SPECIFICATIONS FOR

ELECTRICAL INSTALLATION

LITTLE GRINDSTONE &
GOODMAN'S LANDING, MB

Department of Fisheries & Oceans
Small Craft Harbours Branch
Winnipeg, Manitoba

April 2016

TABLE OF CONTENTS

Section	Page
01 11 05 – General Instructions	3
01 35 29 – Health and Safety Requirements	8
01 35 43 – Environmental Procedures	10
01 45 00 – Quality Control	12
01 77 00 – Closeout Procedures	14
02 41 13 – Selective Site Demolition	16
05 14 12 – Aluminum Pedestal Fabrication	18
05 55 00 - Metal Fabrications	21
26 05 00 – Common Work Results For Electrical	24
26 05 02 – General Electrical Work	29
26 56 19 – Roadway Lighting	32
31 23 33 – Excavating, Trenching And Backfilling	34

01 11 05 – GENERAL INSTRUCTIONS

Part 1 General

1.1 DESCRIPTION OF WORK

.1 The work under this contract covers electrical installation work at Little Grindstone & Goodman's Landing, MB as follows:

.1 Little Grindstone:

- .1 Supply and install aluminum electrical pedestals.
- .2 Supply and install 200 amp electrical panel c/w safety switch, mast, meter and backboard.
- .3 Supply and install 100 amp weatherproof electrical sub-panel c/w backboard.
- .4 Supply and install TECK 90 CU cable including strut channels and clamps.
- .5 Supply and install light poles.
- .6 Supply and install service pole.
- .7 Supply and install floodlights c/w polycarbon vandal shield and photocells.
- .8 Trenching for cable installation.
- .9 Supply and install granular surface.

.2 Goodman's Landing:

- .1 Supply and install 200 amp weatherproof electrical panel c/w safety switch, mast, meter and backboard.
- .2 Supply and install Teck 90 CU cable.
- .3 Supply and install light poles.
- .4 Supply and install service pole.
- .5 Supply and install flood lights c/w polycarbon vandal shield and photocells.
- .6 Trenching for cable installation.
- .7 Supply and install granular surface.

.2 The work to be done by the Contractor under this Contract shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, insurance, and all things necessary for and incidental to the satisfactory performance and completion of all work as specified herein. All work to be done in accordance with details shown on the accompanying plans as specified herein.

1.2 DEFINITIONS

.1 The word "provide" means "supply and install".

.2 For purposes of this contract, "Departmental Representative", "Architect/Engineer" and "Engineer" shall have the same meaning.

1.3 WORK SCHEDULE

.1 Provide within 10 working days after Contract award, schedule showing anticipated progress stages and final completion of work within time period required by contract documents.

.2 Interim reviews of work progress based on work schedule will be conducted as decided by Engineer and schedule updated by Contractor in conjunction with and to approval of Engineer.

.3 Work under this contract is to be performed in a timely manner. Commence planning and preparatory work immediately upon receipt of official notification of acceptance of Contract and schedule the work so that the project will be complete by **August 31st, 2016.**

.4 **Access to the sites and offloading structures shall be maintained for access by commercial fishers until completion of work.**

.5 Work sequence:

.1 Before work is undertaken, ensure that all materials and trades required are available to finish work in as short a period as possible.

.2 No area to be renovated shall be placed out of service until it is confirmed that there shall be no need to stop the work waiting for receipt of materials, equipment or labour.

1.4 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

1.5 FEES, PERMITS AND CERTIFICATES

.1 Provide authorities having jurisdiction with information requested.

.2 Pay fees and obtain certificates and work permits required.

.3 Furnish certificates and permits when requested.

1.6 MEASUREMENT FOR PAYMENT

.1 Notify Engineer sufficiently in advance of operations to permit required measurements for payment.

.2 Submit to Engineer, at least 14 days before Information for first application for payment, cost breakdown, Progress Payment in detail as directed by Engineer, for parts of Work, aggregating total amount of Contract Price, so as to facilitate evaluation of applications for payment. After approval by Engineer, cost breakdown will be used as basis for progress payments.

1.7 INTERPRETATION OF DOCUMENTS

.1 In the event of discrepancies or conflicts in interpreting the Plans (drawings) and Specifications, Specifications take precedence over drawings bound with specifications.

.2 Drawings and specifications are complementary. When work is shown or mentioned on the drawings but is not indicated in the specifications, or when work is indicated in the specifications but is not shown or mentioned on the drawings, it shall nevertheless be included in the Contract.

.3 The sub-division of the Specification into sections, identified by title and number, is for convenience only and does not modify the singularity of the document, nor does it operate to make or imply that the Engineer is an arbiter to establish the limits or extent of contract between Contractor and Subcontractors or to determine the limits or extents of work that may be decided by trade unions or contractors' organizations. Extras to the Contract will not be considered on the grounds of differences in interpretation of the Specification and/or Drawings as to which trade performs the work.

1.8 CONTRACTOR'S USE OF SITE

.1 Co-ordinate use of premises under direction of the Engineer.

.2 Do not unreasonably encumber the site with materials and equipment.

.3 Do not use the existing concrete launch ramp to access the work site.

.4 Assume full responsibility for protection and safekeeping of products under this Contract.

.5 Move stored products or equipment which interfere with operations of Engineer or other harbour users.

.6 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

.7 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.

.8 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Engineer.

.9 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.9 EXISTING SERVICES

.1 Notify Engineer and utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, give Engineer 72 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions.

.3 Establish location and extent of service lines in area of work before starting Work. Notify Engineer of findings.

.4 Submit schedule to and obtain approval from Engineer for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.

.5 Where unknown services are encountered, immediately advise Engineer and confirm findings in writing.

.6 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

.7 Record locations of maintained, re-routed and abandoned service lines.

1.10 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each document as follows:

.1 Contract Drawings.
.2 Specifications.
.3 Addenda.
.4 Reviewed Shop Drawings.
.5 Change Orders.
.6 Other Modifications to Contract.
.7 Copy of Approved Work Schedule.
.8 Health and Safety Plan and Other Safety Related Documents.
.9 Other documents as specified.

1.11 CODES AND STANDARDS

.1 Perform work in accordance with National Building Code of Canada (NBC) and any other code of provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.

.2 Work to meet or exceed requirements of contract documents, specified standards, codes and referenced documents.

1.12 PROJECT MEETINGS

.1 Engineer will arrange project meetings and assume responsibility for setting times and recording and distributing minutes.

1.13 SETTING OUT OF WORK

.1 Engineer will provide only those survey control points and set such stakes as necessary to define general location, alignment and elevations of work. Give engineer reasonable notice of requirements for such control points and stakes.

.2 Set grades and lay out work in detail from control points and grades established by Engineer.

.3 Provide devices needed to lay out and construct work.

.4 Supply such devices needed to lay out and construct work.

.5 Supply such devices as straight edges and templates required to facilitate Engineer's inspection of work.

.6 Supply stakes and other survey markers required for laying out work.

1.14 ADDITIONAL DRAWINGS

.1 Engineer may furnish additional drawings for clarification. These additional drawings have same meaning and intent as if they were included with plans referred to in Contract documents.

.2 When additional drawings and instructions are required by the Contractor, provide reasonable notice in writing to the Engineer in advance of the date they are required.

1.15 EXAMINATION

.1 Before submitting tender, examine existing conditions and determine conditions affecting work.

.2 Obtain all information which may be necessary for proper execution of Contract.

1.16 SITE INSPECTION

.1 The submission of a tender is deemed to be a confirmation of the fact that the Tenderer has inspected the site and is fully conversant with all the conditions under which the work is to be carried out.

1.17 MATERIAL AND EQUIPMENT

.1 Use new products unless otherwise specified.

.2 Deliver and store material and equipment to manufacturer's instructions with manufacturer's labels and seals intact.

.3 When material or equipment specified by standard performance specifications, upon request of Departmental Representative, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

1.18 SECURING WORK AREA

.1 Secure the work areas in each stage in an approved manner. This includes fencing or barricades to prevent public access to any areas where construction activities occur and construction materials are stored.

1.19 DRAWINGS

.1 The following drawings are to be read in conjunction with this specification:

.1 E-1 of 2 Plan and Construction Details – Little Grindstone, MB

.2 E-2 of 2 Plan and Construction Details – Goodman's Landing, MB

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

01 35 29 – HEALTH AND SAFETY REQUIREMENTS

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 No separate measurement will be for work of this section.

1.2 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

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

.1 Material Safety Data Sheets (MSDS).

.3 Province of Manitoba

.1 The Workers Compensation Act RSM 1987 - Updated 2006.

1.3 SUBMITTALS

.1 Submit site-specific Health and Safety Plan: Within 10 days after date of Notice to Proceed and prior to commencement of Work.

.2 Submit copies of incident and accident reports to Engineer.

.3 Engineer will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor after receipt of plan. Revise plan as appropriate and resubmit plan to Engineer within 5 days after receipt of comments from Engineer.

.4 Engineer's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

1.4 SAFETY ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

1.5 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Observe and enforce construction safety measures required by Canadian Construction Safety Code, Provincial Government, Worker's Compensation Board and municipal statutes and authorities.

.3 In the event of a conflict between any provisions of above authorities having the most stringent provision will apply.

1.6 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.7 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative verbally and in writing.

1.8 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or Departmental Representative.

.2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

01 35 43 – ENVIRONMENTAL PROCEDURES

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 No separate measurement will be for work of this section. Work is incidental to the project cost.

1.2 FIRES

.1 Fires and burning of rubbish on site not permitted.

1.3 DRAINAGE

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

.2 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.

.3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.4 WORK ADJACENT TO WATERWAYS

.1 Every effort will be made to minimize the introduction of sediment to the lake and creek during work activities. Any sediment tracked onto the ice during the project must be cleaned off at the end of the project. This includes any ice that needs to be removed from the shoreline to accommodate stabilization works. All material used for shoreline stabilization will be clean and free of silt and clay.

.2 Do not use waterway beds for borrow material.

.3 Waterways to be free of excavated fill, waste material and debris.

.4 Design and construct temporary crossings to minimize erosion to waterways.

.5 Do not skid logs or construction materials across waterways.

.6 Avoid damage to shoreline.

.7 Supply, install, and maintain approved erosion control blankets to unprotected slopes until revegetation is established.

.8 Any impacts below ordinary high water mark that are not shown on the site plan are not permitted without written approval from the Engineer. Up to 30 days may be required for approval.

.9 Reclaim and restore disturbed areas to previous or better condition.

1.5 POLLUTION CONTROL

.1 Control emissions from equipment and plant to local authorities' emission requirements.

.2 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.

.3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

.4 Locate temporary fuel storage 100 metres from shore and comply with Provincial Environmental Legislation.

.5 Refueling, servicing, or cleaning of equipment on ice or within 100 metres of shore is prohibited. Contractor to ensure all equipment operating on project is free of external fluid leaks, grease, oil, and mud.

.6 Contractor to contain all oil leaks from equipment working adjacent to waterways.

.7 No maintenance of vehicles or equipment in construction areas.

.8 Use drip pans to catch leaking oil from compressors, pumps, etc.

1.6 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials on site unless approved by Engineer.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways. Hazardous wastes including fuels, oils and lubricants to be disposed of by a licensed hazardous waste carrier/handler in accordance with Provincial Environment Legislation.

.3 Collect all rubbish and waste material and dispose of in accordance with applicable governing authorities.

.4 Do not allow debris of any type to enter waterway.

1.7 PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties.

.2 Avoid disturbance of topsoil and vegetation unless otherwise specified. Contractor is responsible to restore all impacted areas to original state.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

01 45 00 – QUALITY CONTROL

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 No separate measurement will be for work of this section.

1.2 INSPECTION

.1 Allow Engineer access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Engineer.

.3 Engineer will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

1.3 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies may be engaged by Engineer for purpose of inspecting and/or testing portions of Work.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Engineer at no cost to. Pay costs for retesting and reinspection.

1.4 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.5 PROCEDURES

.1 Notify Engineer in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.6 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Engineer as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of Engineer it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Engineer.

1.7 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

1.8 MILL TESTS

.1 Submit mill test certificates as requested.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

01 77 00 – CLOSEOUT PROCEDURES

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 No separate measurement will be for work of this section.

1.2 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

.2 Contractor's Inspection: Contractor to conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.3 Final Inspection:

.1 When completion tasks are done, request final inspection of Work by Engineer.

.2 When Work incomplete according to Engineer, complete outstanding items and request re-inspection.

.4 Final Payment:

.1 When Engineer considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

.2 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.3 FINAL CLEANING

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

1.4 RECORD DRAWINGS

.1 Maintain project "as-built" record drawings and record accurately significant deviations from Contract documents caused by site conditions and changes ordered by Engineer.

.2 Mark "as-built" changes in red coloured ink.

.3 Record the following information:

.1 Field changes of dimension and detail.

.2 Changes made by Change Order or Field Order.

.4 At completion of project and prior to final inspection, neatly transfer "as-built" notations to second set and submit both sets to Engineer.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

02 41 13 – SELECTIVE SITE DEMOLITION

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 Mobilization and demobilization is to be included in lump sum costs for project.

.2 Removal and disposal of existing electrical connections to be included in lump sum costs for project.

1.2 DELIVERY, STORAGE AND HANDLING

.1 Storage and Protection.

.1 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Engineer and at no cost to Engineer.

.2 Remove and store materials to be salvaged, in manner to prevent damage.

.3 Store and protect in accordance with requirements for maximum preservation of material.

.4 Handle salvaged materials as new materials.

1.3 SITE CONDITIONS

.1 Site Environmental Requirements:

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

.2 Ensure proper disposal procedures are maintained throughout the project.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 PREPARATION

.1 Inspect site and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.

.2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.

.3 Notify and obtain approval of utility companies before starting demolition.

3.2 REMOVAL OPERATIONS

.1 Remove items as indicated.

.2 Do not disturb items designated to remain in place.

3.3 REMOVAL FROM SITE

.1 Dispose of materials not designated for salvage or re-use in work, off-site at location acceptable to Engineer.

3.4 RESTORATION

.1 Remove debris, trim surfaces and leave work site clean, upon completion of Work.

.2 Reinstate areas and existing works outside areas of demolition to conditions that existed prior to commencement of work.

END OF SECTION

05 14 12 – ALUMINUM PEDESTAL FABRICATION

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 Electrical pedestals will be paid for per unit supplied and installed and shall include any fasteners, support brackets, wiring, outlets, connections or hardware required.

1.2 REFERENCES

.1 Aluminum Association (AA)

.2 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.

.3 ASTM International

.4 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.5 ASTM A325-09, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.

.6 ASTM A325M-09, Standard Specification for Structural Bolts, Steel, Heat Treated, 830 MPa Minimum Tensile Strength.

.7 ASTM A490-09, Standard Specification for Structural Bolts Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength.

.8 ASTM A490M-09a, Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3 for Structural Steel Joints.

.9 ASTM B209M-07, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.10 ASTM B210M-05, Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes.

.11 ASTM B211M-03, Standard Specification for Aluminum and Aluminum Alloy Bar, Rod and Wire.

.12 ASTM F593-02(2008), Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.

.13 CSA International

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

.15 CAN/CSA-S157/S157.1-05, Strength Design in Aluminum/Commentary on CAN/CSA-S157, Strength Design in Aluminum.

.16 CSA W47.2-M1987(R2008), Certification of Companies for Fusion Welding of Aluminum.

.17 CSA W59.2-M1991(R2008), Welded Aluminum Construction.

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

.19 Material Safety Data Sheets (MSDS).

.20 Master Painters Institute (MPI)

.21 MPI - EXT 5.5D, Bituminous Finish.

1.3 SUBMITTALS

.1 Product Data:

.2 Submit manufacturer's instructions, printed product literature and data sheets for structural aluminum and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 QUALITY ASSURANCE

.1 Submit 1 copy of mill test reports showing chemical and physical properties and other details of aluminum to be incorporated into work, at least 4 weeks prior to fabrication of structural aluminum. Mill test reports to be certified by metallurgists qualified to practice in Province of Manitoba, Canada.

.2 Fabricator of structural aluminum to provide an affidavit stating that materials and products used in fabrication conform to applicable material and products standards called for by design drawings and specifications.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect structural aluminum from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Aluminum bar, rod, wire: to ASTM B211M.

.2 Aluminum and Aluminum-Alloy Extruded Bar, Rods, Wire, Shapes, and Tubes: to ASTM B221M.

.3 Aluminum sheet or plate: to ASTM B209M.

.4 Aluminum drawn tubes: to ASTM B210M.

.5 Aluminum bolts and rivets: to ASTM B316M.

.6 Aluminum welding wire: to AWS - A5.10/A5.10M.

.7 Stainless steel bolts: to ASTM F593.

.8 Steel bolts: to ASTM A307.

.9 Bituminous paint: MPI - EXT 5.5D, without thinner.

.10 Galvanizing: hot dip galvanize steel bolts to CAN/CSA-G164, minimum zinc coating of 600 g/m^2.

2.2 FABRICATION

.1 Fabricate to CAN/CSA-S157 and in accordance with approved shop drawings.

2.3 FINISHES

.1 Finish: plain mill as indicated on drawings.

Part 3 Execution

3.1 INSTALLATION

.1 Do structural aluminum work: to CAN/CSA-S157.

.2 Do welding: to CSA W59.2.

3.2 CONNECTION TO EXISTING WORK

.1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to Departmental Representative for direction before starting fabrication.

3.3 ERECTION

.1 Erect structural aluminum as indicated and to CAN/CSA-S157 and approved erection drawings.

.2 No field cutting or altering structural members.

3.4 JOINT SEALING AND PAINTING

.1 Surface preparation of aluminum in contact with or embedded in dissimilar materials: to CAN/CSA-S157. Treat locations as if there is moisture present.

.2 Paint to CAN/CSA-S157.

3.5 PROTECTION

.1 Protect installed products and components from damage during construction.

END OF SECTION

05 55 00 - METAL FABRICATIONS

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 No separate measurement will be for work of this section.

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

.2 ASTM A53/A53M-02, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.3 ASTM A269-[02], Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

.4 ASTM A307-[02], Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.5 Canadian General Standards Board (CGSB)

.6 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.

.7 CAN/CGSB-1.181-92, Ready-Mixed, Organic Zinc-Rich Coating.

.8 Canadian Standards Association (CSA International)

.9 CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel.

.1 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.

.10 CAN/CSA-S16.1-01, Limit States Design of Steel Structures.

.11 CSA W48-01, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).

.12 CSA W59-1989(R2001),Welded Steel Construction (Metal Arc Welding) (Imperial Version).

.13 The Environmental Choice Program

.14 CCD-047a-98, Paints, Surface Coatings.

.15 CCD-048-98, Surface Coatings - Recycled Water-borne.

Part 2 Products

2.1 MATERIALS

.1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 350W.

.2 Steel pipe: to ASTM A53/A53M standard weight, painted finish.

.3 Welding materials: to CSA W59.

.4 Welding electrodes: to CSA W48 Series.

.5 Bolts and anchor bolts: to ASTM A307.

.6 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 FABRICATION

.1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.2 Where possible, fit and shop assemble work, ready for erection.

.3 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 FINISHES

.1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m^2 to CAN/CSA-G164.

.2 Chromium plating: chrome on steel with plating sequence of 0.009 mm thickness of copper 0.010 mm thickness of nickel and 0.0025 mm thickness of chromium.

.3 Shop coat primer: to CAN/CGSB-1.40.

.4 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

2.4 ISOLATION COATING

.1 Isolate aluminum from following components, by means of bituminous paint:

.2 Dissimilar metals except stainless steel, zinc, or white bronze of small area.

.3 Concrete, mortar and masonry.

.4 Wood.

2.5 SHOP PAINTING

.1 Apply one shop coat of primer to metal items unless stated otherwise on drawings, with exception of galvanized or concrete encased items.

.2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 degrees C.

.3 Clean surfaces to be field welded; do not paint.

Part 3 Execution

3.1 ERECTION

.1 Do welding work in accordance with CSA W59 unless specified otherwise.

.2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.3 Provide suitable means of anchorage acceptable to Engineer such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.4 Exposed fastening devices to match finish and be compatible with material through which they pass.

.5 Provide components for building by other sections in accordance with shop drawings and schedule.

.6 Make field connections with bolts to CAN/CSA-S16.1, or weld.

.7 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.

.8 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.2 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 Electrical panel, sub-panel, safety switch, mast, meter and backboard will be paid for per unit supplied and installed and shall include any fasteners, support brackets, wiring, connections or hardware required.

.2 TECK 90 CU cable will be paid for per linear metre supplied and installed and shall include any trenching, strut channels and hardware required.

.3 Costs for clearing of trees and shrubs required for installation of service lines, teck cable, overhead lines and poles are the contractors' responsibility and shall be included in the lump sum costs for the project.

.4 Costs for electrical hook up and application to obtain inspection and work permit from the local authority having jurisdiction are the Contractor's responsibility and shall be included in the lump sum cost for the project.

1.2 RELATED SECTIONS

.1 26 05 02 General Electrical Work

1.3 REFERENCES

.1 Canadian Standards Association (CSA International)

.2 CSA C22.1-12, Canadian Electrical Code, Part 1 (22nd Edition), Safety Standard for Electrical Installations.

.3 CAN3-C235-83(R2000), Preferred Voltage Levels for AC Systems, 0 to 50,000 V.

.4 Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)

.1 IEEE SP1122-2000, The Authoritative Dictionary of IEEE Standards Terms, 7th Edition.

1.4 DEFINITIONS

.1 Electrical and electronic terms: unless otherwise specified or indicated, terms used in these specifications, and on drawings, are those defined by IEEE SP1122.

1.5 DESIGN REQUIREMENTS

.1 Operating voltages: to CAN3-C235.

.2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.

.3 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

.1 Identify on wiring diagrams circuit terminals and indicate internal wiring for each item of equipment and interconnection between each item of equipment.

.1 Indicate of drawings clearances for operation, maintenance, and replacement of operating equipment devices.

.2 Submit as required number of copies of drawings and product data to inspection authorities.

.3 If changes are required, notify Project Technician of these changes before they are made.

.2 Quality Control: in accordance with Section 01 45 00 – Quality Control.

.1 Provide CSA certified equipment and material.

.2 Submit test results of installed electrical systems and instrumentation.

.3 Permits and fees: in accordance with General Conditions of contract.

.4 Submit certificate of acceptance from authority having jurisdiction upon completion of Work to Project Technician.

1.7 QUALITY ASSURANCE

.1 Quality Assurance: in accordance with Section 01 45 00 – Quality Control.

.2 Qualifications: electrical Work to be carried out by qualified, licensed electricians who hold valid Master Electrical Contractor license or apprentices in accordance with authorities having jurisdiction as per the conditions of Provincial Act respecting manpower vocational training and qualification.

.1 Employees registered in provincial apprentices program: permitted, under direct supervision of qualified licensed electrician, to perform specific tasks.

.2 Permitted activities: determined based on training level attained and demonstration of ability to perform specific duties.

.3 Site Meetings: schedule site visits, to review Work, at stages listed.

.1 After delivery and storage of products, and when preparatory work is complete but before installation begins.

.2 Upon completion of Work, after cleaning is carried out.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Material Delivery Schedule: provide Project Technician with schedule within 2 weeks after award of Contract.

1.9 SYSTEM STARTUP

.1 Instruct Project Technician and Harbour Authority Representative in operation, care and maintenance of systems, system equipment and components.

Part 2 Products

2.1 MATERIALS AND EQUIPMENT

.1 Provide material and equipment in accordance with Section 01 11 05 - General Instructions.

.2 Material and equipment to be CSA certified.

2.2 WARNING SIGNS

.1 Warning Signs: in accordance with requirements of authority having jurisdiction.

.2 Decal signs, minimum size 175 x 250 mm.

2.3 WIRING TERMINATIONS

.1 Ensure lugs, terminals, screws used for termination of wiring are suitable for either copper or aluminum conductors.

2.4 EQUIPMENT IDENTIFICATION

.1 Identify electrical equipment with nameplates as follows:

.1 Nameplates: lamicoid 3 mm thick plastic engraving sheet, white face, black core, lettering accurately aligned and engraved into core mechanically attached with self-tapping screws.

.2 Sizes as follows:

NAMEPLATE SIZES

Size 1	10 x 50 mm	1 line	3 mm high letters
Size 2	12 x 70 mm	1 line	5 mm high letters
Size 3	12 x 70 mm	2 lines	3 mm high letters
Size 4	20 x 90 mm	1 line	8 mm high letters
Size 5	20 x 90 mm	2 lines	5 mm high letters
Size 6	25 x 100 mm	1 line	12 mm high letters
Size 7	25 x 100 mm	2 lines	6 mm high letters

.2 Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics

.3 Disconnects, starters and contactors: indicate equipment being controlled and voltage.

.4 Terminal cabinets and pull boxes: indicate system and voltage.

2.5 WIRING IDENTIFICATION

.1 Identify wiring with permanent indelible identifying markings, coloured plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.

.2 Maintain phase sequence and colour coding throughout.

.3 Colour coding: to CSA C22.1.

2.6 FINISHES

.1 Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two coats of finish enamel.

Part 3 Execution

3.1 INSTALLATION

.1 Do complete installation in accordance with CSA C22.1 except where specified otherwise.

.2 Do overhead and underground systems in accordance with CSA C22.3 No.1 except where specified otherwise.

3.2 NAMEPLATES AND LABELS

.1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.

3.3 CONDUIT AND CABLE INSTALLATION

.1 Install cables, conduits in trenches and on wharf as indicated.

3.4 LOCATION OF OUTLETS

.1 Locate outlets as indicated on drawings.

.2 Change location of outlets at no extra cost or credit, providing distance does not exceed 3000 mm, and information is given before installation.

3.5 MOUNTING HEIGHTS

.1 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.

3.6 CO-ORDINATION OF PROTECTIVE DEVICES

.1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings.

3.7 FIELD QUALITY CONTROL

.1 Conduct following tests:

- .1 Power distribution system including phasing, voltage, grounding and load balancing.
- .2 Circuits originating from branch distribution panels.
- .3 Lighting and its control.
- .4 Insulation resistance testing:
  - .1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.
  - .2 Check resistance to ground before energizing.

.2 Carry out tests in presence of Project Technician.

.3 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.

3.8 CLEANING

.1 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.

.2 Clean and prime exposed non-galvanized hangers, racks and fastenings to prevent rusting.

END OF SECTION

26 05 02 – GENERAL ELECTRICAL WORK

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 No measurement will be made under this Section. Include costs for electrical work in section 26 05 00 – Common Work Results for Electrical.

1.2 GENERAL REQUIREMENTS

.1 Conform to Section 26 05 00 – Common Work Results for Electrical as applicable.

1.3 REFERENCES

.1 CAN/CSA C22.2 No. 18-98 - Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware

.2 CSA C22.2 No. 131 - TECK 90 Cables

.3 CSA C22.2 No. 211.2 - Rigid PVC Conduit and Fittings

.4 CSA C22.2 No. 211.0

.5 CSA C22.2 No.45 - Rigid Galvanized Steel Conduit and Fittings

1.4 SUBMITTALS

.1 Submit shop drawings for following equipment;

- .1 Clamp support for cables
- .2 Equipment support bases
- .3 Wires and Cables
- .4 Junction boxes
- .5 Conduits

Part 2 Products

2.1 MATERIALS AND EQUIPMENT

.1 Clamp and Accessories

- .1 Cable clamp to be one-piece heavy-duty construction complete. Field verify existing cable diameter sizes to determine sizes of clamps required.

2.2 WIRES AND CABLES, AND ACCESSORIES

.1 Not Used

2.3 RACEWAY AND BOXES

.1 Rigid PVC Conduit and Fittings: Rigid PVC Conduit to CSA C22.2 No. 211.2, CSA C22.2 No. 211.0, UL651, NEMA TC2. Fittings and boxes to CSA C22.2 No. 85, UL514B- UL514C.

.2 Steel Conduits and Fittings: Rigid galvanized heavy wall, corrosion resistant, CSA C22.2 No.45. Use where exposed installation is subject to mechanical injury, as required by Code and specified herein, or indicated on Drawings.

.3 Rigid PVC Junction Box: Flush mount rigid PVC Junction Box, Type p1-7 as per OPSD 2300.010 or approved equal.

.4 Cable pulling accessories: Fish cord, polypropylene.

.5 Fastening and accessories: in accordance with specifications.

Part 3 Execution

3.1 INSTALLATION

.1 Clamp and Accessories

.1 All hardware required for installation of cables to be stainless steel.

.2 Install cables in a manner to minimize sag between clamp support points.

.3 All hardware required for the installation to be stainless steel.

3.2 EQUIPMENT SUPPORT BASES

.1 Design equipment support bases for the relocated electrical equipment based on equipment dimensions and weight. Proposed location of the equipment to be verified by Engineer prior to manufacture of support bases.

3.3 WIRES AND CABLES AND ACCESSORIES

.1 Install wires and cables in accordance with Canadian Electrical Code requirements and other regulatory bodies having jurisdiction.

.2 Terminate conductors using approved wire terminating materials and accessories.

3.4 RACEWAY AND BOXES

.1 Install raceway, boxes, and necessary fittings, including supports, fasteners, and accessories, in compliance with current practices and standards by regulatory bodies having jurisdiction.

.2 Route exposed cables neatly, parallel to and perpendicular to adjoining surfaces, and equally-spaced when in groups with other cables.

.3 Use junction boxes to suit type of raceway and installation for general wiring in accordance with standards and practices by regulatory bodies and authorities having jurisdiction.

.4 Thoroughly clean raceway and boxes, clear of obstructions, prior to wire and cable pulling.

3.5 TESTING AND INSPECTION

.1 Conduct visual inspection at times for signs of physical damages or defects prior to and after installation.

.2 Test installed equipment and wiring for grounds and short-circuit upon completion of work. See also Section 26 05 00 – Common Work Results For Electrical for additional instructions.

END OF SECTION

26 56 19 – ROADWAY LIGHTING

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

.1 Timber light poles will be paid for per unit supplied and installed including any excavation and hardware required as per Manitoba Hydro standards.

.2 Timber service poles will be paid for per unit supplied and installed including any excavation and hardware required as per Manitoba Hydro standards.

.3 Hubbell FXL LED Floodlights will be paid for per unit supplied and installed and shall include any fasteners, support brackets, wiring, photocell, connections or hardware required.

1.2 RELATED REQUIREMENTS

.1 Section 26 05 00 Common Work Results For Electrical

1.3 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA C22.2No.206-M1987, Lighting Poles.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit product data in accordance with Section 01 11 05 GENERAL INSTRUCTIONS.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate facilities.

.2 Do not dispose of preservative treated wood through incineration.

.3 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.

.4 Dispose of treated wood, end pieces, wood scraps and sawdust at sanitary landfill approved by Provincial Authority.

.5 Dispose of unused wood preservative material at official hazardous material collections site approved by Provincial Authority.

.6 Do not dispose of unused preservative material into sewer system, into streams, lakes, onto ground or in any other location where they will pose health or environmental hazard.

Part 2 Products

2.1 WOOD POLES

.1 Wood poles: to CAN/CSA-O15, class 6 Cedar and:

.1 Length: 9.14 m

.2 Minimum diameter: to Manitoba Hydro standards

.3 Pressure treated: to CSA O15

or

.2 Wood poles: to CAN/CSA-O15, class 6 Pine and:

.1 Length: 9.14 m

.2 Minimum diameter: to Manitoba Hydro Standards

.3 Pressure treated: to CSA O15

2.2 LUMINAIRE MOUNTING BRACKETS

.1 Mounting brackets aluminum for specified luminaires:

.1 Single brackets as indicated.

.2 Post top Mounted

2.3 LUMINAIRES

.1 Luminaire with cast aluminum weatherproof housing and:

.1 Lamp type: LED, wattage: 200

.2 Optical assembly:

.1 For LED lamps:

.1 Housing: Die-cast aluminum

.2 Refractor: Tempered glass

.3 Gasket: Neoprene seal between refractor and housing.

.4 Suitable for -35 degrees Celsius.

.3 Factory wired

.4 An acceptable product is Hubbell Outdoor Lighting FXL LED Floodlight or equivalent.

Part 3 Execution

3.1 INSTALLATION

.1 Install poles true and plumb, complete with brackets in accordance with manufacturer's instructions.

.2 Install luminaires on pole and install lamps.

.3 Install photocell.

.4 Check luminaire orientation, level and tilt.

.5 Connect luminaire to lighting circuit. Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.

END OF SECTION

31 23 33 – EXCAVATING, TRENCHING AND BACKFILLING

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

1. 20mm minus granular surface required for backfilling of trenches will be paid for per tonne supplied and installed.

Part 2 Products

2.1 MATERIALS

.1 Granular backfill material: A-base 20mm minus

.1 Crushed, pit run or screened stone, gravel or sand.

.2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117.Sieve sizes to CAN/CGSB-8.1.

.3 The gradation and physical requirements to be as follows:

Sieve Designation	% Passing
20 mm	100
10 mm	35-85
5 mm	15-65
0.08 mm	0-12

Part 3 Execution

3.1 EXCAVATION

.1 Excavate to lines, grades, elevations and dimensions as directed by Engineer.

.2 Excavation must not interfere with bearing capacity of adjacent foundations.

.3 Keep excavated and stockpiled materials safe distance away from edge of excavation as directed by Engineer.

.4 Restrict vehicle operations directly adjacent to open trenches.

.5 Dispose of surplus and unsuitable excavated material off site.

.6 Do not obstruct flow of surface drainage or natural watercourses.

.7 Notify Engineer when bottom of excavation is reached.

.8 Obtain Engineer approval of completed excavation.

3.2 BACKFILLING

.1 Do not commence backfilling until areas of work have been inspected and approved by Engineer.

.2 Ensure no frozen material is placed.

.3 Place material only on clean unfrozen surface, free from snow or ice.

.4 Place granular materials using methods which do not lead to segregation or degradation.

.5 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Engineer may authorize thicker lifts (layers) if specified compaction can be achieved.

.6 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.7 Remove and replace portion of layer in which material has become segregated during spreading.

3.3 COMPACTION

.1 Compaction equipment to be capable of obtaining required material densities.

.2 Compact to density of not less than 98% corrected maximum dry density.

.3 Shape and roll alternately to obtain smooth, even and uniformly compacted base.

.4 Apply water as necessary during compaction to obtain specified density.

.5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Engineer.

.6 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.4 SITE TOLERANCES

.1 Finished granular surface to be within 10 mm of elevation as indicated but not uniformly high or low.

3.5 PROTECTION

.1 Maintain finished granular surface in condition conforming to this section until granular surfacing is accepted by Engineer.

END OF SECTION