Illinois Department of Transportation
Office of Intermodal Project Implementation / Division of Aeronautics
1 Langhorne Bond Drive / Springfield, Illinois 62707-8415

January 10, 2018

SUBJECT: Morris Municipal James R. Washburn Field Airport
Morris, Illinois
Grundy County
Illinois Project Number: C09-4442
SBG Project Number: 3-17-SBGP-120
Contract No. MR022
Item No. 08A, January 19, 2018 Letting
Addendum A

NOTICE TO PROSPECTIVE BIDDERS

Attached is an addendum to the plans or proposal. This addendum involves revised and/or added material.

Reason for Addendum:
This addendum removes the requirement for the PAPI equipment to only be a LED light source system.

The Construction Safety Plan (Sheet 3) has also been updated.

To All Plan Holders:
1. Replace the Construction Safety Plan (Sheet 3) with the attached Revised Construction Safety Plan.

2. Replace the ITEM AR125615 PAPI (L-880 System) special provision (pages 27-34) with the attached revised ITEM AR125615 PAPI (L-880 System) special provision.

Prime contractors must utilize the enclosed material when preparing their bid and must include any Schedule of Prices changes in their bidding proposal.

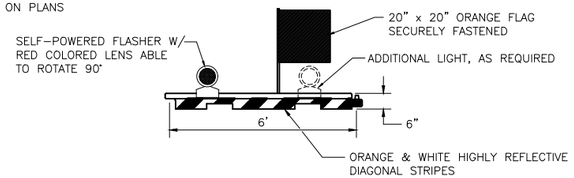
Questions on this addendum may be directed to Casey McCollom, P.E. of Chamlin & Associates, Inc. at 815-942-1402.

## BARRICADE NOTES:

BARRICADES TO BE HIGH IMPACT UV–RESISTANT POLYETHYLENE, LIQUID OR SAND BALLASTED TO WITHSTAND DISPLACEMENT BY WEATHER, JET OR PROP BLAST.

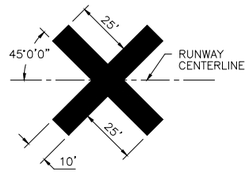
PLACE AT 12' INTERVALS (CENTER TO CENTER) UNLESS SPECIFIED OTHERWISE ON PLANS OR BY ENGINEER.

STEADY BURNING, RED OMNI–DIRECTIONAL LIGHTS MAY BE SUBSTITUTED.




LOW PROFILE BARRICADE

NOT TO SCALE




TEMPORARY CLOSED RUNWAY MARKER DETAIL

NOT TO SCALE

***NOTE:***

1.) CLOSED RUNWAY MARKERS SHALL BE YELLOW.

2.) MARKERS SHALL BE DOUBLE LAYERED PAINTED SNOW FENCE, COLORED PLASTIC, PAINTED PLYWOOD OR OTHER MATERIAL APPROVED BY THE ENGINEER.

3.) CONTRACTOR SHALL MAINTAIN MARKERS AS DIRECTED BY THE ENGINEER.

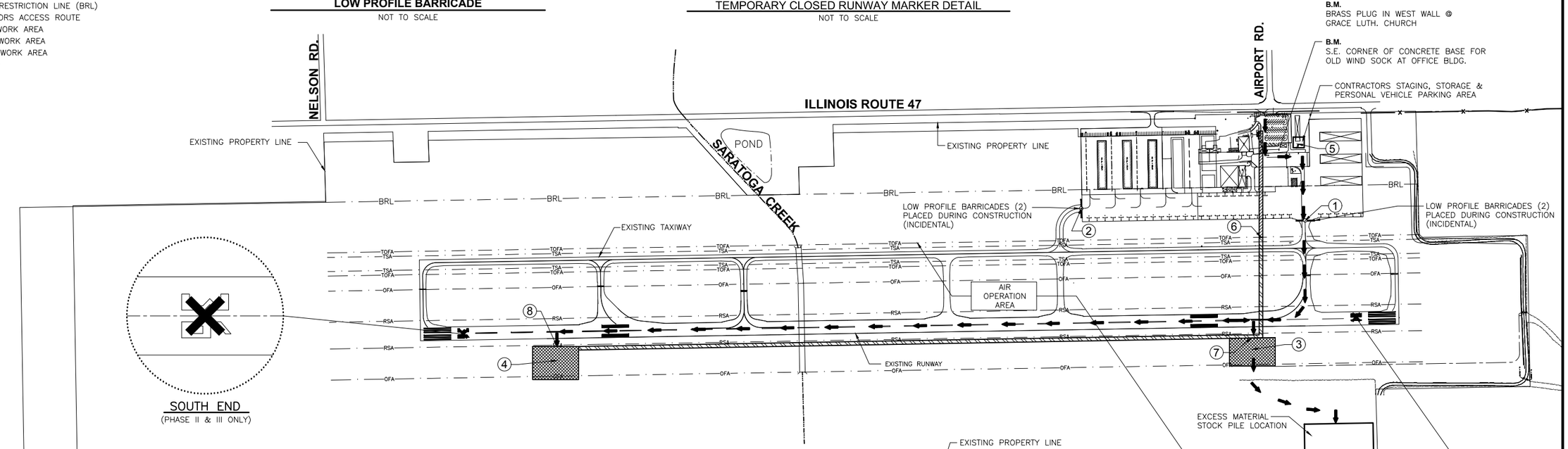
4.) MARKERS SHALL BE PLACED OVER EXISTING RUNWAY NUMERALS AND AS DIRECTED BY THE ENGINEER.

5.) COST OF FURNISHING, INSTALLING, MAINTAINING AND REMOVING MARKERS AND BARRICADES SHALL BE CONSIDERED INCIDENTAL TO CONTRACT.

GRAPHIC SCALE
0 150 300
(IN FEET)

## LEGEND

- RSA — RUNWAY SAFETY AREA (RSA)
- OFA — OBJECT FREE AREA (OFA)
- BRL — BUILDING RESTRICTION LINE (BRL)
- CONTRACTORS ACCESS ROUTE
- PHASE I WORK AREA
- PHASE II WORK AREA
- PHASE III WORK AREA
- BARRICADE




## CRITICAL POINT DATA

| PNT. LOCATION | LATITUDE | LONGITUDE | GRND. ELEV. | HEIGHT (AMSL) | PHASE |
|---|---|---|---|---|---|
| (N) APRON BARRICADE ① | N. 41° 25' 51.03" | W. 88° 25' 15.02" | 585.50 | 588.00 | II & III |
| (S) APRON BARRICADE ② | N. 41° 25' 38.60" | W. 88° 25' 15.88" | 574.50 | 577.00 | II & III |
| PAPI UNIT (N) LOCATION ③ | N. 41° 25' 47.79" | W. 88° 25' 06.45" | 580.64 | 584.64 | III |
| PAPI UNIT (S) LOCATION ④ | N. 41° 25' 09.09" | W. 88° 25' 05.53" | 566.57 | 570.57 | III |
| CONSTRUCTION STAGING AREA ⑤ | N. 41° 25' 50.67" | W. 88° 25' 20.78" | 587.71 | 612.71 | I, II, & III |
| CONSTRUCTON EQUIPMENT ⑥ | N. 41° 25' 48.58" | W. 88° 25' 13.78" | 581.30 | 611.30 | II & III |
| CONSTRUCTION EQUIPMENT ⑦ | N. 41° 25' 48.11" | W. 88° 25' 06.33" | 581.17 | 611.17 | II & III |
| CONSTRUCTION EQUIPMENT ⑧ | N. 41° 25' 09.49" | W. 88° 25' 05.65" | 569.15 | 599.15 | II & III |

*BARRICADES USED ON AIRPORT SURFACES SHALL BE LOW PROFILE WITH REFLECTIVE STRIPES & RED LIGHTS AS PER AC 150/5370–2F "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION".

## SEQUENCE OF CONSTRUCTION & SAFETY

### PHASE I: (WORK OUTSIDE OF AIR OPERATION AREA)

A. CONSTRUCT CONDUIT FROM ELECTRICAL CONTROL UP TO TOFA (465.5' WEST OF RUNWAY CENTERLINE).

### PHASE II: (DAILY WORK INSIDE AIR OPERATION AREA - EXCAVATION OPERATIONS)

A. INSTALL TEMPORARY RUNWAY CLOSURE MARKERS, BARRICADES AND SIGNAGE.
B. INSTALL CONDUIT AND FOUNDATIONS INSIDE DESIGNATED WORK AREAS.
C. BACKFILL ALL OPEN EXCAVATIONS.
D. REMOVE ALL CONSTRUCTION EQUIPMENT AND EXCESS MATERIALS.
E. SWEEP AND CLEAN ALL PAVED SURFACES WITHIN RSA.
F. REMOVE TEMPORARY BARRICADES, SIGNAGE AND RUNWAY CLOSURE MARKERS.

### PHASE III: (DAILY WORK INSIDE AIR OPERATION AREA - ELECTRICAL OPERATIONS)

A. INSTALL TEMPORARY RUNWAY CLOSURE MARKERS, BARRICADES AND SIGNAGE.
B. INSTALL WIRING IN NECESSARY CONDUIT.
C. INSTALL L–880 UNITS.
D. COMPLETE NECESSARY CONNECTIONS.
E. CONFIGURE AND AIM L–880 UNITS.
F. CANCEL N.O.T.A.M. FOR TEMPORARY DAILY CLOSURES OF RUNWAY 18/36.
G. GROUND TEST, FLIGHT CHECK PAPI SYSTEM.
H. ISSUE N.O.T.A.M. FOR OPERATION OF PAPI SYSTEM.

## GENERAL NOTES AND SCOPE OF WORK

1.) SCOPE OF WORK: THE PROJECT WILL CONSIST OF INSTALLING PRECISION APPROACH PATH INDICATORS FOR RUNWAY 18 AND 36. THE SCOPE OF THE PROJECT IS TO INSTALL L–880 UNITS AT THE DESIGNATED LOCATIONS FOR RUNWAY 18 AND RUNWAY 36, APPROXIMATELY 7000 LINEAL FEET OF CONDUIT WITH WIRE AND MODIFY THE EXISTING ELECTRICAL VAULT, AND ALL OTHER NECESSARY APPURTENANCES.

2.) THE MAXIMUM ANTICIPATED CONSTRUCTION EQUIPMENT HEIGHT IS 30'–0".

3.) THE CONTRACTOR SHALL USE THE DESIGNATED ACCESS ROUTE AS SHOWN ON THIS SHEET. THE CONTRACTOR SHALL MAINTAIN THE ROUTE AND REMOVE ANY FOREIGN OBJECT DEBRIS FROM THE WORK AREA AND ACCESS ROUTE AT THE CLOSE OF EACH WORK DAY. THE CONTRACTOR IS RESPONSIBLE TO SWEEP THE ACCESS ROUTE PRIOR TO THE CLOSE OF WORK EACH DAY. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.

4.) PUMPING GROUND WATER AND OR STORM WATER FROM THE WORK AREA IS CONSIDERED INCIDENTAL TO THE PROJECT.

5.) DUE TO THE PROXIMITY TO AIRCRAFT OPERATIONS, THE CONTRACTOR IS REQUIRED TO STRICTLY ADHERE TO THE GUIDELINES REGARDING CONSTRUCTION SAFETY AS SET FORTH IN FAA ADVISORY CIRCULAR 150/5370–2F.

## SAFETY PLAN NOTES

1.) THE SEQUENCE OF CONSTRUCTION SHOWN ON THIS SHEET IS INTENDED TO ALLOW ORDERLY AND SAFE CONSTRUCTION, AND TO AVOID LENGTHY TAXIWAY CLOSINGS.

2.) BARRICADES SHALL BE PLACED AND MAINTAINED AS SHOWN HEREIN, AS INDICATED IN THE SPECIAL PROVISIONS AND AS DIRECTED BY THE ENGINEER. PLACEMENT AND MAINTENANCE OF BARRICADES ARE INCIDENTAL TO CONTRACT.

3.) THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING AND INSTALLING CLOSED TAXIWAY MARKERS AS SHOWN ON THIS SHEET AND AS DIRECTED BY THE AIRPORT MANAGER AND THE ENGINEER. MARKERS SHALL BE PLACED AND REMOVED WHEN SO DIRECTED BY THE OWNER THROUGH THE ENGINEER. THE OWNER SHALL BE RESPONSIBLE FOR NOTIFYING THE FLIGHT SERVICE STATION REGARDING RUNWAY CLOSURE.

4.) ALL BARRICADES, MARKINGS, LATHE, FLAGGING, AND TRAFFIC CONTROL ITEMS ARE INCIDENTAL TO THE CONTRACT.

5.) ALL IDOT TYPE III BARRICADES SHALL HAVE FOUR STANDARD SIZE SAND BAGS PER LEG.

6.) **ALL EXCAVATIONS SHALL BE COMPLETELY FILLED AT THE CLOSE OF EACH WORK DAY AND RUNWAYS REOPENED. BARRICADES, DEBRIS, EQUIPMENT AND ANY OTHER OBJECTS SHALL BE CLEARED FROM THE RUNWAY PRIOR TO REOPENING.**

7.) WHEN THE CONTRACTORS VEHICLES AND EQUIPMENT ARE ON THE AIPRPORT PROPERTY THEY SHALL CARRY A HAZARD IDENTIFICATION FLAG CONSISTING OF A 3 FOOT SQUARE INTERNATIONAL ORANGE AND WHITE CHECKERED FLAG.

8.) WHEN THE CONTRACTOR IS OPERATING IN AOA, HE/SHE SHALL CARRY A TWO WAY RADIO TUNED TO THE FREQUENCY SPECIFIED BY THE AIRPORT MANAGER IN ORDER TO HAVE CONSISTENT AND IMMEDIATE CONTACT WITH AIRPORT OPERATIONS STAFF.

9.) THE CONTRACTOR SHALL NOT UTILIZE EQUIPMENT WITH A HEIGHT GREATER THAN 30 FOOT WITHOUT PRIOR APPROVAL FROM THE RESIDENT ENGINEER.

10.) ALL COSTS INCURRED BY THE CONTRACTOR TO IMPEMENT AND MAINTAIN THE SAFETY PLAN SHALL BE INCLUDED IN THE COST OF THE CONTRACT.

11.) RESTORATION OF AAUL ROUTES AND STAGING AREAS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. NO MEASUREMENT FOR PAYMENT WILL BE MADE FOR THIS WORK AND SHALL BE INCLUDED IN THE COST OF THE CONTRACT.

**POINT OF CONTACT**
AIRPORT MANAGER:
JEFF VOGEN
MORRIS MUNICIPAL AIRPORT
9980 N. RTE. 47
MORRIS, IL 60450
(815) 942–1600



DRAWN BY: ARR
CHECKED BY: CJM
DATE: 11/17

| REVISIONS | | | |
|---|---|---|---|
| LEVEL | BY | DATE | DESCRIPTION |
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CHAMLIN & ASSOCIATES, INC.

PERU MORRIS ILLINOIS

**MORRIS MUNICIPAL AIRPORT**
**ILLINOIS PROJECT NO. C09-4442**
**AIP PROJECT NO. 3-17-SBGP-120**

**CONSTRUCTION SAFETY PLAN**

**100%**
**NOVEMBER 24, 2017**

CURRENT AS OF: 11/24/17
SCALE: AS NOTED
SHEET 3
FILE NO.: 1206.00 Y–
OF 7

## ITEM AR125615 PAPI (L-880 SYSTEM)

DESCRIPTION

125-1.1. This item of work shall consist of furnishing Precision Approach Path Indicators (PAPI's) meeting the requirements of FAA AC No. 150/5345-28G or the most recent edition of FAA-E-3007 performance specification for LED light source PAPI's and installing the equipment at the locations shown on the Construction Plans. Each installation will be in accordance with the details on the Plans and these Special Provisions. Also included in this item will be the, aiming, testing of the installation, and all incidentals necessary to place the respective PAPI system into proper operation and to the satisfaction of the Resident Engineer and FAA Flight Check results.

125-1.2 REFERENCES.

A. ANSI C80.1 – Rigid Steel Conduit, Zinc Coated.

B. ANSI C80.4 – Fittings Rigid Metal Conduit and EMT.

C. FAA AC No. 150/5340-30G "DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS".

D. FAA AC No. 150/5345-28G (or most current issue in effect) "PRECISION APPROACH PATH INDICATOR (PAPI) SYSTEMS"

E. FAA AC 150/5345-42F "SPECIFICATION FOR AIRPORT LIGHT BASES, TRANSFORMER HOUSINGS, JUNCTION BOXES, AND ACCESSORIES".

F. FAA AC No. 150/5345-53 "AIRPORT LIGHTING EQUIPMENT CERTIFICATION PROGRAM" (most current issue) and AC150/5345-53D, AIRPORT LIGHTING EQUIPMENT CERTIFICATION PROGRAM Appendix 3 Addendum.

G. FAA AC No. 150/5370-2F (or most current issue) "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION.

H. FAA Performance Specification for FOUR BOX, LIGHT EMITTING DIODE PRECISION APPROACH PATH INDICATOR (PAPI) – FAA-E-3007, most recent edition

I. NFPA 70 – National Electrical Code (most current issue in force).

J. NFPA 70E – Standard for Electrical Safety in the Workplace

K. OSHA 29 CFR Part 1910 Occupational Safety and Health Standards for electrical safety and lockout/tagout procedures.

L. UL Standard 6 – Rigid Metal Conduit.

M. UL Standard 467 – Grounding and Bonding Equipment.

N. UL Standard 486A8486B Wire Connectors.

O. UL Standard 514B – Conduit, Tubing and Cable Fittings.

125-1.3 SHOP DRAWINGS. The Contractor shall furnish shop drawings for approval before ordering equipment and/or materials. Shop drawings are required for PAPI units and associated equipment and materials to be used on the project. Contractor should submit electronic copies of shop drawings to the

Resident Engineer instead of hard copies. Upon request the Contractor may submit hard copies of the shop drawings. The number of hardcopies required will be determined upon request. Shop drawings shall include the following information:

A. Certification of compliance with Buy American Preference for all materials. All materials and equipment for these items shall comply with the Buy American Preference as required by this contract. The Contractor shall be responsible to provide proof of 100% domestic materials prior to delivering materials to the site. Materials that are unable to meet this requirement shall be reported in the bid documents under Certifications Required by State and/or Federal Law, Buy American Certificate.

B. In order to expedite the shop drawing review, inspection and/or testing of materials, the Contractor shall furnish complete statements to the Project Engineer as to the origin, composition, and manufacturer of all material to be used in the work. Such statements shall be furnished promptly after execution of the contract but, in all cases, prior to delivery of such materials.

C. Cut sheets with part number and specifications for PAPI System.

D. Indicate the pay item number for each respective cable and/or cable in unit duct.

E. Shop drawings shall include wire/conductor/cable cut sheets with type, size, specifications, ETL or UL listing, manufacturer, and catalog or part number.

F. Where cable is required to have colored coded insulation, provide information on the color coding for the respective conductors.

G. Include cut sheets with part numbers and dimensions for base cans, cover plates, and associated components.

H. Concrete mix design.

I. Provide cut sheets with manufacturer’s name, catalog number, dimensions, material and UL listing for each type and size ground rod. Include certification of 100% domestic steel for ground rods. Include cut sheets for exothermic weld connections, ground lugs, and ground wire.

J. Provide cut sheets for all types of conduit used with the PAPI system. Include certification that steel conduits are made with 100 percent domestic steel.

EQUIPMENT AND MATERIALS

125-2.1 PAPI UNITS. The proposed PAPI units shall be a Type L-880 system consisting of four light housing assembly units Style "A" (240 VAC ±10%, 60 Hz input power), a power and control unit (PCU), and all accessories as per FAA AC 150/5345-28G and approved by the FAA AC 150/5345-53D, or latest revision.

The PCU shall include a main breaker to provide overcurrent protection and to serve as a maintenance safety switch to disconnect all power to the PAPI installation when in the “off” or “tripped” position. A photocell shall be provided with the PCU.

Note where the respective PAPI system requires a voltage system other than 240 VAC, single phase, 2-wire with ground, the Contractor shall be responsible to furnish and install the respective transformers and/or additional feeder cable conductors to accommodate the required voltage system.

125-2.2 AIMING AND CALIBRATION EQUIPMENT. Furnish one clinometer (aiming and calibration device) with the PAPI units for each respective runway. Aiming and calibration equipment will be incidental to the PAPI units.

125-2.3 POWER AND CONTROL CABLE. Power cables from the respective power source to the respective PAPI installation shall be sized as detailed on the Plans and in conformance with Item 108. Control cable shall be as recommended by the respective PAPI manufacturer and per FAA AC 150/5345-28G. Power feeds from the PAPI Power and Control Unit to the PAPI lighting units shall be per manufacturer's recommendations and/or instructions. Contractor shall confirm the correct cable sizes with the respective PAPI manufacturer as well as the Resident Engineer. In case of discrepancy between the PAPI manufacturers recommendation and the Resident Engineer, the Resident Engineer's opinion will be deemed correct.

125-2.4 CONDUIT AND DUCTS. Conduit and ducts for the PAPI systems shall conform to Item 110, per manufacturer's recommendations, as detailed on the Plans, and as specified herein. Conduit for power and control cables from the PAPI Power and Control Unit to the PAPI lighting units and between the PAPI lighting units shall be 2 inch Galvanized Rigid Steel Conduit, or larger where required by NEC and/or manufacturer's recommendations for the respective cables. GRSC shall be heavy wall, hot-dipped, galvanized steel pipe bearing the UL label and conforming to UL-6 and ANSI Specification C80.1. Couplings, connectors, and fittings for rigid steel conduit shall be threaded galvanized steel or galvanized malleable iron specifically designed and manufactured for the purpose. Fittings shall conform to ANSI C80.4 and UL-514B. Galvanized rigid steel conduit shall be produced from 100 percent domestic steel.

125-2.5 SPLICE CANS. Splice cans shall conform to the requirements of FAA AC 150/5345-42F for Type L-867, Class IA, Size B (12 inch nominal diameter), 24 inch deep. Splice cans shall have galvanized steel or aviation yellow powder coat painted steel covers, 3/8 in. thick, or as recommended by the respective PAPI manufacturer where the splice can is installed at the PAPI installation. Include internal and external ground lugs on each L-867 splice can.

125-2.6 ANTI-SEIZE COMPOUND. The Contractor will apply an oxide-inhibiting, anti-seizing compound to all screws, nuts, breakable coupling, and all places where metal comes into contact with metal. The anti-seize compound will be as manufactured by I.T.T. brand name "Contax", or an approved equal.

125-2.7 STAINLESS STEEL BOLTS. All base plate mounting bolts shall be stainless steel.

125-2.8 GROUND RODS. Ground rods shall be ¾ inch diameter by 20 foot long UL listed Copper clad, (two ¾ in. diameter by 10 ft long, UL-listed, Copper clad ground rods coupled together). Ground rods shall have 10 mil. minimum Copper coating. Ground rods shall be manufactured in the United States of America. Steel used to manufacture ground rods shall be 100 percent domestic steel.

12561582.9 CONCRETE. Concrete associated with the each PAPI foundation piers/pad and/or splice can shall conform to Item 610 Portland Cement Concrete

125-2.10 BOOST TRANSFORMERS. Provide a boost transformer at the vault where the voltage drop from the vault to the respective PAPI Power and Control Unit exceeds 5% (12 Volts for a 240 VAC nominal supply). Boost transformer is not required where the PAPI Power and Control Unit has an input power transformer tap adjustments suitable for the respective input voltage and cable losses. Boost transformers shall be rated to handle the respective equipment loads, suitable for connection as 240 VAC, 60 Hz, 1 phase, 2-wire input and provide the proper output voltage at the respective PAPI Power and Control Unit with the PAPI system in operation. Boost transformer shall be UL listed and designed, manufactured, and tested in accordance with ANSI Standard Z535.3 and NEMA ST20 where applicable. Transformer shall be suitable for indoor/outdoor installation with a NEMA 3R weatherproof enclosure. Boost transformers for PAPI circuits shall be manufactured in the United States to comply with the "Buy American Act". Confirm proper output voltage for the respective application.

12561582.11 LEGEND PLATES. Legend plates shall be required for all PAPI power control units, safety switches, circuit breakers, disconnects, etc. Legend plates shall be provided to identify the equipment controlled, the power source and voltage, and the function of each device. Legend plates shall be

weatherproof and abrasion resistant phenolic material. Lettering shall be black letters on a white background, unless otherwise noted.

CONSTRUCTION METHODS

125-3.1 INSTALLATION OF PAPI SYSTEMS. Installation of PAPI systems shall conform to FAA AC No. 150/5345-28G titled “PRECISION APPROACH PATH INDICATOR (PAPI) SYSTEMS” and the respective manufacturer’s instructions, as detailed on the Plans, and as specified herein. The Contractor shall construct concrete bases for the PAPI system units per manufacturer’s instructions and recommendations and/or as shown on the Construction Plans. All bolt placements will be as per manufacturer's recommendations. The structural legs shall have breakable couplings not more than 2 in. from the top of the respective base/foundation. Coordinate conduit installations into the bases as applicable for power, control, and/or grounding cable conduits. The power control unit shall be installed in the location shown on the Plans and required by the equipment manufacture. Should the manufacturer of the equipment require the power control unit be installed closer to the runway than shown on the plans, the Contractor shall submit a written request to the Resident Engineer for this change in plans. The poles/support posts installed to support the unit will be anchored in concrete typical to the PAPI base, and each pole/support post shall have a breakable coupling not more than 2 in. from the top of the concrete base/foundation.

The PAPI units shall be installed and aimed in accordance with manufacturer’s specifications and instructions. The aiming angles shall comply with those shown on the Plans.

The Contractor shall install all the required electrical equipment in the electrical vault to place the proposed PAPI units into operation. The furnishing and installing of this electrical equipment will be paid for under Item 109210 Vault Modification per lump sum.

125-3.2 ELECTRICAL. The Contractor shall furnish and install all electrical materials necessary for complete and operational installation of the PAPI systems as shown on the plans and detailed herein. The complete installation and wiring shall be done in a neat, workmanlike manner. All electrical work shall comply with the requirements of the NFPA 70 – National Electrical Code (NEC) most current issue in force. Electrical equipment shall be installed in conformance with the respective manufacturer’s directions and recommendations for the respective application. Any installations which void the UL listing, ETL listing, (or other third party listing), and/or the manufacturer’s warranty of a device will not be permitted.

A. Contractor shall keep a copy of the latest NEC in force on site at all times during construction for use as a reference.

B. Contractor shall keep a copy of the Plans, Special Provision Specifications including any addenda, and copies of any change orders on site at all times during construction.

C. Contractor shall coordinate work and any power outages with the Airport Manager, the respective Airport personnel, and the Resident Engineer/Resident Project Representative. Any shutdown of existing systems shall be scheduled with and approved by the Airport Manager prior to shutdown. Once shut down, the circuits shall be labeled as such to prevent accidental energizing of the respective circuits. All personnel shall follow U.S. Department of Labor Occupational Safety & Health Administration (OSHA) 29 CFR Part 1910 Occupational Safety and Health Standards for electrical safety and lockout/tagout procedures, including, but not limited to, 29 CFR Section 1910.147 The Control of Hazardous Energy (lockout/tagout).

D. Contractor shall comply with the applicable requirements of NFPA 70E – Standard for Electrical Safety in the Workplace.

E. All electrical equipment installed by the Contractor shall be properly labeled, and all cables must be tagged.

F. All changes to the airfield lighting system control wiring will be documented by the Contractor and provided to the Resident Engineer/Resident Project Representative.

G. Locate Existing Underground Utilities and Cables. The location, size, and type of material of existing underground and/or aboveground utilities indicated on the Plans are not represented as being accurate, sufficient, or complete. Neither the Owner nor the Engineer assumes any responsibility whatever in respect to the accuracy, completeness, or sufficiency of the information. There is no guarantee, either expressed or implied, that the locations, size, and type of material of existing underground utilities indicated are representative of those to be encountered in the construction. It shall be the Contractor's responsibility to determine the actual location of all such facilities, including service connections to underground utilities. Prior to construction, the Contractor shall notify the utility companies of his operational plans, and shall obtain, from the respective utility companies, detailed information and assistance relative to the location of their facilities and the working schedule of the companies for removal or adjustment, where required. In the event an unexpected utility interference is encountered during construction, the Contractor shall immediately notify the utility company of jurisdiction. The Owner's Representative and/or the Resident Engineer/Resident Project Representative shall also be immediately notified. Any damage to such mains and services shall be restored to service at once and paid for by the Contractor at no additional cost to the Contract. All utility cables and lines shall be located by the respective utility. **Contact JULIE (Joint Utility Location Information for Excavators) for utility information, phone: 1-800-892-0123.** Contact the FAA (Federal Aviation Administration) for assistance in locating FAA cables and utilities. Location of FAA power, control, and communication cables shall be coordinated with and/or located by the FAA. Also contact Airport Director/Manager and Airport Personnel for assistance in locating underground Airport cables and/or utilities. Also coordinate work with all aboveground utilities.

H. Contractor shall comply with the requirements of FAA AC No. 150/5370-2F (or most current issue) "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION."

I. Secure, identify, and place any temporary exposed wiring in conduit to prevent electrocution and fire ignition sources.

125-3.3 CABLE INSTALLATION FOR PAPI'S. Installation of cables shall conform to Item 108, the applicable sections of FAA AC 150/5345-28G, per the respective equipment manufacturer's recommendations, and as detailed on the Plans. Power and control cables from the PAPI Power and Control Unit to the PAPI lighting units and between the PAPI lighting units shall be installed in 2inch galvanized rigid steel conduit, or larger where required by NEC and/or manufacturer's recommendations for the respective cables.

125-3.4 CONDUIT INSTALLATION FOR PAPI'S. Installation of conduit shall conform to Item 110, the respective PAPI manufacturer's installation instructions and/or recommendations, as detailed on the Plans and as specified herein. Coordinate conduit installations into the PAPI foundations and/or L-867 splice cans. Provide duct seal at conduit terminations inside the PAPI Power and Control Unit enclosure.

125-3.5 GROUNDING FOR PAPI'S. Grounding for PAPI's shall conform to the respective PAPI manufacturer's installation instructions, as detailed on the Plans, and as specified herein. The power circuit to each PAPI unit, including the PAPI PCU (Power and Control Unit), shall include an equipment ground wire of the same size and type as the phase conductors. Furnish and install a ¾ inch diameter by 20 foot long Copper clad ground rod at the PAPI PCU and at each PAPI lighting unit. Bond each PAPI unit (PCU and lighting units) and the respective L-867 splice can to the respective ground rod with a #6 AWG stranded Copper grounding electrode conductor. Top of ground rods shall be buried approximately 24 inches below grade. All connections to ground rods shall be made with exothermic, weld-type connectors, Cadweld by

Erico Products, Inc., Solon, Ohio, (Phone: 800-248-9353), Thermoweld by Continental Industries, Inc., Tulsa, Oklahoma (Phone: 918-663-1440), or Ultraweld by Harger Lightning Protection Grounding Equipment, Grayslake, Illinois (Phone: 800-842-7437), or approved equal. Connections to L-867 splice cans shall be with UL listed grounding connectors suitable for use in direct burial or concrete encasement applications. Connections to PAPI unit frame shall be as recommended by the manufacturer or with a UL listed grounding connector. All ground rods associated with the complete PAPI installation shall be bonded to together with a #6 AWG solid Copper counterpoise conductor. This counterpoise conductor shall be installed in the same trench located 10 inches above the power and control conductors, between each respective PAPI unit (PCU and/or lighting unit).

125-3.6 GROUNDING REQUIREMENTS. Grounding shall conform to the following as applicable: The Contractor shall furnish and install all grounding shown on the Plans and/or as may be necessary or required to make a complete grounding system, as required by the latest NFPA 70 – National Electrical Code in force. The reliability of the grounding system is dependent on careful, proper installation, and choice of materials. Improper preparation of surfaces to be joined to make an electrical path, loose joints, or corrosion can introduce impedance that will seriously impair the ability of the ground path to protect personnel and equipment and to absorb transients that can cause noise in communications circuits. The following functions are particularly important to ensure a reliable ground system:

A. All products associated with the grounding system shall be UL-listed and labeled.

B. All bolted or mechanical connections shall be coated with a corrosion-preventative compound before joining, Sanchem Inc. “NO-OX-ID “A-Special” compound, Burndy Penetrox E, or equal.

C. Metallic surfaces to be joined shall be prepared by the removal of all non-conductive material, per 2011 NEC Article 250-12. All Copper bus bars must be cleaned prior to making connections to remove surface oxidation.

D. Metallic raceway fittings shall be made up tight to provide a permanent low impedance path for all circuits. Metal conduit terminations in enclosures shall be bonded to the enclosure with UL-listed fittings suitable for grounding. Provide grounding bushings with bonding jumpers for all metal conduits entering service equipment (meter base, CT cabinet, main service breaker enclosure, etc.), generator breaker enclosures, and automatic transfer switch enclosures. Provide grounding bushings with bonding jumpers for all metal conduits entering an enclosure through concentric or eccentric knockouts that are punched or otherwise formed so as to impair the electrical connection to ground. Standard locknuts or bushings shall not be the sole means for bonding where a conduit enters an enclosure through a concentric or eccentric knockout.

E. Furnish and install ground rods at all locations where shown on the Plans or specified herein. Ground rods shall be spaced, as detailed on the Plans, and in no case spaced less than one rod length apart. All connections to ground rods and/or buried grounding electrode conductors shall be made with exothermic, weld-type connectors, Cadweld by Erico Products, Inc., Solon, Ohio, (Phone: 1-800-248-9353), Thermoweld by Continental Industries, Inc., Tulsa, Oklahoma (Phone: 918-663-1440), or approved equal. Exothermic-weld connections shall be installed in conformance with the respective manufacturer’s directions using molds, as required for each respective application. Bolted connections will not be permitted at ground rods or at buried grounding electrode conductors.

F. All connections, located above grade, between the different types of grounding conductors shall be made using UL-listed, double-compression, crimp8type connectors or UL-listed, bolted ground connectors. For ground connections to enclosures, cases, and frames of electrical equipment not supplied with ground lugs, the Contractor shall drill required holes for mounting a bolted, ground connector. All bolted, ground connectors shall be Burndy, Thomas and Betts, or equal. Tighten connections to comply with tightening torques in UL Standard 486A to assure permanent and effective grounding.

G. All metal equipment enclosures, conduits, cabinets, boxes, receptacles, etc. shall be bonded to the respective grounding system.

H. Each new feeder circuit and/or branch circuit shall include an equipment ground wire. Metal raceway or conduit shall not meet this requirement. The equipment ground wire from equipment shall not be smaller than allowed by 2011 NEC Table 250-122 “Minimum Size Conductors or Grounding Raceway and Equipment.” When conductors are adjusted in size to compensate for voltage drop, equipment-grounding conductors shall be adjusted proportionately according to circular mil. area. All equipment ground wires shall be Copper, either bare or insulated, green in color. Where the equipment grounding conductors are insulated, they shall be identified by the color green, and shall be the same insulation type as the phase conductors.

I. Install grounding electrode conductors and/or individual ground conductors in Schedule 40 or Schedule 80 PVC conduit. Coordinate the installation of PVC conduit sleeves into the PAPI foundations to accommodate grounding electrode conductor installations from the respective PAPI unit to the respective ground rod.

125-3.7 PAPI OPERATION. Control of the PAPI units shall be with the photocell and lighting contactors located in the PCU. The lighting contactor panel shall include an “ON-OFF-AUTO” three position selector switch for each PAPI system. In the manual mode of operation, the PAPI units shall be activated by the respective “ON-OFF-AUTO” selector switch on the lighting contactor panel. In the “ON” position the PAPI units will be on. In the “AUTO” mode of operation the PAPI units shall be activated by photocell.

125-3.8 RESTORATION. All turf areas disturbed by the installation of the PAPI system and associated work shall be restored, graded, and seeded to establish a stand of grass to the satisfaction of the Engineer and will be considered as incidental to the installation of the PAPI.

125-3.9 INSTRUCTION OF AIRPORT STAFF. Contractor shall provide instruction to airport staff in regard to the operation and maintenance of the PAPI system. Contractor shall demonstrate operating procedures, lamp changing procedures, and items requiring maintenance. Contractor shall furnish operation and maintenance manuals for PAPI and associated equipment.

125-3.10 GROUND CHECK. Prior to final acceptance and activation, each completed PAPI system will be ground checked by the Resident Engineer/Resident Project Representative and/or Illinois Division of Aeronautics, and it shall be the Contractor's responsibility to have a representative present to make any necessary adjustments and/or corrections of the respective PAPI system installation. Ground check will be scheduled after the PAPI is installed and ready for check out. The ground check often includes confirmation and measurement of aiming angle of the PAPI, testing the PAPI, measurement of input voltage, measurement of input current, testing the photocell, confirmation of proper grounding, operational tests, and other tests. The Contractor shall be responsible to provide PAPI systems that pass the ground check. A copy of the PAPI Ground Check List is included in the Appendix.

125-3.11 FLIGHT CHECK. Prior to final acceptance and activation, each completed PAPI system will be flight checked by Federal Aviation Administration and/or Illinois Division of Aeronautics, and it shall be the Contractor's responsibility to have a representative present to make any necessary adjustments in the aiming of the PAPI units. The flight check will be scheduled after the PAPI has passed the ground check. The Contractor shall be responsible to provide a PAPI system that passes the respective flight check by Federal Aviation Administration and/or Illinois Division of Aeronautics.

METHOD OF MEASUREMENT

125-4.1 The PAPI systems to be furnished and installed shall be measured for payment as a unit price per each and shall include a Type L-880 system consisting of four light units, a power and control unit (PCU), all concrete and materials as required for foundations, all cable and conduit between and/or at the PAPI lighting units and PCU, grounding, splice cans, equipment, excavating, labor, tools, aiming and calibration

equipment, testing, and incidentals necessary to furnish a complete and operational PAPI system as approved by the Resident Engineer/Resident Project Representative.

BASIS OF PAYMENT

125-5.1. Payment shall be made at the contract unit price per each. This price and payment shall be full compensation for furnishing and installing all materials, for all excavating, labor, tools, equipment, and incidentals necessary to complete this item of work. Cable in unit duct from the respective power source to the respective PAPI installation shall be paid for under item 108.

Payment will be made under:
Item AR125615 PAPI (L-880 System) - per each