*{Modify the items in brackets and italics according to your industry and specific job requirements}*

**ITEM L-150 MOBILE PHOTOMETRIC TESTING SYSTEM**

**150-1.1 MOBILE PHOTOMETRIC TESTING SYSTEM DESCRIPTION**

This item shall consist of furnishing and commissioning a Mobile Photometric Testing System in accordance with these specifications. The photometric test system shall have the ability to measure main beam average intensity in accordance with FAA AC 150/5340-26 *{ICAO Annex 14 Aerodrome Maintenance, Visual Aids} {Transport Canada AC 302-010 Mobile Photometric Measuring Unit}*.

This item shall also include all equipment and necessary mounting structures to operate the system. It shall also include the testing of the airfield lighting system installation and all incidentals necessary to place the photometric test system in operation as a complete unit to the satisfaction of the Airport and Engineer.

**150-2.1 PHOTOMETRIC TESTING GENERAL**

1. **General.** Delivery of the photometric test system and the photometric testing of all the airfield lighting fixtures, except taxiway edge lights and signs, installed under this contract shall be performed by a firm with demonstrated capability for field measurement of photometric performance of airfield lighting fixtures. The firm shall have experience in evaluating the test results against FAA standards *{ICAO standards}* and manufacturers performance criteria. Suggested contacts for a mobile photometric test system and testing services include the following or an approved equal:

ADB SAFEGATE

 977 Gahanna Pkwy

 Columbus, OH 43230

 Tel: (614) 861-1304

1. **Experience**. Delivery of a mobile photometric test system and the completion of the photometric testing of all airfield lighting installed as a part of this project shall be completed by a company with greater than 5 year’s experience in the aviation photometric industry with previous photometric testing at a Part 139 airport.
2. **Site Readiness Preparation**. The Contractor is responsible for preparing the site prior to starting the photometric testing. The Contractor shall…
	1. Organize and validate that all photometric testing equipment is delivered and ready for testing
	2. Clean and align all the light fixtures to assure that the system is ready for the photometric testing.
	3. Verify series circuit cabling insulation resistance meets minimum criteria specified by the FAA for new installations or equal to or greater than the insulation resistance readings recorded prior to project work (if circuit cabling is not new)
	4. Verify calibration of constant current regulator output current using a true RMS ammeter prior to photometric testing.
3. **Testing Coordination.** The Contractor is responsible for the coordination and organization with the airport during the testing. The Contractor shall…
	1. Requirements under this item shall be coordinated with the Engineer.
	2. The Engineer shall be notified by the Contractor forty-eight (48) hours in advance of photometric testing.
	3. Coordinate with the airport access to runway and taxiway locations as needed for testing.
	4. Coordinate with the airport ability to turn on and off all the required airfield lighting circuits.
	5. Available to correct any deficiencies until the system has successfully passed photometric testing.
	6. Perform all testing at night with minimum interference with airport operations.
4. **Testing Corrective Action**: The Contractor shall be responsible for correcting any deficient condition identified as a result of the photometric testing. Corrective actions include:
5. Failed lights that do not meet photometric testing requirements, shall be repaired by the Contractor at their expense. This may include cleaning, re-lamping (incandescent type lights), correcting alignment or toeing, correcting installation and leveling
6. Contractor may need to grind the pavement around the light fixture. The grinding of the pavement shall be at the Contractor’s expense and incidental to the installation of the light.
7. **Spares:** The Contractor shall furnish spare lamps, lenses, and fixtures for use in correcting any deficiencies at no additional cost to the contract.
8. **Retesting:** Retesting of the light fixtures shall be at the Contractor’s expense. If satisfactory corrective actions cannot be completed within the originally scheduled test period, necessary additional site visits by the testing firm shall be at the Contractor’s expense.

**150-3.1 PHOTOMETRIC TEST SYSTEM EQUIPMENT**

1. **Test System**. The photometric test system shall be comprised of:
2. An array of accurate measurement sensors configured to measure light from each light source as system moves toward and away from that light source. There shall be no loss of accuracy at speeds up to at least 35mph.
3. The capability to test both directions of a bi-directional fixture with one directional pass of the sensors.
4. The capability to be mounted to a standard 2” ball hitch or pintle plate.
5. The capability to be mounted to either the front or rear of the test vehicle.
6. An aiming screen to assist the operator in driving alignment during test.
7. The capability (including additional sensors) to accurately track the position of each measurement sensor relative to the specified main beam area of each light source being measured.
8. The capability to automatically calculate the average intensity (in candela) in the main beam area and estimate vertical and horizontal beam alignment (in degrees) by identifying the position of the brightest part of the light beam measured.
9. The capability to log data during surveys, display results, and identify locations where the average main beam intensity is below FAA minimum output of 70% at full intensity *{ICAO minimum output of 50% at full intensity}* and/or the beam is misaligned either vertically or horizontally.
10. **Fixture Compatibility:** The photometric test system shall be able to test the following fixtures:

L-804 Runway Guard Lights

L-850A Runway Centerline and LAHSO Lights

L-850B Touchdown Zone Lights

L-850C Runway Edge Lights

L-850D Runway End Lights

L-850E Runway Threshold Lights

L-852A Taxiway Centerline straight, CAT I/II

L-852B Taxiway Centerline curved, CAT I/II

L-852C Taxiway Centerline straight, CAT III

L-852D Taxiway Centerline curved, CAT III

L-852G Inpavement Runway Guard Lights

L-852GS Inpavement Runway Guard Light / Stop Bar

L-852J Taxiway Centerline curved Cat I/II

L-852K Taxiway Centerline curved Cat III

L-852S Inpavement Stop Bar Lights

L-861 Medium Intensity Runway Elevated Edge Lights

L-861E Med. Intensity Runway Threshold/End Lights

L-861SE Med. Intensity Runway Threshold/End Lights

L-862 High Intensity Runway Elevated Edge Lights

L-862E High Intensity Runway Threshold/End Lights

L-862S Elevated Stop Bar Light

1. **Dual Photometric Sensor**: In order to minimize the impact on airport operations and testing time, the light sensor shall have dual reading capabilities capable of taking simultaneous photometric readings of bi-directional fixtures in a single measurement pass.
	1. The collection of data shall be undertaken while the photometric system is traveling along the runway or taxiway and capable of reading light output of bi-directional fixtures as it approaches the fixture as well as after it has passed over the fixture.
	2. Single pass bi-directional lighting measurements should limit the total runway access time for runway edge and centerline fixtures to less than 15 minutes per measurement run.
		1. 1 pass for Runway Centerline
		2. 1 pass for each side of the Runway Edge
	3. Single pass bi-directional lighting measurements should also limit the access time on bi-directional taxiway centerline lights.
		1. 1 pass per Taxiway Centerline light circuit

**150-4.1 PHOTOMETRIC TEST REPORT**

1. **Interim Test Report.** During the photometric testing, interim reports will be submitted periodically during the progress of the work so that corrective measures may be taken as necessary. If the corrective measures are made promptly, the circuits and fixtures involved will be retested during the scheduled period of field testing to assure that proper performance has been achieved. If the retesting cannot be done within this period, additional time and costs shall be borne by the Contractor.
2. **Final Test Report.** Final test results shall be documented in a Final Test Report of which two (2) copies shall be submitted to the Engineer. The Final Report shall document the photometric testing and shall include the following:
3. **Tabular Lights List:** Documents the Light ID, Average performance (in candela), percentage of the FAA {IACO} standard, GPS coordinates of the light and color at each location.
4. **Performance Bar Chart:** Provides a visual indication of overall performance for each light as a percentage of the FAA {IACO} standard. Color coded bars representing each light green = 100% compliant, yellow = <100% but greater than minimum level, red = < minimum % level.
5. **Isocandela Curves Report:** A detailed isocandela color-coded graph for each individual light showing average candela, % compliance, vertical and horizontal position (in degrees) of the maximum point in the main beam which can be used to determine proper alignment and installations of the light.
6. **Test Report Data.** Each photometric test report shall be uniquely identified using a combination of the following information:
7. Runway or Taxiway Reference
8. Date and Time of Service
9. Tester (Person who performed the measurements)
10. Light Fixture Name (Identification number)
11. Light Fixture Location (Based on GPS Coordinates)
12. Max candela output in appoint along the main beam
13. Average candela output of the main beam
14. Percentage (%) level compared to FAA {ICAO} requirements
15. Lens Color of the fixture being tested

**150-5.1 METHOD OF MEASUREMENT**

The method of measurement is for the delivery and system acceptance testing of the mobile photometric test system and the service to complete the photometric testing of the airfield lighting systems and will be made on a lump sum basis. This measurement shall include all labor, services, and assistance provided by the Contractor to complete the system acceptance testing and validation of the mobile photometric test system and to complete the photometric testing of all light fixtures installed as part of this project. This measurement also includes furnishing all equipment, materials and appliances necessary for photometric testing of the airfield lighting systems.

**150-6.1 BASIS FOR PAYMENT**

Payment will be made at the contract lump sum price for the mobile photometric test system and the photometric testing of airfield lighting systems. This price shall be full compensation for furnishing all materials and for all preparation, testing, and for all labor, equipment, tools, and incidentals necessary to complete the items to the satisfaction of the Engineer.

Payment will be made under:

Item L-150-1 Mobile Photometric Test System – per lump sum

Item L-150-2 Photometric Testing of the Lighting System – per lump sum

**END OF ITEM L-150**