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| <u>1 General</u> | .1 | This Section covers items common to Sections of Division 26. This section supplements requirements of Division 1. |
| <u>2 General
Description of Work</u> | .1 | Work under this Contract covers all labour, materials, and equipment to Rehabilitate Runway 10-28 and construction of a new Aprons, and other related works at Eureka Airport, Eureka, Nunavut. Removal of existing edge and threshold end lights, cables and pullpits, and installing new edge lights, cables and pulpits. The scope of work includes, but is not limited to:
.1 Remove Runway pull pits, edge and threshod end lights, primary and secondary cables, stakes, isolating transformers and all related accessories inclunding grounding.
.2 Suply and install new runway and aprons pull pits, edge and threshold end lights complete with primary, secondary, and grounding cables, isolating transformers and all related accessories.
.3 Supplying and installing temporary threshold lights for each phase,including any temporary power lines, and removing same after completion of each phase.
.4 Power lock down for each phase of the work.
.5 Other miscellaneous works. |
| <u>3 Codes and
Standards</u> | .1 | Do complete installation in accordance with CSA C22.1-12 or the most current edition and to authorities having jurisdiction. |
| | .2 | Health Canada / Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS) |
| <u>4 Care, Operation
and Start-up</u> | .1 | Instruct Departmental Representative and operating personnel in the operation, care and maintenance of equipment. |
| | .2 | Arrange and pay for services of manufacturer's factory service Departmental Representative to supervise start-up of installation, check, adjust, align, balance and calibrate components. |
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- 4 Care, Operation and Start-up (Cont'd) .3 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with all aspects of its care and operation.
- 5 Voltage Ratings .1 Operating voltages: to CAN3-C235.
- 6 Submittals and Inspection .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Electrical Inspection Department necessary number of drawings and specifications for examination and approval prior to commencement of work.
- .3 Pay associated fees.
- .4 Departmental Representative will provide drawings and specifications required by Electrical Inspection Department at no cost.
- .5 Shop drawings:
.1 Submit drawings stamped and signed by professional engineer registered or licensed in Territory of Nunavut, Canada.
.2 Submit 6 copies of 600 x 600 mm minimum size drawings and product data to authority having jurisdiction.
.3 If changes are required, notify Departmental Representative of these changes before they are made.
- .6 Quality Control:
.1 Provide CSA certified equipment and material.
.2 Where CSA certified equipment and material is not available, submit such equipment and material to authority having jurisdiction for special approval before delivery to site.
.3 Submit test results of installed electrical systems and instrumentation.
.4 Permits and fees: in accordance with General Conditions of contract.
.5 Submit, upon completion of Work, load balance report as described in PART 3 - Load Balance.
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| <u>6 Submittals and Inspection (Cont'd)</u> | .6 | Quality Control:(Cont'd)
.6 Submit certificate of acceptance from authority having jurisdiction upon completion of Work to Departmental Representative. |
| | .7 | Manufacturer's Field Reports: submit to Engineer manufacturer's written report, within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL. |
| <u>7 Finishes</u> | .1 | Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint. |
| | .2 | Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two coats of finish enamel.
.1 Paint outdoor electrical equipment "equipment green" finish.
.2 Paint indoor switchgear and distribution enclosures light gray to EEMAC 2Y-1. |
| | .3 | Clean and prime exposed non-galvanized hangers, racks and fastenings to prevent rusting. |
| <u>8 Wiring Identification</u> | .1 | Identify wiring with permanent indelible identifying markings, either numbered or 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 code: to CSA C22.1. |
| <u>9 Wiring Terminations</u> | .1 | Ensure lugs, terminals, screws used for termination of wiring are suitable for copper conductors. |
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| <u>10 Manufacturers and CSA Labels</u> | .1 | Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed. |
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| <u>11 QUALITY ASSURANCE</u> | .1 | 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 Territorial 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. |
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| <u>12 Field Quality Control</u> | .1 | Carry out tests in presence of Departmental Representative. |
| | .2 | Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project. |
| | .3 | Submit test results for Departmental Representative's review. |
| | .4 | Conduct following tests:
.1 Power distribution system including phasing, voltage, grounding and load balancing.
.3 Circuits originating from airport lighting regulators.
.4 Systems: airport lighting control system.
.5 Insulation resistance testing:
.1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.
.2 Megger 350-600 V circuits, feeders and equipment with a 1000 V instrument.
.3 Megger series airfield lighting circuits with a 5000 V instrument.
.4 Check resistance to ground before energizing. |
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12 Field Quality Control (Cont'd)	.5	<p>Manufacturer's Field Services:</p> <p>.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.</p> <p>.2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.</p> <p>.3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.</p>
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13 Materials and Equipment	.1	Provide material and equipment in accordance with Section 01 61 00 - Common Product Requirements.
	.2	Material and equipment to be CSA certified. Where CSA certified material and equipment is are not available, obtain special approval from authority having jurisdiction before delivery to site and submit such approval as described in - Submittals.
	.3	Factory assemble control panels and component assemblies.

14 Equipment Identification	.1	<p>Identify electrical equipment with nameplates as follows:</p> <p>.1 Nameplates: lamicoid 3 mm thick plastic engraving sheet, black face, white core, lettering accurately aligned and engraved into core mechanically attached with self tapping screws.</p> <p>.2 Sizes as follows:</p>
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NAMEPLATE SIZES

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

14 Equipment (Cont'd)

Size 5 20 x 90mm 2 lines 5 mm high letters

Size 6 25 x 100mm 1 line 12 mm high letters

Size 7 25 x 100mm 2 lines 6 mm high letters

- .2 Wording on nameplates to be approved by Engineer prior to manufacture.
- .3 Allow for minimum of twenty-five (25) letters per nameplate.
- .4 Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics.
- .5 Identify equipment with Size 3 labels engraved "ASSET INVENTORY No. " as directed by Engineer.
- .6 Terminal cabinets and pull boxes: indicate system and voltage.
- .7 Transformers: indicate capacity, primary and secondary voltages.

15 Conduit and
Cable
Identification

- .1 Colour code conduits, boxes and metallic sheathed cables.
 - .2 Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 15 m intervals.
 - .3 Colours: 25 mm wide prime colour and 20 mm wide auxiliary colour.
- | <u>Prime</u> | <u>Auxiliary</u> |
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| .4 up to 250 V Yellow | up to 600 V Yellow |
| Green. | up to 5 KV Yellow Blue up to 15 KV |
| Yellow Red Telephone Green Other Green Blue | Communication Systems Fire Alarm Red Emergency |
| Red Blue Other Red Yellow. | Security Systems |

16 Co-ordination
of Protective
Devices

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

PART 1 - GENERAL

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| <u>1.1</u> | <u>References</u> | .1 | CSA C22.2 No. 0.3-96, Test Methods for Electrical Wires and Cables. |
| | | .2 | CAN/CSA-C22.2 No.131-M89(R1994), Type TECK 90 Cable. |

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| <u>1.2</u> | <u>Product Data</u> | .1 | Submit product data in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups. |
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PART 2 - PRODUCTS

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| <u>2.1</u> | <u>TECK Cable</u> | .1 | Cable: to CAN/CSA-C22.2 No.131. |
| | | .2 | Conductors:
.1 Grounding conductor: copper.
.2 Circuit conductors: copper, size as indicated. |
| | | .3 | Insulation:
.1 Chemically cross-linked thermosetting polyethylene rated type RW90, 1000 V. |
| | | .4 | Inner jacket: polyvinyl chloride material. |
| | | .5 | Armour: interlocking aluminum. |
| | | .6 | Overall covering: thermoplastic polyvinyl chloride material. |
| | | .7 | Fastenings:
.1 One hole steel straps to secure surface cables 50 mm and smaller. Two hole steel straps for cables larger than 50 mm. |
| | | .8 | Connectors:
.1 Watertight, approved for TECK cable. |
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PART 3 - EXECUTION

3.1 Installation
of TECK Cable

- 3.2 - 3.20 V
- .1 Install all cables in trenches in accordance
 - .2 Terminate cables as indicated and as detailed.