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SOW – TLOF Lighting System

DESIGN & BUILD CONTRACT

CCG BASE PARRY SOUND

Parry Sound, ON

MARITIME AND CIVIL INFRASTRUCTURE
Prepared by: BY
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TABLE OF CONTENTS

SECTION: 011100 GENERAL INSTRUCTIONS

PART 1 - GENERAL

1.1 Minimum Standards

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

.1 Meet or exceed requirements of:

.1 Contract documents;

.2 Specified standards, codes and referenced documents.

1.2 Description of Work

.1 Work under this Contract includes but is not limited to the provision of all labour, materials, and equipment required to:

.1 Provide an engineered design for the installation of a pre-purchased TLOF lighting system for a heliport at CCG base Parry Sound. This involve detailing the subgrade requirements, some asphalt paving repairs, and a new concrete apron;

.2 Provide all Labour and Equipment and Material required to complete all civil works related to the installation of the TLOF lighting system.

.2 The following work will be undertaken by others and is hereby excluded:

.1 The purchase of all electrical materials required for this job.

.2 All Labour, Equipment and Material required to complete the electrical works related to this project.

1.3 Submittals

.1 Mandatory submittals and schedule for submission are detailed below and in Appendix B. The following identifies general requirements only. The relevant sections must be consulted for a complete listing of mandatory content.

.2 Detailed Schedule:

.1 Deadline:

.1 No later than ten (10) working days following award.

.2 Deliverables:

.1 The contractor shall furnish a high level schedule outlining the major construction milestones. Schedule shall clearly define the anticipated start and finish of the design,

and field work elements of the project.

.2 The schedule for the project has some key requirements identified below in cl. 1.8. The schedule will be expected to identify these requirements.

.3 Design Package:

.1 Deadline:

.1 No later than thirty [30] working days following award.

.2 Deliverables:

.1 Detailed design drawings of all civil works. Detailed design drawings of all buried electrical works:

.1 Concrete apron replacement details;

.2 Trenching, backfill, and asphalt paving details;

.3 Buried conduit and flush-mount light details to be included for in the drawings.

.4 Construction Plan:

.1 Deadline:

.1 No less than ten [10] working days prior to mobilization.

.2 Deliverables:

.1 A Construction Plan of sufficient detail to demonstrate that the Contractor has considered all the challenges of the project and is prepared to undertake the works in a competent and professional manner in accordance with all legislation, including:

.1 Project specific safety program (Section 013530);

.2 Project environmental protection plan (Section 013543);

.3 Detailed demolition plan (Section 024116);

.4 Detailed construction plan (Section 033000, 310000 & 320000);

.5 As-built and QA/QC:

.1 Deadline:

.1 No more than ten [28] calendar days after construction.

.2 Deliverables:

.1 The following documents shall be forwarded upon completion of the contract:

.1 Set of red-lined as-built drawings (Section 033000 & 320000);

.2 Compaction test results for subgrade and asphalt (Sections 310000 & 320000);

.3 Concrete test results (Section 033000);

1.4 Bidder Qualifications

.1 The work shall be carried out under the supervision and responsibility of a sole specialized Contractor, capable of performing installations of light systems on runways.

.1 The design work must be completed by an engineer licensed to practice in the province of Ontario.

.2 The engineer must be prepared to identify his experience in work on runways and/or heliports.

.2 The Contractor shall designate a project manager or main point of contact for the contract.

.3 The Contractor shall provide a detailed list of all subcontractors being used to complete the work described herein.

1.5 Site Location

.1 The location of the site is as follows:

.1 Lat./Long.: 45°20'37.96"N, 80° 2'38.95"W

.2 The site is located at the Canadian Coast Guard Base in Parry Sound, ON

1.6 Existing Conditions

.1 Bidders must make their own estimate of the difficulties associated with all phases of the works.

.2 The contractor must include in their costs all expenses related to the difficulties of working at the sites.

.3 Photographs of the existing site are included in Appendix A.

1.7 Contractor's Access to Site

.1 Contractor is responsible for transportation of all labour, materials, and equipment to and from the sites, including any and all material furnished or itemized for salvage by Coast Guard.

.2 The Site is accessible by truck.

1.8 Completion, Scheduling and Planning of the Works

.1 Work may commence as early as practical following coast guard's acceptance and approval of mandatory submissions.

.2 All construction work must occur between July 1, 2016 and August 31, 2016. This is an

operational hangar, and this window marks the absence of one craft. The second will be stored outdoors during the demolition and reconstruction of the concrete apron.

.3 The electrical works will be performed by CCG base staff (certified electricians). The contractor will be expected to stage his work in a manner where by the CCG electrician is given appropriate time to run all conduit, conductor, and lights. This should be demonstrated in the submitted schedule.

1.9 Temporary Facilities

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Arrange, pay for, and maintain temporary electrical power supply as required for construction, and water supply as required, in accordance with governing regulations and ordinances.

.3 Maintain emergency spills kit on-site at all times.

1.10 Fees, Permits, Certificates and Information

.1 Contractor shall provide authorities having jurisdiction with all information requested.

.1 Contractor shall provide copies to Coast Guard of any documentation submitted to other authorities related to the work described in this document.

.2 Contractor shall pay fees and obtain certificates and permits required.

.3 Contractor shall furnish certificates and permits when requested.

1.11 Reference Documents

.1 The most recent publication or edition of any document referenced in this specification should be used unless the referencing clause states that this clause does not apply.

1.12 Required Submissions

.1 A summary of the minimum mandatory submissions required can be found in Appendix B2. This summary is not an exhaustive list of all submissions required for the duration of the project. Additional submissions may be required after award.

SECTION: 013300 SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 General

.1 This section specifies general requirements and procedures for the Contractor's submissions of documents to Coast Guard for review.

.2 Do not proceed with the work until submitted documents or samples have been reviewed by Coast Guard.

.3 Where items or information is not produced in SI Metric units, converted values are acceptable.

.4 Contractor's responsibility for errors and omissions in submission is not relieved by Coast Guard's review of the submitted documents.

.5 Notify Coast Guard, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.6 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Coast Guard's review of submission, unless Coast Guard gives written acceptance of specific deviations.

.7 Make any changes to submissions that Coast Guard may require consistent with Contract Documents and resubmit as directed by Coast Guard.

.8 Provide Coast Guard with a written notice, when resubmitting, of any revisions other than those requested Coast Guard.

1.2 Submission Requirements

.1 Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.

.2 Allow three (3) working days, or as stipulated in the specifications, for Coast Guard to review the submission.

.3 The Contractor's Engineer shall stamp and sign any submissions requiring a Professional Engineer's seal certifying his approval of samples, verification of field measurements, and compliance with Contract Documents.

SECTION: 013530 HEALTH AND SAFETY REQUIREMENTS

PART 1 - GENERAL

1.1 Scope

.1 The Contractor shall be responsible to develop, implement and enforce a safety program which addresses all elements of the work.

1.2 References

.1 Work under this section shall be undertaken in strict conformance with all listed references, In the case of any conflict or discrepancy the more stringent requirements shall apply.

.1 Canada Labour Code Part II - January 2008

.2 NRC-CNRC National Building Code of Canada

.3 Ontario Occupational Health and Safety Act and Regulations, 2009.

.4 Any and all other Provincial/Territorial Regulations and Policies; Worker's Compensation Board Policies; Local municipal regulations; pertaining to safety of the contractors workers

1.3 Submittals

.1 Project Specific Safety Program

.1 Deadline:

.1 With Construction Plan

.2 Deliverables:

.1 Safety Program Document, include:

.1 A listing of all activities specific to this phase of the project, their Health & Safety risks or hazards, and the associated mitigations that will be applied.

.2 A listing of personnel responsible for health and safety measures, and Emergency procedures.

.3 Material Safety Data Sheets for hazardous products to be utilized in the execution of the works.

SECTION: 013543 ENVIRONMENTAL PROCEDURES

PART 1 - GENERAL

1.1 Scope of Work

.1 The Contractor must implement and enforce the following procedures throughout the duration of the work to mitigate potential negative impacts on the surrounding environment.

1.2 References

.1 Work under this section shall be undertaken in strict conformance with all listed references, In the case of any conflict or discrepancy the more stringent requirements shall apply.

.1 Canadian Environmental Protection Act

1.3 Submittals

.1 Contractor shall submit and environmental protection plan

.1 Deadline:

.1 With Construction Plan

.2 Deliverables:

.1 Submit a plan addressing procedures to be implemented to mitigate any negative impact on the environment. Detail:

.1 Equipment features (age, spill containment);

.2 Staging, refueling, and cleaning areas;

.3 Clean-up and/or containment procedures (including concrete/grout);

.4 Waste disposal methods and sites;

PART 2 - PRODUCTS

2.1 General

.1 Avoid use of hazardous products. Use environmentally friendly products where practical.

PART 3 - EXECUTION

3.1 Construction Area

.1 Confine construction activities to as small an area as practical.

.2 Establish material storage, cleaning, and refueling areas where impacts to the surrounding environment will be negligible or readily mitigated.

3.2 Stockpiling of materials

.1 Materials must be stockpiled as far from the shoreline as practical. Tarps must be used to control dust and run-off.

.2 Stockpiled excavated materials shall be skirted using filter fabric to control run-off of fines during rain.

3.3 Disposal of Wastes

.1 Clean-up the site at the end of each working day.

.2 All waste material to be disposed of in a legal manner at a site approved by local authorities. Transporter/hauler must be appropriately licensed.

.1 Recycle or reuse materials where possible.

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

.4 Do not bury rubbish and waste materials on site.

3.4 Clearing and Grubbing

.1 Only clear vegetation that interferes with construction.

3.5 Drainage

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

.1 Suspend works during periods of heavy rainfall and add temporary covers to discourage run-off.

.2 Water pumped from excavation shall be adequately treated to ensure that water returning to the watercourse contains minimal fines. Procedures anticipated for preventing the pumping of fines shall be identified in the environmental protection plan, and may include the following:

.1 The use of filter bags;

.2 Straw bale check dams or silt fence;

.3 Discharge through naturally occurring vegetation.

.3 The means for controlling silt run-off shall be dependent on the site and the quantity of water

pumped, and shall be to the discretion of the CCG site staff.

.4 Sediment control measures shall be inspected and improved/cleaned/replaced as necessary.

3.6 Pollution Control

.1 Provide methods, means, and facilities to prevent the contamination of soil, water, and atmosphere from the discharge of pollutants produced by construction operations.

.2 Vehicles, machinery, and equipment shall be in good repair, equipped with emission controls as applicable and operated within regulatory requirements.

.3 Abide by local noise by-laws.

.4 Avoid unnecessary idling of vehicles or heavy machinery.

.5 Limit use of equipment around the shoreline where possible.

.6 Implement and maintain dust and particulate control measures in accordance with provincial requirements:

.1 All bulk material haul equipment shall be appropriately tarped. Watertight vehicles shall be used to haul wet materials

.7 Designate a cleaning area for tools to limit water use and runoff. Do not allow deleterious materials to enter waterways. Ensure emptied containers are sealed and stored safely for disposal.

.8 The contractor shall take all necessary precautions to guard against the release of any noxious substance or pollutant to the environment. In the event of any spill the Contractor shall take immediate action to contain the release and mitigate any impact.

.1 Materials and equipment to intercept, contain, and clean-up any spill or other release shall be maintained on site throughout the construction period and must be readily accessible at all times.

.2 Any uncontrolled release of a known contaminant (spills, fire/smoke) shall be reported to appropriate Provincial Authority and Coast Guard. Spills of deleterious substances to be immediately contained and cleaned up in accordance with provincial regulatory requirements.

.3 Provincial Authority: Ontario Spills Action Centre 1-800-268-6060

3.7 Traffic

.1 Minimize soil compaction by driving, parking vehicles, and walking, etc. on existing paved roadways/laneways. If soil is impacted by compaction, compensate by restoring areas with new soil, as required.

.1 Avoid the use of heavy machinery in areas of sensitive slopes. Avoid using machinery on land during wet weather.

SECTION: 014500 QUALITY CONTROL

PART 1 - GENERAL

1.1 Inspection

.1 Canadian Coast Guard or its representative shall have access to the work at all times. If parts of the work are prepared off-site or in a shop, access shall be given to such work throughout the duration of the project.

.2 In the event the work must be submitted to special testing, inspection or approvals prescribed by Canadian Coast Guard in these specifications or provided for in work-site regulations, the request for inspection must be made without unreasonable delay.

.3 The below list identifies key milestones where the Canadian Coast Guard will require an opportunity to take samples/inspect:

.1 Location verification: The Coast Guard will confirm correct location for installation upon arrival of the barge at site. The contractor shall be required to provide access to the site at all times to CCG site staff.

.2 Pre-tensioning: The Coast Guard shall witness the pre-tensioning of the all-thread rods to the prescribed torque values.

.3 Installation of tower: The Coast Guard shall witness the erection of the new nav-aid tower and witness correct operation of the new light.

1.2 Procedures

.1 Provide Canadian Coast Guard with advance notice whenever testing is required in accordance with these specifications, so that all parties involved can be present.

.2 Provide necessary manpower and installations for obtaining and handling samples and material on site.

.3 Provide access to site if the site is of remote nature whereby the contractor is responsible for providing access to the site

1.3 Rejected Work

.1 Remove defective work, whether incorporated into the work or not, which has been rejected by Canadian Coast Guard as failing to comply with the contract documents. Replace or re-execute in accordance with the Contract Documents.

1.4 Tests and Mixture Formulas

.1 Supply test reports and required mixture formulas.

1.5 Factory Tests

.1 Submit test certificates as prescribed in the relevant section of the specifications.

1.6 Acceptance of Work

.1 Canadian Coast Guard will make acceptance visits of work executed by the Contractor at critical milestones identified in the following sections.

.2 The Contractor shall inform Canadian Coast Guard at least three (3) working days before these inspection visits.

.3 All work shall be completed in compliance with the specifications before requesting the visit for inspection. If the work is not completed or deemed non-compliant, the Contractor shall be responsible for all costs incurred for subsequent inspections.

SECTION: 016100 COMMON PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 General

.1 Secure Coast Guard approval of all products to be incorporated into the works. Work shall not commence until product data and/or samples have received Coast Guard approval.

.2 Supply and/or fabricate material and equipment of prescribed quality, with performance conforming to established standards.

.3 Use new material and equipment unless otherwise specified.

.4 Ensure replacements parts may be readily procured.

.5 Use products from one manufacturer for material and equipment of same type or classification, unless otherwise specified.

1.2 Manufacturer's Instructions

.1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.

.2 Notify Canadian Coast Guard in writing of any conflict between these specifications and manufacturer's instructions; Canadian Coast Guard will designate which document is to be followed.

1.3 Compliance

.1 When material or equipment is specified by standard or performance specifications, upon request of Canadian Coast Guard, obtain an independent testing laboratory report from the manufacturer, stating that material or equipment meets or exceeds specified requirements.

1.4 Substitution

.1 Where specific products have been specified, proposals for substitution may only be submitted after award of contract. Such requests must include statements of respective costs of items originally specified and the proposed substitution.

.2 No substitutions will be permitted without prior written approval of Canadian Coast Guard. Substitutions will be considered by Canadian Coast Guard only when:

.1 Materials specified in Contract Documents, are not available; or,

.2 Delivery date of materials selected from those materials specified would unduly delay

completion of contract; or,

.3 Alternative materials to those specified which are brought to the attention of and considered by Canadian Coast Guard as equivalent to the material specified will result in a credit to the Contract amount.

.3 Should the proposed substitution be accepted either in whole or in part, the Contractor must assume full responsibility and costs when such substitution affects other work on the project including any and all design or drawing changes required as a result of substitution.

1.5 Submittals

.1 Provide product specifications and/or samples upon request from Coast Guard.

SECTION: 024000 DEMOLITION

PART 1 - PART 1 - GENERAL

1.1 Scope of Work

.1 Work under this section consists of the provision of all labour, materials, and equipment necessary to complete the following activities:

.1 Demolition of the existing concrete apron;

.2 Trenching and removal of existing asphalt leading up to and around the Concrete TLOF pad;

1.2 References

.1 Work under this section shall be undertaken in strict conformance with all listed references, In the case of any conflict or discrepancy the more stringent requirements shall apply.

.1 Canada Labour Code Part II - January 2008.

.2 NRC-CNRC National Building Code of Canada 2005.

.3 Ontario Occupational Health and Safety Act and Regulations, 2009.

.4 CSA S350-[M1980(R1998)], Code of Practice for Safety in Demolition of Structures.

1.3 Submittals

.1 Contractor to provide demolition plan.

.1 Deadline:

.1 With Construction Plan.

.2 Deliverables:

.1 Method of demolition including all associated tasks and schedule;

.2 Methods for protecting the site from demolition debris, specifically dust produces from saw cutting.

.3 The ultimate disposal location of all waste materials and debris.

.1 Include documentation detailing regulatory approval for waste disposal facility and transporter.

.2 Work under this section shall not proceed until written approval of the demolition plan has been received from the Coast Guard.

.3 Submit copies of certified receipts from the disposal sites for all material removed from the work site upon request.

1.4 Existing Conditions

.1 Photos of the existing conditions are included in Appendix A.

PART 2 - PART 2 - PRODUCTS

2.1 Not used.

PART 3 - PART 3 - EXECUTION

3.1 General

.1 Work under this section shall be continuous and proceed without interruption unless otherwise approved be Coast Guard.

.2 The coast guard will require two [2] weeks advanced notice prior to the demolition of the concrete apron at the hangar door.

3.2 Protection

.1 Implement effective controls to catch/collect all debris during demolition, specifically dust created during saw cutting of asphalt and concrete.

.2 Implement effective controls to prevent injury to workers, property, and local traffic, specifically dust during saw cutting of asphalt and concrete.

3.3 Preparation

.1 Erect warning signs and barricades prevent access to the construction site.

.2 Ensure all environmental protection/mitigation measures are in place.

.3 Ensure all items identified for salvage have been removed and stored.

3.4 Demolition

.1 Saw cut and remove the concrete apron as identified on the drawings provided in appendix C

.2 Saw cut and remove asphalt pavement to create a trench for cable/conduit as identified in appendix C.

.3 Size and details of the trench shall be clearly defined in the detailed design documents.

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

.5 Ensure demolition is undertaken safely. If at any period during demolition the safety of the Contractor's staff cannot be maintained take preventative measures, stop work and immediately notify Coast Guard.

3.5 Disposal

.1 All material is to be disposed of off-site and a licensed disposal/recycling facility.

SECTION: 033000 CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 Scope of Work

.1 Work of this section includes the supply of all labour, material, and equipment, necessary to complete the following:

.1 Design and installation of a reinforced concrete apron in the location identified in the drawings in appendix C.

1.2 References

.1 Work under this section shall be undertaken in strict conformance with all listed references, In the case of any conflict or discrepancy the more stringent requirements shall apply.

.1 Canada Labour Code Part II - January 2008

.2 NRC-CNRC National Building Code of Canada 2010

.3 Ontario Occupational Health and Safety Act and Regulations

.4 CAN/CSA-A23.1-04 Concrete Materials and Methods of Concrete Construction

.5 CAN/CSA A23.2-04 Methods of Test and Standard Practices for Concrete

.6 CAN/CSA-G30.18 Billet Steel Bars for Concrete Reinforcement

.7 CAN/CSA S269.3 Concrete Formwork

.8 ACI Specification 306 Cold Weather Concreting

1.3 Submittals

.1 Submittals shall be forwarded to Coast Guard in accordance with the provisions of section 013530.

.2 Design Package (Cast-in-place Concrete Apron):

.1 Deadline: with Design Package

.2 Deliverables:

.1 Stamped design details for a reinforced concrete apron. The design shall be submitted to CCG for review prior to commencing any work. Only upon approval of the design drawings shall work commence.

.3 Concrete placement methods and curing procedures and Mix Design

.1 Deadline: with Construction Plan (Section 011100)

.2 Deliverables:

.1 Detailed written description of concrete placement, including:

.1 Mix Design

.2 Mixing plan identifying how and where the mix will be batched, including anticipated haul routes/distances;

.3 Placement methods and procedures;

.4 Location of necessary cold joints and/or saw cuts;

.5 Finishing procedures;

.6 Curing methods and schedule;

.7 Clean-up procedures; and,

.8 Mitigation measures to account for hot or cold temperatures where reasonably anticipated during the construction period.

.4 As-built and Quality Control:

.1 Deadline: 28 days following completion of construction activities (Section 011000)

.2 Deliverables:

.1 Red-lined drawings showing all changes from the sealed design drawings (if any).

.2 Confirmation of subgrade verification by the designing engineer or a delegated authority.

.3 Concrete test results.

.4 Compaction test results for the subgrade.

1.4 Quality assurance and Quality Control

.1 The Contractor shall be responsible for providing qualified personnel (either internal or third party) adequately prepared to confirm the following:

.1 Witness concrete placement ensuring compliance with this specification as well as with the stamped drawings;

.2 Provide subgrade verification in accordance with the designers requirements;

.3 Complete sampling of plastic concrete and undertake at least three strength measurements (one (1) at seven (7) and two (2) at 28 days) during the curing process;

.4 Complete sampling of plastic concrete confirming correct air entrainment and slump;

.5 The results of the Contractor's quality control testing are to be provided to Canadian Coast Guard.

PART 2 - PRODUCTS

2.1 Formwork

.1 Shall be in accordance with CAN CSA S269.3.

2.2 Concrete

.1 Concrete shall possess the minimum characteristic detailed in the stamped design drawings.

.1 Concrete must be air entrained, class F-1 or better.

2.3 Water

.1 Water utilized for the production of concrete must be potable, unless otherwise approved in writing by Coast Guard.

2.4 Reinforcement

.1 Reinforcing steel must be as mandated in CAN CSA A23.1

PART 3 - EXECUTION

3.1 General

.1 Concrete must be placed, finished, and cured in accordance with the Contractor's submitted construction plan, and in accordance with the stamped drawing.

.2 Ensure that the concrete is flush with the surrounding surfaces.

.3 Efforts must be made to ensure that the trolley used to hoist the helicopters stored in the hangar (very low clearance cart) will be able to pass onto and off of this apron without grounding out. This must be confirmed in the design stages, and will require a site visit.

3.2 Design

.1 Design shall clearly identify the location and use of the apron.

.2 Design shall include any material or construction specification deemed important to the designing engineer.

.3 Design shall clearly address how the cart will be able to travel across the apron without grounding out.

.4 Design shall clearly identify the finishing requirements of the apron.

.5 Design shall clearly identify the mix properties of the concrete.

.6 The finished design shall be drawings issued by an engineer licensed to practice in the province of Ontario. A written statement of work or specification is not necessary.

.7 Drawings may be issued electronically only.

3.3 Preparation

.1 Remove all loose and deleterious material.

.2 Construct forms as detailed in the submitted construction plan, and design drawings.

.3 Place reinforcement in accordance with Contract Drawings.

.4 Surfaces must be heated as necessary to account for climatic conditions at the time of the pour.

3.4 Placement

.1 Concrete placement shall not commence until formwork and reinforcement have been inspected by the designer.

.2 Contractor shall place, finish and cure concrete as per CAN CSA A23.1 making all adjustment necessary to account for climatic conditions anticipated during the curing period.

.3 Concrete shall be placed in one continuous pour.

.1 The development of cold joints must be previously approved in writing (Construction Plan).

.4 Cut control joints where specified.

3.5 Curing

.1 Concrete curing must be undertaken in accordance with CAN CSA A23.1 and the Contractor's approved Construction Plan.

.2 Curing regiment employed must take into account local climatic conditions reasonably anticipated to occur during the curing period.

SECTION: 310000 EARTHWORK

PART 1 - GENERAL

1.1 General

.1 Work of this section includes the supply of all labour, material and equipment required to complete:

.1 The excavation for the installation of 12 flush mount TLOF lights, including trenching for cables to run from building to TLOF area:

.1 Stripping and removing offsite any soils deemed unsuitable for backfill by the design engineering;

.2 Backfilling of the excavation, including:

.1 Supply of all required materials;

.2 Placement and compaction of granular material.

.2 The restoration of all disturbed areas within the work site.

1.2 References

.1 Work under this section shall be undertaken in strict conformance with all listed references, In the case of any conflict or discrepancy the more stringent requirements shall apply.

.1 Canada Labour Code Part II - January 2008.

.2 NRC-CNRC National Building Code of Canada 2010.

.3 Ontario Occupational Health and Safety Act and Regulations.

.4 Any and all other Provincial/Territorial Regulations and Policies; Worker's Compensation Board Policies; Local municipal regulations; pertaining to work of this section.

1.3 Submittals

.1 Submittals shall be forwarded to Coast Guard in accordance with the provisions of section 013530.

.2 Design Package (Subgrade):

.1 Deadline: with Design Package

.2 Deliverables:

.1 Stamped design details shall include details of subgrade materials and compaction procedures necessary to support both the concrete apron and asphalt repairs. The design

shall be submitted to CCG for review prior to commencing any work. Only upon approval of the design drawings shall work commence.

.3 As-built and Quality Control:

.1 Deadline: 28 days following completion of construction activities (Section 011000)

.2 Deliverables:

.1 Compaction test results and gradations test results for areas under both the asphalt and under the concrete.

1.4 Existing Conditions

.1 Before commencing work under this section the Contractor must establish the location of all buried services that may interfere with the execution of the work.

1.5 Quality assurance and Quality Control

.1 The Contractor shall be responsible for providing qualified personnel (either internal or third party) adequately prepared to confirm the following:

.1 Gradation test results for all granular materials supplied to the project;

.2 Complete subgrade compaction testing as lifts are placed;

.3 Provide subgrade verification in accordance with the designer's requirements.

PART 2 - PRODUCTS

2.1 General

.1 All materials described in this section shall be supplied by Contractor.

2.2 Water

.1 Shall be free of deleterious material.

2.3 Backfill

.1 Excavated materials may be used for backfill at the discretion of the stamping engineer. Alternately, backfill materials shall be as specified by the engineer in the stamped drawings.

2.4 Aggregates for use in asphalt paving

.1 Materials shall be as specified by the engineer in the stamped drawings.

PART 3 - EXECUTION

3.1 Site Preparation

.1 Prior to commencing excavation, document the condition of all existing structures, landscaping, roadways, and other adjacent facilities anticipated to be impacted by the work.

.2 Install any features required to protect existing infrastructure, and to ensure that CCG base employees are warned of equipment operations.

.3 The contractor shall be responsible for performing locates.

3.2 Design

.1 Design shall include any material or construction specification deemed important to the designing engineer.

.2 Design shall show and account for the installation of buried conduit and flush mount (or inset) lights around the TLOF area. The designer is not expected to design the electrical components

.3 Design shall clearly identify material requirements for the subgrade materials.

.4 Design shall clearly identify installation procedures that are to be followed in installing the subgrade materials.

.5 The finished design shall be drawings issued by an engineer licensed to practice in the province of Ontario. A written statement of work or specification is not necessary.

.6 Drawings may be issued electronically only.

3.3 Excavation

.1 Excavate a trench in the area indicated in Appendix C.

.2 Excavate any areas under the apron deemed as unsuitable.

.1 Remove off site at a licensed and approved disposal site.

3.4 Backfill

.1 Backfill shall occur in two stages:

.1 Backfill and compact to a level suitable to support all conduit and cans for TLOF lights.

.2 Upon completion of electrical installation by CCG electrician, backfill to the underside elevation of asphalt or concrete.

.2 Ensure that surrounding soil is unfrozen or take measures required to thaw frozen materials.

.3 Backfill to be placed in uniform lifts to a maximum depth of 0.2m (8") and compacted to 100% SPMDD, or as otherwise identified by the design drawings.

3.5 Restoration

.1 Restore all disturbed areas within work area and along haul routes. Fill and grade all ruts. Ensure positive drainage away from completed and existing foundations.

SECTION: 321216 ASPHALT PAVING

PART 1 - GENERAL

1.1 General

.1 Work of this section includes the supply of all labour, material and equipment required to complete:

.1 The design and installation of asphaltic courses to repair the trenched asphalt:

.1 Provide detailed design of the asphalt repair;

.2 Supply and Install asphalt in accordance with the stamped drawings.

1.2 References

.1 Work under this section shall be undertaken in strict conformance with all listed references, In the case of any conflict or discrepancy the more stringent requirements shall apply:

.1 Canada Labour Code Part II - January 2008;

.2 NRC-CNRC National Building Code of Canada 2010;

.3 Ontario Occupational Health and Safety Act and Regulations;

.4 American Association of State Highway and Transportation Officials (AASHTO)

.1 AASHTO M320-[02], Standard Specification for Performance Graded Asphalt Binder.

.2 AASHTO R29-[02], Standard Specification for Grading or Verifying the Performance Graded of an Asphalt Binder.

.3 AASHTO T245-[97(2001)], Resistance to Plastic flow of Bituminous Mixtures Using Marshall Apparatus

.5 Any and all other Provincial/Territorial Regulations and Policies; Worker's Compensation Board Policies; Local municipal regulations; pertaining to work of this section.

1.3 Submittals

.1 Submittals shall be forwarded to Coast Guard in accordance with the provisions of section 013530.

.2 Design Package (Asphaltic courses):

.1 Deadline: with Design Package

.2 Deliverables:

.1 Stamped design details shall include details of asphaltic materials, placement, and

compaction procedures. The design shall be submitted to CCG for review prior to commencing any work. Only upon approval of the design drawings shall work commence.

.3 As-built and Quality Control:

.1 Deadline: 28 days following completion of construction activities (Section 011000)

.2 Deliverables:

.1 Compaction test results, and gradation test results for asphalt courses.

1.4 Quality assurance and Quality Control

.1 The Contractor shall be responsible for providing qualified personnel (either internal or third party) adequately prepared to confirm the following:

.1 Complete asphalt compaction testing;

.2 Gradation test results for aggregates used in asphalt mix.

.2 Results of testing shall be forwarded to CCG upon completion of the work.

PART 2 - PRODUCTS

2.1 General

.1 All materials described in this section shall be supplied by Contractor.

2.2 Asphaltic courses:

.1 Shall be clearly identified in the stamped drawings, and shall be supplied in accordance with the drawings.

PART 3 - EXECUTION

3.1 Design

.1 Design shall clearly identify the location and use of the asphalt paving.

.2 Design shall show and account for the installation of buried conduit and flush mount (or inset) lights around the TLOF area. The designer is not expected to design the electrical components, but shall incorporate into his design. Cut sheets for pre-purchased lights are provided in Appendix C.

.3 The engineer shall clearly indicate the mix design to be used for each asphalt course.

.4 Design shall clearly identify the material properties of the granulars to be used in the mix design.

.1 It is preferable to CCG that reclaimed asphalt paving is used in the mix design, but RAP shall not exceed 50%. The engineer responsible for the design of the asphalt shall ensure that

this meets his requirements.

.2 Gradation requirements shall be identified.

.5 Design shall account for the locally available asphalt producers/contractors.

.6 Design shall clearly identify the installation procedures that shall be followed when placing the asphalt courses.

.7 The finished design shall be drawings issued by an engineer licensed to practice in the province of Ontario. A written statement of work or specification is not necessary.

.8 Drawings may be issued electronically only.

3.2 Placing

.1 Strip topsoil over areas impacted by new construction. Stockpile materials on-site

.2 Excavate the area indicated in Appendix B3.

.1 Side slopes must be maintained around the perimeter of the excavation in accordance with provincial legislation.

.3 Take all reasonable precautions to minimize the disturbance of the existing vegetation.

3.3 Compaction

.1 Ensure that surrounding soil is unfrozen or take measures required to thaw frozen materials.

.2 Backfill to be placed in uniform lifts to a maximum depth of 0.2m (8") and compacted to 95% SPMDD.

APPENDIX A: SITE LOCATION AND PHOTOGRAPHS

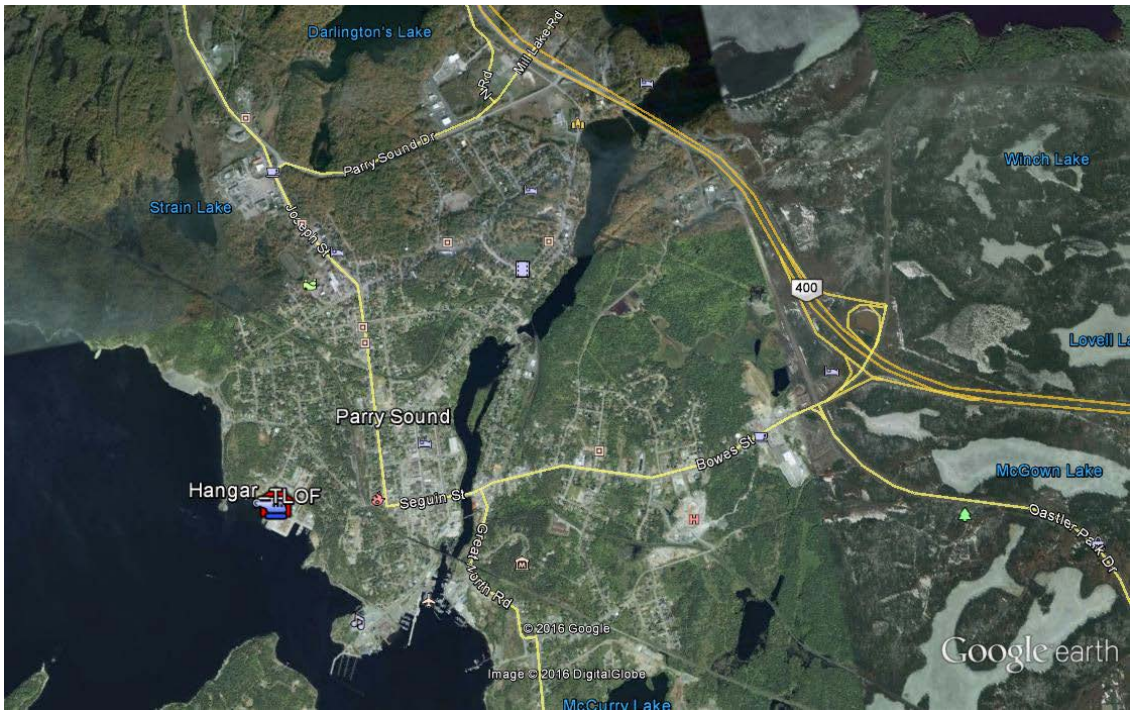


Figure 1: CCG Base Parry Sound Location 45°20'37.96"N, 80° 2'38.95"W

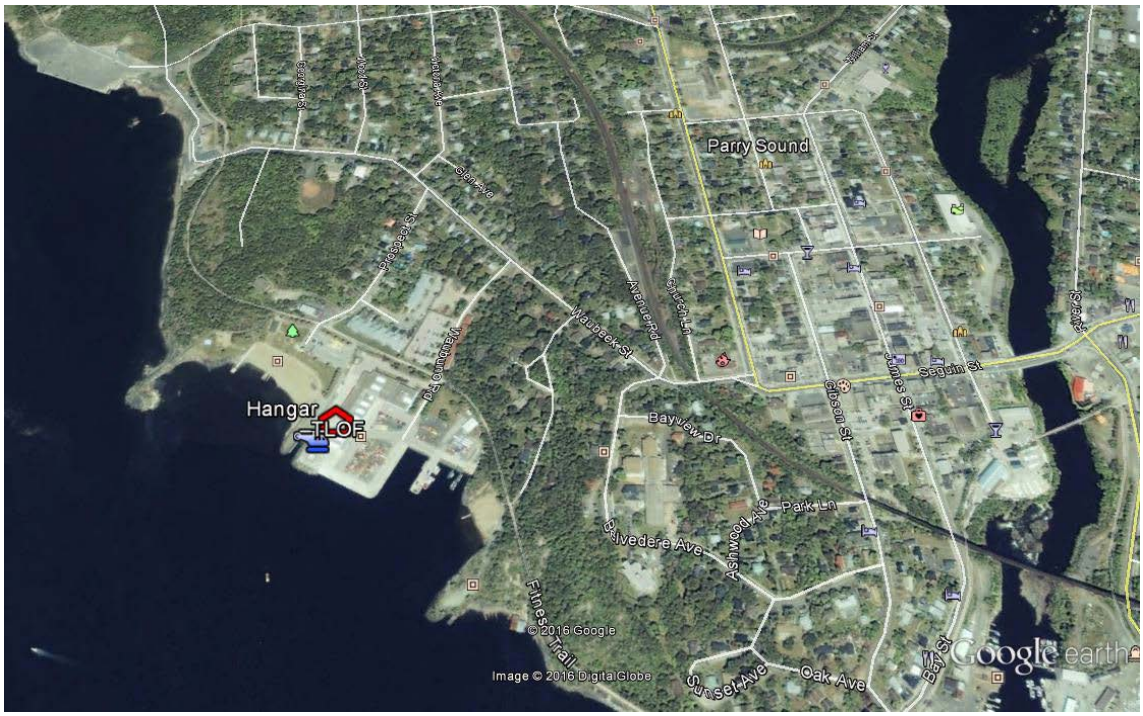


Figure 2: CCG Base Parry Sound Location

Figure 3: Hanger and TLOF are at CCG Base Parry Sound

Figure 4: Hangar doors, and buried concrete apron

Figure 5: Hangar doors

Figure 6: Behind the Station. Embankment climbs towards Bluewater Ave.

Figure 7: Existing Tower Base

Figure 8: Existing Tower

Figure 9: Existing tower.

APPENDIX B – SUMMARY OF SUBMITTALS

Following Contract Award	
Submission Description	***Section(s)***
Deadline: 10 working days following award	
Detailed Schedule:	*011100*
Deadline: 30 working days following award	
Design Package including concrete apron, any backfill material, and asphalt Paving design.	*011100* *033000* *310000* *321216*
Deadline: 10 working days prior to mobilization	
Construction Plan a) Project specific safety program b) Project environmental protection program c) Detailed demolition plan d) Concrete plan7	 *013530* *013543* *024116* *033000*
Deadline: 28 calendar days following acceptance of the works	
As-built drawings Compaction test results Gradation test results Concrete test results	*033000 & 133613* *033000* *033000*

APPENDIX C – DRAWINGS & CUT SHEETS

CAD PRODUCED DRAWING
PRODUIT PAR DAO

inches / pouces

REPORT ANY ERRORS OR OMISSIONS TO AMSS SUPERVISOR
SIGNALER LES ERREURS OU LES OMISSIONS AU SUPERVISEUR SGAS

DWG NO - NO DES

TANKS
FILL PIPES
2.1 x 5.6
10,500
178 400
A COLUMN LINE
17m
G
178 450
178 450
178 400
TOP OF WALL 179 400
SWALE
ASPHALT SPILLWAY
CONCRETE APRON
7500
800
EXPANSION JOINT
7.5m
3m
FUEL DISPENSER
CONC CURB
23
07 08
ASPHALT PAVING
(MEDIUM DUTY)
Removed Concrete Apron
Trench Through Asphalt
13.5m
EXISTING CONC PAD
CONCRETE APRON
CONTROL JOINTS
TOP 178
178 200
10m
17 400
178 100
EXPANSION JOINT
178 100
178 300
9144 x 9144
CONC. PAD
10m
13 150
29
07 011
ASPHALT PAVING

millimeters / millimètres

Fisheries and Oceans Canada / Pêches et Océans Canada
Canadian Coast Guard / Garde côtière Canadienne

Vendor / Sous-traitant

Measurements are rough, based on field observations

0	DESCRIPTION	BY	DATE
rev	description	by par	date

Asset - Actif

CCG BASE PARRY SOUND
HELO PAD

Drawing - Dessin

TRENCH DIAGRAM

drawing no. - no. dessin		date
S. GADE		2016-04-11
designed - conception		date
DESIGNED		YYYY-MM-DD
checked - vérifié		date
CHECKED		YYYY-MM-DD
approved - approuvé		date
APPROVED		YYYY-MM-DD
CCG project no. - no. projet GCC	scale - échelle	
AFI25	NTS	
drawing no. - no. dessin	sheet-feuille	rev
DWG NO - NO DES	01/01	0

ANSI B

PARRY SOUND HELO BASE.DWG - April-12-16 12:13:20 PM

Light Bases

Compliance with Standards

FAA: L-867 & L-868 AC 150/5345-42 (Current Edition)

Uses

FAA L-867	Applications subject to occasional light vehicular loads but no aircraft or other heavy vehicular loads. Some product applications are: • Elevated Lights • Navaids such as Precision Approach Path Indicators (PAPI), Runway End Identifier Lights (REIL), and ALSF/MALSR Approach Systems • Signs • Junction/Splice Box
FAA L-868	Applications subject to aircraft and other heavy vehicular loads. Some product applications are: • Runway In-pavement Lights • Taxiway In-pavement Lights • Junction/Splice Box

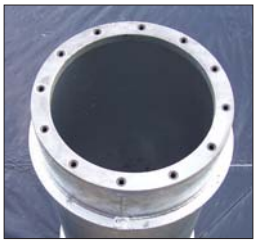
Features

- One- and two-piece configurations
- Extensions and spacers available
- Manufactured in the USA by ETL-Certified suppliers
- Supplied with 2-2" grommeted or threaded hub openings at 0-180° (standard). Optional locations and sizes available.
- All bases provided with an internal and external ground strap
- One copper ground lug kit provided with each base (standard). A second ground lug kit can be provided as an option.
- Optional drain hole or hub in user-specified sizes
- Standard bases provided as Class IA, galvanized steel unless otherwise specified
- Optional Class IB available in stainless steel or internal epoxy coating. See ordering code for options.

Optional Replaceable Threaded Inserts

Optional RTI (replaceable threaded insert) system facilitates:

- Replacement of failed threaded fixture-mounting bolt holes
- Replacement of stripped, sheared, cross-threaded, frozen fixture-mounting bolts
- Does not require changing the azimuth location of the base bolt circle
- Accommodates standard, non proprietary spacer rings and flange rings (with/without dam rings)



L-868 Replaceable Insert

Optional Replaceable Threaded Inserts (Continued)

- Kit part numbers to add RTI to L-867/L-868 bases:
  - L-867 Base – L867RTI06 (set of six inserts)
  - L-868 Base – L868RTI12 (set of twelve inserts)

L-867 Light Base

Notes

- Tapped holes in top flange rings are located on centerline of couplings. Tolerance: ±0.1875 inch (0.47 cm).
- Light bases available with either 2-inch (5.08 cm) NPT hub or 2-inch (5.08 cm) grommet openings. Couplings located 180° apart. Tolerance: ±1°.
- Threads inside couplings are protected with L.D.P.E. plugs
- All light bases provided with an Exterior Grade CC plywood shipping cover that is 0.5-inch (1.27 cm) thick grade CC with 0.4375-inch (1.11 cm) diameter bolt holes
- Six 3/8-inch-16 x 1-inch stainless steel machine screws secure the plywood shipping cover to the light base
- Optional second ground lug kit for grounding provision and/or drain coupling or weep hole must be specified when ordering
- Finish is hot dip galvanized per ASTM A123/A123M-02 and A153 or material is 304 stainless steel
- Standard lengths for the 12-inch (30.48 cm) diameter light base are 20 inches (50.8 cm) and 24 inches (60.96 cm) with a tolerance of ±0.25 inch. Standard lengths for the 16-inch (40.64 cm) diameter light base are 20 inches (50.80 cm) and 24 inches (60.96 cm) with a tolerance of ±0.25 inch. Standard lengths for the 24-inch (60.96 cm) diameter light base are 20 inches (50.80 cm) and 24 inches (60.96 cm) with a tolerance of ±0.25 inch. Custom heights available.
- Adjustable L-867 telescoping bases available. Please contact the ADB Sales Department for details.

Dimensions - L-867

Inches				
Nom. Dia.	**"A"**	**"B"**	**"C"**	**"D"**
12.0	13.500	10.250	12.250	9.250
16.0	17.375	14.250	16.250	12.375
24.0	24.000	21.500	22.500	20.000
Centimeters				
Nom. Dia.	**"A"**	**"B"**	**"C"**	**"D"**
30.5	34.290	26.035	31.115	23.495
40.6	44.133	36.195	41.275	31.433
61.0	60.960	54.610	57.150	50.800

L-868 Light Base

Notes

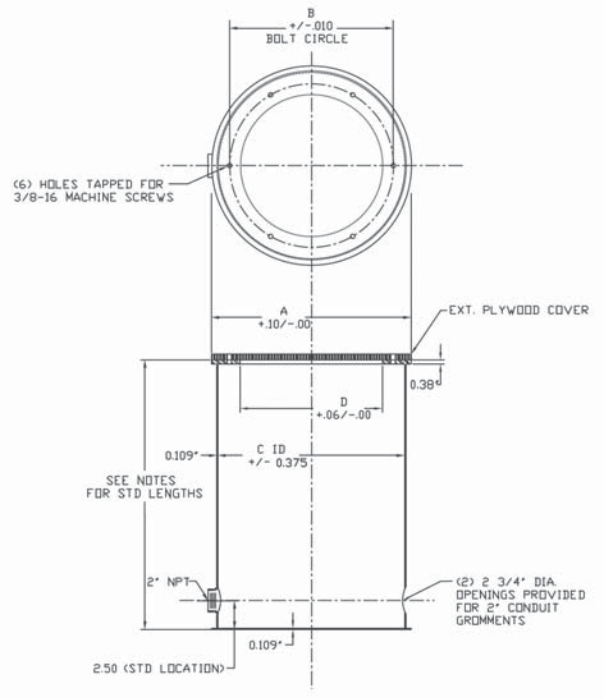
- Light bases available with either 2-inch (5.08 cm) NPT hub or 2-inch (5.08 cm) grommeted openings. Couplings or grommeted openings located 180° apart. Tolerance: ±1°
- Threads inside hubs are protected with L.D.P.E. plugs
- All light bases are provided with a nylon (standard) or plywood (optional) shipping cover:
  8-in (20.3 cm) Nom. O.D.: 8.5-in dia. x 0.750-in thick (21.590 cm x 1.905 cm)
  12-in (30.5 cm) Nom. O.D.: 12.5-in dia. x 0.750-in thick (31.75 cm x 1.905 cm)
  15-in (38.1 cm) Nom. O.D.: 17.750-in dia. x 1.25-in thick (45.085 cm x 3.175 cm)
- Six $^{3}/_{8}$-inch -16 x 1-inch stainless steel machine screws secure the plywood shipping cover to the light base
- Finish is hot dip galvanized per ASTM A123/A123M-02 and A153 or material is 304 stainless steel
- Optional Equipment – Second ground lug kit for grounding provision, drain coupling or opening. Anti-rotation bars must be specified when ordering.

Dimensions - L-868

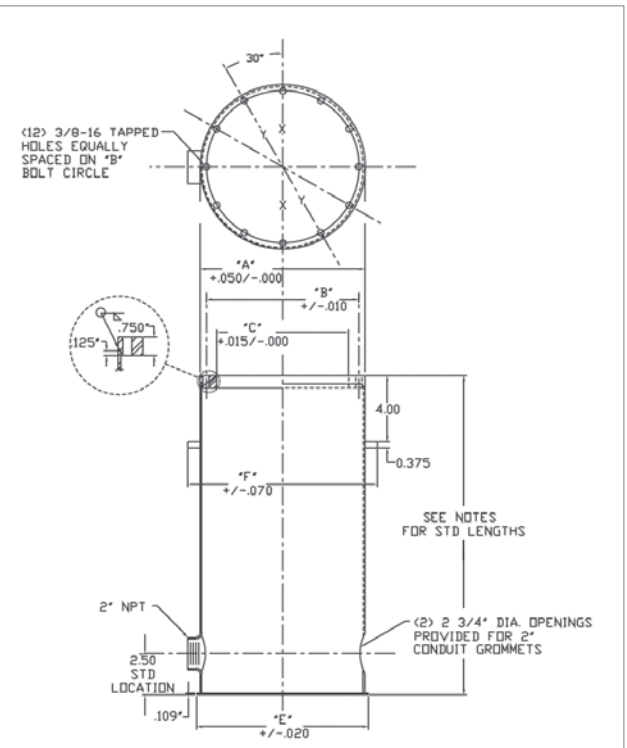
Inches					
Nom. Dia.	**"A"**	**"B"**	**"C"**	**"E"**	**"F"**
8.0	8.5000	7.250	6.500	9.000	10.000
12.0	12.500	11.25	10.000	13.000	14.000
15.0	15.500	14.25	13.000	16.000	17.000
Centimeters					
Nom. Dia.	**"A"**	**"B"**	**"C"**	**"E"**	**"F"**
25.4	21.590	18.415	16.510	22.860	25.400
30.5	31.750	28.575	25.400	33.020	35.560
38.1	39.370	36.195	33.020	40.640	43.180

Base Options

Description	Part No.
(4) side-mounted, anti-rotation fins in 90° pattern. Typically used with L-868 load bearing bases.	ANTI-FIN
(6) bottom-mounted, anti-rotation hooks/bars in 60° pattern. Typically used with shallow L-868 load bearing bases.	ANTI-HOOK
Copper Ground Lug Kit. (Each base supplied w/one).	0919



Typical L-867D - All dimensions shown in inches



Typical L-868 - All dimensions shown in inches

Ordering Code

FAA Type & Size
867B = 12” diameter
867BT = Telescoping, 12” diameter
867D = 16” diameter
867DT = Telescoping, 16” diameter
867DD = 16” diameter with 0.5” dam
867E = 24” diameter
868A = 8” diameter
868AB = Bottom section, 8” diameter
868B = 12” diameter
868BB = Bottom section, 12” diameter
868C = 15” diameter
868CB = Bottom section, 15” diameter

Height
20 = 20 inches overall height
24 = 24 inches overall height
XX = Customer specified in inches

Type of Opening
B = Mixed type and/or size[1]
C = 2-inch Coupling
F = 2-inch Flex (Grommet)
G = 3-inch Flex
H = 3-inch Coupling
S = 0.75-inch Coupling
T = 0.75-inch Flex

Opening Quantity & Location
1 = One opening at 0°[3]
2 = Two openings at 0°, 180°
3 = Three openings at 0°, 90°, 180°
4 = Four openings at 0°, 90°, 180°, 270°
5 = Five openings at 0°, 0°, 90°, 180°, 180°
6 = Six openings - customer specified
9 = Two openings at 0°, 90°[3]
A = Three 2” flex at 0°, 90°, 180°, one 2” coupling at 270°[2]
B = One 2” flex at 0°; one 3” flex at 180°[2]
C = One 2” coupling at 0°; one 3” coupling at 180°[2]

Drain Type
C = Coupling
F = Flex (Grommet)
H = Hole
N = None

Drain Size
0 = None
1 = 1 inch
2 = 2 inch
3 = 0.75 inch
4 = 0.5 inch
5 = 0.5 inch offset, 3.5 inches from center
6 = 0.75 inch offset, 3.5 inches from center
7 = 1 inch offset, 3.5 inches from center

Class IB or RWSL Options
SS = Stainless steel
PA = Potassium acetate resistant (PAR), internal coating; external is galvanized
01 = With 48” 1/0 bare copper earth ground wire
Z0 = RWSL copper clamp (PN AGNDSSASSY0_3125) w/out earth ground wire
Z1 = RWSL copper clamp with externally attached 48” 1/0 bare copper earth ground wire

Notes
[1] Only use with options A, B or C under Opening Qty & Location
[2] Only use with option B under Type of Opening

L-867 Base Plate and Gasket

Notes
- Gasket suitable for locations where heat is not present, such as elevated edge lights, edge light extensions, transformer boxes, or junction boxes
- Base plate finish is oxide primer and aviation yellow enamel
- Base plate individually packed with neoprene gasket, steel cable clamp and screws for securing L-823 connector, and assembly instructions
- High-strength 1832RGL base plate is mandatory for FAA L-804 applications and should be used for ICAO applications.

Dimensions - Base Plate

Inches				
Nom. Dia.	**“A”**	**“B”**	**“C”**	**“D”**
12	12.000	10.250	7.875	0.625
16	16.000	14.250	11.125	0.750
Centimeters				
Nom. Dia.	**“A”**	**“B”**	**“C”**	**“D”**
30.5	30.48	26.035	20.002	1.588
40.7	40.65	36.195	28.258	1.905

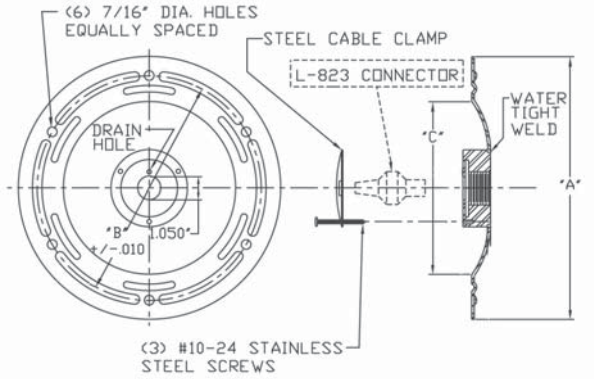
L-867 Base Plate Ordering Code

Base Plate
19 = 12 in, L-867B
29 = 16 in, L-867D

Thread Size
32 = 2 in TPI
35 = 1.5 in - 12 TPI

Material
n/a = None
G = With ground lug

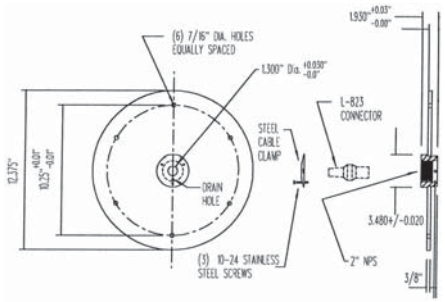
Note: L-867 Base Plate includes gasket. See bullet 3 above.



L-867 Base Plate - All dimensions shown in inches

Notes (Continued)
[3] Base must have opening at 0° and 180° to allow for draining of the galvanizing materials. A solid grommet will be installed at 180°.

L-867 Base Plate and Gasket (Continued)



1832RGL Base Plate - All dimensions shown in inches

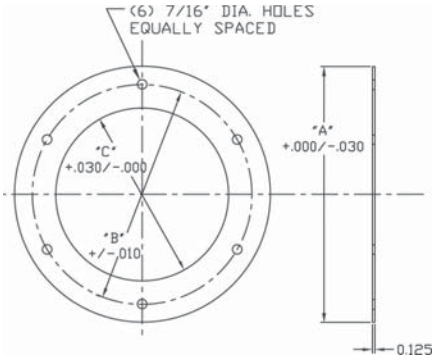
Dimensions - Neoprene Gasket

Inches			
Nom. Dia.	**"A"**	**"B"**	**"C"**
12	11.938	10.250	9.312
16	15.938	14.250	12.438
24	23.750	21.500	20.000
Centimeters			
Nom. Dia.	**"A"**	**"B"**	**"C"**
30.5	30.232	26.035	23.652
40.7	40.483	36.195	31.593
60.96	60.325	54.610	50.800

Neoprene Gasket Ordering Code

52 ☐☐

Base Plate
20 = 12 in, L-867B
60 = 16 in, L-867D
70 = 24 in, L-867E



Neoprene Gasket - All dimensions shown in inches

L-867 / L-868 Blank Steel Cover

Notes

- "T" = thickness in sixteenths of an inch. Specify thickness when ordering.
- $^{7}/_{16}$-inch (1.113 cm) diameter bolt holes have 1-1/8-inch (2.858 cm) diameter counter bore when cover thickness is 0.50 inch (1.27 cm) or greater
- Finish is hot dip galvanized per ASTM A123/A123M-02 and A153
- Blank steel covers do not include bolts or gaskets

Dimensions - L-867 / L-868 Blank Steel Cover

Inches						
Dia. Base	**12 L-867**	**16 L-867**	**24 L-867**	**8 L-868**	**12 L-868**	**15 L-868**
"X" O.D.	13.500	17.375	24.000	8.000	12.000	15.000
"Y" O.D.	10.250	14.250	21.500	7.250	11.250	14.250
"T" (Typ.)	0.375	0.375	0.500	0.750	0.750	1.250
Dimensions - Centimeters						
Dia. Base	**30.5 L-867**	**40.6 L-867**	**61 L-867**	**20.3 L-868**	**30.5 L-868**	**38.1 L-868**
"X" O.D.	34.290	44.133	60.960	20.320	30.480	38.100
"Y" O.D.	26.035	36.195	54.610	18.415	28.575	36.195
"T" (Typ.)	0.953	0.953	0.953	1.905	1.905	3.175

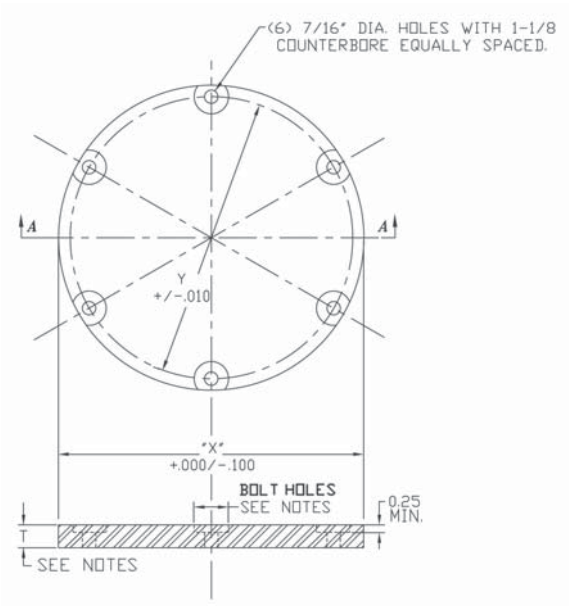
Steel Cover Ordering Code

000- ☐ **-** ☐☐

Diameter
1 = 13-1/2 in, L-867B
2 = 17-3/8 in, L-867D
4 = 12 in, L-868B
5 = 15 in, L-868C
7 = 24 in, L-867E
8 = 8 in, L-868A

Thickness
4 =1/4 in (L-867B only)
6 =3/8 in
8 =1/2 in
10 = 5/8 in
12 = 3/4 in
14 = 7/8 in
16 = 1 in
18 = 1-1/8 in
20 = 1-1/4 in

Material
(n/a) = Galvanized
SS = Sta inless Steel
PA = PAR Coated (Class 1B option)



Blank Steel Cover - All dimensions shown in inches

L-868 Flange Ring with Pavement Ring

Notes

- "T" = thickness in sixteenths of an inch. Minimum thickness is 0.375 inch (0.953 cm) and maximum thickness is 0.75 inch (1.905 cm). Specify when ordering.
- Finish is hot dip galvanized per ASTM A123/A123M-02 and A153 for flange ring
- Six $^{3}/_{8}$-16-inch x "T"-inch + $1^{1}/_{4}$-inch long stainless steel bolts. $^{3}/_{8}$-inch locking washers and O-ring gasket shipped with flange ring. If flange ring is to be stacked over spacer ring, please consult ADB Airfield Solutions for a bolt chart to obtain the appropriate bolt length and ordering information.

Dimensions - Flange Ring with Pavement Ring

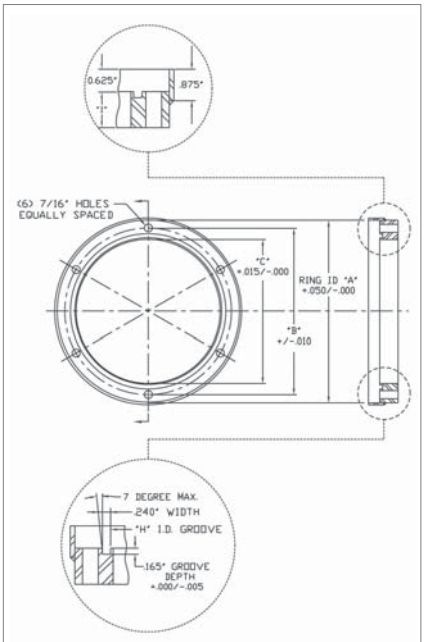
Inches				
Nom. Dia.	**"A"**	**"B"**	**"C"**	**"H"**
8"	8.160	7.250	6.500	6.645
12"	12.160	11.250	10.000	10.145
15"	15.160	14.250	13.000	13.145
Centimeters				
Nom. Dia.	**"A"**	**"B"**	**"C"**	**"H"**
20.3	20.726	18.415	16.510	16.878
30.5	30.798	28.575	25.400	25.768
38.1	38.506	36.195	33.020	3 .388

Flange Ring Ordering Code

Diameter
08 = 8 in
54 = 12 in
55 = 15 in

Thickness
4 = 1/4 in
6 = 3/8 in
8 = 1/2 in
12 =3/4 in

Material
(n/a) = Galvanized
SS = Stainless Steel
PA = PAR Coated (Class 1B option)



Flange Ring with Pavement Ring
All dimensions shown in inches

L-867 1.5-inch Nylon Composite Base Plate

Notes

- Nylon composite base plate designed for use in highly corrosive environments, such as coastal areas with high salt concentrations
- UV protectant and color are an integral part of nylon composite
- Base plate has a 12-inch diameter with six 7/16" diameter holes equally spaced on 10.25" bolt circle
- Base plate individually packed with:
  - Neoprene gasket
  - (6) 3/8" stainless steel washers
  - One copper ground lug
  - Steel cable clamp and screws for securing L-823 connector
  - Assembly instructions
- Aluminum center hub and aluminum inserts in bolt holes

Ordering Code **127B015P**

Product specifications may be subject to change, and specifications listed here are not binding. Confirm current specifications at time of order.

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B-1930 Zaventem
Belgium

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ADB
Airfield Solutions

User Manual

IUL-L

LED In-pavement Utility and Heliport Perimeter Light

96A0364, Rev. D,

A.0 Disclaimer / Standard Warranty

A.1 CE certification

The equipment listed as CE certified means that the product complies with the essential requirements concerning safety and hygiene. The directives that have been taken into consideration in the design are available on written request to ADB.

A.2 ETL certification

The equipment listed as ETL certified means that the product complies with the essential requirements concerning safety and FAA Airfield regulations. The directives that have been taken into consideration in the design are available on written request to ADB.

A.3 LED Product Guarantee

Where applicable, per FAA EB67(applicable edition), ADB L858(L) Airfield Guidance Signs are warranted against electrical defects in design or manufacture of the LED or LED specific circuitry for a period of 4 years. ADB LED light fixtures (with the exception of obstruction lighting) are warranted against mechanical and physical defects in design or manufacture for a period of 12 months from date of installation; and are warranted against electrical defects in design or manufacture of the LED or LED specific circuitry for a period of 4 years per FAA EB67 (applicable edition).

NOTE: See your sales order contract for a complete warranty description. In some specific cases, deviations are (to be) accepted in the contract, which will supersede the standard warranty.

A.4 Standard Product Guarantee

Products of ADB manufacture are guaranteed against mechanical, electrical, and physical defects (excluding lamps) which may occur during proper and normal use for a period of one year from the date of installation or 2 years from date of shipment and are guaranteed to be merchantable and fit for the ordinary purposes for which such products are made. ADB L858 Airfield Guidance Signs are warranted against mechanical and physical defects in design or manufacture for a period of 2 years from date of installation per FAA AC 150/5345-44 (applicable edition).

NOTE: See your sales order contract for a complete warranty description.

A.5 All Products

LED Products of ADB, manufactured and sold by ADB or its licensed representatives, meets the corresponding requirements of FAA, ICAO and IEC.

ADB will correct by repair or replacement per the applicable guarantee above, at its option, equipment or parts which fail because of mechanical, electrical or physical defects, provided that the goods have been properly handled and stored prior to installation, properly installed and properly operated after installation, and provided further that Buyer gives ADB Airfield Solutions written notice of such defects after delivery of the goods to Buyer. Refer to the Safety section for more information on Material Handling Precautions and Storage precautions that must be followed.

ADB reserves the right to examine goods upon which a claim is made. Said goods must be presented in the same condition as when the defect therein was discovered. ADB Airfield Solutions furthers reserves the right to require the return of such goods to establish any claim.

ADB's obligation under this guarantee is limited to making repair or replacement within a reasonable time after receipt of such written notice and does not include any other costs such as the cost of removal of defective part, installation of repaired product, labor or consequential damages of any kind, the exclusive remedy being to require such new parts to be furnished.

ADB's liability under no circumstances will exceed the contract price of goods claimed to be defective. Any returns under this guarantee are to be on a transportation charges prepaid basis. For products not manufactured by, but sold by ADB Airfield Solutions, warranty is limited to that extended by the original manufacturer.

This is ADB's sole guarantee and warranty with respect to the goods; there are no express warranties or warranties of fitness for any particular purpose or any implied warranties of fitness for any particular purpose or any implied warranties other than those made expressly herein. All such warranties being expressly disclaimed.

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A.6 Liability

WARNING

Use of the equipment in ways other than described in the catalogue leaflet and the manual may result in personal injury, death, or property and equipment damage. Use this equipment only as described in the manual.

ADB cannot be held responsible for injuries or damages resulting from non-standard, unintended uses of its equipment. The equipment is designed and intended only for the purpose described in the manual. Uses not described in the manual are considered unintended uses and may result in serious personal injury, death or property damage.

Unintended uses includes the following actions:

- Making changes to equipment that have not been recommended or described in this manual or using parts that are not genuine ADB replacement parts or accessories.
- Failing to make sure that auxiliary equipment complies with approval agency requirements, local codes, and all applicable safety standards if not in contradiction with the general rules.
- Using materials or auxiliary equipment that are inappropriate or incompatible with your ADB equipment.
- Allowing unskilled personnel to perform any task on or with the equipment.

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TABLE OF CONTENTS

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1.0 Safety

This section contains general safety instructions for installing and using ADB Airfield Solutions equipment. Some safety instructions may not apply to the equipment in this manual. Task- and equipment-specific warnings are included in other sections of this manual where appropriate.

1.1 HAZARD Icons used in the manual

For all HAZARD symbols in use, see the Safety section. All symbols must comply with ISO and ANSI standards.

Carefully read and observe all safety instructions in this manual, which alert you to safety hazards and conditions that may result in personal injury, death or property and equipment damage and are accompanied by the symbol shown below.

	**WARNING** • Failure to observe a warning may result in personal injury, death or equipment damage.
	**DANGER - RISK OF ELECTRICAL SHOCK OR ARC FLASH** • Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage. ARC Flash may cause blindness, severe burns or death.
	**WARNING - WEAR PERSONAL PROTECTIVE EQUIPMENT** • Failure to observe may result in serious injury.
	**WARNING - DO NOT TOUCH** • Failure to observe this warning may result in personal injury, death, or equipment damage.
	**CAUTION** • Failure to observe a caution may result in equipment damage.

1.1.1 Qualified Personnel

IMPORTANT INFORMATION

The term **qualified personnel** is defined here as individuals who thoroughly understand the equipment and its safe operation, maintenance and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations and have been trained to safely install, operate, maintain and repair the equipment. It is the responsibility of the company operating this equipment to ensure that its personnel meet these requirements.

Always use required personal protective equipment (PPE) and follow safe electrical work practices.

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1.2 To use this equipment safely:

WARNING

Read installation instructions in their entirety before starting installation.

- Become familiar with the general safety instructions in this section of the manual before installing, operating, maintaining or repairing this equipment.
- Read and carefully follow the instructions throughout this manual for performing specific tasks and working with specific equipment.
- Make this manual available to personnel installing, operating, maintaining or repairing this equipment.
- Follow all applicable safety procedures required by your company, industry standards and government or other regulatory agencies.
- Install all electrical connections to local code.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.
- Protect components from damage, wear, and harsh environment conditions.
- Allow ample room for maintenance, panel accessibility, and cover removal.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning prior to returning power to the circuit.

Failure to follow these warnings may result in serious injury or equipment damage.

1.2.1 Additional Reference Materials:

IMPORTANT INFORMATION

- IEC - International Standards and Conformity Assessment for all electrical, electronic and related technologies
- IEC 60364 - Electrical Installations in Buildings
- FAA Advisory: AC 150_5340_26 (current edition) Maintenance of Airport Visual Aid Facilities
- ANSI/NFPA 79, Electrical Standards for Metalworking Machine Tools.
- National and local electrical codes and standards.

1.2.2 Intended Use

WARNING

IMPROPER USE

Using this equipment in ways other than described in this manual may result in personal injury, death or property and equipment damage. Use this equipment only as described in this manual.

THESE WARNINGS MAY RESULT IN SERIOUS INJURY OR EQUIPMENT DAMAGE.

1.2.3 Fasteners

WARNING

FOREIGN OBJECT DAMAGE - FOD

- Only use fasteners of the same type as the one originally supplied with the equipment.
- Always tighten the fasteners to the recommended torque. Use a calibrated torque wrench and apply the recommended adhesive type.
- Obey the instructions of the adhesives necessary for the fasteners.

Failure to follow these warnings may cause the fasteners to loosen, damage the equipment, potentially to loosen the equipment. This can lead to a highly dangerous situation of FOD, with potential lethal consequences.

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1.2.4 Operation

CAUTION

IMPROPER OPERATION

- Only qualified personnel, physically capable of operating the equipment and with no impairments in their judgment or reaction times, should operate this equipment.
- Read all system component manuals before operating this equipment. A thorough understanding of system components and their operation will help you operate the system safely and efficiently.
- Before starting this equipment, check all safety interlocks, fire-detection systems, and protective devices such as panels and covers. Make sure all devices are fully functional. Do not operate the system if these devices are not working properly. Do not deactivate or bypass automatic safety interlocks or locked-out electrical disconnects or pneumatic valves.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning.
- Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.
- Never operate equipment with a known malfunction.
- Do not attempt to operate or service electrical equipment if standing water is present.
- Use this equipment only in the environments for which it is rated. Do not operate this equipment in humid, flammable, or explosive environments unless it has been rated for safe operation in these environments.
- Never touch exposed electrical connections on equipment while the power is ON.

Failure to follow this instruction can result in equipment damage.

1.2.5 Storage

CAUTION

IMPROPER STORAGE

If equipment is to be stored prior to installation, it must be protected from the weather and kept free of condensation and dust.

Failure to follow this instruction can result in equipment damage.

1.2.6 Material Handling Precautions

CAUTION

ELECTROSTATIC SENSITIVE DEVICES

This equipment may contain electrostatic sensitive devices.

- Protect from electrostatic discharge.
- Electronic modules and components should be touched only when this is unavoidable e.g. soldering, replacement.
- Before touching any component of the cabinet you should bring your body to the same potential as the cabinet by touching a conductive earthed part of the cabinet.
- Electronic modules or components must not be brought in contact with highly insulating materials such as plastic sheets, synthetic fiber clothing. They must be laid down on conductive surfaces.
- The tip of the soldering iron must be grounded.
- Electronic modules and components must be stored and transported in conductive packing.

Failure to follow this instruction can result in equipment damage.

WARNING

UNSTABLE LOAD

- Use extreme care when moving heavy equipment.
- Verify that the moving equipment is rated to handle the weight.
- When removing equipment from a shipping pallet, carefully balance and secure it using a safety strap.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

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1.2.7 Action in the Event of a System or Component Malfunction

DANGER

ARC FLASH AND ELECTRIC SHOCK HAZARD

- Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.
- An open airfield current circuit is capable of generating >5000 Vac and may appear OFF to a meter.
- Never unplug a device from a constant current circuit while it is operating. Arc flash may result.
- Disconnect and lock out electrical power.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual.

Failure to follow these warnings will result in death or equipment damage.

1.2.8 Maintenance

WARNING

ELECTRIC SHOCK HAZARD

- Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.
- Disconnect and lock out electrical power.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual.

Failure to follow these warnings will result in death or equipment damage.

1.2.9 Maintenance and Repair

DANGER

ARC FLASH AND ELECTRIC SHOCK HAZARD

Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks.

- Only persons who are properly trained and familiar with ADB Airfield Solutions equipment are permitted to service this equipment.
- An open airfield current circuit is capable of generating >5000 Vac and may appear OFF to a meter.
- Never unplug a device from a constant current circuit while it is operating. Arc flash may result.
- Disconnect and lock out electrical power.
- Always use safety devices when working on this equipment.
- Follow the recommended maintenance procedures in the product manuals.
- Do not service or adjust any equipment unless another person trained in first aid and CPR is present.
- Connect all disconnected equipment ground cables and wires after servicing equipment. Ground all conductive equipment.
- Use only approved ADB Airfield Solutions replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.
- Check the interlock systems periodically to ensure their effectiveness.
- Do not attempt to service electrical equipment if standing water is present. Use caution when servicing electrical equipment in a high-humidity environment.
- Use tools with insulated handles when working with airfield electrical equipment.

Failure to follow these warnings will result in death or equipment damage.

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2.0 LED IUL

This manual covers all information pertaining to the ADB LED In-pavement Utility Light (IUL).

2.1 About this manual

The manual shows the information necessary to:

- Install and maintain ADB LED In-pavement Utility Light in an airfield application.

2.1.1 How to work with the manual

1. Become familiar with the structure and content.
2. Carry out the actions completely and in the given sequence.

2.1.2 Record of changes

Page	Rev	Description	Checked	Approved	Date
All	A	Released manual.	WT/GM/TK	WT	4/2/07
2-5 7-6	B	Revised wattage on yellow LED and revised Intensity data. Revised LED wattages in the parts list	WT/PS/TK/GM	WT	5/2/07
All	C	Updated drawings, Parts and pictures	JH	ER	8/8/12
All	D	Updated entire manual	RW	JC	4/24/15

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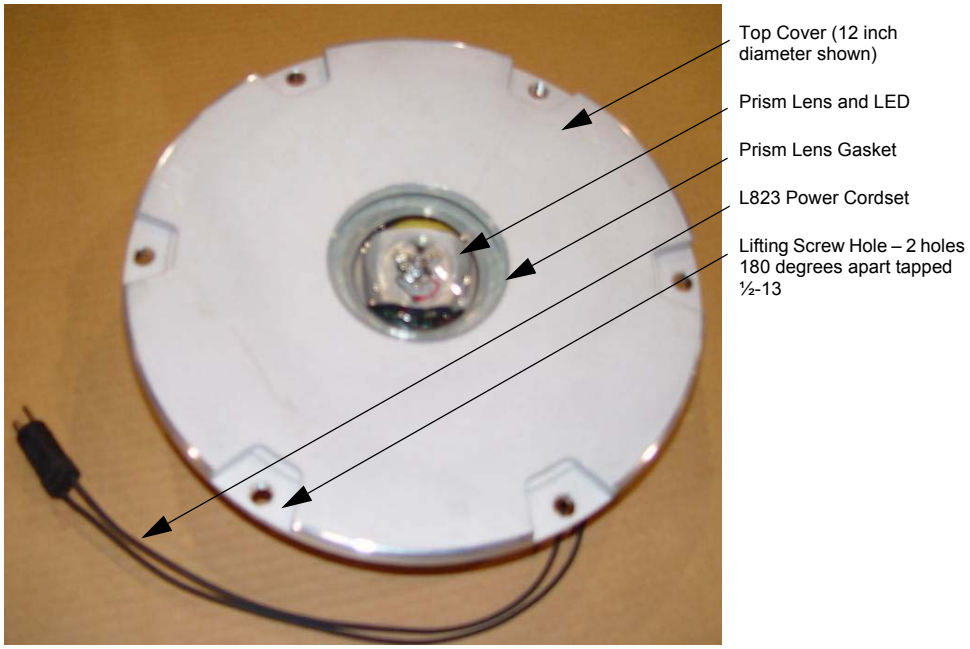
2.2 Introduction

See Figure 1. This section describes the ADB Airfield Solutions IUL (In-pavement Utility Light). See Figure 1. The IUL is manufactured in accordance with FAA specification AC 150/5345-46 and FAA Engineering Brief 67 for the LED performance requirements, Style 3 (≤ ¼ inch Height Above Grade). The fixture is available in both 8 inch and 12 inch diameter versions. The 8- inch mounts on a special shallow base and is typically glued into place. The standard 12-inch mounts directly on a FAA L-868B Light Base or can be machined to mount on a FAA L-867B light base. See Section 3 for additional installation instructions. The standard 12-inch fixture is shown in Figure 1. The fixture can be supplied with either a white, yellow, green, blue, or red light beam. The fixture is voltage driven.

Figure 1: IUL In-pavement Light Assembly



2.2.1 Compliance with Standards

FAA: Manufactured to applicable L-852T(L) requirements in FAA AC 150/5345-46 (Current Edition) and the FAA Engineering Brief No. 67

2.2.2 Uses

- Heliports with constant voltage sources
  - — Yellow for military and existing civilian applications
  - — Green for new civilian applications
  - — Used as boundary marking of final approach and takeoff (FATO) areas, touchdown and lift-off (TLOF) areas, and aprons
  - — Also used for taxiway edges and aiming points
- Gate security
- Under vehicle inspection illumination
- Used for a variety of special applications where a balance of vertical and horizontal light output is required
- Provides essential lighting for the protection of fixed installations and other potential targets
- Used in high security areas to assist detection of bombs and smuggling, in maintenance facilities to spot vehicle damage, and to protect entrances to security areas
- Fixture layout/quantity can be designed for individual and/or pattern control to enable use of alternate traffic patterns

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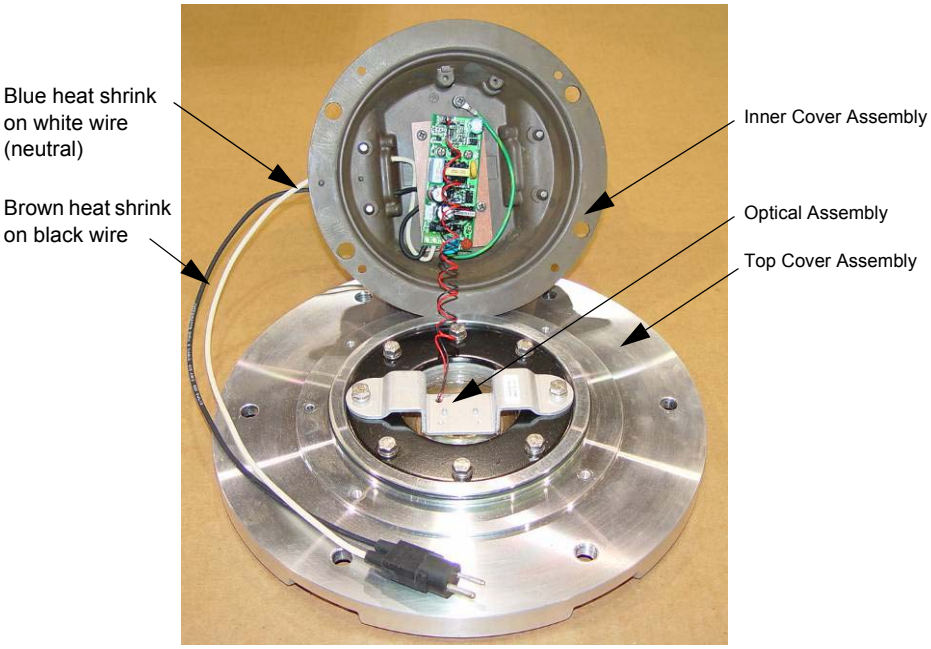
2.2.3 Top Cover and Inner Cover Assemblies

See Figure 2. The Omni directional assembly consists of the top cover assembly (prism lens, gaskets, and mounting hardware), the LED Optical Assembly (LED, Mounting Bracket, Power Lead, and mounting hardware), and the Inner Cover Assembly (inner cover, power cordset, and LED PCB Power Supply Assembly)

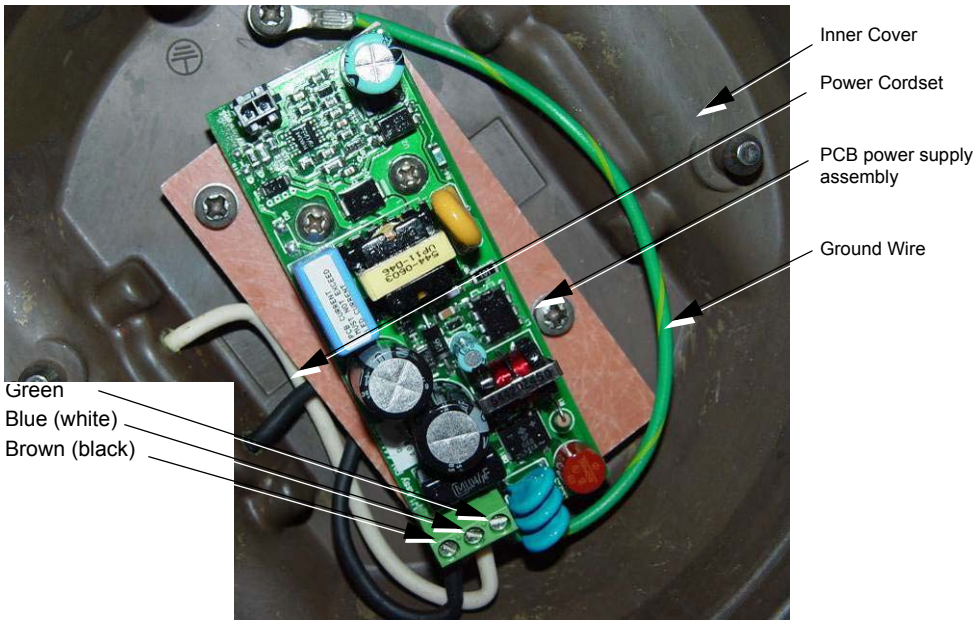
Figure 2: Top Cover Assembly with Optical Assembly



2.2.4 Inner Cover Subassembly

See Figure 3. The inner cover assembly is comprised of the inner cover, power cordset, pressure release screw (not shown), and LED PCB power supply assembly.

Figure 3: Inner Cover Subassembly



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2.2.5 IUL Light Fixture: Required Equipment

Refer to Table 1 for required equipment that is supplied. Refer to Table 2 for required equipment that is not supplied. Refer to “Spare Components” on page 26.

Table 1: Required Equipment Supplied

Description	Quantity
IUL In-pavement light, with LED assembly	1
Instruction manual	1 per order

Table 2: Required Equipment Not Supplied

Description	Quantity
Torque wrench (0 to 200 in-lb) (0–22.6 Nt-M)	1
Alignment jig	1
Crimping tool	1
Small water suction pump	1
Set of fiber brushes	1
Set of socket wrenches, 1/2 in. (12.7 mm) drive	1
Metric Socket for M6 Hex Hd Screw	1
Set of screwdrivers, one with 3/8 in. (9.525 mm) minimum blade width	1
Silicone grease	As required
P606 Joint sealing filler	As required
Pressure test fitting assembly (44A6104)	1
3/8 diameter x 16 long rod or pipe	1
½ -13 threaded eyebolt	2

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2.2.6 Specifications

This subsection provides specifications for the IUL in-pavement light fixtures.

2.2.6.1 Electrical Supply

Input voltage

W/out Heater	With Heater
95 VAC (min.) - 264 VAC (max.), 50/60 Hz	120 VAC, ±10%, 50/60 Hz

Maximum Input Power

	W/out Heater	With Heater
Yellow	10.2 VA	33.2 VA
Green	14.3 VA	37.3 VA
Blue	13.5 VA	36.5 VA
White	14.3 VA	37.3 VA
Red	14.3 VA	37.3 VA

2.2.6.2 Expected LED Life

100, 000 hours

2.2.6.3 Photometric Data

Table 3: Photometric Data

Type	Beam Shape	LED Color/Wattage	Intensity and Coverage (Cd = Candelas)
IUL	Vertical (Lambert)	White, 3 Watt LED	.15 to 9.40 Ft-Candles 18 Inches above ground
	Side Emitting	Yellow LED, 1 Watt LED	2.44 min Cd 4.90 typ 1 to 6 Deg Vertical
	Side Emitting	Green , 3 Watt LED	7.81 min Cd 11.74 typ 1 to 6 Deg Vertical
	Side Emitting	Blue, 5 Watt, LED	4.8 min Cd 7.0 typ 1 to 6 Deg Vertical

2.2.6.4 Environmental Operating Conditions

The IUL light fixture is designed to operate under the conditions presented below for temperature, altitude, and relative humidity.

Temperature	-40 to + 55 °C (-40 to +131 °F)
Altitude	Sea level to 10,000 feet (3000 m)
Relative Humidity	Up to 100 %

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2.2.7 Packaging

8-inch Fixture

In cardboard box:	6 x10 x10 in (15.24 x 25.4 x 25.4 cm)
Weight with packing:	7.65 lb (3.47 kg)
Weight without packing:	5.65 lb (2.56 kg)

8-inch Base Can

Weight:	3.95 lb (1.79 kg)

12-inch Fixture

In cardboard box:	7 x 13 x 13 in (17.8 x 33 x 33 cm)
Weight with packing:	15.3 lb (6.94 kg)
Weight without packing:	12.3 lb (5.58 kg)

2.2.7.1 Mounting and Dimensions

Table 4: Light Fixture Dimensions

IUL Type	Mounting Base	Outside Diameter Mounting	Bolt-circle diameter	No. of Bolts
8- Inch	Special Cast Aluminum Shallow base	8.43 in. (214 mm)	7.32 in (186 mm)	2
12- Inch	L-868B (standard)	11.94 in. (303 mm)	11.25 in. (286 mm)	6
12- Inch	L-867B	11.94 in. (303 mm)	10.25 in (260 mm)	6

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2.3 Installation

WARNING

Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

Read installation instructions in their entirety before starting installation.

- Become familiar with the general safety instructions in this section of the manual before installing, operating, maintaining or repairing this equipment.
- Read and carefully follow the instructions throughout this manual for performing specific tasks and working with specific equipment.
- Make this manual available to personnel installing, operating, maintaining or repairing this equipment.
- Follow all applicable safety procedures required by your company, industry standards and government or other regulatory agencies.
- Install all electrical connections to local code.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.
- Protect components from damage, wear, and harsh environment conditions.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning prior to returning power to the circuit.

Failure to follow these warnings may result in serious injury or equipment damage.

This section provides instructions for installing the IUL in-pavement lights. Refer to airport project plans and specifications for the specific installation instructions. The installation shall conform to the applicable sections of the National Electric Code and local codes.

2.3.1 Unpacking

Each unit is individually packaged in a durable, cushioned, corrugated cardboard carton. To avoid unnecessary damage to the light assembly, unpack the carton at the installation site.

To unpack the carton, open the flaps and carefully remove the top packing material. Thread an eyebolt into each of the two opposite threaded holes. Run a rod through the eyebolts and lift the light assembly from the shipping carton. Set the light assembly in a protected area.

If damage to any equipment is noted, file a claim form with the carrier immediately. The carrier may request to inspect the equipment.

2.3.2 Input Requirement

The IUL light fixture requires a 95-264V input lighting circuit.

WARNING

The light fixture is supplied with a molded FAA L-823 2-pin plug on the end of the Power Cordset. Removing the plug will allow water to wick back into the fixture. Removal of the L-823 plug supplied with the fixture voids the warranty.

Install a FAA L-823, secondary connector kit to the field circuit leads to maintain a water tight seal. See parts list for full description and part number of the kit and see Figure 5 for installation of the field receptacle kit.

WARNING

In-pavement light must be grounded. Use grounding lug provided on in - pavement light, Ref Figure 8. Ground the fixture per local codes.

NOTE: Black wire (power) has a brown piece of heat shrink for European installations. The White wire (neutral) has a piece of blue heat shrink for European installations.

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2.3.3 Installation on L867 or L-868 Base

The light assembly is shipped complete and is ready for installation.

CAUTION:

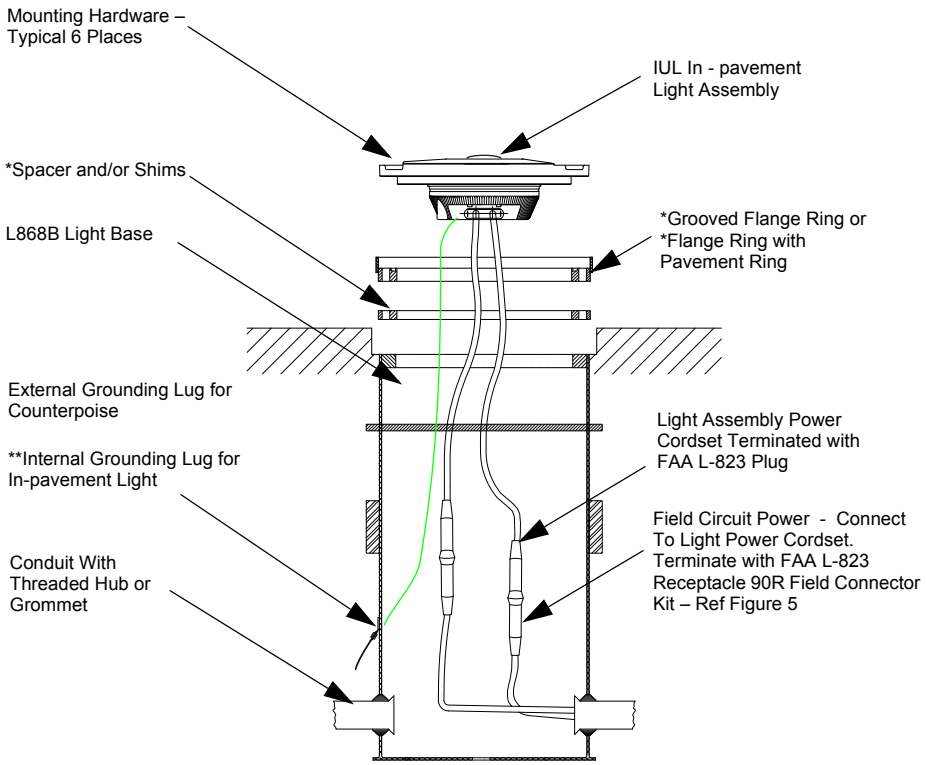
Insure that all flange rings, flange ring with pavement ring, spacers, shims, extensions, etc., have been installed correctly on light base per the site plans and specifications before mounting the light assembly onto the light base, Make sure not to drop the light assembly or to pinch the wires of the Power Cordset when mounting the light fixture on the light base.

NOTE: Replace the power corset immediately if the wires become damaged.

To install the standard 12-inch IUL light fixture (e.g. part number IUL-1110) on the L-868B light base, perform the following procedure:

1. See Figure 4. Clean the light base. Make sure that the light base does not contain water and is completely clean and dry. The mating surfaces between the light assembly and the light base must be clean and free of foreign particles.

Figure 4: Typical Installation IUL on a Standard L-868B, FAA Light Base



NOTE: * These items are optional

NOTE: ** In-pavement Light is equipped with an external grounding lug Ref Figure 9

NOTE: See “Installation on L867 or L-868 Base” on page 12 for L867B and Shallow Base installations.

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Figure 5: Figure 3-2 Field Connector Kit

The Secondary Connector Kit is comprised of a receptacle and body. The Kit is sized for 10-12 AWG stranded wire with a cable range of 0.155 to 0.205 inch diameters.

The field circuit leads are inserted through the ports on the body and then crimped to the lead contacts on the receptacle. Each kit comes with a detailed instruction sheet.

2. The IUL assembly can be easily be lifted in place to be installed on or removed from the light base by using a simple lifting tool. Screw 1/2-13 eye-bolts into the two mating tapped holes in the top cover. Insert a 3/8 diameter x 16 inch long round aluminum bar or pipe through the eye bolts and then lift the fixture off of the light base.
3. Place the light assembly beside the opening in the light base so that the field connector kit can be connected to light fixture Power Cordset. Make sure that the connection is solid and meets local electrical codes.
4. Turn on the power. Operate the light assembly for a minimum of five minutes. Turn off the power.
5. Position the light assembly over the L-868 base and set onto the base. Make sure items such as spacers, shims, and gaskets are installed on the light base per site plans, specifications, and drawings. Remove the eyebolts and lifting rod.

   NOTE: Do not use anti-seize compounds that contain copper.

   NOTE: Always torque the bolts across the corners. Refer “Torquing Mounting Bolts” on page 16.

   NOTE: Applying more than one drop of Loctite to the bolt threads will create future difficulty in removal of the bolts.

   NOTE: After several removals of the light fixture, the threaded holes in the light base may accumulate with dirt and excessive Loctite. If this occurs, screws may not seat properly. Clean holes with light weight oil or diesel fuel using a small fiber brush. Wipe the holes clean with alcohol to remove all oil or diesel fuel and dirt. Clean with dry, oil-free, low-pressure air. After the bolt has been retorqued three times, replace with new bolt. If bolt is continuously loose, inspect tapped thread in the light base flange for damage. If thread is damaged, contact ADB Airfield Solutions, Sales Department for field repair inserts kit.

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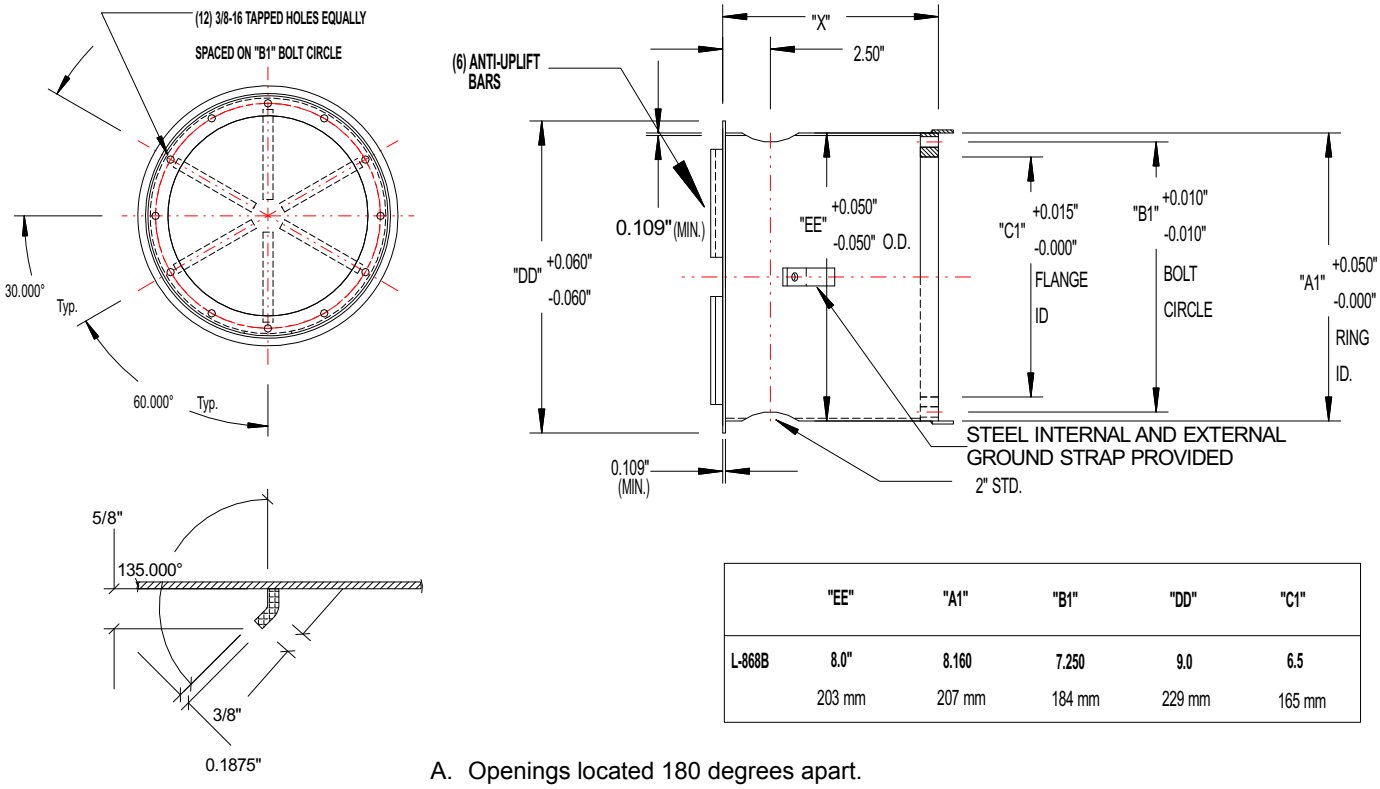
To install the 12-inch IUL light fixture (e.g. part number IUL-1210) on the L-867B light base, perform the following procedure:

1. The 12-inch IUL light fixture with a 10.250 diameter bolt circle mounts on the L-867B deep the same way as shown for the standard 12-inch IUL in Figure 4. Since the L-867B has a larger mounting flange than the L-868B there will be a nominal 0.750 wide gap between the outside diameter of the light fixture and the outside diameter of the L-867B light base.

2.3.3.1 8" Shallow Base

To install the 8-inch IUL light fixture (e.g. part number IUL-1310) the IUL fixture requires a special shallow base. Use the following procedure:

Figure 6: Shallow Light base



	"EE"	"A1"	"B1"	"DD"	"C1"
L-868B	8.0"	8.160	7.250	9.0	6.5
	203 mm	207 mm	184 mm	229 mm	165 mm

A. Openings located 180 degrees apart.
Tolerance: +/- 1 degree optional hole sizes and/or locations must be specified when ordering.

B. Plywood shipping cover for L-868 is exterior grade CC.

L-868 8" Nom. O.D. : 8.0" Dia. X 3/4" thick

NOTE: Plywood thickness runs undersize
3/4" - actual 23/32 +0/-1/32"

C. Six (6) 3/8-16X1" Stainless steel bolts included.

D. Finish is hot dip galvanize, astm A123/A 123M-02 & A153.

E. Optional copper ground lug, drain coupling and/or opening, anti-rotation fins and/or anti-uplift bars must be specified when ordering.

L-868 8" NOM. O.D. : OLSON #88ICG(X)Y
Example: 88ICG06Y Height = 6" (152 mm)

F. Optional copper ground lug, drain coupling and/or opening, anti-rotation fins must be specified when ordering.

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2.4 Maintenance

This section provides maintenance information and procedures for the IUL light fixtures.

2.4.1 Maintenance Schedule

Service life depends upon the entire assembly being waterproof. All surfaces must be clean, dry and free of all foreign matter and all bolts must be properly tightened if the light fixture is to operate for extended periods without requiring maintenance.

To keep the IUL light fixtures operating efficiently, follow a preventive maintenance schedule. Refer to Table 5. Refer to FAA AC 150/5340-26 for more detailed information on maintenance.

Table 5: IUL Light Fixture Maintenance

Interval	Check	Action
Daily	Low light output	Clean outer surface of prism lens if dirty. Refer to *Cleaning Prism Lens* this section. Check for presence of moisture inside fixture.
Monthly (or more frequently during rainy seasons)	For presence of moisture or water (visual inspection for condensation on inner side of prism lens and on LED)	Open up light assembly. Clean, dry, and inspect light assembly. Replace cover/inner cover gasket and other parts found defective. Replace LED assembly if LED does not light or dirt can not be removed. Refer *to Replacing LED Assembly* in the *Repair* section.
Bimonthly	Torque hold-down bolts	Torque six bolts holding fixture to base. Refer to T*orquing Mounting Bolts* in this section or in the installation section.
Semi-annually (or more frequently during rainy seasons)	For six inches (152 mm) of water in the L-868B base	Pump water from base. Inspect light for water damage. Refer to *Removing water from L-867 or L-868 Base* in this section.
After snow removal	For damaged light fixtures	Replace damaged fixtures. Use a power broom for snow removal, if practical.

2.4.2 Maintenance Procedures

This subsection describes the following maintenance procedures:

- cleaning light prism lens
- torquing mounting bolts
- removing water from L-867 or L-868 base
- lifting light unit off of light base
- testing for leaks

2.4.2.1 Cleaning Lens

To clean the lens, perform the following procedure:

1. Clean the outer surface of the prism lens (3) using liquid glass cleaner. If the prism lens is coated with a substance impervious to the cleaner, apply a suitable solvent sparingly with a wad of cotton or a patch of cloth.
2. After the solvent has acted, remove the softened coating with a clean piece of cotton or cloth.
3. Dry the prism lens gently with dry, oil-free compressed air at a pressure no greater than 10 psi (69 KNt/m^2) to evaporate or remove all remaining cleaner.

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2.4.3 Torquing Mounting Bolts

The importance of bolted connections cannot be overlooked. Using the proper bolt torque is crucial to ensure that the two parts are mated together so they can resist the impact forces generated by aircraft tires striking the light fixture. Refer to FAA Engineering Brief 83 (*In-pavement Light Fixture Bolts*) and FAA Advisory Circular 150/5345-46 (*Specification for Runway and Taxiway Light Bases),* FAA AC 150/5340-26 *(Maintenance of Airport Visual Aid Facilities*) and FAA Cert Alert No. 14-03 (*Preventive Maintenance of In-pavement Lighting Systems*) for recommended guidelines and standards.

1. A torque of 185 in-lbs**.** (21 N·m) for a **dry 18-8 bolt** is recommended. A torque of 185 in. lbs. **should not** be used for a 18-8 bolt with anti-seize compound applied to the threads. With anti-seize compounds and ceramic coated bolts, less torque is required to achieve the clamping forces required to offset fixture movement in the presence of opposing forces. Refer to Table 6 for recommended torque values.

Table 6: Torque Values

3/8-16 Bolt Material	Anti-seize Compound	Torque Value +/- 10 in-lb. (+/- 1.1 N·m)
18-8 SS (step 5)	Loctite 51609 HD	160 (18 N·m)
18-8 SS	Dry	185 (21 N·m)
** SAE J429 Gr 2, CMF coating	None	140 (16 N·m)

** SAE J429 Grade 2 hex bolt using a ceramic-metallic/fluoropolymer coating

NOTE: The use of anti-seize compound is recommended in FAA AC 150/5345-42 (*Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories*), except for coated bolts. Each type of anti-seize compound has a unique K (friction) coefficient, resulting in a different bolt torque.

2. SAE J429 Grade 2 hex head tap bolts using a ceramic-metallic/fluoropolymer coating are highly recommended based on the evaluations performed in engineering brief 83. See Table 6 for the recommended range of bolt torque. Do not use anti-seize or thread locking compounds with coated bolts.
3. To preclude galvanic corrosion with stainless steel and zinc galvanized light bases, the use of fluoropolymer metallic-ceramic coated SAE J429 Grade 2 carbon steel bolts is highly recommended. The coating effectively insulates the bolt from both the zinc coating and aluminum light fixture and minimizes the risk of galvanic corrosion.
4. For every installation a two part clamping lock washer is used to secure the light fixture bolts. This style of locking washer is effective in preventing bolt loosening caused by high dynamic loads. Locking washers should be replaced each time a light fixture is disassembled from its base. Never exceed the recommended bolt torque. If a bolt is known to be over tightened, replace both the bolt and the two part washers when the light fixture is reinstalled on the light base.
5. If using thread-locking adhesive, apply only one drop to each of the 3/8-in mounting bolts.
6. Clean and inspect the threads in the light base upper flange. Use compressed air or a solvent spray (use safety glasses to prevent injury from any flying debris or solvent) to remove dirt prior to the insertion of any bolts. The same applies for water - the bolt holes must be dry.

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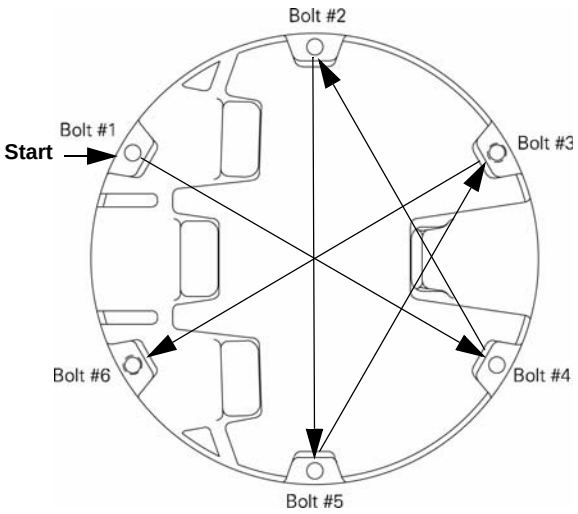
7. Always torque the bolts in opposing pairs. To do so, tighten bolts in the following sequence (see figure at left):
   - If you start with Bolt #1, then tighten Bolt #4
   - Next tighten Bolts #2 and #5
   - Then tighten Bolts #3 and #6

Figure 7: Sequence for Torquing Mounting Bolts



2.4.3.1 Reuse of Bolts?

See FAA AC 150/5340-26 and FAA Cert Alert No. 14-03. Always use new bolts and washer assemblies. **NEVER reuse bolts on in-pavement fixtures.**

1. Clean and inspect the threads in the light base upper flange. Use compressed air or a solvent spray (use safety glasses to prevent injury from any flying debris or solvent) to remove dirt prior to the reinsertion of any bolts.
2. Clean the light base and light fixture flanges before any reassembly is attempted. Check the condition of the O-ring and replace if it is damaged.
3. If light base threads are damaged, use a tap to attempt to restore them. If the threads are severely damaged and will not allow the proper torque, use an appropriate insert to repair the threaded hole.
4. Always reapply a **thin layer** of anti-seize compound with a brush or rag to a clean and dry bolt - do not dip the bolt in the anti-seize compound.

NOTE: An established schedule for checking light fixture bolt torque and bolt condition is strongly recommended. This is particularly true for areas that are subject to high impact loads from aircraft – runway status lights, touchdown zone lights, runway centerline lights, and taxiway lead-off lights.

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2.4.3.2 Lifting Light Unit From Base

To lift the light unit from the light base, perform the following procedure:

1. Remove all mounting bolts and lockwashers.
2. See Figure 5. Screw two 1/2-13 threaded eyebolts into the two ½-13 tapped holes found in mounting bolt holes. Align the eyebolts and then slip a 3/8 dia x 16 inch long rod or pipe through the eyes and lift the light assembly off of the light base.

   NOTE: Check for and remove any P606 or other compound from the outside diameter of the in - pavement light top cover that would prevent removal of the light assembly from the light base.
3. Disconnect the light fixture wires from the power wires coming from the transformer(s).
4. Mount a serviced or new light fixture as described in “Installation on L867 or L-868 Base” on page 12.

   NOTE: see “Torquing Mounting Bolts” on page 16.
5. Take the in-pavement fixture unit back to the maintenance base where it can be serviced entirely.

NOTE: Never hold the light fixture by the power lead wire. This may damage the insulation, break the waterproof seal, and cause insulation faults and water leakage.

2.4.3.3 Testing for Leaks

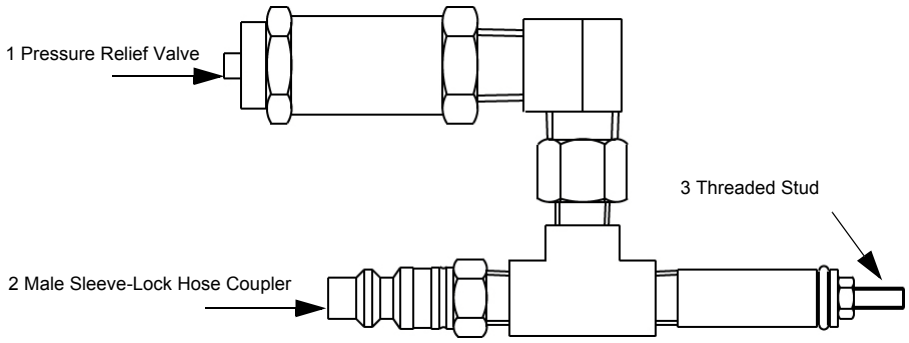
To test for leaks, perform the following procedure:

1. See Figure 9. Remove pressure relief screw (1).
2. See Figure 8. Screw pressure test fitting stud (3) into the pressure relief port (the opening created when the pressure relief screw is removed). Screw fitting hand-tight only.

WARNING

Over tightening the test fixture will cause the small threaded stud to break.

Figure 8: Pressure Test Fitting Assembly



3. Attach the air hose to the sleeve-lock hose coupler (2).
4. Pressurize to 20 psi.
5. Submerge the pressure test fitting in a water tank. Water should be only deep enough to cover the inset light. Check for air bubbles. Air bubbles indicate a leak.
6. Locate the leak source, depressurize, replace the seal that is leaking, reassemble, and retest by following steps 2 through 5.
7. See Figure 9. If leak is fixed, depressurize and reinstall the pressure release screw.

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2.5 Troubleshooting

WARNING

Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

De-energize the circuit and lock out the circuit or regulator so that the circuit cannot be energized by remote means before attempting to service the fixture.

2.5.1 Introduction

This section contains troubleshooting information. This information covers only the most common problems that you may encounter. If you cannot solve the problem with the information given here, contact your local ADB Airfield Solutions representative for help.

2.5.2 Troubleshooting Procedures

Troubleshooting procedures for the IUL In-pavement lights are contained here.

Problem	Possible Cause	Corrective Action
1. LED not energizing	LED defective	Replace Optical LED assembly. Refer to “Replacing LED Assembly” on page 22.
	Loose LED Power Cordset	Replace Optical assembly
	IUL PCB defective	Replace the PCB power supply assembly
	IUL Control Transformer	Replace transformer
	Moisture inside assembly causing current leakage	Open up light assembly. Clean, dry, and inspect light assembly. Replace O-ring.
	No connection to the field circuit.	Check connection between the assembly Power Cordset and the field circuit connector kit
2. Weak light output	Partial short circuit in primary loop	Check cable assembly.
	Defective IUL transformer	Replace transformer
	Dirty prism lens	Clean prism lens. Refer *to* “Cleaning Lens” on page 15.
3. Light beam distorted	Broken or damaged lens /cover	Replace lens or entire fixture. Refer to “Replacing Prism Lens and Gasket” on page 22.
4. Short LED life	Current too high	Check output current of isolation transformer at full brightness. Replace LED transformer if defective.
	Moisture in lighting fixture	1. Open light assembly. Refer to “Opening Light Assembly” on page 20. 2. Check for cause of leakage (dirty or damaged o-ring seal mating surfaces, defective lens seals, cracked or broken lens, loose screws or damaged wire insulation). 3. Clean, dry, inspect, or replace damaged components.

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2.6 Repair

This section describes procedures for repairing and replacing parts.
It includes opening the light assembly, LED assembly, and prism lens and prism lens gasket. It also describes how to close the light assembly.

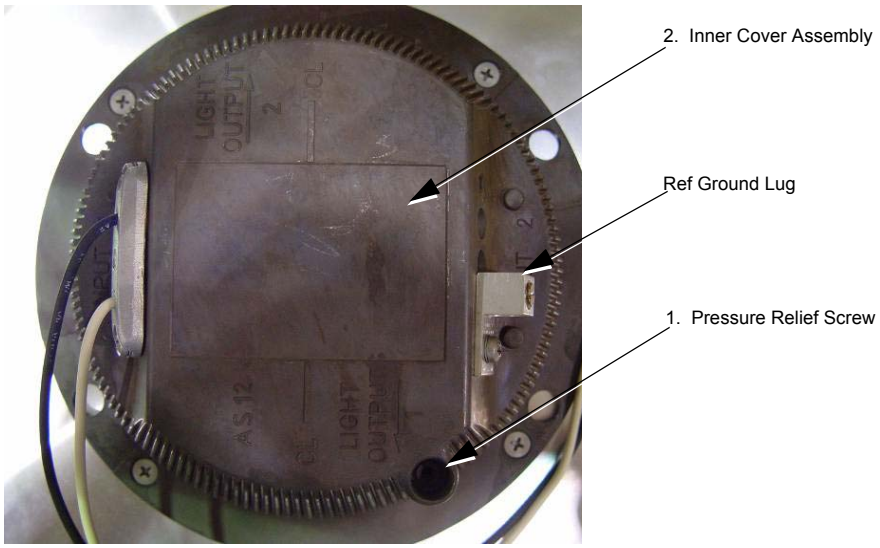
NOTE: If the power cordset needs servicing, contact the ADB Airfield Solutions Sales department.

2.6.1 Opening Light Assembly

To open the light assembly, perform the following procedure:

1. Turn the light unit upside-down and place the assembly onto a surface that will not damage the prism lens.
2. See Figure 9. Remove the pressure release screw (2). This relieves any built-up internal pressure and makes it easier to remove the inner cover.

Figure 9: Removing Pressure Release Screw



3. Remove the four Phillips Cover head screws that fasten the inner cover to the top cover. The use of an impact driver may be required to unlock the screws.
4. Carefully lift off the inner Cover (2) from the cover, taking care not to damage the wire connection between the PCB power supply assembly and the LED assembly.

   NOTE: If the inner cover does not separate from the cover assembly easily, use a flat bladed screwdriver to separate it by inserting the screwdriver blade in the pry slots. The pry slot is located on the underside of the top cover flange.
   See Figure 11.

WARNING

Be careful. Do not pull on the LED lead cable when you lift the inner Cover. This might damage the connection!

5. See Figure 10. Disconnect the LED Optical Assembly from the PCB power supply assembly by pulling on the quick disconnect on the PCB. See Figure 10. If necessary use a small flat screwdriver to separate the quick disconnect from the terminal on the PCB.

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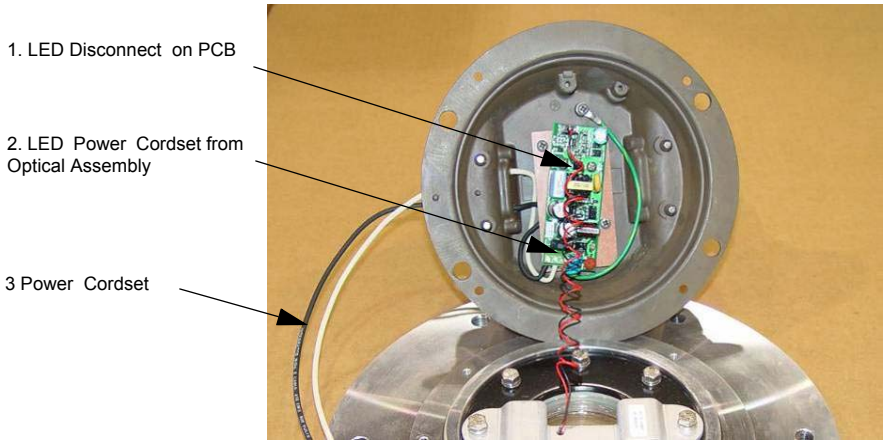
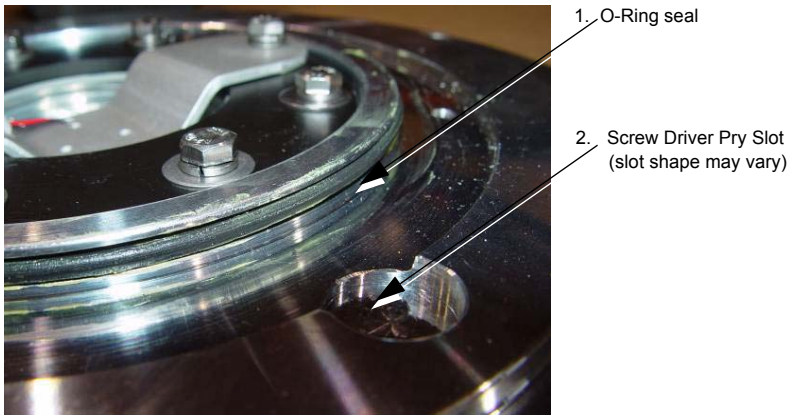
Figure 10: Disconnecting LED Optical Assembly



6. Remove the inner Cover from the cover.

NOTE: See Figure 11. Always replace the inner cover O-Ring seal Item 1 whenever the in-pavement fixture is opened.

Figure 11: Replacing Cover/Inner Cover O-ring Seal



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2.6.2 Replacing LED Assembly

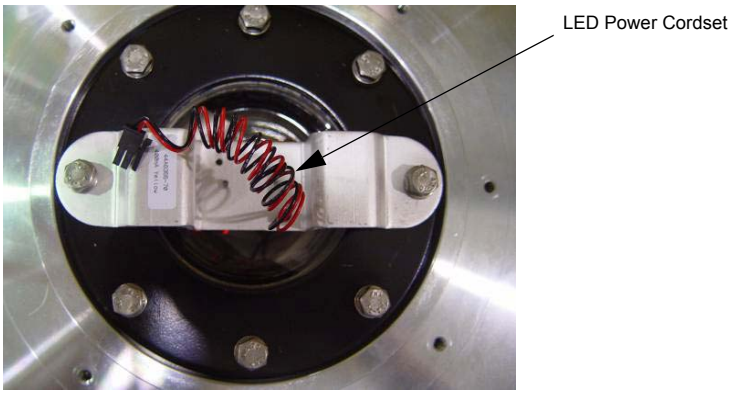
WARNING

Turn off the circuit before replacing LEDs. Failure to observe this warning may result in personal injury, death, or equipment damage.

To replace the LED assembly perform the following procedure:

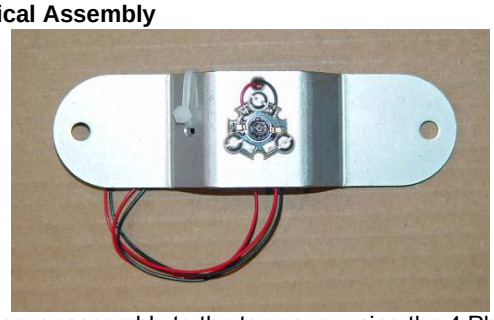
1. Open the light assembly. Refer to “Opening Light Assembly” on page 20.
2. See Figure 12. Unscrew the two M6 hex head screws that fasten the LED Optical Assembly bracket to the top cover.

Figure 12: Led Assembly



3. Disconnect the LED Power Cordset from the PCB power supply assembly and remove and discard the existing LED Optical Assembly. See Figure 10.
4. Install the new LED Optical Assembly (purchased as a complete assembly) See Figure 13 and torque screws to 75 +/- 5 In-lbs. Re-connect the LED lead to the terminal on the PCB power supply assembly.

Figure 13: LED Optical Assembly



5. Re-install the inner cover assembly to the top cover using the 4 Phillips flat head screws. Apply a droplet of Loctite 222 to the last threads. Torque screws to 75 +/- 5 In-lbs.

2.6.3 Replacing Prism Lens and Gasket

To replace the lens and lens gasket, perform the following procedure:

1. Open the light assembly. Refer to “Opening Light Assembly” on page 20.
2. See Figure 14. Unscrew the eight M6 metric Hex Head Cap Screws and then remove the LED bracket and the lens support plate.

   NOTE: The two M6 Hex Cap Screws used to mount the optical assembly bracket to the top cover are longer than the other mounting screws used to attach the support plate. See Figure 19 and Figure 20.

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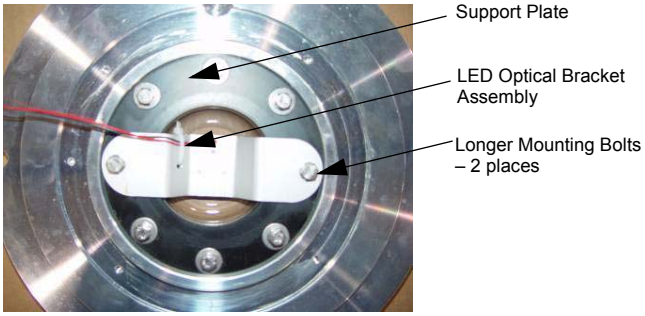
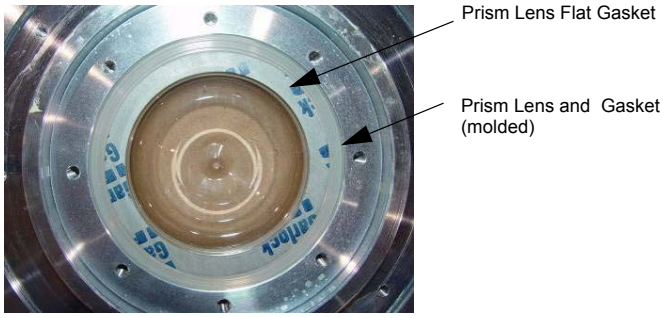
Figure 14: Remove LED Optical Bracket and Support Plate



3. See Figure 15. Remove the prism lens flat gasket.

Figure 15: Remove Flat Gasket



4. Turn the top cover over and push the prism lens and gasket out of the recessed pocket from the outside of the top cover.

WARNING

Cracked or broken glass is very sharp. Take necessary precautions to protect hands from being cut.

5. If prism lens is cracked, pitted, or damaged discard. Examine the inside of the light fixture and remove any glass shards found in the fixture. Re-checked the prism lens recess and remove any debris.
6. Install a new gasket over the prism lens.
7. Using a small brush, apply a thin layer of lubricant MOLYKOTE BG87 INETRA (Part number 67A0095) in the prism lens recess and then gently push the prism lens gasket assembly into the recess from the inside of the top cover.
8. Install a new the flat gasket on top of the prism lens and gasket. Install the support plate and LED Optical bracket in the reverse order as disassembled. Re-install the 6 hex head screws and finger- tighten them against the support plate.
9. Torque the eight M6 hex head screws across corners to 75 +/- 5 in-lbs.

   NOTE: Be sure to use the two longer M6 Hex Cap screws to fasten the optical bracket to the top cover. See Figure 14.

10. 10. Close the light fixture. Refer to “Closing and Testing Light Assembly” on page 24.

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2.6.4 Closing and Testing Light Assembly

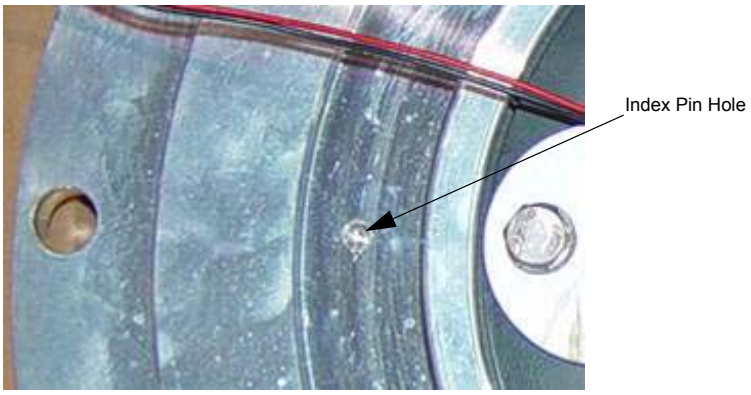
To close and test the light assembly, perform the following procedure:

WARNING

Misalignment of the index pin in the inner cover flange and its mating hole in the underside of the top cover will prevent components from being assembled correctly. Damage may also occur to the top cover and inner cover.

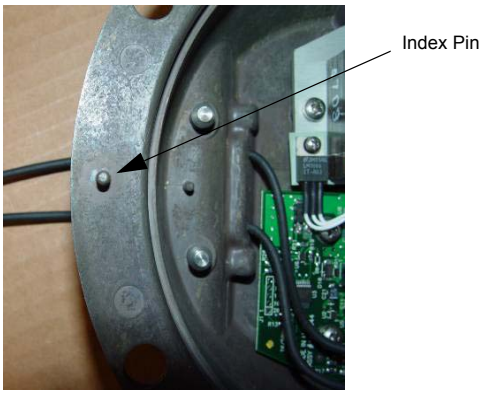
1. See Figure 16. Turn the cover over and find the index pin hole machined underside area of the top cover.

Figure 16: Index Pin Hole in Top Cover Flange



2. See Figure 17. Find index pin molded into the flange of the inner cover.

Figure 17: Index Pin on Inner Cover



3. Gently put the inner cover over the top cover and align the index pin on the inner cover flange with the index pin hole in the flange of the top cover. Make sure that LED Power Cordset does not get damaged when the inner cover is installed on the top cover.
4. Press the inner cover on the top cover and secure with new Phillips flat head screws. Apply a drop of Loctite to the end thread of the screw before insert screw into the tapped hole. Refer to “Torquing Mounting Bolts” on page 16.
5. Check the waterproofness of the fixture assembly by applying a maximum of 20 psi of air pressure through the pressure port using the ADB Pressure Test Fitting Assembly. Refer to *“Testing for Leaks” on page 18,* for test fitting, Figure 8, and detailed testing instructions. After testing is completed remove fixture from the water remove air hose, test fitting, and dry the fixture.
6. Install and tighten the pressure release screw and return fixture to service if no leaks are found. Repair fixture if leaks are found and then retest.

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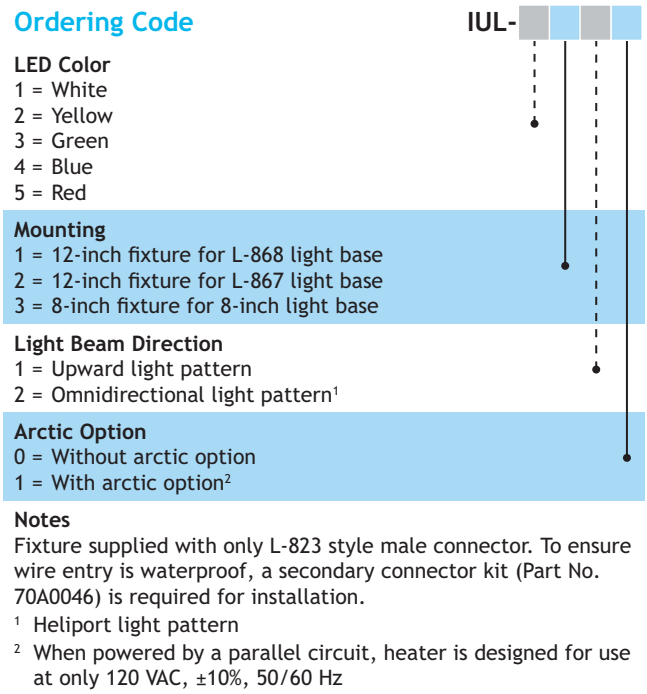
3.7 Parts

To order parts, call ADB Airfield Solutions Customer Service or your local representative. Use this four-column parts list, and the accompanying illustration, to describe and locate parts correctly.

3.7.1 IUL LED Low Profile In-pavement Light Fixture Ordering Code

Figure 18 shows how to determine the part number for a particular IUL in-pavement light fixture.

Figure 18: IUL In-pavement Lights Order Code



Notes

Fixture supplied with only L-823 style male connector. To ensure wire entry is waterproof, a secondary connector kit (Part No. 70A0046) is required for installation.

[1] Heliport light pattern

[2] When powered by a parallel circuit, heater is designed for use at only 120 VAC, ±10%, 50/60 Hz

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3.8 Spare Components

Description	Part No.
Cord set	73A0136-23
Inner pan assembly, 95-264 V, yellow	44A6354-10
Inner pan assembly, 95-264 V, blue	44A6354-20
Inner pan assembly, 95-264 V, green, white	44A6354-30
LED optical assembly, white, omni-directional light pattern, w/out heater	44A7217-10
LED optical assembly, white, omni-directional light pattern, with heater	44A7217-11
LED optical assembly, yellow, omni-directional light pattern, w/out heater	44A7217-20
LED optical assembly, yellow, omni-directional light pattern, with heater	44A7217-21
LED optical assembly, green, omni-directional light pattern, w/out heater	44A7217-30
LED optical assembly, green, omni-directional light pattern, with heater	44A7217-31
LED optical assembly, blue, omni-directional light pattern, w/out heater	44A7217-40
LED optical assembly, blue, omni-directional light pattern, with heater	44A7217-41
LED optical assembly, red, omni-directional light pattern, w/out heater	44A7217-50
LED optical assembly, red, omni-directional light pattern, with heater	44A7217-51
LED optical assembly, white, upward light light pattern, w/out heater	44A7217-60
LED optical assembly, white, upward light pattern, with heater	44A7217-61
Lens gasket, molded	4071.76.041
O-ring, inner cover seal	7080.90.335
Prism lens	63A1071
Secondary female connector kit	70A0046
Top cover, 8-inch	4071.76.002
Top cover, 12-inch, L-868 11.25” bolt circle	62A2157-1
Top cover, 12-inch, L-867 10.25” bolt circle	62A2157-2

3.8.1 8-inch Load Bearing Base Can

Part Number 88ICC05Y

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3.8.2 IUL Light Fixture Parts

Figure 19: Top Cover without Heater

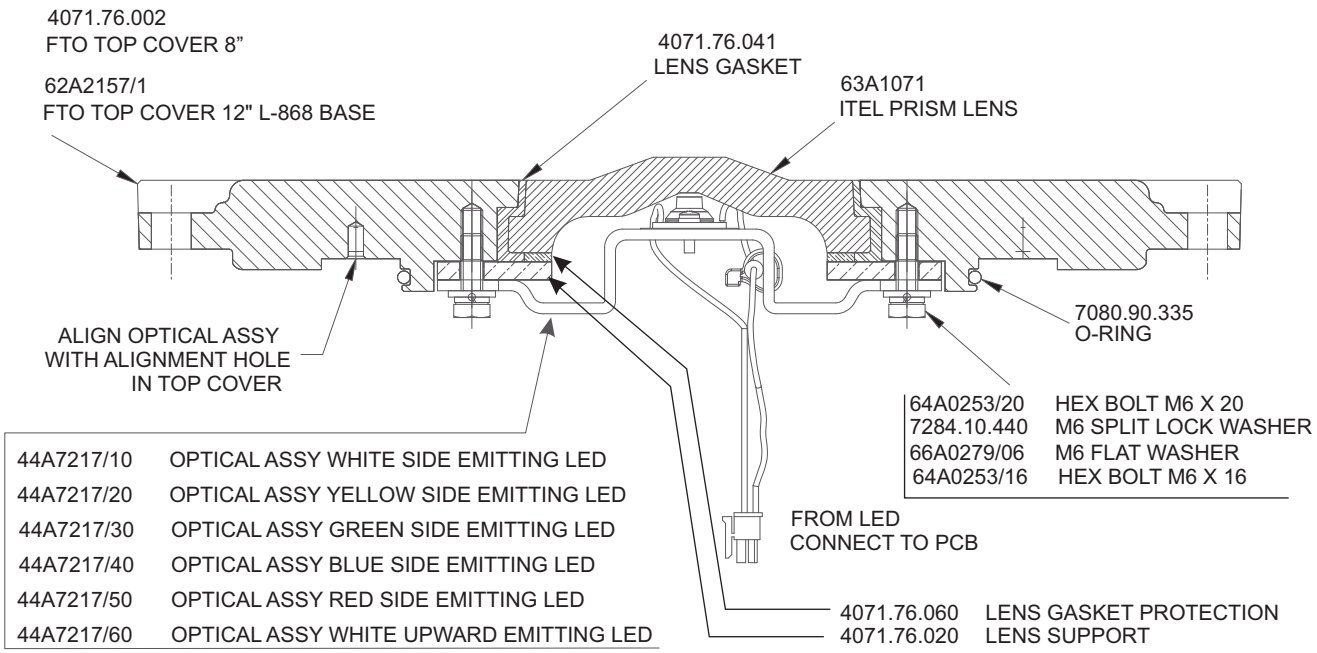

Figure 20: Top Cover with Heater

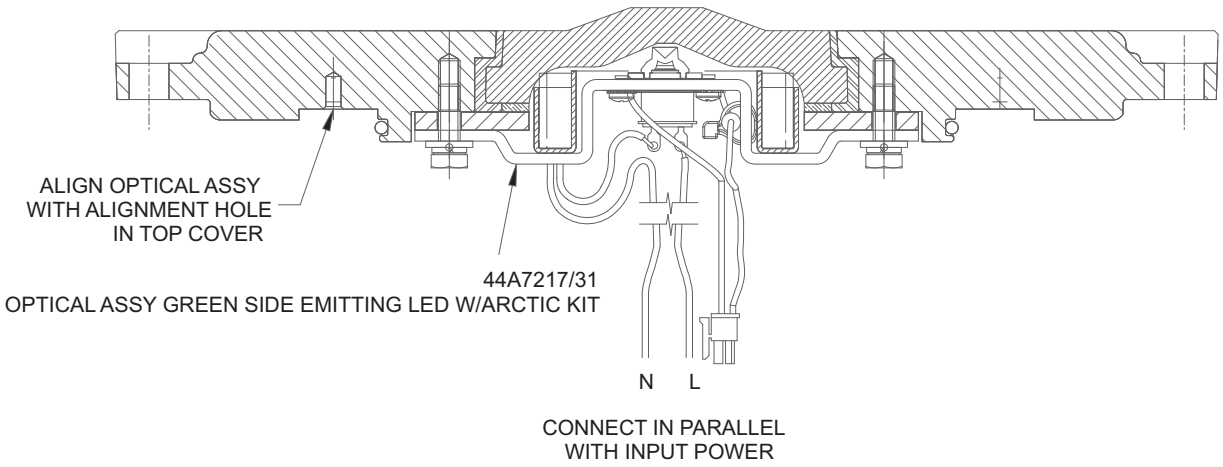

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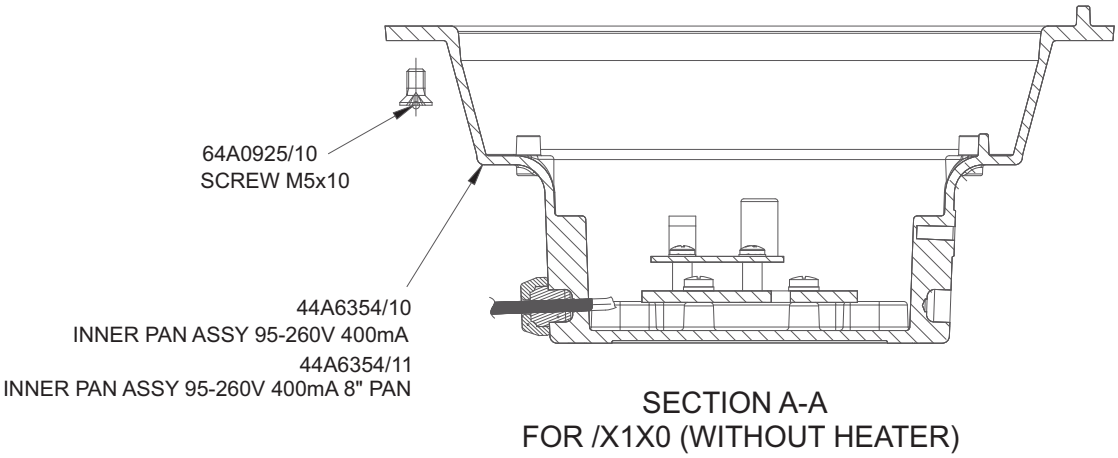
Figure 21: IUL Inner Pan



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