

PART 1 - GENERAL

1.1 Related

Sections .1 Section 34 43 14 - Elevated Edge Lighting for

1.2 References

- .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.

1.3 System
Description

- .1 Remove and raise medium intensity edge
lighting and other lighting on:
.1 Runway 16-34.
.2 Runway 16-34 thresholds and ends.
.3
.2 Medium intensity edge lighting on:
.1 Taxiway A.
.2 Adjacent areas where new work is
being performed.
.3 Locate, inspect, verify, existing components and
provide as-is CAD drawings.
.4 Provide temporary HV (5KV) primary AFL
circuits cables where required to maintain
Taxiway A lights ON at all times during
construction. Protect all cables with
mechanical protection and secure in place.
.5 Inspect all pulpits primary and secondary
cables, connectors and transformers and clean
(vacuum means) fully all electrical
components and pull each pit.

1.4 Submittals

- .1 Provide written confirmation of compliance
with CSA standard.
.2 Provide shop drawings for all new equipment.

PART 2 - PRODUCTS

- 2.1 Primary Cable .1 Single conductor stranded soft drawn copper, #8 AWG, 5000 volt, combined cross linked polyethylene insulation and jacket: CSA C22.2 No.179.
- 2.2 Breakable Coupling, Type 1 .1 DOT specification K-300. Use for mounting of elevated runway, taxiway and apron edge lighting fixtures as detailed on PWGSC Standard Drawing 0000 S230 P030.
- 2.3 Breakable Coupling, Type 2 .1 DOT specification K-300. Use for mounting of approach light fixtures installed at runway threshold as detailed on PWGSC Standard Drawing 0000 S230 P030.
- 2.4 Breakable Coupling, Type 3 .1 DOT specification K-300. Use for mounting of approach lighting on aluminum column as detailed on PWGSC Standard Drawing 0000 S230 P030.
- 2.5 Conduits Extensions/Reduction .1 Increase or lower height of existing fixture stem and/or provide new to accommodate new final grade elevation and as shown on drawings.
- 2.6 Primary Plug Receptacle Connectors .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.
- .2 Confirm exact outside diameter of primary cable in accordance with PWGSC drawing No. 000 OS230 P010 prior to ordering connector kits. Primary connector kits are to be Amerace 'Super 54' kits.
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- 2.7 Primary Cable Splice Kit .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.
- 2.8 Secondary Plug and Receptacle Connectors .1 Secondary male plug connector kit; to field assemble secondary extension or terminate fixture lead, using 2 - #12 AWG type SOW secondary cable, Amerace No. 91BPF6.
- .2 Secondary female receptacle connector kit; to field assemble secondary extension or repair transformer lead, using 2 - #12 AWG type SOW secondary cable, Amerace No. 91BRF6.
- .3 Factory assembled secondary extension, length as required, #12 AWG , one two conductor cable terminated with male connector on one end and female connector on other end , for long secondary runs between transformers and fixtures.
- .4 Construction to DOT specification K-255 .
- 2.9 Isolating Transformer .1 CSA C22.2 No. 180, rated 30/45, 200 and 300 watt. Use for 5000 volt series circuits.
- 2.10 Transformer Pullpit .1 Construction to DOT specification K-303, galvanized metal cover, locking type.
- .1 450 mm diameter, 600 mm depth for single transformer.
- .2 600 mm diameter, 750 mm depth, for multiple transformers and pulling cables.
- .3 Acceptable Material: Century Plastics Ltd., Polyrama Ltd.
- .2 Provide new pullpit extensions to suit existng pullpit where required and as detailed on drawings.
- 2.11 Light Unit Ground Anchor .1 Conduit anchor 50.8 mm diameter conduit, 1.5 m long, galvanized steel, threaded one end, with conduit coupling and ground connector .
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2.12 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 Stranded with green TW insulation for placing in duct or conduit, as counterpoise for airfield lighting circuits buried beneath hard surfaces, and for power circuit insulated bonding conductors.

2.13 Ground Rod .1 Copper clad steel 19 mm x 3000 mm long complete with ground connector.

2.14 Other Material .1 Cable, secondary:
.1 Two conductor #12, copper, type SOW, Cab Tire.
.2 Cable ties: nylon black, length as required.
.3 Conductor markers: brass tags 20 mm diameter with width for 15 mm high letters.
.4 Conduit, rigid:
.1 Aluminum: 50 mm diameter.
.2 FRE: 50 mm diameter as indicated.
.5 Splicing sleeves : Nicopress 1-102C or
.1 Nicopress 1-102C or Slater 1-128/7J.
.6 Tape: PVC type.
.1 Acceptable Material: Scotch 88.
.7 Tubing, polyethylene:
.1 517.11 kPa, 25 and 50 mm diameter as indicated.

PART 3 - EXECUTION

3.1 General .1 Install Airport Lighting underground circuitry in accordance with Canadian Electrical Code.
.2 Take precautions and protect existing pullpits and associated components for re-use.

3.2 Removals and Salvage .1 Remove and salvage existing edge lighting fixtures, pullpits and all equipment as indicated and where applicable.

3.3 Installation of Light Unit Anchors .1 Install 50 mm diameter, light unit anchors, at locations indicated. Set plumb and vertical with top of conduit coupling at same elevation as adjacent ground surface:
.1 In common soil:
.1 Drive in conduit.
.2 Screw coupling on.

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.

3.5 Installation of Transformer Pullpits .1 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.
.6 Backfill with sand 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 Airport Lighting Primary u/g Cables .1 Install airport lighting primary underground cables, as indicated and to PWGSC Standard 0000S230P041 sheet 1 and 2 .
.1 Pull in ducts.

3.6 Installation of .2 Make connections using approved connectors as indicated.
Airport Lighting
Primary u/g Cables
(Cont'd)

- .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 markers on cable identifying circuit numbers in each pullpit.

3.7 Installation of .1 Install with runs of series lighting primary
Ground Counterpoise 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:
 - .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 1 conductor #8 stranded with TW green insulation, with cables pulled in ducts and/or tubing under pavement.
- .3 Use appropriate ground connector and connect counterpoise wire to:
 - .1 Power supply system common ground.
 - .2 Each light unit anchor and isolating transformer.
 - .3 Each ground rod.
 - .4 Other ground wires in same trench.

3.8 Installation of .1 Install as indicated.
Secondary Cables

- .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 loose cable end above ground to light unit location.
 - .4 Backfill as indicated and compact to same level and density as adjacent ground.

3.9 Testing-
General

- .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 50 megohms.
 - .5 Circuits are operable by:
 - .1 Energizing and operating each circuit at each brightness not less than 10 times.
 - .2 Energizing and operating each circuit at full load for continuous period of not less than eight hours.
- .2 Provide Departmental Representative with report 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 | Installation of Direct Buried Cables and Ducts to applicable Section. |
| | .3 | Adjust existing high and medium intensity runway (16-34) and taxiway "A", and adjacent new work areas light units to meet new grade levels and as noted. Details for these lights are shown on standard drawing details and as detail on drawings. |
| | .4 | Adjuste existing high and medium intensity runway (16-34) threshold end lights to meet new grade levels and as noted. Details for these lights are shown on standard drawing details and as detailed on drawings. |
| | .5 | Identify any damaged or non operable units and components to departmental representative. |
| | .6 | Provide new breble couplers and adjust to new finish grades. |
| <u>1.2 Submittals</u> | .1 | Provide shop drawings for all new equipment. |
| <u>1.3 Measurement for Payment</u> | .1 | Adjusting(Raising or lowering) of runway, taxiway, and apron lights in asphalt surface area will be measured as each unit regardless of depth of raise or lower required (Type 1). |
| | .2 | Adjusting (Raising or lowering) of runway, taxiway, and apron lights mounted on pullpits in grassed area,including pullpits height adjustment, will be measured as each unit regardless of depth of raise or lower required for lights and pullpits (Type 2). |
| | .3 | Adjusting (Raising or lowering) of runway, taxiway, and apron lights mounted on pullpits in asphalt surface area,including pullpits height adjustment, will be measured as each unit regardless of depth of raise or lower required for lights and pullpits (Type 3). |

1.3 Measurement for .3 (Cont'd)
Payment
(Cont'd)

PART 2 - PRODUCTS

- 2.1 High Intensity .1 Light unit - quartz halogen lamp - runway
Elevated Edge Light edge and threshold/end:
- Series Circuit .1 Lamps - quartz halogen lamp - with 150
watt for runway edge and 150 watt for
threshold end;
.2 Clear globe with symmetrical photometric
distribution;
.3 Filters and colour as indicated;
.4 External SOW cord assembly with male
plug;
.5 Suitable for mounting on 50mm diameter
anchor stake coupling;
.6 Breakable coupling;
.7 Isolating transformer, 6.6A/6.6A - 200W.
.8 Reflective light locator flag.
- .2 Conduit anchors - Provide new conduit nipple
(50mm) and conduit coupling (50mm) to each
raised light unit of sufficient length to
extend anchor to meet new required grade
levels. Details for these couplings are shown
on standard drawing No. 000 S230 P030.
- .3 Secondary Cable cord - Where it is necessary
to replace secondary cable cord leads, use
pre-fabricated 2c No. 12 type SOW cab tire
cable with Amerace No. 91 BPF6 male plug and
91 BRF6 female plug. Secondary cable not to be
spliced rather a new pre-fabricated cable to
be used. Details for these cables are shown on
standard drawings No. 000 S230 P010, 000 S230
P011, 000 S230 P020, 000 S230 P021 & 000 S230
P022.
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PART 3 - EXECUTION

3.1 Light Unit
Installation

- .1 Raising - Disconnect existing secondary cable cord, remove light unit and breakable coupling, loosen secondary cable cord into transformer pull pit, install new threaded nipple and coupler into conduit, re-install breakable coupler, light, adjust cable cord slack re-connect and seal.
- .2 Lowering - Disconnect existing secondary cable cord, remove light unit and breakable coupling, loosen secondary cable cord into transformer pull pit, excavate around conduit anchor, pass buried isolating transformer ground terminal connector and exposed ground clamp, disconnect ground cable, slide connector up and drive conduit into ground (to required depth), secure ground connector to the new height and reconnect cable cord. Backfill to new finish grade requirements, re-install breakable coupler, light, adjust secondary cable slack, re-connect and seal.
- .3 Install at locations indicated or as directed by Departmental Representative.
- .4 Assemble in accordance with manufacturer's installation instructions. Connect isolating transformer secondary lead to light unit pre-fabricated cord assembly by means of disconnecting plug and receptacle. Do not tape this connection.
- .5 Level as recommended by manufacturer or as directed.
- .6 Install lamp of proper rating as indicated.
- .7 Install colored filters as indicated.
- .8 Install lens as indicated.
- .9 Perform all tests in accordance with Section 34 43 10 - Airport Lighting: General.