Fisheries and Oceans Canada | Pêches et Océans Canada

Canadian Coast Guard | Garde côtière canadienne

SOW – 24.4 m (80 ft) SELF SUPPORT VHF TOWERS

CONSTRUCTION CONTRACT

CAMBRIDGE BAY MCTS TX AND RX SITES

Cambridge Bay, NU

MARITIME AND CIVIL INFRASTRUCTURE
Prepared by: LL
Approved by: BY
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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, territorial or local application. In the case of any conflict or discrepancy, the more stringent requirements shall apply.

.1 Meet or exceed requirements of:

.1 Contract documents;

.2 Specified standards, codes and referenced documents.

1.2 Description of Work

.1 Work under this Contract includes but is not limited to the provision of all labour, materials, and equipment required to:

.1 Fabricate and install two [2] self-support towers c/w foundations as per included design drawings;

.2 Remove antennas from existing towers and reinstall on replacement towers;

.3 Remove and dispose of existing towers, guys, guy anchors and foundations;

.4 Wire brush and repaint rusted areas of four [4] existing CCG towers on site;

.1 This work is to be completed at the Transmitter and the Receiver site.

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

.1 Connection of antennas inside CCG shelter and testing for correct operation of all antennas.

1.3 Submittals

.1 Mandatory submittals and schedule for submission are detailed below and in Appendix B. The following identifies general requirements only. The relevant sections must be consulted for a complete listing of mandatory content.

.2 Detailed Schedule:

.1 Deadline:

.1 No later than ten [10] working days following award.

.2 Deliverables:

.1 The contractor 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 CWB certification:

.1 Deadline:

.1 No later than ten [10] working days following award.

.2 Deliverables:

.1 Proof of welding shop Certification (CWB div 2) for tower fabricator (Section 011100 – 1.4.1.1).

.4 Construction Plan:

.1 Deadline:

.1 No less than ten [10] working days prior to beginning fabrication.

.2 Deliverables:

.1 A Construction Plan of sufficient detail to demonstrate that the Contractor has considered all the challenges of the project and is prepared to undertake the works in a competent and professional manner in accordance with all legislation, including:

.1 Project Specific Safety Program (Section 013530);

.2 Project Environmental Protection Plan (Section 013543);

.3 Detailed Demolition Plan (Section 024116);

.4 Detailed Pile Driving Schedule (Section 316113);

.5 Detailed Tower Erection Plan (Section 133613); and

.6 The contractor shall provide a detailed list of all subcontractors being used to complete the work described herein (Section 011100 – 1.4.2.2).

.5 Repainting Plan:

.1 Deadline:

.1 No less than ten [10] working days prior to beginning fabrication.

.2 Deliverables:

.1 A Repainting Plan of sufficient detail to demonstrate that the Contractor has considered all the challenges of this portion project and is prepared to undertake the works in a

competent and professional manner in accordance with all legislation and is to include:

.1 Surface Preparation Plan (Section 099113.01);

.2 Application Plan (Section 099113.01).

.6 Mill Test Certificates

.1 Deadline:

.1 Upon receipt of metal purchased.

.2 Deliverables:

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

.7 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 (Section 316113 & 133613);

1.4 Contractor Qualifications

.1 The work shall be carried out under the supervision and responsibility of a sole specialized Contractor, capable of performing installations of telecommunication towers.

.1 The fabrication must be completed by a shop certified to DIVISION 2 or greater by the Canadian Welding Bureau (CWB).

.2 The Contractor shall designate the following key project members, including any subcontractors. The project members shall have completed projects of similar scope and complexity to the work described herein.

.1 Project Manager: Contact information for the main point of contact for the project shall be provided by the contractor.

.2 The contractor shall provide a detailed list of all subcontractors being used to complete the work described herein.

.3 Requests to amend the project team, following contract award, must be forwarded in writing. Coast Guard reserves the right to reject any proposal to amend the project team.

1.5 Site Location

.1 Both sites are located in Cambridge Bay, NU:

.1 Transmitter Site: 69° 6'52.68"N, 105° 1'0.20"W

.2 Receiver Site: 69° 6'58.21"N, 105° 4'43.20"W

.2 Cambridge Bay is serviced by commercial northern airlines on a regular schedule.

.3 The site is accessible by road and vehicle arrangements can be made through the local hotel.

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 An unknown quantity of materials and supplies exists at the site. It is the Contractor's responsibility to supply all tools, equipment and materials required to complete to work.

1.7 Contractor's Access to Site

.1 Contractor is responsible for transportation of all labour, materials and equipment to and from the site, including any and all material furnished or itemized for salvage by Coast Guard.

.2 The site is accessible by standard motor vehicle.

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 August 31, 2017, unless otherwise negotiated and approved in writing.

1.9 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.

1.10 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.

1.11 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.

1.12 Required Submissions

.1 A summary of the minimum mandatory submissions required can be found in Appendix B. This summary is not an exhaustive list of all submissions required for the duration of the project.

.2 Additional submissions may be required after award.

SECTION: 013300 SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 General

.1 This section specifies general requirements and procedures for the Contractor's submissions of documents to Coast Guard for review.

.2 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 by Coast Guard.

1.2 Submission Requirements

.1 Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.

.2 Allow three [3] working days, or as stipulated in the specifications, for Coast Guard to review the submission.

.3 The Contractor's Engineer 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.

1.2 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, 2015

.3 Nunavut Occupational Health and Safety (OHS) Regulations, 2016

.4 Nunavut Safety Act, 2016

.5 Any and all other Provincial/Territorial Regulations and Policies; Worker's Compensation Board Policies; Local municipal regulations; pertaining to safety of the contractors workers

1.3 Submittals

.1 Project Specific Safety Program

.1 Deadline:

.1 With Construction Plan

.2 Deliverables:

.1 Safety Program Document, include:

.1 A listing of all activities specific to this phase of the project and their Health & Safety risks or hazards;

.2 Detailed descriptions of how the activities are to be carried out as well as methods for mitigating hazards and risks;

.3 A listing of personnel responsible for health and safety measures, and Emergency procedures; and

.4 Material Safety Data Sheets for hazardous products to be utilized in the execution of the works.

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 General Standards Board (CGSB)

.2 Transportation of Dangerous Goods

.3 Canadian Council of Ministers of the Environment (CCME) Documentation

.4 Canadian Environmental Protection Act

1.3 Submittals

.1 Contractor shall submit an environmental protection plan

.1 Deadline:

.1 With Construction Plan

.2 Deliverables:

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

.1 Equipment features (age, spill containment);

.2 Staging, refueling, and cleaning areas;

.3 Clean-up and/or containment procedures (including concrete/grout);

.4 Waste disposal methods and sites; and

.5 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 and to prevent excavation of soils below stockpiles.

3.3 Disposal of Wastes

.1 Clean-up the site at the end of each working day.

.2 All waste material to be disposed of in a legal manner at a site approved by local authorities. Transporter/hauler must be appropriately licensed.

.1 Recycle or reuse materials where possible.

.3 Fires and burning of rubbish 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 once approved to do so by Coast Guard.

3.5 Drainage

.1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.

.1 Suspend works during periods of heavy rainfall and add temporary covers to discourage run-off.

.2 Water pumped from excavation 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 Territorial Authority: Nunavut 24-Hour Spill Report Line 1-867-920-8130

3.7 Traffic

.1 Minimize soil compaction by driving, parking vehicles, and walking, etc. on existing paved roadways/laneways. If soil is impacted by compaction, compensate by restoring areas with new soil, as required.

.1 Avoid the use of heavy machinery in areas of sensitive slopes. Avoid using machinery on land during wet weather.

SECTION: 014500 QUALITY CONTROL

PART 1 - GENERAL

1.1 Inspection

.1 Coast Guard or its representative 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 Coast Guard in these specifications or provided for in work-site regulations, the request for inspection must be made without unreasonable delay.

.3 The below list identifies key milestones where the Coast Guard will require an opportunity to take samples/inspect:

.1 Location verification: Coast Guard will confirm correct location for installation upon arrival of the tower at the site. The contractor shall be required to provide access to the site at all times to CCG site staff.

.2 Installation of foundations: Coast Guard shall witness the installation of piles used to make up the foundation for each tower.

.3 Paint application results: Coast Guard will confirm the correct locations of painted color bands as well as satisfactory paint coverage before tower erection.

.4 Pre-tensioning: Coast Guard shall witness the pre-tensioning of the all-thread rods to the prescribed torque values.

.5 Installation of towers: Coast Guard shall witness the erection of the new nav-aid towers.

.6 Installation of transmission lines: Coast Guard will confirm the correct location of all antennas installed on or between the new towers.

1.2 Procedures

.1 Provide Coast Guard with advance notice whenever testing is required in accordance with these specifications, so that all parties involved can be present.

.2 Provide necessary manpower and installations for obtaining and handling samples and material on site.

.3 Provide access to site if the site is of remote nature whereby the contractor is responsible for

providing access to the site

1.3 Rejected Work

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

1.4 Tests and Mixture Formulas

.1 Supply test reports and required mixture formulas.

1.5 Factory Tests

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

1.6 Acceptance of Work

.1 Coast Guard will make acceptance visits of work executed by the Contractor at critical milestones identified in the following sections.

.2 The Contractor shall inform 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 Coast Guard in writing of any conflict between these specifications and manufacturer's instructions; Coast Guard will designate which document is to be followed.

1.3 Compliance

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

1.4 Substitution

.1 Where specific products have been specified, proposals for substitution may only be submitted after award of contract. Such requests must include statements of respective costs of items originally specified and the proposed substitution.

.2 No substitutions will be permitted without prior written approval of Coast Guard. Substitutions will be considered by Coast Guard only when:

.1 Materials specified in Contract Documents, are not available or,

.2 Delivery date of materials selected from those materials specified would unduly delay completion of contract or,

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

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

1.5 Submittals

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

SECTION: 024116 DEMOLITION OF STRUCTURES

PART 1 - GENERAL

1.1 Scope of Work

.1 Work under this section consists of the provision of all labour, materials, and equipment necessary to complete the following activities:

.1 Demolition of the existing towers, guy anchors, and foundations;

.2 Disposal of all waste at a licensed waste disposal facility;

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 2015

.3 Nunavut Occupational Health and Safety (OHS) Regulations, 2016

.4 Nunavut Safety Act, 2016

.5 CSA S350-[M1980(R1998)], Code of Practice for Safety in Demolition of Structures.

1.3 Submittals

.1 Contractor is to provide a demolition plan.

.1 Deadline:

.1 With Construction Plan.

.2 Deliverables:

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

.2 Methods for protecting the site from demolition debris; and

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

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

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

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

1.4 Existing Conditions

.1 Photos of the existing towers are included in Appendix A.

PART 2 - PRODUCTS

2.1 Not used.

PART 3 - EXECUTION

3.1 General

.1 Work under this section shall only begin after the new towers have been erected, as to minimize the down time of the site.

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

.3 Towers may not be felled.

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, property, and local traffic.

3.3 Preparation

.1 Erect warning signs and barricades.

.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 all antennas

.2 Demolish and dispose of existing steel towers in their entirety.

.3 Demolish existing concrete foundation to 300mm (1 ft.) below grade and fill resultant excavation with 19mm (¾ in.) clear crushed aggregate.

.4 Demolish existing guy anchor foundations to 300mm (1 ft) below grade and fill resultant excavation with 19mm (¾in) clear crushed aggregate.

.5 Ensure that demolition does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.

.6 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.

SECTION: 099113.01 EXTERIOR REPAINTING

PART 1 - GENERAL

1.1 Scope of Work

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

.1 Removal of rust and loose paint from the following towers in order to expose a sound surface for repainting.

.1 M3 tower located on the Tx site,

.2 M19 tower located on the Tx site,

.3 North tower located on the Rx site and

.4 South tower located on the Rx site.

.5 Details of the towers and site layouts can be found in Appendices C and F.

.2 Removal of dust and debris from the tower to ensure proper bonding of the new paint;

.3 Ensuring all antennas, lights, ladders and other items not to be painted are protected from paint coverage.

.4 Repainting the required areas, ensuring proper coverage.

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, 2015

.3 CSA S37-13 - Antenna Towers and Antenna Supporting Structures

.4 Canadian Aviation Regulations 2016-1 – Standard 621 – Obstruction Marking and Lighting

.5 United States Federal Standard FED-STD-595 Paint Spec

.6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.7 The Master Painters Institute (MPI)

.8 Steel Structures Painting Council (SSPC)

1.3 Submittals

.1 Surface Preparation Plan

.1 Deadline:

.1 With Work Plan

.2 Deliverables:

.1 Submit a plan detailing the method in which any rust, loose existing paint, dirt and other contaminants will be removed as to expose a sound surface to be primed and painted. Detail:

.1 Abrasion method to be used;

.2 Cleaning procedure and products to be used.

.2 Application plan

.1 Deadline:

.1 With Work Plan

.2 Deliverables:

.1 Manufacturer's Technical Data Sheets for paint chosen;

.2 Submit a detailed plan for painting the tower. Detail:

.1 Paint application method;

.2 Method of verifying applied thicknesses.

1.4 Quality Assurance

.1 Coast Guard's minimum inspection requirements are detailed below. The Contractor shall be responsible to notify Coast Guard of the date and time that the works may be inspected. Notice must be provided in advance and as early as practical 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. Work shall not progress until inspections have been completed and the Contractor has been provided with written notice to proceed with the works:

.1 Upon completion of the work to ensure tower has been painted satisfactorily;

.3 Conform to latest MPI requirements for exterior repainting work including cleaning, preparation

and priming.

.4 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, and solvents) to be in accordance with the latest edition of the MPI Approved Product List and to be from a single manufacturer for each system used.

1.5 Ambient Conditions

.1 Temperature, Humidity and Substrate Moisture Content Levels:

.1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and, applied product manufacturer.

.2 Do not perform repainting work when:

.1 Ambient air and substrate temperatures are below 5 degrees C.

.2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperatures.

.3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.

.4 Relative humidity is above 85% or when dew point is less than 3 degrees C variance between air/surface temperatures.

.5 Rain or snow is forecast to occur before paint has thoroughly cured.

.6 It is foggy, misty, raining or snowing at site.

PART 2 - PRODUCTS

2.1 Materials

.1 Paint:

.1 Apply two [2] coats of zinc-enriched or Galvicon paint.

.2 Or an approved equal

PART 3 - EXECUTION

3.1 Manufacturer’s Instructions

.1 Compliance: comply with manufacturer’s written data, including product technical bulletins, product catalogue installation instructions, product carton installations and data sheets.

3.2 Preparation

.1 Metal surfaces to be repainted should be cleaned by removing loose, cracked, brittle or non-adherent paint, rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances.

.2 Scrape edges of old paint back to sound material where remaining paint is thick and sound. Feather exposed edges.

.3 Remove all loose material from surfaces, pockets and corners to be painted with a clean wire brush, by blowing with clean dry compressed air, by vacuum cleaning or by low pressure water blasting with trapping around structure.

.4 Do not apply any paint until the prepared surface has been accepted by the Coast Guard.

3.3 Protection of Surfaces

.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by Coast Guard.

.2 If rusting occurs after completion of surface preparation, clean surfaces again.

.3 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before paint coat is applied and between applications of remaining coats. Remove contaminants from surface and apply paint immediately.

.4 Protect cleaned and freshly painted surfaces from excessive dust.

.5 Protect factory finished products and equipment.

3.4 Restoration

.1 Clean and re-install hardware items removed before undertaken painting operations.

.2 Remove paint splashing on affected exposed surfaces. Remove smears and spatter immediately as operations progress, using compatible solvent.

.3 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Coast Guard

SECTION: 133613 STEEL TOWERS

PART 1 - GENERAL

1.1 Scope of Work

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

.1 Fabrication, supply and installation of two new 24.4 m [80 ft] self-support towers including all appurtenances. Appurtenances shall include but are not necessarily limited to:

.1 Fall arrest system;

.2 Anti climb system (3.0 m [10 ft] height); and

.3 Grounding system

.2 Removal of all antennas from existing towers;

.3 Installation of all antennas onto replacement towers;

.1 Contractor is to design and supply new tower mounts for all antennas, winches and snatch blocks to accommodate changes in leg diameter and face width.

.4 Extend and splice cable runs from CCG antennas to shelter as necessary;

.2 A summary of the scope of work can be found in Appendix D.

1.2 References

.1 CSA S37-13 - Antenna Towers and Antenna Supporting Structures

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

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

.4 CSA Z259.2.5-12 – Fall Arresters and Vertical Lifelines

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

.6 Canada Labour Code Part II – January 2008

.7 Health and Welfare Canada Limits of Exposure to Radio-Frequency Fields Frequencies from 3 KHz – 300 GHz, Safety Code 6

.8 Nunavut Occupational Health and Safety (OHS) Regulations, 2016

.9 Nunavut Safety Act, 2016

.10 National Building Code of Canada – 2015

.11 TC CAR Standard 621.19 - Standards Obstruction Markings

.12 SSPC-SP 1 Solvent Cleaning

.13 SSPC-SP 7/NACE No. 4, Brush-Off Blast Cleaning

.14 Standards and Guidelines for Communication Sites, Motorolla, R-56, recent edition

1.3 Submittals

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

.2 Erection Plan

.1 Deadline:

.1 With Construction Plan (Section 011100)

.2 Deliverables:

.1 A construction plan of adequate detail to clearly show Coast Guard that the work will be undertaken in a competent and safe manner.

.1 At minimum, identify hoisting equipment and associated certification.

.3 As-built Drawings / QC Control documentation

.1 Deadline:

.1 28 calendar days following installation (Section 011100)

.2 Deliverables:

.1 Red-lined drawings showing all changes from the sealed design drawings (if any).

.2 Those documents identified within the following section and any additional documents assembled in accordance with the Contractors established quality control program.

1.4 Guarantee

.1 The Contractor shall guarantee that all material and workmanship used in the fabrication and construction of the towers is in accordance with all applicable specifications listed in this section.

.2 For a period of three [3] years from the date of installation, the Contractor shall replace, free of charge, all defective components. A failure of 10% or more of a particular item shall be interpreted

as failure in all similar units. All these items shall be replaced by units of a superior design at no cost to Coast Guard.

1.5 Contractor's Quality Control

.1 The following activities shall be completed by the contractor at the contractor's expense as a demonstration that the delivered product is of the quality prescribed within the specification.

.2 Contractor shall provide Steel Mill Test Certificates as outlined in Section 011100 – 1.3.6 of this specification.

.3 Tests for thickness and uniformity of galvanized coating shall be made as considered necessary by Coast Guard. Tests shall be conducted in full accordance with the requirements of CSA S37-13. If required, contractor shall pay for testing, all costs to be included in the tender price.

.4 Ground resistance testing

1.6 Quality Assurance

.1 Coast Guards minimum inspection requirements are detailed below:

.1 Throughout tower erection

.2 Upon completion for the testing of Cables

.1 The Contractor shall inform the Coast Guard at least three days in advance of the installation of the cables and antennas so that Coast Guard can perform quality checks after the connectors and all supports and grounding kits are in place.

PART 2 - PRODUCTS

2.1 Structural Steel

.1 Must conform to CSA Standard G40.21, Grade 300W, or better. All materials used in the tower to be new and in conformance with requirements of CSA S37-13.

2.2 Fasteners

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

2.3 Steel coatings

.1 Coating System to be water based Acrylic (no Alkyds are acceptable). Suggested methods

.1 Primer: Devflex 4208 Acrylic @ 1.5 – 2.0 mils dft. Finish: Devflex 4208 Acrylic @ 1.5 – 2.0 mils dft. Or,

.2 Single coat: 'Evotech' Aqualux 522-121/516, 2.5-3 mils dft.

2.4 Mounting hardware

.1 All mounts, mount hardware, and line hangers shall be new (not salvaged) and be heavy-duty hot dip galvanized or stainless steel.

2.5 Fall arrest system

.1 Provide fall arrest system as per drawings provided.

.2 Must be a rail system, cable systems are prohibited.

.3 Rail and trolley must meet all requirements of CSA Z259.2.4-15

.1 Trylon TSF, Turris Corp., Honeywell Safety Products USA, Inc. or approved equivalent type, complete with trolley.

2.6 Grounding

.1 Rods: Must be 19mm [¾"] copper clad, 3.0m [10'] long ground rods

.2 Conductors: Must be tinned copper, AWG 4/0

.3 Connections: Must be exothermic or irreversible mechanical type

2.7 Other Materials

.1 Contractor is to supply and install the following:

.1 Snatch Blocks:

.1 Four [4] McKissick 419 Light Champion, 109037t Snatch Blocks; or

.2 Approved equal.

.2 Winches:

.1 Four [4] Jet Hand Operated Industrial Winch

.1 Product No.: 113264

.2 Model No.: IWF-1000N

.3 Capacity Vertical Lift: 1653 lbs.

.3 Wire Rope:

.1 Each winch is to be installed with wire rope meeting the following properties.

.1 5/16 in;

.2 Minimum capacity of 1500 lbs;

.3 160 ft length;

.4 Galvanized or other approved corrosion inhibiting properties.

.4 Jet Winch Mounting Plates as per drawing provided in Appendix E.

.5 #10 3-Wire Strand Copperweld wire

.1 To be used to replace the vertical lines between HF dipoles and stub posts.

.2 Contractor must supply 350 ft of wire

PART 3 - EXECUTION

3.1 Fabrication

.1 Each tower segment shall be designated with a number that is easily read after galvanizing. This mark shall be stamped into each piece in such a manner, or in such a place, as will not injure or reduce the strength of the piece. The marks on like pieces shall be in the same relative position on each piece. The markings indicated on each piece shall correspond with that shown on the erection drawings.

.2 All members shall be fabricated in accordance with the Engineering Plans and as per CSA S37-13.

.3 All like parts shall be interchangeable. All like parts shall have the same number.

.4 In any bending or reworking of any material, methods employed shall ensure that the physical properties of the material are not impaired.

.5 All welding shall be performed in accordance with CSA Standard W59 latest revision and shall be undertaken by a fabricator approved by the Canadian Welding Bureau to the requirements to CSA Standard W47, latest revision.

.6 Special mounting arrangements shall be incorporated into the tower sections for the secure mounting of:

.1 All lighting fixtures, junction boxes, and cable supports.

.2 Fall arrest system extension where it extends above the top of the tower;

.3 Ground lugs or grounding attachments.

.7 The Contractor shall ensure that electrical continuity exists between all tower sections.

3.2 Galvanizing

.1 All materials, structural steel, pipe and fittings, including bolts, nuts and washers shall be hot dip galvanized to the requirement of CSA S37-13 and CSA-G164 and as otherwise specified therein.

.2 All materials shall be completely fabricated before galvanizing (except the tapping of nuts).

.3 Before galvanizing, the steel shall be thoroughly cleaned of all paint, grease, rust, scale or other materials that will interfere with proper binding of the zinc with the steel.

3.3 Painting

.1 Tower painting will be carried out in the factory and shall be applied in 7 equal and alternating bands of International Orange and White according to the requirements of Transport Canada TC CAR Standard 621.19. Painting and proper drying will be done prior to delivery.

.2 Galvanized steel must be cleaned prior to painting in accordance with SSPC –SP-1 – “Solvent Cleaning”.

.1 Light Sweep blast all surfaces in accordance with SSPC-SP-7 to remove any chromate treatment, or poorly adhered zinc salts that may be present to increase mechanical bonding through increased roughness.

.1 Care should be taken to remove as little zinc as possible while maintaining desired toughness.

.2 After sweep blasting, the coating system should be applied ideally the same day and a max of one day later.

.3 Grit shall not be recycled.

.3 All paint shall be applied in shop conditions as per manufacturer’s instructions, evenly spread and free from all marks, stains, defects and flaws.

.1 All surfaces of the tower are to be painted with the exception of the areas on the mating surfaces of leg splice plates and attachment points for grounding lugs to ensure good electrical connection for grounding purposes.

3.4 Handling of Material and Transportation

.1 The tower and parts are to be built so they may be safely transported to the site from the manufacturer’s premises.

.2 Materials shall be handled and stored in the plant and on the job site in such a manner that no

damage shall be done to the materials of any existing building or structure.

.3 Special care shall be taken to ensure that galvanizing is not damaged during handling and erection of materials.

.4 Storage of materials on the site will be the responsibility of the Contractor.

3.5 Tower Installation

.1 Prior to site mobilization, Contractor shall submit a Construction Plan detailing construction tasks, methods, and equipment required to complete work to Coast Guard for review. Construction Plan should include methods of completing work, equipment required, as well as hazards and mitigation for hazards for each work task.

.2 The Contractor is to provide the CCG Project Authority with the maximum advance notice of mobilization to coordinate the mobilization of CCG representation to this location.

.3 The tower shall be erected in a manner that will not bend, scrape, distort, or injure the component parts of the galvanizing.

.4 The Contractor shall be responsible to ensure that no members of the tower are over stressed during erection.

.5 Every failure of the tower sections to join together properly shall be reported to the Coast Guard.

.6 Upon completion of erection, the tower shall be inspected by the Contractor for damage. Any damaged or missing items, including nuts, bolts, etc., shall be replaced. The tightness of all bolts shall be rechecked at this time.

.1 Any members damaged during erection shall be replaced at the Contractor's cost.

.7 The Contractor shall be responsible for any damages done to the work of others, or to adjoining structures and property during erection.

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

.9 The Contractor shall field paint all steel members of the tower 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.

3.6 Antennas

.1 Care shall be taken to ensure that no damage is done to any antenna or mounting hardware during removal, storage and handling of any antenna.

.2 One [1] UHF antenna is to be removed from the existing M10 tower and reinstalled on the replacement tower at the same elevation.

.1 Yagi UHF COMPROD 426-70 antenna per data sheet found in Appendix E

.1 Mounting location: Tower leg with Azimuth 295° orientation.

.3 One [1] HF dipole antenna, hanging between the existing M6 and M10 towers, is to be removed and reinstalled between the replacement towers.

.1 4363 KHz antenna per data sheet found in Appendix E

.1 Mounting location:

.1 Hanging between replacement towers at 22.86 m [75 ft] elevation.

.4 One [1] HF dipole antenna, hanging between the existing M6 and M10 towers, is to be removed and reinstalled between the replacement towers.

.1 6501 KHz antenna per data sheet found in Appendix E

.1 Mounting location:

.1 Hanging between replacement towers at 13.9 m [45.5 ft] elevation.

.5 One [1] HF dipole antenna, hanging between the existing M6 and M10 towers, is to be removed and reinstalled between the replacement towers.

.1 8794 KHz antenna per data sheet found in Appendix E

.1 Mounting location:

.1 Hanging between replacement towers at 13.9 m [45.5 ft] elevation.

.6 Two [2] Nav Canada HF dipole antennas, hanging from the existing M6 and M5 towers are to be removed and reinstalled between the replacement M6 and existing M5 tower.

.1 2868 KHz and 8193.5 KHz antennas per data sheet found in Appendix E

.1 Mounting location:

.1 Hanging between replacement M6 tower and existing M5 tower at 22.8 m [75 ft] elevation.

3.7 Transmission Lines

.1 All lines shall be mounted to mounting plates included in the fabrication of the tower.

.1 The use of wrap lock/tie wrap devices to secure TX lines is not acceptable.

.2 The cable used for the UHF antenna shall be extended in order to reach the new tower location and is to include new male and female 7/16” connectors.

.1 The connectors shall have captivated pins as to avoid separation with temperature.

.2 Soldering of the center conductor pin directly onto the heliax cable is not acceptable.

.3 Every effort shall be made to ensure that the external connections are made waterproof using the best commercial practice.

3.8 Warranty

.1 Contractor shall warranty all galvanizing work for a period of not less than three [3] years.

.2 Contractor shall warrant all painted items for three [3] years for 90% coverage.

.1 For clarity: for a period of three years following installation any damage to the paint from normal environmental conditions prevalent at the site shall be repaired by the Contractor at no cost to the Owner in a manner approved by the Owner

SECTION: 260527 GROUNDING

PART 1 - GENERAL

1.1 Scope of Work

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

1.2 References

.1 Canada Labour Code Part II – January 2008

.2 Ontario Occupational Health and Safety Act and Regulations for Construction Projects – 2011

.3 National Building Code of Canada – 2015

.4 CAN/CSA S37-13 Antennas, Towers, and Antenna-Supporting Structures

.5 CAN/CSA C22.1-15 Canadian Electrical Code

.6 Ontario Provincial Standard Specification – OPSS 1010 Material Specification for Aggregates – Base, Sub-base, Select Sub-grade, and Backfill Material

.7 Ontario Provincial Standard Specification – OPSS 1004 Material Specification for Aggregates – Miscellaneous

1.3 Disposal of Wastes

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

1.4 Submittals

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

.2 Grounding Plan

.1 Deadline

.1 With Construction Plan

.2 Deliverables

.1 Drawings detailing the installation of the grounding system.

1.5 Existing conditions

.1 The existing grounding may not be reused.

.2 Before commencing work under this section the Contractor must establish the location of all buried services which may interfere with the execution of the work.

PART 2 - PRODUCTS

2.1 Materials

.1 Ground rods shall be 19mm (3/4 in) diameter copper-clad steel, 3 m (10 ft) in length.

.2 Buried ground cable shall be 4/0 AWG stranded tinned copper conductor.

.3 Exposed ground cable shall be ½" galvanized aircraft cable.

.4 Ground cable/rod connections shall be made with exothermic connectors.

2.2 Quality Control

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

PART 3 - EXECUTION

3.1 General

.1 Contractor shall field verify all dimensions and details before proceeding with work.

.2 Safeguard existing antennas, transmission lines, and other tower attachments, as well as the tower members and connections; do not alter or otherwise impair the performance of any of these items during the course of work without written approval of Coast Guard.

.3 Ensure existing towers, guy anchors and stub posts are not disturbed by excavation and backfill activities.

.4 Any areas requiring excavation shall be investigated by Contractor to ensure they are free of any underground utilities. If the location of underground utilities interferes with the installation of grounding system, notify Coast Guard.

3.2 Site Grounding Installation

.1 All ground cables will be buried 610 mm (24 in) below grade.

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

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

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

additional topsoil as required.

3.3 Tower Grounding Ring

.1 Supply and install three [3] ground rods 120° apart in a 2 m (6.5 ft) diameter ring around each new tower base.

.2 Supply and install 4/0 AWG tinned copper cable in a 2 m (6.5 ft) diameter loop. Connect cable to the ground rods using satisfactory connections.

.3 Supply and install three [3] lengths of aircraft cable from exothermic welded connections to each leg of new tower.

.4 Connect tower ground ring to existing radials and building ground loop with 4/0 AWG tinned copper cable.

SECTION: 316113 PILE FOUNDATIONS

PART 1 - GENERAL

1.1 Scope of Work

.1 Work of this section includes the supply of all labour, material, and equipment, necessary to complete the following:

.1 Supply and installation of tower foundations as per drawings provided in Appendix E: Drawings and Data Sheets

.2 All piles are to be Rock Socketed type of 40 ft length.

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 2015

.3 Nunavut Occupational Health and Safety (OHS) Regulations, 2016

.4 Nunavut Safety Act, 2016

.5 Canadian Standards Association (CSA International)

.6 CAN/CSA-A3000-[03(R2005)], Cementitious Materials Compendium (consists of A3001, A3002, A3003, A3004 and A3005)

.7 CAN/CSA-S6-[00(R2005)], Canadian Highway Bridge Design Code

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

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

.10 CAN/CSA A23.2-04 Methods of Test and Standard Practices for Concrete

.11 ACI Specification 306 Cold Weather Concreting

1.3 Submittals

.1 Provide submittals in accordance with Section 013300 Submittal Procedures

.2 Detailed Pile Driving Schedule

.1 Deadline

.1 With Construction Plan

.2 Deliverables

.1 Submit a detailed schedule for planned sequence of driving piles.

.2 Submit manufacturer's printed product literature, specifications and datasheets for the equipment to be used in the installation of the piles.

.3 As-built Drawings / QC Control documentation

.1 Deadline: 28 calendar days following installation (Section 011100)

.2 Deliverables:

.1 Red-lined drawings showing all changes from the sealed design drawings (if any)

1.4 Delivery, Storage and Handing

.1 Deliver, store and handle materials in accordance with section 016100 Common Product Requirements and manufacturer's instructions.

.2 Protect piles from damage due to excessive bending stresses, impact, abrasion or other causes during delivery, storage and handling.

.3 Replace damaged piles as directed by Coast Guard.

PART 2 - PRODUCTS

2.1 Materials

.1 Steel piles are to be of minimum 5.5" diameter.

.2 Supply or fabricate full length piles as indicated in drawings and provide equipment to handle full length piles without cutting and splicing.

2.2 Equipment

.1 Non-impact methods of installation such as drilling, jacking, vibratory hammers or other means: provide full details of characteristics necessary to evaluate performance.

PART 3 - EXECUTION

3.1 Preparation

.1 In the event that while pre-drilling a hole rock is not encountered at a depth of 40 ft [12 m], the Contractor is to install ad-freeze pile in its place.

.1 Ad-freeze piles are to be installed as indicated in note on drawing provided in Appendix E.

.2 Protection

.1 Protect adjacent structures, services and work of other sections from hazards due to pile driving operations.

.2 Arrange sequencing of pile driving operations and methods to avoid damages to adjacent existing structures.

.3 When damages occur, remedy damaged items to restore to original or better condition at own expense.

.3 Ensure that ground conditions at pile locations are adequate to support pile driving operation and load testing operation.

.1 Make provisions for access and support of piling equipment during performance of work.

3.2 Application / Driving

.1 Remove loose and displaced material from around piles after completion of driving, and leave clean, solid surfaces to receive foundation platforms.

.2 Cut off piles neatly and squarely at appropriate elevations.

.1 Provide sufficient length above cut-off elevation so that the part damaged during driving is cut off.

.2 Do not cut tendons or other reinforcement, which will be used to tie pile caps to pile.

.3 Remove cut-off lengths from site on completion of work.

3.3 Repair and Restoration

.1 Pull out rejected piles and replace with new piles.

.2 Remove rejected pile and replace with new and, if necessary, longer pile.

.3 Remove rejected pile and fill hole as directed by Coast Guard.

.4 Leave rejected pile in place and cut off as directed by Coast Guard.

.5 No extra compensation will be made for removing and replacing or other work made necessary through rejection of defective piles.

3.4 Field Quality Control

.1 Measurement

.1 Maintain accurate records of driving for each pile, including:

.1 Pile size and length, location of pile in pile group, location or designation of pile group;

.2 Sequence of driving piles in group;

.3 Final tip and cut-off elevations;

.4 Other pertinent information such as interruption of continuous driving and pile damage;

.5 Record elevation taken on adjacent piles before and after driving of each pile

3.5 Cleaning

.1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

APPENDIX A: SITE LOCATION AND PHOTOGRAPHS

Figure 1: Project Sites
Cambridge Bay MCTS TX and RX Sites
TX: 69° 6'52.68"N, 105° 1'0.20"W
RX: 69° 6'58.21"N, 105° 4'43.20"W

Figure 2: Cambridge Bay TX Site

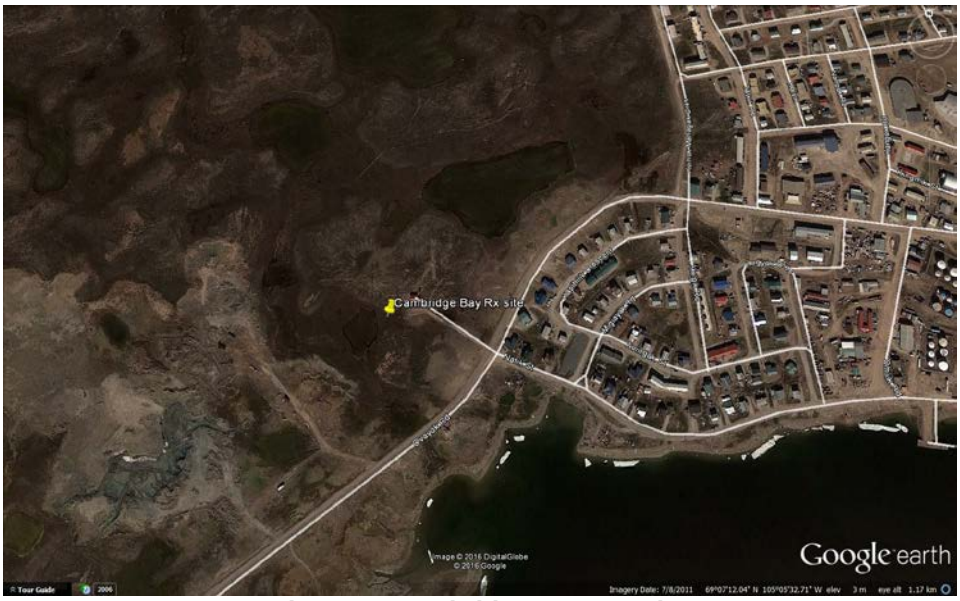


Figure 3: Cambridge Bay RX Site

Figure 4: M6 and M10 towers to be replaced

Figure 5: Existing M10 tower and VHF Antenna

Figure 6: Existing M6, M5 and M4 towers

Figure 7: M3 Tower
Paint touch up required

Figure 8: M19 Tower
Paint touch up required

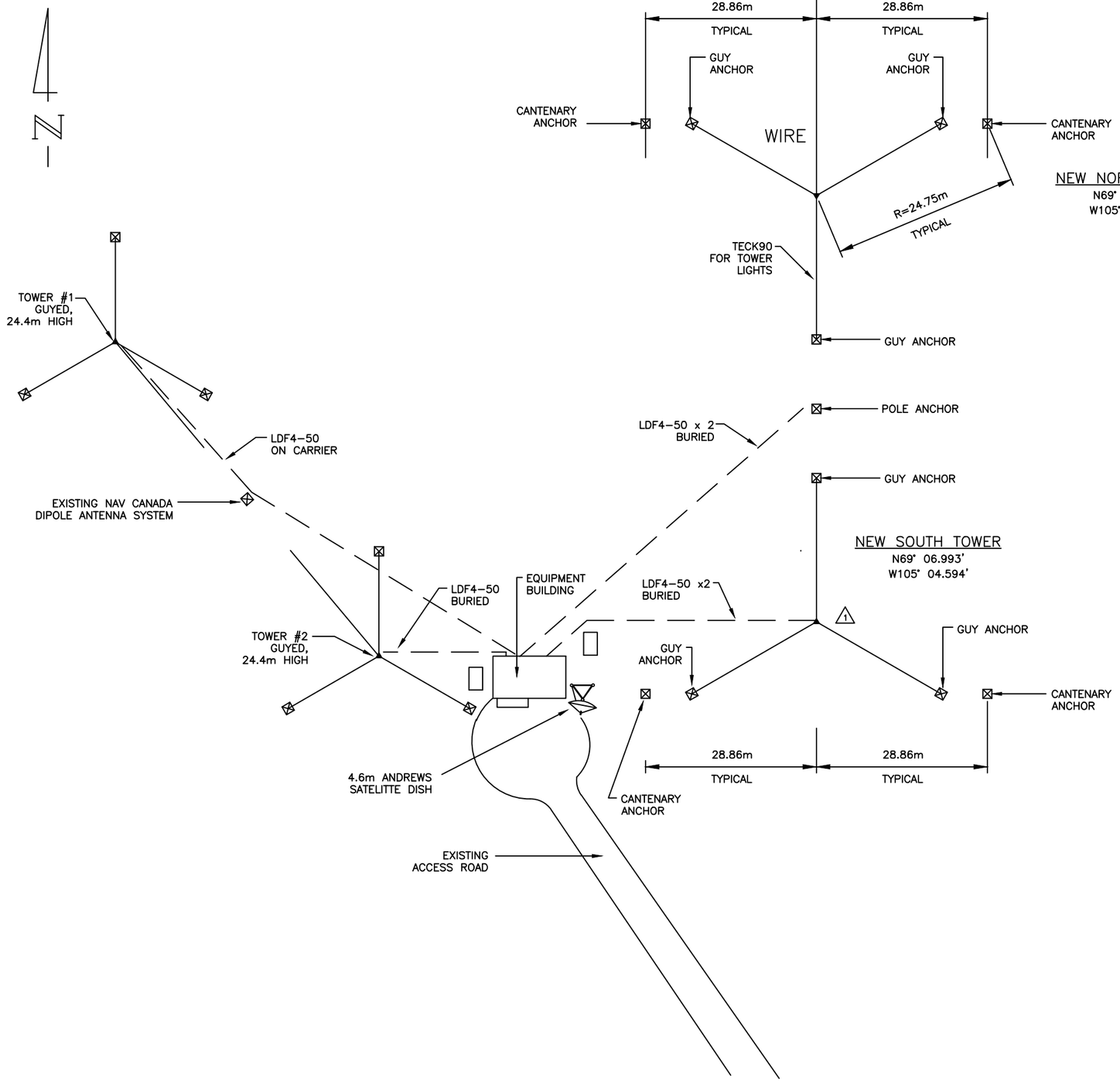
Figure 9: North Tower - RX Site
Paint touch up required

APPENDIX B: SUMMARY OF SUBMITTALS

Following Contract Award

Deadline	Submission Description	*Section(s)*
10 working days following award	Detailed schedule	*011100 – 1.3.2*
	Proof of CWB div. 2 certification of fabrication shop	*011100 – 1.3.3*
10 working days prior to beginning fabrication	Construction Plan	
	a) Project Specific Safety Program	*013530*
	b) Project Environmental Protection Plan	*013543*
	c) Detailed Demolition Plan	*024116*
	d) Detailed Pile Driving Schedule	*316113*
	e) Grounding Plan	*260527*
	f) Detailed Tower Erection Plan	*133613*
	Listing of all subcontractors	*011100 - 1.4.2.2*
	Repainting Plan	
	a) Surface Preparation Plan	*099113.01*
	b) Application Plan	*099113.01*
28 calendar days after construction	As-built and QA/QC documents	*316113 & 133613*
Upon receipt of metals purchased	Mill Test Certificates	*011100 – 1.3.5*
Upon request of Coast Guard	Product specifications and/or samples	*016100 – 1.5*
	Copies of certified receipts from the disposal sites	*024116 – 1.3*

APPENDIX C: SITE LAYOUT



NEW TOWER/ANTENNA INFORMATION (NORTH & SOUTH TOWERS):

MANUFACTURER: ANTENNA PRODUCTS CORPORATION
MODEL: BDP-230/1S
FREQUENCY RANGE: 2 to 30 MHz
POWER CAPABILITY: 10kw AVERAGE, 20kw PEAK
POLARIZATION: HORIZONTAL
TOWER HEIGHT: 24.38m (80 FT)
TOWER FACE WIDTH: 762mm (30") C/C OF TOWER LEGS
GUY WIRE RADIUS: 19.26m (63'-2") FOR FLAT GROUND

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

Vendor / Sous-traitant

NOTES:
1. VHF ANTENNA 210C4 LOCATED ON NEW SOUTH TOWER.

rev	description	by par	date
E	REMOVED TOWER 3	SK	06-13-06
D	GENERAL REVISION	SK	01-25-05
C	GENERAL REVISION	SK	09-17-03

Asset - Actif

Drawing - Dessin

CAMBRIDGE BAY
RX SITE

ANTENNA LAYOUT

designed - conception — date

drawn - dessiné — date: 01-27-64

checked - vérifié — date: S.B.

approved - approuvé — date

CCG ref. no. - no. réf. GCC

scale - échelle: NTS

drawing no. - no. dessin: CM116-301-AL

sheet-feuille: 1/1

rev

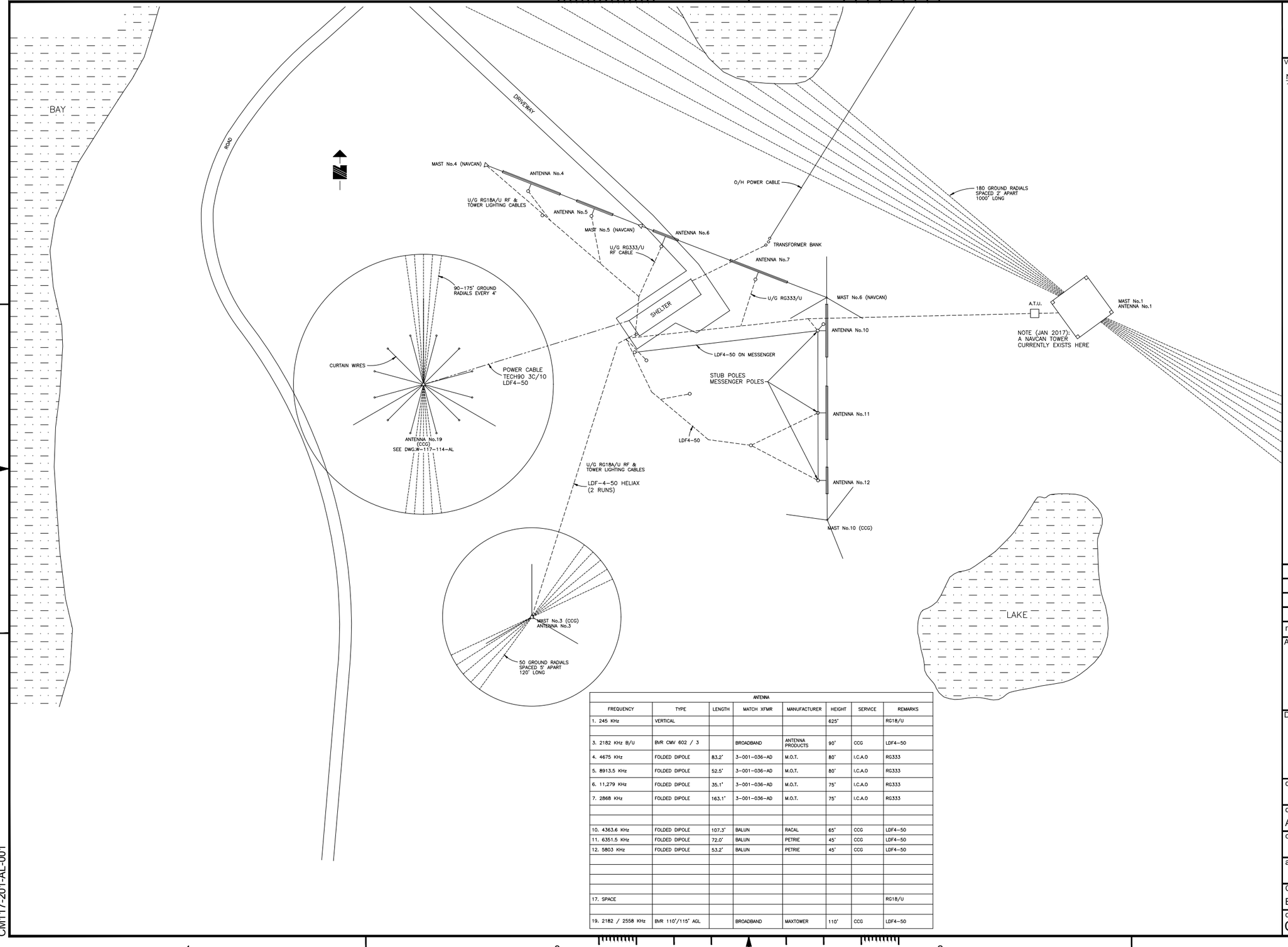
CM116-301-AL

ANSI B

File / Fichier: 116301AL1.DWG - Printed / Imprimé: 2017/03/14 9:53

CAD PRODUCED DRAWING
PRODUIT PAR DAO

REPORT ANY ERRORS OR OMISSIONS TO ILS MANAGER
SIGNALER LES ERREURS OU LES OMISSIONS AU GESTIONNAIRE SLI



ANTENNA							
FREQUENCY	TYPE	LENGTH	MATCH XFMR	MANUFACTURER	HEIGHT	SERVICE	REMARKS
1. 245 KHz	VERTICAL				625'		RG18/U
3. 2182 KHz B/U	BVR CMV 602 / 3		BROADBAND	ANTENNA PRODUCTS	90'	CCG	LDF4-50
4. 4675 KHz	FOLDED DIPOLE	83.2'	3-001-036-AD	M.O.T.	80'	I.C.A.O	RG333
5. 8913.5 KHz	FOLDED DIPOLE	52.5'	3-001-036-AD	M.O.T.	80'	I.C.A.O	RG333
6. 11,279 KHz	FOLDED DIPOLE	35.1'	3-001-036-AD	M.O.T.	75'	I.C.A.O	RG333
7. 2868 KHz	FOLDED DIPOLE	163.1'	3-001-036-AD	M.O.T.	75'	I.C.A.O	RG333
10. 4363.6 KHz	FOLDED DIPOLE	107.3'	BALUN	RACAL	65'	CCG	LDF4-50
11. 6351.5 KHz	FOLDED DIPOLE	72.0'	BALUN	PETRIE	45'	CCG	LDF4-50
12. 5803 KHz	FOLDED DIPOLE	53.2'	BALUN	PETRIE	45'	CCG	LDF4-50
17. SPACE							RG18/U
19. 2182 / 2558 KHz	BVR 110'/115' AGL		BROADBAND	MAXTOWER	110'	CCG	LDF4-50

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

Vendor / Sous-traitant

NOTES:
1. THE DIMENSIONS DO NOT INCLUDE THE END INSULATORS.

rev	description	by / par	date
F	GENERAL REVISION	LL	2017-01-16
E	GENERAL REVISION	SK	2010-02-24
D	GENERAL REVISION	SK	2004-06-25
C	GENERAL REVISION	SK	2004-06-25

Asset - Actif

Drawing - Dessin

CAMBRIDGE BAY TX
TRANSMITTER SITE

EXISTING LAYOUT

designed - conception — date

drawn - dessiné — date
A.D. MILLER — 1991-12-12

checked - vérifié — date

approved - approuvé — date
1992-01-15

CCG ref. no. - no. réf. GCC: EWT 8055-525
scale - échelle: SCALE
drawing no. - no. dessin: CM117-201-AL-001
sheet-feuille: 1/1
rev: 0

CM117-201-AL-001

File / Fichier: DRAWING FOR LAYOUT CHANGES.DWG - Printed / Imprimé: 2017/04/07 1:3

ANSI B

CM117-201-AL-001

CAD PRODUCED DRAWING
PRODUIT PAR DAO

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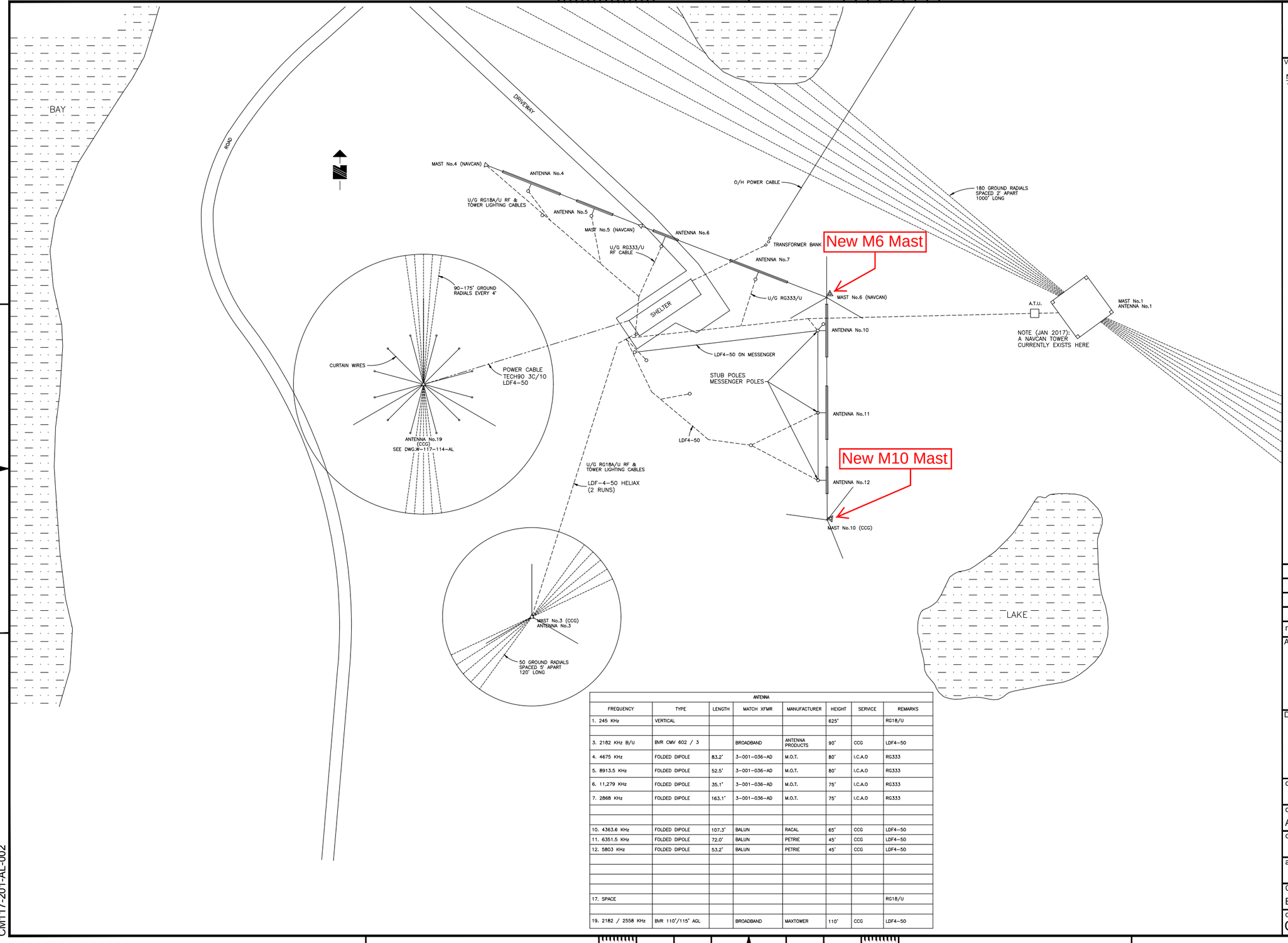
REPORT ANY ERRORS OR OMISSIONS TO ILS MANAGER
SIGNALER LES ERREURS OU LES OMISSIONS AU GESTIONNAIRE SLI



ANTENNA							
FREQUENCY	TYPE	LENGTH	MATCH XFMR	MANUFACTURER	HEIGHT	SERVICE	REMARKS
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12. 5803 KHz	FOLDED DIPOLE	53.2'	BALUN	PETRIE	45'	CCG	LDF4-50
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Fisheries and Oceans Canada / Pêches et Océans Canada
Canadian Coast Guard / Garde côtière Canadienne

Vendor / Sous-traitant

NOTES:
1. THE DIMENSIONS DO NOT INCLUDE THE END INSULATORS.

rev	description	by / par	date
F	GENERAL REVISION	LL	2017-01-16
E	GENERAL REVISION	SK	2010-02-24
D	GENERAL REVISION	SK	2004-06-25
C	GENERAL REVISION	SK	2004-06-25

Asset - Actif

Drawing - Dessin

CAMBRIDGE BAY TX
TRANSMITTER SITE

PROPOSED TOWER LOCATIONS

designed - conception — date

drawn - dessiné — date
A.D. MILLER — 1991-12-12

checked - vérifié — date

approved - approuvé — date
1992-01-15

CCG ref. no. - no. réf. GCC: EWT 8055-525
scale - échelle: SCALE
drawing no. - no. dessin: CM117-201-AL-002
sheet-feuille: 1/1
rev: 0

CM117-201-AL-002

File / Fichier: DRAWING FOR LAYOUT CHANGES.DWG - Printed / Imprimé: 2017/04/07 12:59

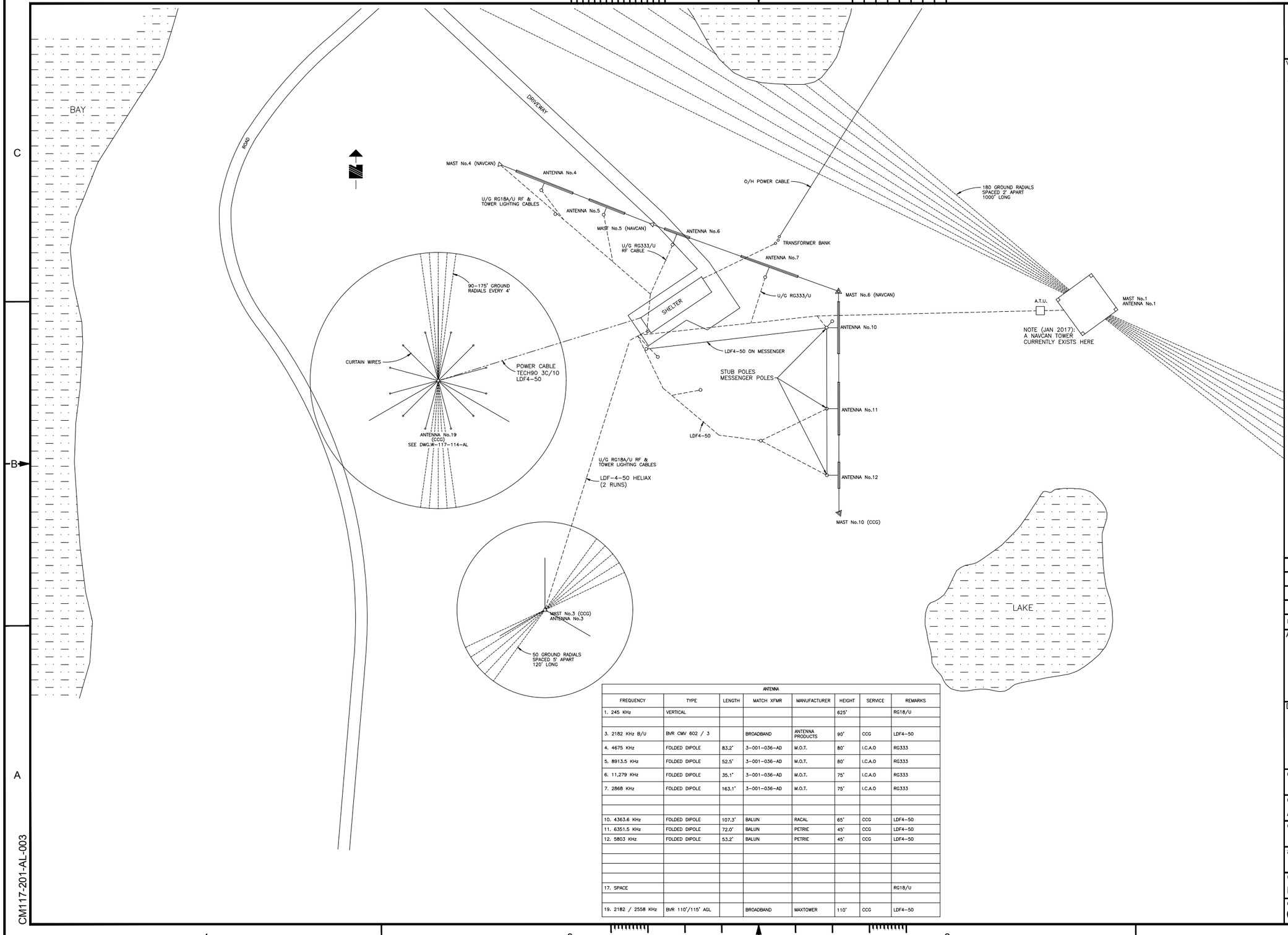
ANSI B

millimeters 0 1 2 3 — millimètres 5 6 7 8

4 3 2 1

CAD PRODUCED DRAWING
PRODUIT PAR DAO

REPORT ANY ERRORS OR OMISSIONS TO ILS MANAGER
SIGNALER LES ERREURS OU LES OMISSIONS AU GESTIONNAIRE SLI



ANTENNA

FREQUENCY	TYPE	LENGTH	MATCH XFMR	MANUFACTURER	HEIGHT	SERVICE	REMARKS
1. 245 KHz	VERTICAL				625'		RG18/U
3. 2182 KHz B/U	BVR CMV 602 / 3		BROADBAND	ANTENNA PRODUCTS	90'	CCG	LDF4-50
4. 4675 KHz	FOLDED DIPOLE	83.2'	3-001-036-AD	M.O.T.	80'	I.C.A.O	RG333
5. 8913.5 KHz	FOLDED DIPOLE	52.5'	3-001-036-AD	M.O.T.	80'	I.C.A.O	RG333
6. 11,279 KHz	FOLDED DIPOLE	35.1'	3-001-036-AD	M.O.T.	75'	I.C.A.O	RG333
7. 2868 KHz	FOLDED DIPOLE	163.1'	3-001-036-AD	M.O.T.	75'	I.C.A.O	RG333
10. 4363.6 KHz	FOLDED DIPOLE	107.3'	BALUN	RACAL	65'	CCG	LDF4-50
11. 6351.5 KHz	FOLDED DIPOLE	72.0'	BALUN	PETRIE	45'	CCG	LDF4-50
12. 5803 KHz	FOLDED DIPOLE	53.2'	BALUN	PETRIE	45'	CCG	LDF4-50
17. SPACE							RG18/U
19. 2182 / 2558 KHz	BVR 110'/115' AGL		BROADBAND	MAXTOWER	110'	CCG	LDF4-50

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

Vendor / Sous-traitant

NOTES:
1. THE DIMENSIONS DO NOT INCLUDE THE END INSULATORS.

rev	description	by / par	date
F	GENERAL REVISION	LL	2017-01-16
E	GENERAL REVISION	SK	2010-02-24
D	GENERAL REVISION	SK	2004-06-25
C	GENERAL REVISION	SK	2004-06-25

Asset - Actif

Drawing - Dessin

CAMBRIDGE BAY TX
TRANSMITTER SITE
EXPECTED POST
CONSTRUCTION LAYOUT

designed - conception — date

drawn - dessiné — date
A.D. MILLER — 1991-12-12

checked - vérifié — date

approved - approuvé — date
1992-01-15

CCG ref. no. - no. réf. GCC: EWT 8055-525
scale - échelle: SCALE
drawing no. - no. dessin: CM117-201-AL-003
sheet-feuille: 1/1
rev: 0

CM117-201-AL-003

File / Fichier: DRAWING FOR LAYOUT CHANGES.DWG - Printed / Imprimé: 2017/04/07 1:2

ANSI B

CM117-201-AL-003

APPENDIX D: SUMMARY OF WORK REQUIREMENTS

TOWER	TOWER OWNER	LOCATION	DESCRIPTION	HEIGHT	TOWER SERVICE REQUIRED
M3	CCG	Tx Site	Guyed tower	90'	Wire brush all parts showing signs of rust and paint with two coats of zinc rich paint.
M5	Nav Canada	Tx Site	Guyed tower	75'	No action required.
M6	Nav Canada	Tx Site	Guyed tower to be replaced with free standing tower	Existing: 75' Replacement: 80'	Remove existing tower. Install replacement tower.
M10	CCG	Tx Site	Guyed tower to be replaced with free standing tower	Existing: 75' Replacement: 80'	Remove existing tower. Install replacement tower.
M19	CCG	Tx Site	Guyed tower	110'	Wire brush all parts showing signs of rust and paint with two coats of zinc rich paint.
North Tower	CCG	Rx Site	Guyed tower	80'	Wire brush all parts showing signs of rust and paint with two coats of zinc rich paint.
South Tower	CCG	Rx Site	Guyed tower	80'	Wire brush all parts showing signs of rust and paint with two coats of zinc rich paint.

APPENDIX E: DRAWINGS & DATA SHEETS

GENERAL NOTES:

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS (INCLUDING LATEST AMENDMENTS) AND OTHER LOCAL AUTHORITIES HAVING JURISDICTION.
2. WHERE DOCUMENTS AND STANDARDS ARE REFERENCED IN THE NOTES, THEY SHALL BE THE LATEST EDITIONS, UNLESS OTHERWISE NOTED OR SHOWN.
3. ALL DIMENSIONS AND ELEVATIONS SHALL BE VERIFIED ON THE JOB BY THE CONTRACTOR. CONTRACTOR IS TO REPORT DISCREPANCIES TO THE ENGINEER PROMPTLY AND BEFORE CONSTRUCTION.
4. READ DRAWINGS IN CONJUNCTION WITH SPECIFICATIONS AND ALL OTHER CONTRACT DOCUMENTS, WHERE APPLICABLE.
5. BEFORE PROCEEDING WITH WORK, CHECK ALL THE DIMENSIONS SHOWN ON THE STRUCTURAL DRAWINGS AGAINST THE ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS (WHERE APPLICABLE) AND REPORT DISCREPANCIES TO THE CONSULTANT.
6. DRAWINGS ARE NOT TO BE SCALED.

DESIGN CRITERIA:

1. ALL DESIGN AND WORKMANSHIP ON THIS PROJECT SHALL MEET THE REQUIREMENTS OF THE 2010 NATIONAL BUILDING CODE.
2. CLIMATIC DATA: CAMBRIDGE BAY, NUNAVUT.
   WIND: $q_{(1/50)}$ = 0.54 kPa
3. FOUNDATION DESIGN
3.1. DESIGN LOADS AS PER ALLAN PIPE FAB INC. DRAWINGS FILE No. 7214 DATED JAN 9, 2017.

STRUCTURAL STEEL

1. STRUCTURAL STEEL SHALL BE DESIGNED IN ACCORDANCE WITH CSA STANDARD S16-09.
2. FABRICATION, CONSTRUCTION, ERECTION, TOLERANCES, WELDING, ETC SHALL CONFORM TO THE REQUIREMENTS OF CSA S16-09.
3. ROLLED STEEL SHAPES SHALL BE NEW MATERIAL CONFORMING TO THE REQUIREMENTS OF CSA STANDARD G40.21, GRADE 350W OR ASTM STANDARD A572/A992, GRADE 50.
4. PLATES, CHANNELS, AND ANGLES SHALL BE NEW MATERIAL CONFORMING TO THE REQUIREMENTS OF CSA STANDARD G40.21, GRADE 300W.
5. SUBMIT SHOP DRAWINGS FOR STRUCTURAL STEEL TO CONSULTANT FOR REVIEW PRIOR TO FABRICATION.

6. WELDING:
6.1. WELDING OF CARBON STEEL SHALL BE PERFORMED IN ACCORDANCE WITH CSA STANDARD W59 BY A FIRM CERTIFIED BY THE CANADIAN WELDING BUREAU TO THE REQUIREMENTS OF CSA STANDARD W47.1.
6.2. WELDING ELECTRODES FOR CARBON STEEL SHALL BE E49XX, OR EQUIVALENT, CONFORMING TO THE REQUIREMENTS OF CSA STANDARD W48.
7. BOLTING:
7.1. BOLTS GRATER THAN OR EQUAL TO ½" IN DIAMETER SHALL CONFORM TO THE REQUIREMENTS OF ASTM STANDARD A325. ACCOMPANYING NUTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM STANDARD A563 OR A194, GRADE 2H. ACCOMPANYING WASHERS SHALL CONFORM TO THE REQUIREMENTS OS ASTM STANDARD F436.
8. GALVANIZING:
8.1. (WHERE NOTED) STRUCTURAL STEEL TO BE HOT-DIP GALVANIZED AND FIELD TOUCHED UP WITH ZINC-RICH PAINT.
8.2. NUT, BOLT, AND WASHER ASSEMBLIES TO MEET STATED REQUIREMENTS FOR STRENGTH AND HAVE A GALVANIZED FINISH.
8.3. PROVIDE DRAIN/WEEP HOLES IN ALL CLOSED-SECTION MEMBERS.
8.4. BRACING, COLUMN SPLICE, AND MOMENT CONNECTION MATING SURFACES TO BE WIRE-BRUSHED.
8.5. IF REQUIRED, BOLT HOLE DIAMETERS SHOWN ON DRAWINGS MAY BE INCREASED BY $\frac{1}{16}$" FOR THE PURPOSES OF GALVANIZING.
9. STEEL PAINTING:
9.1. STEEL SURFACES SHALL BE PREPARED AND COATED IN ACCORDANCE WITH SSPC-SP1 AND SP3 STANDARDS.
9.2. ALL MATING SURFACES OF BRACING, COLUMN SPLICE AND MOMENT CONNECTIONS TO REMAIN UNPAINTED.
9.3. STEEL SURFACES SHALL BE PRIMED WITH A SINGLE COAT OF QUALITY PRIMER.
9.4. STEEL SURFACES SHALL BE TOP COATED WITH COLOUR CHOSEN BY OWNER. OWNER TO SUPPLY A COLOUR SAMPLE.
9.5. MATING SURFACES DAMAGED OR LEFT EXPOSED FOLLOWINGS STEEL INSTALLATION SHALL BE TOUCHED UP WITH QUALITY PRIMER AND PAINT TO MATCH IN-SHOP COATINGS.

10. GRATING:
10.1. GRATING SHALL BE NEW 3 lb. CARBON STEEL EXPANDED METAL GRATING.
10.2. EXPANDED METAL GRATING SHALL BE MANUFACTURED IN ACCORDANCE WITH THE EMMA STANDARD 557-99 FROM SHEET CONFORMING TO ASTM STANDARD A569 OR A1011.
10.3. WELD EXPANDED METAL GRATING TO THE SUPPORT AT EVERY 4th STRAND OR EVERY 6", WHICHEVER IS LESS.
10.4. EXPANDED METAL GRATING TO OVERLAP THE SUPPORT A MINIMUM 1½" AT ALL LOCATIONS.
10.5. APPROXIMATE OPEN AREA (%) = 60

FOUNDATION NOTES:

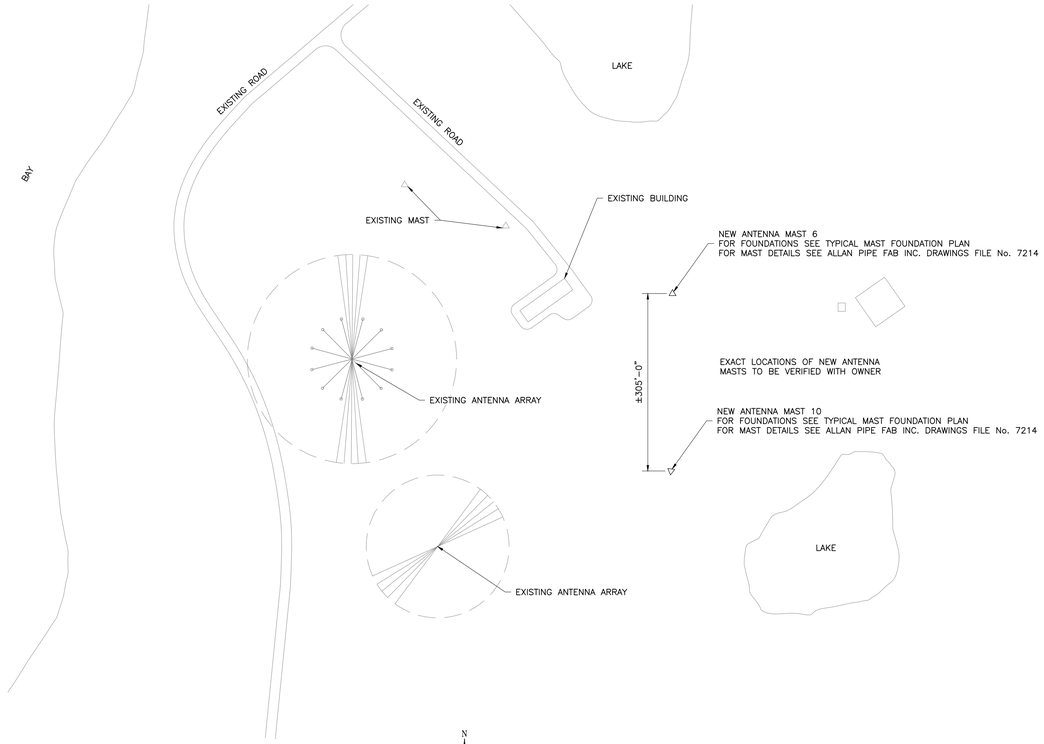
1. CONTRACTOR RESPONSIBLE FOR VERIFYING DIMENSIONS PRIOR TO PROCEEDING WITH EXCAVATIONS, ETC.
2. REMOVE ALL UNSUITABLE FILL AND ORGANIC MATERIAL FROM CONSTRUCTION AREA. THESE MATERIALS ARE NOT TO BE USED FOR BACKFILL OR OTHER SOIL REMEDIATIONS.
3. CONTRACTOR TO CONSULT GEOTECHNICAL ENGINEER TO VERIFY EXISTING CONDITIONS AND PROVIDE RECOMMENDATIONS.

STEEL PIPE PILES:

1. PILES ARE TO BE MINIMUM ø5½" (O.D.)
2. PILE HOLES TO BE DRILLED TO A DIAMETER AT LEAST 2" LARGER THAN THE OUTSIDE DIAMETER OF THE PILE.
3. ADFREEZE PILES ARE TO BE FILLED WITH A SAND SLURRY MIX BOTH INSIDES AND OUTSIDE OF THE PILE.
4. USE ADFREEZE PILES EXCEPT WHERE BEDROCK IS ENCOUNTERED WITHIN EMBEDMENT DEPTH. WHERE BEDROCK IS ENCOUNTERED USE ROCK SOCKETED PILES. REFER TO TYPICAL DETAILS FOR DESIGN CRITERIA AND ADDITIONAL INSTALLATION REQUIREMENTS.

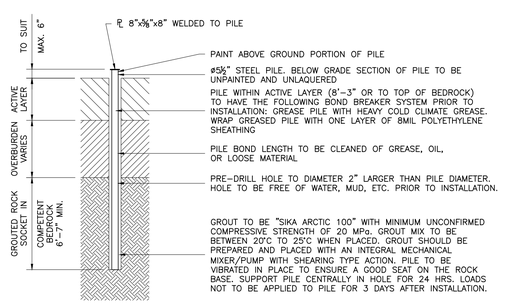
FALL ARREST:

1. FALL ARREST SYSTEM SHALL BE TRYLON TSF COUGAR SAFETY RAIL INSTALLED AS PER MANUFACTURERS RECOMMENDATIONS.
2. FALL ARREST SYSTEM TO COMPLY WITH CSA STANDARDS Z259.
3. MAXIMUM ONE PERSON PER FALL ARREST TIE OFF.
4. USER TO SELECT LANYARDS OF APPROPRIATE LENGTH AS REQUIRED FOR THE TASK.
5. FALL ARREST RAIL TO BE MOUNTED TO LADDER ON TOWER FACE AS INDICATED ON DRAWINGS PREPARED BY ALLAN PIPE FAB.



SITE PLAN

SCALE: N.T.S.

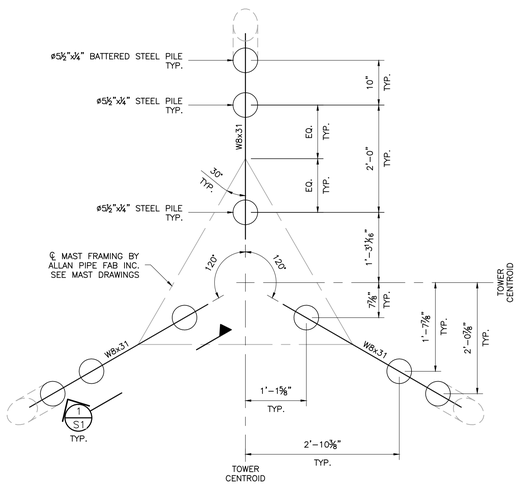


TYPICAL ROCK SOCKETED PILE

SCALE: N.T.S.

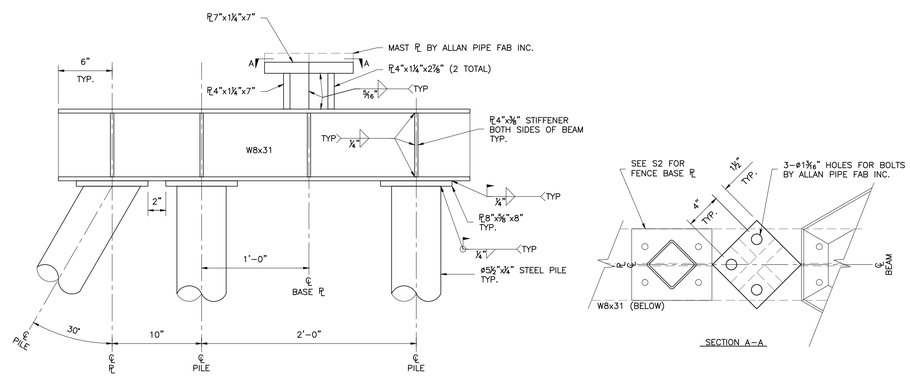
DESIGN DATA FOR ROCK SOCKETED PILES:

- THE PILES ARE TO BE DESIGNED ON THE BASIS OF A COMBINED FACTORED RESISTANCE AT ULS OF 5 MPa OVER THE FULL BASE AREA OF THE GROUTED PILES AND A FACTORED BOND BETWEEN THE GROUT AND THE BEDROCK OF 300 kPa.
- MIN. EMBEDMENT 6'-7" BELOW COMPETENT BEDROCK



TYPICAL MAST FOUNDATION PLAN

SCALE: 3/4"=1'-0"



SECTION A-A

TYPICAL FOUNDATION ELEVATION

1 S1 SCALE: 1-1/2"=1'-0"

NOTE:
STEEL MEMBERS FOR FOUNDATION FRAMING TO BE HOT-DIP GALVANIZED. REFER TO GENERAL NOTES.

NO.	REVISION	DATE
1	ISSUED FOR REVIEW	JAN. 18, 2017
2	ISSUED FOR PRICING	FEB. 8, 2017
3	REISSUED FOR PRICING	FEB. 14, 2017
4		
5		
6		
7		

NOTES:

CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR REPORTING ALL DISCREPANCIES TO OWNER AND/OR CONSULTANT PRIOR TO TENDER CLOSING

LATEST APPROVED DRAWINGS ONLY TO BE USED FOR CONSTRUCTION.

PRINTS ARE NOT TO BE SCALED.

PERMIT TO PRACTICE
Concentric Associates International Inc.
Signature
Date 02/14/2017
PERMIT NUMBER: P 492
The Association of Professional Engineers, Geologists and Geophysicists of the NWT / NU

REGISTERED PROFESSIONAL ENGINEER
S.T. PARKER
LICENSEE 02/14/2017
NT/NU

REGISTERED PROFESSIONAL ENGINEER
A.D. MURRAY
LICENSEE 02/14/2017
N.W.T.

CONCENTRIC
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WINNIPEG Toll Free 1-866-919-4531
TORONTO Tel. 1-647-351-0095
COQUITLAM Tel. 1-604-553-4056

CLIENT NAME:
CANADIAN COAST GUARD

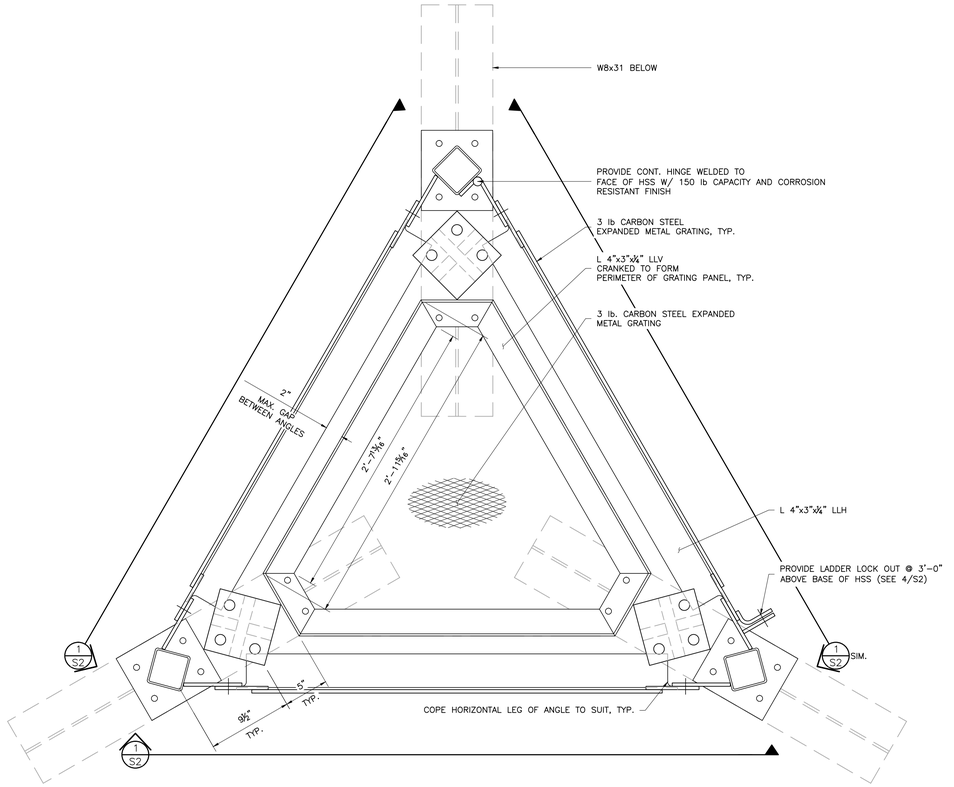
PROJECT ADDRESS:
CAMBRIDGE BAY, NUNAVUT

PROJECT NAME:
NEW ANTENNA ARRAY FOUNDATION

DRAWING TITLE:
PROJECT NOTES, SITE PLAN, FOUNDATION PLAN AND DETAILS

DESIGN:	SDH	SCALE:	AS SHOWN
DRAWN:	AJG	DATE:	JAN./2017
APPVD:	EGB	FILE No:	16-7124

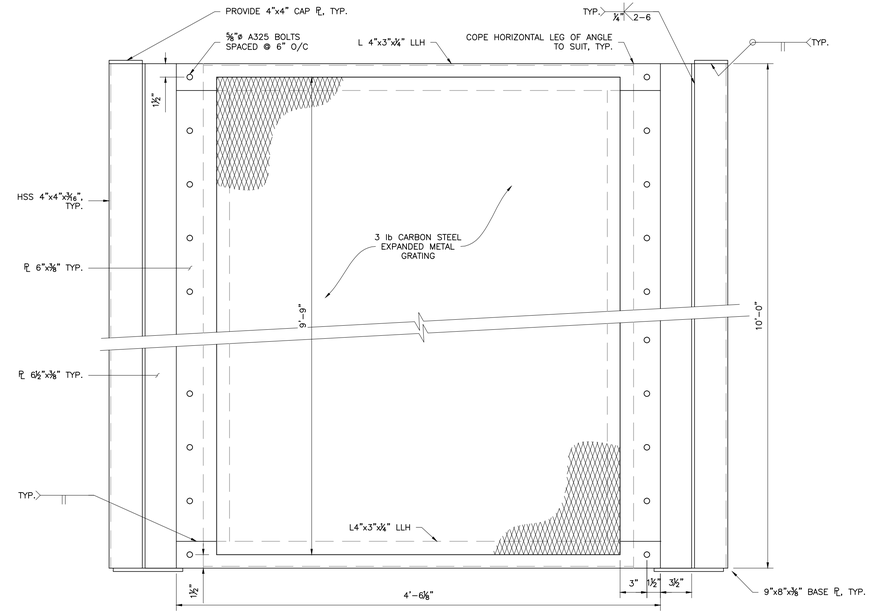
SHEET No.
S1



FENCE PLAN @ TOP OF W8x31

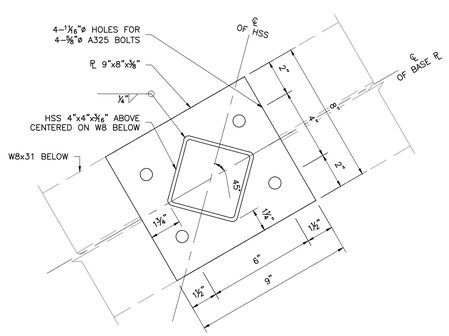
SCALE: 1-1/2"=1'-0"

FENCE FRAMING TO BE PAINTED TO MATCH ANTENNA MAST COLOURS. SEE S1 FOR PAINT NOTES.



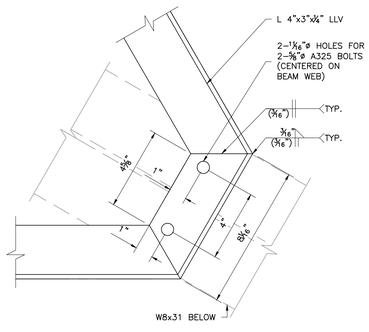
1/S2 FENCE ELEVATION

SCALE: 1-1/2"=1'-0"



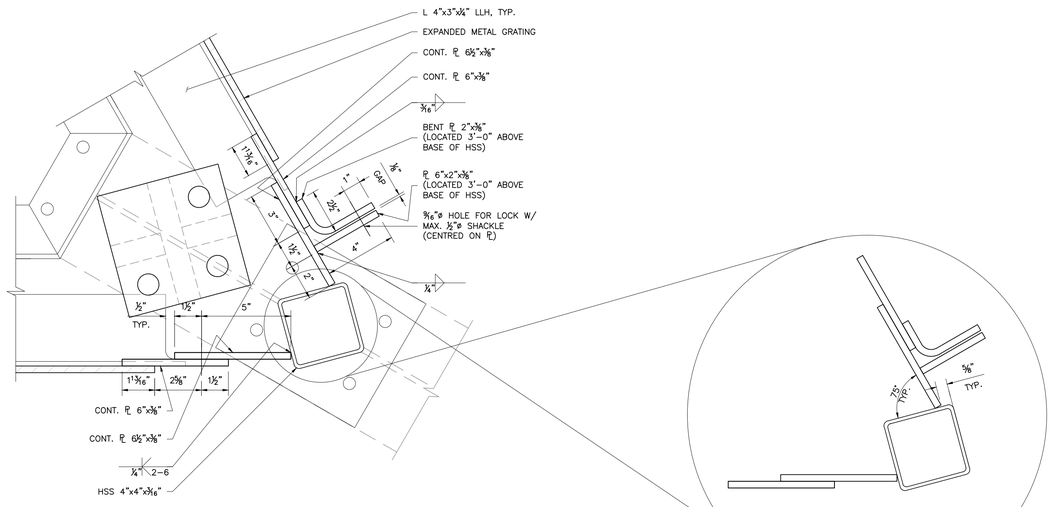
2/S2 TYPICAL HSS BASE PLATE DETAIL

SCALE: 3"=1'-0"



3/S2 TYPICAL ANGLE TO BEAM CONNECTION DETAIL

SCALE: 3"=1'-0"



4/S2 LADDER LOCK OUT AND TYPICAL HSS CONNECTION DETAIL

SCALE: 3"=1'-0"

NO.	REVISION	DATE
1	ISSUED FOR REVIEW	JAN. 18, 2017
2	ISSUED FOR PRICING	FEB. 8, 2017
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4		
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CLIENT NAME:
CANADIAN COAST GUARD

PROJECT ADDRESS:
CAMBRIDGE BAY, NUNAVUT

PROJECT NAME:
NEW ANTENNA ARRAY FOUNDATION

DRAWING TITLE:
FENCE PLAN, ELEVATION AND DETAILS

DESIGN:	SDH	SCALE:	AS SHOWN
DRAWN:	BHR	DATE:	JAN./2017
APPV'D:	EGB	FILE No:	16-7124

SHEET No.
S2

ORIGINAL JOB NO. N/A

QUOTE NO. Q-7259

PAPER SIZE: 11X17

DRAWING INDEX		
DRAWING No	DESCRIPTION	REVISION
7214.960.100-1	TITLE PAGE	B
7214.960.102-1	TOWER PROFILE (MAST #6)	B
7214.960.102-2	TOWER PROFILE (MAST #10)	B
7214.960.104-1	SITE LAYOUT	A
7214.960.108-1	TOWER BASE DETAILS (MAST #6 & 10)	A

SITE INFORMATION	
OWNERS NAME:	CANADIAN COAST GUARD
SITE NAME/CODE:	CAMBRIDGE BAY
DESCRIPTION:	80' 48" A.W. SELF SUPPORT TOWERS
LOCATION:	NUNAVUT
SITE COORDINATES:	N/A

PERMIT TO PRACTICE
MTSE INC.
Signature
Date
PERMIT NUMBER: P 1057
NT/NU Association of Professional Engineers and Geoscientists

Jan 11 2017

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I.M. TEODORESCU
LICENSEE
NT/NU

Jan 11 2017

OWNERS NAME:
CANADIAN COAST GUARD

PROJECT TITLE:
80' 48" A.W. SELF SUPPORT TOWER
-

SITE NAME / CODE:
CAMBRIDGE BAY, NU
-

CUSTOMER NAME:
ONPOWER INC

CUSTOMER REF / PO#:
16-7124

REVISIONS

No.	Description	Date
A	ISSUE FOR CONSTRUCTION	01/09/2017
B	REVISED	01/11/2017
*	*	*
*	*	*

DRAWING TITLE:
TITLE PAGE
-

APFI JOB No.
7214

DRAWING No.
7214.960.100-1

DRWN BY	CHK'D BY	APPR'D BY
MO	-	-

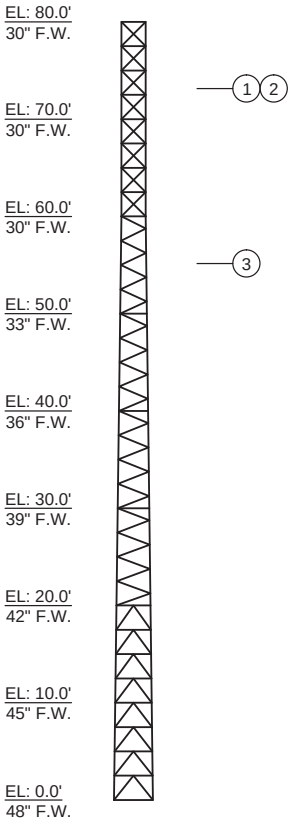
ORIGINAL JOB NO. N/A

QUOTE NO. Q-7259

PAPER SIZE: 11X17

MEMBER LEGEND
A - 5" x 5" x 5/8" PLATE
B - (3) 3/4" x 2-3/4" A325 BOLT ASS'Y

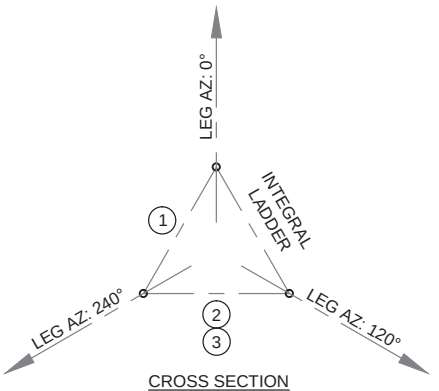
PAINT	2-1/2" S.R.	2-1/4" S.R.	1" S.R.	7/8" S.R.	PL 7" x 7" x 1"	(3) 1-1/8" x 4" A325	K-BRACE		
LEG (50W)								2" S.R.	1-3/4" S.R.	1-5/8" S.R.
HORIZ. (44W)									N/A		3/4" S.R.
DIAG. (44W)										3/4" S.R.	
SPLICE PAD								PL 6" x 6" x 3/4"			A
SPLICE BOLTS								(3) 1" x 3-1/4" A325			B
BRACE PATTERN								W-BRACE			X-BRACE



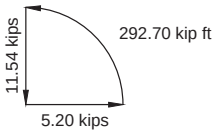
ELEVATION

ITEM NO.	ANTENNA LOADING					TX LINES	
	QTY	MAKE / MODEL OF ANTENNA	ELEV. (ft)	AZ. (MAG)	STATUS	QTY	DESCRIPTION
1	1	NAV CANADA SUPPORT CABLE PULLEY	73.0	292°	INITIAL	1	3/8" CABLE
2	1	CCG UPPER TRANSMITTER WIRE ANTENNA	73.0	180°	INITIAL	1	3/8" CABLE
3	1	CCG LOWER TRANSMITTER WIRE ANTENNA	55.0	180°	INITIAL	1	3/8" CABLE

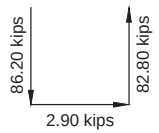
TOWER DESIGNED TO:
CODE: CSA-S37-2013
WIND LOADING: 560 Pa
ICE LOADING: 10 mm



CROSS SECTION



TOTAL FOUNDATION LOADS
(FACTORED)



INDIVIDUAL FOUNDATION LOADS
(FACTORED)

STRUCTURAL NOTES:
1. ALL DIMENSIONS ARE IMPERIAL UNLESS NOTED OTHERWISE
2. TOWER ERECTION SHALL CONFORM TO CSA-S37 AND S16 (LATEST REVISION)
3. ALL WELDING SHALL CONFORM TO CSA-47.1 & W59 (LATEST REVISION)
4. ALL SOLID ROUND MEMBERS GREATER THAN 2" [51mm] Ø MUST BE PRE-HEATED PRIOR TO WELDING
5. ALL STRUCTURAL STEEL SHALL BE MIN. G40.21-44W [300W] OR 50W [350W] AS NOTED
6. LIMIT STATES DESIGN, FACTORED LOADING
7. ALL MATERIAL SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH CSA-G164 U.N.O.
8. ALL STRUCTURAL BOLTS SHALL CONFORM TO ASTM-A325 U.N.O. BOLTS SHALL BE TENSIONED USING THE TURN OF NUT METHOD

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ENGINEER STAMP

REGISTERED PROFESSIONAL ENGINEER
I.M. TEODORESCU
LICENSEE
NT/NU

Jan 11 2017

OWNERS NAME:
CANADIAN COAST GUARD

PROJECT TITLE:
80' 48" A.W. SELF SUPPORT TOWER
-

SITE NAME / CODE:
CAMBRIDGE BAY, NU
TOWER M6

CUSTOMER NAME:
ONTOWER INC

CUSTOMER REF / PO#:
16-7124

REVISIONS		
No.	Description	Date
A	ISSUE FOR CONSTRUCTION	01/09/2017
B	REVISED FOUNDATION LOADS	01/11/2017
*	*	*
*	*	*

DRAWING TITLE:
TOWER PROFILE
MAST #6

APFI JOB No.
7214

DRAWING No.
7214.960.102-1

DRWN BY	CHK'D BY	APPR'D BY
MO	-	-

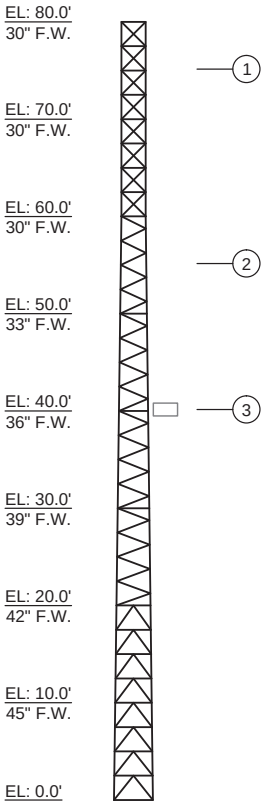
ORIGINAL JOB NO. N/A

QUOTE NO. Q-7259

PAPER SIZE: 11X17

MEMBER LEGEND
A - 5" x 5" x 5/8" PLATE
B - (3) 3/4" x 2-3/4" A325 BOLT ASS'Y

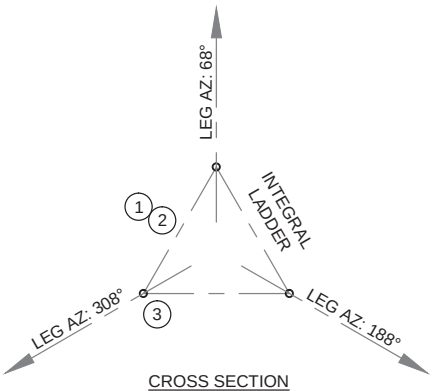
PAINT	2-1/2" S.R.	2-1/4" S.R.	2" S.R.	1-3/4" S.R.	1-5/8" S.R.			
LEG (50W)	1" S.R.	7/8" S.R.	N/A	3/4" S.R.				
HORIZ. (44W)								
DIAG. (44W)								
SPLICE PAD	PL 7" x 7" x 1"		PL 6" x 6" x 3/4"		A			
SPLICE BOLTS	(3) 1-1/8" x 4" A325		(3) 1" x 3-1/4" A325		B			
BRACE PATTERN	K-BRACE		W-BRACE		X-BRACE			



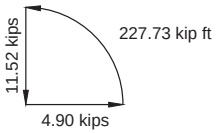
ELEVATION

ITEM NO.	ANTENNA LOADING					TX LINES	
	QTY	MAKE / MODEL OF ANTENNA	ELEV. (ft)	AZ. (MAG)	STATUS	QTY	DESCRIPTION
1	1	CCG UPPER TRANSMITTER WIRE ANTENNA	75.0	0°	INITIAL	1	3/8" CABLE
2	1	CCG LOWER TRANSMITTER WIRE ANTENNA	55.0	0°	INITIAL	1	3/8" CABLE
3	1	YAGI UHF COMPROD 426-70	40.0	295°	INITIAL	1	LDF4-50A

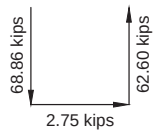
TOWER DESIGNED TO:
CODE: CSA-S37-2013
WIND LOADING: 560 Pa
ICE LOADING: 10 mm



CROSS SECTION



TOTAL FOUNDATION LOADS
(FACTORED)



INDIVIDUAL FOUNDATION LOADS
(FACTORED)

STRUCTURAL NOTES:
1. ALL DIMENSIONS ARE IMPERIAL UNLESS NOTED OTHERWISE
2. TOWER ERECTION SHALL CONFORM TO CSA-S37 AND S16 (LATEST REVISION)
3. ALL WELDING SHALL CONFORM TO CSA-47.1 & W59 (LATEST REVISION)
4. ALL SOLID ROUND MEMBERS GREATER THAN 2" [51mm] Ø MUST BE PRE-HEATED PRIOR TO WELDING
5. ALL STRUCTURAL STEEL SHALL BE MIN. G40.21-44W [300W] OR 50W [350W] AS NOTED
6. LIMIT STATES DESIGN, FACTORED LOADING
7. ALL MATERIAL SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH CSA-G164 U.N.O.
8. ALL STRUCTURAL BOLTS SHALL CONFORM TO ASTM-A325 U.N.O. BOLTS SHALL BE TENSIONED USING THE TURN OF NUT METHOD

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I.M. TEODORESCU
LICENSEE
NT/NU

Jan 11 2017

OWNERS NAME:
CANADIAN COAST GUARD

PROJECT TITLE:
80' 48" A.W. SELF SUPPORT TOWER
-

SITE NAME / CODE:
CAMBRIDGE BAY, NU
TOWER M10

CUSTOMER NAME:
ONTOWER INC

CUSTOMER REF / PO#:
16-7124

REVISIONS		
No.	Description	Date
A	ISSUE FOR CONSTRUCTION	01/09/2017
B	REVISED FOUNDATION LOADS	01/11/2017
*	*	*
*	*	*

DRAWING TITLE:
TOWER PROFILE
MAST #10

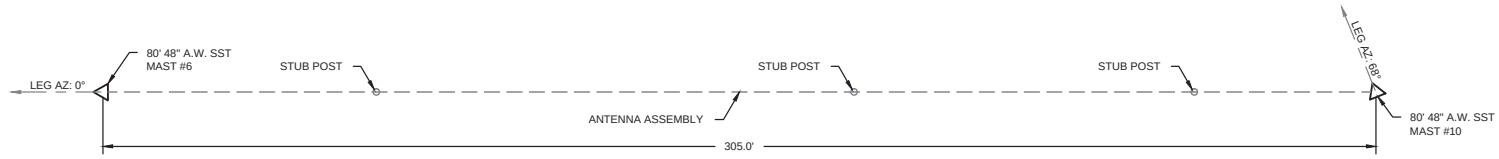
APFI JOB No.
7214

DRAWING No.
7214.960.102-2

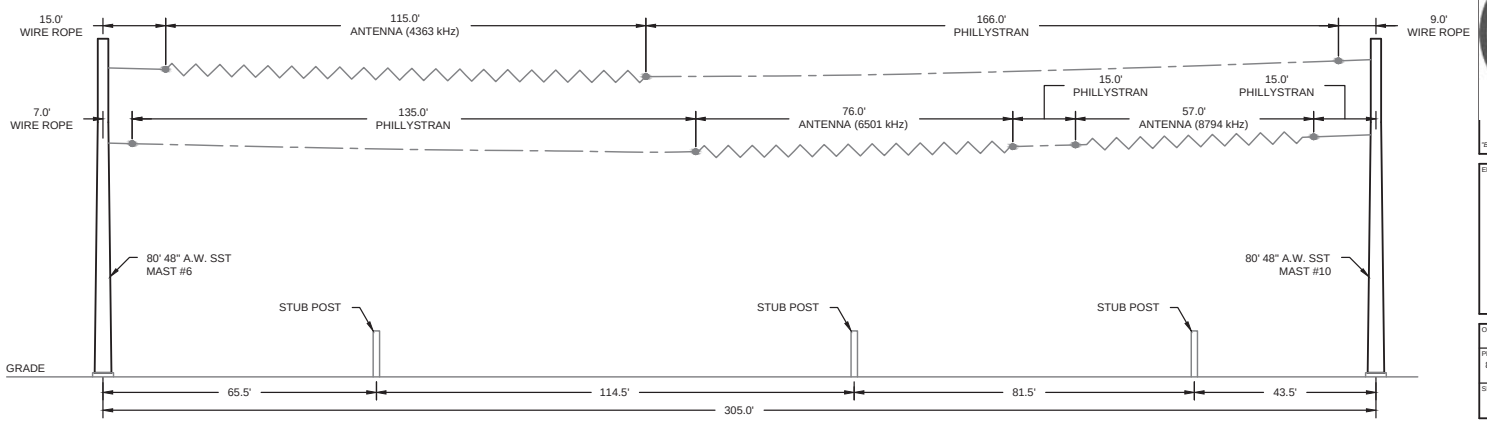
DRWN BY	CHK'D BY	APPR'D BY
MO	-	-

ORIGINAL JOB NO.: N/A

QUOTE NO.: Q-7259



PLAN VIEW



ELEVATION

ALLAN PIPE

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I.M. TEODORESCU
LICENSEE
NT/NU

Jan 11 2017

OWNERS NAME:
CANADIAN COAST GUARD

PROJECT TITLE:
80' 48" A.W. SELF SUPPORT TOWER
-

SITE NAME / CODE:
CAMBRIDGE BAY, NU
TOWER M6 & M10

CUSTOMER NAME:
-

ONTOWER

CUSTOMER REF / PO#:
16-7124

REVISIONS

No.	Description	Date
A	ISSUE FOR CONSTRUCTION	01/09/2017
-	-	-
-	-	-
-	-	-

DRAWING TITLE:
SITE LAYOUT
MAST #6 & 10

APFI JOB No.
7214

DRAWING No.
7214.960.104-1

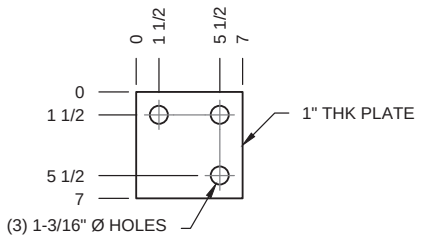
DRWN BY	CHKD BY	APPR'D BY
MO	-	-

PAPER SIZE: 11X17

ORIGINAL JOB NO. N/A

QUOTE NO. Q-7259

PAPER SIZE:: 11X17



DETAIL 'A'

TOWER BASE LAYOUT

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LICENSEE
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Jan 11 2017

OWNERS NAME:	CANADIAN COAST GUARD
PROJECT TITLE:	80' 48" A.W. SELF SUPPORT TOWER -
SITE NAME / CODE:	CAMBRIDGE BAY, NU TOWER M6 & M10
CUSTOMER NAME:	ONTOWER INC
CUSTOMER REF / PO#:	16-7124

REVISIONS

No.	Description	Date
A	ISSUE FOR CONSTRUCTION	01/09/2017
*	*	*
*	*	*
*	*	*

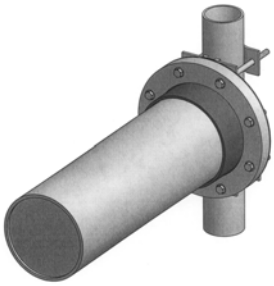
DRAWING TITLE:	TOWER BASE DETAILS MAST #6 & 10
APFI JOB No.	7214
DRAWING No.	7214.960.108-1

DRWN BY	CHK'D BY	APPR'D BY
MO	-	-

RADOME YAGI ANTENNAS SERIES

The Radome Yagi Antenna Series is available in UHF & 700/800/900 MHz configurations. For UHF type, we have two types of radomes: fiberglass or PVC. In 700/800/900 MHz, only the PVC model is available. Antennas can be customized to your applications.

- Antenna has rugged design to withstand the most extreme environmental conditions.
- Mounting hardware supplied will permit either vertical or horizontal polarization.
- DC ground for lightning protection.
- The PVC enclosure is ½" thick water main.
- These are heavy-duty versions and are part of our "Avalanche Series". Contact a COMPROD technical support technician for more information.



490-70R

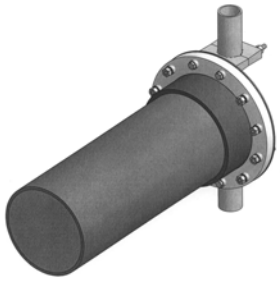
Complete your RF solution

Multicouplers
Pass-Reject
Combline Filters/Preselectors...
Clamps

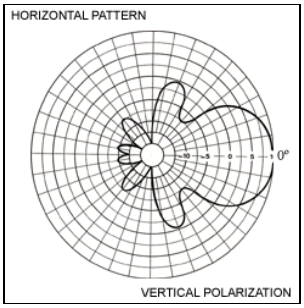
› Pdf format

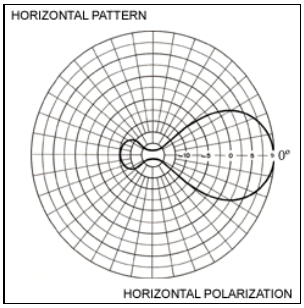
RADOME YAGI ANTENNA			
Electrical Specifications	**425-70**	**426-70**	**490-70R**
Frequency Range, MHz	406-512	406-512	746-960
Nominal Gain, dBd	10	10	10
Number of Elements	Loop Yagi	Loop Yagi	7
Bandwidth: 1.5:1 VSWR, MHz	20	20	72
Polarization	Vert. or Horiz.	Vert. or Horiz.	Vert. or Horiz.
Horizontal Beamwidth (Vert. Pol.)	62º	62º	56º
Vertical Beamwidth (Vert. Pol.)	48º	48º	42º
Front to Back, dB	20	20	20
Pattern	Directional	Directional	Directional
Power Rating, Watts	250	250	150
Nominal Impedance, Ohms	50	50	50
Lightning Protection	DC Ground	DC Ground	DC Ground
Standard Termination	Type N Male	Type N Male	Type N Male
Mechanical Specifications			
Length, in (mm)	31 (787)	30 (762)	29 (737)
Width (1/2 Wave Spacing), in (mm)	16 (406)	16 (406)	14 (356)
Weight, lbs (kg)	44 (20)	19 (8.6)	28 (12)
Radome Material	PVC	Fiberglass	PVC
Rated Wind Velocity: No Ice, mph (km/h)	150 (241)	120 (193)	150 (241)
Rated Wind Velocity: 0.5" (13mm) Ice, mph (km/h)	105 (169)	110 (177)	115 (185)
Lateral Thrust @ 100mph wind, lbs (kg)	69 (31.3)	61 (27.7)	47.4 (21.5)
Projected Area, ft² (m²)	2.6 (0.24)	2.3 (0.21)	1.8 (0.17)
Mounting Information	2.9" O.D.	2.4" O.D.	2.9" O.D.

Order Information	(2) Stacked	(4) Stacked	406-430	430-450	450-470
425-70	2*425-70	4*425-70	425-70*1	425-70*2	425-70*3
426-70	2*426-70	4*426-70	426-70*1	426-70*2	426-70*3
490-70R	2*490-70R	4*490-70R	n/a	n/a	n/a



425-70





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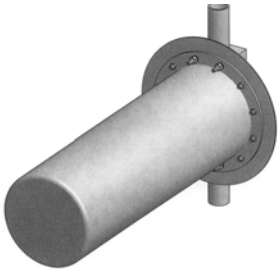

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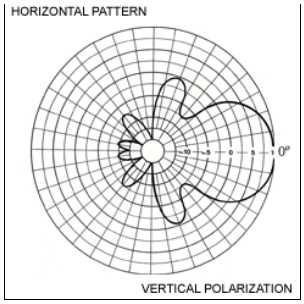
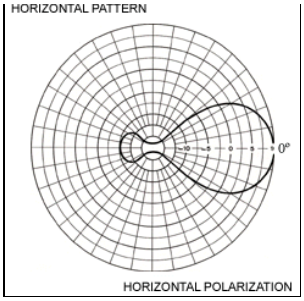
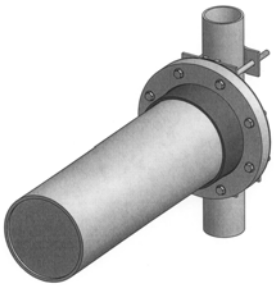
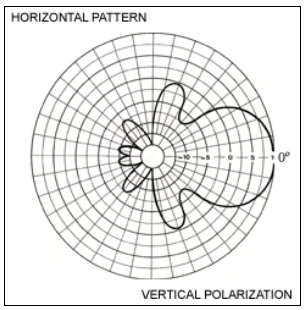
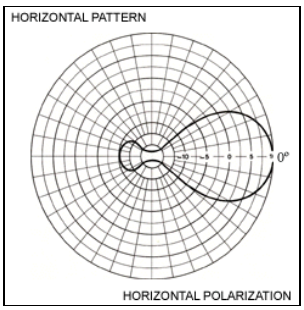


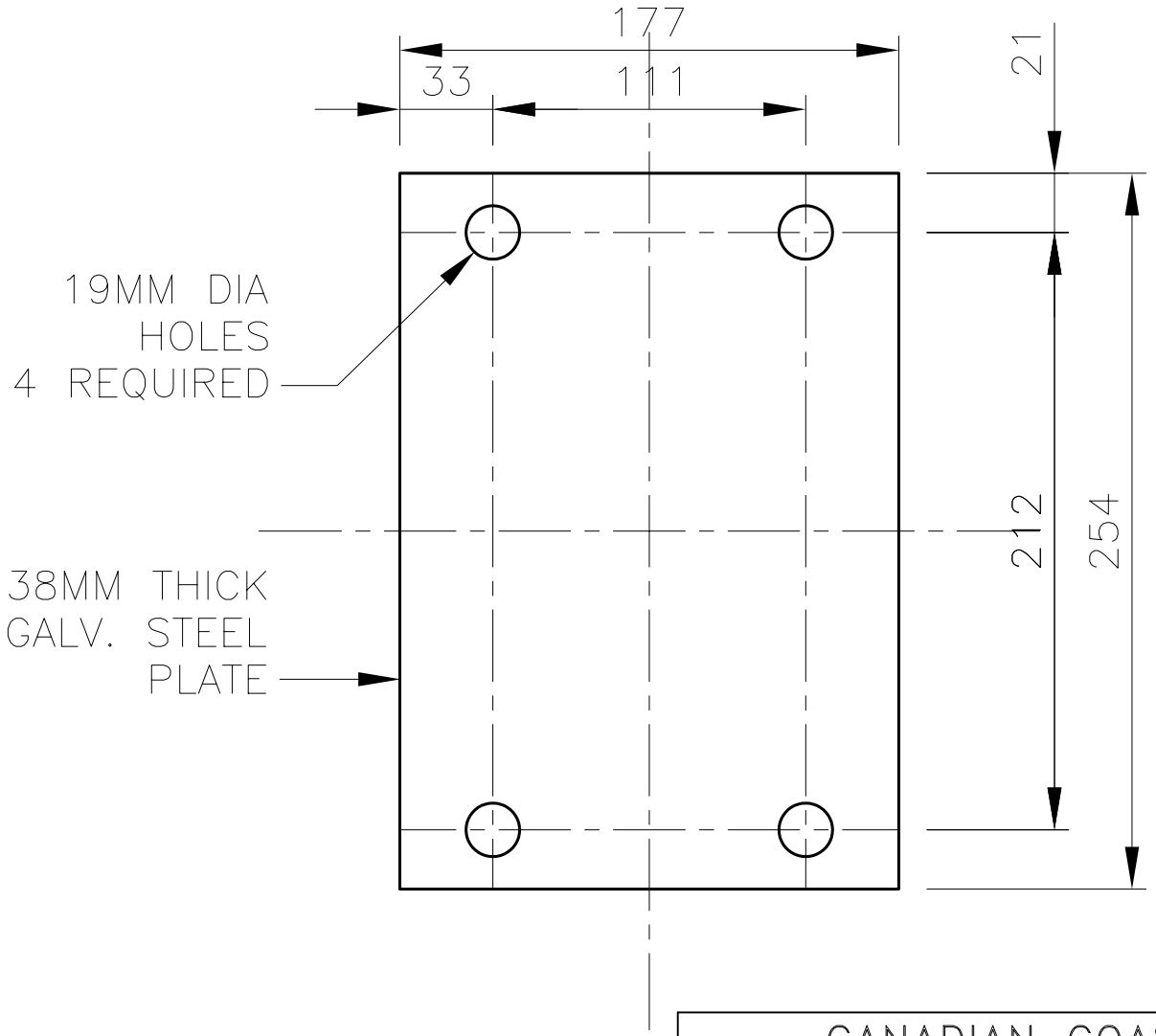




490-70R





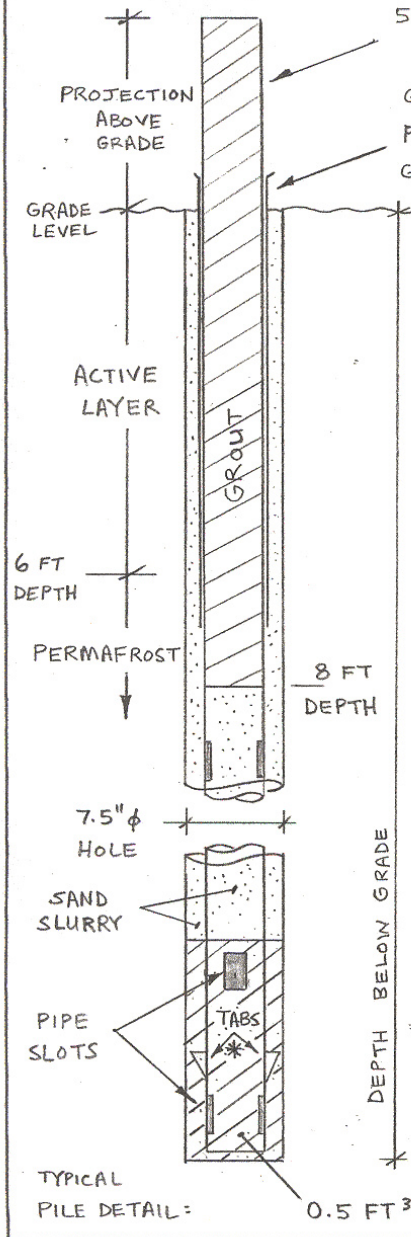


NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.

CANADIAN COAST GUARD 520 EXMOUTH STREET, SARNIA, ON. N7T 8B1					FILE NO. EWT 8055-529-1	
DWGS MAY NOT BE DUPLICATED OR DISCLOSED WITHOUT WRITTEN CONSENT FROM CANADIAN COAST GUARD						
					JET WINCH 1 WF-1000 N MOUNTING PLATE RESOLUTE BAY TX SITE	
Ø	12-22-06	DRAWING INITIATED.	R.C.S.	JAW	SCALE N.T.S.	DWG NO. SK-05	ISSUE 1
ISS.	DATE	DESCRIPTION	DRWN	APP'D			

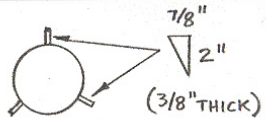
APPENDIX F: EXISTING TOWER DRAWINGS



5.5"ϕ x 0.275" WT PIPE

GREASE PIPE AND WRAP WITH POLY (6 mil) FROM 6" ABOVE GRADE TO 6.5 FT BELOW

* TABS



3 TABS AT 120° SPACING LOCATED @ ONE FOOT ABOVE BOTTOM OF PIPE AND @ MID-DEPTH (WELDED TO PIPE)

GENERAL SPECIFICATIONS

MEAN GROUND TEMPERATURE = -1.5 °C

SLURRY : SAND AGGREGATE ≤ 3/16" PARTICLE SIZE
POTABLE NON-SALINE WATER
0°C < PLACEMENT TEMPERATURE ≤ 6°C
SLURRY SALINITY < 5 PPT
MIX TO CONSISTENCY OF WET PASTE

GROUT : SIKA ARCTIC 100

PIPE SLOTS : 4" x 2" ON BOTH SIDES OF PIPE AT 20" INTERVALS DOWN PIPE ALTERNATE SLOTS 90 DEGREES (FIRST SET SLOTS AT 10' DEPTH)

STEEL PIPE : 300 W

SOIL VALUES : GLACIAL TILL
PERMAFROST ENCOUNTERED AT 6 FEET
DEPTH TO BEDROCK - UNKNOWN

WELDING : SHALL CONFORM TO CSA STANDARD W59 AND CSA S37-01

WEDGES : SHALL BE LEFT IN PLACE FOR 48 HRS AFTER PILES HAVE BEEN PLACED

NOTE : NO STRUCTURAL LOADS SHALL BE APPLIED TO PILES UNTIL FREEZE-BACK HAS OCCURED (CAN BE VERIFIED WITH GROUND TEMP. CABLES)

0.5 FT³ (1 BAG) OF SIKA ARCTIC 100 GROUT AT BASE OF PILE

ADVANTAGE TOWER LTD.
BOX 1 SITE 21 RR9
CALGARY ALBERTA CANADA
T2J 5G5
PHONE: 403-201-7983 FAX: 403-201-7963
Email: jcurzon@advantagetower.com
1-800-399-0667

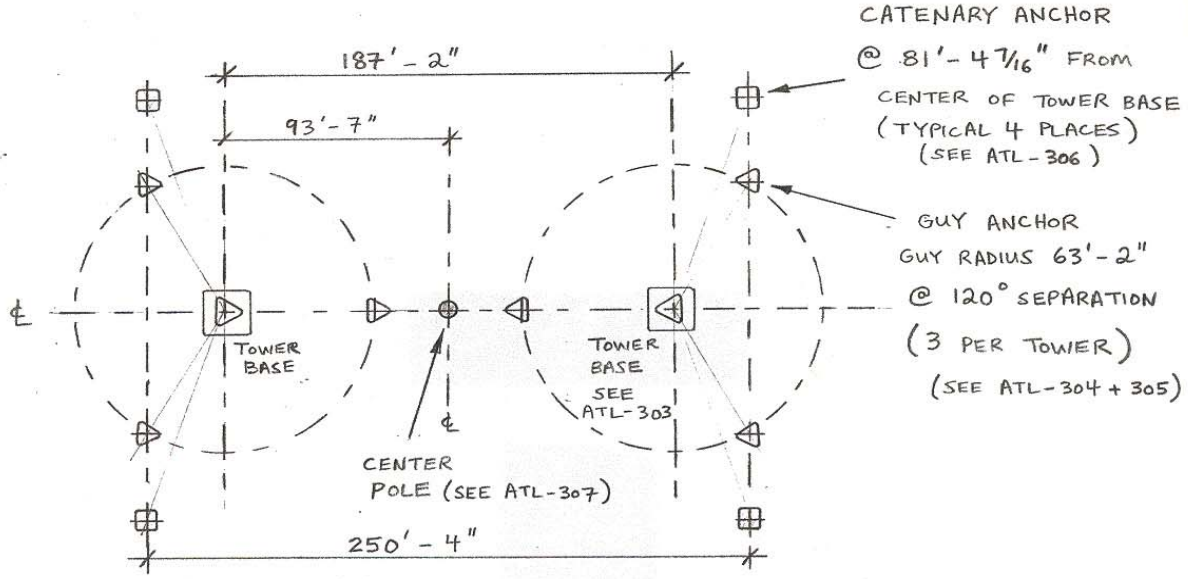
REGISTERED PROFESSIONAL ENGINEER
M.E. CURZON
LICENSEE
NWT/NU

DATE:	APRIL 12/04
SCALE:	N.T.S.
DRAWN BY:	MEC
DWG NO:	ATL-301
SHEET	

PROJECT: BDP-230/IS ANTENNA
CANADIAN COAST GUARD - RX SITE
CAMBRIDGE BAY, NU

DWG TITLE: PILE DETAIL AND SPECIFICATIONS

04/24/04
P0454



PILE SCHEDULE

PILE TYPE	LOAD (KIPS)	NO. PILES PER TYPE	NO. PILES	DEPTH (FT)	PILE CUT-OFF ELEVATION
TOWER BASE	50.7↓ 2.6→	3	6	24	99'-11"
GUY ANCHOR	13.5→ 10.9↑	1 (BATTER) 2 (VERTICAL)	6 12	33 24	100'-2 1/4"
CATENARY ANCHOR	6.7→ 6.7↑	2 (BATTER)	8	24	100'-4 3/4"
CENTER POLE	1.0→ 2.8↑	1	1	24	99'-11"

Σ = 33 PILES

ADVANTAGE TOWER LTD.
BOX 1 SITE 21 RR9
CALGARY ALBERTA CANADA
T2J 5G5
PHONE: 403-201-7983 FAX: 403-201-7963
Email: jcurzon@advantagetower.com
1-800-399-0667

REGISTERED PROFESSIONAL ENGINEER
M.E. CURZON
LICENSEE
NWT/NU

04/24/04
P0454

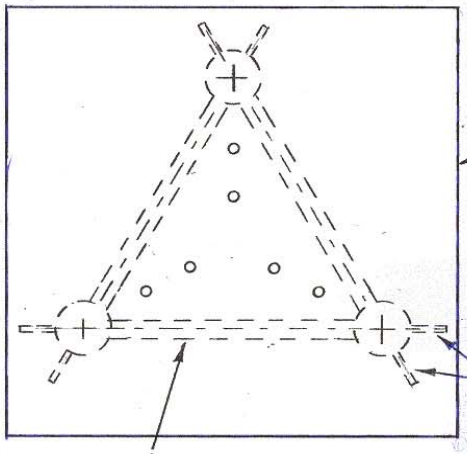
DATE: APRIL 19/04
SCALE: N.T.S.
DRAWN BY: MEC

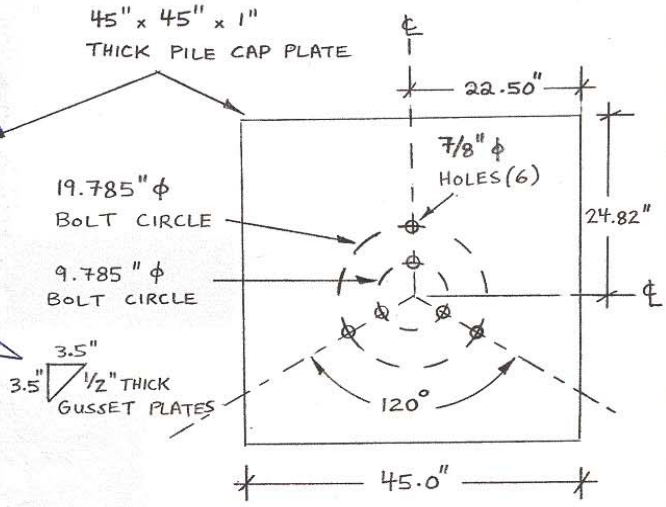
PROJECT: BDP-230/15 ANTENNA
CANADIAN COAST GUARD - RX SITE
CAMBRIDGE BAY, NU

DWG TITLE: PILE LAYOUT AND SCHEDULE

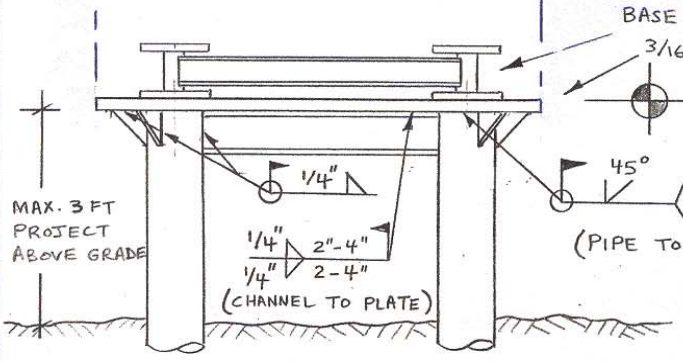
DWG NO: ATL-302
SHEET

PLAN VIEW





C4" x 5.4 lb

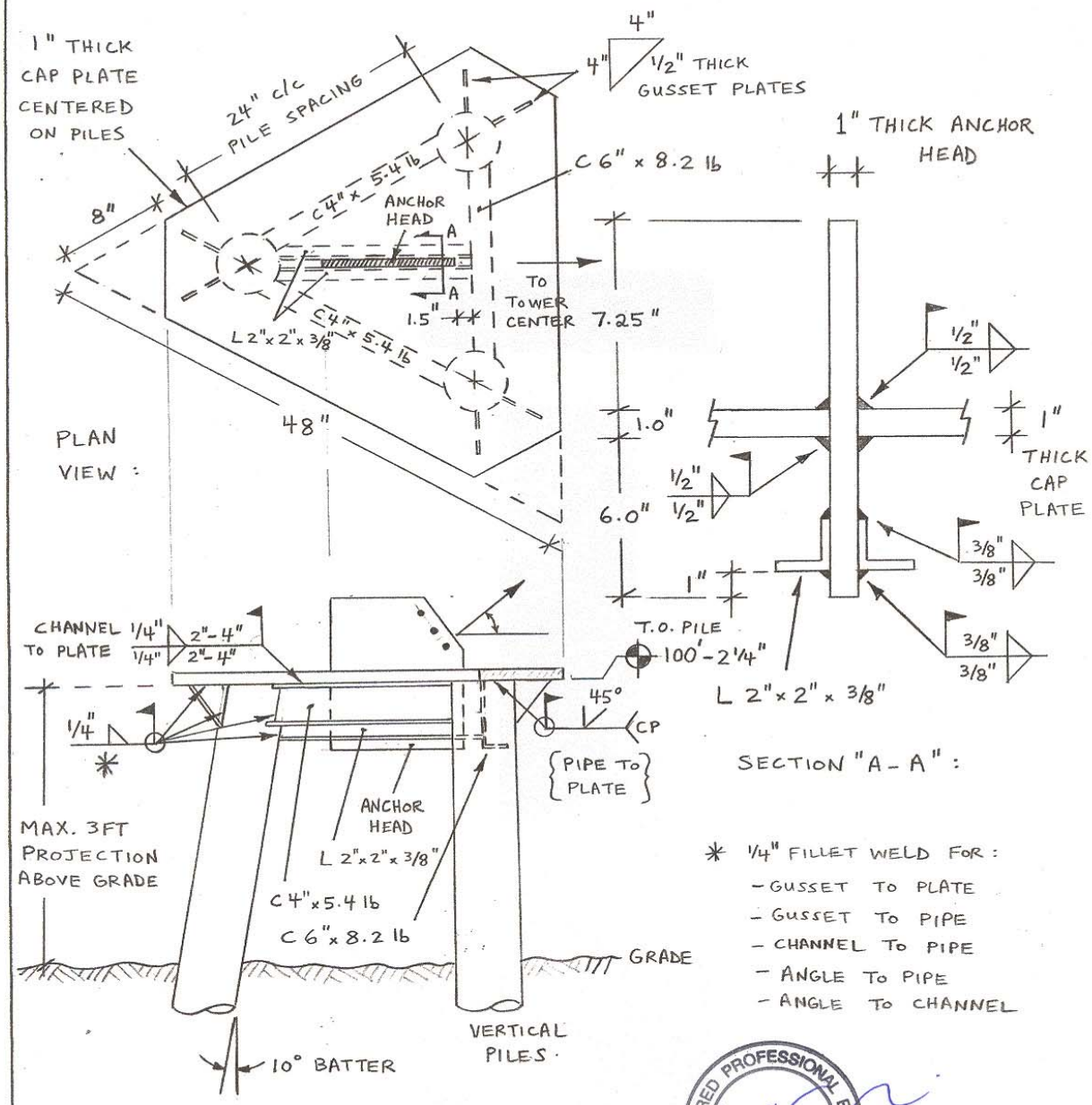


TOP OF PILE = 99'-11"

ADVANTAGE TOWER LTD.
BOX 1 SITE 21 RR9
CALGARY ALBERTA CANADA
T2J 5G5
PHONE: 403-201-7983 FAX: 403-201-7963
Email: jcurzon@advantagetower.com
1-800-399-0667

REGISTERED PROFESSIONAL ENGINEER
M.E. CURZON
LICENSEE
NWT/NU
04/24/04

PROJECT: BDP-230/15 ANTENNA CANADIAN COAST GUARD - TX SITE CAMBRIDGE BAY, NU	DWG TITLE: TOWER BASE - PILE CAP DETAILS P0454
DATE: APRIL 21/04	
SCALE: N.T.S	
DRAWN BY: MEC	
DWG NO: ATL-303	SHEET



ADVANTAGE TOWER LTD.
BOX 1 SITE 21 RR9
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PHONE: 403-201-7983 FAX: 403-201-7963
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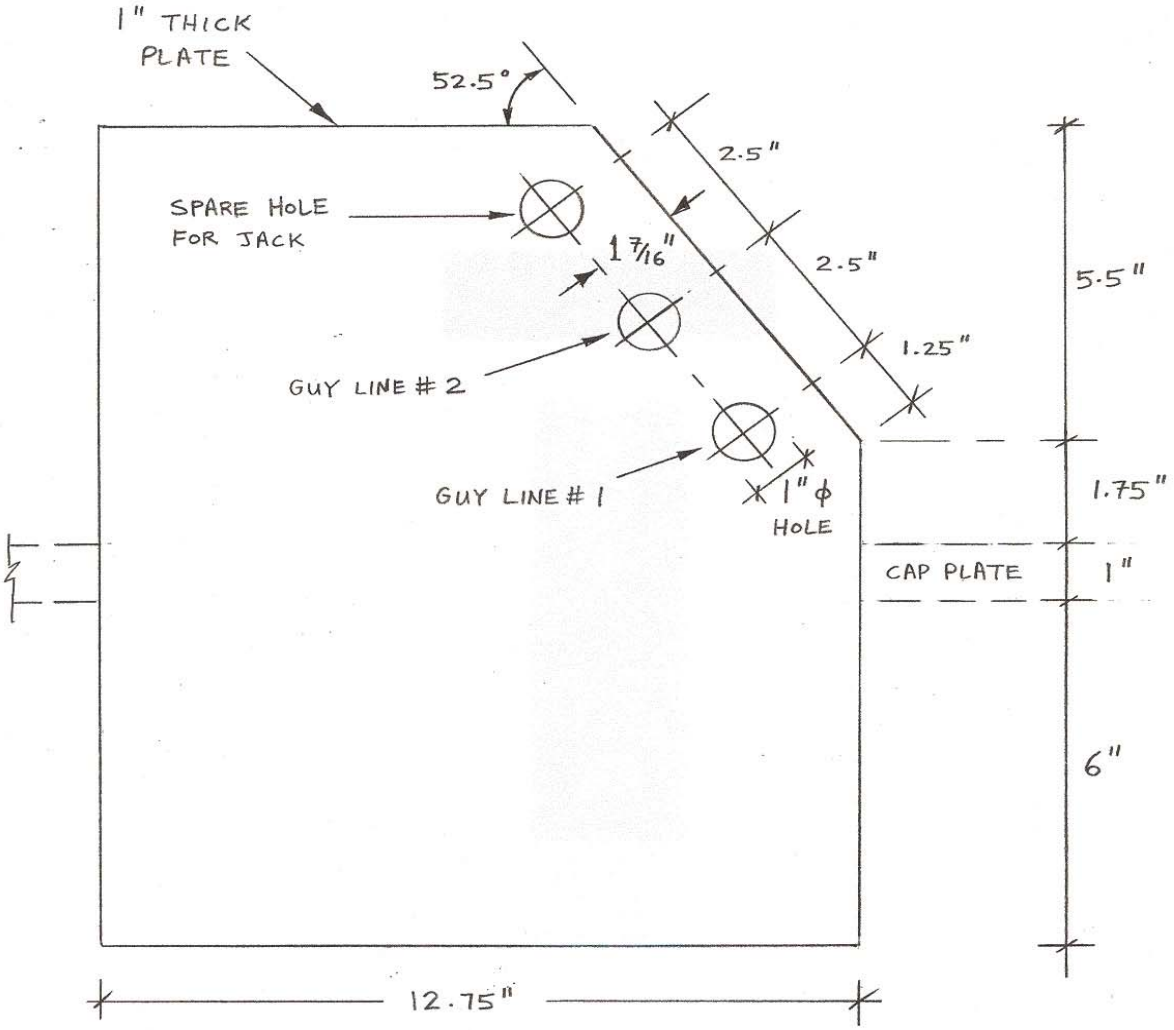
1-800-399-0667

REGISTERED PROFESSIONAL ENGINEER
M.E. LOURZON
LICENSED
NWT/NU
04/24/04
P0454

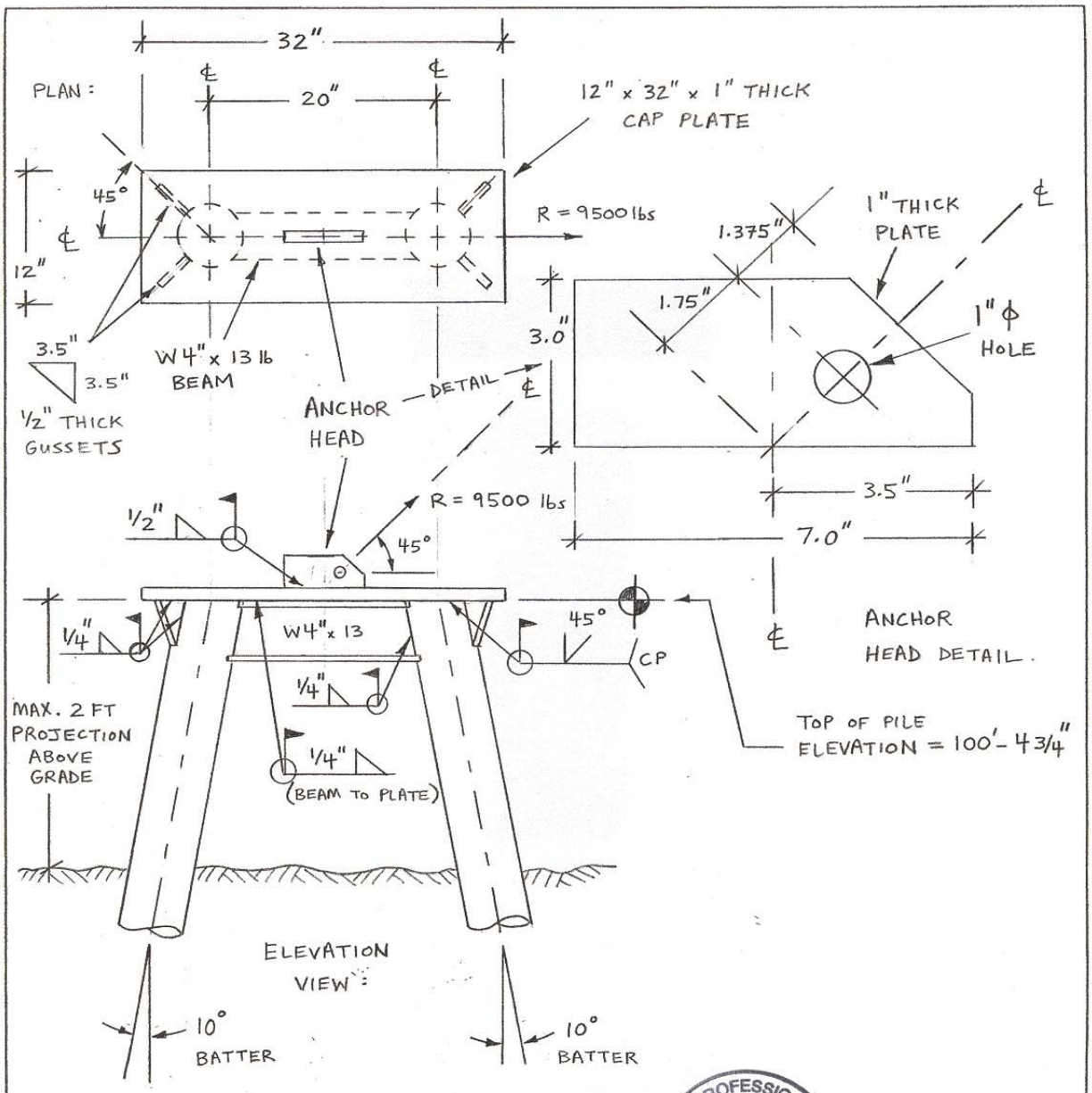
DATE:	APRIL 17/04
SCALE:	NTS
DRAWN BY:	MEC.
DWG NO:	ATL-304
SHEET	
PROJECT:	BDP - 230/15 ANTENNA CANADIAN COAST GUARD - RX SITE CAMBRIDGE BAY, NU
DWG TITLE:	GUY ANCHOR - PILE CAP DETAIL



REGISTERED PROFESSIONAL ENGINEER
M.E. CURZON
LICENSEE
NWT/NU
04/24/04
P0454

ADVANTAGE TOWER LTD.
BOX 1 SITE 21 RR9
CALGARY ALBERTA CANADA
T2J 5G5
PHONE: 403-201-7983 FAX: 403-201-7963
Email: jcurzon@advantagetower.com
1-800-399-0667

PROJECT: BDP - 230/15 ANTENNA CANADIAN COAST GUARD - RX SITE CABRIDGE BAY, NU	DWG TITLE: GUY ANCHOR HEAD DETAIL
DATE: APRIL 19/04	
SCALE: NTS	
DRAWN BY: MEC	
DWG NO: ATL - 305	SHEET



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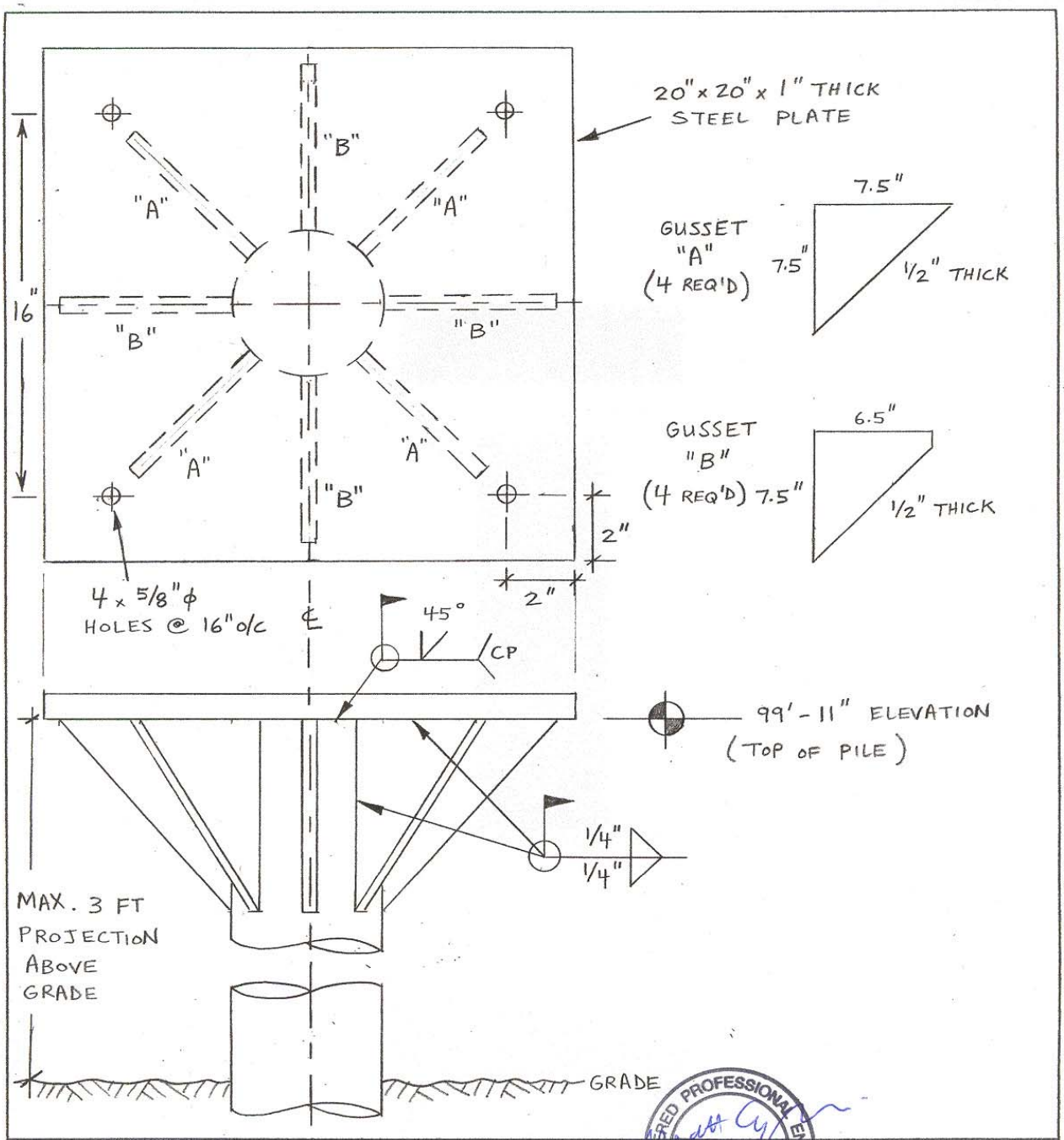
04/24/04
P0454

PROJECT: BDP-230/15 ANTENNA CANADIAN COAST GUARD - RX SITE CAMBRIDGE BAY, NU	DWG TITLE: CATENARY ANCHOR DETAIL
DATE: APRIL 22/04	
SCALE: NTS.	
DRAWN BY: MEC	
DWG NO: ATL-306	SHEET



ADVANTAGE TOWER LTD.
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Email: jcurzon@advantagetower.com
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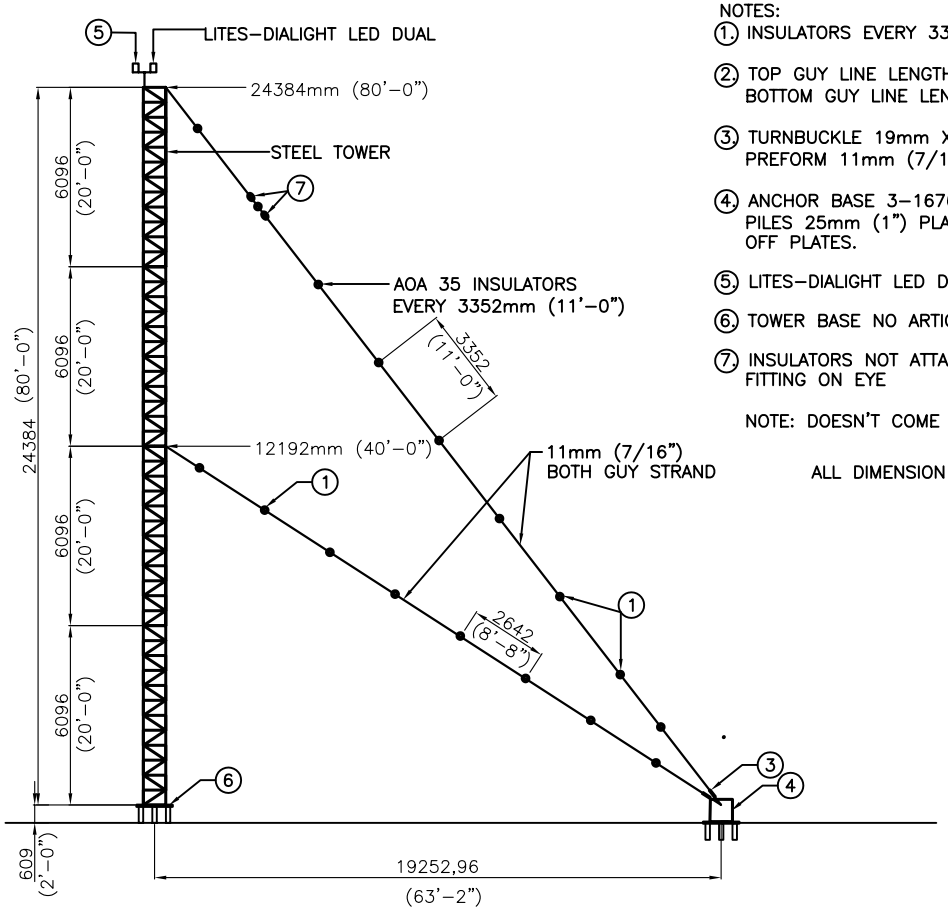
REGISTERED PROFESSIONAL ENGINEER
M.E. CURZON
LICENSEE
NWT/NU
04/24/04

DATE: APRIL 22/04
SCALE: NTS
DRAWN BY: MEC
DWG NO: ATL-307
SHEET

PROJECT: BDP - 230/IS ANTENNA
CANADIAN COAST GUARD - RX SITE
CAMBRIDGE BAY, NU

DWG TITLE: CENTER POLE DETAIL

P0454



NOTES:

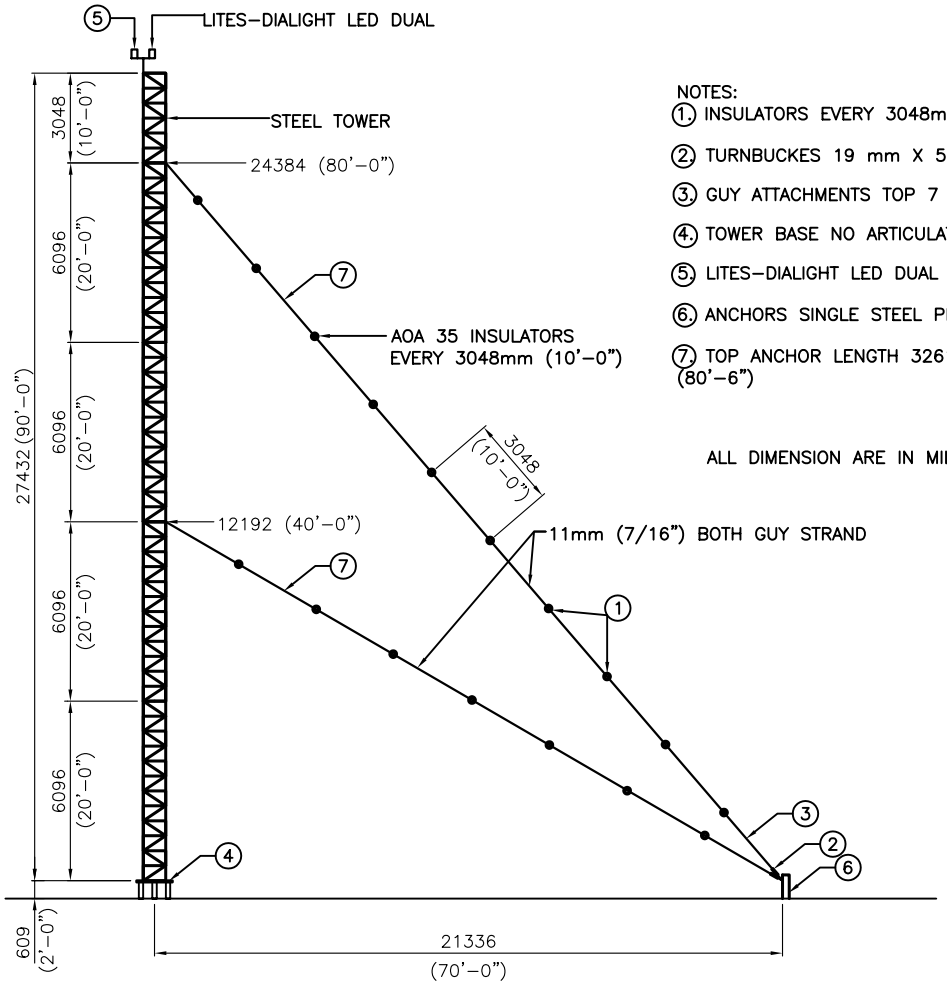
1. INSULATORS EVERY 3352mm (11'–0") (AOA35)
2. TOP GUY LINE LENGTH 30998mm (101.7')
   BOTTOM GUY LINE LENGTH 22860mm (75')
3. TURNBUCKLE 19mm X 509mm (3/4" X1'–8")
   PREFORM 11mm (7/16")
4. ANCHOR BASE 3–16764mm (55'–0") STEEL
   PILES 25mm (1") PLATE WITH WELDED PULL
   OFF PLATES.
5. LITES–DIALIGHT LED DUAL
6. TOWER BASE NO ARTICULATION.
7. INSULATORS NOT ATTACHED WITH PREFORM–COMPRESSED.
   FITTING ON EYE

   NOTE: DOESN'T COME APART.

ALL DIMENSION ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

TOWER PROFILE 24.4 M (80'–0") ANTENNA PRODUCT BDP 230/1S (2 NO.) TRIANGULAR GUYED ALL WELDED

CANADIAN COAST GUARD 201 N. FRONT STREET, SUITE 703, SARNIA ON. N7T 8B1					FILE NO. EWT 8055–525–1		
DWGS MAY NOT BE DUPLICATED OR DISCLOSED WITHOUT WRITTEN CONSENT FROM CANADIAN COAST GUARD							
					RECEIVER SITE CAMBRIDGE BAY RX SITE TOWER 1 AND 2		
1	06–04–19	ISSUED FOR TENDER	R.C.S.				
Ø	06–04–11	ISSUED FOR REVIEW	R.C.S.	MR	SCALE N.T.S.	DWG NO. SK–01	ISSUE 1
ISS.	DATE	DESCRIPTION	DRWN	APP'D			



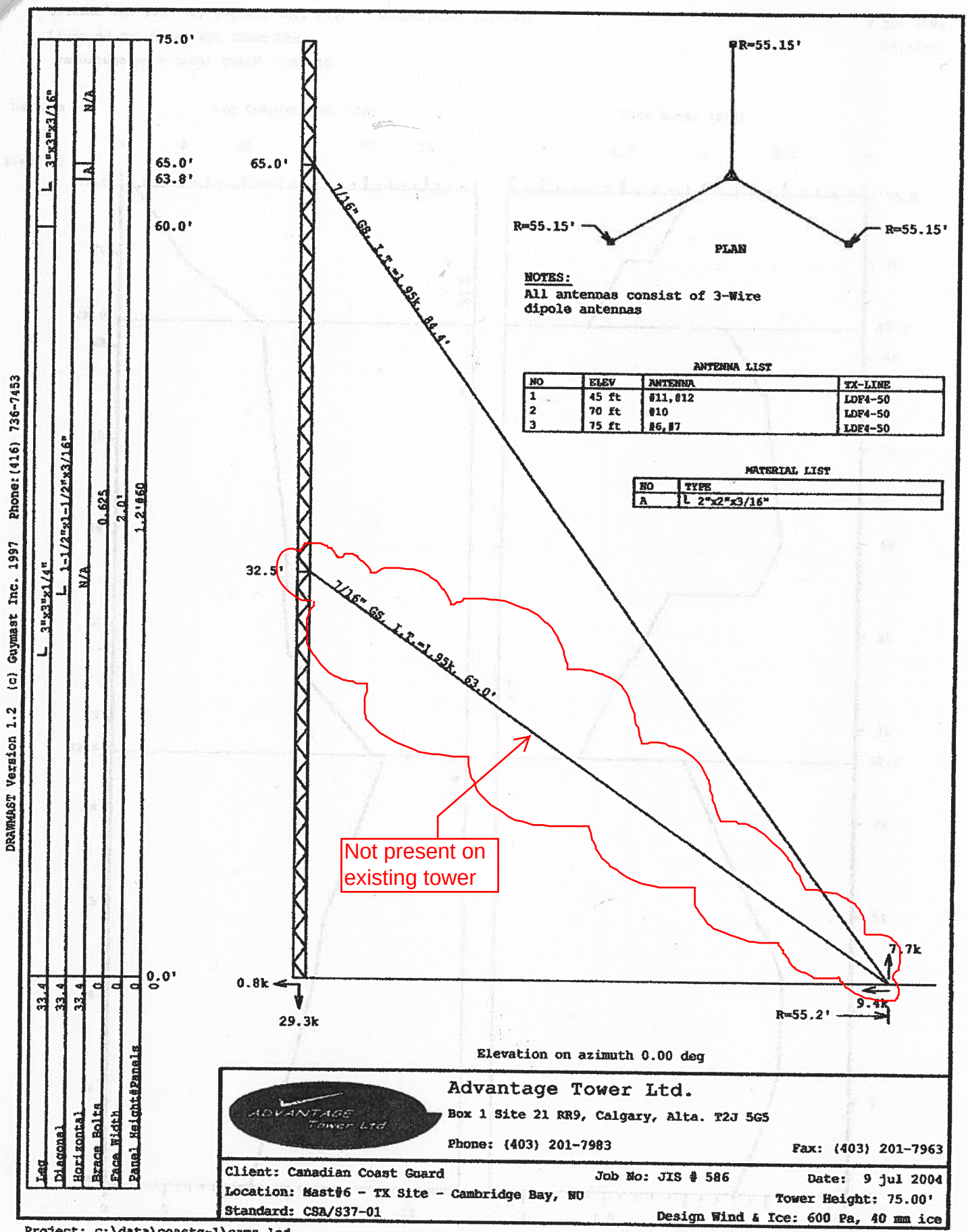
NOTES:

1. INSULATORS EVERY 3048mm (AOA35)
2. TURNBUCKES 19 mm X 509 mm (3/4"x1'–8")
3. GUY ATTACHMENTS TOP 7 BOTTOM 11mm PREFORMS
4. TOWER BASE NO ARTICULATION
5. LITES–DIALIGHT LED DUAL
6. ANCHORS SINGLE STEEL PIPE 228mm (9")
7. TOP ANCHOR LENGTH 32614mm (107'–0") BOTTOM 24566mm (80'–6")

ALL DIMENSION ARE IN MILLIMETERS UNLESS OTHERSWISE NOTED.

TOWER PROFILE 27.4 M (90'–0") A.P.C. CMV 602

CANADIAN COAST GUARD 201 N. FRONT STREET, SUITE 703, SARNIA ON. N7T 8B1					FILE NO. EWT 8055–525–1		
DWGS MAY NOT BE DUPLICATED OR DISCLOSED WITHOUT WRITTEN CONSENT FROM CANADIAN COAST GUARD							
					TRANSMITTER SITE CAMBRIDGE BAY Tx SITE ANTENNA PRODUCTS CORPORATION (APC) CMV–602 PROFILE		
1	06–04–19	ISSUED FOR TENDER	R.C.S.				
Ø	06–04–11	DRAWING INITIATED.	R.C.S.	M.R.	SCALE N.T.S.	DWG NO. SK–07	ISSUE 1
ISS.	DATE	DESCRIPTION	DRWN	APP'D			



NOTES:
All antennas consist of 3-Wire dipole antennas

ANTENNA LIST

NO	ELEV	ANTENNA	TX-LINE
1	45 ft	#11,#12	LDF4-50
2	70 ft	#10	LDF4-50
3	75 ft	#6,#7	LDF4-50

MATERIAL LIST

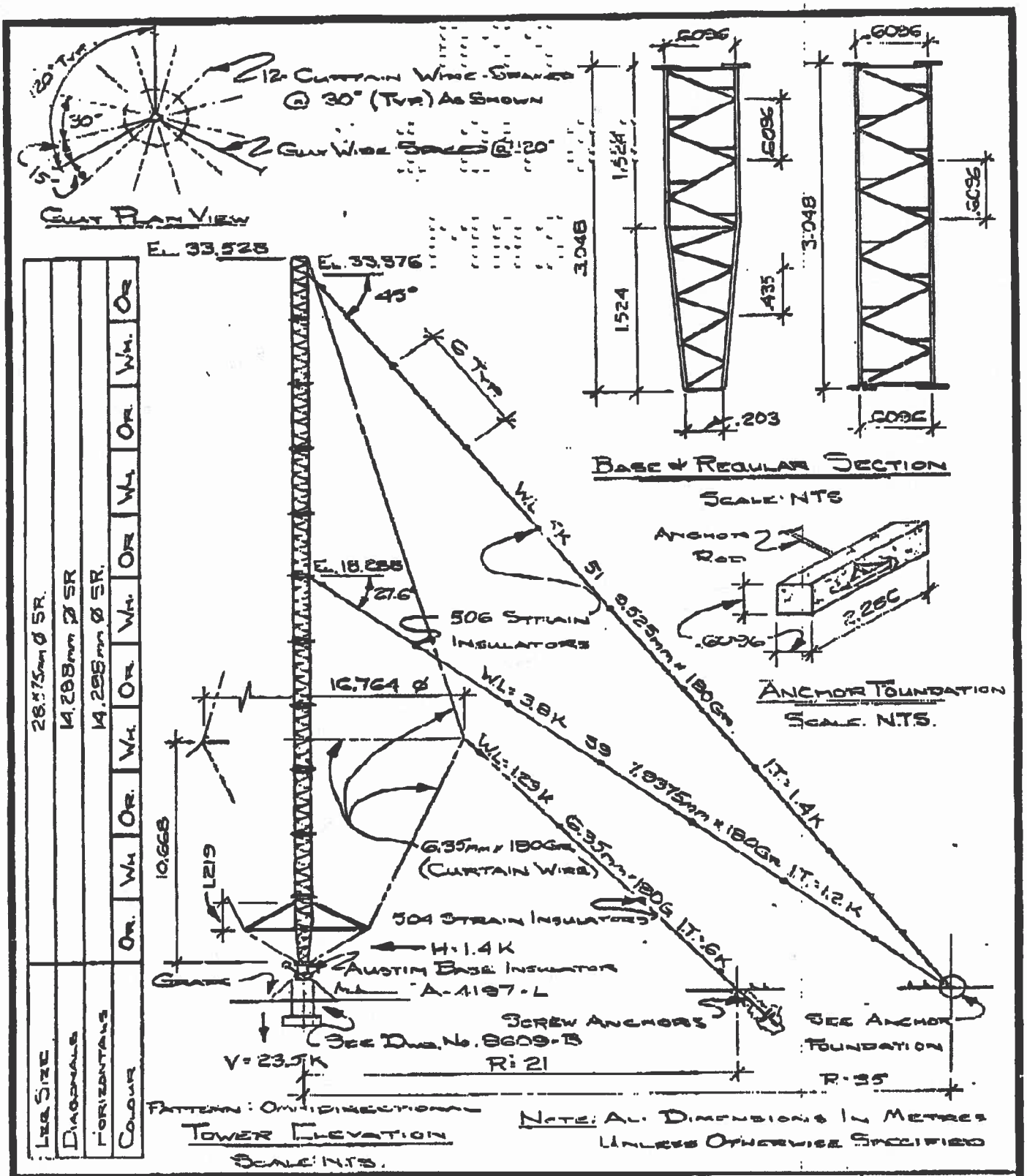
NO	TYPE
A	L 2"x2"x3/16"

DRAWMAST Version 1.2 (c) Guymast Inc. 1997 Phone:(416) 736-7453

Advantage Tower Ltd.
Box 1 Site 21 RR9, Calgary, Alta. T2J 5G5
Phone: (403) 201-7983 Fax: (403) 201-7963

Client: Canadian Coast Guard Job No: JIS # 586 Date: 9 jul 2004
Location: Mast#6 - TX Site - Cambridge Bay, NU Tower Height: 75.00'
Standard: CSA/S37-01 Design Wind & Ice: 600 Pa, 40 mm ice

Project: c:\data\coastg~1\cams.lod



Canadian Coast Guard 35.5m Vertical Radiator (2-5 Mhz) Designed To CSA: Zone 'B' Wind Class. II Ice	MAXTOWER CO. 5 Edmondson Street Brantford, Ontario	Date: 23/01/96	Scale: As Shown
		Drawing No 8609-A	Drawn By: Ron. R
		Checked By	Approved By: