

PART 1 - GENERAL

<u>1.1 Related Sections</u>	.1	Section 34 43 27 - Airfield Lighting Regulator Assembly.
	.2	Section 34 43 25 - Wind Cone.
	.3	Section 34 43 14 - Elevated Edge Lighting.
<u>1.2 References</u>	.1	Canadian Standards Association (CSA)
	.1	CSA C22.2 No.179-M1987, Airport Series Lighting Cables.
	.2	CSA C22.2 No.180-M1983, Series Isolating Transformers for Airport Lighting.
<u>1.3 System Description</u>	.1	Medium intensity edge lighting on:
	.1	Runway 10, 28.
	.2	Aprons.
	.2	Re-wire existing wind cones at runway ends 10, 28.
	.3	Retroflective markers.
<u>1.4 Submittals</u>	.1	Provide written confirmation of compliance with CSA standard.
	.2	Submit shop drawings and product data in accordance with Section 01 33 00 - Submittal Procedures.
<u>1.5 Maintenance Materials</u>	.1	Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
<u>1.6 Waste Management and Disposal</u>	.1	Place materials defined as hazardous or toxic waste in designated containers.

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## PART 2 - PRODUCTS

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| <u>2.1 Primary Cable</u>                            | .1 | Single conductor stranded soft drawn copper, #8 AWG, 5000 volt, combined cross linked polyethylene insulation and jacket: CSA C22.2 No.179.  |
| <u>2.2 Breakable Coupling, Type 1</u>               | .1 | DOT specification K-300. Use for mounting of elevated runway, taxiway and apron edge lighting fixtures. PWGSC Standard Drawing 0000S230P030.   |
| <u>2.3 Breakable Coupling, Type 2</u>               | .1 | DOT specification K-300. Use for mounting of approach light fixtures installed at runway threshold. PWGSC Standard Drawing 0000S230P030.   |
| <u>2.4 Primary Plug Receptacle Connectors</u>       | .1 | Primary plug and receptacle connector kit, straight type, one male plug, one female plug, for use with isolating transformer or use for separable straight splice of #8 AWG primary cable. Primary connector kits to be Amerace Super 54 series, matched to the diameter of the primary cable. |
|   | .2 | Primary cable extensions, 600 mm long, one terminated with factory moulded male plug.  |
| <u>2.5 Primary Cable Kit</u>                        | .1 | Use compression splice : 5 kv rated inner heat shrink sleeve, and a 600 V rated outer heat shrink sleeve for abrasion protection, and install per manufacturer's instructions.   |
| <u>2.6 Secondary Plug and Receptacle Connectors</u> | .1 | Secondary male plug connector kit; to field assemble secondary extension or terminate fixture lead, using 2 - #12 AWG type SOW secondary cable.  |
|   | .2 | Secondary female receptacle connector kit; to field assemble secondary extension or repair transformer lead, using 2 - #12 AWG type SOW secondary cable.   |
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2.6 Secondary Plug and Receptacle Connectors (Cont'd)	.3	Secondary male plug connector kit; to field assemble secondary extension or terminate fixture lead, using 2 - #12 AWG conductors.
	.4	Secondary female receptacle connector kit; to field assemble secondary extension or repair transformer lead, using 2 - #12 AWG conductors.
	.5	Construction to DOT specification K-255.
2.7 Isolating Transformer	.1	CSA C22.2 No180, rated 30/45 watt, and as indicated. Use for 5000 volt series circuits.
2.8 Transformer Pullpit	.1	Construction to DOT specification K-303, galvanized metal cover locking type with tabs to centre and prevent side movement. .1 Type A 450 mm diameter, 450 mm depth for single transformer. .2 Type B 450 mm diameter, 610 mm depth for two transformers. .3 Type C 450 mm diameter, 750 mm depth where indicated or required.
2.9 Light Unit Ground Anchor	.1	Conduit anchor 50.8 mm x 50.8 mm angle, 914 mm long, galvanized steel, with cast aluminum stake head and ground connector.
2.10 Ground Counterpoise Wire	.1	Single conductor #8 AWG, soft drawn copper wire: .1 Solid bare for direct burial as counterpoise for airfield lighting circuits.
2.11 Other Material	.1	Cable, secondary: .1 Two conductor #12, copper, type SOW, Cab Tire.
	.2	Three conductor #10, copper, type NMWU.
	.3	Cable ties: nylon black 200 mm, long.
	.4	Tape: PVC type: Scotch 33 or equivalent, as required.

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|---------------------------------|----|--|
| 2.11 Other Material<br>(Cont'd) | .5 | Expandable foam sealant for sealing pipe ends in pullpits. |
|                                 | .6 | 5kV Heat shrink sleeves.                                   |
| 2.12 Spare Parte                | .1 | Provide the following spare components:                    |
|                                 | .1 | 300m - #8 AWG 5 kV Primary Cable                           |
|                                 | .2 | 300m - #8 AWG SDBC ground counterpoise cable               |
|                                 | .3 | 5 - Transformer Pullpits                                   |
|                                 | .4 | 10 - Primary Connector kits                                |
|                                 | .5 | 5 - 30/45W Isolation Transformers                          |
|                                 | .6 | 2 - 100W Isolation Transformers                            |
|                                 | .7 | 2 - 200W Isolation Ttransformers                           |
|                                 | .8 | 5 - 5kV Heat Shrink Sleeves                                |

### PART 3 - EXECUTION

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|---|----|--|
| 3.1 General                             | .1 | Install Airport Lighting underground circuitry in accordance with Canadian Electrical Code.  |
| 3.2 Removals and Salvage                | .1 | Remove and salvage existing edge lighting fixtures from runway 10-28, and from areas indicated and provide new.  |
| 3.3 Installation of Light Unit Anchors  | .1 | Install 50 mm x 50mm angle light unit mounting stake, at locations indicated. Set plumb and vertical with top of conduit coupling at same elevation as adjacent ground surface. After installation of anchor stake, screw on breakable coupling. |
| 3.4 Installation Isolating Transformers | .1 | Install isolating transformers adjacent to primary cable trench, at locations indicated:   |
|   | .1 | In transformer pullpits  |
|   | .1 | Place suitable transformer(s) in pullpits.   |
|   | .2 | Make connections to:   |
|   | .1 | Primary cable.   |
|   | .2 | Edge light secondary cable.  |
|   | .3 | Ground counterpoise.   |
|   | .3 | Place back cover.  |
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3.5 Installation of .1  
Transformer  
Pullpits

Install transformer pullpits at locations indicated.

- .1 Excavate to size and depth indicated.
- .2 Cover bottom of excavation with layer of bedding material.
- .3 Place pullpit so that cover is 75 mm below adjacent ground surface.
- .4 Make holes in pullpit wall suitable for tubing used.
- .5 Install incoming and outgoing tubing and/or conduit. Seal tubing or conduit ends with expandable foam.
- .6 Backfill with and common backfill material around pullpit and compact to same level and density as adjacent ground as indicated.
- .7 Place cover on pullpit and lock, turning cover in clockwise rotation.

3.6 Installation of .1  
Airport Lighting  
Primary u/g Cables

Install airport lighting primary underground cables, to PWGSC Standard Drawing 0000S230P014 and 0000S230P041 sheets 1 and 2.

- .1 Place in tubing.
- .2 Make connections using approved connectors as indicated.
  - .1 Leave 600 mm loop of loose cable at each connection, avoid mechanical tension on connector.
  - .2 Install connector in accordance with manufacturer's instructions.
  - .3 Install 5 kV heat shrink sleeve over primary connectors. Sleeves to be 150mm longer (at each end) than final connector assembly length.
  - .4 After cables are installed and terminated, seal polyethylene tubing openings with expandable foam sealant.
- .3 Install markers on cable identifying circuit numbers in each pullpit.

3.7 Installation of .1  
Ground Counterpoise

Install with runs of series lighting primary cables, in trench, duct and/or tubing at locations as indicated:

- .1 Use 1 conductor #8SDBC wire with cables directly buried in trench or in protective tubing:
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- 3.7 Installation of .1 (Cont'd)  
Ground Counterpoise .1 (Cont'd)  
(Cont'd)
- .1 Place counterpoise wire on top of additional 75 mm layer of bedding material above cables or tubing.
  - .2 Run counterpoise wire in straight line or in zig-zag pattern as indicated.
- .2 Use appropriate ground connector and connect counterpoise wire to:
- .1 Power supply system common ground.
  - .2 Each light unit anchor and isolating transformer.
  - .3 Other ground wires in same trench.
  - .4 Pullpit cover.
- 3.8 Installation of .1 Install as indicated:  
Secondary Cables
- .1 Bury directly in common soil.
  - .2 Place in tubing.
  - .3 Run in conduits.
- .2 Make connections using approved connectors as indicated.
- .1 In series lighting circuits, connect to isolating transformer secondary outlet.
  - .2 Leave 60 cm loop of loose cable at connection to transformer.
  - .3 Run as indicated on PWGSC standard drawing 0000 S230 P021-3 .
  - .4 Backfill as indicated and compact to same level and density as adjacent ground.
- 3.9 Testing .1 Testing requirements:
- .1 Assign tests to qualified personnel only.
  - .2 Provide necessary instruments and equipment to demonstrate that:
    - .1 Circuits are continuous, free of short circuits and unspecified grounds.
    - .2 Circuits are connected according to applicable wiring diagrams.
    - .3 Circuits perform designated functions in sequence and manner intended.
    - .4 Resistance to ground of circuits, measured with 5 kV Megger is not less than 5000 megohms.
    - .5 Circuits are operable by:
      - .1 Energizing and operating each circuit at each brightness not less than 10 times.
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3.9 Testing  
(Cont'd)

- .1 (Cont'd)
- .2 (Cont'd)

.2 Energizing and operating each circuit at full load for continuous period of not less than eight hours.

- .2 Provide Engineer with list of test results indicating:
  - .1 Location at which test was made.
  - .2 Circuit number or designator of circuit tested.
  - .3 Individual test results.

## PART 1 - GENERAL

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| <u>1.1 Related Work</u>            | .1 | Airport Lighting (General): Section 34 43 10   |
|                                    | .2 | Duct, Conduit Installation: Section 33 65 76.  |
|                                    | .3 | Removal of existing lighting units and replaced with new to suit new finish grade.   |
| <u>1.2 Measurement for Payment</u> | .1 | Supply and installation of new Runway and aprons edge and threshold end lights, including pullpits, will be measured as each unit. |
|                                    | .2 | Removal of existing Runway and Aprons edge and threshold end lights, including pullpits, will be measured as each unit.            |
|                                    | .3 | Include trenching, bedding, surround, and backfilling materials, all cable, ducts, and other parts cost in above related items.    |

## PART 2 - PRODUCTS

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|---|----|---|
| <u>2.1 Medium Intensity Elevated Light - Series Circuit</u> | .1 | Light unit - runway, taxiway, apron edge:   |
|   | .1 | 30 watt 6.6A quartz halogen series lamp   |
|   |    | as indicated;   |
|   |    | distribution or asymmetrical photometric distribution, colour, as indicated;  |
|   | .3 | Internal SOW cord assembly with male plug;  |
|   | .4 | Breakable coupling;   |
|   | .5 | Suitable for mounting on 50.8 mm diameter threaded anchor stake coupling;   |
|   | .6 | Isolating transformer 6.6A/6.6A - 30/45 W.  |
|   | .7 | Retro-reflective fixture marker, 610mm long, constructed of high grade polyurethane tube, orange in colour, spring loaded at base, complete with bracket to mount to fixture. |
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2.1 Medium  
Intensity Elevated  
Light - Series  
Circuit  
(Cont'd)

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- .2 Light unit, runway threshold/end:
- .1 100 watt 6.6A quartz halogen series lamp as indicated;
  - .2 Clear globe with asymmetrical photometric distribution;
  - .3 Green/red filters;
  - .4 Internal SOW cord assembly with male plug;
  - .5 Breakable coupling;
  - .6 Suitable for mounting on 50 mm diameter threaded anchor stake coupling.
  - .7 Isolating transformer 6.6A/6.6A - 100 W.
  - .8 Retro-reflective fixture marker, 610mm long, constructed of high grade polyurethane tube, orange in colour, spring loaded at base, complete with bracket to mount to fixture.

2.2 Spare Parts

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- .1 Provide the following spare components:
- .1 5 - Medium intensity edge light fixtures complete with anchor stake, breakable coupling and ground clamp;
  - .2 4 - High intensity edge light fixtures complete with red and green filters, anchor stake, breakable coupling and ground clamp;
  - .3 10 - retroreflective markers complete with base and mounting bracket
  - .4 30 - 30W lamps for runway edge light units
  - .5 10 - 100W lamps for runway threshold/end light units

PART 3 - EXECUTION

3.1 Light Unit  
Installation

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- .1 Install at locations indicated or as directed by departmental representative.
  - .2 Install to Section 34 43 10 - Airfield Lighting - General and as indicated:
    - .1 On stake anchors.
  - .3 Assemble in accordance with manufacturer's installation instructions. Connect isolating transformer secondary lead to light unit cord assembly by means of disconnecting plug and receptacle. Do not tape this connection.
  - .4 Level as recommended by manufacturer.
  - .5 Install lamp of proper rating as indicated.
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3.1 Light Unit	.6	Install colored filters as indicated.
Installation		
(Cont'd)	.7	Install lens as indicated.