

TECHNICAL SPECIFICATION FOR

Installation of 33.5m MF Tower
Receive Antenna System
Hopedale Hill, Hopedale, Labrador
55° 27' 52" N
60° 13' 13" W
Project # F6839-165008

DFO Contract # FP802-160094

Fisheries & Oceans Canada / Pêches et Océans Canada
P.O.Box 5667 St. John's, Nfld. and Labrador /
Saint Jean, Terre Neuve et Labrador
A1C 5X1

PROJECT NO. F6839-165008
DATE: May 2016

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Summary of Work

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1.0 General

The work covered under this project consists of the **installation** of a MF Broad Band MF Tower Antenna System for the CCG at the **Hopedale Hill, Hopedale, Labrador** site. A **33.50 m MF Broad Band MF Tower Transmit Antenna System** has been designed and fabricated (See Appendix B). Additionally, civil work completed includes installation of tower base, guy anchors, antenna anchors and grounding rods as per attached drawings in Appendix C.

Work for this contract shall include but not be limited to the following:

- Installation of a **33.50 m MF Broad Band MF Tower Transmit Antenna System**, guys (structural and curtain), guy insulators, guy hardware, required antenna matching unit, base insulator, lighting system, antenna system and antenna/tower interface components. Refer to general arrangement and site layout drawings in Appendix B.
- CCG will supply the tower system, anchors, antenna tuning unit and ground screen materials for this site (see Appendix F). Materials will be available in Hopedale, Labrador.
- Tower and anchor layout in accordance with approved engineering drawings. Actual layout shall be subject to the approval of Owner prior to commencement of any work.
- Installation of the antenna tuning system (curtain guys) including transmission lines, in accordance with the manufacturer's instructions and specifications. Contractor is responsible to interface appropriately, the antenna systems and transmission lines to the tower.
- Installation of auxiliary facilities such as ladders, safety rails, ice guards, ATU Enclosure, and platforms.
- Design, installation and supply of an approximately 115m long above ground cable tray from transmitter building to antenna. Installation to meet all applicable standards including the Canadian Electrical Code.
- Contractor shall be responsible for checking all material against the material list and protection of the material until it is installed and accepted by Owner.
- Contractor will be responsible for arranging all snow clearing requirements as necessary. Snow clearing will be based on actual rates and in addition to base bid costs.
- Transportation of all materials and equipment to the site as required.
- Contractor shall be responsible for the dismantling of existing tower refer to Section 05200.
- All materials used on this project are to be of specification grade, meaning complete dimensional, manufacturing, technical/engineering specifications and standards information must be available for all materials to ensure "fit for use" compliance.
- Contractor is to receive all materials for the project on behalf of the Owner as required and to ensure and be responsible for safe keeping until completion inspection.
- Clean up of site following completion of all work.

Summary of Work

- Tuning and testing of MF-RX Antenna System not part of this contract.

2.0 Definitions

“Owner” means: Fisheries and Oceans Canada, Canadian Coast Guard (CCG)

“Engineering Consultant” means: for this project, to be determined at a later date.

3.0 Existing Site

- 3.1 The Contractor should note that this site is owned by NavCanada and is on the site of existing operational towers. Refer to site surveys appended to this Specification for location of existing facilities, property boundaries and new tower location.
- 3.2 Before tendering the Contractor should familiarize themselves with the remote location, scope of work, site restrictions, short construction season and temporary measures required to complete work as specified. No after claim will be allowed for any work or material necessary for proper execution and completion of the contract.
- 3.3 Site is located at 55° 27' 52" N (latitude) and 60° 13' 13" W (Longitude), at the existing NavCan site at **Hopedale Hill, Hopedale, Labrador**. This site is 106m above sea level. Refer to Appendix A for site location.
- 3.4 Any dimensions given in this Specification or appended drawings are approximate and are for guidance only. Exact dimensions and layouts to be determined by the Contractor in the field.
- 3.5 Rock anchor foundations for proposed 33.5m MF all-weld guyed communication tower will be in place. This includes tower base, guy anchors, antenna anchors and grounding rods refer to Appendix B.

4.0 Contractor Qualifications

- 4.1 All work to be carried out by a qualified contractor with proven experience completing projects of similar nature.
- 4.2 Site foreman to have a minimum of 5 years' experience working on projects of similar nature.
- 4.3 Submit details of contract quote as per tender submission required in section 1300.

Summary of Work**5.0 Site Access**

- 5.1 Normal site access is by 2WD on 2Km gravel from the town. Winter access is by snowmobile or helicopter. Access to the site should be arranged by contacting the Owner. Contractor is responsible for access to the proposed tower location. This involves the construction of a suitable construction access road to base and anchor locations and a 14 m X 14 m tower compound.

6.0 Completion Schedule

- 6.1 All work on this contract shall be completed within the time indicated in the tender document.
- 6.2 Tender submission shall include a schedule of all Contractors activities including transportation and installation. Installation to be completed by September 30, 2016.

7.0 Existing Site Conditions

- 7.1 Contractors should note that there are restrictions at this location with regard to:
- access to current site
 - the available space
 - location of cable trenches
 - location of overhead power conductors
 - location of buildings
 - location of other substation equipment

It shall be the Contractor's responsibility to locate and protect all buried cables and other underground or overhead structures. Any damage to such structures shall be the responsibility of Contractor. Where unknown services are encountered Contractor to log location and advise Owner immediately.

8.0 Work Commencement

- 8.1 Contractor is to **provide an updated detailed schedule and** commence work immediately upon award of contract and after review and approval of all submittals.
- 8.2 The weather conditions, short construction season and site remoteness may require the use of longer work days and additional work force to complete the project within the scheduled completion date.

Summary of Work

8.3 The Contractor is to make every effort to ensure sufficient material and equipment is delivered to site at the earliest time possible upon award of the contract.

9.0 Site Operations

9.1 Arrange for sufficient space adjacent to project site for conduct of operations storage of material etc. Exercise care so as not to obstruct or damage public or private property in area. Do not interfere with normal day-to-day operations at site. All arrangements made for space, access and security shall be made by the Contractor.

9.2 At completion of work restore area to its original condition. The Contractor must repair damage to ground and property. Remove all construction materials, residue, excess etc., and leave site in a condition acceptable to Owner.

10.0 Project Meetings

10.1 Owner will arrange and give notice of all project meetings. Contractor is responsible for any expenses related to attending these meetings.

10.2 All project meetings will take place at site of work unless otherwise directed by the Owner.

10.3 Prior to commencement of work there will be a Project “Kick-Off” Meeting. The Contractors Project Manager (at their own expense), the Owner and the Engineering Consultant will be in attendance. The meeting will be held in St. John’s, NL.

Data and an agenda will be distributed prior to the meeting and the following agenda discussed at the initial meeting;

- Introduction of all key personnel participating in the meeting and the project and names of responsible individuals.
- Establishing limits on work hours, access, movements, security on site, etc.
- Organizational arrangement of the contractor’s forces and personnel as well as those of the sub-contractors and material suppliers.
- Chain of command, channels and procedures for communication.
- Detailed work breakdown structure (WBS) of the construction schedule, including sequence of critical work.
- Contract documents, including distribution of required copies of original documents and amendments.

Summary of Work

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- Processing of shop drawings and other data submitted as directed by the Engineer of Record.
- Processing of bulletins, field decisions, and change orders.
- Site procedures for Occupational Health and Safety, First Aid, security, quality control, housekeeping and other related matters.
- Other items as required.

10.4 Owner/Engineering Consultant will be responsible for recording minutes and distribution.

10.5 Contractor to have a responsible representative present at all job meetings and to the maximum extent possible, this should be the same person.

11.0 Protection of Materials and Equipment

11.1 Store all materials and equipment to prevent theft or damage. Repair or replace all material or equipment damaged in transit or storage to the satisfaction of and to no cost to the Owner.

12.0 Documents Required on Site

12.1 Contractor to maintain on site one copy of the following:

- Health and Safety Plan
- First Aid Kit
- Contract drawings and specifications
- Addenda
- Reviewed shop drawings
- Change Orders
- Other modifications to Contract
- Field test reports
- Copy of approved work schedule
- Manufactures installation and application instructions
- Copies of tower climbers certification and qualifications
- Contact information for Owner and Engineering Consultant
- Tower rescue kit
- Other items as requested

13.0 Taxes and Permits

13.1 Contractor to obtain all Federal, Provincial and Municipal permits and pay all applicable taxes.

END OF SECTION

Submittals**1.0 Tender Submission**

- 1.1 The Tenderer shall include the following documentation with the tender submission:
- a) List and description of previous projects completed which are of a similar nature.
 - b) List of subcontractors proposed complete with the work items there will be performed
- 1.2 Questions pertaining to any of the above or other items in the specification documents MUST be addressed to the Contracting Officer for this project as indicated in the Tender documents

2.0 Contract Technical Submission

- 2.1 On acceptance of Tender, the Contractor shall submit for review:
- 2.1.1 Contractor shall submit a detailed work schedule including all project milestones. This schedule shall be maintained and updated. Each revision shall be submitted to the Owner/Engineering Consultant for review.

3.0 As Built Drawings

- 3.1 Upon completion of all work, and prior to release of contract holdback, the Contractor shall issue a full set of As Built drawings, which reflect any and all changes from the original contract drawings. These drawings shall be stamped AS BUILT DRAWINGS and shall be sealed by a Professional Engineer in accordance with the requirements of this specification. Submit a full set of stamped drawings and on CD in AutoCAD format.

4.0 Inspection Reports

- 4.1 The Contractor is to submit two (2) copies of all quality control test reports required by this specification immediately upon completion of testing.

5.0 Safety Plan

- 5.1 The Contractor is to submit two (2) copies of their project and site specific Safety Plan, general work site safety, hazardous material safety (WHMIS), site security, public safety, etc. and emergency response plans, for review prior to commencement of work on site.

END OF SECTION

Quality Control**1.0 Completion Inspection**

- 1.1 A completion inspection is to be carried out by the Engineering Consultant. The completion inspection does not relieve the Contractor of his responsibility to execute the work in a quality fashion as per the project specifications and industry standards. The Contractor is to inform the Owner by letter stating that the installation is completed and is ready for inspection. The Contractor shall have sufficient crew on site during the inspection to correct deficiencies identified. Contractor to advise Owner **ONE WEEK** in advance to completion of the tower to permit scheduling of this inspection.
- 1.2 The completion inspection by the Engineering Consultant will be the Owner's expense. All costs incurred by the Contractor during the acceptance inspection shall be at the Contractor's expense.
- 1.3 All work must be completed and satisfactory prior to the Engineering Consultant's completion inspection. Any deficiencies should be reported prior to the inspection teams mobilization to site. **The Contractor will be responsible for the costs of all repeat completion inspections necessitated by work, which is considered by the Engineering Consultant to be incomplete or deficient.**
- 1.4 Any adjustments to tension, twist or alignment shall be made by Contractor in consultation with the owner to ensure affects on signal coverage can be reviewed and monitored.
- 1.5 After any adjustment measures are carried out to the tower, the Contractor shall, as required, under the direction of the Owner, re-orient any antennas.
- 1.6 An as-built tension pulse charts with actual measured guy lengths, radii and anchor elevations along with initial design guy tensions, must be provided prior to the inspection.

Quality Control**2.0 Post Erection Inspection**

- 2.1 Not less than six (6) months and not more than one (1) year after the completion inspection, the Engineering Consultant shall re-inspect the tower. At this time the Contractor shall have a minimum crew of two present and carry out any adjustments necessary to ensure the structure meets the requirements of CSA S37- 13 standard. The post-erection inspection by the Engineering Consultant will be at the Owner's expense. All costs incurred by the Contractor during the Post Erection Inspection shall be at the Contractor's expense.
- 2.2 Owner to advise Contractor at least ONE WEEK in advance of the post erection check in order to facilitate scheduling.
- 2.3 Any adjustments to the tension, twist or alignment shall be made by the Contractor in consultation with the owner to ensure affects on signal coverage can be reviewed and monitored.
- 2.4 After any adjustment measures that are carried out on the tower, the Contractor shall, as required, under the direction of the Owner, re-orient any antennas.

3.0 Conformance Letter

Upon completion of the installation stage of the project the Contractor is to provide the Owner with a Conformance Certification Letter stating that the tower has been designed, fabricated and installed as per the Project Specifications.

END OF SECTION

Temporary Facilities**1.0 Access**

- 1.1 Access to the tower site is available as described in Section 01010. When appropriate, maintain this access during the construction period. Contractor is responsible for providing their own site office and accommodations.
- 1.2 The owner must approve any temporary roads planned. A plan for remediation must be included.
- 1.3 If authorized to use existing roads for access to the project site, maintain such roads for the duration of the Contract and make good damage resulting from Contractor's use of roads.
- 1.4 Any damages as a result of Contractor's activities to existing roadways, property, adjacent property shall be returned to original condition at Contractors expense.

2.0 Sanitary Facilities

- 2.1 Provide sanitary facilities for work force in accordance with regulations and ordinances.
- 2.2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

3.0 Power

- 3.1 Contractor to provide own temporary power during construction.
- 3.2 If connection to CCG power source is available all connections to power supply must be in accordance with Canadian Electrical Code

4.0 Drainage

- 4.1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- 4.2 Do not pump water containing suspended materials into waterways, sewer or drainage systems.

Temporary Facilities

- 4.3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements and any other applicable Federal or Provincial requirements.

END OF SECTION

Safety Requirements**1.0 Summary**

- 1.1 This section describes specific safety requirements to be observed and enforced during the scope of this work.
- 1.2 Inclusion of these safety requirements shall not constitute a relief of the Contractors responsibility but is a precaution against oversight and errors.
- 1.3 The Contractor is solely responsible for safety procedures necessary to, meet the requirements of these specifications and to ensure the safety of workers and the general public.

2.0 Construction Safety

- 2.1 The Contractor shall prepare a written project/site specific **Construction Safety Plan** outlining all procedures and safe work practices which must be followed by all personnel working on the construction site. This plan is to be developed in conjunction with all subcontractors who will be working on site. It is the Contractor's responsibility to become familiar with all safety laws and regulations applicable to the type of work to be undertaken. These safety laws and regulations shall be addressed in the safety plan as clear and specific safety rules, procedures and work practices. The Contractor shall ensure that all of his workers and his sub-contractors, as well as any other authorized persons working or circulating in the construction work area, have been briefed and are familiar with the safety rules and measures indicated in the Safety Plan and understand that these measures are mandatory at the construction site. Regular Site Safety Meetings and daily tailgate/job assessment meetings shall be held and minuted by the Contractor.
- 2.2 Provide all workers, including sub-trades, with adequate and appropriate safety regulations prior to commencement of their duties. Ensure all workers comply with all safety regulations required by Federal and Provincial Regulations, Worker's Compensation Board and municipal statutes. Take all precautions and provide all required protection to ensure the safety of the general public and the workers in accordance with the current edition of the Occupational Health and Safety Act and Regulations applicable for construction projects and all applicable regulations such as but not limited to The Canada Labour Code, The Provincial Workers Compensation Regulations, Health and Welfare Canada Safety Code 6.

Safety Requirements

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- 2.3 In the event of conflict between any provisions of the above authorities the most stringent shall govern.
- 2.4 Provide health and safety protection required by the manufacturer's printed literature and ensure that all workers are trained in the safe use of health and safety equipment and the handling of materials. Ensure that at least one-person remains on site at all times who is properly trained in the first aid aspects required to deal with emergency situations that may arise. The safety person should be trained in the proper use of climbing harnesses and equipment.
- 2.5 A first aid station must be maintained on site, available to workers at all times.
- 2.6 Protect all utilities and services against damage or interruption. Any claims resulting from damage will be the Contractor's responsibility. The possible location of any underground cables must be established and marked prior to any excavation.
- 2.7 Post "NO SMOKING" signage where flammable materials are being used. Do not allow use of spark producing equipment during application of flammable materials. Ensure that at least one site person is trained to deal with emergency situations that may arise due to fire.
- 2.8 Take all required precautions, including those recommended by the manufacturers printed instructions, to protect persons and property, including vehicles from over-spray of materials.
- 2.9 Contractors' Safety Plan shall incorporate the following;
- a) Continuous attachment at all times while on the tower. No unattached climbing will be permitted at any time
 - b) Use of CSA approved; full body harness, belts, lanyards, trolleys, safety hats, safety boots, and other equipment used to complete the job.
 - c) Only experienced personnel with previous training and demonstrated experience working on similar structures and heights to work on the project.
 - d) Not allowing personal to use equipment winches for transport of personnel.
 - e) The ability for any worker to discuss issues that they feel affects workers safety.
 - f) Tailgate/job assessment forms to be completed daily and made available upon request.

Safety Requirements

- g) All tower climbing personnel shall be properly trained in fall arrest techniques and have tower climbing certification and tower rescue training.

3.0 Fire Safety

- 3.1 Comply with the latest requirements of standard for Building Construction Operations FCC, No. 301, (Latest Edition) issued by the Fire Commissioner of Canada.

4.0 Falsework and Scaffolding

Design and construct all falsework as per CSA S269.1 (latest edition) and scaffolding as per CSA S269.2 (latest edition).

5.0 Overloading

Ensure no part of the work is subject to load(s) which endanger safety or will cause permanent deformations.

6.0 Signage and Barriers

- 6.1 The contractor is to maintain necessary signage to ensure workers, people accessing the site and the general public is aware of any hazards or potential hazards. Barriers are to be provided as required by regulation to ensure access to work by the general public is restricted.
- 6.2 The Safety Plan must be placed on the Construction Site in a common area visible to all workers and other persons accessing the site. All employees are to be advised of the Safety Plan. The Safety Plan shall also address the means to communicate the intent to all persons.
- 6.3 Submission of a Safety Plan to the Engineering Consultant and Owner does not relieve the Contractor of any legal obligations for the provision of construction safety as specified by Federal and/or Provincial Safety Acts or Regulations.
- 6.4 Contractor shall ensure compliance with the Safety Plan. The Owner or authorised representative reserves the right to demand removal of any person(s) not complying. Any person removed shall not be permitted re-entry to the site.

Safety Requirements

- 6.5 Provide Safety Plan immediately upon award of contract. The Safety Plan shall be submitted to the Owner for review prior to commencement of work. Work shall not be allowed to begin until safety plan has been submitted. Revise Safety Plan as required for changes in work procedures or when directed by Owner, Safety Officer or authority.

7.0 Hazardous Products

- 7.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials, and regarding labelling and provision of material safety data sheets acceptable to Labour Canada and Health and Welfare Canada.
- 7.2 Deliver copies of WHMIS data sheets to Owner on delivery of materials.
- 7.3 All data sheets must be posted on site in a common area visible to all workers and subcontractors.
- 7.4 Make all efforts to select and use materials (i.e. adhesives, solvents, cleaners etc.) for the type and nature of work being performed which are the least hazardous products available, of low VOC content or low toxicity type products and emitting low noxious odours. Select products known to be friendly to the environment and to human health. Communicate this intent to all subcontractors, suppliers and manufacturers.
- 7.5 Where the use of hazardous and toxic products can not be avoided:
- 1) Advise Owner beforehand of the product(s) intended to be used. Submit WHMIS data sheets as per requirements above.
 - 2) Schedule in conjunction with the Owner, to carry out the work during "Off Hours" where workers and employees have left the site.

END OF SECTION

Environmental Protection**1.0 Summary**

- 1.1 This section describes environmental protection requirements to be observed and enforced during the progress of the Work.
- 1.2 Inclusion of these environmental requirements shall not constitute a relief of the Contractor's responsibility but is a precaution against oversight or errors.
- 1.3 The Contractor is solely responsible for all environmental protection procedures deemed necessary by the Contractor to meet the requirements of these Specifications. Contractor shall comply with all applicable Federal, Provincial and Municipal regulatory requirements.
- 1.4 Contractor is fully responsible for all costs associated with required remediation occurring from contractors work on site.

2.0 Fires

- 2.1 Fires and burning of rubbish on site are not permitted.

3.0 Disposal of Waste

- 3.1 Do not bury rubbish or waste materials on site.
- 3.2 Do not dispose of waste or volatile materials such as mineral spirit, oil or paint thinner, into waterways, storm or sanitary sewers.

4.0 Pollution Control

- 4.1 Control emissions from equipment and plant to governing authorities' emission control requirements.
- 4.2 Prevent dust and debris from demolition operations and other extraneous materials from contaminating air beyond application area by providing temporary enclosures.
- 4.3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.
- 4.4 Contractor is to ensure all equipment is in good repair and no fuels or fluids are leaking from it. Equipment in disrepair will be removed

Environmental Protection

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- from site. Basic petroleum spill clean up equipment should be on site.
- 4.5 No maintenance, beyond that of a required daily routine nature shall be performed on equipment while on site. No refueling to be completed within 30 m of a water body.
- 4.6 No bulk storage of fuel or hazardous products will be permitted on site.
- 4.7 Work should be scheduled to avoid periods of heavy precipitation. Erosion control structures such as temporary matting, geotextile filter-fabric are to be used, as appropriate, to prevent erosion and silt runoff during the construction phase.
- 4.8 Construction waste material such as pre-treated wood must be disposed of in an appropriate manner and shall not be incinerated onsite. Construction waste material such as aluminum, steel, iron, etc. should be recycled through a metal recycler.
- 4.9 All exposed soil should be minimized by limiting the area that is exposed at any one time and by limiting the time that any one area is exposed. Stockpiled soil must be covered and/or dyked to prevent erosion or silt runoff from leaving the site.
- 4.10 **All spills or leaks should be promptly contained, cleaned up and reported to the CCG - Traffic Center at 709-772-2083 and notification given to the Project Officer handling the job.**
- 4.11 Any and all stipulations of federal, provincial, or municipal authorities must be strictly followed.
- 4.12 During the constructional and operational phases of the project, limit or prohibit any activities on any of the surrounding wetland/bog (i.e. Heavy Equipment).
- 4.13 During constructional phase of the project, target areas for excavation should be limited to areas that are not considered a wetland/bog.

Environmental Protection

5.0 Drainage

- 5.1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water at all times.
- 5.2 Do not pump water suspected of containing suspended materials into waterways, sewer or drainage systems.

END OF SECTION

Materials and Equipment**1.0 Submittals**

- 1.1 Within five working days of written request by the Owner, submit following information for any and all materials and products proposed for use:
- name and address of all manufacturers and suppliers
 - trade name, model and catalogue number
 - performance, descriptive and test data
 - manufacturer's installation or application instructions
 - evidence of arrangements to procure
 - conformance to applicable standards

2.0 Supply and Use

- 2.1 Use new material and equipment unless otherwise specified.
- 2.2 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.
- 2.3 Use products of one manufacturer for equipment or material of same type or classification unless otherwise specified.

3.0 Manufacturer's Instructions

- 3.1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.
- 3.2 Prior to use of product or material, notify Owner in writing of any conflict between these specifications and manufacturer's instructions. Owner will designate which document is to be followed.

4.0 Conformance

- 4.1 When material or equipment is specified by standard or performance specification, upon request of Owner, obtain from manufacturer and independent testing laboratory report stating that materials or equipment meets or exceeds specified requirements. Trace-ability of all materials is to be performed.

Materials and Equipment**5.0 Substitution**

- 5.1 Owner is not obligated to consider any substitutes or changes after contract award. Contractor is responsible for all costs associated with reviewing requested changes.
- 5.2 Proposals for substitution after Contract Award must include, all documentation and information required as part of this contract and statements of respective cost differences of items originally specified and proposed substitutions.
- 5.3 Should proposed substitution be accepted either in part or in whole, contractor will assume full responsibility and costs when substitution affects other work on project and pay for design or drawing changes required as result of substitution.
- 5.4 Amount of credits arising from approval of substitutions will be determined by the Owner and the Contract Sum will be reduced accordingly. No substitutions will be permitted without prior written approval from Owner.

END OF SECTION

Clean Up

1.0 Clean Up

- 1.1 Upon completion of the work, or sooner if ordered by the Owner, remove all temporary structures and clear away all rubbish, equipment, surplus and waste material remaining on or about the site, and attributable to this Contract, and place the site in a neat and tidy condition.
- 1.2 Under no circumstances will burning of construction refuse be allowed on the Owner's site. Remove all waste materials from the site to an approved dumping area as designated by local authority.
- 1.3 If the Contractor fails to clean up the site and restore to an acceptable condition, the Owner shall initiate completion of the work and deduct for same from monies due to the Contractor.

END OF SECTION

Tower Structure**1.0 General**

- 1.1 The installation of the tower shall be in accordance with the latest version of but not limited to the codes and standards identified in Section 01010 Summary of Work and as per the detailed design tower drawings that will be provided.

2.0 Connections

- 2.1 Make all bolted connections with high strength bolts clearly marked A325 conforming to A.S.T.M. Standard Specification A325. Place a hardened washer in under the bolt element (nut or bolt head) turned in tightening the bolt. Tighten all bolts by the turn of the nut method as specified in CSA Standard S16.

3.0 Workmanship

- 3.1 Materials shall be handled and stored on the job site in such a manner that no damage shall be done to the materials of any existing building or structure. Special care shall be taken to ensure that galvanizing, priming, or painting is not damaged during handling and erection of materials. Storage of materials on the site will be the responsibility of the Contractor.
- 3.2 Coating Protection
- 3.2.1 The tower shall be erected in a manner that will not bend, scrape, distort, or injure the component parts of the galvanizing.
- 3.2.2 Any areas damaged during transit or erection shall be cleaned and touched up with new Zinc rich primers and/or paint as directed by the Project Engineer.

4.0 Tower Erection

- 4.1 Upon award of contract, Contractor is to provide a detailed Erection Plan to include the use of gin poles, winches, cranes and erection equipment.
- 4.2 The use of iron sledges for hammering or driving any members will not be tolerated. All hammering is to be done with wooden mauls or hammers of plastic, lead or other soft material.
- 4.3 Every failure of the material to join together properly shall be reported to the Owner.

Tower Structure

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- 4.4 The Contractor shall be responsible to ensure that no members of the tower are over stressed during erection. Any members damaged during erection shall be replaced. The Contractor shall be responsible for any damages done to the work of others, or to adjoining structures and property during erection.
- 4.5 The guy tensions shall be adjusted to within +15% and -5% of the stipulated design tensions noted in the design drawings and as per the requirements of CSA S37-13. The tension calculations shall consider the ambient temperature at the time of adjustment. Full consideration of anchor location with respect to the tower base must be incorporated into the calculation of correct guy tensions. It shall be the Contractor's responsibility to obtain accurate measurements pertaining to elevation differences between the tower base and guy anchors.
- 4.6 The Contractor shall use a three-transit set up to complete final adjustment of vertical alignment and twist and to ensure it meets the requirements of CSA S37-13 for vertical alignment and twist.
- 4.7 Contractor is responsible for establishing temporary obstruction lighting in accordance with Transport Canada requirements.

5.0 Cathodic Protection of Anchor Shafts

- 5.1 All anchor shafts are to be protected from deterioration and/or corrosion by a properly installed cathodic protection system designed by the Contractor. Anodes to be zinc or magnesium and to last the performance life of the tower.

END OF SECTION

Auxiliary Facilities**1.0 Tower Components**

The following facilities shall be considered to be an integral part of the tower contract and shall be supplied and erected as such. In mounting any of these auxiliary facilities, care shall be taken that the structural members of the tower are not weakened by the drilling of holes or any other means.

- 1.1 **Ladder** – The tower shall be equipped with a climbing ladder (outside climb required) complete with a CSA approved fall arrest rail centered in the ladder. The ladder shall be a separate assembly bolted to the tower and shall conform to the latest version of CSA S37-13. Provide an unobstructed climbing path and maintain the required climbing radius as per CSA S37-13.

1.2 Ice Protection

- 1.2.1 Bonding strap from tower to tuning unit housing, the tuning unit housing and all horizontal runs of transmission lines shall be protected from falling ice in a manner approved by the Owner.
- 1.2.2 Three U-Bolt clips are to be spaced 300 mm apart, directly above the grounding connection and guy markers on each guy.

1.3 Turnbuckles and Shackles

- 1.3.1 Install all turnbuckles so as to provide a minimum of 250 mm of take-up for future adjustment. Install the locking device for each turnbuckle including turnbuckles used on broadband array (if applicable).

1.4 Guy (100%) Terminations

- 1.4.1 The Bridge sockets shall be installed so as to provide a minimum of 760 mm of take-up for future adjustment. Contractor is to provide details of other 100% terminations.

1.5 Anti-climb Devices

- 1.5.1 The tower is to be provided with a lockable, anti-climb device approved and supplied by the Owner. The Anti-climb should incorporate a framed, heavy gauge expanded wire mesh cage bolted flush to the tower face using round headed hardware that cannot be used as a step or hand hold. The panel should be 2.5 m high (minimum) with the lower edge positioned

Auxiliary Facilities

-
- approximately 3 m above grade. Access should be prevented from both outside and inside the tower.
- 1.5.2 The anti-climb shall be hinged on the climbing face. Operable panels shall be framed, hinged on one vertical side, with a combined latching mechanism with a lock on the opposite vertical edge. A locking mechanism requiring removable hardware such as long steel rods to open access panels is not acceptable.
- 1.5.3 For an inside climb, the anti-climb shall be accessible through a hatch door inside the structure.
- 1.5.4 The trap door in the horizontal anti-climb should easily open up to allow safe access to the tower.
- 1.5.5 Barbed wire will not be permitted as part of the anti-climb.

1.6 Guy Markers

Each guy shall be equipped with yellow vinyl guy markers located at the anchor end of each guy. Install such that markers extend to mark at a point 4 m above the ground.

- 1.6.1 Guy markers are approximately 2 m in length and vandal resistant. Field drill 25 mm holes as 200 mm spacing to render these useless for other purposes.

1.7 Fall Arrest

- 1.7.1 The Contractor shall install a CSA approved Fall Arrest Rail to meet CSA S37-13 and the latest version of CSA Z259.1-1976 and CSA Z259.2-M1979. Rail system is to be Tylon type trolley compliant or approved equivalent.
- 1.7.2 The fall arrest rail shall be free from obstructions for the complete height of the tower.
- 1.7.3 The fall arrest rail shall be supported at spans not more than 1 m. Any extension beyond the top of the tower must be structurally supported for the entire height.
- 1.7.4 Proper manufactured stop hardware is to be installed at the top of the fall arrest rail to prevent accidental dislodging of the trolley from the rail.

Auxiliary Facilities

1.7.5 Cable fall arrest systems are not acceptable.

2.0 Security Fence

2.1 Contractor shall install a galvanized chain link security fence around the base of the tower that is minimally 14 m X 14m, 2.5 m high with three levels of barb wire and a 1.2m wide single gate split horizontally into two independently operable sections. All fence posts, rails etc. are to be grounded.

END OF SECTION

Dismantle Existing Tower**1.0 General**

- 1.1 After testing/optimization/commissioning of the new tower and Owner is satisfied with performance of the new system; the Contractor is to dismantle and clean up the existing tower and site.
- 1.2 The Contractor shall dismantle and dispose as directed by the Owner the existing tower and associated components. These components shall include, but not necessarily be limited to tower steel, guys, anchor assemblies to 300 mm below grade, conduit, lights, ladders, etc. All disposal shall be completed in a manner acceptable to the Federal, Provincial and Municipal authorities having jurisdiction.
- 1.3 The tower shall be dismantled in such a manner so as to pose no threat to the new tower, antennas or transmitter buildings. Responsibility for any and all damage to property as a result of the dismantling and disposal of the existing tower shall be the sole responsibility of the Contractor.
- 1.4 The Contractor shall provide sufficient detail to the Engineer with regard to the proposed method of dismantling the tower. Details should include measures to protect other property such as the new tower, guys and transmitter building. This method must be reviewed by the Engineer prior to the start of any work. This review shall not relieve the Contractor of his responsibilities and liabilities with the regard to the dismantling process. The Contractor shall provide these details in writing to the Engineer complete with sketches if required.
- 1.5 Contractor shall provide the Owner with a minimum notice of **ONE WEEK** prior to the proposed tower dismantling start.
- 1.6 All items, as determined by the Owner/Engineer shall be salvaged and stored on site as directed by the Owner/Engineer. Remaining items shall be disposed of by the Contractor in an approved manner. Contractor shall provide written documentation with regard to where and how material was disposed of. On site disposal is strictly prohibited.
- 1.7 Contractor is to remove existing foundations to 300mm below grade. All steel to be removed from site and recycled where possible.
- 1.8 Damaged areas to be restored to original conditions.

END OF SECTION

Grounding**1.0 General**

- 1.1 The Contractor shall be responsible for the installation of the remaining parts of the complete permanent continuous grounding system for the MF tower system as per attached drawings.
- 1.2 Refer to Appendix B for details of grounding required for this tower system.
- 1.3 Refer to Appendix F for CCG supplied materials.
- 1.4 In rock conditions, the Contractor shall propose products and systems which shall attain the desired protection. This must be clearly shown on design drawings. All above ground runs of conductor must be securely attached to the rock at spaces not more than 3 m.
- 1.5 The Contractor will connect tower guys to the grounding systems as follows:
 - 1) to the tower-using Burndy Versatail or exothermic welding (Cadweld)
 - 2) to the guy wires – using Burndy KVSU or approved equal connectors, such that adverse reactions of different materials will not occur.
 - 3) to the ground ring – by means of exothermic welding (Cadweld).
 - 4) wire to wire connections underground – using exothermic welding (Cadweld).
 - 5) all connections shall be made according to manufacturer's directions. Provide Burndy Pentrox E compound on all connections.
 - 6) Before making a ground system connection, remove all paint, foreign matter or dirt.

2.0 Ground Rods

- 2.1 All ground rods shall be directly connected to the basic ground grid using thermit connectors.

A compression connection shall be installed as per the manufacturer's instructions and shall not be used to connect to more than one conductor per compression operation unless specified by the manufacturer.

3.0 Earth Enhancing Compounds

Earth enhancing compounds shall be considered for use at sites where the main external buried ground grid impedance to true earth cannot be reduced to the value specified in section 5.2 using metallic conductors and ground rods.

4.0 Standards of Acceptance

- 1) Ground Rods and Lightning Rods:
 - C.L.M. DN6CC10
 - L.C.A. 7510
 - Slater 9450

- 2) Thermit Connectors:
 - Cadwell connectors manufactured by ERICO Products Inc.
 - Compression Connectors: Burndy Hyground Compression System

5.0 Measurement of Ground Resistance

The Contractor shall measure the resistance to ground at a point near all anchors, the tower base and the transmission line entrance to the building. These readings shall be submitted to the Owner.

6.0 Transmission Line Grounding

- 6.1 The transmission line shall have an appropriate surge arrester installed on it before it enters the building. Subsequently, the surge arrester shall be appropriately grounded and tied into the building ground system.

7.0 Fencepost Grounding

- 7.1 All metallic fences around to be grounded every 20 ft to a Ground Rod, to the grounding electrode system or as specified by the engineer using tinned, stranded copper conductors.

Grounding

Project: F6839-165008

Page 3

- 7.2 All corner fence posts are to be CAD-welded to a tinned, #2 AWG stranded copper conductor connected to the ground electrode system.
- 7.3 All gate posts are to be grounded with a tinned, #2 AWG stranded conductor to the ground electrode system.
- 7.4 All fence components, chain-link, string-wires, deterrent (barbed) wires, etc. to be bonded by flexible, stranded bonding jumpers to fence and gate posts that are in turn bonded to the perimeter electrode system. All bonding jumpers to be jacked to prevent bare copper to come into contact with galvanized steel.

END OF SECTION

Lighting and Power Supply**1.0 General**

- 1.1 Contractor is responsible to verify requirements for obstruction lighting as per 621.19/TP382. Obstruction lights for the tower shall conform to the latest edition of Canadian Aviation Regulations 621.19/TP382 and the National Electrical Manufacturers Association (NEMA). The tower height shall be based on the highest intended projection of the structure.
- 1.2 All required equipment is to be installed, as specified, by Contractor.
- 1.3 The complete wiring system and lighting fixtures shall be of a waterproof type using COREFLEX CABLE or an approved equal, rigid fittings, and cast-iron or aluminum, type junction boxes.
- 1.4 All wiring shall be in accordance with CSA requirements, and type RA-90-40C wire shall be used throughout the installation. Wires shall be routed in to a junction box or fixture, and shall be routed down the tower from the top of the junction box or fixture.
- 1.5 Tower obstruction lighting shall be wired so that lamps in each double obstruction fixture will be on opposite side of a three-wire circuit. Circuits are to be wired in a flip-flop fashion and controlled by a photocell as the base of the tower.
- 1.6 The obstruction lamps shall be 130 volts long life, type 116 A21-TS or equivalent.
- 1.7 As required for Medium Frequency (hot) towers, contractor is to install base Austin (or equivalent transformer) for lighting power.
- 1.8 Lighting system to have a control system that is capable of remote monitoring and signalling operation.
- 1.9 Lighting system to operate automatically using a photovoltaic cell protected from falling ice.

2.0 Auxiliary Power Outlet

- 2.1 A weatherproof power receptacle shall be located at the base of the tower. The AC outlets will be complete with GFI protection and will be on separate circuits. 120V, 20 amps.

Lighting and Power Supply**3.0 Permits and Temporary Lighting**

- 3.1 The Contractor shall obtain an electrical installation permit from the appropriate agency and submit to the Owner evidence that the lighting installation has been inspected and approved by the said agency.
- 3.2 When required by Transport Canada, the tower Contractor shall make arrangements to provide temporary tower lighting until the tower is accepted, and the permanent power supply is available. These arrangements will be subject to the final approval of the Owner.

4.0 Ice Protection

- 4.1 The Contractor shall install ice protection for all lights and lighting systems.

5.0 Cable Attachment

- 5.1 The Contractor shall adequately secure the cables at distances not exceeding 750mm. Use of wrap-lock/tie wrap device to secure cables is unacceptable.

6.0 Termination of Wire and Hook Up

- 6.1 The Contractor shall terminate all wiring inside the building, in the existing electrical panel. The Contractor shall attach conduit to ceilings and walls so as to avoid conflict with existing equipment. All conduits shall be installed in a neat manner.

END OF SECTION

Electrical-Antenna**1.0 General**

- 1.0.1 Work under this section relates to the Design, Fabrication, Installation, Testing, Optimization and Commissioning of a Medium Frequency Receive antenna tower system.
- 1.0.2 Contractor is responsible for the complete installation of the antenna tower arrangement including structure, broadband elements, base insulator, guy insulators, tuning unit, ground plane and all other items required for the system to operate on the parameters identified below.

1.1 Antenna Specifications

1.1.1 The Medium Frequency Antenna Tower is required to perform as follows:

1.1.2 Receive MF Tower:

Frequency range: 2- 4.6 Mhz

Bandwidth: 2.6 Mhz

Antenna System VSWR: Not to exceed 2.5 over the specified frequency range.

Radiation pattern: Omni-directional

Polarization: Vertical

Characteristic Impedance: Nominal 50 ohms unbalanced.

Impedance matching: The ATU will consist of a "T" matching network which must consist of an input coil, shunt capacitor and an output capacitor. The "T" matching network must use variable components for optimum tuning. The ATU will also have a static drain coil going from the RF output to ground. The ATU shall not incur an insertion loss greater than 1.5 dB over the specified frequency range. Design, supply and installation of this unit is the complete responsibility of the contractor.

2.0 Products

2.1 Materials for MF Tower

2.2 A rain shield shall be installed over the base insulator.

2.3 A lighting transformer shall be incorporated into the base insulator, or supported from tower.

2.4 The radio frequency connection will be by means of Andrews' LDF-5-50, foam dielectric Heliax cable or approved equivalent from the new MF

Electrical-Antenna

tower ATU Enclosure to the receiver multicoupler in the existing equipment building.

- 2.5 Ground rods to be 19 mm by 3000 mm, copper clad.
Grounding equipment to: CSA C22.2 No. 41 1950 (R1967)
Copper grounding cables to: ASA G7.1 1964
Radial Ground screen: 90 radials spaced evenly 4 degrees apart consisting of #8 soft drawn solid copper wires extending a distance of 50 m from the center of the tower, including ground rods, straps, and ring as per Appendix B.
(See Appendix H for CCG supplied materials).

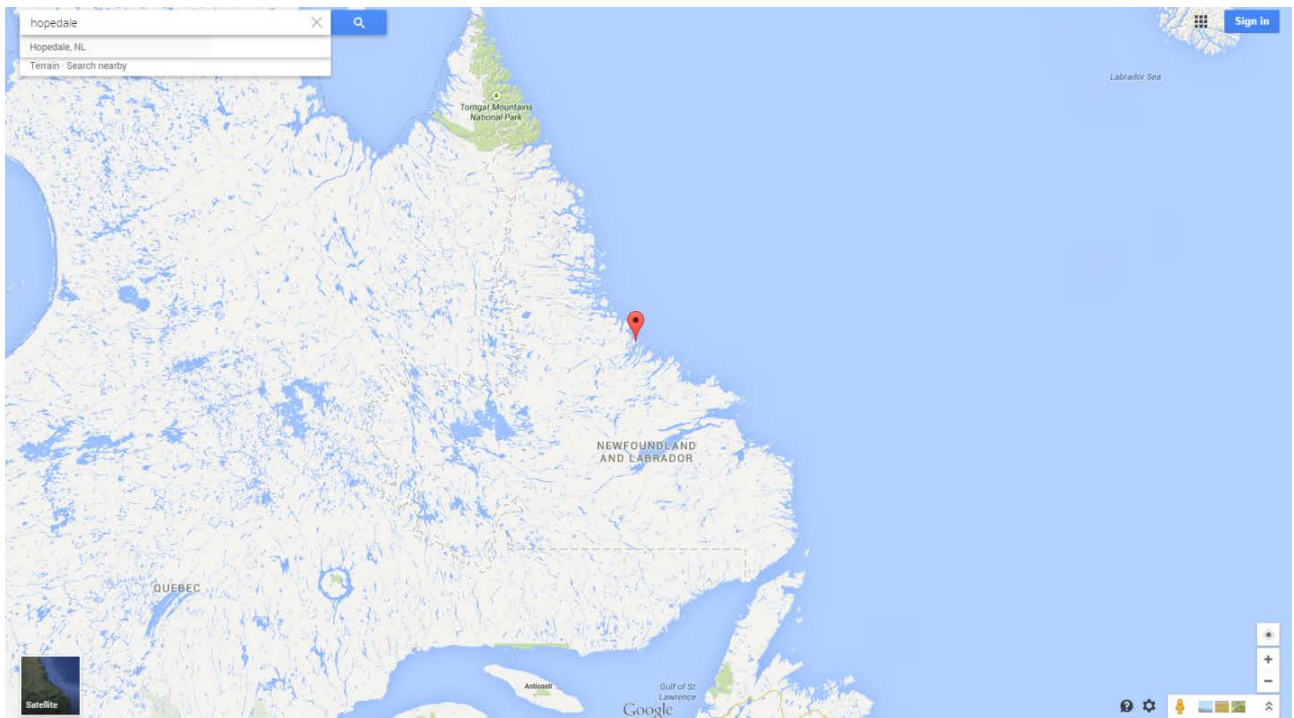
3.0 Execution**3.1 Electrical Bonding**

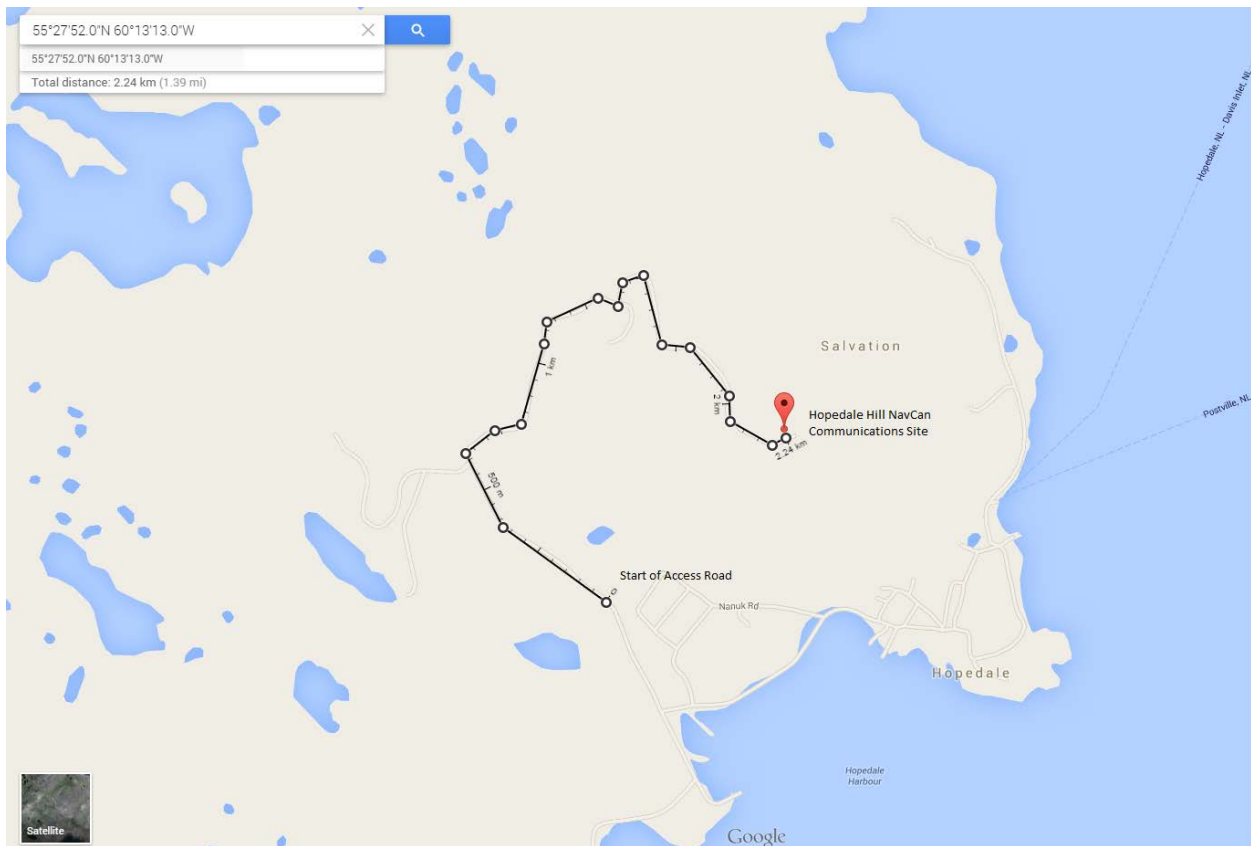
- 3.2 Special care shall be taken to ensure continuity of required electrical connections and proper bonding of electrical conduits, etc., upon initial assembly and throughout antenna structure life when subjected to salt spray conditions in coastal installation.

END OF SECTION

Appendix A

Site Location Map





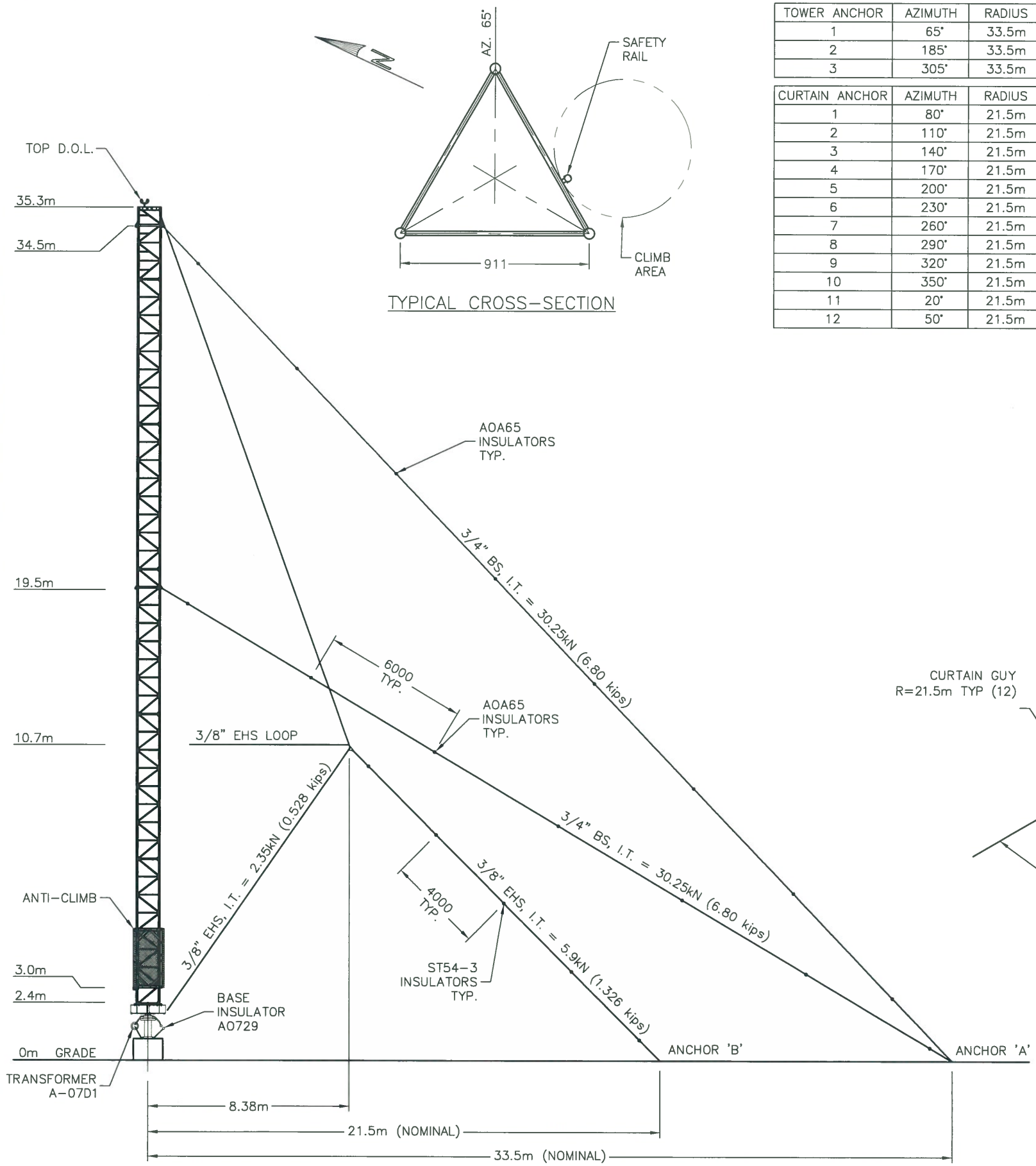
Appendix B

Drawings

INCHES 1 0 1 2 3 4 POUÇES 1 0 1 2 3 4 5 6 7 8 9 10 CENTIMETRES

A - SR 19mm \emptyset
+ FB 7.9x76
B - SR 19mm \emptyset

SECTION	90G00AA	90G00AA	90G00AA	90G33AA	90G00AA	90G00AA	90G00AA	500176C
LEGS (350W)				SR 51mm \emptyset				
DIAGONALS				SR 25mm \emptyset				
HORIZONTALS							SR 19mm \emptyset	
FACE WIDTH				0.9m				
SPLICE BOLTS				1" x 6-1/2"			1" x 6-1/2"	
PAINT				ORANGE			WHITE	
				ORANGE			ORANGE	



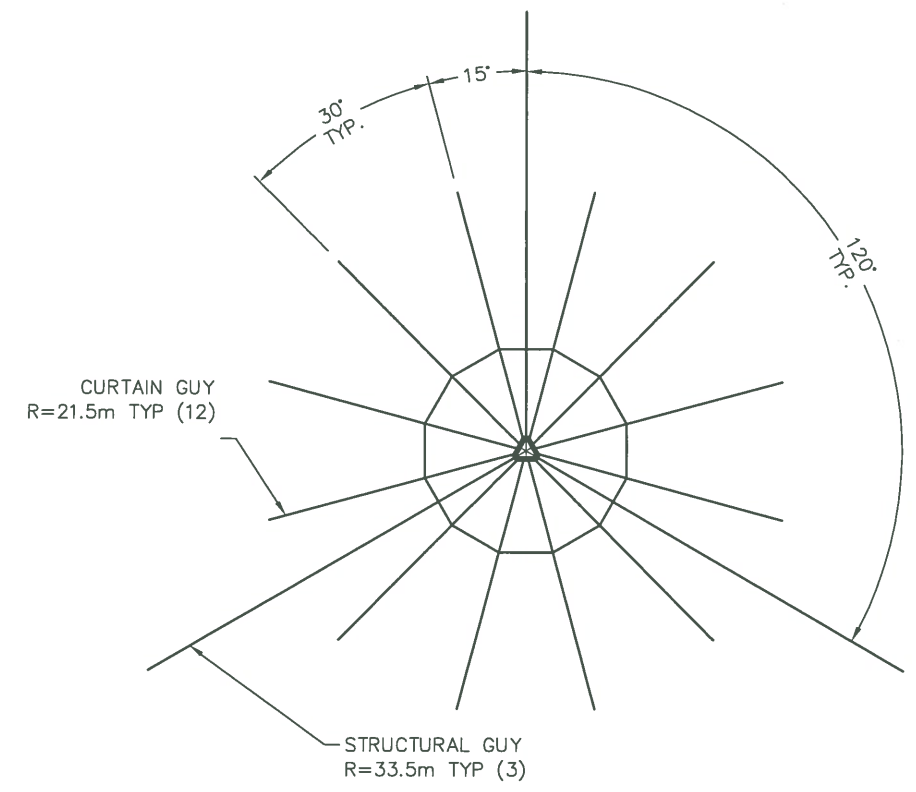
TOWER PROFILE

TOWER ANCHOR	AZIMUTH	RADIUS	ELEVATION
1	65°	33.5m	-3.20m
2	185°	33.5m	-2.10m
3	305°	33.5m	-3.70m

CURTAIN ANCHOR	AZIMUTH	RADIUS	ELEVATION
1	80°	21.5m	-3.7m
2	110°	21.5m	-3.7m
3	140°	21.5m	-3.7m
4	170°	21.5m	-4.3m
5	200°	21.5m	-1.7m
6	230°	21.5m	-0.5m
7	260°	21.5m	-2.4m
8	290°	21.5m	-1.7m
9	320°	21.5m	-2.5m
10	350°	21.5m	-4.2m
11	20°	21.5m	-4.5m
12	50°	21.5m	-4.5m

DESIGN SPECIFICATIONS:
 TO: CAN/CSA/S37-13
 WIND: 890Pa SITE SPECIFIC
 ICE: 50mm
 STEEL: G40.21, 300W UNO
 TWIST & TILT: <2° AT TOP
 SERVICEABILITY FACTOR: 1.0
 SERVICEABILITY WIND: $q_e(1/10)=690Pa$
 TERRAIN: OPEN
 OBSTRUCTION MARKING: RED LIGHTING & PAINT
 LADDER IS INTEGRAL
 TRYLON SAFETY RAIL

FACTORED FOUNDATION LOADING:
FOUNDATION LOADS:
 MAST SHEAR=9kN
 MAST AXIAL=814kN
ANCHOR 'A' LOADS:
 LATERAL=150kN
 UPLIFT=129kN
ANCHOR 'B' LOADS:
 LATERAL=24kN
 UPLIFT=27kN



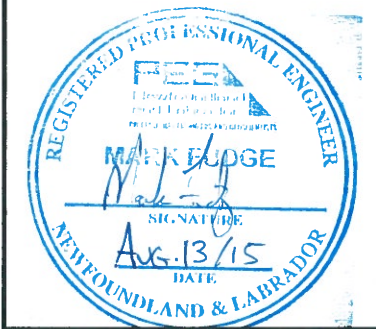
GUY LAYOUT

PROVINCE OF NEWFOUNDLAND AND LABRADOR
PERMIT HOLDER
 This Permit Allows
WESTOWER COMMUNICATIONS LTD.
 To practice Professional Engineering
 in Newfoundland and Labrador.
 Permit No. as issued by PEG _____
 which is valid for the year _____

REV.	DATE	BY	CHK	APP
0	15JUL15	PJS	mm	mm

DESCRIPTION:

ISSUED FOR CONSTRUCTION



Westower Communications
 60 South Field Drive
 Elmira, Ontario Canada N3B 2Z2
 Tel.: (519) 669-4144 Fax: (519) 669-1980

DIMENSIONS ARE IN: mm

TOWER PROFILE

35.3m 90AWG TOWER
 CANADIAN COAST GUARD
 HOPEDALE HILL
 LABRADOR

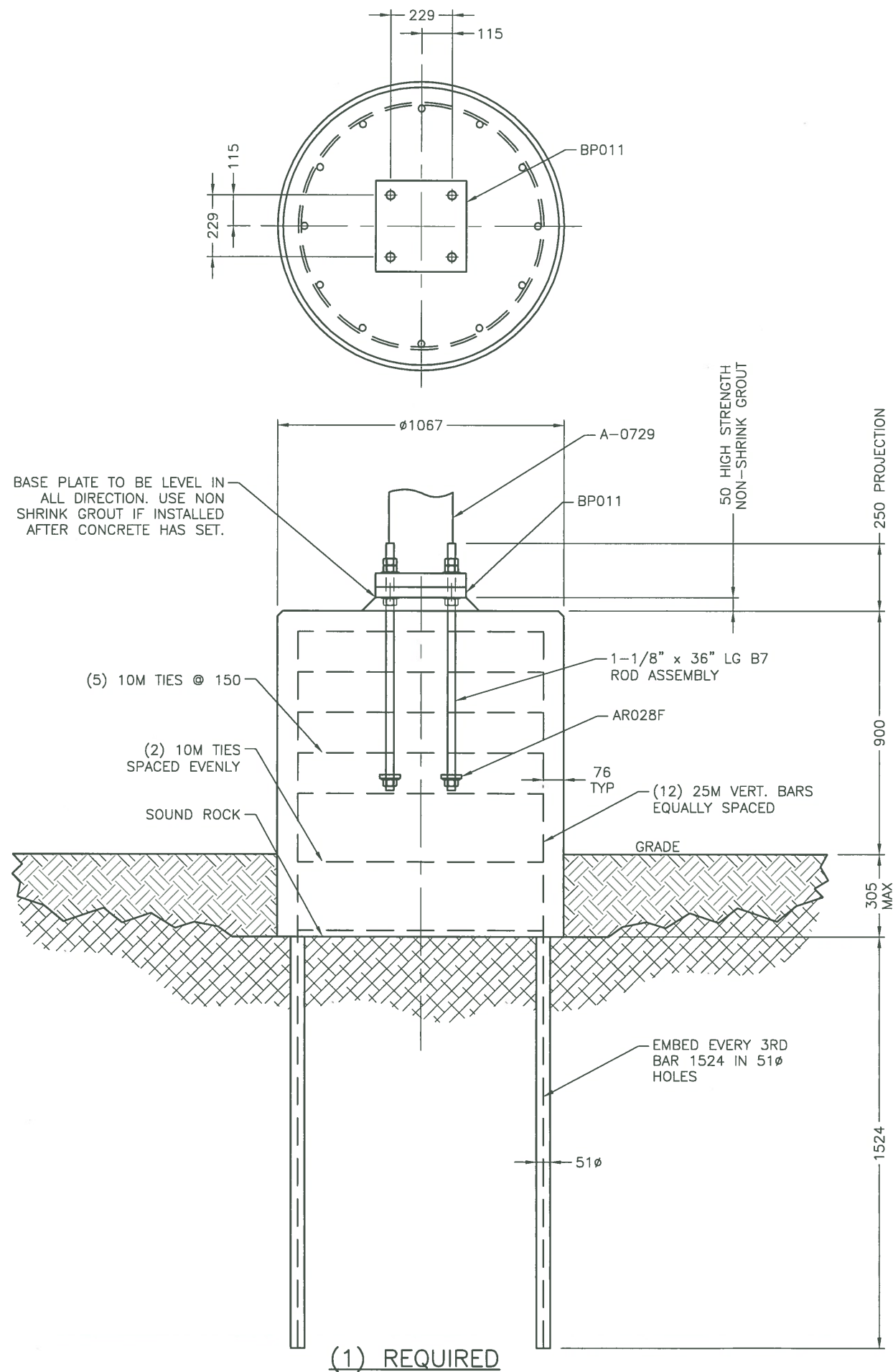
WESTOWER PROJECT No. 50-00176 SCALE: NTS

DRAWN BY: PJS CHECKED BY: mm APPROVED BY: mm DATE: 15JUL15

DRAWING NO: 500176A01 SHEET 1

INCHES 1 0 1 2 3 4 POUÇES

1 0 1 2 3 4 5 6 7 8 9 10 CENTIMETRES



BASE PLATE TO BE LEVEL IN ALL DIRECTION. USE NON SHRINK GROUT IF INSTALLED AFTER CONCRETE HAS SET.

50 HIGH STRENGTH NON-SHRINK GROUT

(5) 10M TIES @ 150

(2) 10M TIES SPACED EVENLY

SOUND ROCK

1-1/8" x 36" LG B7 ROD ASSEMBLY

ARO28F

76 TYP

(12) 25M VERT. BARS EQUALLY SPACED

GRADE

EMBED EVERY 3RD BAR 1524 IN 51Ø HOLES

51Ø

(1) REQUIRED

FABRICATED PARTS

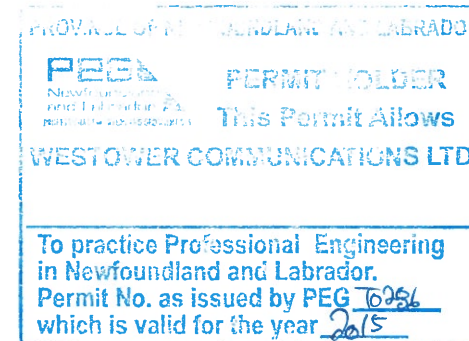
QTY	PART No.	REV	DESCRIPTION	UNIT WT	SUBTOTAL
4	ARO28F	1	PL13x76 1-3/16 HOLE WASHER	0.6	2.4
1	BP011	0	PL 38 x 337 BASE PLATE	30.4	30.4
TOTAL WEIGHT kg					32.8

HARDWARE

QTY	PART No.	DESCRIPTION
4	1108034	1-1/8" x 3'-0" B7 ROD ASSEMBLY (4N,3FW) - HDG
1	A-0729	BASE INSULATOR (GUYED) (90720 kg MAX. DOWNLOAD)

REV.	DATE	BY	CHK	APP
0	15JUL15	PJS	smm	mim

DESCRIPTION:
ISSUED FOR CONSTRUCTION



GENERAL NOTES:

- FOUNDATION DESIGNED ACCORDING TO SOILS REPORT.
BY: STANTEC
REPORT No. F6839-145551
DATED: NOVEMBER 25, 2014
- REMOVE ALL LOOSE AND WEATHERED ROCK.
- CALL WESTOWER ENGINEERING (ELMIRA) IF CONDITIONS VARY FROM DRAWINGS.
- LEVELLING OF BEDROCK SURFACE IS REQUIRED.

DIMENSIONS ARE IN: mm

FOUNDATION - TOWER

35.3m 90AWG TOWER
CANADIAN COAST GUARD
HOPEDALE HILL
LABRADOR

WESTOWER PROJECT No. 50-00176 SCALE: NTS

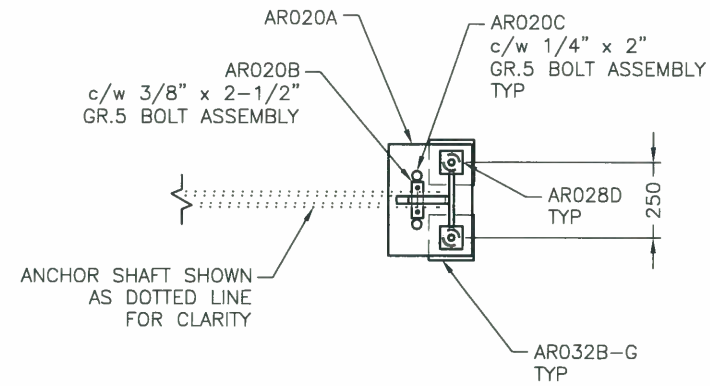
DRAWN BY: PJS CHECKED BY: smm APPROVED BY: mim DATE: 15JUL15

DRAWING NO: 500176A03 SHEET 1

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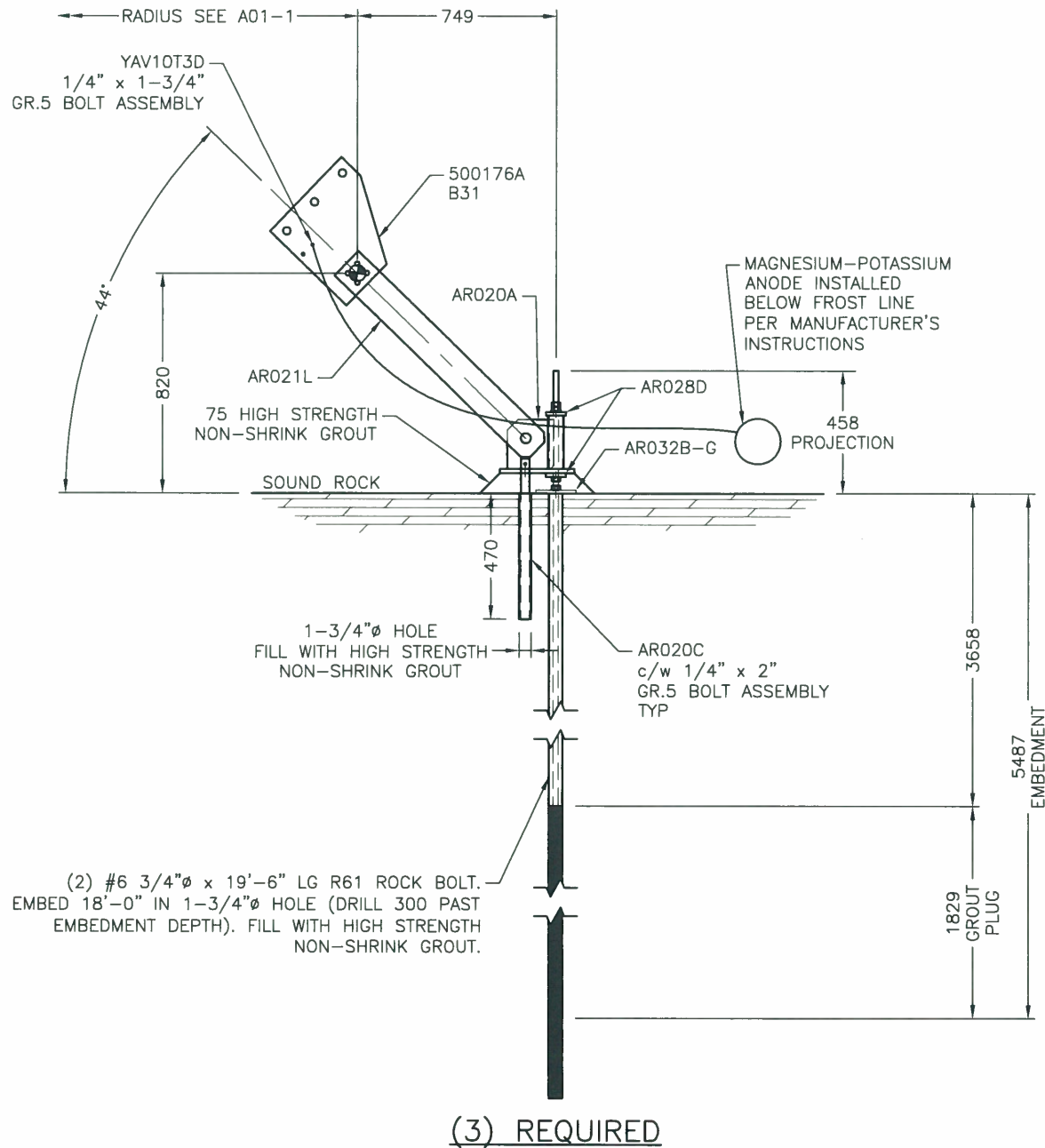
INCHES 1 0 1 2 3 4 POUÇES

1 0 1 2 3 4 5 6 7 8 9 10 CENTIMETRES



FABRICATED PARTS						REV.	DATE	BY	CHK	APP
QTY	PART No.	REV	DESCRIPTION	UNIT WT	SUBTOTAL	0	15JUL15	PJS	mm	mm
3	500176A	0	PL 25x385 ANCHOR HEAD PLATE	25.4	76.2	DESCRIPTION:				
3	ARO20A	3	2 BOLT ROCK ANCHOR WELDMNT (250kN)	25.9	77.7	ISSUED FOR CONSTRUCTION				
3	ARO20B	1	SR38 ANCHOR PIN	1.1	3.3					
6	ARO20C	1	SR32 SHEAR PIN	3.7	22.2					
6	ARO21L	1	FB13x127 (250kN) ANCHOR SHAFT	12.6	75.6					
12	ARO28D	1	PL 13x76 (15/16 HOLE WASHER)	0.6	7.2					
6	ARO32B-G	10	FB13x150 ANCHOR KEY PLATE	2.3	13.8					
TOTAL WEIGHT kg					276.0					

HARDWARE		
QTY	PART No.	DESCRIPTION
3		1/4" x 1-3/4" GR.5 BOLT ASSEMBLY
6		1/4" x 2" GR.5 BOLT ASSEMBLY
6		3/8" x 2-1/2" GR.5 BOLT ASSEMBLY
12	B31	5/8" x 3-1/4" A325 BOLT ASSEMBLY
6	R61-06	#6 3/4" x 19'-6" GR75 ALL THREAD REBAR (4N, 3FW) GALV 36" ONE END
3		BURNDY CONNECTION (TINNED)
3		MAGNESIUM-POTASSIUM ANODE (17D3GG)



ROCK BOLT INSTALLATION LOADS
PRETENSION = 97.9 kN

PROVINCE OF NEWFOUNDLAND AND LABRADOR

PEG PERMIT HOLDER
Newfoundland and Labrador
This Permit Allows
WESTOWER COMMUNICATIONS LTD.

To practice Professional Engineering in Newfoundland and Labrador.
Permit No. as issued by PEG To 286
which is valid for the year 2015

GENERAL NOTES:

- FOUNDATION DESIGNED ACCORDING TO SOILS REPORT.
BY: STANTEC
REPORT No. F6839-145551
DATED: NOVEMBER 25, 2014
- REMOVE ALL LOOSE AND WEATHERED ROCK.
- CALL WESTOWER ENGINEERING (ELMIRA) IF CONDITIONS VARY FROM DRAWINGS.
- CALL WESTOWER ENGINEERING (ELMIRA) BEFORE LOCATING ANCHOR IF ANCHOR ELEVATIONS DIFFER BY MORE THAN 1500±.
- USE PENETROX AT ANODE CONNECTION TO PLATE (IF REQUIRED).
- AFTER ROCK BOLTS HAVE BEEN SET AND PRETENSIONED AS REQUIRED, COMPLETELY FILL ROCK BOLT HOLES WITH NON-SHRINK GROUT.
- BACKFILL SHALL BE COMPACTED IN 300mm (MINIMUM) LIFTS (MINIMUM 955 STANDARD PROCTOR DENSITY) (IF REQUIRED).
- LEVELLING OF BEDROCK SURFACE IS REQUIRED.
- PRE-TENSION SHALL BE VERIFIED USING THE DIRECT TENSION METHOD (METHOD A) AS SPECIFIED BY WILLIAMS FORM ENGINEERING CORP. THE TORQUE TENSIONING METHOD (METHOD B) IS NOT ACCEPTABLE.



60 South Field Drive
Elmira, Ontario Canada N3B 2Z2
Tel.: (519) 669-4144 Fax: (519) 669-1980

DIMENSIONS ARE IN: mm

TOWER ANCHOR

35.3m 90AWG TOWER
CANADIAN COAST GUARD
HOPEDALE HILL
LABRADOR

WESTOWER PROJECT No. 50-00176 SCALE: NTS

DRAWN BY: PJS CHECKED BY: mm APPROVED BY: mm DATE: 15JUL15

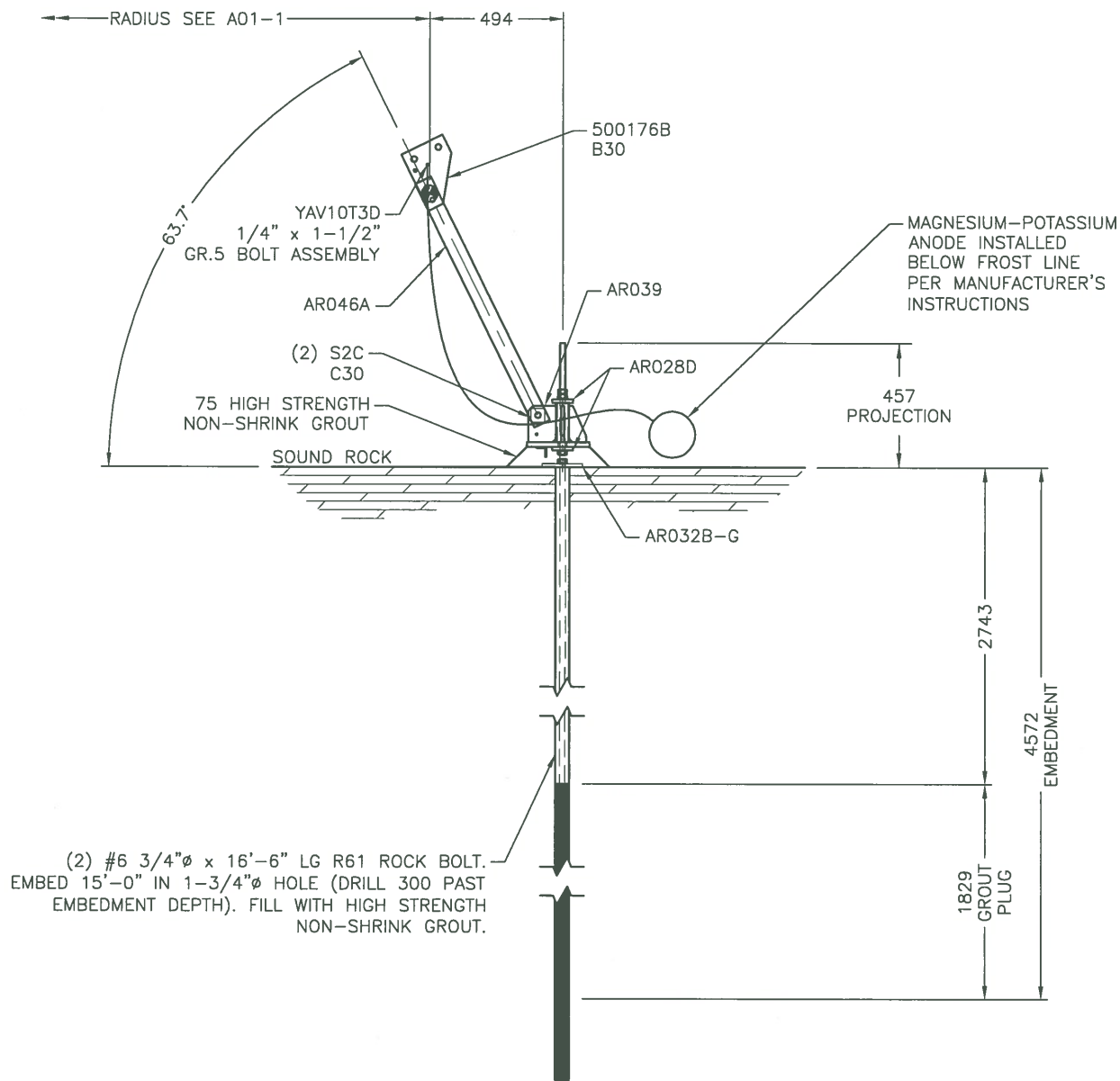
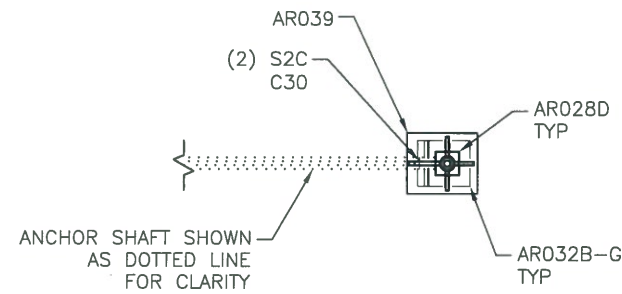
DRAWING NO: 500176A03 SHEET 2

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(3) REQUIRED

INCHES 1 0 1 2 3 4 POUÇES

1 0 1 2 3 4 5 6 7 8 9 10 CENTIMETRES



(2) #6 3/4" ϕ x 16'-6" LG R61 ROCK BOLT. EMBED 15'-0" IN 1-3/4" ϕ HOLE (DRILL 300 PAST EMBEDMENT DEPTH). FILL WITH HIGH STRENGTH NON-SHRINK GROUT.

(12) REQUIRED

FABRICATED PARTS

QTY	PART No.	REV	DESCRIPTION	UNIT WT	SUBTOTAL
12	500176B	0	PL 19x170 CURTAIN ANCHOR HEAD PLATE	4.6	55.2
24	ARO28D	1	PL 13x76 (15/16 HOLE WASHER)	0.6	14.4
12	ARO32B-G	10	FB13x150 ANCHOR KEY PLATE	2.3	27.6
12	ARO39	0	PL 13x102 ROCK ANCHOR WELDMENT	10.4	124.8
24	ARO46A	0	FB 13x64 ANCHOR SHAFT	6.4	153.6
				TOTAL WEIGHT kg	378.2

HARDWARE

QTY	PART No.	DESCRIPTION
12		1/4" x 1-1/2" UNC GR.5 BOLT
24	B30	5/8" x 3" A325 BOLT ASSEMBLY
12	C30	3/4" x 3" A325 BOLT ASSEMBLY
12	R61-06	#6 3/4" x 16'-6" GR75 ALL THREAD REBAR (4N,3FW) GALV 36" ONE END
12		BURNDY CONNECTION (TINNED)
12		MAGNESIUM-POTASSIUM ANODE (17D3GG)
24	S2C	PL3.2x51 (13/16" HOLE PLATE SPACER)

ROCK BOLT INSTALLATION LOADS
PRETENSION= 97.9 kN

PROVINCE OF NEWFOUNDLAND AND LABRADOR

PEG
Newfoundland and Labrador
PROFESSIONAL ENGINEERS AND GEOSCIENTISTS

PERMIT HOLDER
This Permit Allows
WESTOWER COMMUNICATIONS LTD.

To practice Professional Engineering in Newfoundland and Labrador. Permit No. as issued by PEG 10286 which is valid for the year 2015

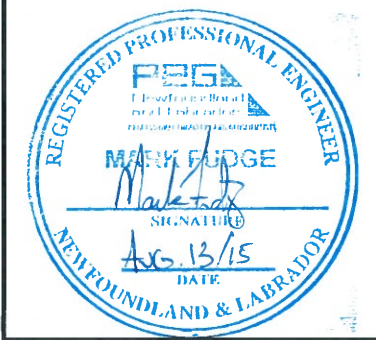
GENERAL NOTES:

- FOUNDATION DESIGNED ACCORDING TO SOILS REPORT. BY: STANTEC REPORT No. F6839-145551 DATED: NOVEMBER 25, 2014
- REMOVE ALL LOOSE AND WEATHERED ROCK.
- CALL WESTOWER ENGINEERING (ELMIRA) IF CONDITIONS VARY FROM DRAWINGS.
- CALL WESTOWER ENGINEERING (ELMIRA) BEFORE LOCATING ANCHOR IF ANCHOR ELEVATIONS DIFFER BY MORE THAN 1500 \pm .
- USE PENETROX AT ANODE CONNECTION TO PLATE (IF REQUIRED).
- AFTER ROCK BOLTS HAVE BEEN SET AND PRETENSIONED AS REQUIRED, COMPLETELY FILL ROCK BOLT HOLES WITH NON-SHRINK GROUT.
- BACKFILL SHALL BE COMPACTED IN 300mm (MINIMUM) LIFTS (MINIMUM 955 STANDARD PROCTOR DENSITY) (IF REQUIRED).
- LEVELLING OF BEDROCK SURFACE IS REQUIRED.
- PRE-TENSION SHALL BE VERIFIED USING THE DIRECT TENSION METHOD (METHOD A) AS SPECIFIED BY WILLIAMS FORM ENGINEERING CORP. THE TORQUE TENSIONING METHOD (METHOD B) IS NOT ACCEPTABLE.

REV.	DATE	BY	CHK	APP
0	15JUL15	PJS	mm	mm

DESCRIPTION:

ISSUED FOR CONSTRUCTION



WESTOWER COMMUNICATIONS
60 South Field Drive
Elmira, Ontario Canada N3B 2Z2
Tel.: (519) 669-4144 Fax: (519) 669-1980

DIMENSIONS ARE IN: mm

CURTAIN ANCHOR

35.3m 90AWG TOWER
CANADIAN COAST GUARD
HOPEDALE HILL
LABRADOR

WESTOWER PROJECT No. 50-00176 SCALE: NTS

DRAWN BY: PJS CHECKED BY: mm APPROVED BY: mm DATE: 15JUL15

DRAWING NO: 500176A03 SHEET 3

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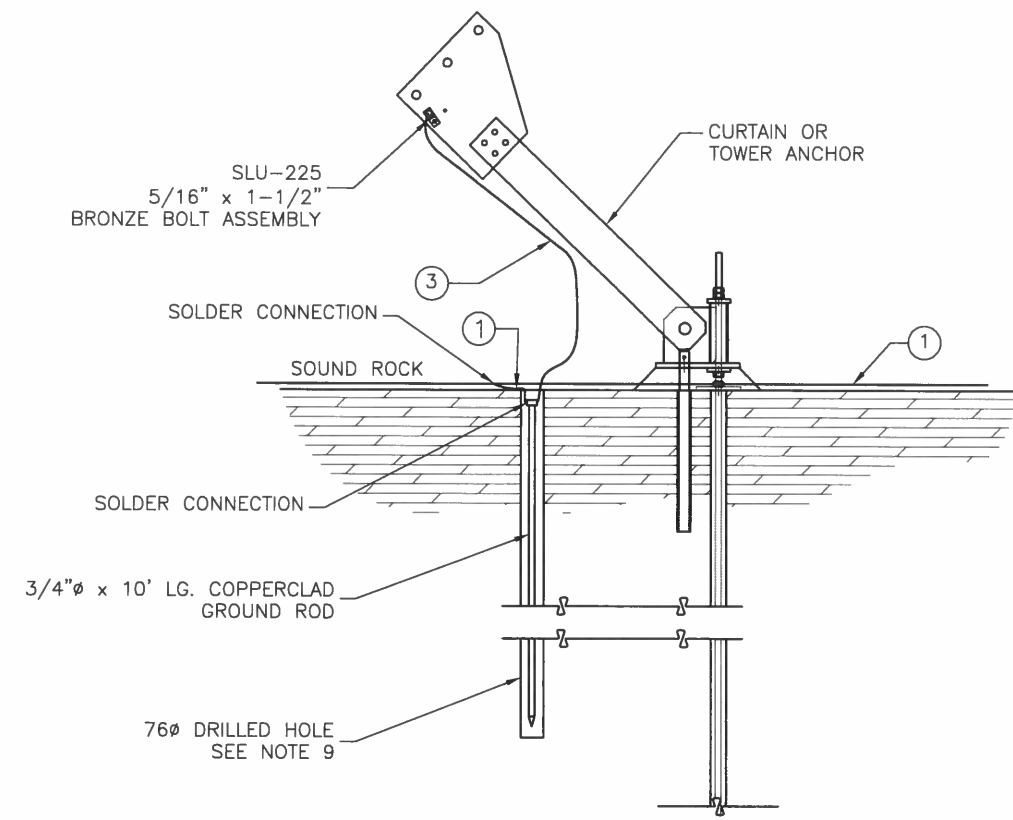
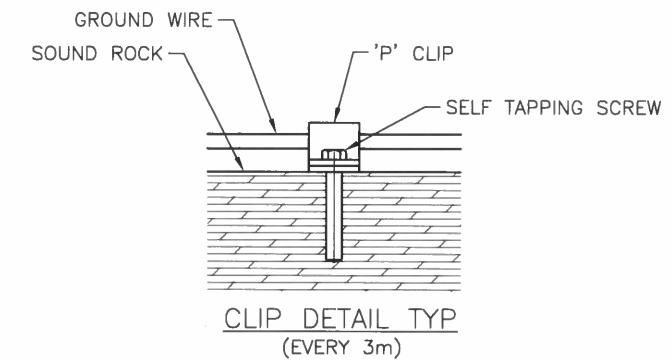
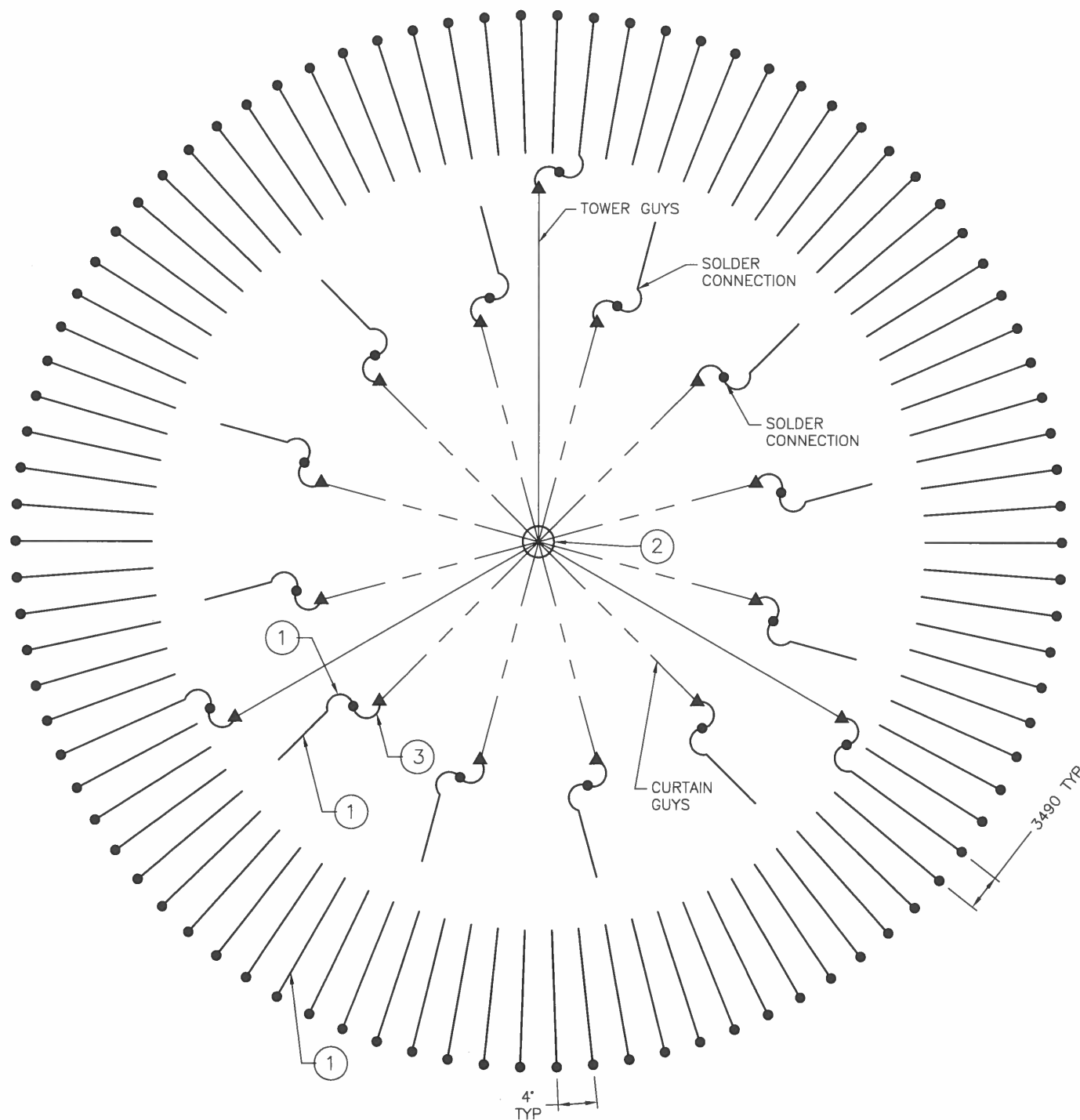
INCHES 1 0 1 2 3 4 POUÇES

1 0 1 2 3 4 5 6 7 8 9 10 CENTIMETRES

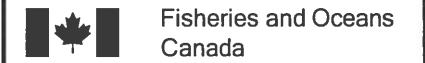
NOTES:

1. COPPER STRAP FROM TOWER BASE TO RADIAL RING TO BE PINNED TO SOLID ROCK AT 3000 SPACING MAXIMUM
2. RADIAL RING TO BE PINNED TO SOLID ROCK AT 3000 SPACING MAXIMUM
3. GROUND RODS TO BE BURIED BELOW SOLID ROCK SURFACE
4. RADIALS TO BE PINNED TO SOLID ROCK AT 3000 SPACING MAXIMUM
5. BEFORE MAKING A GROUND SYSTEM CONNECTION, REMOVE ALL PAINT, FOREIGN MATTER OR DIRT.
6. COUNTERPOISES SHALL BE RADIALS INSTALLED OUTWARD FROM THE TOWER TO A MAXIMUM LENGTH OF 30.0m
7. ALL GROUND CONDUCTORS TO BE INSTALLED TO AVOID SHARP BENDS AND EXCESS LOOPS.
8. ALL CONNECTIONS EXCEPT LEAD FROM GROUND ROD TO ANCHOR PLATE TO BE SOLDERED.
9. GROUND RODS SHALL BE PLACED IN A 76φ DRILLED HOLE, FILLED WITH A BENTONITE AND WATER MIXTURE. THE PROCEDURE FOR PLACING THE ROD IN BENTONITE IS AS FOLLOWS:
 - 1) DRILL 76φ HOLE IN ROCK AT REQUIRED DEPTH
 - 2) POUR WATER 1/3 HEIGHT OF HOLE
 - 3) INSERT GROUND ROD
 - 4) ADD BENTONITE POWDER IN HOLE, ALTERNATING WATER

RUN#	TYPE	DESCRIPTION	LENGTH	REV.	DATE	BY	CHK	APP
1	#10 S.D.C.W.	RADIALS (90 x 50m) (15 x 3m)	4545m	0	15JUL15	PJS	sm7	ET
2	4/0 B.S.C.W.	RADIAL RING 3mφ	10m	DESCRIPTION:				
3	#2 I.S.C.W.	GROUND ROD TO ANCHOR HEAD (15 x 3m)	45m	ISSUED FOR CONSTRUCTION				
HARDWARE								
	#10 SOFT DRAWN COPPER WIRE (S.D.C.W.)		4545m					
	4/0 BARE STRANDED COPPER WIRE (B.S.C.W.)		10m					
	#2 INSULATED STRANDED COPPER WIRE (I.S.C.W.)		45m					
	3/4"φ x 10' LG. COPPERCLAD GROUND RODS		105					
	COPPER GROUND STRAP (1 x 300 x 3500)		4					
	SLU-225 (COPPER SOLDERLESS LUG)		15					
	5/16" x 1-1/2" BRONZE BOLT ASSEMBLY		15					
	'P' CLIPS NYLON FOR 1/8" OD WIRE		1515					
	SELF-TAPPING SCREW		1515					
45	'P' CLIPS FOR 9/16" OD WIRE		4					
42	'P' CLIPS FOR 5/16" OD WIRE		15					
	3/8" x 3" GR.5 BOLT		19					



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DIMENSIONS ARE IN:		mm
SITE SPECIFIC GROUNDING		
35.3m 90AWG TOWER CANADIAN COAST GUARD HOPEDALE HILL LABRADOR		
WESTOWER PROJECT No. 50-00176	SCALE: NTS	
DRAWN BY: PJS	CHECKED BY: sm7	APPROVED BY: ET
DATE: 15JUL15		SHEET 1
DRAWING NO: 500176A04		

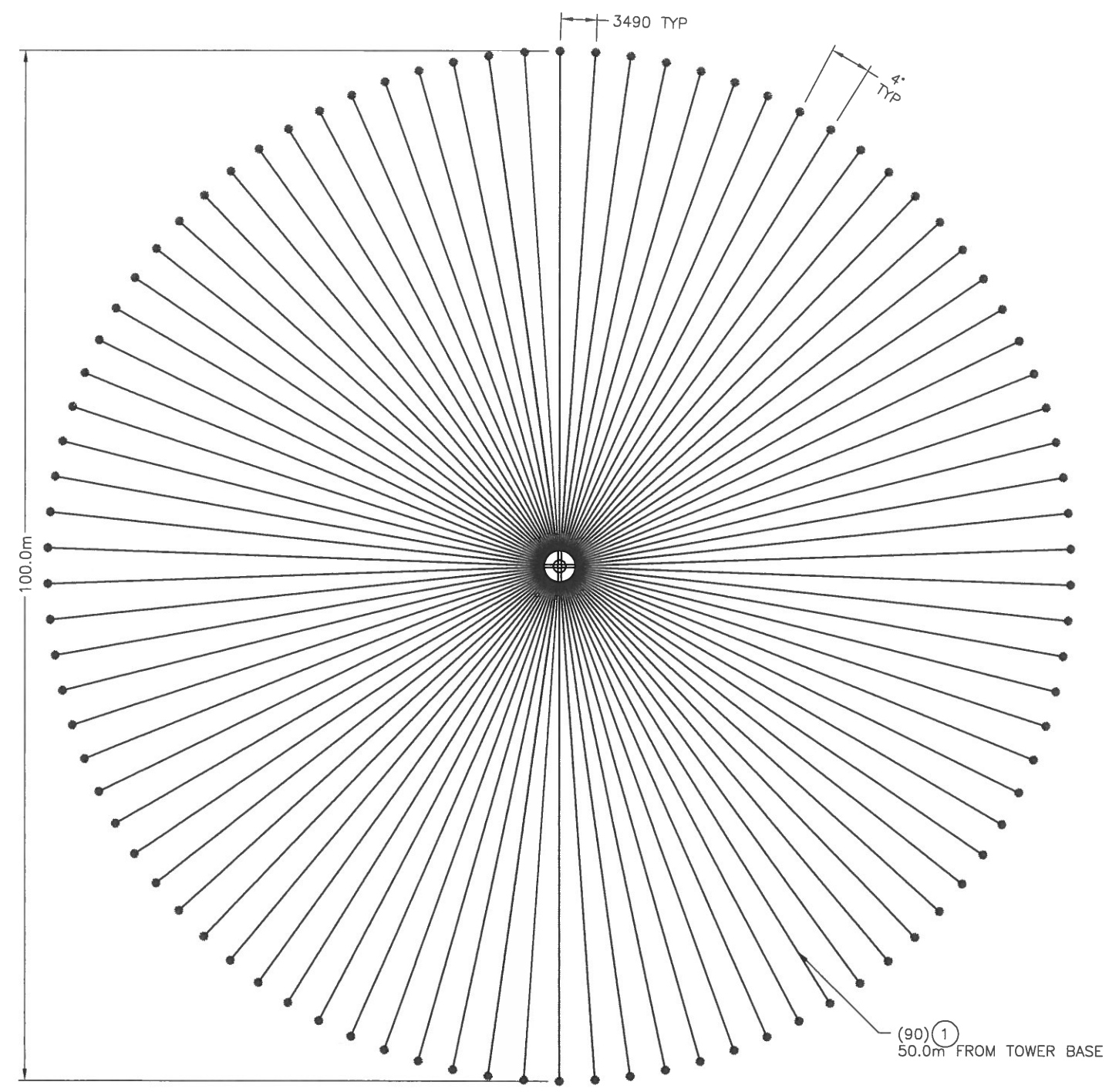
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POUCES

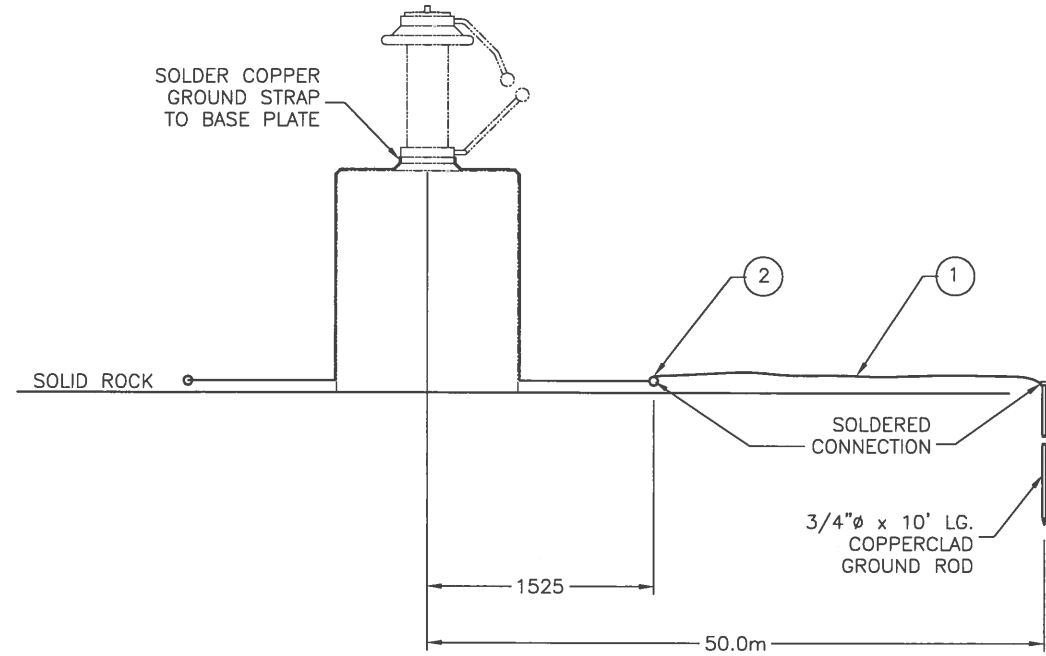
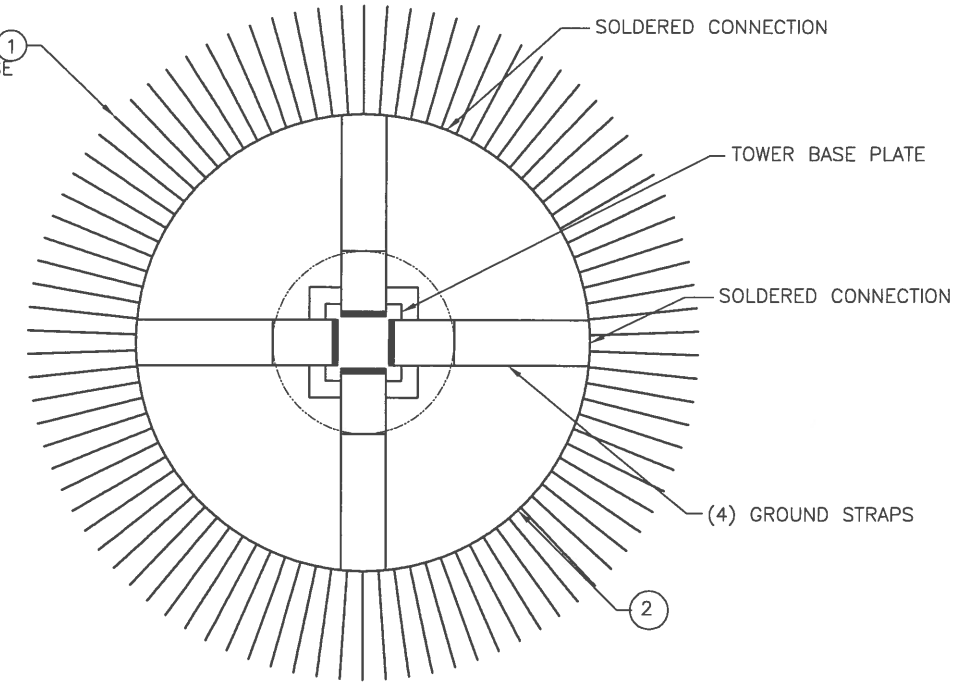
1 0 1 2 3 4 5 6 7 8 9 10 CENTIMETRES

REV.	DATE	BY	CHK	APP
0	15JUL15	PJS	Sm7	ET

DESCRIPTION:
ISSUED FOR CONSTRUCTION



GROUND RADIAL
PLAN VIEW



BASE DETAIL

Fisheries and Oceans
Canada

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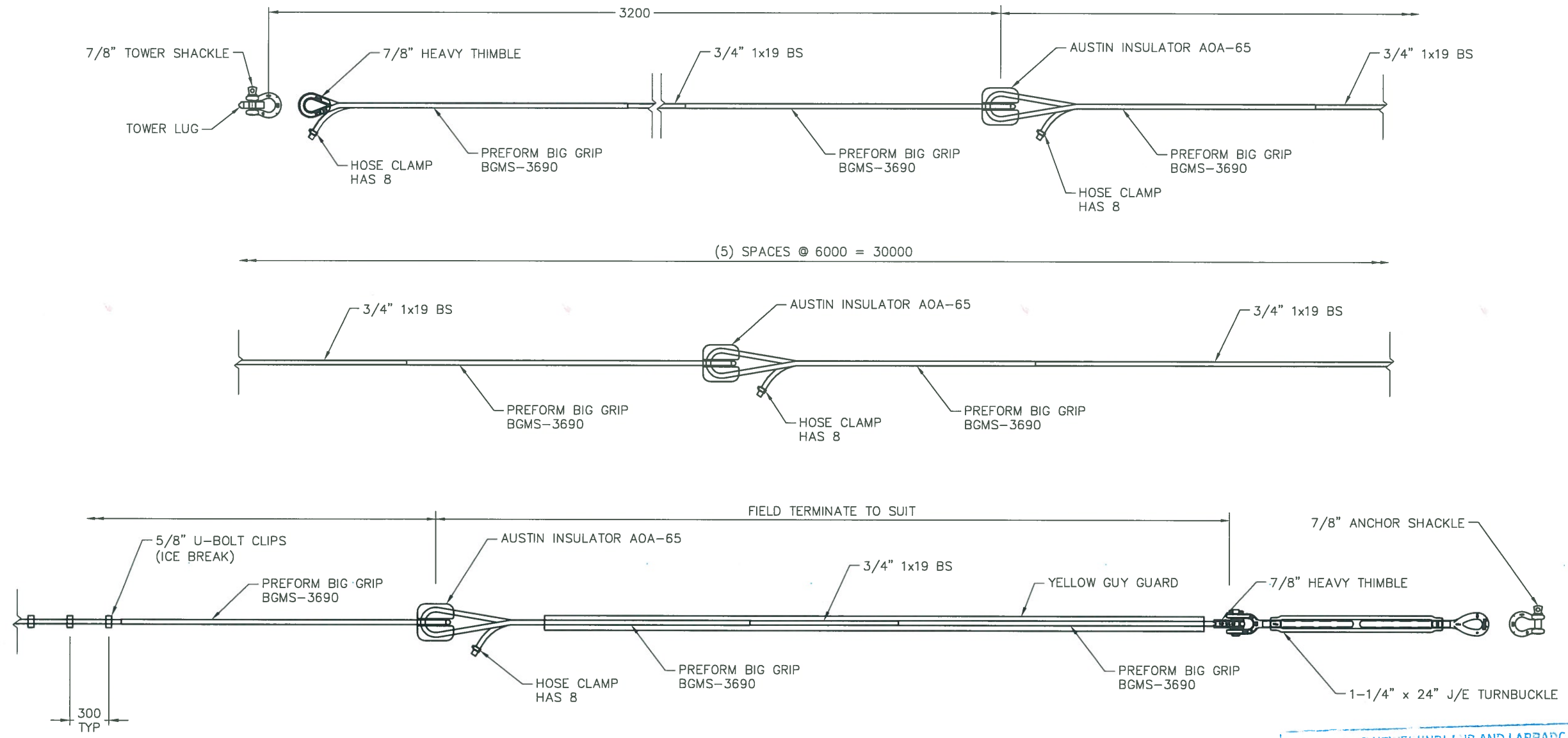
DIMENSIONS ARE IN: mm
SITE SPECIFIC GROUNDING
35.3m 90AWG TOWER
CANADIAN COAST GUARD
HOPEDALE HILL
LABRADOR

WESTOWER PROJECT No. 50-00176	SCALE: NTS
DRAWN BY: PJS	CHECKED BY: Sm7
APPROVED BY:	DATE: 15JUL15
DRAWING NO: 500176A04	SHEET 2

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D
C
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A

REV.	DATE	BY	CHK	APP
0	15JUL15	PJS	SM7	ET
DESCRIPTION:				
ISSUED FOR CONSTRUCTION				
				
				
				
DIMENSIONS ARE IN:		mm		
TOWER GUY ASSEMBLY				
35.3m 90AWG TOWER CANADIAN COAST GUARD HOPEDALE HILL LABRADOR				
WESTTOWER PROJECT No. 50-00176		SCALE: NTS		
DRAWN BY: PJS	CHECKED BY: SM7	APPROVED BY: ET	DATE: 15JUL15	
DRAWING NO: 500176A05				SHEET 1





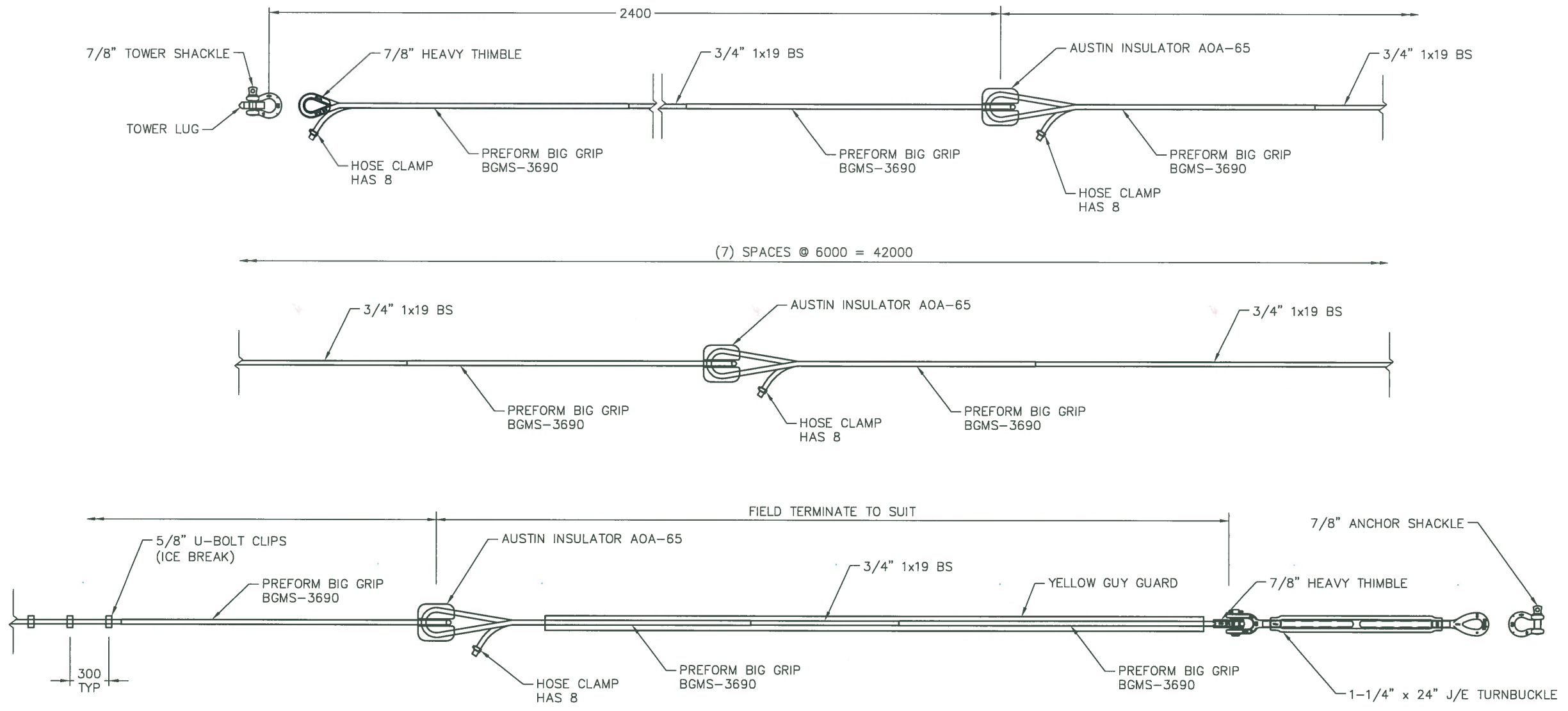
500176GA – STRUCTURAL GUY ASSEMBLY AT
EL. 19.5m
(3) REQUIRED

- NOTE:
- GUY INSULATORS: AUSTIN INSULATORS INC. AOA-65.
 - SHACKLES: CROSBY G-209 HOT DIPPED GALVANIZED.
 - TURNBUCKLES: CROSBY JAW & EYE HG-227 HOT DIPPED GALVANIZED.
 - THIMBLES: CROSBY HEAVY G-414 HOT DIPPED GALVANIZED.
 - U-BOLT CLIPS: CROSBY G-450 HOT DIPPED GALVANIZED.
 - PREFORM BIG GRIP: PREFORM LINE PRODUCTS.
 - GUY GUARDS: IPEX #25504-Y
 - GUY INSULATOR LOOPS MUST BE LARGE ENOUGH TO REMOVE AND INSTALL INSULATOR.
 - INSTALL GUY GUARDS ON FIRST GUY LEVEL FROM ANCHOR TO 4m ABOVE GROUND.
 - LOCATE ICE BREAKS ABOVE GUY GUARD.
 - VERIFY GUY RADIUS & ELEVATIONS PRIOR TO CUTTING LENGTHS.

PROVINCE OF NEWFOUNDLAND AND LABRADOR
 **PERMIT HOLDER**
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 which is valid for the year 2015

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REV.	DATE	BY	CHK	APP
0	15JUL15	PJS	SMT	FT
DESCRIPTION:				
ISSUED FOR CONSTRUCTION				
				
				
 <p>60 South Field Drive Elmira, Ontario Canada N3B 2Z2 Tel.: (519) 669-4144 Fax: (519) 669-1980</p>				
DIMENSIONS ARE IN:		mm		
TOWER GUY ASSEMBLY				
35.3m 90AWG TOWER CANADIAN COAST GUARD HOPEDALE HILL LABRADOR				
WESTTOWER PROJECT No.		SCALE:		
50-00176		NTS		
DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	
PJS	SMT	FT	15JUL15	
DRAWING NO:				SHEET
500176A05				2



500176GB - STRUCTURAL GUY ASSEMBLY AT
 EL. 34.5m
 (3) REQUIRED




- NOTE:**
- GUY INSULATORS: AUSTIN INSULATORS INC. AOA-65.
 - SHACKLES: CROSBY G-209 HOT DIPPED GALVANIZED.
 - TURNBUCKLES: CROSBY JAW & EYE HG-227 HOT DIPPED GALVANIZED.
 - THIMBLES: CROSBY HEAVY G-414 HOT DIPPED GALVANIZED.
 - U-BOLT CLIPS: CROSBY G-450 HOT DIPPED GALVANIZED.
 - PREFORM BIG GRIP: PREFORM LINE PRODUCTS.
 - GUY GUARDS: IPEX #25504-Y
 - GUY INSULATOR LOOPS MUST BE LARGE ENOUGH TO REMOVE AND INSTALL INSULATOR.
 - INSTALL GUY GUARDS ON FIRST GUY LEVEL FROM ANCHOR TO 4m ABOVE GROUND.
 - LOCATE ICE BREAKS ABOVE GUY GUARD.
 - VERIFY GUY RADIUS & ELEVATIONS PRIOR TO CUTTING LENGTHS.

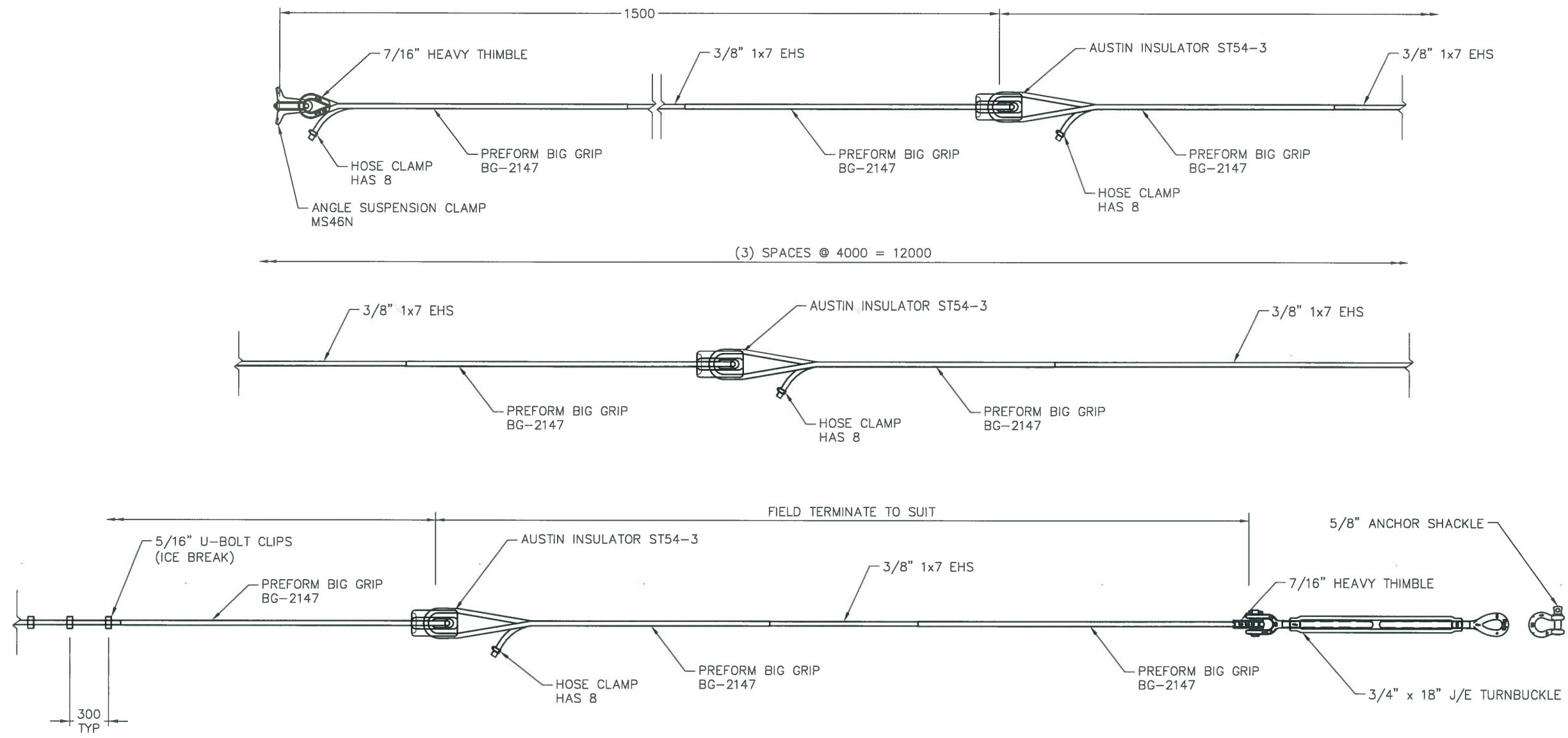
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REV.	DATE	BY	CHK	APP
0	15JUL15	PJS	SM7	FT
DESCRIPTION:				
ISSUED FOR CONSTRUCTION				
				
				
 <p>60 South Field Drive Elmira, Ontario Canada N3B 2Z2 Tel.: (519) 669-4144 Fax: (519) 669-1980</p>				
DIMENSIONS ARE IN:		mm		
CURTAIN GUY ASSEMBLY				
35.3m 90AWG TOWER CANADIAN COAST GUARD HOPEDALE HILL LABRADOR				
WESTTOWER PROJECT No. 50-00176		SCALE: NTS		
DRAWN BY: PJS	CHECKED BY: SM7	APPROVED BY: FT	DATE: 15JUL15	
DRAWING NO: 500176A05				SHEET 3



500176GC - CURTAIN GUY ASSEMBLY
(3) REQUIRED

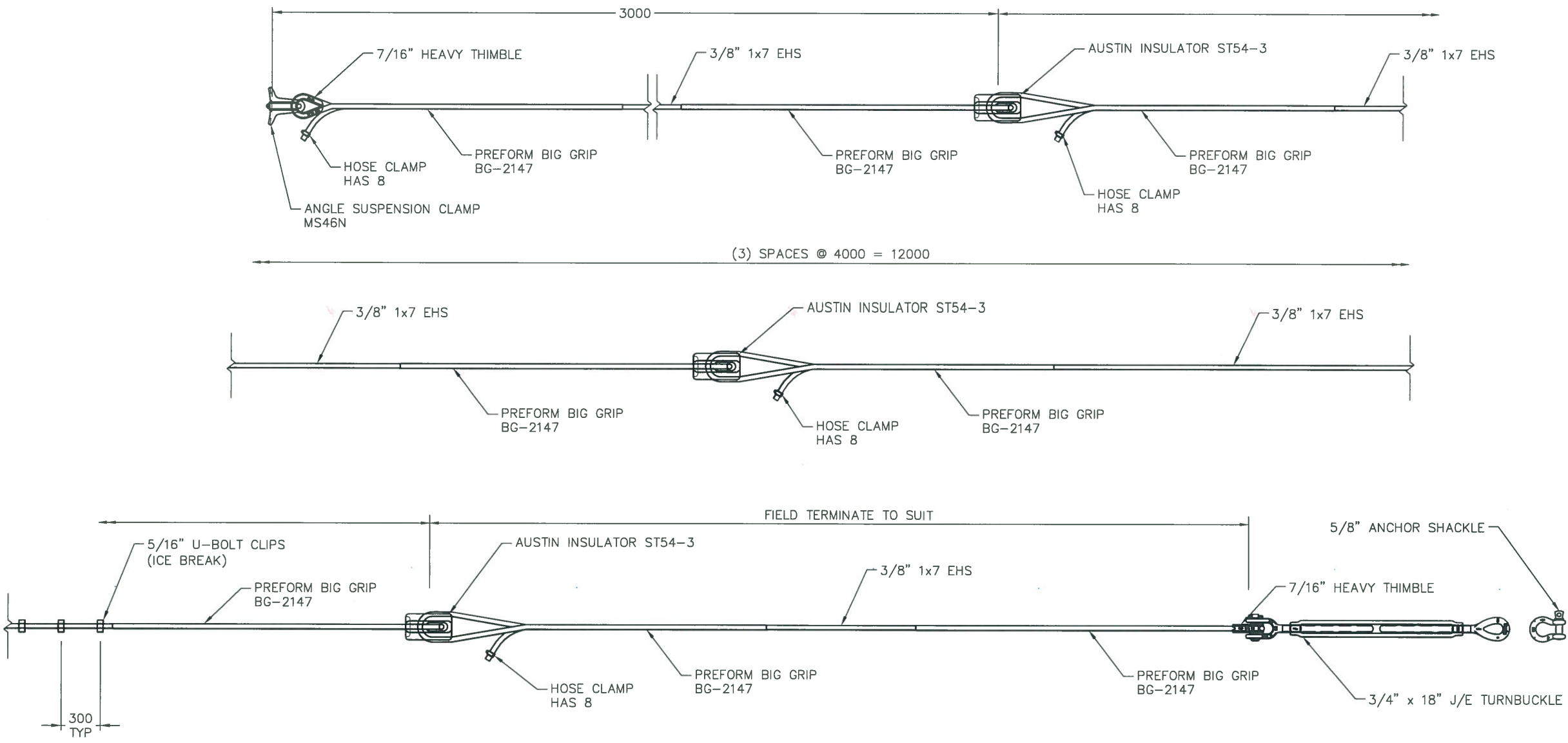
- NOTE:
- GUY INSULATORS: AUSTIN INSULATORS INC. ST54-3.
 - SHACKLES: CROSBY G-209 HOT DIPPED GALVANIZED.
 - TURNBUCKLES: CROSBY JAW & EYE HG-227 HOT DIPPED GALVANIZED.
 - THIMBLES: CROSBY HEAVY G-414 HOT DIPPED GALVANIZED.
 - U-BOLT CLIPS: CROSBY G-450 HOT DIPPED GALVANIZED.
 - PREFORM BIG GRIP: PREFORM LINE PRODUCTS.
 - GUY INSULATOR LOOPS MUST BE LARGE ENOUGH TO REMOVE AND INSTALL INSULATOR.
 - VERIFY GUY RADIUS & ELEVATIONS PRIOR TO CUTTING LENGTHS.

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REV.	DATE	BY	CHK	APP
0	15JUL15	PJS	SM	ET

DESCRIPTION:
ISSUED FOR CONSTRUCTION



500176GD - CURTAIN GUY ASSEMBLY
(9) REQUIRED

- NOTE:
- GUY INSULATORS: AUSTIN INSULATORS INC. ST54-3.
 - SHACKLES: CROSBY G-209 HOT DIPPED GALVANIZED.
 - TURNBUCKLES: CROSBY JAW & EYE HG-227 HOT DIPPED GALVANIZED.
 - THIMBLES: CROSBY HEAVY G-414 HOT DIPPED GALVANIZED.
 - U-BOLT CLIPS: CROSBY G-450 HOT DIPPED GALVANIZED.
 - PREFORM BIG GRIP: PREFORM LINE PRODUCTS.
 - GUY INSULATOR LOOPS MUST BE LARGE ENOUGH TO REMOVE AND INSTALL INSULATOR.
 - VERIFY GUY RADIUS & ELEVATIONS PRIOR TO CUTTING LENGTHS.

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Fisheries and Oceans Canada

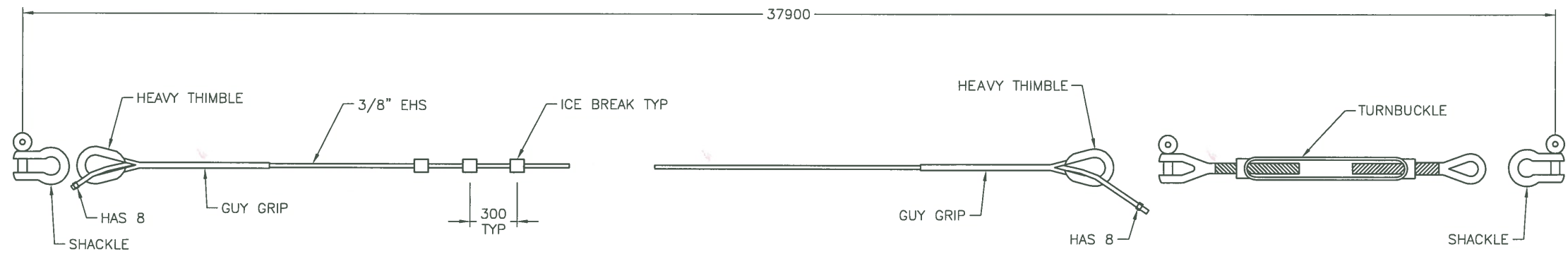
WESTOWER COMMUNICATIONS
60 South Field Drive
Elmira, Ontario Canada N3B 2Z2
Tel.: (519) 669-4144 Fax: (519) 669-1980

DIMENSIONS ARE IN:		mm
CURTAIN GUY ASSEMBLY		
35.3m 90AWG TOWER CANADIAN COAST GUARD HOPEDALE HILL LABRADOR		
WESTOWER PROJECT No.	SCALE:	
50-00176	NTS	
DRAWN BY:	CHECKED BY:	APPROVED BY:
PJS	SM	ET
DATE:		15JUL15
DRAWING NO:	SHEET	
500176A05	4	

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REV.	DATE	BY	CHK	APP
0	15JUL15	PJS	SM	ET

DESCRIPTION:
ISSUED FOR CONSTRUCTION

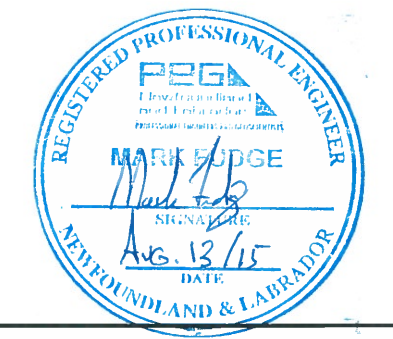


PART NUMBER	TOWER SHACKLE	THIMBLE	GUY GRIP	ICE BREAK	GUY STRAND SIZE	SUPPLIED GUY LENGTH	BOTTOM GUY GRIP	HOSE CLAMP	THIMBLE	J/E TURNBUCKLE SIZE	ANCHOR SHACKLE	QTY
500176GE	5/8"	7/16"H	BG-2147	5/16" G-450	3/8" EHS (1x7)	42.0m	BG-2147	HAS 8	7/16"H	3/4" x 18"	5/8"	12

500176GE – CURTAIN ANTENNA ASSEMBLY
(12) REQUIRED

NOTE:
 1. SHACKLES: CROSBY G-209 HOT DIPPED GALVANIZED.
 2. TURNBUCKLES: CROSBY JAW & EYE HG-227 HOT DIPPED GALVANIZED.
 3. THIMBLES: CROSBY HEAVY G-414 HOT DIPPED GALVANIZED.
 4. PREFORM BIG GRIP: PREFORM LINE PRODUCTS.

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 Tel.: (519) 669-4144 Fax: (519) 669-1980

DIMENSIONS ARE IN:		mm
CURTAIN ANTENNA ASSEMBLY		
35.3m 90AWG TOWER CANADIAN COAST GUARD HOPEDALE HILL LABRADOR		
WESTOWER PROJECT No. 50-00176	SCALE: NTS	
DRAWN BY: PJS	CHECKED BY: SM	APPROVED BY: ET
DATE: 15JUL15		
DRAWING NO: 500176A05	SHEET 5	

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2015-08-10 2:19 PM

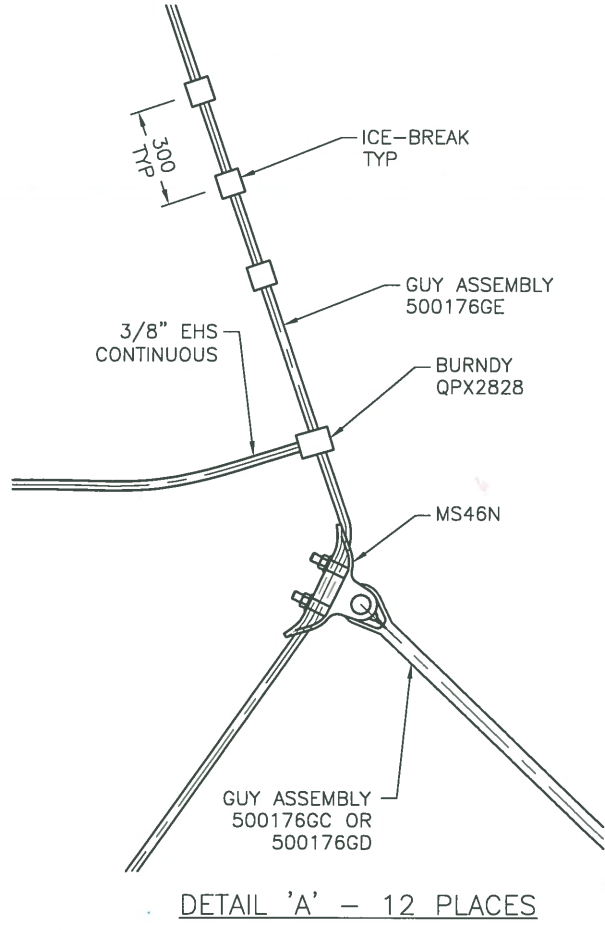
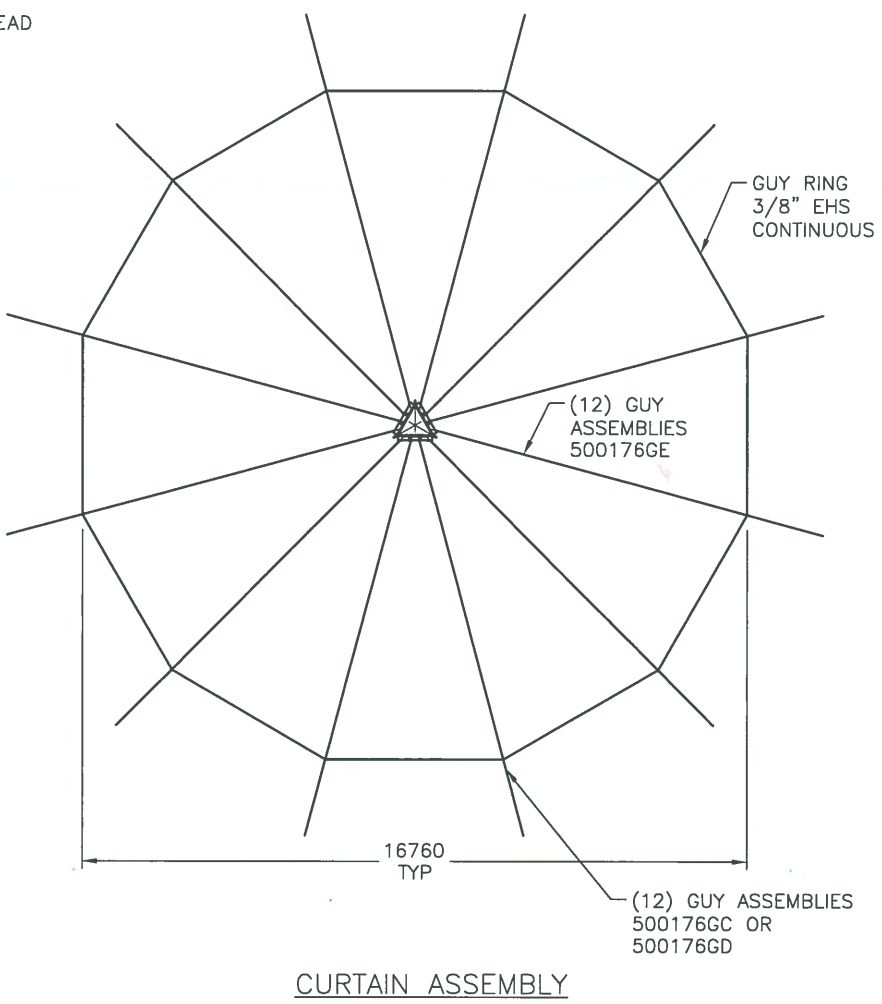
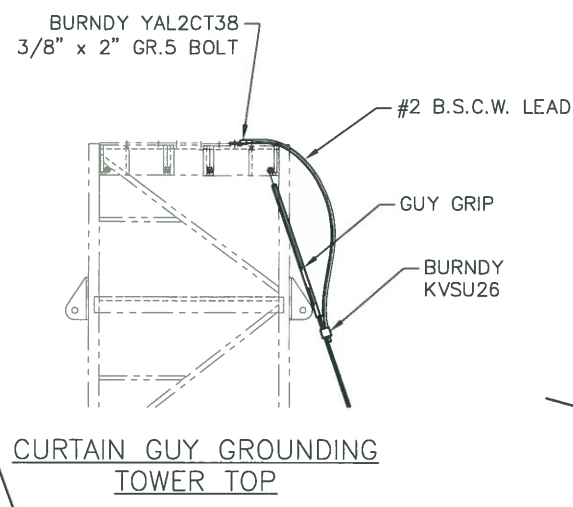
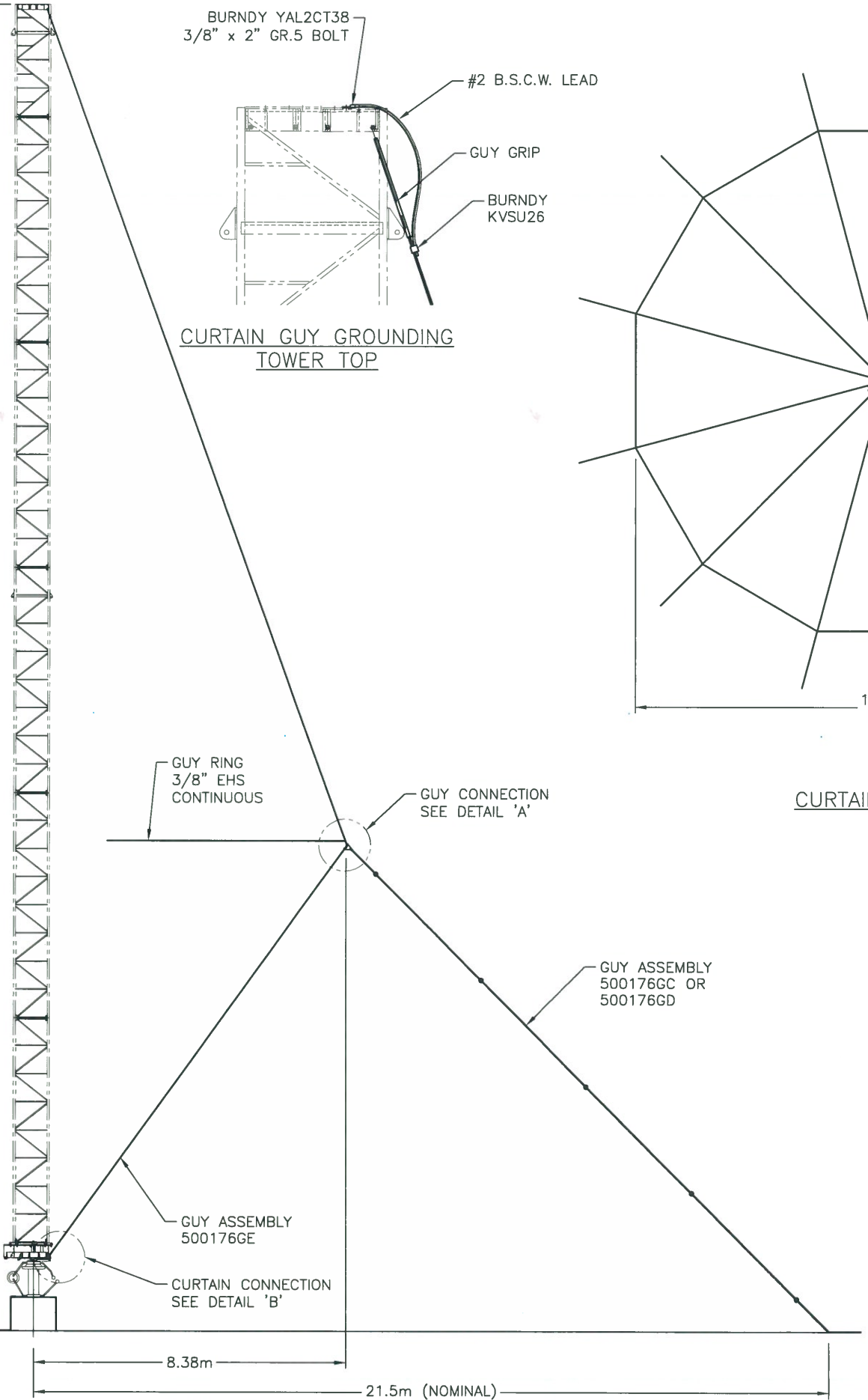
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EL. 35.3m

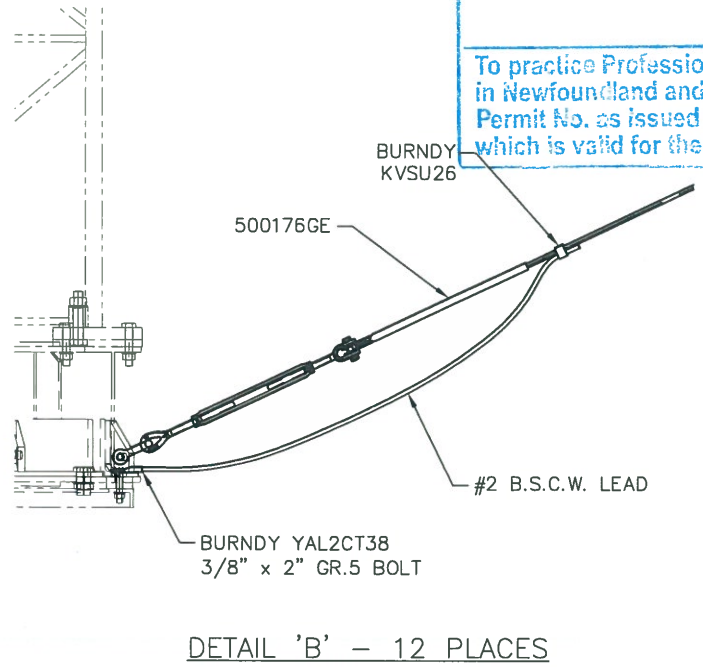
EL. 10.7m

EL. 2.4m

EL. 0m GRADE



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REV.	DATE	BY	CHK	APP
0	15JUL15	PJS	SM? ET	
DESCRIPTION:				
ISSUED FOR CONSTRUCTION				
DIMENSIONS ARE IN:		mm		
CURTAIN ANTENNA ASSEMBLY				
35.3m 90AWG TOWER CANADIAN COAST GUARD HOPEDALE HILL LABRADOR				
WESTOWER PROJECT No. 50-00176		SCALE: NTS		
DRAWN BY: PJS	CHECKED BY: SM? ET	APPROVED BY:	DATE: 15JUL15	
DRAWING NO: 500176A05				SHEET 6

D
C
B
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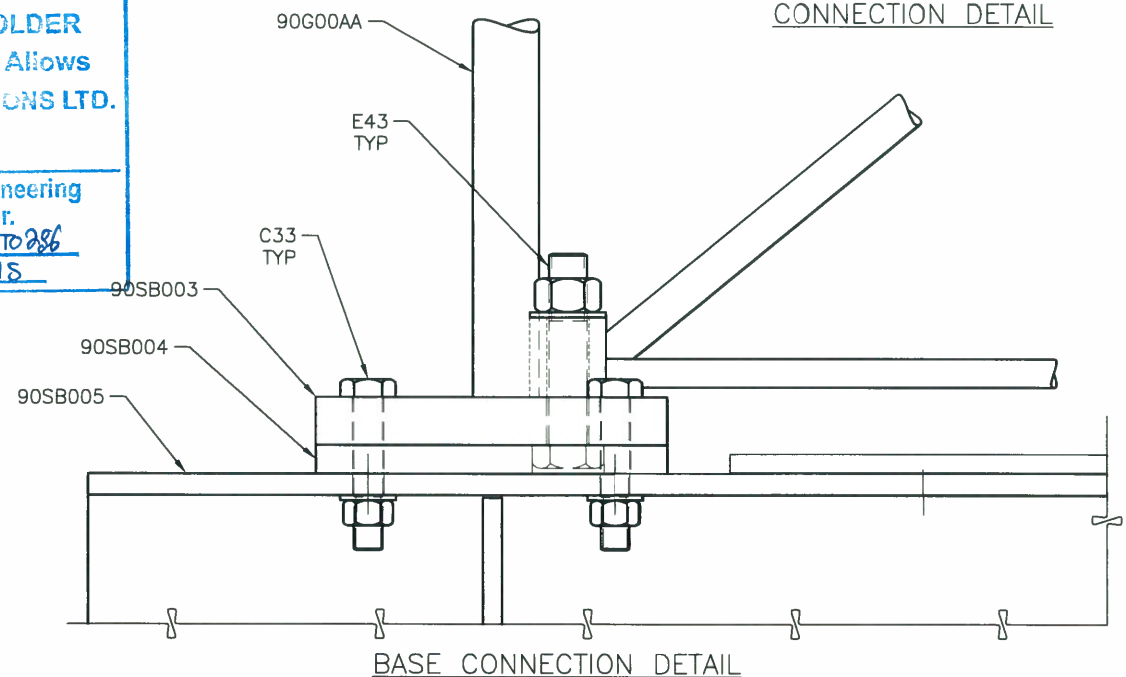
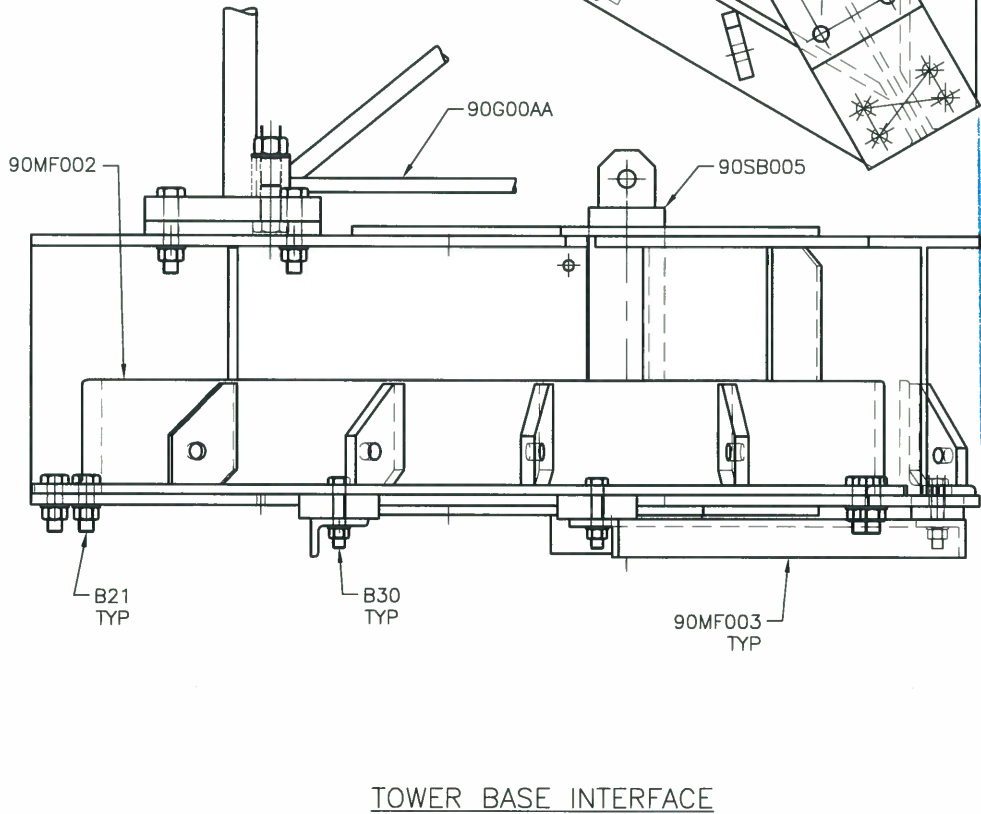
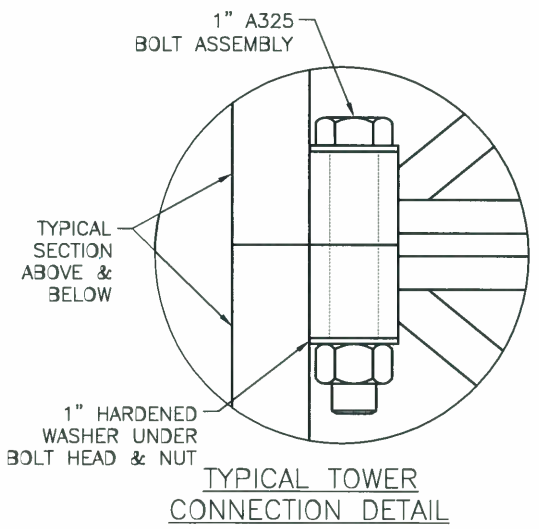
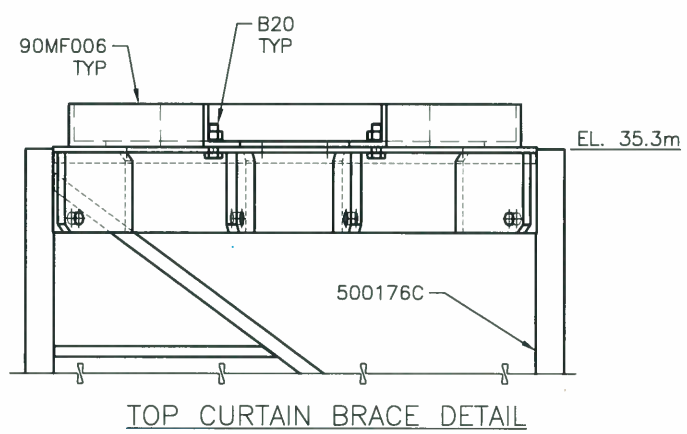
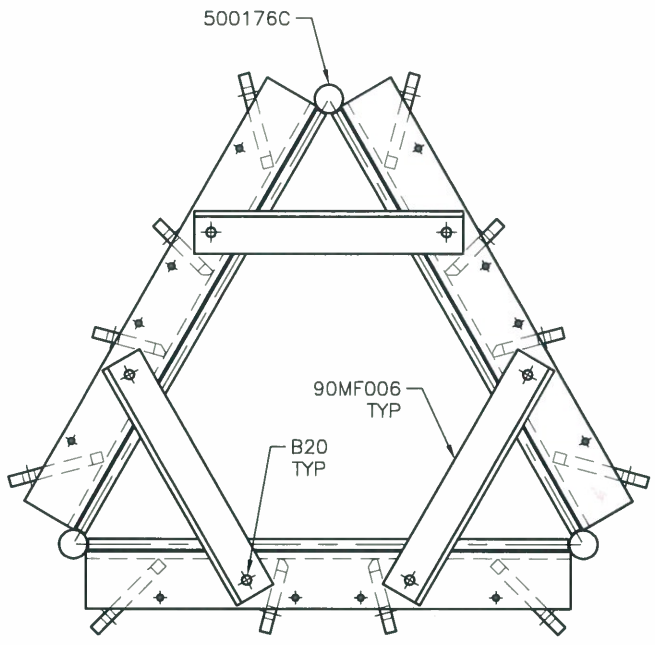
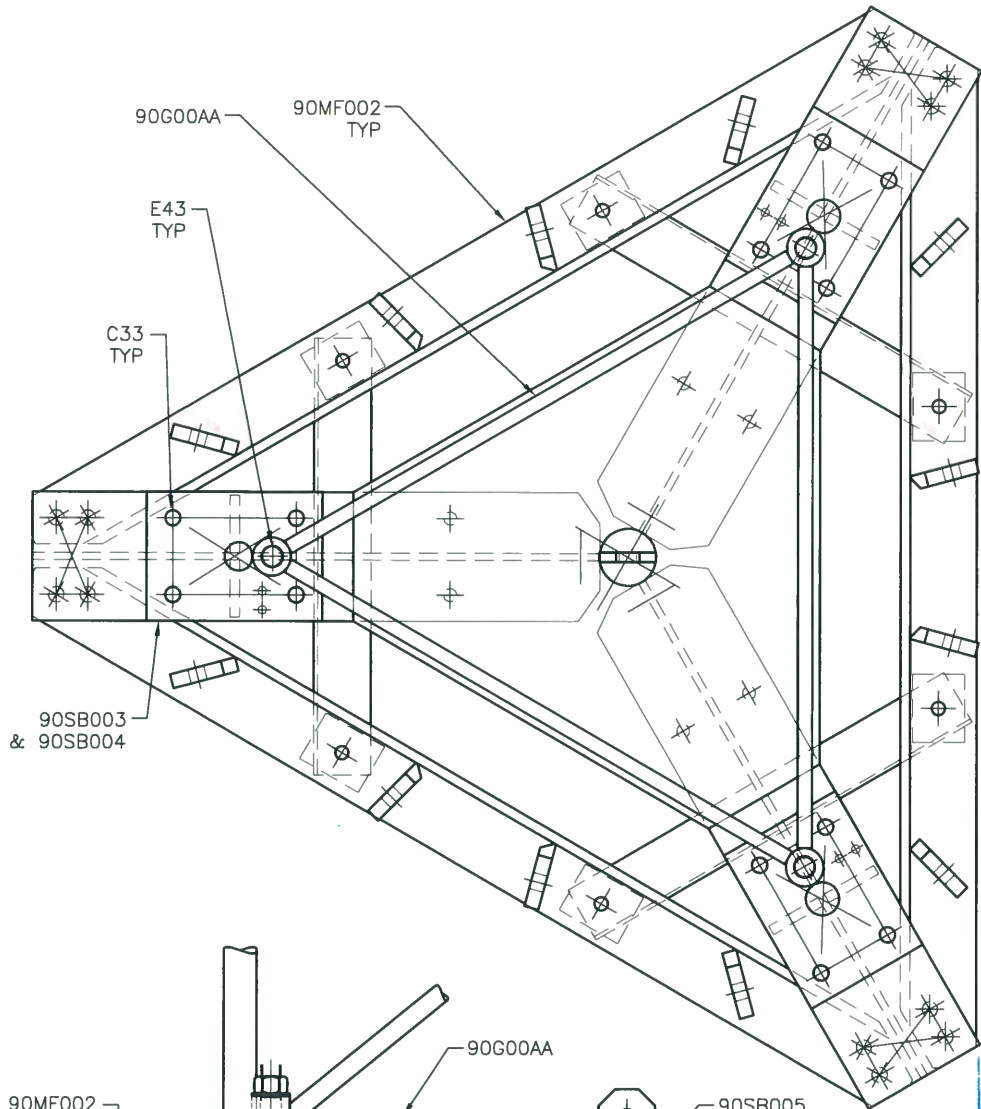
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INCHES 1 0 1 2 3 4 POUÇES 1 0 1 2 3 4 5 6 7 8 9 10 CENTIMETRES

FABRICATED PARTS						REV.	DATE	BY	CHK	APP
QTY	PART No.	REV	DESCRIPTION	UNIT WT	SUBTOTAL	0	15JUL15	PJS	SM	FI
1	500176C	0	90AWG 3m TOP SECTION	357.6	357.6	DESCRIPTION:				
4	90G00AA	3	90AWG 6m REG SECTION	468.9	1875.6	ISSUED FOR CONSTRUCTION				
1	90G33AA	1	90AWG 6m GUY SECTION	488.4	488.4					
3	90MF002	0	CURTAIN TOWER BRACE WELDMENT	41.3	123.9					
3	90MF003	0	L 76x51x4.8 STARBASE BRACE	2.7	8.1					
3	90MF006	0	L 76x51x9.5 TOP CURTAIN BRACE	4.2	12.6					
3	90SB003	0	PL172x32 ADAPTER PLATE	10.0	30.0					
3	90SB004	2	PL172x19 MOUNTING PLATE	5.9	17.7					
1	90SB005	1	STAR BASE FOR CURTAIN GUYS	229.7	229.7					
				TOTAL WEIGHT kg	3143.6					

HARDWARE		
QTY	PART No.	DESCRIPTION
6	B20	5/8" x 2" A325 BOLT ASSEMBLY
6	B30	5/8" x 3" A325 BOLT ASSEMBLY
12	C21	3/4" x 2-1/4" A325 BOLT ASSEMBLY
12	C33	3/4" x 3-3/4" A325 BOLT ASSEMBLY
3	E43	1" x 4-3/4" A325 BOLT ASSEMBLY
3	E60	1" x 6" A325 BOLT ASSEMBLY
9	E62	1" x 6-1/2" A325 BOLT ASSEMBLY
3	E70	1" x 7" A325 BOLT ASSEMBLY
15		1" F-436 FLATWASHER



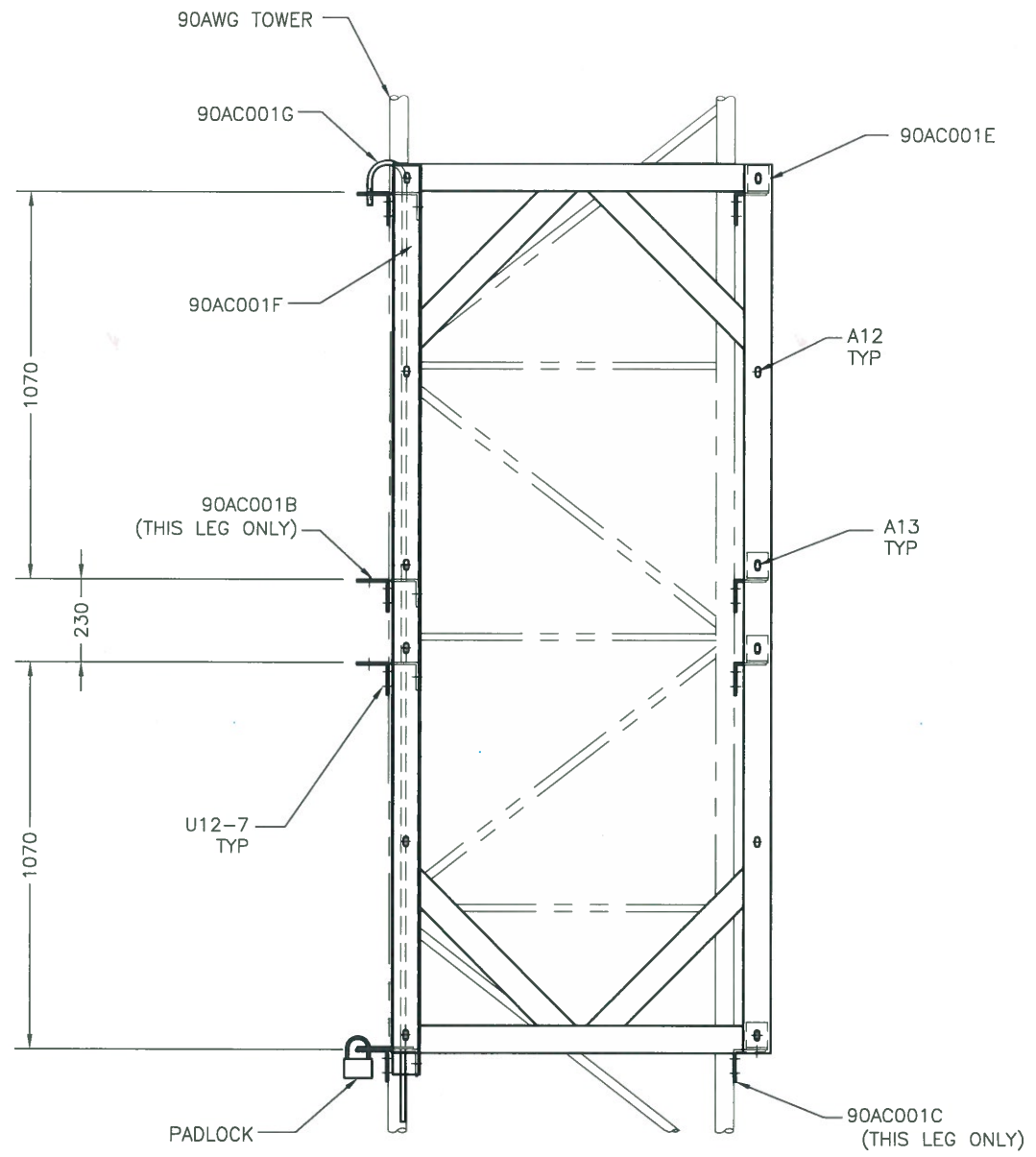
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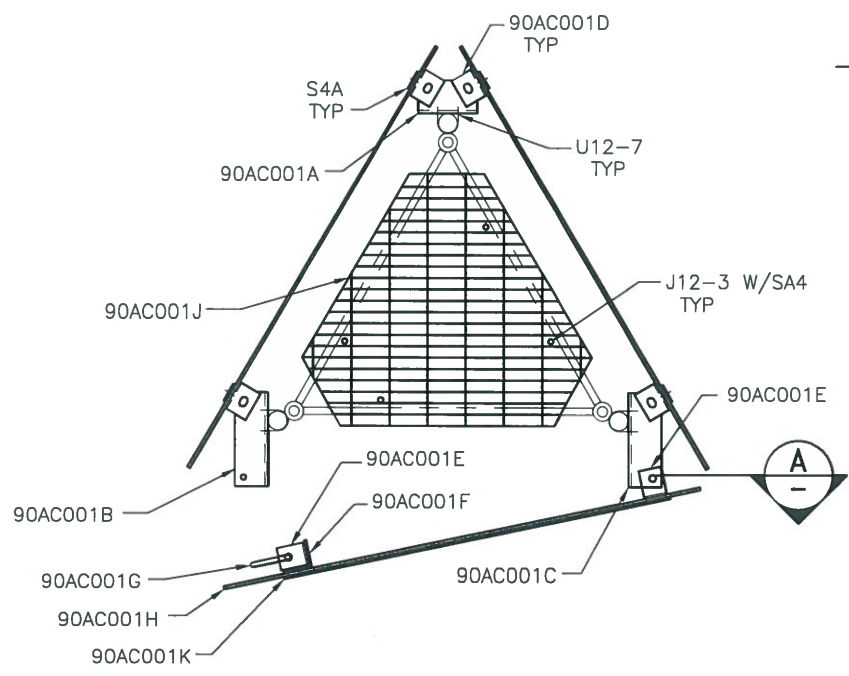
Fisheries and Oceans
Canada

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COMMUNICATIONS
 60 South Field Drive
 Elmira, Ontario Canada N3B 2Z2
 Tel.: (519) 669-4144 Fax: (519) 669-1980

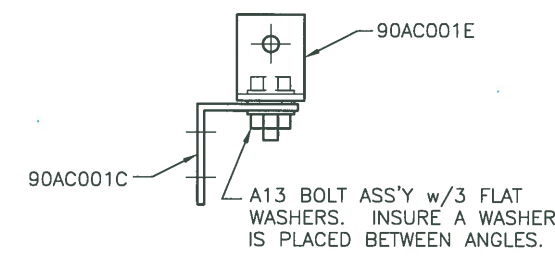
DIMENSIONS ARE IN:		mm
TOWER ASSEMBLY		
35.3m 90AWG TOWER CANADIAN COAST GUARD HOPEDALE HILL LABRADOR		
WESTOWER PROJECT No. 50-00176	SCALE: NTS	
DRAWN BY: PJS	CHECKED BY: SM	APPROVED BY: FI
DATE: 15JUL15		SHEET 7
DRAWING NO: 500176A05		



ELEVATION VIEW
MESH PART# 90AC001H
NOT SHOWN FOR CLARITY



PLAN VIEW



A HINGE DETAIL

PROVINCE OF NEWFOUNDLAND AND LABRADOR

PERMIT HOLDER
This Permit Allows
WESTOWER COMMUNICATIONS LTD.

To practice Professional Engineering
in Newfoundland and Labrador.
Permit No. as issued by PEG 10286
which is valid for the year 2015

FABRICATED PARTS						REV.	DATE	BY	CHK	APP	
QTY	PART No.	REV	DESCRIPTION	UNIT WT	SUBTOTAL	0	15JUL15	PJS	SM7	FT	
4	90AC001A	1	L 89x89x6.4 ANTI-CLIMB LEG MOUNT	1.4	5.6	DESCRIPTION:					
4	90AC001B	1	L 89x89x6.4 ANTI-CLIMB LEG MOUNT	2.3	9.2	ISSUED FOR CONSTRUCTION					
4	90AC001C	1	L 89x89x6.4 ANTI-CLIMB LEG MOUNT	2.3	9.2						
16	90AC001D	1	L 64x64x6.4 ANTI-CLIMB LEG MOUNT	0.5	8.0						
8	90AC001E	0	L 76x76x6.4 ANTI-CLIMB MOUNT ANGLE	0.5	4.0						
1	90AC001F	0	L 76x76x6.4 LOCKING ANGLE	17.9	17.9						
1	90AC001G	3	ANTI-CLIMB LOCKING BENT WELDMENT	3.4	3.4						
6	90AC001H	1	1-1/2"-10 EXPANDED MESH	14.5	87.0						
1	90AC001J	4	ANTI-CLIMB GRATING	12.6	12.6						
1	90AC001K	2	FLAT BAR WELDMENT ANTI-CLIMB DOOR	33.8	33.8						
24	S4A	3	PL6.4x51 (9/16" HOLE PLATE SPACER)	0.3	7.2						
HARDWARE					TOTAL WEIGHT kg	197.9					
QTY	PART No.	DESCRIPTION									
20	A12	1/2" x 1-1/2" A325 BOLT ASSEMBLY									
32	A13	1/2" x 1-3/4" A325 BOLT ASSEMBLY									
8		1/2" F-436 FLATWASHER - HDG									
4	J12-3	J12-3 (1/2" x 3" LG J-BOLT ASSEMBLY) (1N,1LW,1FW)									
24	U12-7	1/2" x 2-3/8" c/c U-BOLT ASSEMBLY (2N,2LW,2FW)									



WESTOWER COMMUNICATIONS
60 South Field Drive
Elmira, Ontario Canada N3B 2Z2
Tel.: (519) 669-4144 Fax: (519) 669-1980

DIMENSIONS ARE IN:		mm
ANTI-CLIMB INSTALLATION		
35.3m 90AWG TOWER CANADIAN COAST GUARD HOPEDALE HILL LABRADOR		
WESTOWER PROJECT No. 50-00176	SCALE: NTS	
DRAWN BY: PJS	CHECKED BY: SM7	APPROVED BY: FT
DRAWING NO: 500176A05	DATE: 15JUL15	SHEET 8

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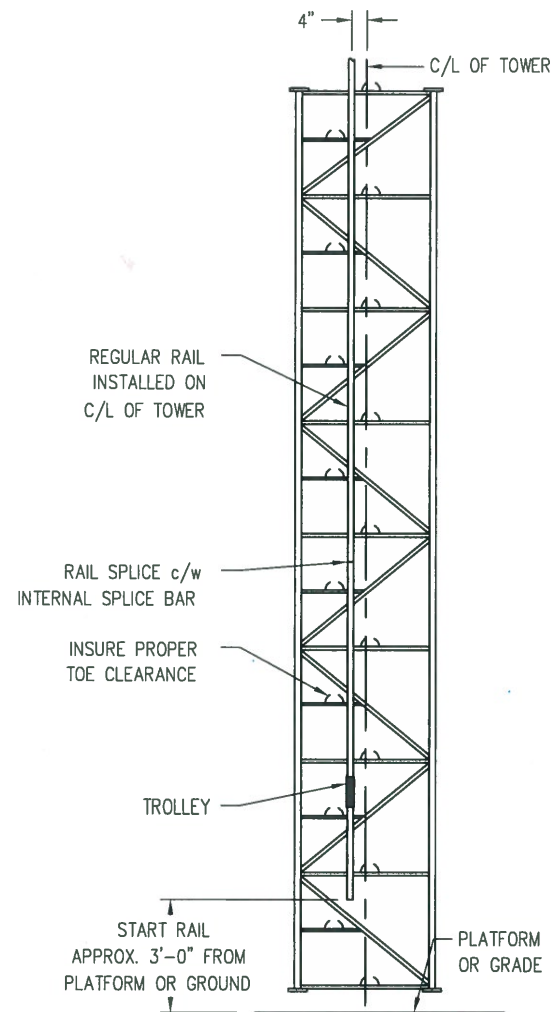
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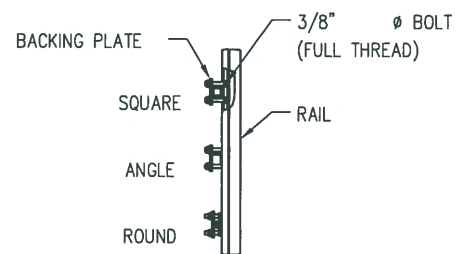
INCHES 1 0 1 2 3 4 5 6 7 8 9 10 CENTIMETRES

REV.	DATE	BY	CHK	APP
0	15JUL15	PJS	smf	FT

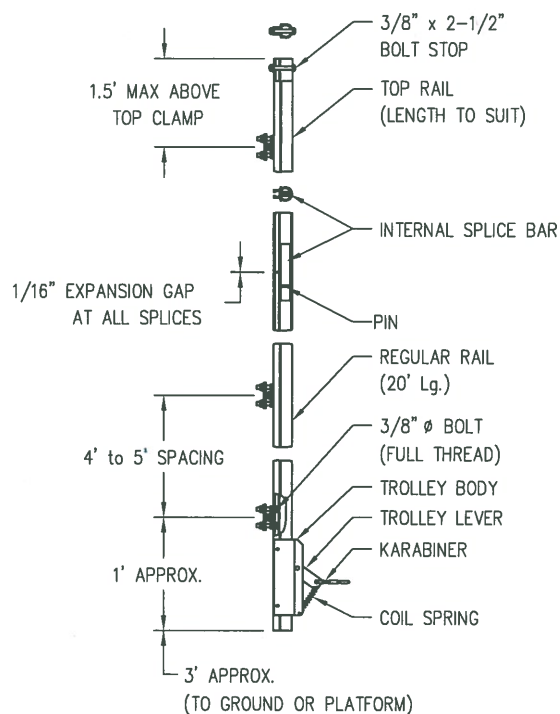
DESCRIPTION:
ISSUED FOR CONSTRUCTION



TYP. INSTALLATION DETAIL FOR AW TOWERS WITH MID PANEL STEP HORIZONTALS



STANDARD RAIL ATTACHMENT



TYP. ATTACHMENT NOTES AND DETAILS

START BOTTOM RAIL APPROXIMATELY 3 FEET FROM BOTTOM OF LADDER OR BASE STARTING POSITION. LOCATE RAIL AT CENTER OF LADDER OR CLIMBWAY TO ALLOW BALANCED FOOT PLACEMENT.

ATTACH THE FIRST CLAMP ONE FOOT FROM THE LOWER END OF THE BOTTOM RAIL. CLAMP EVERY 4' TO 5' AS RUNGS PERMIT. TOP CLAMP SHOULD BE ON TOP RUNG OF LADDER. RAIL CAN SAFELY EXTEND MAX. 1.5 FEET ABOVE LADDER TOP TO PERMIT SAFE ARRIVAL AT LADDER TOP. FOR BEST RESULTS, PLACE CLAMP BOLTS IN CONTINUOUS T-SLOTS AND FINGER TIGHTEN AT APPROXIMATE LOCATIONS BEFORE RAISING RAIL SECTIONS INTO PLACE. PUT SPLICE SECTIONS RAIL TOPS AND TIGHTEN TO ALLOW POSITIVE JOINING OF IN RAILS. RAISE AND SECURE THE FIRST RAIL BEFORE CONTINUING WITH INTERMEDIATE RAILS. LEAVE 1/16" OPEN AT EACH JOINT FOR EXPANSION AND CONTRACTION. INSTALL TOP RAIL WITH BOLT STOP (3/8" X 2-1/2") THROUGH TOP HOLE. THE 3/8" BOLTS SUPPLIED ARE SUITABLE FOR MOST APPLICATIONS.

IMPORTANT NOTE: LADDER TYPE, RUNG SIZE, RUNG SPACING AND ALL INFORMATION PERTINENT TO THE INSTALLATION SHOULD BE GIVEN WHEN ORDERING EACH KIT. INSTALLATION RECOMMENDATIONS AND SPECIAL BRACKETS FOR NON-TYPICAL INSTALLATIONS AVAILABLE BY CONTACTING TRYLON MANUFACTURING CO. LTD.

TO CLIMB: SLIDE TROLLEY ONTO RAIL. ATTACH SAFETY HARNESS SNUGLY AROUND WAIST WITH 'D' RING AT FRONT. REFER TO MANUFACTURERS INSTRUCTIONS FOR PROPER BODY FIT ON THE HARNESS. ATTACH TROLLEY SNAP TO 'D' RING ON HARNESS. LEAN SLIGHTLY AWAY FROM RAIL TO DISENGAGE PAWL AND CLIMB OR DESCEND IN LIKE MANNER. RELEASING TENSION AUTOMATICALLY ENGAGES LOCK.

CONFORMS TO CSA Z259.2.1-98

INFORMATION COPIED FROM TRYLON SAFETY RAIL INSTALLATION DRAWING NO. 000001.957.0002



60 South Field Drive
Elmira, Ontario Canada N3B 2Z2
Tel.: (519) 669-4144 Fax: (519) 669-1980

DIMENSIONS ARE IN: mm

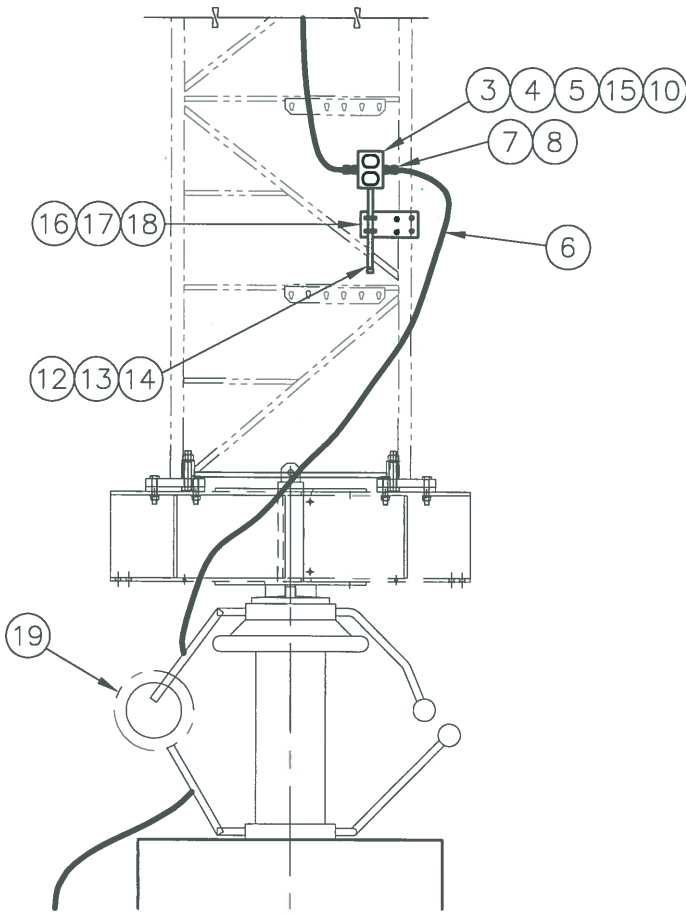
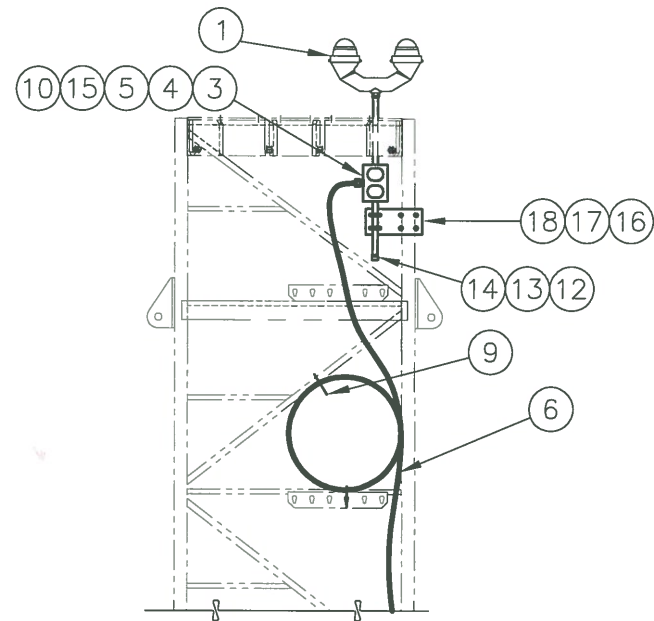
SAFETY RAIL INSTALLATION

35.3m 90AWG TOWER
CANADIAN COAST GUARD
HOPEDALE HILL
LABRADOR

WESTOWER PROJECT No. 50-00176 SCALE: NTS

DRAWN BY: PJS CHECKED BY: smf APPROVED BY: FT DATE: 15JUL15

DRAWING NO: 500176A05 SHEET 15



LIGHTING & UTILITY CIRCUIT ELEVATION

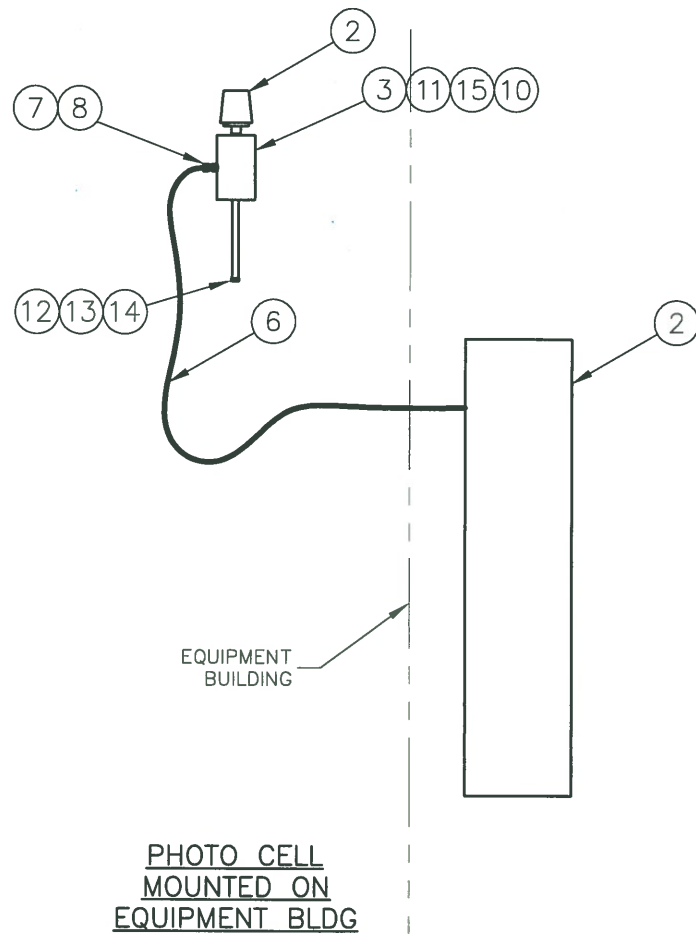


PHOTO CELL MOUNTED ON EQUIPMENT BLDG

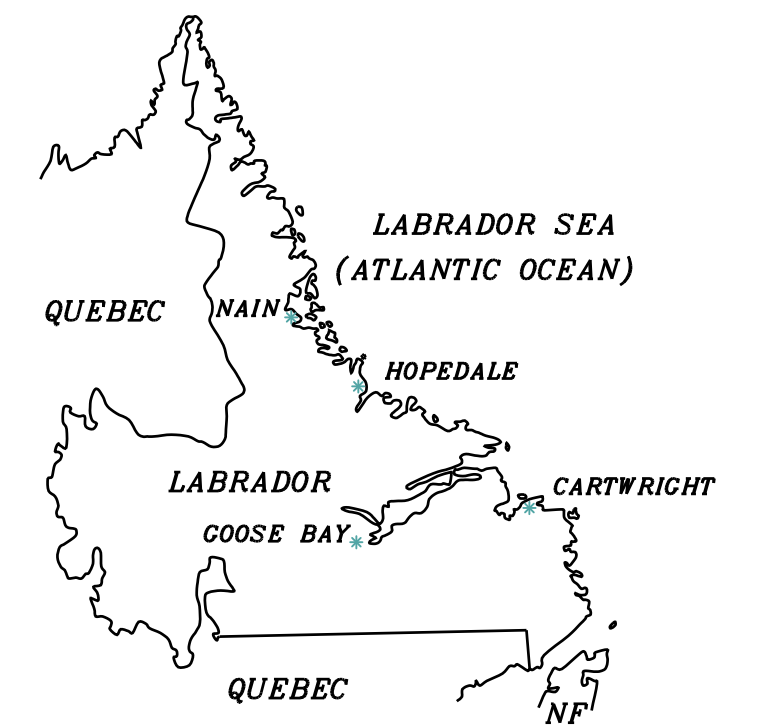
HARDWARE			
ITEM	QTY	PART No.	DESCRIPTION
1	1	860-6R01-002	DOUBLE OBSTRUCTION LIGHT RED
2	1	LC-A0-LED-N4	CONTROLLER c/w PHOTO CELL
3	3	FDX-2	JUNCTION BOX (4 WAY - 3/4" HUBS)
4	2	GF15LA	GFI RECEPTACLE
5	2	FSK-1VDR	GFCI RECEPTACLE HINGED COVER & GASKET
6	55m		3#14 TECK 90 CABLE RW90
7	8	TMC2050075A	1/2" CABLE CONNECTOR (3/4" OD CABLE)
8	8	RB75-50A	REDUCER 3/4" TO 1/2"
9	40	TF7X	TY-WRAPS BLACK 13"
10	3	PLG-75RA	CLOSE-UP PLUG (3/4" ALUMINUM)
11	1	FS-100g	COVER, GASKET & MOUNTING SCREWS
12	4		3/4" x 10" NIPPLE
13	3		3/4" PLASTIC BUSHING
14	3		FILTER SCREEN WASHER
15	12	333	MARRETTE CONNECTORS
16	3	LT032	FB 9.5x102x230
17	6	U12-8	1/2" x 2-5/8" U-BOLT ASSEMBLY
18	6	U38-3	3/8" x 1-1/2" U-BOLT ASSEMBLY
19	1	A-07D1	TRANSFORMER

REV.	DATE	BY	CHK	APP
0	15JUL15	PJS	SM7	MGE
DESCRIPTION:				
ISSUED FOR CONSTRUCTION				
<p>60 South Field Drive Elmira, Ontario Canada N3B 2Z2 Tel.: (519) 669-4144 Fax: (519) 669-1980</p>				
DIMENSIONS ARE IN: mm				
TOWER LIGHTING				
35.3m 90AWG TOWER CANADIAN COAST GUARD HOPEDALE HILL LABRADOR				
WESTOWER PROJECT No.		SCALE:		
50-00176		NTS		
DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:	
PJS	SM7	MGE	15JUL15	
DRAWING NO:				SHEET
500176A08				1

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Appendix C

Site Survey



KEY LOCATION PLAN

N.E. PARROTT SURVEYS LTD.
NEWFOUNDLAND LAND SURVEYORS
GOOSE BAY, NEWFOUDLAND AND LABRADOR
896-5019

NEIL E. PARROTT N.L.S., C.L.S.

LEGEND

Guy Wire	→ CW
Chain Link Fence	- X - X - X -
Proposed Cable	—

NOTE:
ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO
PROVINCIAL CONTROL MONUMENT BOYD...No 4109020
M.T.M. ZONE 4, NAD 83.
RTK DATA COLLECTED ON OCTOBER 8, 2015

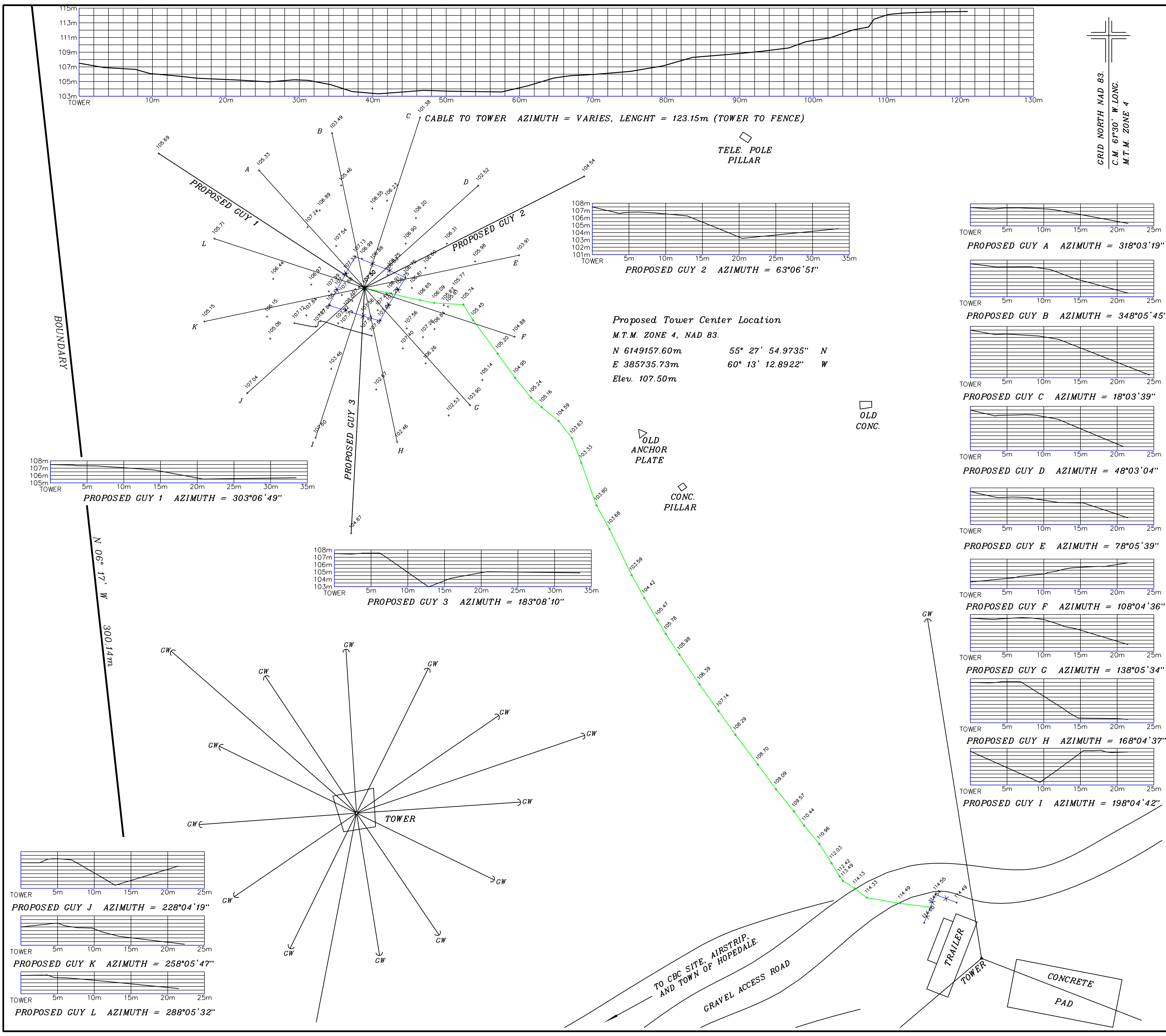
PLAN SHOWING TOPOGRAPHIC SURVEY
FOR PROPOSED TOWER SITE
HOPEDALE HILL (MF -RX)
HOPEDALE, NEWFOUNDLAND AND LABRADOR

no.	eco no.	revision	date	by	approved

PROPOSED TOWER - SITE SURVEY 2015

CANADIAN COAST GUARD COMMUNICATIONS SITE
HOPEDALE

date - date	drown - dessine	checked - verifie	designed - dessine par	approved
OCT. 27, 2015	R.G.S.			
scale - echelle	project no. - projet no.	drawing no. - no du dessin	sheet	feuille
1:250	15-305	A1	1 of 1	1 of 1



Appendix D

Existing MF Tower Information



T5441 Hopedale Hill

MCTS	Latitude	Longitude	AoR Travel Time	AoR Distance (km)	AoR	Cell Coverage
Goose Bay	55° 27' 52.7"	60° 13' 13.001	N/A	2216	St. John's	<input type="checkbox"/>
Fence Install Year	Linear Meters of Fence	Site Access	Helipad	Fenced Compound		
		helicopter, 4x4, v	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Server Link			Google Maps Link			
\\dcNlnewNA01b\MCIEngineering\MCTS\T5441-Hopedale Hill			http://maps.google.com/maps?q=55+27+52.7003+N,+60+13+13.000			
Year Established	Property Area (Ha)	Ownership	Year Surveyed	Surveyor	Site #	
1961	7.634	NavCan	2005	N.E. Parrott Surveyor	N A 00285	

MF Receive Tower



Tower	T5441.202
Height (m)	30.5
Latitude	55° 27' 52.7" N
Longitude	60° 13' 13" W
Base HASL (m)	106.3
Year Installed	1986
Year Refurbished	
Year Last Inspected	2008
Design	
Structure Type	Guyed
Connection Type	All Weld
Cross Section	Triangular
Manufacturer	Leblanc & Royal
MCTS Phone #	(709) 896-2252
Inspection Zone	1
Owner	CCG
RPIS Comp #	57396
Tower Fenced	<input checked="" type="checkbox"/>
Drawings Available	<input type="checkbox"/>

Appendix E

Site Photos







Appendix F

List of CCG Supplied Materials



Customer FISHERIES AND OCEANS Site: F6839-155503
 Location Hopedale Hill, Hopedale, NL
 Tower Type 90AWG 35.3m

Project Number
50-00176

Date 02-Jul-15
 Detailed by: PJS
 "All Materials 'HDG' unless note

Shipping BOM

Section 1 Below Grade

Page: 1
 Page Section Revision: 1

Tower Foundation

TOWER BASE

Material

#	QTY	PartNo	Rev.	Description	Suggested Supplier	Field Supplied	Line Total	OR	Finish WH	SP	Package	
1	4 pc	AR028F	1	PL13x76 x 76mm 1-3/16 HOLE WASHER	Westower	<input type="checkbox"/>	5.3					
2	1 pc	BP011	0	PL 38 x 337 x 337mm BASE PLATE	Westower	<input type="checkbox"/>	72.8					
SubTotal:							78.1 lbs					

Hardware

#	QTY	PartNo	Rev.	Description	Suggested Supplier	Field Supplied	Line Total	OR	Finish WH	SP	Package	
1	4 pc	1108034		1-1/8" x 3'-0" B7 ROD ASSEMBLY (4N,3FW) - HDG	Fastenal	<input type="checkbox"/>	84.4					
2	1 pc	1406001		LIGHTING TRANSFORMER (0.7 kVA, 115/230V)	Austin A-07D1	<input type="checkbox"/>	70.6					
3	1 pc	1406014		BASE INSULATOR (GUYED) (90720 kg MAX. DOWNLOAD)	Austin A-0729	<input type="checkbox"/>	366.0					
4	1 pc	1406072		AUSTIN INSULATOR TRANSFORMER MOUNT KIT (A-07D1 TO A-4722-B)	Austin	<input type="checkbox"/>	0.0					
SubTotal:							521.0 lbs					

Rev. 1 29-Jul-15 Hardware ADDED TRANSFORMER AND MOUNT KIT - PJS



Customer FISHERIES AND OCEANS Site:F6839-155503
 Location Hopedale Hill, Hopedale, NL
 Tower Type 90AWG 35.3m

Project Number
50-00176

Date 02-Jul-15
 Detailed by: PJS
 "All Materials 'HDG' unless note

Shipping BOM

Section 1 Below Grade

Page: 4
 Page Section Revision: 1

Below Grade Grounding

Hardware						Field	Line	Finish			Package	
#	QTY	PartNo	Rev.	Description	Suggested Supplier	Supplied	Total	OR	WH	SP		
1	1530 pc	1106148		#10-12 x 2" PAN HEAD, SQUARE SELF TAPPING SCREW	Kerry PCT-10X2-Z	<input checked="" type="checkbox"/>	0.0					
2	1530 pc	1106225		6/6 Nylon P Clip - 1/8" ID White (pkg of 100)(3/16" fastener not included)	SPAENAU 086-660	<input type="checkbox"/>	0.0					
3	10 m	1201009		4/0 BARE STRANDED COPPER WIRE	Anixter	<input checked="" type="checkbox"/>	0.0					
4	45 m	1201017		#2 INSULATED STRANDED COPPER WIRE	Anixter	<input checked="" type="checkbox"/>	0.0					
5	14 m	1201019		300mm x 1.23mm COPPER STRAP	Anixter	<input checked="" type="checkbox"/>	0.0					
6	4545 m	1201025		#10 SOFT DRAWN SOLID COPPER WIRE	Anixter	<input checked="" type="checkbox"/>	0.0					
7	105 pc	1202004		COPPER CLAD GROUND ROD 19 DIA x 3000mm	Anixter	<input checked="" type="checkbox"/>	0.0					
8	20 pc	215-0001	3	SH16 3/8" DIA. CABLE CLAMP ALUM #42	Astron 42	<input type="checkbox"/>	0.0					
9	6 pc	215-0003	0	SH16 5/8" DIA. CABLE CLAMP ALUM #45	Astron 45	<input type="checkbox"/>	0.0					
SubTotal:								0.0 lbs				

Rev. 1 06-Aug-15 Hardware (1530) 1106148 CHANGED TO 'FIELD SUPPLY' - PJS



Customer FISHERIES AND OCEANS Site:F6839-155503
 Location Hopedale Hill, Hopedale, NL
 Tower Type 90AWG 35.3m

Project Number
50-00176

Date 02-Jul-15
 Detailed by: PJS
 "All Materials 'HDG' unless note

Shipping BOM

Section 2 Above Grade

Page: 1
 Page Section Revision: 0

Above Grade Grounding

Hardware

#	QTY	PartNo	Rev.	Description	Suggested Supplier	Field Supplied	Line Total	Finish OR	WH	SP	Package
1	15 pc	1103012		5/16" x 1-1/2" SILICONE BRONZE BOLT (1N,1LW)	Kerry	<input type="checkbox"/>	0.0				
2	12 pc	402-0410		UNIVERSAL OKLIP BURNDY 5/16" to 7/16"	Westburne Ruddy KVSU26	<input type="checkbox"/>					
3	6 pc	402-0415	0	UNIVERSAL OKLIP BURNDY 3/4" to 3/4"	Westburne Ruddy KVSU34	<input type="checkbox"/>	0.0				
4	15 pc	1206003		4/0-2 STR. 5/16" BOLT SIZE ILSCO	Kerry SLU-225	<input type="checkbox"/>	0.0				
SubTotal:								0.0 lbs			



Customer FISHERIES AND OCEANS Site: F6839-155503
 Location Hopedale Hill, Hopedale, NL
 Tower Type 90AWG 35.3m

Project Number
50-00176

Date 02-Jul-15
 Detailed by: PJS
 "All Materials 'HDG' unless note

Shipping BOM

Section 3 Tower

Page: 1
 Page Section Revision: 3

Tower Material		Tower Material				Field	Line	Finish			Package	
#	QTY	PartNo	Rev.	Description	Suggested Supplier	Supplied	Total	OR	WH	SP		
1	1 pc	500176C	1	90AWG 3m TOP SECTION x 3000mm MF CURTAIN WELDMENT	Westower	<input type="checkbox"/>	800.4			1		
2	4 pc	90G00AA	3	90AWG 6m REG SECTION (51 LEG, 25 DIAG) (18) Tx-lines total	Westower	<input type="checkbox"/>	4,135.7			4		
3	1 pc	90G33AA	1	90AWG 6m GUY SECTION (51 LEG, 25 DIAG) (18) Tx-lines total	Westower	<input type="checkbox"/>	1,076.9			1		
4	3 pc	90MF002	0	CURTAIN TOWER BRACE x 1355mm WELDMENT (12 CURTAINS-5/8" SHACKLE)	Westower	<input type="checkbox"/>	273.2					
5	3 pc	90MF003	0	L 76x51x4.8 x 581mm STARBASE BRACE	Westower	<input type="checkbox"/>	17.9					
6	3 pc	90MF006	0	L 76x51x9.5 x 480mm TOP CURTAIN BRACE	Westower	<input type="checkbox"/>	27.8					
7	3 pc	90SB003	0	PL172x32 x 235mm ADAPTER PLATE	Westower	<input type="checkbox"/>	66.2					
8	3 pc	90SB004	2	PL172x19 x 235mm MOUNTING PLATE	Westower	<input type="checkbox"/>	39.0					
9	1 pc	90SB005	1	STAR BASE FOR CURTAIN GUYS x 1464mm	Westower	<input type="checkbox"/>	506.5					
SubTotal:								6,943.5 lbs				

Hardware						Field	Line	Finish			Package	
#	QTY	PartNo	Rev.	Description	Suggested Supplier	Supplied	Total	OR	WH	SP		
1	7 pc	202-0104	0	5/8" x 2" A325 BOLT ASSEMBLY - HDG (B20)	Kerry B20	<input type="checkbox"/>	2.9					
2	6 pc	202-0108	0	5/8" x 3" A325 BOLT ASSEMBLY - HDG (B30)	Kerry B30	<input type="checkbox"/>	3.0					
3	12 pc	202-0203	0	3/4" x 2-1/4" A325 BOLT ASSEMBLY - HDG (C21)	Kerry C21	<input type="checkbox"/>	7.9					
4	12 pc	202-0209	0	3/4" x 3-3/4" A325 BOLT ASSEMBLY - HDG (C33)	Kerry C33	<input type="checkbox"/>	10.2					
5	3 pc	202-0408	0	1" x 4-3/4" A325 BOLT ASSEMBLY - HDG (E43)	Kerry E43	<input type="checkbox"/>	5.6					
6	3 pc	202-0413	0	1" x 6" A325 BOLT ASSEMBLY - HDG (E60)	Kerry E60	<input type="checkbox"/>	6.5					
7	9 pc	1102109		1" x 6-1/2" A325 BOLT ASSEMBLY - HDG (E62)	Kerry E62	<input type="checkbox"/>	20.5					
8	3 pc	1102110		1" x 7" A325 BOLT ASSEMBLY - HDG (E70)	Kerry E70	<input type="checkbox"/>	7.2					
9	18 pc	210-0006	0	1" F-436 FLATWASHER - HDG	Kerry	<input type="checkbox"/>	1.7					
SubTotal:								65.4 lbs				

- Rev. 1 20-Jul-15 Hardware ADDED HARDWARE - PJS
- Rev. 1 20-Jul-15 Material 500176C REPLACES 90G33EA; ADDED 90SB005, 90SB003, 90SB004, 90MF002, 90MF003, 90MF006 - PJS
- Rev. 2 05-Aug-15 Material Added paint quantities - PJS
- Rev. 3 06-Aug-15 Material PART 500176C WAS REVISION 0 - PJS



Customer FISHERIES AND OCEANS Site:F6839-155503
 Location Hopedale Hill, Hopedale, NL
 Tower Type 90AWG 35.3m

Project Number
50-00176

Date 02-Jul-15
 Detailed by: PJS
 "All Materials 'HDG' unless note

Shipping BOM

Section 4 Guys

Page: 1

Page Section Revision: 0

Guy Material Tower Guy Material

Hardware											
#	QTY	PartNo	Rev.	Description	Suggested Supplier	Field Supplied	Line Total	Finish OR	WH	SP	Package
1	15 m	702-0103		3/4" 1x19 BRIDGE STRAND - GALVANIZED	Unalloy	<input checked="" type="checkbox"/>	58.0				
2	313 m	702-0103	0	3/4" 1x19 BRIDGE STRAND - GALVANIZED	Unalloy	<input type="checkbox"/>	1,211.2				
3	12 pc	706-0006	0	7/8" SCREW PIN SHACKLE G-209 CROSBY	Unalloy 1018516	<input type="checkbox"/>	43.4				
4	12 pc	705-0008	0	7/8" HEAVY THIMBLE G-414 CROSBY	Unalloy 1037791	<input type="checkbox"/>	21.3				
5	6 pc	703-0262	0	1-1/4x24 JAW & EYE TURNBUCKLE HG-227 CROSBY	Unalloy 1032297	<input type="checkbox"/>	171.0				
6	18 pc	707-0007	0	5/8" WIRE ROPE CLIP G-450 CROSBY	Unalloy 1010177	<input type="checkbox"/>	19.8				
7	96 pc	704-0006	0	BIG GRIP DEAD END (BRIDGE) - GALV. STEEL - 3/4"	PLP BGMS-3690	<input type="checkbox"/>	1,268.0				
8	42 pc	1406076		GUY INSULATOR OPEN-END TYPE AOA-65 7/8" CABLE	Austin AOA-65	<input type="checkbox"/>	0.0				
9	27 pc	1408002		YELLOW GUY GUARD (44 ID x 2000 LG) IPEX	Westburne Ruddy 25504-Y	<input type="checkbox"/>	75.6				
10	54 pc	1602001		BLACK NYLON TY-RAP, 13" LONG	Home Hardware TF7X	<input type="checkbox"/>	0.0				
11	96 pc	1602003		HOSE CLAMPS HAS 8 (up to 1")	Kerry HAS-8	<input type="checkbox"/>	0.0				
SubTotal:							2,868.4 lbs				



Customer FISHERIES AND OCEANS Site:F6839-155503
 Location Hopedale Hill, Hopedale, NL
 Tower Type 90AWG 35.3m

Project Number
50-00176

Date 02-Jul-15
 Detailed by: PJS
 "All Materials 'HDG' unless note

Shipping BOM

Section 4 Guys

Page: 2

Page Section Revision: 0

Guy Material **Curtain Guy Material**

Hardware						Field	Line	Finish			Package	
#	QTY	PartNo	Rev.	Description	Suggested Supplier	Supplied	Total	OR	WH	SP		
1	280 m	1403003		3/8" 1x7 EHS GUY STRAND - GALVANIZED	Unalloy	<input type="checkbox"/>	250.7					
2	12 pc	706-0004	0	5/8" SCREW PIN SHACKLE G-209 CROSBY	Unalloy 1018473	<input type="checkbox"/>	16.4					
3	24 pc	705-0003	0	7/16" HEAVY THIMBLE G-414 CROSBY	Unalloy 1037693	<input type="checkbox"/>	8.3					
4	12 pc	703-0231	0	3/4x18 JAW & EYE TURNBUCKLE HG-227 CROSBY	Unalloy 1032117	<input type="checkbox"/>	84.0					
5	36 pc	707-0002	0	5/16" WIRE ROPE CLIP G-450 CROSBY	Unalloy 1010079	<input type="checkbox"/>	10.1					
6	120 pc	704-0103	0	BIG GRIP DEAD END - GALV. STEEL - 3/8"	PLP BG-2147	<input type="checkbox"/>	158.4					
7	12 pc	1405030		ANGLE SUSPENSION CLAMPS HUBBELL POWER SYSTEMS	Westburne Ruddy MS46N	<input type="checkbox"/>	25.9					
8	48 pc	1406073		STANDARD ANSI INSULATOR	Austin ST54-3	<input type="checkbox"/>	137.6					
9	120 pc	1602003		HOSE CLAMPS HAS 8 (up to 1")	Kerry HAS-8	<input type="checkbox"/>	0.0					
SubTotal:								691.4 lbs				



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 "All Materials 'HDG' unless note

Shipping BOM

Section 4 Guys

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Guy Material Curtain Antenna Material

Hardware						Field	Line	Finish			Package	
#	QTY	PartNo	Rev.	Description	Suggested Supplier	Supplied	Total	OR	WH	SP		
1	30 pc	203-0206	0	3/8" x 2" UNC GR.5 BOLT - HDG (1N,1LW)	Kerry	<input type="checkbox"/>	2.2					
2	48 m	1201022		#2 BARE STRANDED COPPER WIRE	Anixter	<input type="checkbox"/>	0.0					
3	24 pc	1205003		1-HOLE HYLUG #2 WIRE, 3/8" STUD BURNDY	Westburne Ruddy YAL2CT38	<input type="checkbox"/>	0.0					
4	24 pc	402-0410	0	UNIVERSAL OKLIP BURNDY 5/16" to 7/16"	Westburne Ruddy KVSU26	<input type="checkbox"/>	0.0					
5	13 pc	402-0712	0	BURNDY QPX-2828 CONNECTOR BURNDY	Westburne Ruddy QPX2828	<input type="checkbox"/>	0.0					
6	560 m	1403003		3/8" 1x7 EHS GUY STRAND - GALVANIZED	Unalloy	<input type="checkbox"/>	501.3					
7	24 pc	706-0004	0	5/8" SCREW PIN SHACKLE G-209 CROSBY	Unalloy 1018473	<input type="checkbox"/>	32.9					
8	24 pc	705-0003	0	7/16" HEAVY THIMBLE G-414 CROSBY	Unalloy 1037693	<input type="checkbox"/>	8.3					
9	12 pc	703-0231	0	3/4x18 JAW & EYE TURNBUCKLE HG-227 CROSBY	Unalloy 1032117	<input type="checkbox"/>	84.0					
10	36 pc	707-0002	0	5/16" WIRE ROPE CLIP G-450 CROSBY	Unalloy 1010079	<input type="checkbox"/>	10.1					
11	24 pc	704-0103	0	BIG GRIP DEAD END - GALV. STEEL - 3/8"	PLP BG-2147	<input type="checkbox"/>	31.7					
12	24 pc	1602003		HOSE CLAMPS HAS 8 (up to 1")	Kerry HAS-8	<input type="checkbox"/>	0.0					
SubTotal:								670.5 lbs				



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Section 5 Ladder

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Anti-Climb ANTI-CLIMB

Material						Field	Line	Finish			Package	
#	QTY	PartNo	Rev.	Description	Suggested Supplier	Supplied	Total	OR	WH	SP		
1	4 pc	90AC001A	1	L 89x89x6.4 x 158mm ANTI-CLIMB LEG MOUNT	Westower	<input type="checkbox"/>	12.3					
2	4 pc	90AC001B	1	L 89x89x6.4 x 250mm ANTI-CLIMB LEG MOUNT	Westower	<input type="checkbox"/>	20.3					
3	4 pc	90AC001C	1	L 89x89x6.4 x 250mm ANTI-CLIMB LEG MOUNT	Westower	<input type="checkbox"/>	20.3					
4	16 pc	90AC001D	1	L 64x64x6.4 x 80mm ANTI-CLIMB LEG MOUNT	Westower	<input type="checkbox"/>	17.6					
5	8 pc	90AC001E	0	L 76x76x6.4 x 60mm ANTI-CLIMB MOUNT ANGLE	Westower	<input type="checkbox"/>	8.8					
6	24 pc	S4A	3	PL6.4x51 x 51mm 9/16" HOLE PLATE SPACER	Westower S4A	<input type="checkbox"/>	15.9					
7	1 pc	90AC001F	0	L 76x76x6.4 x 2535mm ANTI-CLIMB LOCKING ANGLE	Westower	<input type="checkbox"/>	39.5					
8	1 pc	90AC001G	3	SR13 x 2446mm ANTI-CLIMB LOCKING BENT WELD'T	Westower	<input type="checkbox"/>	7.5					
9	6 pc	90AC001H	1	1-1/2"-10 ExPANDED MESH 1220x1220 ANTI-CLIMB MESH	Westower	<input type="checkbox"/>	191.8					
10	1 pc	90AC001J	4	1x3/16 W19-4 BAR 668x772 ANTI-CLIMB GRATING	Westower	<input type="checkbox"/>	27.8					
11	1 pc	90AC001K	2	FLAT BAR WELDMENT ANTI-CLIMB DOOR	Westower	<input type="checkbox"/>	74.5					
SubTotal:								436.4 lbs				

Hardware						Field	Line	Finish			Package	
#	QTY	PartNo	Rev.	Description	Suggested Supplier	Supplied	Total	OR	WH	SP		
1	22 pc	202-0001	0	1/2" x 1-1/2" A325 BOLT ASSEMBLY - HDG (A12)	Kerry A12	<input type="checkbox"/>	4.7					
2	34 pc	1102003		1/2" x 1-3/4" A325 BOLT ASSEMBLY - HDG (A13)	Kerry A13	<input type="checkbox"/>	7.7					
3	9 pc	210-0002	0	1/2" F-436 FLATWASHER - HDG	Kerry	<input type="checkbox"/>	0.2					
4	4 pc	J12-3	8	1/2" x 3" Lg J-BOLT ASSEMBLY (1N,1LW,1FW) (dwg HW001)	Martin J12-3	<input type="checkbox"/>	1.6					
5	24 pc	U12-7	6	1/2" x 2-3/8" c/c U-BOLT ASSEMBLY (2N,2LW,2FW) (dwg HW005) U12-7	Martin U12-7	<input type="checkbox"/>	12.1					
SubTotal:								26.2 lbs				



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Section 5 Ladder

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Safety Rail Safety Rail

Hardware

#	QTY	PartNo	Rev.	Description	Suggested Supplier	Field Supplied	Line Total	Finish OR	WH	SP	Package	
1	1 pc	1501023		120' SAFETY RAIL KIT (NO TROLLEY) c/w SPLICES, MOUNTING HARDWARE, TOP STOP BOLT	Trylon 4.97.0400.120	<input type="checkbox"/>	130.0					
2	2 pc	1504554		TRYLON TSF COUGAR MAX TROLLEY	Trylon 4.957.0037.001	<input type="checkbox"/>	0.0					
SubTotal:							130.0 lbs					

Rev. 1 05-Aug-15 Hardware Added (2) trolley - PJS



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Section 8 Lighting

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Lighting Material

Lighting Material

Material						Field	Line	Finish			Package	
#	QTY	PartNo	Rev.	Description	Suggested Supplier	Supplied	Total	OR	WH	SP		
1	3 pc	LT032	1	FB9.5x102 x 230mm	Westower	<input type="checkbox"/>	11.9					
SubTotal:								11.9 lbs				

Hardware						Field	Line	Finish			Package	
#	QTY	PartNo	Rev.	Description	Suggested Supplier	Supplied	Total	OR	WH	SP		
1	8 pc	303-0093	0	1/2" TMC2050075A CONNECTOR APPLETON (0.5-0.76 CABLE)(was TMC5076)	Westburne Ruddy TMC2050075A	<input type="checkbox"/>	0.0					
2	1 pc	1305011		SINGLE GANG VAPORTIGHT COVER APPLETON	Westburne Ruddy FS-100g	<input type="checkbox"/>	0.6					
3	3 pc	302-0702	0	PLG CLOSE-UP PLUG (3/4" ALUM) APPLETON	Westburne Ruddy PLG-75RA	<input type="checkbox"/>	0.0					
4	8 pc	302-0501	0	THD. REDUCER (3/4" TO 1/2") APPLETON	Westburne Ruddy RB75-50A	<input type="checkbox"/>	0.5					
5	3 pc	1305032		3/4" PLASTIC BUSHING APPLETON	Westburne Ruddy PB-200-D	<input type="checkbox"/>	0.0					
6	2 pc	1305035		GFI RECEPTACLE APPLETON	Westburne Ruddy GF15LA	<input type="checkbox"/>	0.0					
7	3 pc	1305054		FD SINGLE GANG BOX (4 PORT - 3/4" HUB) APPLETON x 1mm	Appleton FDX-2	<input type="checkbox"/>	0.0					
8	2 pc	1305055		GFI RECEPTACLE HINGED COVER (VERTICAL MOUNT)	Appleton FSK-1VDR	<input type="checkbox"/>	0.0					
9	55 m	301-0307	0	3#14 TECK 90 CABLE	Anixter	<input type="checkbox"/>	0.0					
10	3 pc	1307003		FILTER SCREEN WASHER	Westburne Ruddy	<input type="checkbox"/>	0.0					
11	12 pc	1307004		MARRETTE #333	Westburne Ruddy	<input type="checkbox"/>	0.0					
12	4 pc	1307008		3/4" x 10" PIPE NIPPLE CONDUIT PIPE THREAD EACH END	Westburne Ruddy	<input type="checkbox"/>	0.0					
13	1 pc	1308014		LIGHTING CONTROLLER WITH ALARM AND PHOTOCCELL	RVA LC-AO-LED-NEMA4	<input type="checkbox"/>	0.0					
14	1 pc	1308023		OBSTRUCTION LIGHT, DOUBLE, RED 3/4 BOTTOM HUB	RVA 860-6R01-002	<input type="checkbox"/>	0.0					
15	40 pc	1602001		BLACK NYLON TY-RAP, 13" LONG	Home Hardware TF7X	<input type="checkbox"/>	0.0					
16	6 pc	U12-8	6	1/2" x 2-5/8" c/c U-BOLT ASSEMBLY (2N,2LW,2FW) (dwg HW005) U12-8	Martin U12-8	<input type="checkbox"/>	2.6					
17	6 pc	U38-3	7	3/8" x 1-1/2" c/c U-BOLT ASSEMBLY (2N,2LW,2FW) (dwg HW006) U38-3	Martin U38-3	<input type="checkbox"/>	1.5					
SubTotal:								5.2 lbs				

Rev. 1 11-Aug-15 Hardware REMOVED LIGHTING TRANSFORMER A-07S1 - PJS



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Section 10 Name Plate

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Name Plate NAME PLATE SECTION 10 FOR NEW TOWER

Material

#	QTY	PartNo	Rev.	Description	Suggested Supplier	Field Supplied	Line Total	Finish OR	WH	SP	Package
1	1 pc	NP013	0	SH16x610 x 610mm CLIMBER WARNING SIGN	Westower	<input type="checkbox"/>	0.0				
2	1 pc	GG019	0	ALUM SH 30x76x76 ANODIZED BLANK TAG SEE REPORT	Westower	<input type="checkbox"/>	0.0				
3	1 pkg	9900IN	0	INSTALLATION PACKAGE	Westower	<input type="checkbox"/>	0.0				
SubTotal:								0.0 lbs			

Hardware

#	QTY	PartNo	Rev.	Description	Suggested Supplier	Field Supplied	Line Total	Finish OR	WH	SP	Package
1	2 pc	1106165		#6 x 3/8" "U" DRIVE SCREW	Fastenal	<input type="checkbox"/>	0.0				
2	4 pc	215-0003	3	SH16 15/32" DIA. CABLE CLAMP ALUM #43	Astron 43	<input type="checkbox"/>					
3	5 pc	203-0203		3/8" x 1-1/4" UNC GR.5 BOLT - HDG (1N,1LW)	Kerry	<input type="checkbox"/>	0.2				
SubTotal:								0.2 lbs			