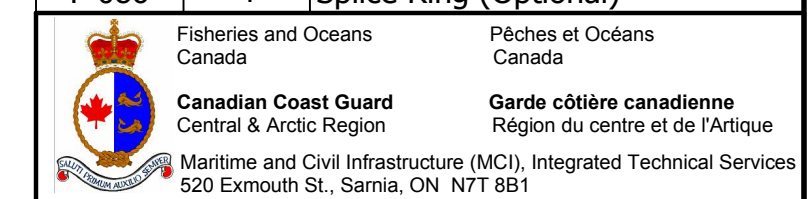
Note: Splice can be utilized in place of the usual backer bar, in situations where erecting the tower in multiple sections is advantageous and/or necessary

Notes:

1. Design Location - Great Lakes, Ontario shore line, from Cornwall to Thunder Bay. Wind design loads include allowance for wind speed up on hill top location (Maximum hill height = 45m).
2. Design shall be in accordance with the National Building Code of Canada. (NBC 2005), NBC 1995 Structural Commentaries (wind) and CSA S16-01.
3. All work to comply with CSA S16-01, NBC 2005 & Canada Labour Code.
4. **Materials**
 - Structural Shapes - CSA G40.21M, Grade 300W.
 - HSS - CSA G40.21M, Grade 350W, CL. C.
 - Plates & Bar - CSA G40.21M Grade 300W.
5. **Welding**
 - Electrodes - E49XX (E70XX).
 - All connections shall be fully welded U.N.O.
 - Fabricator must be certified by CWB to CSA standard W47.1, division 1 or 2.1
 - Shall be in accordance with CSA S16-01, W47 & W59, latest version.
 - Remove all weld splatter, sharp edges & corners
 - Provide 6x50mm [1/4x2in] Backer Bar on all tower fabricated seams, weld 100% inside.
6. **Galvanization**
 - Tower to be hot dip galvanized
 - Hot dip galvanizing shall conform to CAN/CSA-G164
7. **Bolts**
 - Structural Bolts - ASTM A325 U.N.O.
8. **Paint**
 - Primer - CAN/CGSB-1.40 ALKYD Type.
 - Paint - CAN/CGSB-1.60 ALKYD Enamel or High Build Mastic Epoxy or Polyurethane.
 - Apply in accordance with CGSB 85-GP-14M.
9. **Fall Protection**
 - Supply and install DBI-SALA "LAD-SAF" system in accordance with manufacturer's instructions.
 - Installation must allow for simultaneous use by two personnel.
 - D-Ring Anchorage - DBI SALA D-Ring Anchorage Connector, Stainless Steel D-Ring, Stainless Steel Anchorage Plate with 9/16in Dia. mounting holes.
 - 9.5mm [3/8 in] doubler Plate to be installed as shown.
10. **Manufacturing Tolerance**
 - Maximum out of roundness of 1% on diameter, $D_{max} - D_{min} = 0.6in$.

Canadian Coast Guard 24' Claymar Tower With Daymark Attachment

PARTS LIST		
ITEM	QTY	DESCRIPTION
A 001	1	Bottom Assembly
A 002	1	8' Middle Assembly
A 004b	1	Top Assembly
P 085	2	Backer Bar
P 086	4	Splice Ring (Optional)



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

Cover Page					
FILE No.	06044	SCALE:	N.T.S.	DWG No.:	1 of 22
Rv.	DATE	DESCRIPTION	DRAWN	APP'D	
0	N/A	DRAWING INITIATED	A.W.	A.W.	
1	8 Mar 13	UPDATED DRAWINGS BASED ON GLOS REVISIONS	E.G.	B.Y.	
2	26 Apr 13	TOWER DRAWING COMPLETED	E.G.	B.Y.	
3	5 Nov 13	REDESIGNED COVER PAGE AND SPLICE DETAILS	G.L.	B.Y.	

All Dimensions in mm unless otherwise noted.



GLOS ASSOCIATES INC.
3535 North Service Road East, Windsor, Ontario
NBW 5R7
TEL: (519) 946-6750
FAX: (519) 946-6753
ISO 9001:2000 REGISTERED PROJECT: 06044

Notes

- DESIGN LOCATION - GREAT LAKES, ONTARIO SHORE LINE, FROM CORNHALL TO THUNDER BAY. WIND DESIGN LOADS INCLUDE ALLOWANCE FOR WIND SPEED UP ON HILL TOP LOCATION (MAXIMUM HILL HEIGHT 45m.)
- DESIGN SHALL BE IN ACCORDANCE WITH THE NATIONAL BUILDING CODE OF CANADA (NBC 2005), NBC 1995 STRUCTURAL COMMENTARIES (WIND) AND CSA 516-01.
- ALL WORK TO COMPLY WITH CSA 516-01, NBC 2005 & CANADA LABOUR CODE

- 4/ MATERIALS
- STRUCTURAL SHAPES - CSA G40.21M GRADE 300H
 - HSS - CSA G40.21M, GRADE 350M, CL. C
 - PLATES & BARS - CSA G40.21M, GRADE 300H
 - GRATING - TYPE 1944, WELDED, 32mm X 5mm (1 1/4" X 3/8")
 - SERRATED BEARING BARS, BAND EDGES, HOT DIPPED GALVANIZED FINISH.
 - PIPE - ASTM A53

- 5/ WELDING
- ELECTRODES: E60XX (E70XX)
 - ALL CONNECTIONS SHALL BE FULLY WELDED UNO.
 - SHALL BE IN ACCORDANCE WITH CSA 516-01, PART 4 AND W89, LATEST EDITION
 - REMOVE ALL WELD SPATTER SHARP EDGES & CORNERS.
 - PROVIDE 6x50 (1/4x2) BACKER BAR ON ALL TOWER FABRICATED PLATE SEAMS WELD 100% INSIDE.

- 6/ BOLTS
- STRUCTURAL BOLTS - ASTM A325 UNO.
 - SECONDARY CONNECTIONS - SAE J429, GRADE 5

- 7/ PAINT
- PRIMER: CAN/CGSB-140 ALKYD TYPE
 - PAINT: CAN/CGSB-160 ALKYD ENAMEL OR HIGH BUILD PASTIC EPOXY OR POLYURETHANE
 - APPLY IN ACCORDANCE WITH CGSB B5-GP-14P1.

- 8/ FALL PROTECTION
- PROVIDE FALL PROTECTION IN ACCORDANCE WITH CANADA OCCUPATIONAL HEALTH AND SAFETY REGULATIONS SECTION 12.10
 - SYSTEM HAS A MAXIMUM CAPACITY OF TWO USERS (1 USER + 1 RESCUER) WITH A MAXIMUM COMBINED HEIGHT OF 1.4 m (315 lbs) PER USER INCLUDING TOOLS AND EQUIPMENT
 - PROVIDE CAPACITY SIGNAGE AT BASE OF LADDER.

- 9/ FOUNDATIONS
- PROVIDE DETAILED FOUNDATION DESIGN FOR INDIVIDUAL LOCATIONS
 - CONCRETE - 25 MPa MINIMUM
 - ANCHOR RODS - CSA G40.21M GR. 300H
 - GROUT - SIKKA F1-BED STANDARD OR EQUAL

- 10/ MANUFACTURING TOLERANCE
- MAXIMUM OUT OF ROUNDNESS OF IS ON DIAMETER, $D_w - D_m = \pm 0.6$

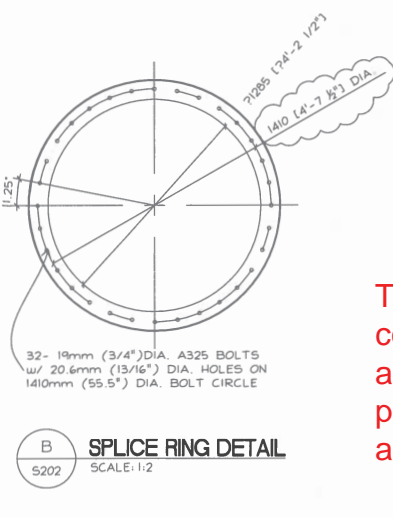
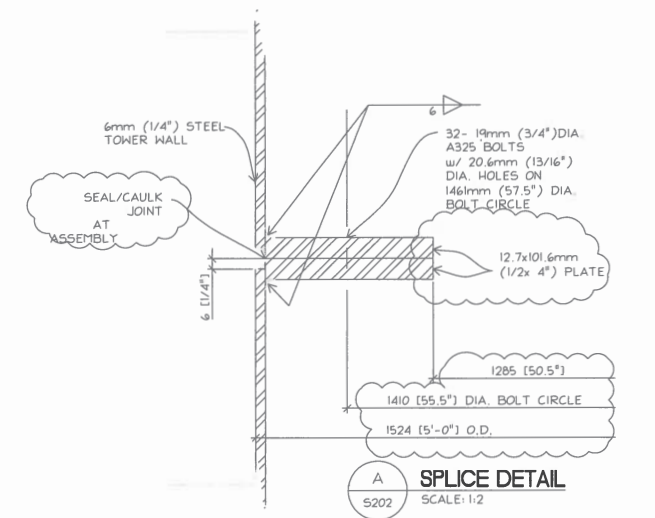
Revision	Date	By	Description
01	MAR 28/08	GLOS	MINOR REVISIONS AS NOTED

FACILITIES ENGINEERING AND CONSTRUCTION
FACILITES INGENIERIE ET CONSTRUCTION

project title
1524m (5'-0") DIA CLAYMAR TOWER

drawing title
MODULAR TOWER SECTIONS FOR HELICOPTER LIFTS

date - date	drawn - dessiné	checked - vérifié	approved - approuvé
04/05/2006	AS/AG/DP	DL	
scale - échelle	reference - référence	drawing no. - no du dessin	sheet / feuille
AS NOTED		S202	1



This drawing is to be considered a reference only and is provided for the purposes of communicating anticipated weights.

TOWER HEIGHT	6' TOP SECTION		8' TOP SECTION		INTERMEDIATE w/ LOWER DAYMARK PLATFORM		INTERMEDIATE w/ LOWER DAYMARK PLATFORM		4' INTERMEDIATE		8' INTERMEDIATE		6' BASE		8' BASE		TOTAL WEIGHT		
	(m)	(ft)	(kN)	(lbs)	(kN)	(lbs)	(kN)	(lbs)	(kN)	(lbs)	(kN)	(lbs)	(kN)	(lbs)	(kN)	(lbs)	(kN)	(lbs)	
3.658	12	9.0	2,030	-	-	-	-	-	-	-	-	-	-	6.9	1,550	-	-	15.9	3,580
4.877	16	-	-	10.6	2,380	-	-	-	-	-	-	-	-	-	-	8.9	2,000	19.5	4,380
6.096	20	-	-	10.6	2,380	5.1	1,150	-	-	-	-	-	-	-	-	8.9	2,000	24.6	5,530
7.315	24	-	-	10.6	2,380	-	-	7.9	1,785	-	-	-	-	-	-	8.9	2,000	27.4	6,165
8.534	28	-	-	10.6	2,380	-	-	7.9	1,785	4.0	900	-	-	-	-	8.9	2,000	31.4	7,065
9.754	32	-	-	10.6	2,380	-	-	7.9	1,785	4.0	900	7.1	1,595	-	-	8.9	2,000	34.5	7,760
10.973	36	-	-	10.6	2,380	-	-	7.9	1,785	4.0	900	7.1	1,595	-	-	8.9	2,000	38.5	8,660
12.192	40	-	-	10.6	2,380	-	-	7.9	1,785	-	-	7.1	1,595	-	-	8.9	2,000	41.6	9,355

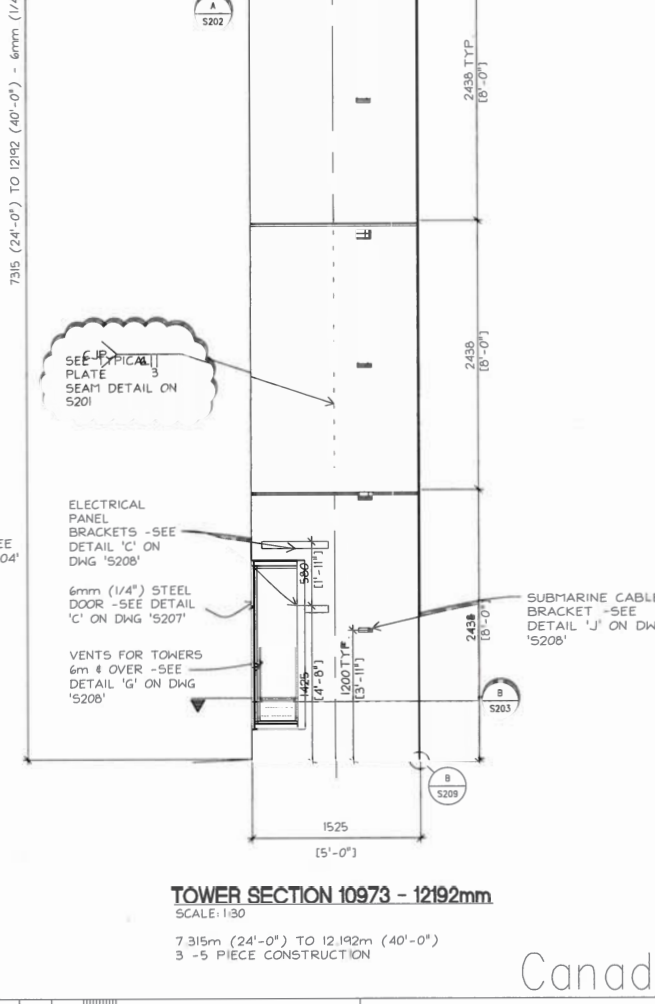
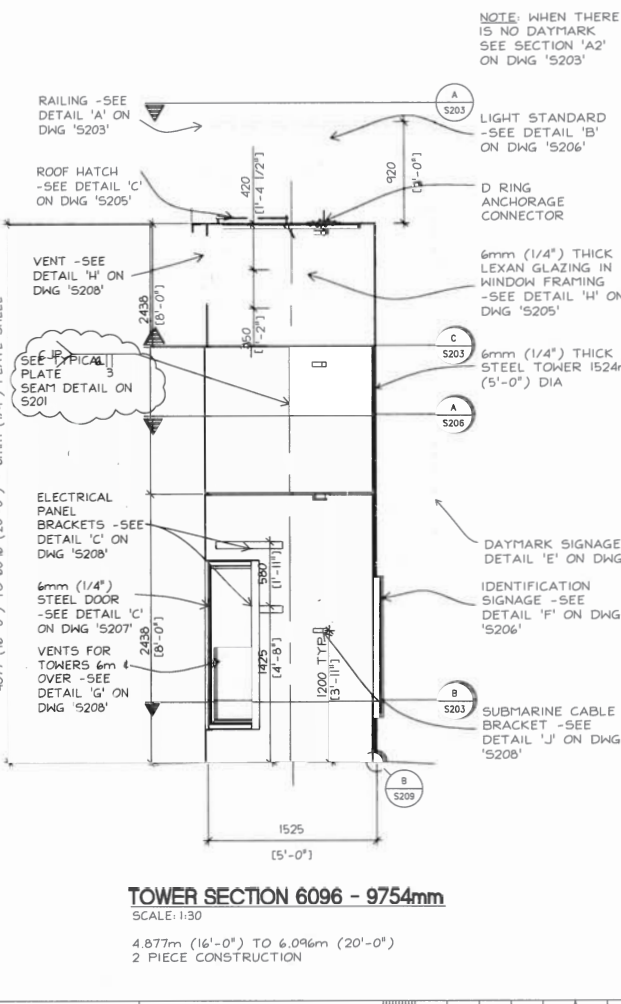
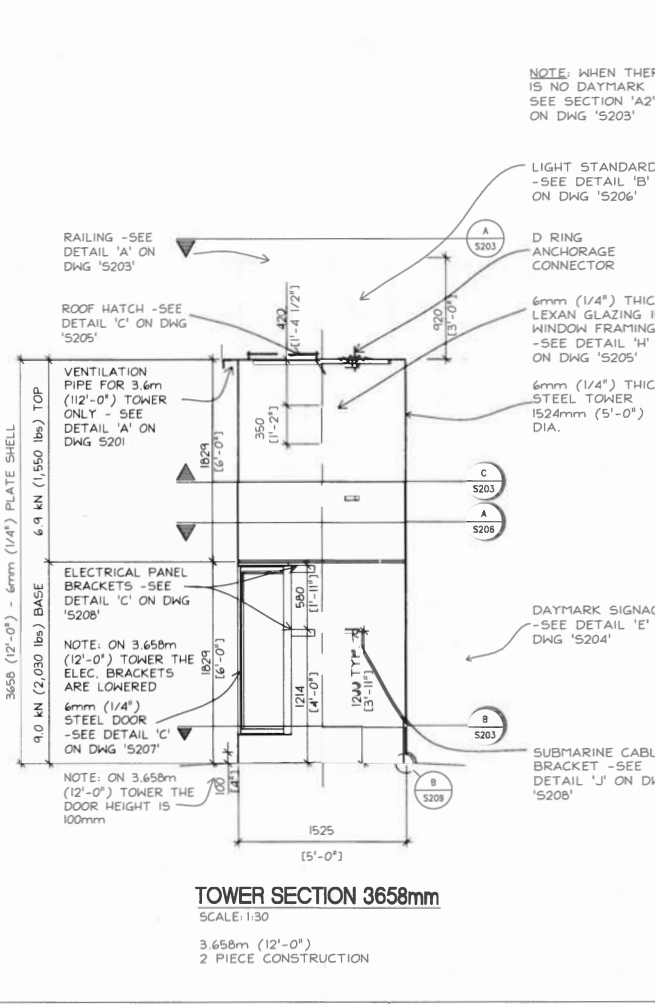
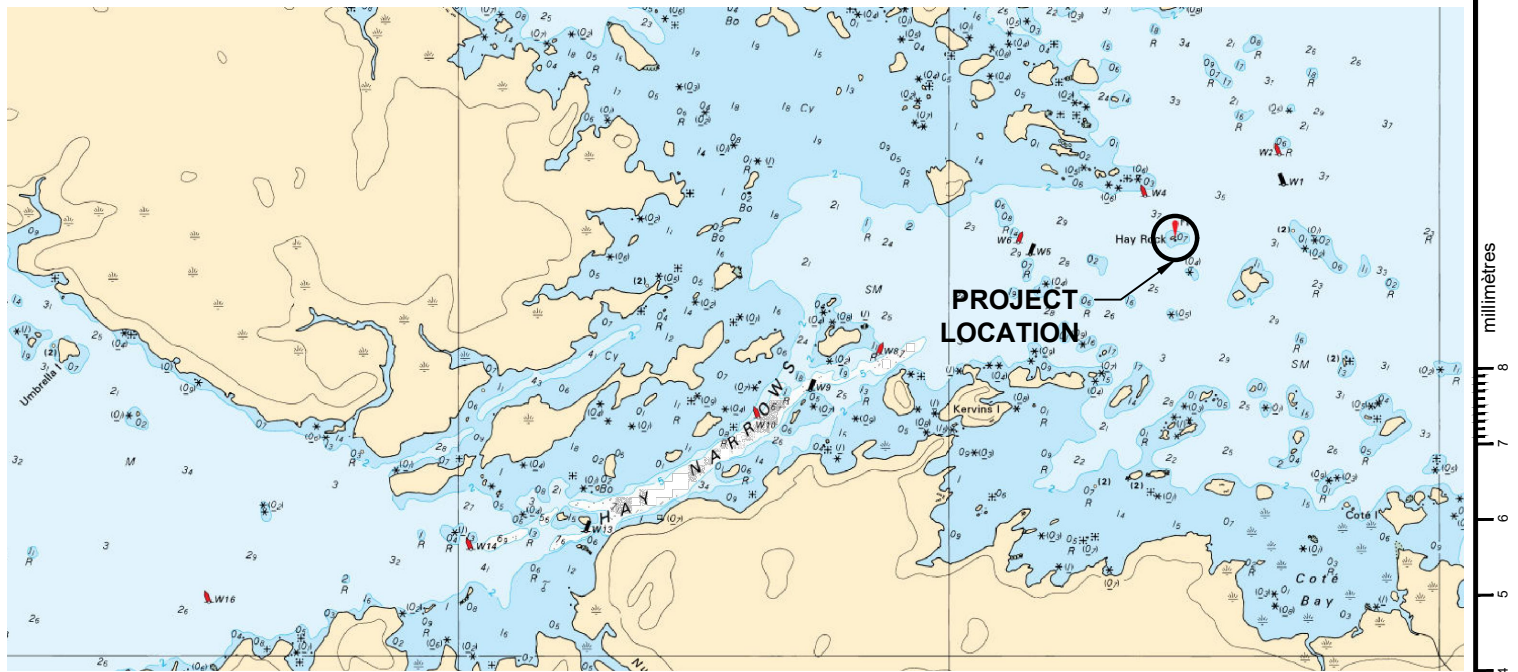
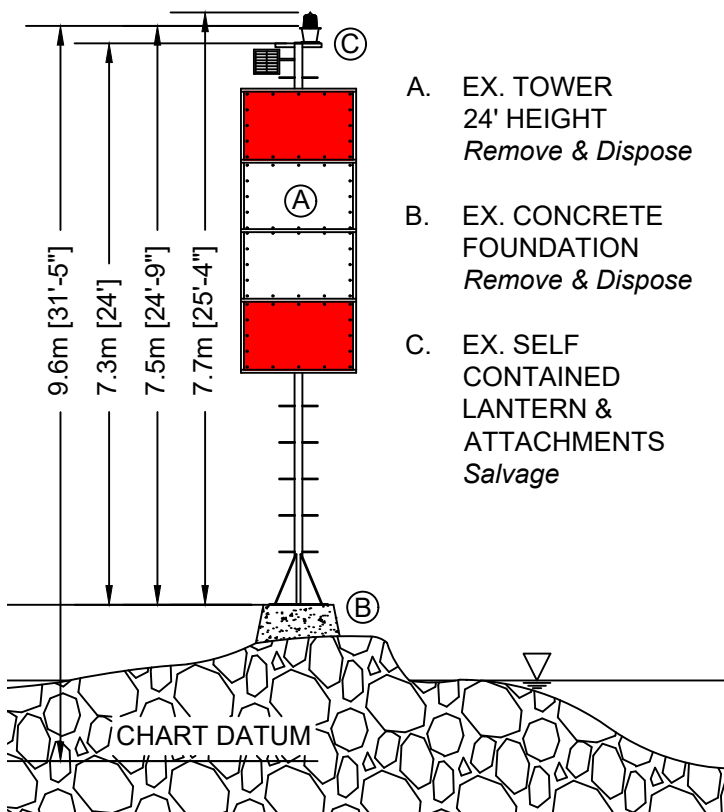


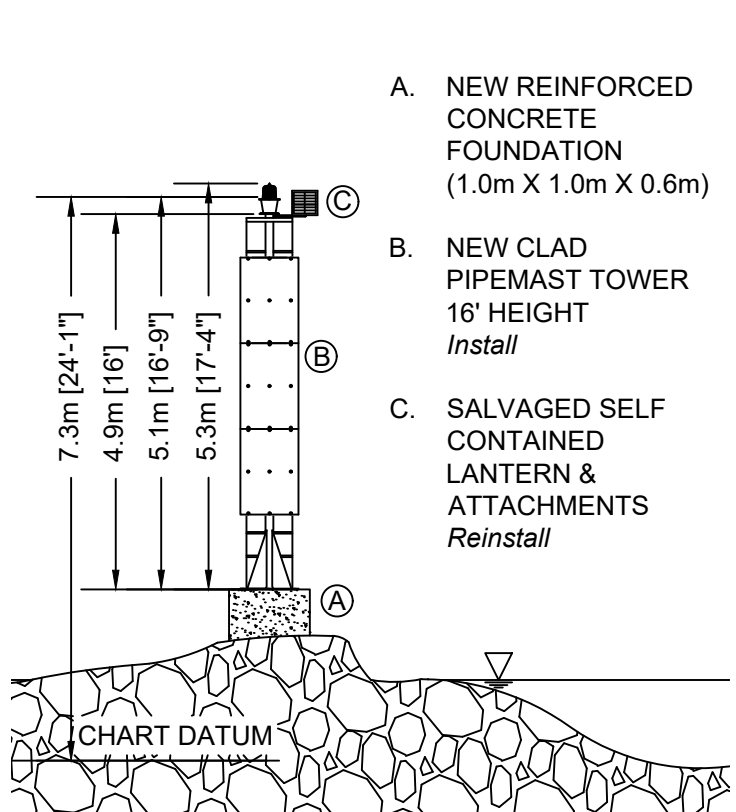
CHART 6037



EXISTING AID



PROPOSED AID



NOTES:

1. NEW TOWER TO BE PLACED PRIOR TO REMOVAL OF EXISTING TOWER TO REDUCE DOWN TIME. THE LOCATION OF THE NEW TOWER WILL BE DECIDED BASED ON HOW FLAT THE ROCK IS AND BY THE PROXIMITY TO THE EXISTING TOWER.

Fisheries and Oceans Canada Canadian Coast Guard	Pêches et Océans Canada Garde côtière Canadienne

Asset - Actif LL1437 HAY ROCK
Drawing - Dessin PROPOSED REPLACEMENT

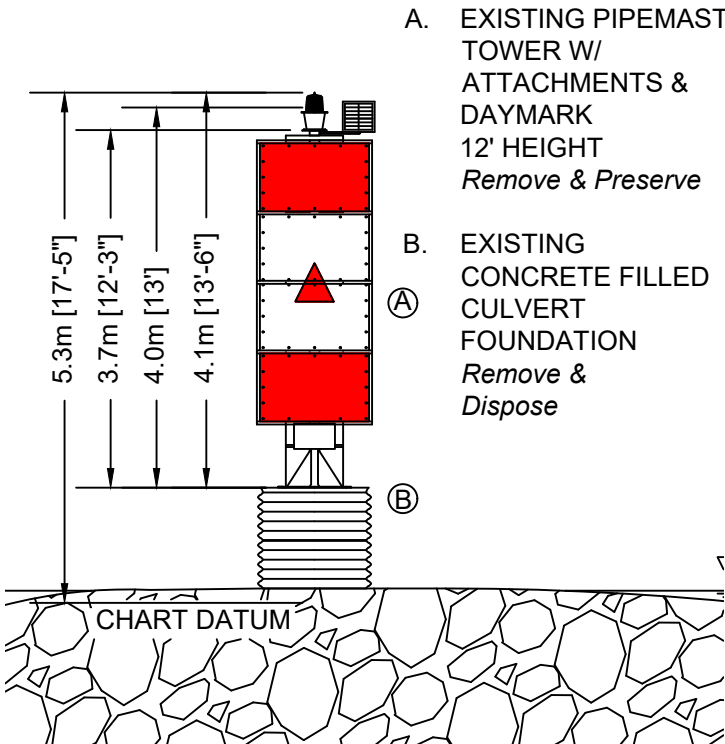
designed - conception M. FINNISON	date 2020-03-02
approved - approuvé	date YYYY-MM-DD
drawing no. - no. dessin CM-1437000-1	sheet-feuille 01/01
	rev 0

CHART 6037

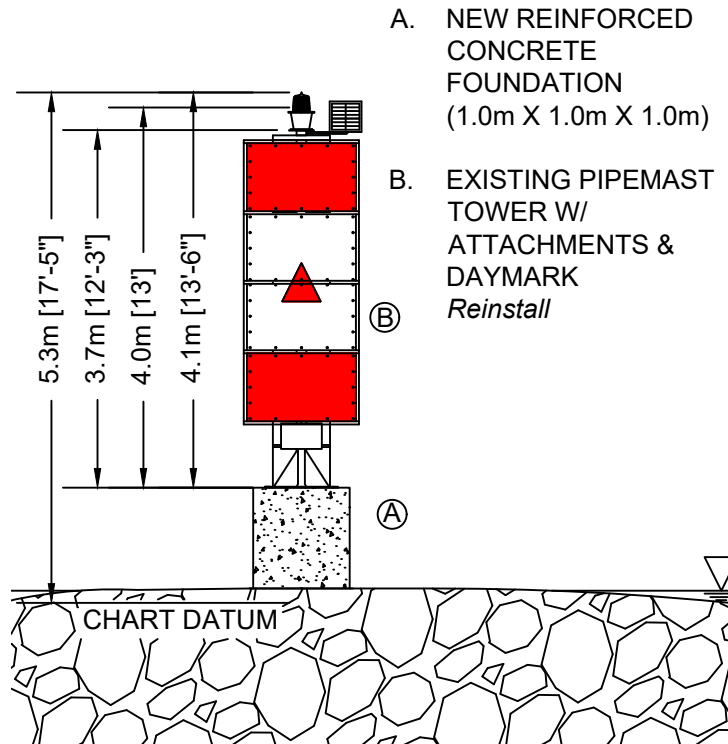


EXISTING AID

PROPOSED AID



- A. EXISTING PIPEMAST TOWER W/ ATTACHMENTS & DAYMARK 12' HEIGHT *Remove & Preserve*
- B. EXISTING CONCRETE FILLED CULVERT FOUNDATION *Remove & Dispose*



- A. NEW REINFORCED CONCRETE FOUNDATION (1.0m X 1.0m X 1.0m)
- B. EXISTING PIPEMAST TOWER W/ ATTACHMENTS & DAYMARK *Reinstall*

NOTES:

1. NEW FOUNDATION TO BE PLACED PRIOR TO REMOVAL OF EXISTING TOWER TO REDUCE DOWN TIME. THE LOCATION OF THE NEW TOWER WILL BE DECIDED BASED ON HOW FLAT THE ROCK IS AND BY THE PROXIMITY TO THE EXISTING TOWER.

Fisheries and Oceans Canada Canadian Coast Guard	Pêches et Océans Canada Garde côtière Canadienne

Asset - Actif	LL1438 HARDWOOD ISLANDS
Drawing - Dessin	PROPOSED REPLACEMENT

designed - conception	M. FINNISON	date	2020-03-12
approved - approuvé		date	YYYY-MM-DD
drawing no. - no. dessin	CM-1438000-1	sheet-feuille	01/01
		rev	0

CONCRETE & EPOXY

FORMS MAY EITHER BE KEPT DE-WATERED OR CONTAIN STANDING WATER DURING CONSTRUCTION, PROVIDED REQUIREMENTS FOR EACH CASE ARE MET AS FOLLOWS:

IF INSIDE OF FORM IS KEPT DE-WATERED AND DRY DURING PLACEMENT OF REINFORCING AND POURING OF CONCRETE, CONCRETE MAY BE POURED IN CONVENTIONAL MANNER (CHUTE). ENSURE DRILLED HOLES ARE FREE OF STANDING WATER WHEN EPOXYING THE VERTICAL REBAR.

IF INSIDE OF FORM IS NOT KEPT DEWATERED AND WILL HAVE STANDING WATER DURING PLACEMENT OF REINFORCING AND POURING OF CONCRETE, THEN A TEMPLATE FOR DRILLING THE HOLES FOR THE VERTICAL BARS SHALL BE USED. ALSO, THE CONCRETE SHALL BE PLACED USING THE TREMIE METHOD, AND THE MIX DESIGN TO HAVE ANTI-WASH ADDITIVE.

IN GENERAL, CONTRACTOR SHALL BE EXPERIENCED IN PLACING EPOXYED REBAR IN WET OR SUBMERGED CONDITIONS AS REQUIRED.

CONFORM TO CSA STANDARDS CAN3-A23.1-A23.3 AND THEIR SUPPLEMENTS.

TOLERANCES: CONFORM TO CSA STANDARD CAN3-A23.1

PORTLAND CEMENT WATER AND AGGREGATES TO CONFORM TO CSA A23.1 AND CAN3-A5.

AIR ENTRAINMENT ADMIXTURE: TO CSA STANDARD A266.1.

CHEMICAL ADMIXTURES: TO CSA STANDARD A266.2.

CURING/SEALING COMPOUND: TO ASTM C309.

ALL REINFORCING STEEL SHALL BE GRADE 400 MPa, CSA G30.18, EPOXY COATED.

INSTALL EPOXY ADHESIVE IN CONFORMANCE WITH MANUFACTURER'S INSTRUCTIONS. EPOXY ADHESIVE TO BE HILTI HIT-RE 500 V3.

USE VIBRATORS FOR PLACEMENT OF CONCRETE.

FOR READY-MIX CONCRETE THE MAXIMUM TIME PERMITTED BETWEEN CHARGING THE MIXER AND FINAL DEPOSIT IS 90 MINUTES. THERE IS NO TOLERANCE FOR ADDITIONAL TIME SPANS UNLESS A CONCRETE RETARDER IS USED.

EXPOSED CONCRETE SHALL BE FREE FROM HONEYCOMBING, VOIDS, LOSS OF FINES, VISIBLE FLOW LINES AND COLD JOINTS, CHIPS AND SPALLS.

PROTECT FRESH CONCRETE FROM PREMATURE DRYING, SUNSHINE, EXCESSIVELY HOT OR COLD TEMPERATURES AND MECHANICAL INJURY, MAINTAIN AT A RELATIVELY CONSTANT TEMPERATURE FOR AS LONG AS REQUIRED FOR HYDRATION OF THE CEMENT AND CURING OF THE CONCRETE.

SUPPLEMENTAL ADMIXTURES IMPACTING PLASTIC AND HARDENED PERFORMANCE SHALL BE SUBJECT TO APPROVAL OF COAST GUARD.

PLACEMENT OF REINFORCEMENT TO BE CONFIRMED BY COAST GUARD PRIOR TO CONCRETE PLACEMENT.

CONTRACTOR TO PROVIDE CONCRETE TESTING FOR 7 DAY AND 28 DAY COMPRESSIVE STRENGTH. ALSO PROVIDE TESTING FOR SLUMP AND AIR CONTENT. TESTING REPORTS TO BE SUBMITTED TO COAST GUARD FOR REVIEW.

TOWER SHALL NOT BE ERECTED UNTIL CONCRETE TESTING INDICATES AT LEAST 75% OF 28 DAY COMPRESSIVE STRENGTH

REFER TO COAST GUARD SPECIFICATIONS FOR FURTHER CONCRETE REQUIREMENTS

CLASS OF CONCRETE

PROVIDE NORMAL DENSITY CONCRETE TO ACHIEVE THE FOLLOWING PROPERTIES:

- CLASS OF EXPOSURE: C-1
- CEMENT TYPE: 10
- MINIMUM COMPRESSIVE STRENGTH: 5076psi (35MPa)
- MAXIMUM WATER CEMENT RATIO: 0.50
- AIR ENTRAINMENT: 5%-8%
- NOMINAL SIZE OF COURSE AGGREGATE: 3/4" (20MM)
- SLUMP AT 3" ±1" (75MM ±25MM)
- CURING REGIME TYPE: 2, (7 DAYS TOTAL AT >10°C)

SUBMITTALS

CONTRACTOR SHALL SUBMIT A SUMMARY OF CONCRETE PROPERTIES WITH CONSTRUCTION PLAN. SUBMIT TO COAST GUARD FOR REVIEW.

SUBMIT REBAR SHOP DRAWINGS FOR COAST GUARD REVIEW

FORMWORK AND FALSEWORK SHALL BE AS DETAILED IN APPROVED CONSTRUCTION PLAN. FOR DE-WATERED INSTALLATION, THE CONSTRUCTION PLAN SHALL SHOW ENGINEERED METHOD OF KEEPING WATER OUT OF THE FORM, EITHER WITH CAISSON AROUND FORM, OR USING THE FORM ITSELF.

CURING SHALL BE COMPLETED IN ACCORDANCE WITH APPROVED CONSTRUCTION PLAN

ANY ALTERNATE PRODUCTS OR PROCEDURES MUST BE APPROVED BY THE COAST GUARD

BEDROCK

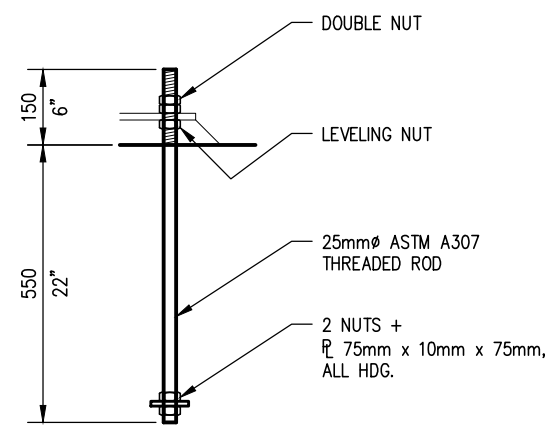
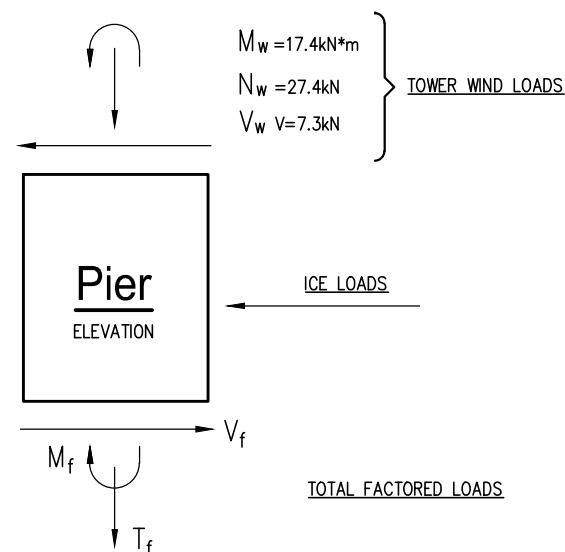
VERTICAL REBAR SHALL BE EMBEDDED IN COMPETENT BEDROCK HAVING A MINIMUM COMPRESSIVE STRENGTH OF 5076 psi (35 MPa). SUITABILITY OF BEDROCK TO EITHER BE VERIFIED BY A GEOTECHNICAL ENGINEER, OR APPROVED BY COAST GUARD PERSONNEL.

DESIGN LOAD NOTES

TOWER WIND LOADS: WIND TOWER LOADS AS PROVIDED BY CANADIAN COAST GUARD, AND ARE SHOWN FACTORED

ICE LOADS: ICE LOADS HAVE BEEN DETERMINED IN ACCORDANCE WITH THE CANADIAN HIGHWAY BRIDGE DESIGN CODE CAN/CSA-S6.

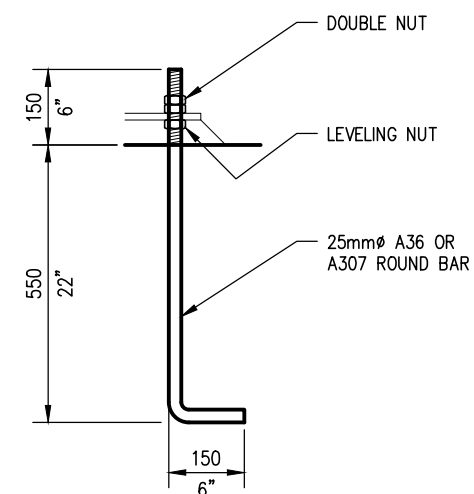
TOTAL FACTORED LOADS: FOR TOTAL FACTORED DESIGN FORCES AND MOMENTS ON BASE OF PIER, SEE DWGS. s2.0 AND s3.0 AS APPLICABLE.



* ALL COMPONENTS HOT DIP GALVANIZED.

Typ. Anchor Bolt Detail

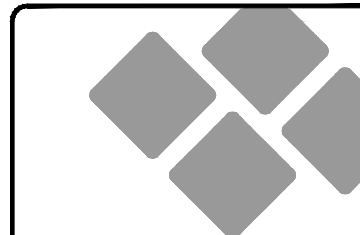
SCALE: 1:15



* ALL COMPONENTS HOT DIP GALVANIZED.

Alternate Anchor Bolt Detail

SCALE: 1:15

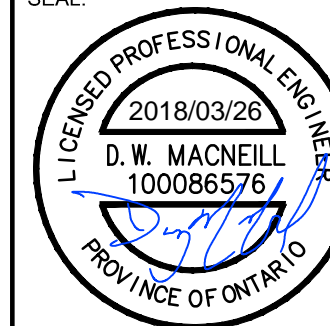


STEM
ENGINEERING GROUP

REVISIONS:

NO.	DESCRIPTION	DATE

SEAL:



CLIENT:

FISHERIES AND OCEANS
CANADIAN COAST GUARD

PROJECT:

FOUNDATION FOR 16'-0"
PIPEMAST NAVIGATION
BEACONS

DRAWING:

GENERAL NOTES
DESIGN LOADS
ANCHOR BOLT DETAIL

SCALE: N.T.S.

PLOT SCALE: 1:1

STEM PROJ. NO: 17266

CAD FILE: 17266 s0.0

FORMAT SIZE: 280mmx432mm

DRAWN: TAB

DESIGNED: DMAC

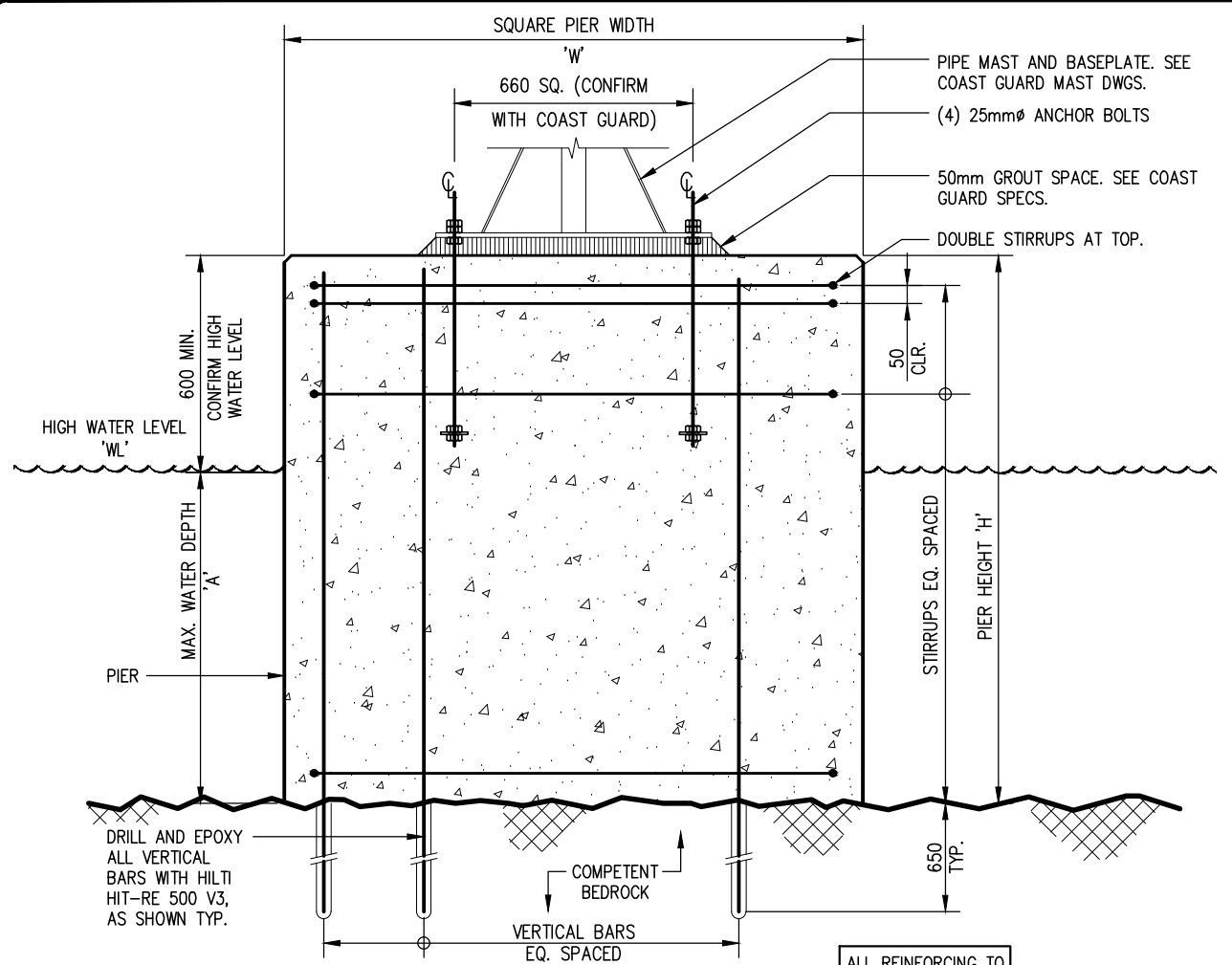
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DATE: 18.03.26

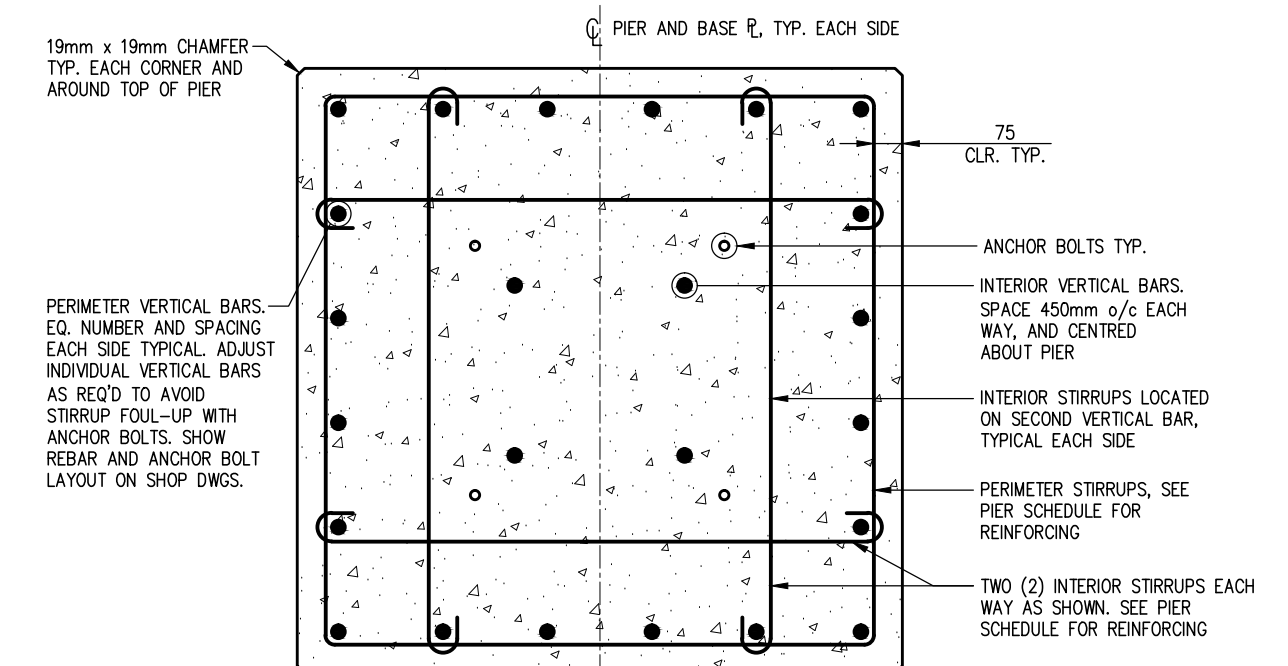
DRAWING:

1 OF 4

s0.0



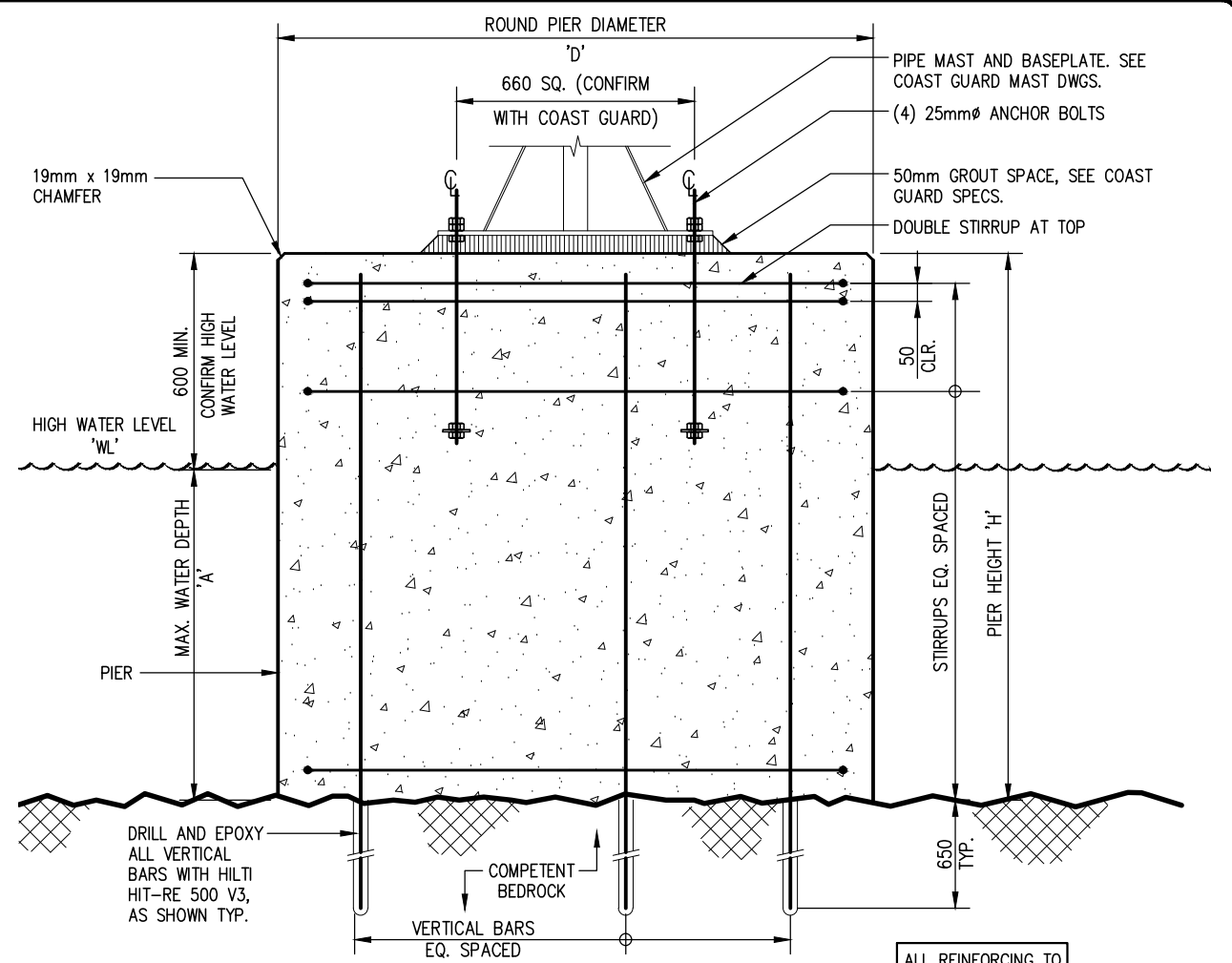
SECTION-VIEW (SQUARE PIER)



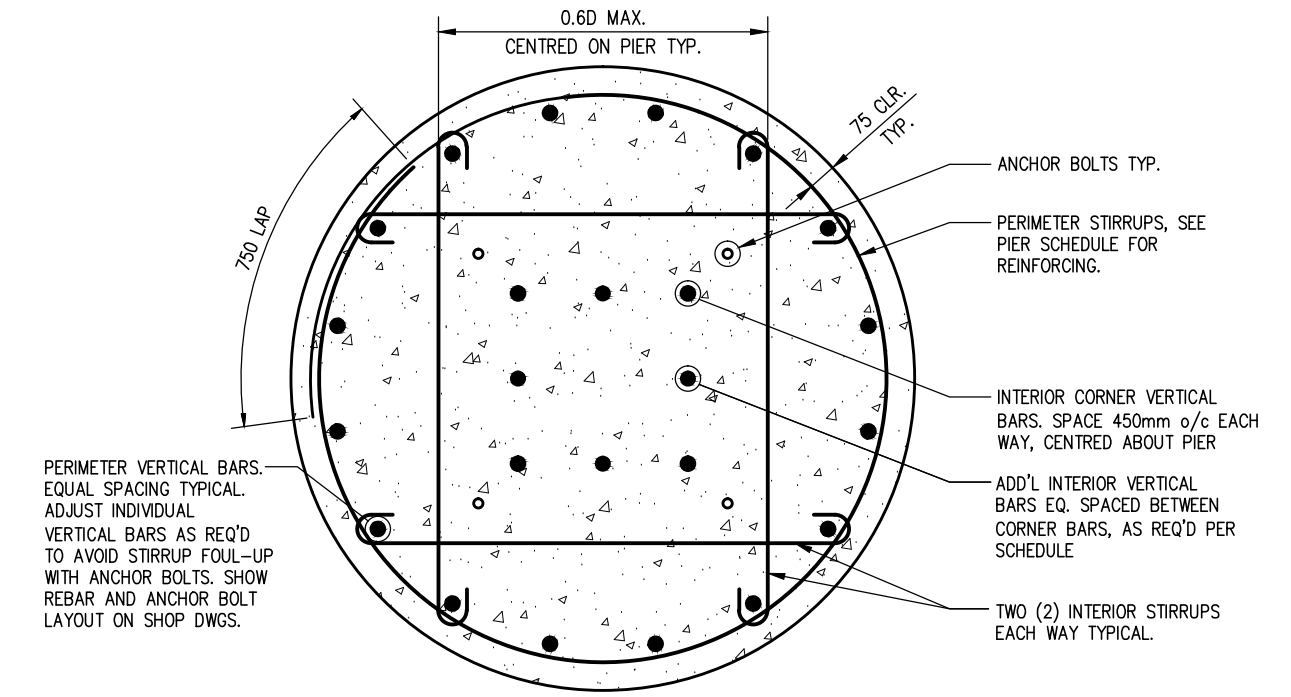
PLAN-VIEW (SQUARE PIER)

4.87m (16') PIPEMAST FOUNDATION PIER

SOUTHERN ONTARIO PIER SCHEDULE, SEE DWG. s2.0.
NORTHERN ONTARIO PIER SCHEDULE, SEE DWG. s3.0.



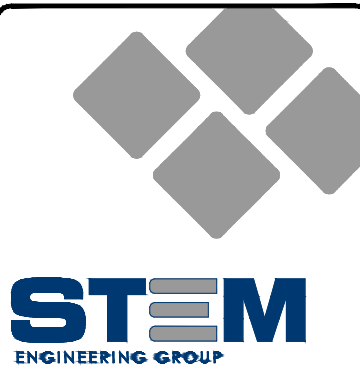
SECTION-VIEW (ROUND PIER)



PLAN-VIEW (ROUND PIER)

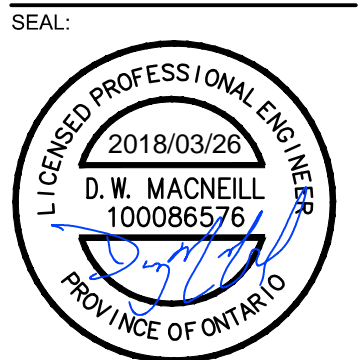
4.87m (16') PIPEMAST FOUNDATION PIER

SOUTHERN ONTARIO PIER SCHEDULE, SEE DWG. s2.0.
NORTHERN ONTARIO PIER SCHEDULE, SEE DWG. s3.0.



REVISIONS:

NO.	DESCRIPTION	DATE

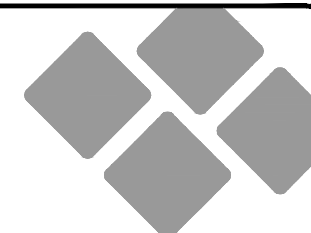


CLIENT:
FISHERIES AND OCEANS
CANADIAN COAST GUARD

PROJECT:
FOUNDATION FOR 16'-0"
PIPEMAST NAVIGATION
BEACONS

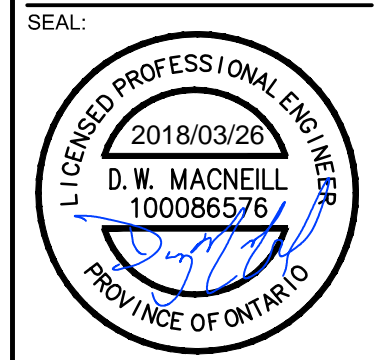
DRAWING:
SQUARE PIER DETAILS
ROUND PIER DETAILS

SCALE:	AS NOTED
PLOT SCALE:	1:1
STEM PROJ. NO:	17266
CAD FILE:	17266 s1.0
FORMAT SIZE:	280mmx432mm
DRAWN:	TAB
DESIGNED:	DMAC
CHECKED:	DMAC
DATE:	18.03.26



STEM
ENGINEERING GROUP

REVISIONS:		
NO.	DESCRIPTION	DATE



CLIENT:
FISHERIES AND OCEANS
CANADIAN COAST GUARD

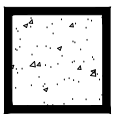
PROJECT:
FOUNDATION FOR 16'-0"
PIPEMAST NAVIGATION
BEACONS

DRAWING:
PIER SCHEDULES
NORTHERN ONTARIO

SCALE: AS NOTED
PLOT SCALE: 1:1
STEM PROJ. NO: 17266
CAD FILE: 17266 s3.0
FORMAT SIZE: 280mmx432mm
DRAWN: TAB
DESIGNED: DMAC
CHECKED: DMAC
DATE: 18.03.26

DRAWING:
4 OF 4 **s3.0**

Square Pier: 'Northern Ontario' Classification: North of Ottawa and Extends to Kenora & Big Woods Lake as the Limit



Freezing Index 3000 F° Deg. Days

Pier Geometry			Pier Reinforcing				Total Factored Ice & Wind Forces on Base of Pier (S6-06 Bridge Code)			
Water Depth 'A' (m)	Pier Height 'H' (m)	Square Pier Width 'W' (m)	Perimeter Vertical Bars Total	Interior Vertical Bars Total	Perimeter Stirrups Typical	Interior Stirrups Typical	Design Ice thickness (mm)	Vf (kN)	Mf (kN-m)	Tf (kN)
0.000	0.600	1.050	8-25M's	0	15M's @300	0	0	9	22	-43
0.305	0.905	1.050	12-25M's	0	15M's @300	0	305	630	114	139
0.610	1.210	1.200	16-30M's	4-30M's	15M's @300	0	610	1433	456	651
0.915	1.515	1.500	20-35M's	4-35M's	15M's @300	15M's @300	832	2438	1237	1233
1.220	1.820	1.800	24-35M's	4-35M's	15M's @300	15M's @300	832	2924	2373	1220
1.525	2.125	1.900	28-35M's	4-35M's	15M's @300	15M's @300	832	3086	3447	1202
1.830	2.430	2.000	32-35M's	4-35M's	15M's @300	15M's @300	832	3248	4619	1180

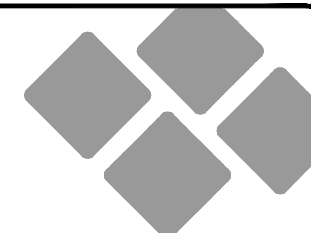
Round Pier: 'Northern Ontario' Classification: North of Ottawa and Extends to Kenora & Big Woods Lake as the Limit



Freezing Index 3000 F° Deg. Days

Pier Geometry			Pier Reinforcing				Total Factored Ice & Wind Forces on Base of Pier (S6-06 Bridge Code)			
Water Depth 'A' (m)	Pier Height 'H' (m)	Round Pier Diameter 'D' (m)	Perimeter Vertical Bars Total	Interior Vertical Bars Total	Perimeter Stirrups Typical	Interior Stirrups Typical	Design Ice thickness (mm)	Vf (kN)	Mf (kN-m)	Tf (kN)
0.000	0.600	1.350	8-25M's	0	15M's @300	0	0	9	22	-48
0.305	0.905	1.350	12-25M's	0	15M's @300	0	305	620	113	137
0.610	1.210	1.350	12-30M's	4-30M's	15M's @300	15M's @300	610	1235	396	651
0.915	1.515	1.650	16-35M's	4-35M's	15M's @300	15M's @300	832	2055	1046	1232
1.220	1.820	1.800	20-35M's	4-35M's	15M's @300	15M's @300	832	2241	1824	1223
1.525	2.125	2.000	24-35M's	6-35M's	15M's @300	15M's @300	832	2490	2785	1207
1.830	2.430	2.000	24-35M's	8-35M's	15M's @300	15M's @300	832	2490	3546	1193

Note: Anchor bolts for Day Beacon Masts will require modified placement from the locations detailed in the STEM foundation drawings.



STEM
ENGINEERING GROUP

REVISIONS:

NO.	DESCRIPTION	DATE

SEAL:



CLIENT:
FISHERIES AND OCEANS
CANADIAN COAST GUARD

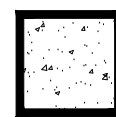
PROJECT:
FOUNDATION FOR 16'-0"
PIPEMAST NAVIGATION
BEACONS

DRAWING:
PIER SCHEDULES
SOUTHERN ONTARIO

SCALE: AS NOTED
PLOT SCALE: 1:1
STEM PROJ. NO: 17266
CAD FILE: 17266 s2.0
FORMAT SIZE: 280mmx432mm
DRAWN: TAB
DESIGNED: DMAC
CHECKED: DMAC
DATE: 18.03.26

DRAWING:
3 OF 4 **s2.0**

Square Pier: 'Southern Ontario' Classification: Ottawa & Huntsville Inclusive and All Areas Extending Southwards



Freezing Index 1800 F° Deg. Days

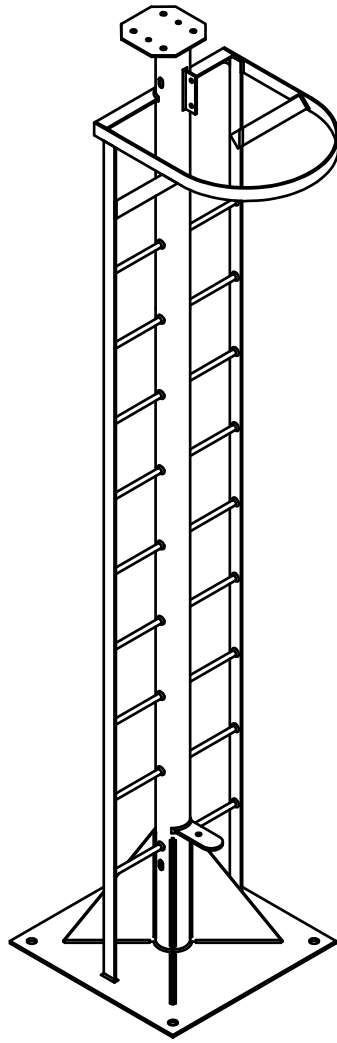
Pier Geometry			Pier Reinforcing				Total Factored Ice & Wind Forces on Base of Pier (S6-06 Bridge Code)			
Water Depth 'A' (m)	Pier Height 'H' (m)	Square Pier Width 'W' (m)	Perimeter Vertical Bars Total	Interior Vertical Bars Total	Perimeter Stirrups Typical	Interior Stirrups Typical	Design Ice thickness (mm)	Vf (kN)	Mf (kN-m)	Tf (kN)
0.000	0.600	1.050	8-25M's	0	15M's @300	0	0	9	22	-43
0.305	0.905	1.050	12-25M's	0	15M's @300	0	305	630	114	139
0.610	1.210	1.200	16-30M's	0	15M's @300	0	610	1433	456	651
0.915	1.515	1.200	12-35M's	4-35M's	15M's @300	0	644	1512	917	724
1.220	1.820	1.400	16-35M's	4-35M's	15M's @300	0	644	1764	1606	715
1.525	2.125	1.600	20-35M's	4-35M's	15M's @300	15M's @300	644	2015	2447	698
1.830	2.430	1.800	24-35M's	4-35M's	15M's @300	15M's @300	644	2266	3442	674

Round Pier: 'Southern Ontario' Classification: Ottawa & Huntsville Inclusive and All Areas Extending Southwards

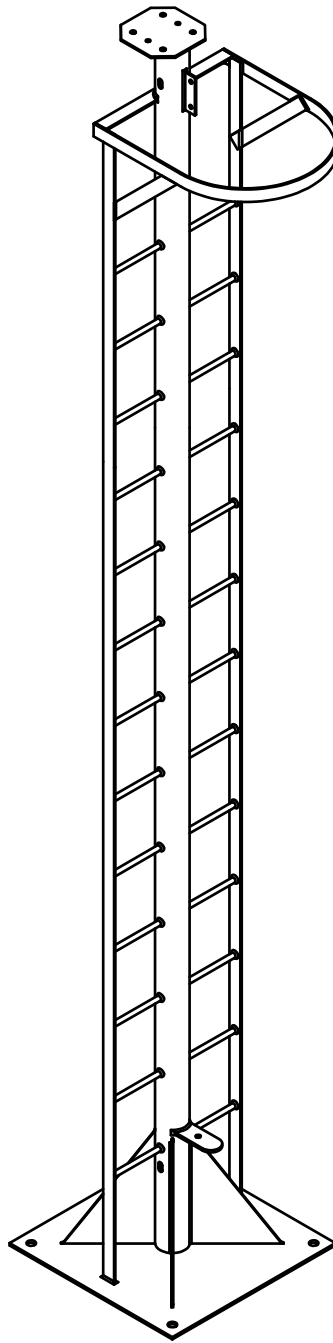


Freezing Index 1800 F° Deg. Days

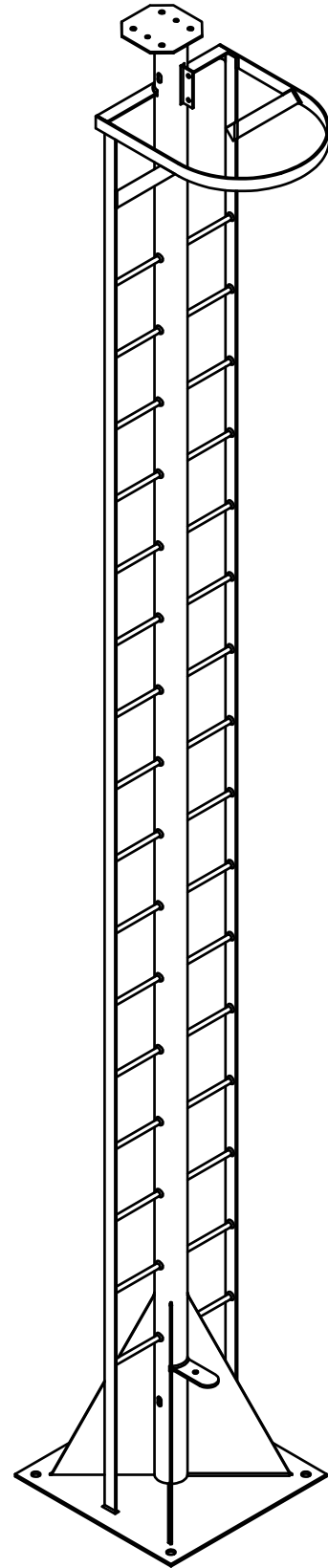
Pier Geometry			Pier Reinforcing				Total Factored Ice & Wind Forces on Base of Pier (S6-06 Bridge Code)			
Water Depth 'A' (m)	Pier Height 'H' (m)	Round Pier Diameter 'D' (m)	Perimeter Vertical Bars Total	Interior Vertical Bars Total	Perimeter Stirrups Typical	Interior Stirrups Typical	Design Ice thickness (mm)	Vf (kN)	Mf (kN-m)	Tf (kN)
0.000	0.600	1.350	8-25M's	0	15M's @300	0	0	9	22	-48
0.305	0.905	1.350	12-25M's	0	15M's @300	0	305	620	113	137
0.610	1.210	1.350	12-30M's	4-30M's	15M's @300	15M's @300	610	1235	396	651
0.915	1.515	1.500	12-35M's	4-35M's	15M's @300	15M's @300	644	1449	879	724
1.220	1.820	1.500	16-35M's	4-35M's	15M's @300	15M's @300	644	1449	1323	716
1.525	2.125	1.650	18-35M's	4-35M's	15M's @300	15M's @300	644	1593	1940	704
1.830	2.430	1.800	20-35M's	4-35M's	15M's @300	15M's @300	644	1737	2645	688



12' PIPEMAST




16' PIPEMAST



20' PIPEMAST

inches 0 1 2 3 4

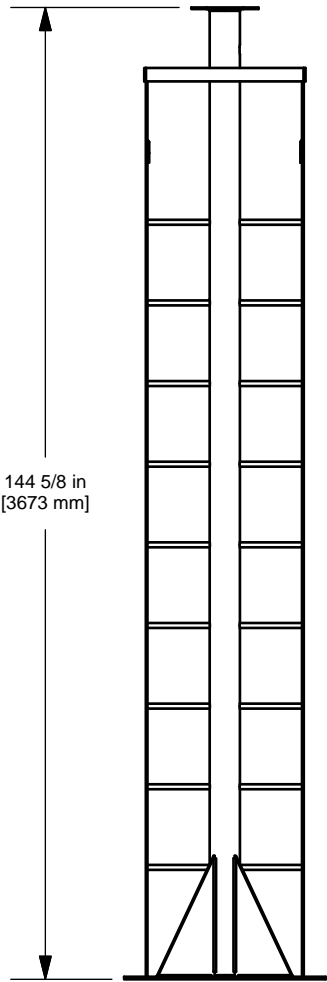
millimeters 0 1 2 3 4 5 6 7 8

 Fisheries and Oceans Canada Canadian Coast Guard	Pêches et Océans Canada Garde côtière Canadienne	Asset - Actif	designed - conception	date
		12', 16', AND 20' PIPEMASTS		BH
Drawing - Dessin	approved - approuvé			date
CCG ref. no. - no. réf. GCC	scale - échelle		BY	2017-12-11
EWTM-8010-6	AS SHOWN		drawing no. - no. dessin	sheet-feuille
			EWTM-8010-6	1/25
				rev
				0

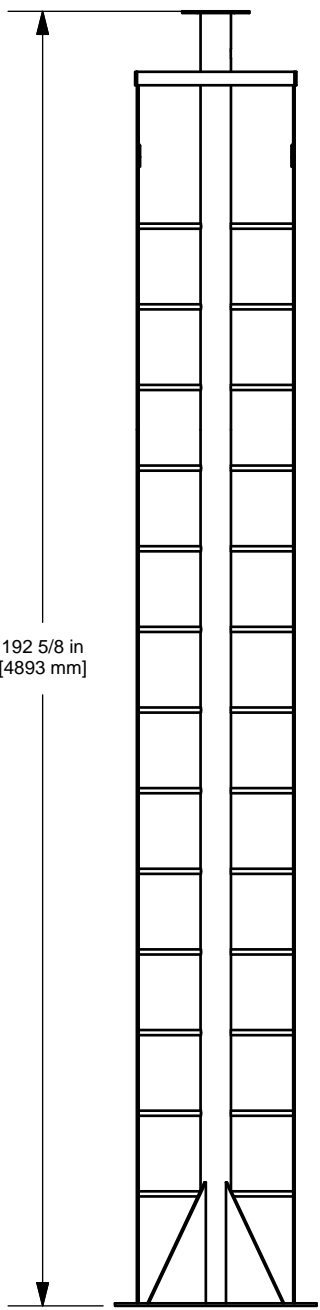
File / Fichier: 12', 16' and 20' Pipemasts.dwg

inches
0
1
2
3
4
pouces

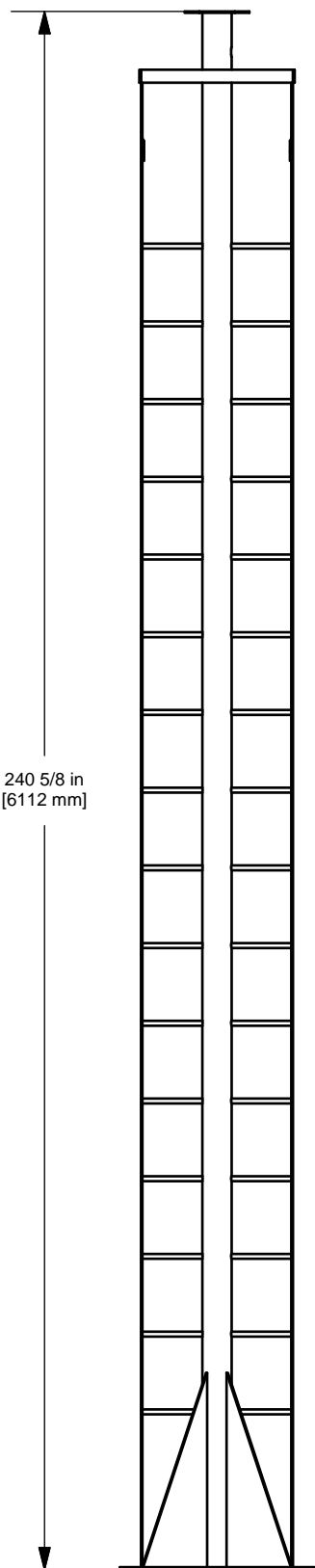
millimeters
0
1
2
3
4
5
6
7
8
millimètres




144 5/8 in
[3673 mm]



192 5/8 in
[4893 mm]



240 5/8 in
[6112 mm]

 Fisheries and Oceans Canada Canadian Coast Guard	Pêches et Océans Canada Garde côtière Canadienne

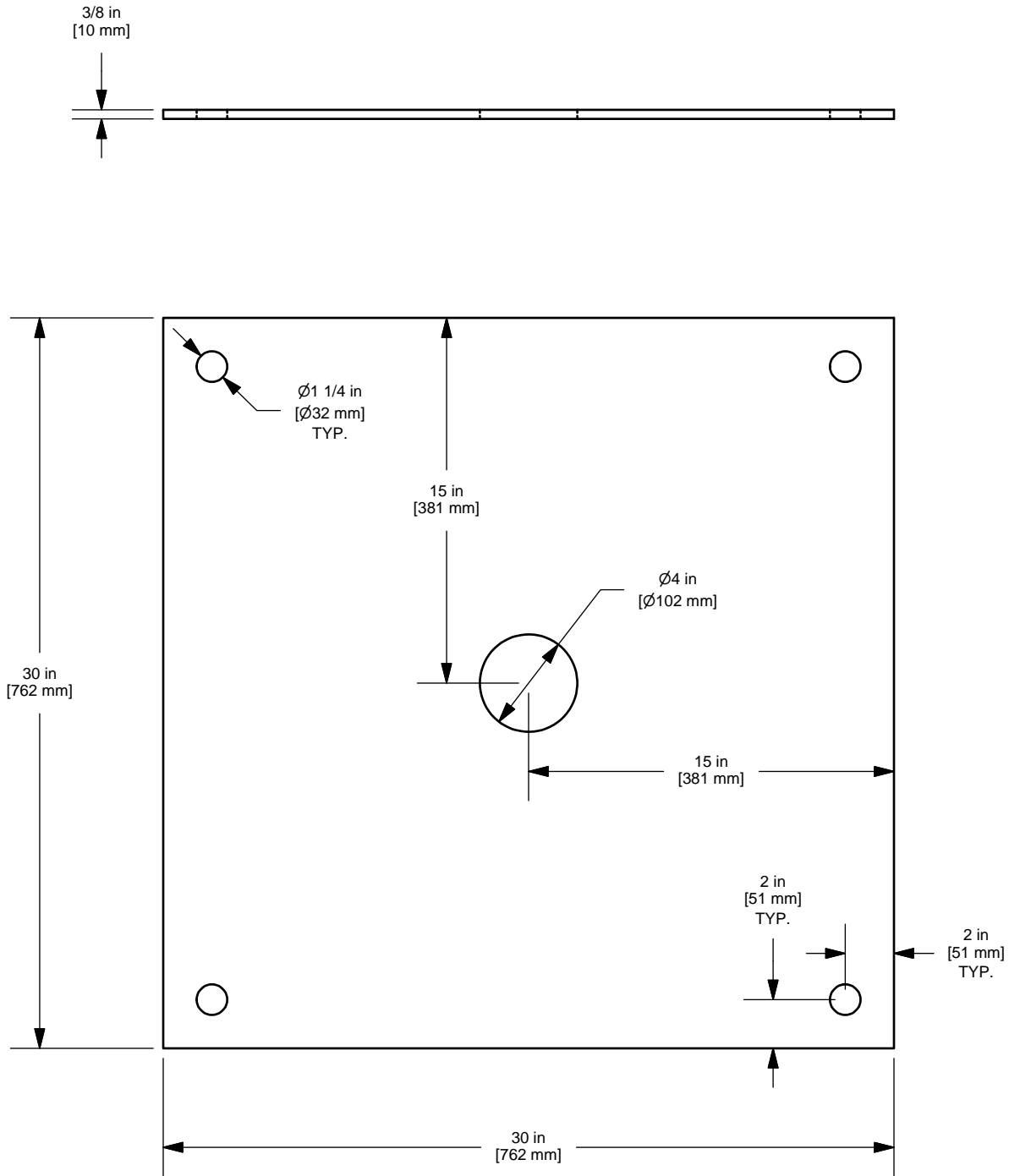
Asset - Actif	<h3>12', 16', AND 20' PIPEMASTS</h3>	
Drawing - Dessin		
<h4>PIPEMAST SIZES</h4>		scale - échelle AS SHOWN

designed - conception	BH	date	2017-12-11
approved - approuvé	BY	date	2017-12-11
drawing no. - no. dessin	EWTM-8010-6	sheet-feuille	2/25
		rev	0

File / Fichier: 12', 16' and 20' Pipemasts.dwg

inches
0
1
2
3
4
pouces

millimeters
0
1
2
3
4
5
6
7
8
millimètres



Fisheries and Oceans
Canada
Canadian
Coast Guard

Pêches et Océans
Canada
Garde côtière
Canadienne

Asset - Actif

12', 16', AND 20' PIPEMASTS

designed - conception

date

BH

2017-12-11

approved - approuvé

date

BY

2017-12-11

CCG ref. no. - no. réf. GCC
EWTM-8010-6

scale - échelle
AS SHOWN

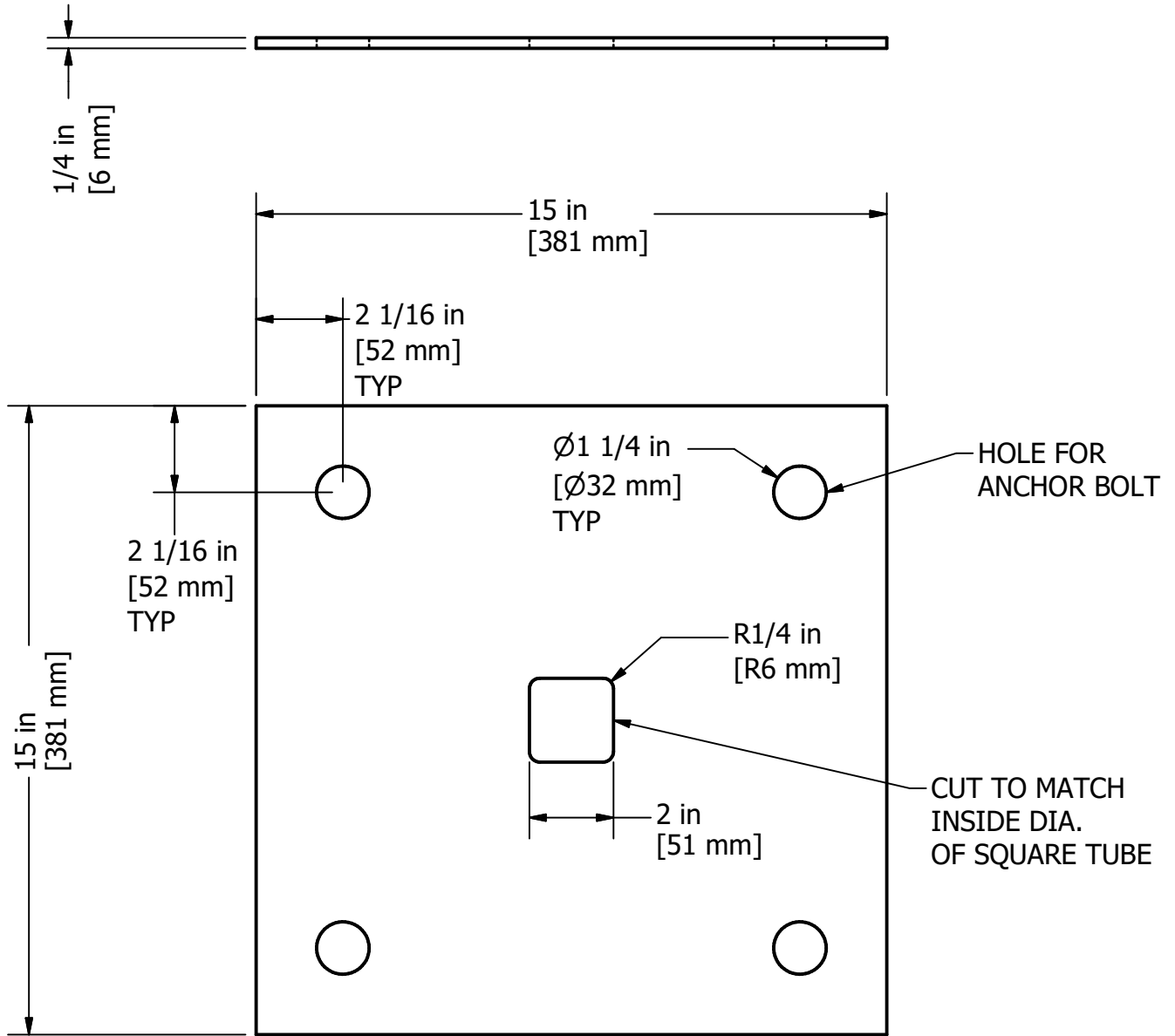
Drawing - Dessin

P5 - BASE PLATE

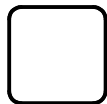
drawing no. - no. dessin
EWTM-8010-6

sheet-feuille
10/25

rev
0



P1 - BASE PLATE



USE CENTER CUT OUT OF BASE PLATE TO CAP TOP OF MAST

P4 - TOP CAP

Note: Anchor bolts for Day Beacon Masts will require modified placement from the locations detailed in the STEM foundation drawings.

<p>Fisheries and Oceans Canada Canadian Coast Guard</p>	<p>Pêches et Océans Canada Garde côtière Canadienne</p>	Asset - Actif	designed - conception N. CURTIS 2019-10-17		date	
		Drawing - Dessin		approved - approuvé B. YOUNG 2019-10-17		date
CCG ref. no. - no. réf. GCC	scale - échelle N.T.S.	P1 - BASE PLATE 1 MILE DAYBEACON MAST		drawing no. - no. dessin	sheet-feuille 2/5	rev 1



Fisheries and Oceans
Canada

Pêches et Océans
Canada

Canadian
Coast Guard

Garde côtière
canadienne



APPENDIX B4 – 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.