

CONSTRUCTION PLANS - ISSUED SEPTEMBER 22, 2017

**REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS**

**PEKIN MUNICIPAL AIRPORT (C15)  
PEKIN, TAZEWELL COUNTY, ILLINOIS**

**IDA PROJECT NO. C15-4578  
SBG PROJECT NO. 3-17-SBGP-133/139**

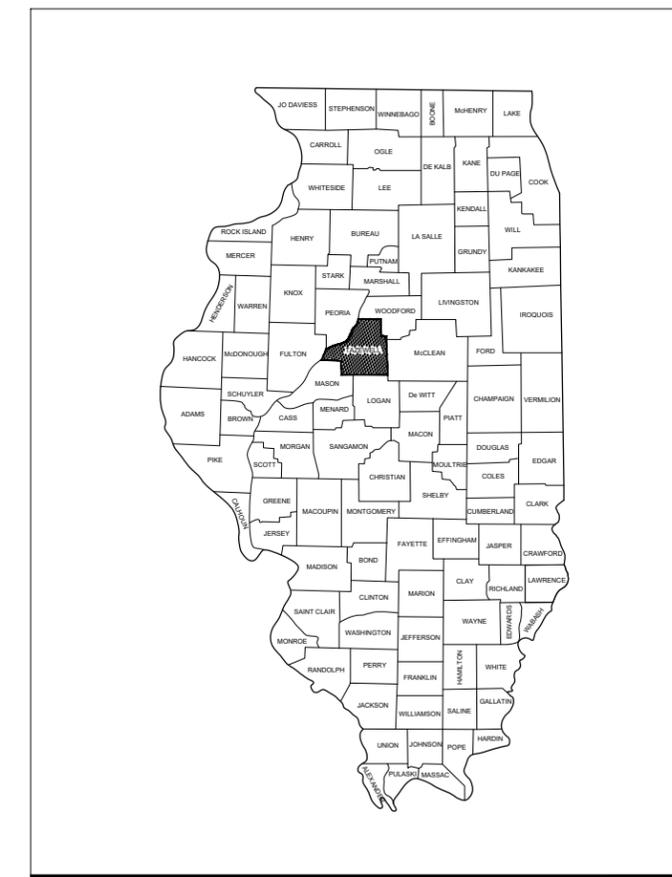
**SCOPE OF WORK:**

THIS PROJECT CONSISTS OF REMOVING THE EXISTING ELECTRICAL VAULT AND CONSTRUCTION OF A NEW ELECTRICAL VAULT, REMOVING AND REPLACING THE RUNWAY LIGHTING AND TAXI GUIDANCE SIGNS, REMOVAL OF ONE EXISTING PAPI SYSTEM AND FURNISHING AND INSTALLING ONE L-880 PAPI SYSTEM ON RUNWAY 27, REMOVING THE EXISTING L-801A BEACON AND TOWER AND FURNISHING AND INSTALLING AN L-802A BEACON WITH NEW TILT-DOWN TOWER, FURNISHING AND INSTALLING REILS ON RUNWAY ENDS 9 AND 27, AND THE ASSOCIATED CABLING, DUCT WORK, HANDHOLES, MANHOLES, AND VAULT WORK.

THE ADDITIVE ALTERNATE NUMBER 1 CONSISTS OF FURNISHING AND INSTALLING NEW L-807(L) PRIMARY LIGHTED WIND CONE.



VICINITY MAP  
"NOT TO SCALE"



LOCATION MAP  
SCALE 1" = 50 MILES

**NOTICE TO CONTRACTORS AND BIDDERS**

THESE CONSTRUCTION PLANS RELY UPON THE SPECIAL PROVISIONS AND THE SPECIFICATIONS TO PROVIDE FOR A COMPLETE DESCRIPTION OF THE WORK AND CONSTRUCTION REQUIREMENTS. THE PLANS SHALL ONLY BE USED IN COMBINATION WITH ALL CONTRACT DOCUMENTS.

No.	Issue/Description	Sheets Changed	Date	By



*Kevin N. Lightfoot*  
Kevin N. Lightfoot, P.E. Lic. Exp. 11/30/2017  
Electrical Engineer Date 9/8/2017

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9/8/2017  
Date



REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

IL Proj. No.: C15-4578

SBG No:  
3-17-SBG-133/139

Contract No. PN010

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: 09/22/2017  
PROJECT NO: 17A0002  
CAD FILE: G-002-FLP.DWG  
DESIGN BY: KNL 07/12/2017  
DRAWN BY: CWS 07/31/2017  
REVIEWED BY: BSS 08/21/2017

SHEET TITLE

SUMMARY OF QUANTITIES AND INDEX OF SHEETS

SUMMARY OF QUANTITIES - BASE BID

ITEM NO.	DESCRIPTION	TOTAL QUANTITY	UNIT	AS-BUILT QUANTITY
AR101515	HIGH INTENSITY AIRPORT BEACON	1	EACH	
AR103410	BEACON TOWER	1	EACH	
AR103900	REMOVE BEACON TOWER	1	EACH	
AR108086	1/C #6 XLP-USE	5,540	L.F.	
AR108108	1/C #8 5KV UG CABLE	2,400	L.F.	
AR108158	1/C #8 5KV UG CABLE IN UD	13,800	L.F.	
AR108258	2/C #8 5KV UG CABLE IN UD	1,100	L.F.	
AR108756	1/C #6 GROUND	12,326	L. F.	
AR109100	CONSTRUCT ELECTRICAL VAULT	1	L. S.	
AR109200	INSTALL ELECTRICAL EQUIPMENT	1	L. S.	
AR109901	REMOVE ELECTRICAL VAULT	1	L. S.	
AR110012	2" DIRECTIONAL BORE	270	L.F.	
AR110013	3" DIRECTIONAL BORE	870	L.F.	
AR110202	2" PVC DUCT, DIRECT BURY	180	L.F.	
AR110503	3-WAY CONCRETE ENCASED DUCT	663	L.F.	
AR110504	4-WAY CONCRETE ENCASED DUCT	356	L.F.	
AR115610	ELECTRICAL HANDHOLE	13	EACH	
AR115710	ELECTRICAL MANHOLE	3	EACH	
AR125410	MITL-STAKE MOUNTED	19	EACH	
AR125415	MITL-BASE MOUNTED	8	EACH	
AR125441	TAXI GUIDANCE SIGN, 1 CHARACTER	1	EACH	
AR125444	TAXI GUIDANCE SIGN, 4 CHARACTER	2	EACH	
AR125445	TAXI GUIDANCE SIGN, 5 CHARACTER	1	EACH	
AR125446	TAXI GUIDANCE SIGN, 6 CHARACTER	1	EACH	
AR125505	MIRL, STAKE MOUNTED	38	EACH	
AR125510	MIRL, BASE MOUNTED	13	EACH	
AR125540	MI THRESHOLD LIGHT STAKE MTD	12	EACH	
AR125545	MI THRESHOLD LIGHT BASE MTD	4	EACH	
AR125565	SPLICE CAN	1	EACH	
AR125610	REILS	2	PAIR	
AR125615	PAPI (L-880 SYSTEM)	1	EACH	
AR150510	ENGINEER'S FIELD OFFICE	1	L.S.	
AR150520	MOBILIZATION	1	L.S.	
AR800476	REMOVE AIRFIELD LIGHTING	1	L. S.	

CERTIFIED PAYROLLS

THE RESIDENT ENGINEER CANNOT FORWARD CONSTRUCTION REPORTS TO THE ILLINOIS DIVISION OF AERONAUTICS FOR PROCESSING UNTIL ALL CERTIFIED PAYROLLS FOR THE PERIOD HAVE BEEN RECEIVED.

MATERIAL CERTIFICATION

MATERIAL TO BE INCORPORATED INTO THE PROJECT CANNOT BE USED WITHOUT PRIOR APPROVAL. ALL MATERIAL TO BE USED IN THE PROJECT MUST BE SUBMITTED TO THE RESIDENT ENGINEER FOR APPROVAL. USE OF MATERIAL WITHOUT PRIOR APPROVAL AND ULTIMATELY DETERMINED TO BE UNACCEPTABLE BY THE ILLINOIS DIVISION OF AERONAUTICS ARE SUBJECT TO REMOVAL AND/OR NON-PAYMENT.

EROSION CONTROL

THIS PROJECT WILL DISTURB LESS THAN 1 ACRE OF LAND, THEREFORE NO N.P.D.E.S. PERMIT WILL BE REQUIRED.

SUMMARY OF QUANTITIES - ADDITIVE ALTERNATE

ITEM NO.	DESCRIPTION	TOTAL QUANTITY	UNIT	AS-BUILT QUANTITY
AS107812	L-807 WC-12' INTERNALLY LIT	1	EACH	

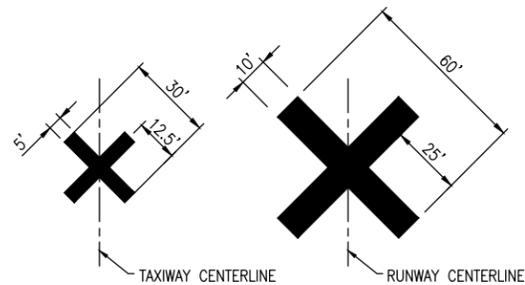
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**BARRICADE NOTES**

- IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO PLACE AND MAINTAIN BARRICADES AS SHOWN ON THE PLANS AND AS DIRECTED BY THE AIRPORT MANAGER.
- ALL CONSTRUCTION SIGNS AND TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES INCLUDING THE ILLINOIS SUPPLEMENT (LATEST EDITION) AND THE FAA ADVISORY CIRCULARS (LATEST EDITION) UNLESS NOTED OTHERWISE. THE FAA OR MORE STRINGENT SPECIFICATIONS SHALL GOVERN.
- BARRICADES SHALL BE SPACED END TO END THE WIDTH OF THE PAVEMENT IN 4' INCREMENTS AS DIRECTED BY THE ENGINEER. BARRICADES ARE TO BE SET BACK 66' FROM THE ACTIVE TAXIWAY CENTERLINE OR AS SHOWN ON THE PLANS.
- CONSTRUCTION RED WARNING LIGHT: THESE ARE PORTABLE, LENS DIRECTED, ENCLOSED LIGHTS. THE COLOR OF THE LIGHT EMITTED SHALL BE RED. THEY MAY BE USED IN EITHER A STEADY BURN (TYPE C) OR LOW INTENSITY FLASHING MODE (TYPE A) UNLESS NOTED OTHERWISE.
- THE LIGHTING SHALL BE MAINTAINED IN OPERATION DURING THE HOURS OF DARKNESS BETWEEN 1/2 HOUR BEFORE SUNSET AND 1/2 HOUR AFTER SUNRISE AND WHEN CONDITIONS EXIST WHICH TEND TO OBSCURE VISION.
- BARRICADES SHALL BE SECURED TO THE GROUND BY APPROVED METHODS TO PREVENT MOVEMENT BY PROP WASH, JET BLAST OR OTHER WIND CURRENTS.
- THE COLOR COMBINATION ON BARRICADES IS ORANGE AND WHITE. THE ORANGE STRIPES SHALL BE ENCAPSULATED LENS REFLECTIVE SHEETING. THE WHITE STRIPES SHALL BE EITHER ENCAPSULATED OR ENCLOSED LENS REFLECTIVE SHEETING AND MUST BE IN ACCEPTABLE CONDITION.
- THE BARRICADES SHALL MEET THE APPLICABLE REQUIREMENTS OF FAA AC 150/5370-2, "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION" (CURRENT EDITION) AND SHALL BE APPROVED BY THE RESIDENT ENGINEER/RESIDENT TECHNICIAN PRIOR TO USE ON THE PROJECT.
- COST FOR PLACING, MAINTAINING, AND REMOVING BARRICADES WILL NOT BE PAID FOR SEPARATELY, BUT IS TO BE CONSIDERED INCIDENTAL TO THE PROJECT.



- TEMPORARY CLOSURE CROSS MARKINGS SHALL BE "AVIATION YELLOW."
- TEMPORARY CLOSURE CROSS MARKINGS SHALL BE CONSTRUCTED OF PLYWOOD, SNOW FENCE OR APPROVED FABRIC AND SHALL BE SECURED TO PAVEMENT BY SANDBAGS OR OTHER APPROVED METHOD.
- COST FOR PROVIDING, PLACING, MAINTAINING, AND REMOVING CLOSURE CROSSES SHALL BE INCLUDED IN THE COST OF THE OTHER CONTRACT ITEMS.

**CLOSURE CROSS MARKER DETAIL**

NOT TO SCALE

**UTILITY NOTE**

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 WHATSOEVER 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 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.

**GENERAL NOTES**

- THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL, EQUIPMENT, AND TRANSPORTATION NECESSARY TO CONSTRUCT ALL ELEMENTS OF THE PROJECT AS DESCRIBED IN THE CONSTRUCTION PLANS AND SPECIFICATIONS.
- THE RULES, REGULATIONS, AND SPECIFICATIONS NOTED HEREIN SHALL BE CONSIDERED AS MINIMUM REQUIREMENTS. THEY SHALL NOT PROHIBIT THE CONTRACTOR FROM FURNISHING AND INSTALLING HIGHER GRADES OF MATERIAL THAN ARE SPECIFIED HEREIN.
- THE CONSTRUCTION ENTRANCES AS SHOWN ON THE SAFETY PLAN SHALL BE USED FOR THE PROJECT. ACCESS TO THE PROJECT FOR ALL HAULING OF MATERIALS AND EQUIPMENT SHALL BE RESTRICTED TO THE DESIGNATED CONSTRUCTION ENTRANCES AND HAUL ROUTES. ACCESS TO THE WORK AREAS FROM THE STAGING AREA SHALL BE COORDINATED WITH THE RESIDENT ENGINEER/RESIDENT TECHNICIAN AND AIRPORT MANAGEMENT.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT, PRESERVE AND REPAIR THE EXISTING AIRFIELD AND ROADWAY PAVEMENTS AT ALL TIMES. THE CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING ELECTRICAL, DRAINAGE, AND PAVEMENT STRUCTURES AT NO ADDITIONAL COST TO THE CONTRACT.
- CONTRACTOR IS REQUIRED TO PROVIDE THEIR OWN RESTROOM FACILITIES.
- UNLESS OTHERWISE NOTED, ALL DISTURBED AREAS OUTSIDE OF THE PROPOSED CONSTRUCTION LIMITS SHALL BE GRADED, SEEDED AND/OR HYDROMULCH SEEDED AT NO ADDITIONAL COST TO THE CONTRACT.
- ALL WASTE MATERIAL SHALL BE HAULED FROM THE AIRPORT AND PROPERLY DISPOSED OF UNLESS OTHERWISE SPECIFIED HEREIN.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING PERMITS FOR HAULING ON PUBLIC ROADS, AS APPLICABLE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTING ANY DAMAGES TO ANY PAVEMENTS (PUBLIC OR PRIVATE) CAUSED BY HIS/HER CONSTRUCTION EQUIPMENT OR PERSONNEL.
- THE OWNER SHALL HAVE THE RIGHT OF FIRST REFUSAL FOR ALL SALVAGEABLE MATERIAL REMOVED ON THE PROJECT.
- THE CONTRACTOR SHALL PROVIDE ONE SET OF REDLINED RECORD DRAWINGS TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN AT THE COMPLETION OF THE PROJECT.
- CONTRACTOR SHALL NOTE THAT ALL AREAS WITHIN THE AIRPORT PROPERTY LINE AND OUTSIDE THE CONSTRUCTION LIMITS MAY BE USED FOR AGRICULTURAL PURPOSES. THE CONSTRUCTION LIMITS SHALL BE RESTRICTED TO AREAS THAT ARE ABSOLUTELY NECESSARY TO DISTURB TO COMPLETE THE REQUIRED WORK ITEMS. LIMITS SHALL BE COORDINATED WITH THE RESIDENT ENGINEER PRIOR TO BEGINNING ANY WORK. ALL AREAS WHICH HAVE BEEN FARMED AND OR DESIGNATED TO BE FARMED AFTER THE PROJECT COMPLETION, AND HAVE BEEN DISTURBED BY CONSTRUCTION ACTIVITY, SHALL BE CHISEL PLOWED (36" MAX.) OR OTHERWISE SCARIFIED TO RETURN THE AREA TO A REASONABLE TILLABLE CONDITION (IF SO PERMITTED BY THE AIRPORT MANAGER.)
- CONTRACTOR SHALL RESTORE TO ORIGINAL CONDITION ALL GRASS, STONE, OR PAVEMENT DISTURBED BY CONTRACTOR'S CONSTRUCTION OPERATIONS, STAGING, AND CONSTRUCTION ACCESS ROUTES. DISTURBED AREAS WILL BE REPAIRED, GRADED, MULCHED AND SEEDED UNLESS OTHERWISE NOTED. STAGING AREA AND SITE ACCESS RESTORATION SHALL BE INCLUDED IN THE COST OF THE PROJECT.
- THE PROJECT PAY ITEMS ARE INTENDED TO BE INCLUSIVE OF ALL WORK TO BE PERFORMED AS SHOWN IN THESE PLANS. ALL INCIDENTAL WORK REQUIRED TO COMPLETE THE PROJECT TO THE SATISFACTION OF THE RESIDENT ENGINEER/RESIDENT TECHNICIAN IS TO BE INCLUDED IN THE COSTS OF PERFORMING THESE ITEMS.
- APPROXIMATE LOCATIONS OF SOME UNDERGROUND UTILITIES ARE SHOWN THROUGHOUT THESE PLANS. THE CONTRACTOR SHALL DETERMINE EXACT LOCATIONS AND PROTECT THESE UTILITIES DURING CONSTRUCTION. ANY UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. CONTRACTOR SHALL COORDINATE WITH THE PROPER PERSONS FOR THE PURPOSE OF LOCATING AND PROTECTING EXISTING UNDERGROUND UTILITIES.
- THE CONTRACTOR MUST AT ALL TIMES MAINTAIN PROPER DRAINAGE FOR ALL AREAS AFFECTED BY HIS WORK.

**SAFETY NOTES**

- FOLLOWING ARE THE CONSTRUCTION SAFETY PROCEDURES THAT THE CONTRACTOR SHALL FOLLOW THROUGHOUT THIS PROJECT:
- ALL PROVISIONS OF THE LATEST EDITION OF FAA ADVISORY CIRCULAR AC 150/5370-2 (CURRENT EDITION), "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION", APPLY TO THIS CONTRACT, EXCEPT AS MODIFIED BY THIS SAFETY PLAN, OR AS MODIFIED BY THE OWNER THROUGH THE RESIDENT ENGINEER AT THE PRECONSTRUCTION CONFERENCE, OR DURING THE COURSE OF THE CONTRACT.
- THE CONTRACTORS SHALL MINIMIZE DISRUPTION OF STANDARD OPERATING PROCEDURES FOR AERONAUTICAL ACTIVITY BY REMAINING WITHIN THE PRESCRIBED STAGING, CONSTRUCTION, AND PHASING AREAS PRESENTED ON THE PROPOSED SAFETY PLAN.
- NO UNAUTHORIZED PERSONNEL SHALL ENTER ANY AREA OF THE AIRPORT THAT COULD POTENTIALLY BE HAZARDOUS. THE ENGINEER, ENGINEER'S REPRESENTATIVE AND/OR AIRPORT MANAGER RESERVE THE RIGHT TO SUSPEND OPERATIONS IN ORDER TO MAINTAIN SAFETY AT THE AIRPORT.
- CONTRACTOR EQUIPMENT, VEHICLES, AND PROJECT MATERIALS SHALL BE STORED AT THE STAGING AREA SHOWN ON THE PLAN VIEW, EXCEPT AS OTHERWISE PROVIDED FOR AT THE PRECONSTRUCTION CONFERENCE.
- ALL CONSTRUCTION EQUIPMENT OPERATING IN THE PRESCRIBED CONSTRUCTION AREA IS REQUIRED TO DISPLAY A CHECKERBOARD FLAG PROPERLY LOCATED AND/OR A ROTATING BEACON (STROBE) AS SPECIFIED IN AC 150/5210-5, "PAINTING, MARKING, AND LIGHTING OF VEHICLES USED ON AN AIRPORT" LATEST EDITION.
- NO CONSTRUCTION MATERIAL STOCKPILES SHALL BE LOCATED WITHIN 250' OF RUNWAY 9-27 CENTERLINE WHEN ACTIVE, WITHIN 66' OF AN ACTIVE TAXIWAY CENTERLINE, WITHIN 58' OF AN ACTIVE TAXI LANE CENTERLINE, OR PENETRATE A PART 77 IMAGINARY SURFACE (PROVIDED BY THE ENGINEER) EXTENDING OUT AND UPWARDS FROM ALL SIDES OF AN ACTIVE RUNWAY.
- CLOSED AIRFIELD PHASING AREAS, OPEN TRENCHES, AND STOCKPILED MATERIALS AT THE CONSTRUCTION SITE SHALL BE PROMINENTLY MARKED WITH LIGHTED BARRICADES WITH STEADY BURNING OR FLASHING RED LIGHTS AS SPECIFIED IN 150/5370-2, "OPERATIONAL SAFETY ON AIRPORT DURING CONSTRUCTION", LATEST EDITION. LIGHTED BARRICADES MUST BE NO TALLER THAN 24" (EXCLUSIVE OF SUPPLEMENTARY LIGHTS) ON THE TAXIWAYS AND COMPLY WITH ADVISORY CIRCULAR 150/5370-2, LATEST EDITION. CONTRACTOR SHALL NIGHT CHECK BARRICADES DAILY FOR PROPER OPERATION.
- NO OPEN TRENCHES WITHIN 75' OF RUNWAY 9-27 CENTERLINE WHEN ACTIVE OR WITHIN 39.5' OF AN ACTIVE TAXIWAY OR TAXILANE (TAXIWAY SAFETY AREA), WILL BE PERMITTED. OTHER TRENCHES SHALL BE MAINTAINED SAFE, I.E., BARRICADED OR COVERED WITH STEEL PLATES IN ALL OTHER AREAS.
- OPEN TRENCHES, EXCAVATIONS, AND STOCKPILED MATERIALS AT THE CONSTRUCTION SITE SHOULD BE PROMINENTLY MARKED WITH ORANGE FLAGS AND LIGHTED WITH FLASHING YELLOW LIGHTS DURING HOURS OF RESTRICTED VISIBILITY AND/OR DARKNESS.
- NO OPEN FLAME WELDING OR TORCH CUTTING OPERATION IS PERMITTED UNLESS ADEQUATE FIRE AND SAFETY PRECAUTIONS ARE PROVIDED AND HAVE BEEN APPROVED BY THE AIRPORT MANAGER. NO FLARE POTS ARE ALLOWED ON THE PROJECT.
- SOIL, DEBRIS, AND LOOSE MATERIAL DROPPED OR TRUCKED ONTO AIRPORT ROADS, TAXIWAYS, AND SOD SURFACES, OR WHICH CAN BE BLOWN ONTO SUCH SURFACES, SHALL BE IMMEDIATELY SWEEP, PICKED UP AND REMOVED, OR PLACED INTO CLOSED CONTAINERS. ANY DAMAGE TO AIRPORT PROPERTY SHALL BE REPAIRED IMMEDIATELY AT NO COST TO THE OWNER.
- EACH CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND MAINTAINING AIRPORT LIGHTING AND NAVIGATIONAL ELECTRICAL SYSTEMS DURING CONSTRUCTION. A CONTACT PERSON AND TELEPHONE NUMBER FOR 24 HOUR EMERGENCY IMMEDIATE REPAIR SHALL BE SUBMITTED TO THE AIRPORT MANAGER AND ENGINEER. HAUL ROUTES CROSSING PAVEMENT, DRAINAGE, MISCELLANEOUS. STRUCTURES AND/OR AIRFIELD CABLES SHALL BE PROTECTED FROM DAMAGE.
- ALL AIRCRAFT AND AIRPORT OPERATIONS HAVE THE RIGHT-OF-WAY. CONTRACTOR TO YIELD TO VEHICLES AND REMAIN CLEAR AT ALL TIMES.
- CONTRACTOR SHALL PLACE, SECURE, AND MAINTAIN LIGHTED BARRICADES AND CLOSURE CROSSES WHEN A RUNWAY/TAXIWAY/APRON IS CLOSED OR AS REQUIRED BY THE PLANS AND DESIGNATED BY THE ENGINEER.
- CONTRACTOR SHALL MARK HAZARDOUS AREA WITH STEADY-BURNING OR FLASHING RED AND YELLOW LIGHTS DURING PERIODS OF LOW VISIBILITY AS REQUIRED.
- THE CONTRACTOR SHALL PERIODICALLY PERFORM ONSITE INSPECTIONS THROUGHOUT THE DURATION OF THE PROJECT WITH THE IMMEDIATE REMEDY OF ANY DIFFERENCES, WHETHER CAUSED BY NEGLIGENCE, OVERSIGHT, OR PROJECT SCOPE CHANGE.
- CONTRACTOR SHALL MOVE MAINTENANCE OF TRAFFIC COMPONENTS AT THE DIRECTION OF THE AIRPORT MANAGER AND/OR THE RESIDENT ENGINEER/RESIDENT TECHNICIAN AT NO ADDITIONAL COST.
- CONTRACTOR SHALL NOT REMOVE THE BARRICADES WITHOUT THE APPROVAL BY THE AIRPORT MANAGER AND/OR RESIDENT ENGINEER/RESIDENT TECHNICIAN.
- CONTRACTOR SHALL MAINTAIN FLASHERS, SIGNS AND/OR BARRICADES AS REQUIRED BY THE PLANS, CITY OR COUNTY REGULATIONS OR CONTRACTOR ACTIVITIES. CONTRACTOR SHALL OBTAIN ANY AND ALL REQUIRED LOCAL PERMITS UNLESS SPECIFIED OTHERWISE.
- THE CONTRACTOR SHALL UTILIZE WATER AND/OR CHEMICALS APPROVED BY THE ENGINEER AS NECESSARY TO CONTROL DUST.
- CONSTRUCTION EQUIPMENT OR CONSTRUCTION ACTIVITY WILL NOT BE PERMITTED WITHIN THE RUNWAY SAFETY AREA OF ANY ACTIVE RUNWAY CENTERLINE OR WITHIN THE OBJECT FREE AREA OF AN ACTIVE TAXIWAY OR APRON.
- UNLESS SPECIFIED OTHERWISE, COST FOR THE ABOVE IS TO BE CONSIDERED INCIDENTAL TO THE PROJECT. SEPARATE PAYMENT WILL NOT BE MADE.



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ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: G-004-NOTE.DWG  
 DESIGN BY: KNL 07/12/2017  
 DRAWN BY: CWS 07/31/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

PROPOSED SAFETY PLAN NOTES





REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

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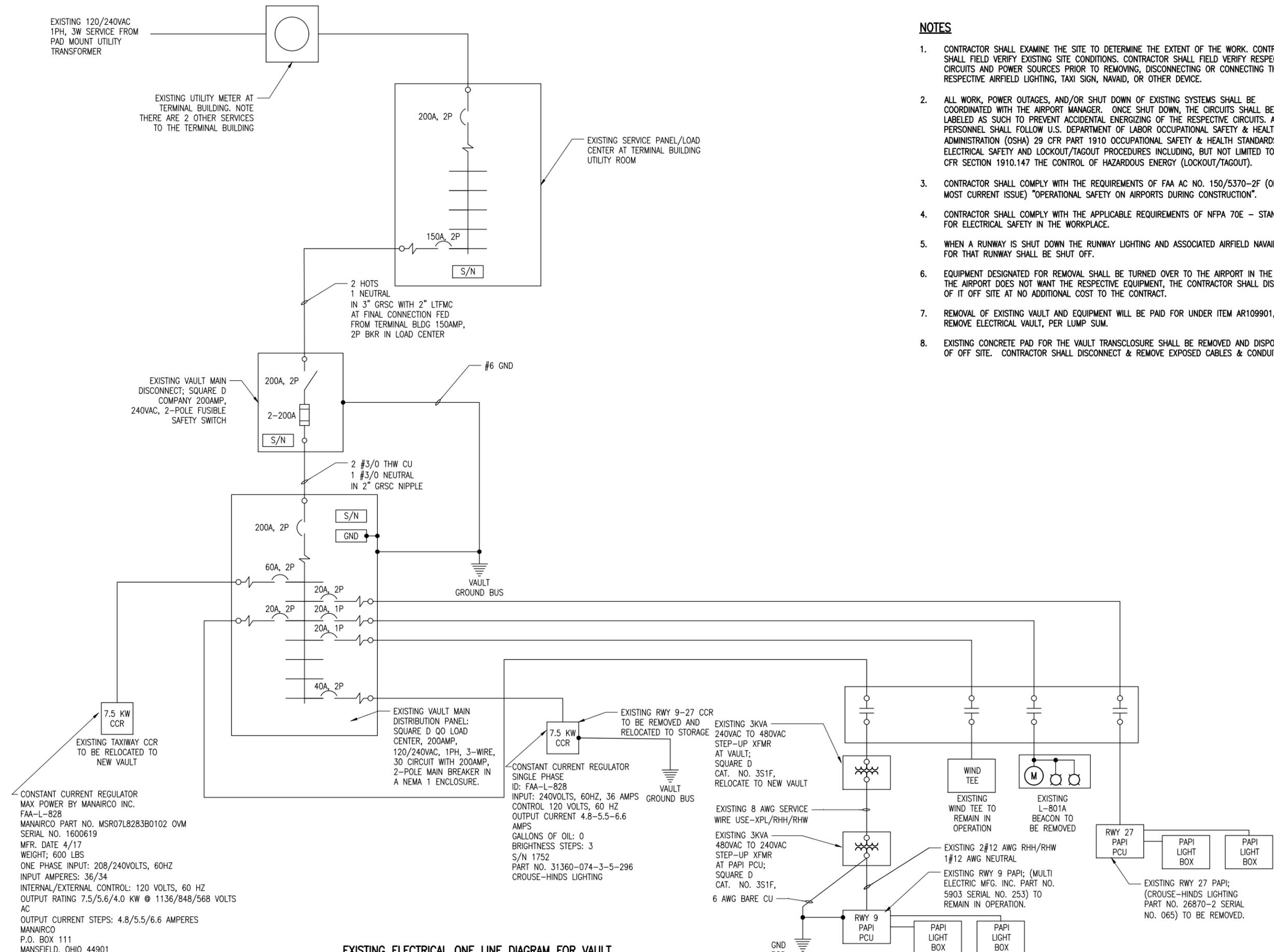
PROJECT NO: 17A0002  
CAD FILE: E-601-LINENEW.DWG  
DESIGN BY: KNL 07/12/2017  
DRAWN BY: CWS 07/21/2017  
REVIEWED BY: BSS 08/21/2017

SHEET TITLE

EXISTING ELECTRICAL ONE LINE DIAGRAM FOR VAULT

**NOTES**

1. CONTRACTOR SHALL EXAMINE THE SITE TO DETERMINE THE EXTENT OF THE WORK. CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL FIELD VERIFY RESPECTIVE CIRCUITS AND POWER SOURCES PRIOR TO REMOVING, DISCONNECTING OR CONNECTING THE RESPECTIVE AIRFIELD LIGHTING, TAXI SIGN, NAVAID, OR OTHER DEVICE.
2. ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER. 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 & 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).
3. CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF FAA AC NO. 150/5370-2F (OR MOST CURRENT ISSUE) "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION".
4. CONTRACTOR SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF NFPA 70E - STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE.
5. WHEN A RUNWAY IS SHUT DOWN THE RUNWAY LIGHTING AND ASSOCIATED AIRFIELD NAVAIDS FOR THAT RUNWAY SHALL BE SHUT OFF.
6. EQUIPMENT DESIGNATED FOR REMOVAL SHALL BE TURNED OVER TO THE AIRPORT IN THE EVENT THE AIRPORT DOES NOT WANT THE RESPECTIVE EQUIPMENT, THE CONTRACTOR SHALL DISPOSE OF IT OFF SITE AT NO ADDITIONAL COST TO THE CONTRACT.
7. REMOVAL OF EXISTING VAULT AND EQUIPMENT WILL BE PAID FOR UNDER ITEM AR109901, REMOVE ELECTRICAL VAULT, PER LUMP SUM.
8. EXISTING CONCRETE PAD FOR THE VAULT TRANSCLOSURE SHALL BE REMOVED AND DISPOSED OF OFF SITE. CONTRACTOR SHALL DISCONNECT & REMOVE EXPOSED CABLES & CONDUITS.



**EXISTING ELECTRICAL ONE LINE DIAGRAM FOR VAULT**

SEP 08, 2017 3:26 PM SCHUB01446 1317JOBS17A000217A0002CAD/AIRPORTSHEETE-601-LINENEW.DWG

CONSTANT CURRENT REGULATOR  
MAX POWER BY MANAIRCO INC.  
FAA-L-828  
MANAIRCO PART NO. MSR07L8283B0102 OVM  
SERIAL NO. 1600619  
MFR. DATE 4/17  
WEIGHT; 600 LBS  
ONE PHASE INPUT: 208/240VOLTS, 60HZ  
INPUT AMPERES: 36/34  
INTERNAL/EXTERNAL CONTROL: 120 VOLTS, 60 HZ  
OUTPUT RATING 7.5/5.6/4.0 KW @ 1136/848/568 VOLTS  
AC  
OUTPUT CURRENT STEPS: 4.8/5.5/6.6 AMPERES  
MANAIRCO  
P.O. BOX 111  
MANSFIELD, OHIO 44901  
MR180-5



REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

IL Proj. No.: C15-4578

SBG No:  
 3-17-SBG-133/139

Contract No. PN010

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

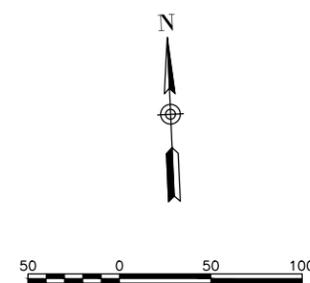
ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: C-141-ELE.DWG  
 DESIGN BY: MLH 05/24/2017  
 DRAWN BY: MLH 05/24/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

EXISTING AIRFIELD LIGHTING - STA. 100+00 TO 113+25

**AIRFIELD LIGHTING REMOVAL NOTES**

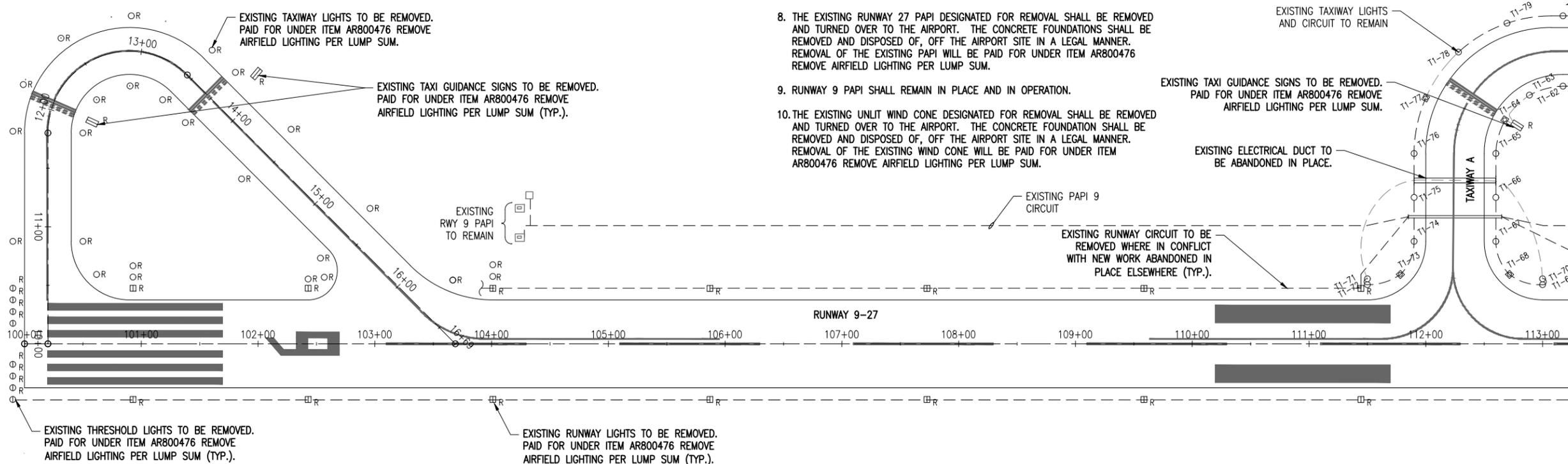
1. ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT DIRECTOR/MANAGER. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & 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).
2. CONTRACTOR SHALL EXAMINE THE SITE TO DETERMINE THE EXTENT OF THE WORK. CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. THE TAXIWAY LIGHTING, RUNWAY 9-27 LIGHTING, RUNWAY 9-27 PAPI'S, BEACON, AND WIND TEE ARE UNDERSTOOD TO BE POWERED FROM THE AIRPORT ELECTRICAL VAULT. THERE ARE OTHER CIRCUITS AND EQUIPMENT ON THE AIRFIELD POWERED FROM OTHER SOURCES. POWER FOR EACH RESPECTIVE SYSTEM OR DEVICE DESIGNATED FOR REMOVAL SHALL BE SHUT OFF AND DISCONNECTED AT THE RESPECTIVE POWER SOURCE PRIOR TO REMOVING THE SYSTEM OR DEVICE. CONTRACTOR SHALL FIELD VERIFY RESPECTIVE CIRCUITS AND POWER SOURCES PRIOR TO REMOVING OR DISCONNECTING THE RESPECTIVE AIRFIELD LIGHTING, TAXI SIGN, NAVAID, HANDHOLE, JUNCTION CAN, OR OTHER DEVICE.
3. CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF FAA AC NO. 150/5370-2F (OR MOST CURRENT ISSUE) "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION".
4. CONTRACTOR SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF NFPA 70E - STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE.
5. THE EXISTING AIRFIELD LIGHTS AND THEIR ISOLATED TRANSFORMERS DESIGNATED FOR REMOVAL SHALL BE REMOVED AND TURNED OVER TO THE AIRPORT. THE CONCRETE LIGHT BASES SHALL BE REMOVED AND DISPOSED OF, OFF THE AIRPORT SITE IN A LEGAL MANNER. REMOVAL OF THE EXISTING AIRFIELD LIGHTS WILL BE PAID FOR UNDER ITEM AR800476 REMOVE AIRFIELD LIGHTING PER LUMP SUM.
6. THE EXISTING TAXI GUIDANCE SIGNS, AND THEIR ISOLATED TRANSFORMERS DESIGNATED FOR REMOVAL SHALL BE REMOVED AND TURNED OVER TO THE AIRPORT. THE CONCRETE FOUNDATIONS SHALL BE REMOVED AND DISPOSED OF, OFF THE AIRPORT SITE IN A LEGAL MANNER. REMOVAL OF THE EXISTING TAXI GUIDANCE SIGNS WILL BE PAID FOR UNDER ITEM AR800476 REMOVE AIRFIELD LIGHTING PER LUMP SUM.
7. EXISTING SPLICE CANS AND/OR HANDHOLES DESIGNED FOR REMOVAL SHALL BE REMOVED AND DISPOSED OF, OFF THE AIRPORT SITE IN A LEGAL MANNER. REMOVAL OF SPLICE CANS AND/OR HANDHOLES WILL BE PAID FOR UNDER ITEM AR800476 REMOVE AIRFIELD LIGHTING PER LUMP SUM.
8. THE EXISTING RUNWAY 27 PAPI DESIGNATED FOR REMOVAL SHALL BE REMOVED AND TURNED OVER TO THE AIRPORT. THE CONCRETE FOUNDATIONS SHALL BE REMOVED AND DISPOSED OF, OFF THE AIRPORT SITE IN A LEGAL MANNER. REMOVAL OF THE EXISTING PAPI WILL BE PAID FOR UNDER ITEM AR800476 REMOVE AIRFIELD LIGHTING PER LUMP SUM.
9. RUNWAY 9 PAPI SHALL REMAIN IN PLACE AND IN OPERATION.
10. THE EXISTING UNLIT WIND CONE DESIGNATED FOR REMOVAL SHALL BE REMOVED AND TURNED OVER TO THE AIRPORT. THE CONCRETE FOUNDATION SHALL BE REMOVED AND DISPOSED OF, OFF THE AIRPORT SITE IN A LEGAL MANNER. REMOVAL OF THE EXISTING WIND CONE WILL BE PAID FOR UNDER ITEM AR800476 REMOVE AIRFIELD LIGHTING PER LUMP SUM.
11. THE EXISTING DUCTS AND AIRFIELD LIGHTING CABLES ASSOCIATED WITH AIRFIELD LIGHTING REMOVALS SHALL BE ABANDONED IN PLACE UNLESS IT CONFLICTS WITH THE INSTALLATION OF A PROPOSED LIGHT OR CABLE, PAVEMENT, OR OTHER WORK, THEN IT SHALL BE REMOVED AND DISPOSED OF OFF SITE AT NO ADDITIONAL COST TO THE CONTRACT. CONTRACTOR MAY REMOVE ABANDONED CABLES AT NO ADDITIONAL COST TO THE CONTRACT AND SHALL HAVE THE SALVAGE RIGHTS TO ABANDONED CABLES.
12. ALL ABOVEGROUND JUMPERS SHALL BE IN A DUCT WITH ALL CONNECTIONS SEALED. THE CONTRACTOR SHALL SECURE, IDENTIFY AND PLACE ALL TEMPORARY EXPOSED WIRING IN CONDUIT, DUCT, OR UNIT DUCT TO PREVENT ELECTROCUTION AND FIRE IGNITION SOURCES AS PER THE REQUIREMENTS OF FAA 150/5370-2F, OPERATION SAFETY ON AIRPORTS DURING CONSTRUCTION, SECTION 218, c.
13. THE CONTRACTOR IS REQUIRED TO FILL IN ALL HOLES AND DEPRESSIONS RESULTING FROM THE LIGHT, SIGN, NAVAID, HANDHOLE, JUNCTION STRUCTURE FOUNDATIONS AND/OR BASE REMOVAL WITH EARTH MATERIAL. THE EARTH MATERIAL SHALL BE FURNISHED BY THE CONTRACTOR. THE AREAS SHALL BE COMPACTED TO PREVENT FUTURE SETTLEMENT AND FERTILIZED, SEED, AND MULCHED IN ACCORDANCE WITH ITEMS 901 AND 908 RESPECTIVELY.
14. WHEN A RESPECTIVE RUNWAY IS CLOSED THE LIGHTS AND NAVAIDS FOR THAT RUNWAY SHALL BE SHUT OFF.
15. CONTRACTOR SHALL CONFIRM RESPECTIVE LIGHTS TO BE REMOVED WITH RESIDENT ENGINEER/RESIDENT TECHNICIAN PRIOR TO REMOVAL.
16. NO CONNECTION TO AN ACTIVE LIGHTING CIRCUIT SHALL BE BROKEN UNTIL THE CIRCUIT HAS BEEN TURNED OFF IN ACCORDANCE WITH THE ABOVE NOTE 1.



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 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.

- LEGEND**
- EXISTING PAVEMENT
  - ▬ EXISTING BUILDING
  - EXISTING MARKING
  - ▭ EXISTING ELECTRICAL DUCT
  - - - EXISTING ELECTRICAL CABLES
  - E- EXISTING ELECTRICAL CABLES
  - >- EXISTING STORM SEWER/UNDERDRAIN
  - UGE- EXISTING ELECTRIC UTILITY UG PRIMARY
  - EXISTING STAKE MOUNTED TAXIWAY LIGHT
  - R EXISTING STAKE MOUNTED TAXIWAY LIGHT TO BE REMOVED
  - ◻ EXISTING BASE MOUNTED TAXIWAY LIGHT
  - ◻R EXISTING BASE MOUNTED TAXIWAY LIGHT TO BE REMOVED
  - ▣R EXISTING STAKE MOUNTED RUNWAY LIGHT TO BE REMOVED
  - ▣R EXISTING BASE MOUNTED RUNWAY LIGHT TO BE REMOVED
  - ⊙R EXISTING STAKE MOUNTED RUNWAY THRESHOLD LIGHT TO BE REMOVED
  - ▣R EXISTING TAXI GUIDANCE SIGN TO BE REMOVED
  - ▣HH EXISTING ELECTRICAL HANDHOLE





REPLACE AIRFIELD  
 ELECTRICAL VAULT,  
 REPLACE BEACON UNIT  
 AND TOWER; RELOCATE  
 REGULATOR; REPLACE  
 REMAINING AIRFIELD  
 LIGHTING, SIGNAGE AND  
 NAVIGATIONAL AIDS

IL Proj. No.: C15-4578

SBG No:  
 3-17-SBGP-133/139

Contract No. PN010

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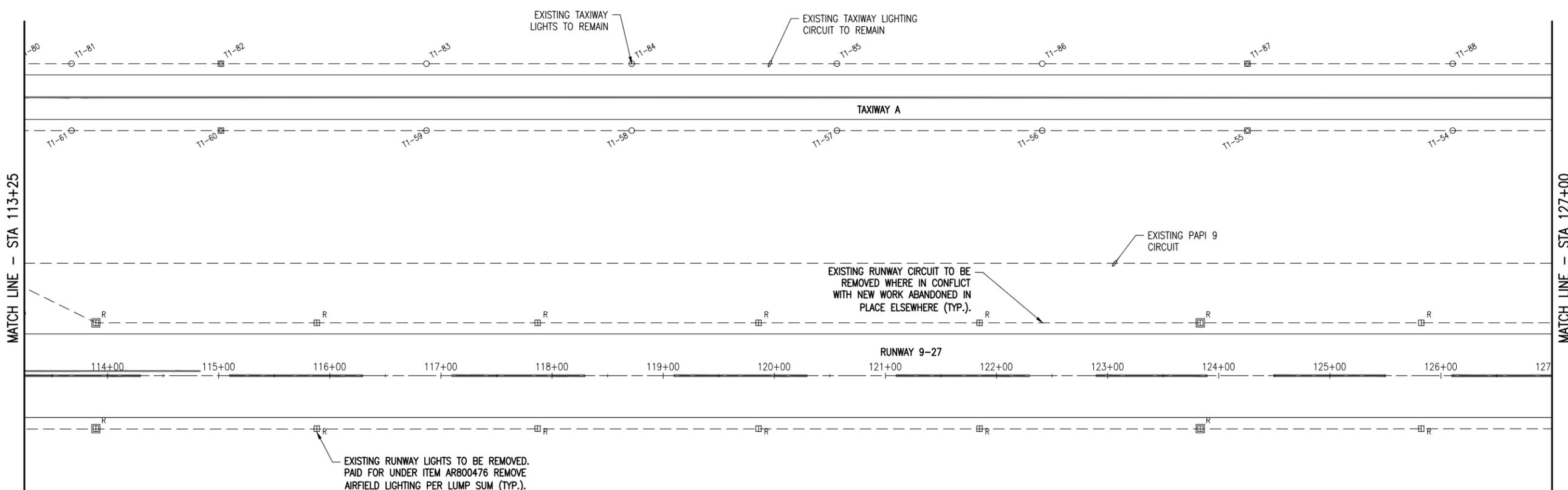
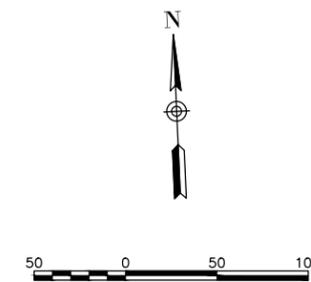
ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: C-141-ELE.DWG  
 DESIGN BY: MLH 05/24/2017  
 DRAWN BY: MLH 05/24/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

EXISTING AIRFIELD  
 LIGHTING - STA.  
 113+25 TO 127+00

**LEGEND**

- EXISTING PAVEMENT
- ▬ EXISTING BUILDING
- EXISTING MARKING
- ▬ EXISTING ELECTRICAL DUCT
- - - - EXISTING ELECTRICAL CABLES
- E — EXISTING ELECTRICAL CABLES
- > — EXISTING STORM SEWER/UNDERDRAIN
- UGE — EXISTING ELECTRIC UTILITY UG PRIMARY
- EXISTING STAKE MOUNTED TAXIWAY LIGHT
- R EXISTING STAKE MOUNTED TAXIWAY LIGHT TO BE REMOVED
- ◻ EXISTING BASE MOUNTED TAXIWAY LIGHT
- ◻R EXISTING BASE MOUNTED TAXIWAY LIGHT TO BE REMOVED
- ▣R EXISTING STAKE MOUNTED RUNWAY LIGHT TO BE REMOVED
- ▣R EXISTING BASE MOUNTED RUNWAY LIGHT TO BE REMOVED
- ⊙R EXISTING STAKE MOUNTED RUNWAY THRESHOLD LIGHT TO BE REMOVED
- ▣R EXISTING TAXI GUIDANCE SIGN TO BE REMOVED
- ▣HH EXISTING ELECTRICAL HANDHOLE



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REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

IL Proj. No.: C15-4578

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Contract No. PN010

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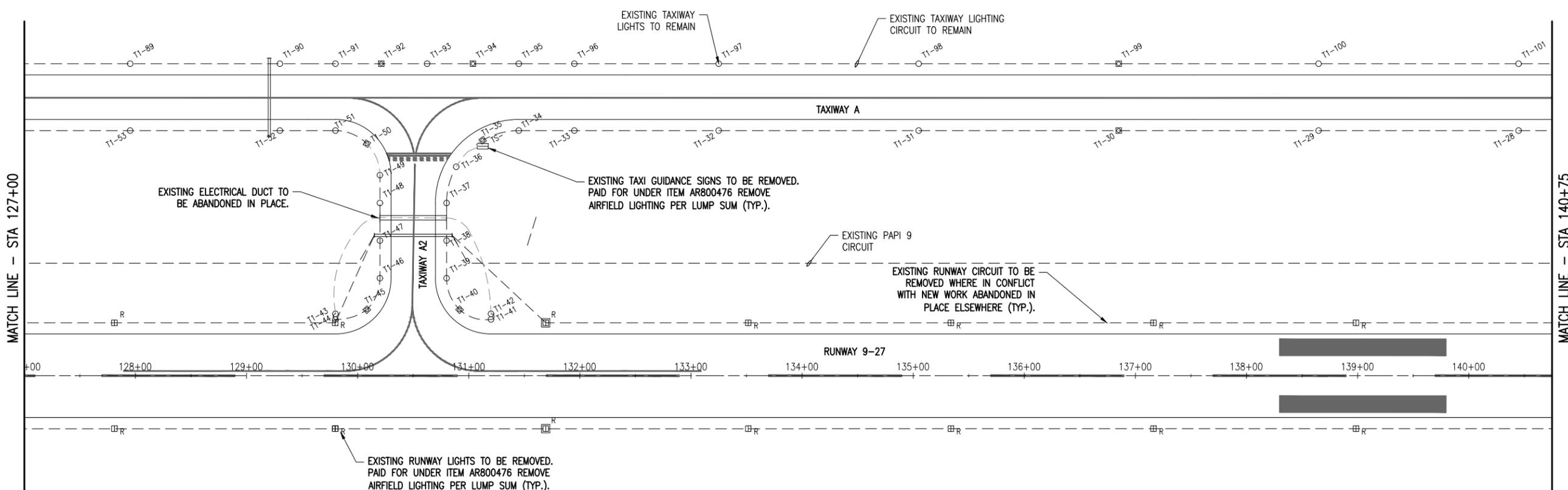
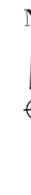
ISSUE: 09/22/2017  
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 DESIGN BY: MLH 05/24/2017  
 DRAWN BY: MLH 05/24/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

EXISTING AIRFIELD LIGHTING - STA. 127+00 TO 140+75

**LEGEND**

- EXISTING PAVEMENT
- ▬ EXISTING BUILDING
- EXISTING MARKING
- ▭ EXISTING ELECTRICAL DUCT
- - - EXISTING ELECTRICAL CABLES
- E— EXISTING ELECTRICAL CABLES
- >— EXISTING STORM SEWER/UNDERDRAIN
- UGE— EXISTING ELECTRIC UTILITY UG PRIMARY
- EXISTING STAKE MOUNTED TAXIWAY LIGHT
- R EXISTING STAKE MOUNTED TAXIWAY LIGHT TO BE REMOVED
- ◻ EXISTING BASE MOUNTED TAXIWAY LIGHT
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- ▣R EXISTING STAKE MOUNTED RUNWAY LIGHT TO BE REMOVED
- ▣R EXISTING BASE MOUNTED RUNWAY LIGHT TO BE REMOVED
- ⊙R EXISTING STAKE MOUNTED RUNWAY THRESHOLD LIGHT TO BE REMOVED
- ▣R EXISTING TAXI GUIDANCE SIGN TO BE REMOVED
- ◻HH EXISTING ELECTRICAL HANDHOLE



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PEKIN MUNICIPAL AIRPORT  
 111 South Capitol Street  
 Pekin, Illinois 61554  
 Telephone: 309.477.2300

REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

IL Proj. No.: C15-4578

SBG No:  
 3-17-SBGP-133/139

Contract No. PN010

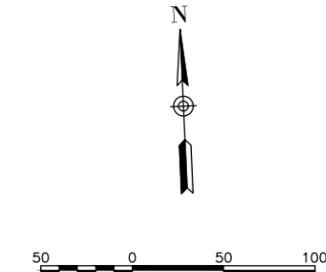
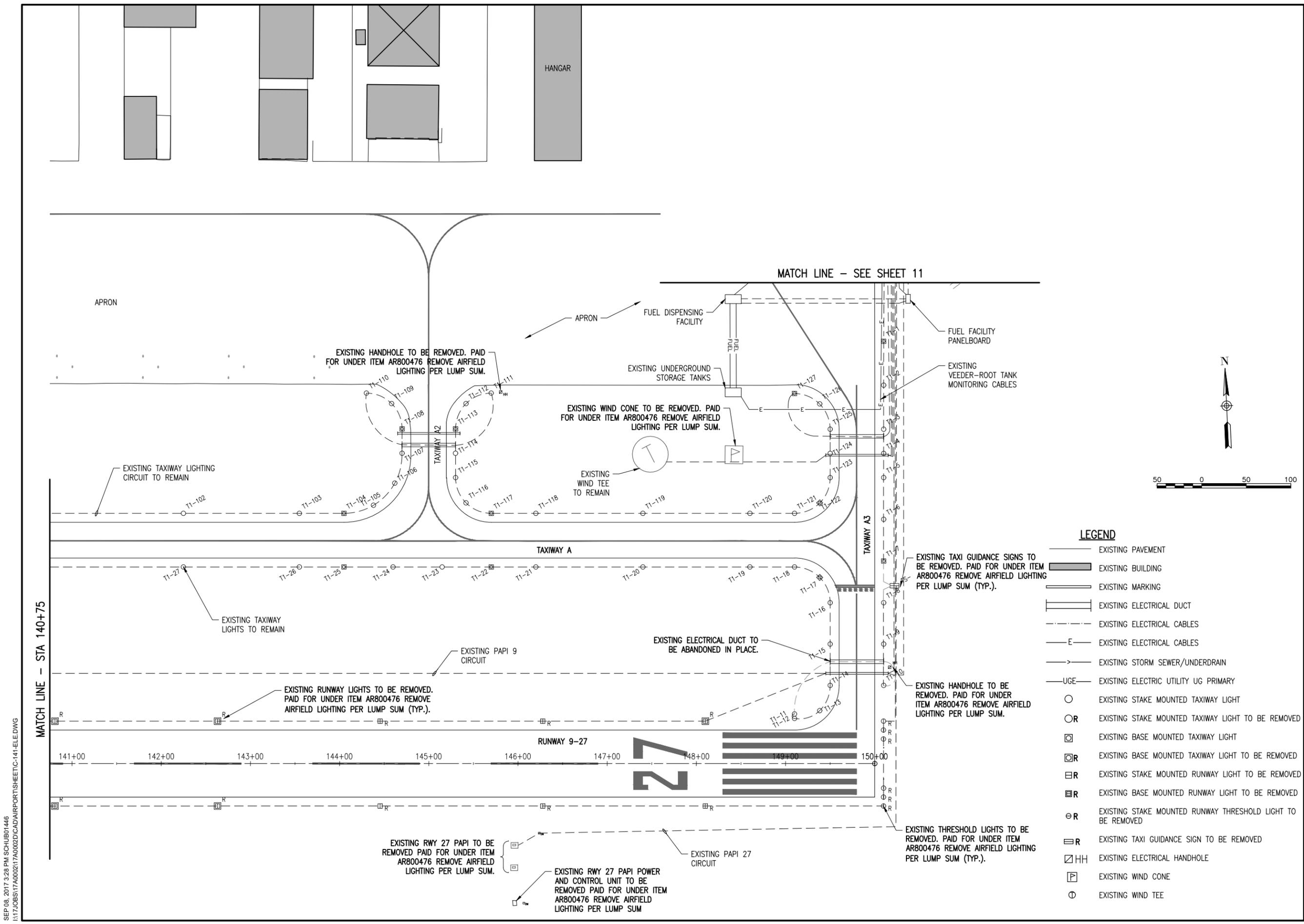
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PROJECT NO: 17A0002  
 CAD FILE: C-141-ELE.DWG  
 DESIGN BY: MLH 05/24/2017  
 DRAWN BY: MLH 05/24/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

EXISTING AIRFIELD LIGHTING - STA. 140+25 TO 150+00



- LEGEND**
- EXISTING PAVEMENT
  - ▬ EXISTING BUILDING
  - EXISTING MARKING
  - ▬ EXISTING ELECTRICAL DUCT
  - - - EXISTING ELECTRICAL CABLES
  - E— EXISTING ELECTRICAL CABLES
  - >— EXISTING STORM SEWER/UNDERDRAIN
  - UGE— EXISTING ELECTRIC UTILITY UG PRIMARY
  - EXISTING STAKE MOUNTED TAXIWAY LIGHT
  - R EXISTING STAKE MOUNTED TAXIWAY LIGHT TO BE REMOVED
  - EXISTING BASE MOUNTED TAXIWAY LIGHT
  - R EXISTING BASE MOUNTED TAXIWAY LIGHT TO BE REMOVED
  - ⊞R EXISTING STAKE MOUNTED RUNWAY LIGHT TO BE REMOVED
  - ⊞R EXISTING BASE MOUNTED RUNWAY LIGHT TO BE REMOVED
  - ⊙R EXISTING STAKE MOUNTED RUNWAY THRESHOLD LIGHT TO BE REMOVED
  - ⊞R EXISTING TAXI GUIDANCE SIGN TO BE REMOVED
  - ⊞HH EXISTING ELECTRICAL HANDHOLE
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  - ⊞ EXISTING WIND TEE

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PEKIN MUNICIPAL AIRPORT  
111 South Capitol Street  
Peekin, Illinois 61554  
Telephone: 309.477.2300

REPLACE AIRFIELD  
ELECTRICAL VAULT,  
REPLACE BEACON UNIT  
AND TOWER; RELOCATE  
REGULATOR; REPLACE  
REMAINING AIRFIELD  
LIGHTING, SIGNAGE AND  
NAVIGATIONAL AIDS

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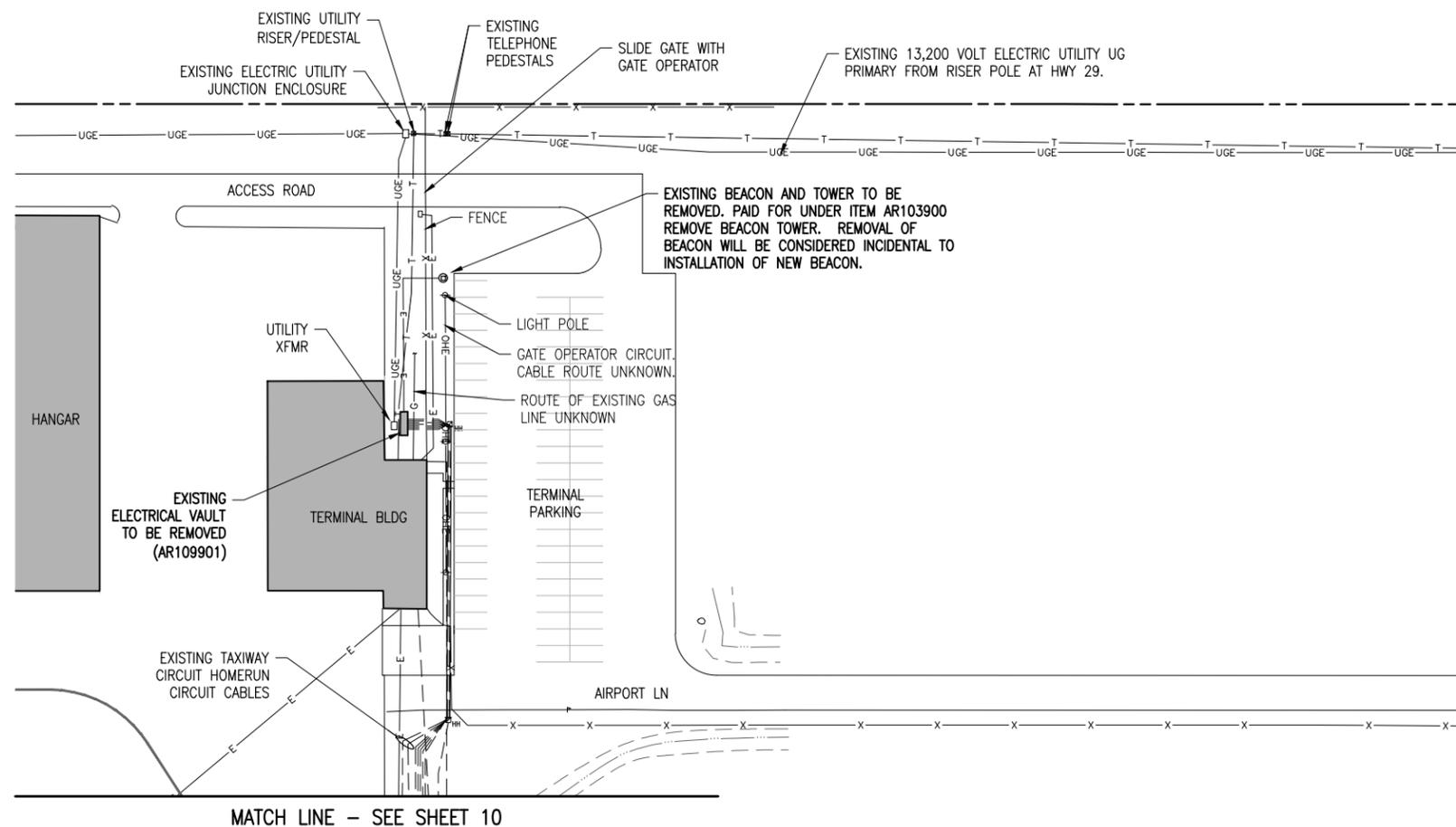
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SHEET TITLE

EXISTING AIRFIELD  
LIGHTING - BEACON  
AREA



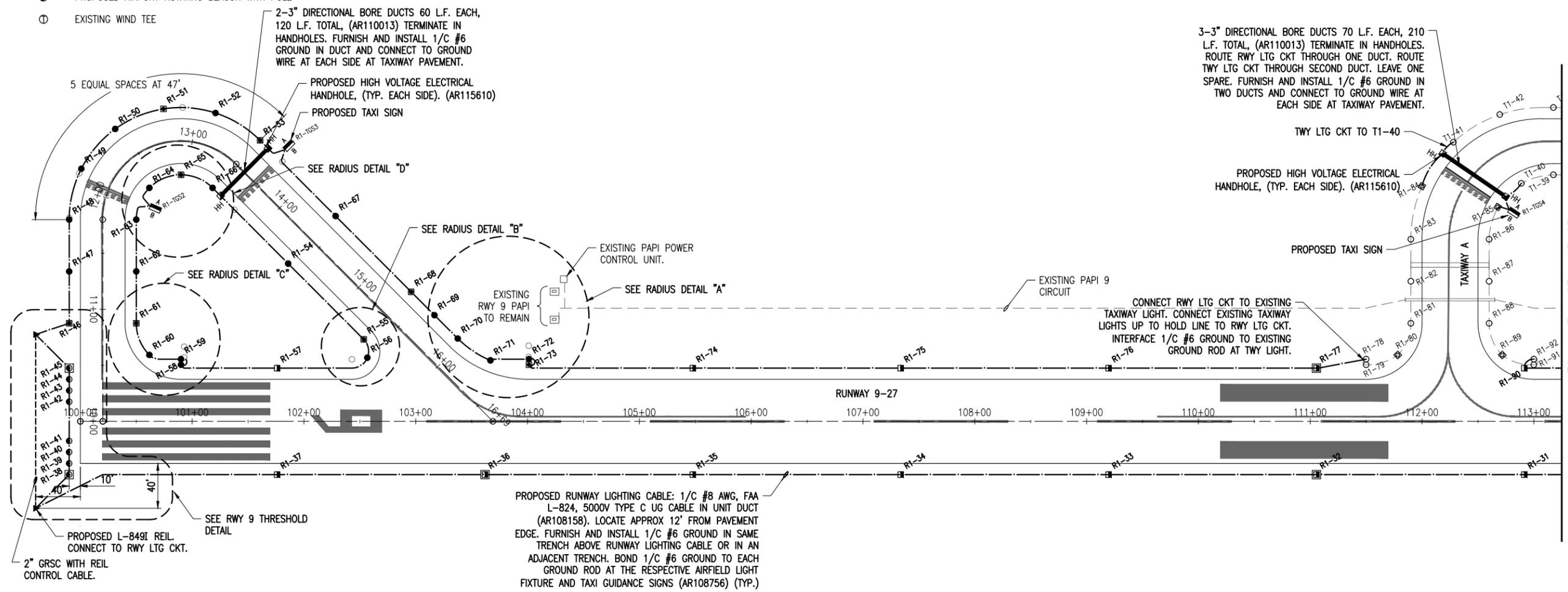
**LEGEND**

- EXISTING PAVEMENT
- ▒ EXISTING BUILDING
- EXISTING MARKING
- EXISTING ELECTRICAL DUCT
- EXISTING ELECTRICAL CABLES
- E — EXISTING ELECTRICAL CABLES
- > EXISTING STORM SEWER/UNDERDRAIN
- UGE — EXISTING ELECTRIC UTILITY UG PRIMARY
- OHE — EXISTING OVERHEAD ELECTRIC
- T — EXISTING TELEPHONE
- G — EXISTING GAS
- X — EXISTING FENCE
- EXISTING STAKE MOUNTED TAXIWAY LIGHT
- R EXISTING STAKE MOUNTED TAXIWAY LIGHT TO BE REMOVED
- ◻ EXISTING BASE MOUNTED TAXIWAY LIGHT
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- ◻R EXISTING BASE MOUNTED RUNWAY LIGHT TO BE REMOVED
- ⊙R EXISTING STAKE MOUNTED RUNWAY THRESHOLD LIGHT TO BE REMOVED
- ◻R EXISTING TAXI GUIDANCE SIGN TO BE REMOVED
- ◻HH EXISTING ELECTRICAL HANDHOLE

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**LEGEND**

- EXISTING PAVEMENT
- ▬ EXISTING BUILDING
- x- EXISTING FENCE
- - - EXISTING ELECTRICAL CABLE
- /⊠ EXISTING TAXIWAY EDGE LIGHT
- ▭ EXISTING DUCTS
- ▬ PROPOSED ELECTRICAL DUCTS
- PROPOSED 3-1/C #6 USE IN 2" DUCT
- PROPOSED PAPI CABLE
- PROPOSED RUNWAY LIGHTING CABLE
- ▭ PROPOSED TAXIWAY GUIDANCE SIGN
- ▭ PROPOSED STAKE MOUNTED RUNWAY LIGHT
- ▭ PROPOSED BASE MOUNTED RUNWAY LIGHT
- PROPOSED STAKE MOUNTED THRESHOLD LIGHT
- ⊠ PROPOSED BASE MOUNTED THRESHOLD LIGHT
- PROPOSED STAKE MOUNTED TAXIWAY EDGE LIGHT
- ▭ PROPOSED BASE MOUNTED TAXIWAY EDGE LIGHT
- ▭ SC PROPOSED SPLICE CAN
- HH PROPOSED ELECTRICAL HANDHOLE
- MH PROPOSED ELECTRICAL MANHOLE
- ◀ PROPOSED L-849I REIL
- ◀ PROPOSED L-807(L) WIND CONE
- ⊕ PROPOSED AIRPORT ROTATING BEACON WITH POLE
- ⊙ EXISTING WIND TEE



SEP 08, 2017 3:30 PM SCHUB01446  
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PEKIN MUNICIPAL AIRPORT  
111 South Capitol Street  
Pekin, Illinois 61554  
Telephone: 309.477.2300

REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

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SHEET TITLE

PROPOSED AIRFIELD LIGHTING - STA. 100+00 TO 113+25



REPLACE AIRFIELD ELECTRICAL VAULT; REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

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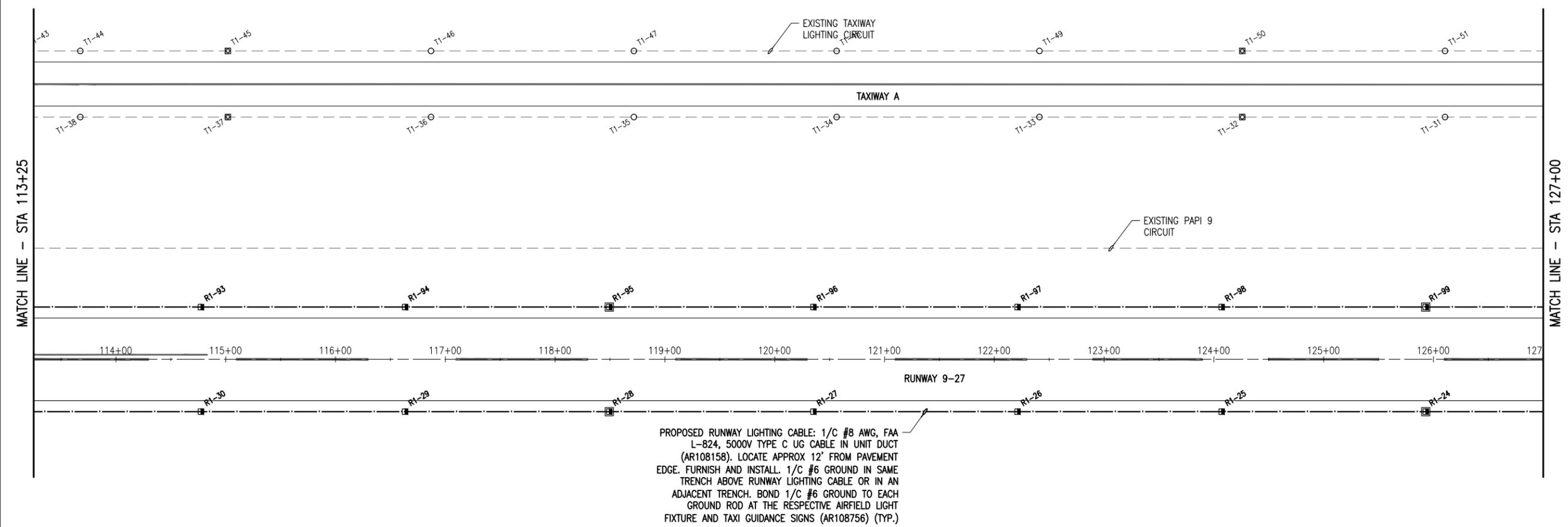
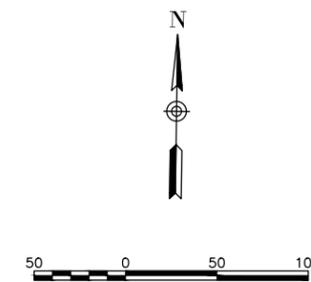
ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: C-142-ELE.DWG  
 DESIGN BY: MLH 05/24/2017  
 DRAWN BY: MLH 05/24/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

PROPOSED AIRFIELD LIGHTING - STA. 113+25 TO 127+00

**LEGEND**

- EXISTING PAVEMENT
- ▬ EXISTING BUILDING
- x- EXISTING FENCE
- - - EXISTING ELECTRICAL CABLE
- /□ EXISTING TAXIWAY EDGE LIGHT
- ▬ EXISTING DUCTS
- ▬ PROPOSED ELECTRICAL DUCTS
- PROPOSED 3-1/C #6 USE IN 2" DUCT
- PROPOSED PAPI CABLE
- PROPOSED RUNWAY LIGHTING CABLE
- ▬ PROPOSED TAXIWAY GUIDANCE SIGN
- PROPOSED STAKE MOUNTED RUNWAY LIGHT
- PROPOSED BASE MOUNTED RUNWAY LIGHT
- PROPOSED STAKE MOUNTED THRESHOLD LIGHT
- PROPOSED BASE MOUNTED THRESHOLD LIGHT
- PROPOSED STAKE MOUNTED TAXIWAY EDGE LIGHT
- PROPOSED BASE MOUNTED TAXIWAY EDGE LIGHT
- <sub>SC</sub> PROPOSED SPLICE CAN
- HH ■ PROPOSED ELECTRICAL HANDHOLE
- MH ■ PROPOSED ELECTRICAL MANHOLE
- ▲ PROPOSED L-849I REIL
- ▬ PROPOSED L-807(L) WIND CONE
- ⊕ PROPOSED AIRPORT ROTATING BEACON WITH POLE
- ⊙ EXISTING WIND TEE



PROPOSED RUNWAY LIGHTING CABLE: 1/C #8 AWG, FAA L-824, 5000V TYPE C UG CABLE IN UNIT DUCT (AR108158). LOCATE APPROX 12' FROM PAVEMENT EDGE. FURNISH AND INSTALL. 1/C #6 GROUND IN SAME TRENCH ABOVE RUNWAY LIGHTING CABLE OR IN AN ADJACENT TRENCH. BOND 1/C #6 GROUND TO EACH GROUND ROD AT THE RESPECTIVE AIRFIELD LIGHT FIXTURE AND TAXI GUIDANCE SIGNS (AR108756) (TYP.)

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REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

IL Proj. No.: C15-4578

SBG No:

3-17-SBGP-133/139

Contract No. PN010

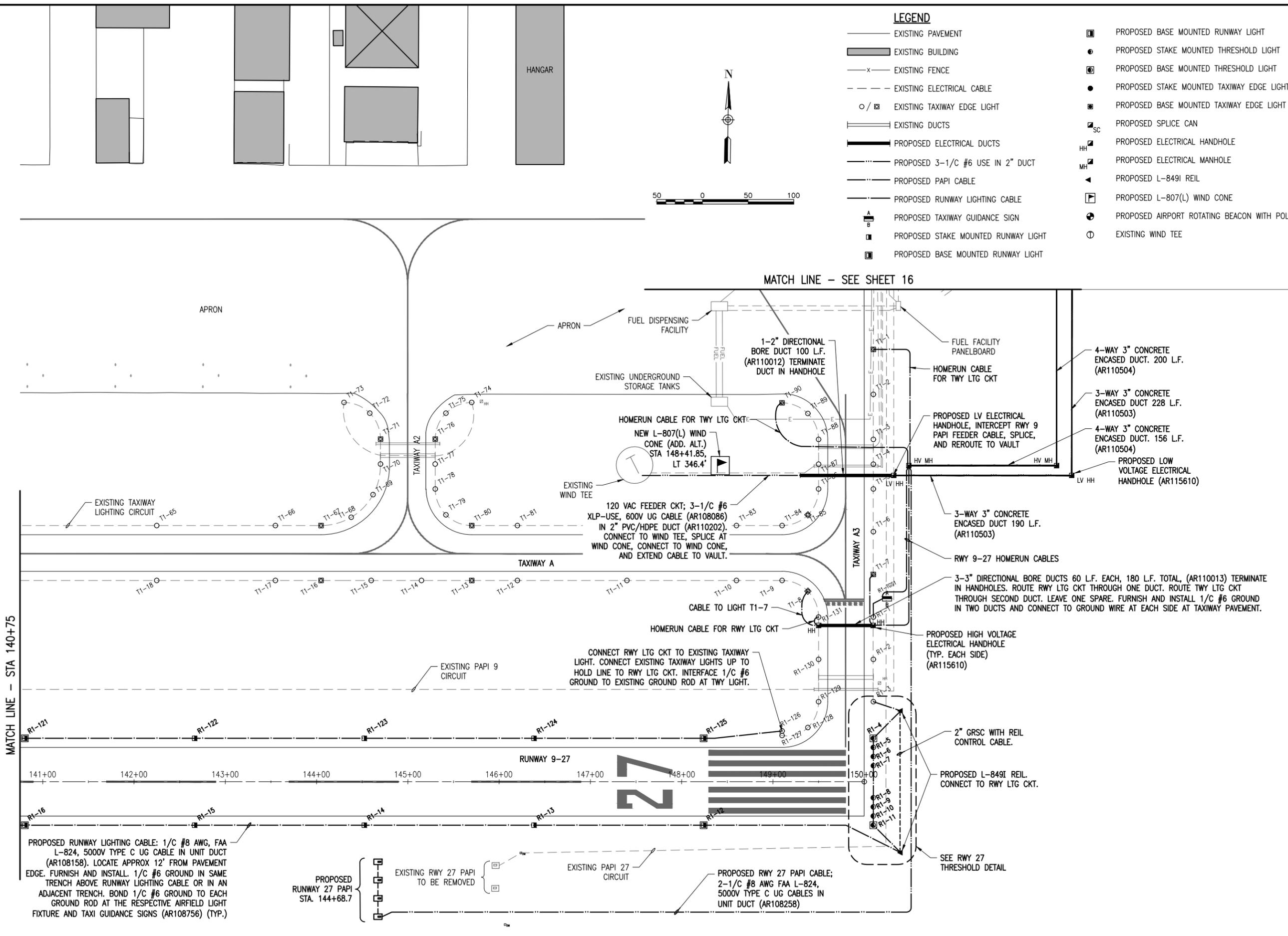
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ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: C-142-ELE.DWG  
 DESIGN BY: MLH 05/24/2017  
 DRAWN BY: MLH 05/24/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

PROPOSED AIRFIELD LIGHTING - STA. 140+25 TO 150+00

- LEGEND**
- EXISTING PAVEMENT
  - █ EXISTING BUILDING
  - x- EXISTING FENCE
  - - - EXISTING ELECTRICAL CABLE
  - /□ EXISTING TAXIWAY EDGE LIGHT
  - ▬ EXISTING DUCTS
  - ▬ PROPOSED ELECTRICAL DUCTS
  - ▬ PROPOSED 3-1/C #6 USE IN 2" DUCT
  - ▬ PROPOSED PAPI CABLE
  - ▬ PROPOSED RUNWAY LIGHTING CABLE
  - ▲ PROPOSED TAXIWAY GUIDANCE SIGN
  - PROPOSED STAKE MOUNTED RUNWAY LIGHT
  - PROPOSED BASE MOUNTED RUNWAY LIGHT
  - PROPOSED BASE MOUNTED RUNWAY LIGHT
  - PROPOSED STAKE MOUNTED THRESHOLD LIGHT
  - PROPOSED BASE MOUNTED THRESHOLD LIGHT
  - PROPOSED STAKE MOUNTED TAXIWAY EDGE LIGHT
  - PROPOSED BASE MOUNTED TAXIWAY EDGE LIGHT
  - SC PROPOSED SPLICE CAN
  - HH PROPOSED ELECTRICAL HANDHOLE
  - MH PROPOSED ELECTRICAL MANHOLE
  - ◀ PROPOSED L-849I REIL
  - ▬ PROPOSED L-807(L) WIND CONE
  - PROPOSED AIRPORT ROTATING BEACON WITH POLE
  - EXISTING WIND TEE



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**AIRFIELD LIGHTING NOTES**

- ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT DIRECTOR/MANAGER. 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 & 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).
- CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL FIELD VERIFY RESPECTIVE CIRCUITS AND POWER SOURCES PRIOR TO REMOVING OR DISCONNECTING THE RESPECTIVE AIRFIELD LIGHTING, NAVAID, OR OTHER DEVICE.
- PROPOSED AIRFIELD LIGHTS, TAXIWAY LIGHTS, GUIDANCE SIGNS, OTHER AIRFIELD LIGHTING, SPLICE CANS, HANDHOLES, MANHOLES, ELECTRICAL DUCTS, AND CABLE SHALL BE INSTALLED AT THE LOCATIONS SHOWN AND IN COMPLIANCE WITH THE SPECIFICATIONS, SPECIAL PROVISIONS, RESPECTIVE DETAILS, AND MANUFACTURER'S RECOMMENDATIONS.
- PROPOSED TAXI GUIDANCE SIGNS SHALL BE LOCATED SUCH THAT THE CLOSEST SIDE OF THE SIGN IS 15' FROM THE PAVEMENT EDGE, UNLESS SHOWN OTHERWISE.
- PROPOSED CABLE FOR RUNWAY AND TAXIWAY LIGHTING SHALL BE INSTALLED APPROXIMATELY 12' FROM THE PAVEMENT EDGE. CABLES SHALL BE PLACED A MINIMUM OF 18" BELOW FINISHED GRADE.
- THE PROPOSED RUNWAY AND TAXIWAY LIGHTING CABLE SHALL BE 1/C, #8 AWG, FAA L-824, 5000 VOLT, TYPE C UNDERGROUND CABLE IN UNIT DUCT.
- IN AREAS WHERE THERE IS A CONGESTION OF CABLES OR WHERE THE PROPOSED CABLE CROSSES AN EXISTING CABLE, THE CONTRACTOR IS REQUIRED TO HAND DIG THE TRENCH NECESSARY FOR THE PROPOSED CABLE. AT OTHER LOCATIONS, THE PROPOSED CABLE MAY BE TRENCHED OR PLOWED INTO PLACE. HAND DIGGING, TRENCHING AND/OR PLOWING WILL BE CONSIDERED INCIDENTAL TO THE PROPOSED CABLES AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- PROPOSED AIRFIELD LIGHTS WILL BE FITTED WITH LENSES IN ACCORDANCE WITH THE LIGHT LENS SCHEDULE.
- ALL PROPOSED AIRFIELD LIGHTS, AND TAXI GUIDANCE SIGNS AND EXISTING AIRFIELD LIGHTS ON TAXIWAY CIRCUIT, SHALL BE TAGGED BY THE CONTRACTOR IN ACCORDANCE WITH THE LIGHT NUMBERS SHOWN ON THESE CONSTRUCTION DRAWINGS. TAGS FOR THE PROPOSED LIGHTS AND EXISTING LIGHTS SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- SEE "TAXI GUIDANCE SIGN SCHEDULE" FOR INFO ON SIGN LEGENDS.
- RUNWAY EXIT/TAXIWAY ENTRANCE LIGHTS (TAXIWAY LIGHTS TO DEFINE THE THROAT OR ENTRANCE INTO THE INTERSECTING TAXIWAY ROUTE) SHALL BE CONNECTED TO THE RESPECTIVE RUNWAY SERIES CIRCUIT TO BE ILLUMINATED WHEN THE RUNWAY EDGE LIGHTS ARE ON TO COMPLY WITH FAA AC 150/5340-30H, CHAPTER 2, PART 2.1.4b(4).
- HOLDING POSITION SIGNS FOR RUNWAYS SHALL BE CONNECTED TO THE RESPECTIVE RUNWAY SERIES CIRCUIT TO BE ILLUMINATED WHEN THE ASSOCIATED RUNWAY LIGHTS ARE ILLUMINATED TO COMPLY WITH FAA AC 150/5340-18F, CHAPTER 1, PART 15 "SIGN OPERATION".
- THE CONTRACTOR SHALL SECURE, IDENTIFY AND PLACE ALL TEMPORARY EXPOSED WIRING IN CONDUIT, DUCT OR UNIT DUCT TO PREVENT ELECTROCUTION AND FIRE IGNITION SOURCES AS PER THE REQUIREMENTS OF FAA AC 150/5370-2F, PART 218, PARAGRAPH C. ALL LABOR, MATERIALS, AND TIME NECESSARY TO COMPLY WITH THIS REQUIREMENT SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- HOMERUN CABLES FOR A RESPECTIVE CIRCUIT THAT ARE INSTALLED IN CONDUIT OR DUCT SHALL BE RUN TOGETHER IN THE SAME RACEWAY OR DUCT.
- EXISTING AIRFIELD LIGHTING CABLES (SCHEDULED FOR REPLACEMENT) IN AREAS OF NEW WORK SHALL BE DISCONNECTED & REMOVED WHERE IN CONFLICT WITH NEW CONSTRUCTION. IN OTHER AREAS CABLES MAY BE ABANDONED IN PLACE.
- THE CONTRACTOR IS REQUIRED TO FILL IN ALL HOLES AND DEPRESSIONS RESULTING FROM THE NEW WORK, WITH EARTH MATERIAL. THE AREAS SHALL BE COMPACTED TO PREVENT FUTURE SETTLEMENT AND FERTILIZED, SEEDED, AND MULCHED IN ACCORDANCE WITH ITEMS 901 AND 908 RESPECTIVELY.
- FURNISH AND INSTALL A #6 AWG BARE SOLID COPPER GROUND AND BOND IT TO EACH GROUND ROD AT THE RESPECTIVE AIRFIELD LIGHT FIXTURES AND TAXI GUIDANCE SIGNS. THE #6 AWG GROUND SHALL BE DIRECT BURIAL IN TRENCH APPROXIMATELY 12 TO 18 IN. BELOW GRADE. THE GROUND CONDUCTOR MAY BE INSTALLED ABOVE THE #8 FAA L-824, 5,000-VOLT CABLE IN UNIT DUCT OR IN AN ADJACENT TRENCH. THE #6 AWG GROUND SHALL BE CONNECTED TO EACH RESPECTIVE GROUND ROD WITH AN EXOTHERMIC WELD CONNECTION. THE COMPLETED GROUND WIRE INSTALLED WILL PROVIDE A GROUND RING SYSTEM FOR THE RESPECTIVE AIRFIELD LIGHTING CIRCUIT. THE GROUND WIRE WILL NOT BE INSTALLED WITH THE HOMERUN CABLES FOR THE RESPECTIVE AIRFIELD LIGHTING CIRCUIT. THE #6 AWG BARE SOLID COPPER GROUND WILL BE PAID FOR UNDER ITEM AR108756 1/C #6 GROUND PER LINEAL FOOT.
- IN THE EVENT THAT OTHER CONSTRUCTION PROJECTS ARE IN PROGRESS AT THE AIRPORT AT THE SAME TIME AS THIS PROJECT, THE CONTRACTOR WILL BE REQUIRED TO COOPERATE WITH ALL OTHER CONTRACTORS AND THE AIRPORT MANAGER IN THE COORDINATION OF THE WORK.
- NO CONNECTION TO AN ACTIVE LIGHTING CIRCUIT WILL BE BROKEN UNTIL THE CIRCUIT HAS BEEN TURNED OFF IN ACCORDANCE WITH NOTE 1.

LIGHT LENS SCHEDULE			
LIGHT NUMBERS	LENS	ORIENTATION	FIXTURE TYPE
R1-1 TO R1-3	BLUE	----	EXISTING L-861T(L)
R1-4 TO R1-11	RED/GREEN	RED SIDE FACING WEST (TOWARD THRESHOLD)	L-861E(L)
R1-12 TO R1-21	CLEAR-WHITE/YELLOW	YELLOW SIDE FACING WEST (TOWARD RUNWAY 9 APPROACH)	L-861(L)
R1-22 TO R1-27	CLEAR-WHITE	----	L-861(L)
R1-28 TO R1-37	CLEAR-WHITE/YELLOW	YELLOW SIDE FACING WEST (TOWARD RUNWAY 27 APPROACH)	L-861(L)
R1-38 TO R1-45	RED/GREEN	RED SIDE FACING EAST (TOWARD THRESHOLD)	L-861E(L)
R1-46 TO R1-56	BLUE	----	L-861T(L)
R1-57	CLEAR-WHITE/YELLOW	YELLOW SIDE FACING EAST (TOWARD RUNWAY 27 APPROACH)	L-861(L)
R1-58 TO R1-73	BLUE	----	L-861T(L)
R1-74 TO R1-77	CLEAR-WHITE/YELLOW	YELLOW SIDE FACING EAST (TOWARD RUNWAY 27 APPROACH)	L-861(L)
R1-78 TO R1-89	BLUE	----	EXISTING L-861T(L)
R1-90	CLEAR-WHITE/YELLOW	YELLOW SIDE FACING EAST (TOWARD RUNWAY 27 APPROACH)	L-861(L)
R1-91 TO R1-92	BLUE	----	EXISTING L-861T(L)
R1-93 TO R1-95	CLEAR-WHITE/YELLOW	YELLOW SIDE FACING EAST (TOWARD RUNWAY 27 APPROACH)	L-861(L)
R1-96 TO R1-101	CLEAR-WHITE	----	L-861(L)
R1-102 TO R1-115	BLUE	----	EXISTING L-861T(L)
R1-116 TO R1-125	CLEAR-WHITE/YELLOW	YELLOW SIDE FACING WEST (TOWARD RUNWAY 9 APPROACH)	L-861(L)
R1-126 TO R1-131	BLUE	----	EXISTING L-861T(L)

TAXI GUIDANCE SIGN SCHEDULE			
SIGN NUMBERS	LOCATION	SIDE A	SIDE B
R1-TGS1	TAXIWAY A3 INTERSECTION WITH RUNWAY 27 AT HOLD LINE.	A3 27	RAMP ↑
R1-TGS2	TAXIWAY TURNAROUND INTERSECTION WITH RUNWAY 9 AT HOLD LINE.	9	BLANK
R1-TGS3	TAXIWAY TURNAROUND INTERSECTION WITH RUNWAY 27-9 AT HOLD LINE	27-9	BLANK
R1-TGS4	TAXIWAY A INTERSECTION WITH RUNWAY 27-9 AT HOLD LINE	A 27-9	BLANK
R1-TGS5	TAXIWAY A1 INTERSECTION WITH RUNWAY 27-9 AT HOLD LINE	A1 27-9	BLANK

**TAXI GUIDANCE SIGN SCHEDULE**

- A** TYPE L-858L(L) LOCATION SIGN - YELLOW LEGEND AND BORDER ON A BLACK BACKGROUND
- 27-9** TYPE L-858R(L) MANDATORY INSTRUCTION SIGN - BLACK OUTLINE ON OUTSIDE EDGE OF WHITE LEGEND ON A RED BACKGROUND
- RAMP ↑** TYPE L-858Y(L) DIRECTION, DESTINATION, AND BOUNDARY SIGN - BLACK LEGEND ON A YELLOW BACKGROUND
- BLANK** BLANK - BLACK BACKGROUND

**TAXI GUIDANCE SIGN NOTES**

- THE PROPOSED TAXI GUIDANCE SIGNS SHALL CONFORM TO ADVISORY CIRCULAR 150/5345-44 (CURRENT ISSUE(S) IN EFFECT) AND BE FAA-APPROVED FOR TYPE L-858Y(L) DIRECTION, DESTINATION, AND BOUNDARY SIGNS (BLACK LEGEND ON YELLOW BACKGROUND); TYPE L-858R(L) MANDATORY INSTRUCTION SIGN (BLACK OUTLINE ON OUTSIDE EDGE OF WHITE LEGEND ON RED BACKGROUND); AND/OR TYPE L-858L(L) LOCATION SIGN (YELLOW LEGEND AND BORDER ON BLACK BACKGROUND).
- THE SIGNS SHALL BE SIZE 1, 18-IN. SIGN FACE WITH A 12-IN. LEGEND; STYLE 2, POWERED FROM A 4.8 TO 6.6 AMP SERIES LIGHTING CIRCUIT; CLASS 2, FOR OPERATION FROM -40 DEGREES F TO 131 DEGREES F; MODE 2, TO WITHSTAND WIND LOADS OF 200 M.P.H., BASE-MOUNTED, DOUBLE-SIDED, AS SPECIFIED ON THE PLANS.
- TAXI GUIDANCE SIGNS SHALL HAVE LED (LIGHT EMITTING DIODE) TYPE ILLUMINATION AND THEY SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF FAA ENGINEERING BRIEF NO. 67D LIGHT SOURCES OTHER THAN INCANDESCENT AND XENON FOR AIRPORT AND OBSTRUCTION LIGHTING FIXTURES.
- THE PROPOSED TAXI GUIDANCE SIGNS SHALL BE LOCATED SUCH THAT THE CLOSEST SIDE OF THE SIGN IS 15' FROM THE PAVEMENT EDGE OR RESPECTIVE RUNWAY SURFACE EDGE.
- ALL PROPOSED TAXI GUIDANCE SIGNS SHALL BE TAGGED BY THE CONTRACTOR IN ACCORDANCE WITH THE SIGN NUMBERS SHOWN ON THESE CONSTRUCTION DRAWINGS.



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REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

IL Proj. No.: C15-4578

SBG No:  
 3-17-SBG-133/139

Contract No. PN010

NO.	DATE	DESCRIPTION		
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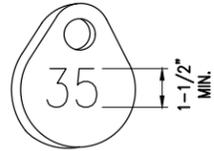
ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: E-641-SCHED.DWG  
 DESIGN BY: KNL 07/12/2017  
 DRAWN BY: CWS 07/21/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

AIRFIELD LIGHTING NOTES AND SCHEDULES

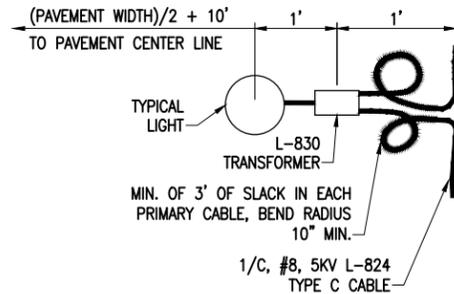




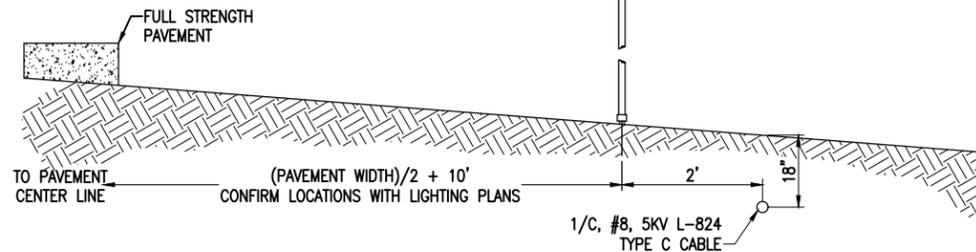


**NUMBERING TAG DETAIL**  
(NOT TO SCALE)

**NOTE:**  
AFFIX NON-CORROSIVE TAG TO FIXTURE FACING RUNWAY WITH SET SCREW, WIRE TIE, OR METAL BAND. NUMERALS SHALL BE ENGRAVED FOR PERMANENT READABILITY.



**PLAN VIEW**



**PROFILE VIEW**

**LIGHT AND CABLE INSTALLATION DETAIL**  
(NOT TO SCALE)

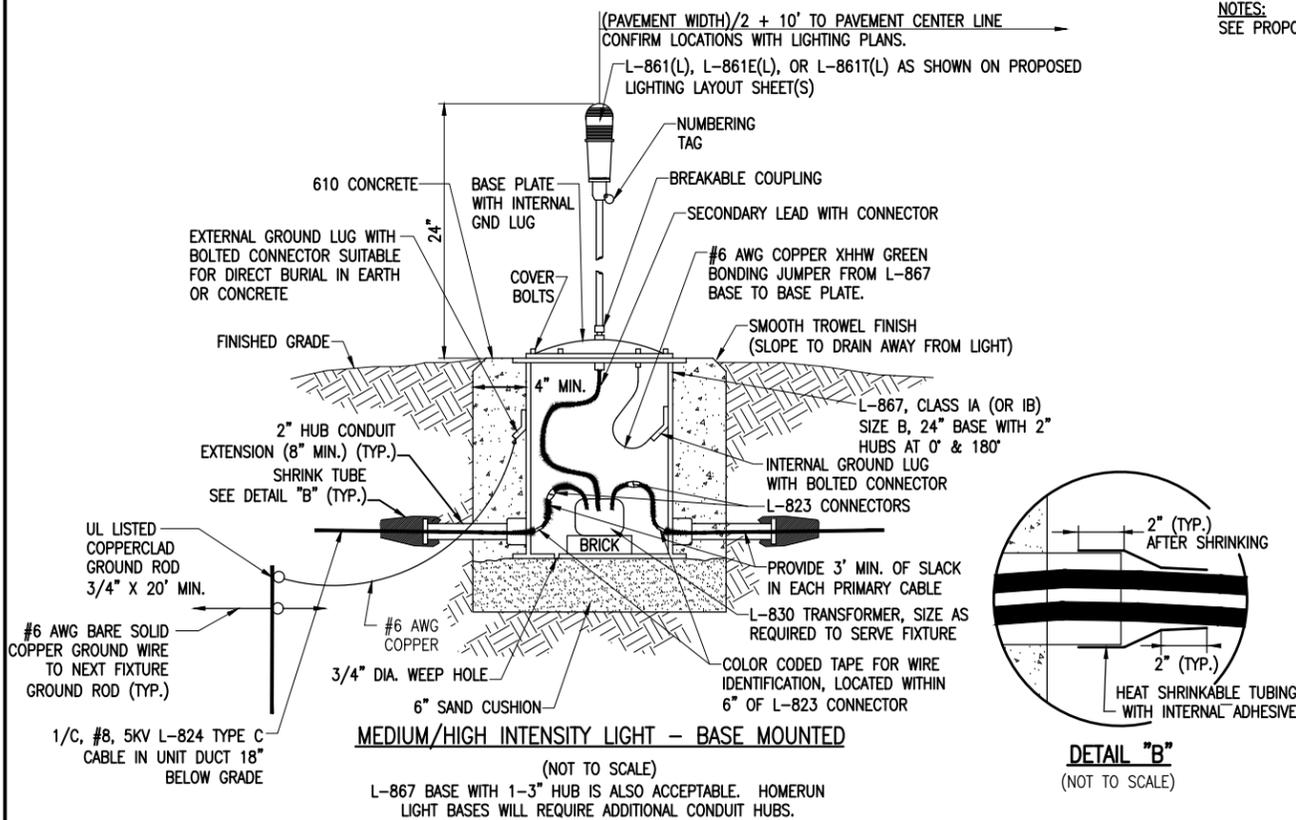
**NOTES:**

1. SEE ELECTRICAL NOTES SHEETS.
2. SEE "ELECTRICAL NOTES SHEET 2" AND "GROUNDING NOTES" SHEET FOR GROUNDING NOTES FOR AIRFIELD LIGHTING.
3. SEE PROPOSED LIGHTING LAYOUT SHEET(S) FOR LIGHT LOCATIONS

PER FAA AC 150/5340-30H DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, A LIGHT BASE GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. A LIGHT BASE GROUND SHALL BE INSTALLED AT EACH STAKE MOUNTED LIGHT AND EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. THE LIGHT BASE GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR CONNECTED TO THE GROUND LUG ON THE RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND A 3/4-INCH DIAMETER BY 20-FEET LONG (MINIMUM) UL LISTED COPPER CLAD GROUND ROD.

**NOTES:**

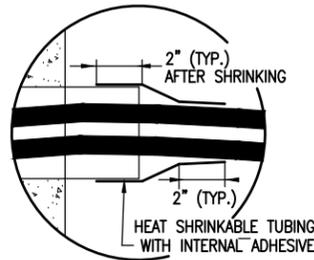
SEE PROPOSED LIGHTING LAYOUT SHEET FOR LIGHT LOCATIONS.



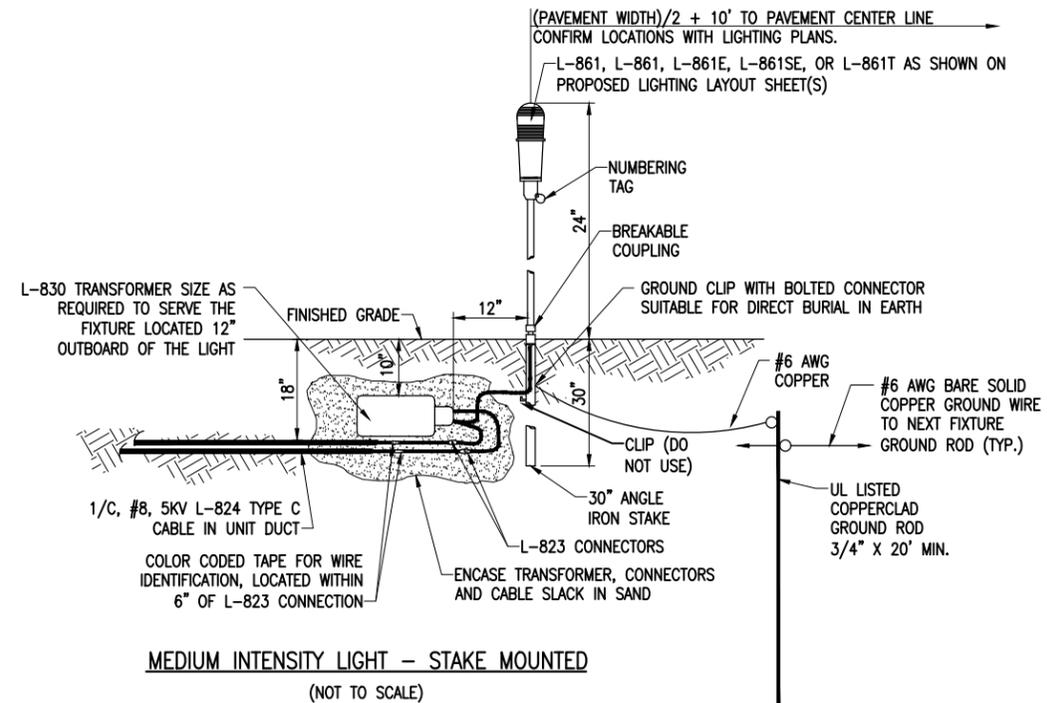
**MEDIUM/HIGH INTENSITY LIGHT - BASE MOUNTED**

(NOT TO SCALE)

L-867 BASE WITH 1-3" HUB IS ALSO ACCEPTABLE. HOMERUN LIGHT BASES WILL REQUIRE ADDITIONAL CONDUIT HUBS.



**DETAIL "B"**  
(NOT TO SCALE)



**MEDIUM INTENSITY LIGHT - STAKE MOUNTED**

(NOT TO SCALE)



REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

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SBG No:

3-17-SBGP-133/139

Contract No. PN010

NO.	DATE	DESCRIPTION

ISSUE: 09/22/2017

PROJECT NO: 17A0002

CAD FILE: E-501-ELEC.DWG

DESIGN BY: KNL 07/12/2017

DRAWN BY: CWS 07/21/2017

REVIEWED BY: BSS 08/21/2017

SHEET TITLE

AIRFIELD LIGHTING

DETAILS SHEET 1



REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

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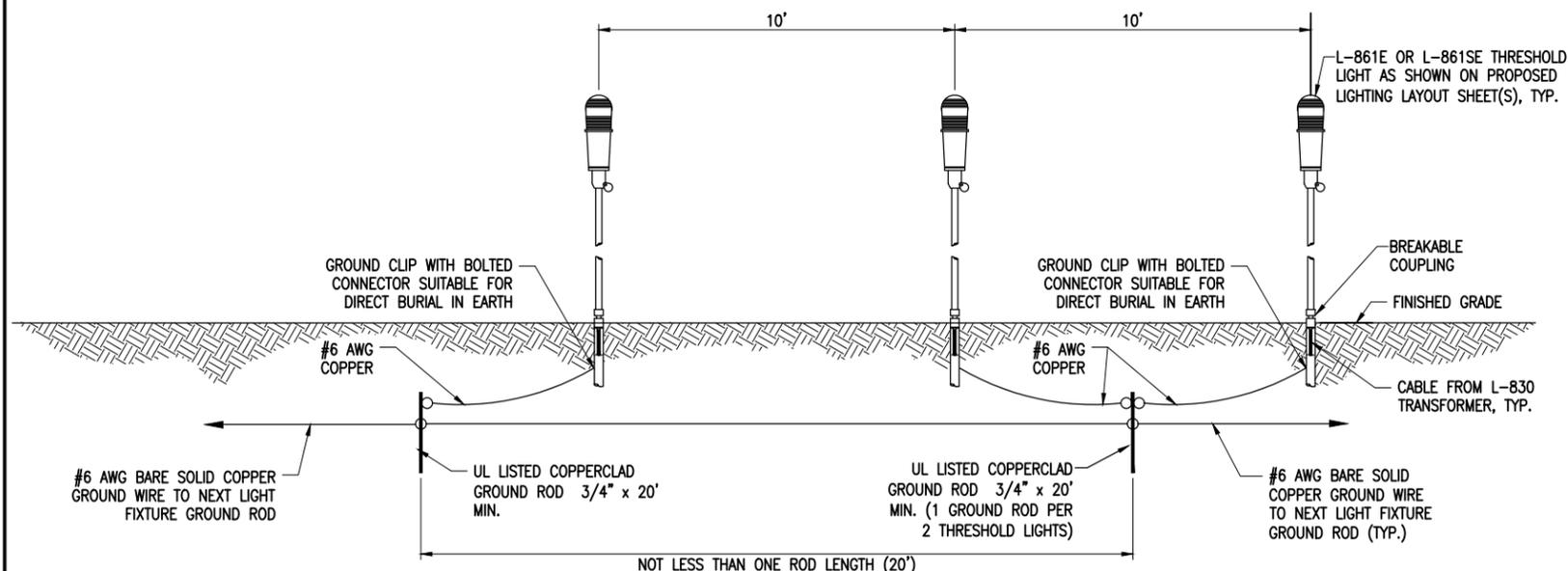
ISSUE: 09/22/2017  
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 DRAWN BY: CWS 07/21/2017  
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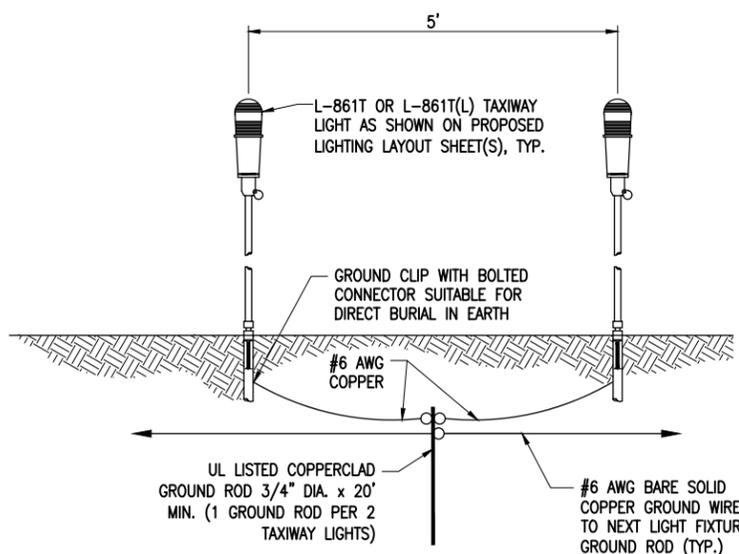
AIRFIELD LIGHTING  
 DETAILS SHEET 2

NOTES

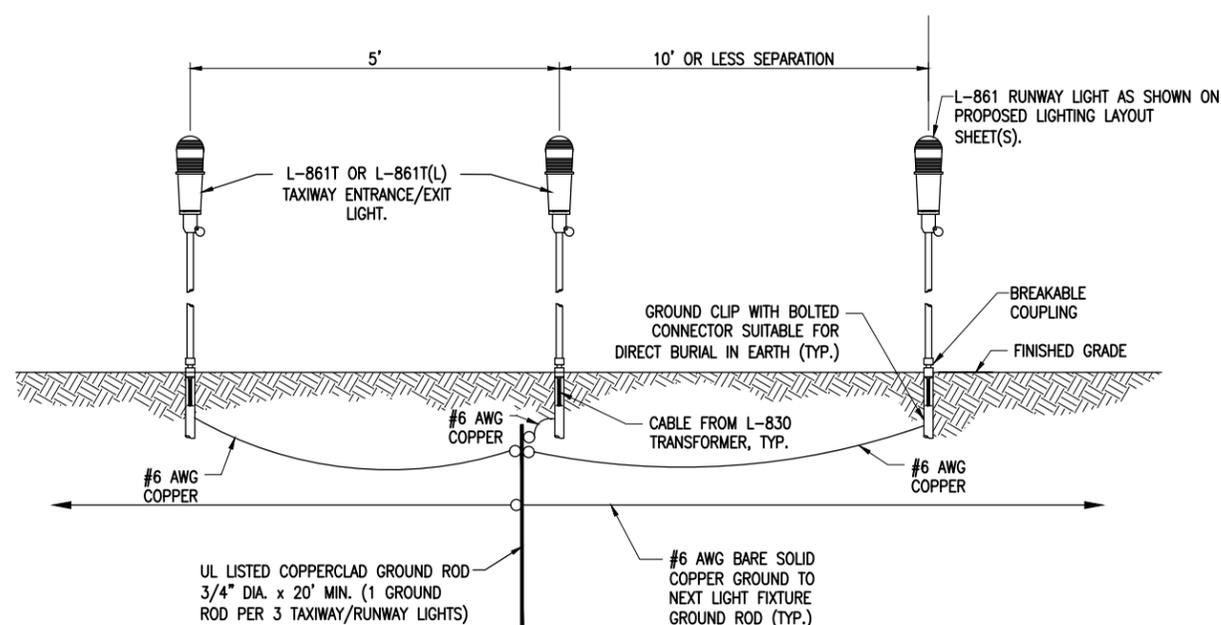
- GROUNDING FOR RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS SHALL BE AS DETAILED ON THE PLANS AND AS SPECIFIED HEREIN. PER FAA AC 150/5340-30H DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, CHAPTER 12, PART 12.6; A GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. THE PURPOSE OF THE LIGHT BASE GROUND IS TO PROVIDE A DEGREE OF PROTECTION FOR MAINTENANCE PERSONNEL FROM POSSIBLE CONTACT WITH AN ENERGIZED LIGHT BASE OR MOUNTING STAKE THAT MAY RESULT FROM A SHORTED POWER CABLE OR ISOLATION TRANSFORMER. A LIGHT BASE GROUND SHALL BE INSTALLED AT EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. A LIGHT BASE GROUND SHALL ALSO BE INSTALLED AT EACH STAKE MOUNTED LIGHT FIXTURE. A LIGHT BASE GROUND SHALL BE INSTALLED AND CONNECTED TO THE METAL FRAME OF EACH TAXI GUIDANCE SIGN AS DETAILED ON THE PLANS AND IN ACCORDANCE WITH THE RESPECTIVE TAXI GUIDANCE SIGN MANUFACTURER RECOMMENDATIONS. THE LIGHT BASE GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR BONDED TO THE GROUND LUG ON THE RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND A 3/4-INCH DIAMETER BY 20-FOOT LONG (MINIMUM) UL LISTED COPPER CLAD GROUND ROD. (TWO 3/4-INCH DIAMETER BY 10-FOOT LONG, UL LISTED COPPERCLAD GROUND RODS COUPLED TOGETHER). 20-FOOT LONG GROUND RODS ARE REQUIRED DUE TO POOR RESISTANCE OF THE SOIL AT THE RESPECTIVE SITE. CONNECTIONS TO GROUND LUGS ON THE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE SHALL BE WITH A UL LISTED GROUNDING CONNECTOR SUITABLE FOR DIRECT BURIAL IN EARTH OR CONCRETE. CONNECTIONS TO GROUND RODS SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY PENTAIR ERICO PRODUCTS, INC., THERMOWELD BY CONTINENTAL INDUSTRIES, INC., ULTRAWELD BY HARGER, 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. TOP OF GROUND RODS SHALL BE BURIED 12 INCHES MINIMUM BELOW GRADE, UNLESS SPECIFIED OTHERWISE HEREIN, FOR RESPECTIVE APPLICATIONS
- FOR BASE MOUNTED LIGHT FIXTURES THE LIGHT FIXTURE MUST BE BONDED TO THE LIGHT BASE INTERNAL GROUND LUG VIA A #6 AWG STRANDED COPPER WIRE RATED FOR 600 VOLTS WITH GREEN XHHW INSULATION OR A BRAIDED GROUND STRAP OF EQUIVALENT CURRENT RATING. THE GROUND WIRE LENGTH MUST BE SUFFICIENT TO ALLOW THE REMOVAL OF THE LIGHT FIXTURE FROM THE LIGHT BASE FOR ROUTINE MAINTENANCE. SEE THE LIGHT FIXTURE MANUFACTURER'S INSTRUCTIONS FOR PROPER METHODS OF ATTACHING A BONDING WIRE.
- FURNISH AND INSTALL A #6 AWG BARE SOLID COPPER GROUND AND BOND IT TO EACH GROUND ROD AT THE RESPECTIVE AIRFIELD LIGHT FIXTURES AND TAXI GUIDANCE SIGNS. THE #6 AWG GROUND SHALL BE DIRECT BURIAL IN TRENCH APPROXIMATELY 12 TO 18 INCHES BELOW GRADE. THE GROUND CONDUCTOR MAY BE INSTALLED ABOVE THE #8 FAA L-824, 5000-VOLT CABLE IN UNIT DUCT OR IN AN ADJACENT TRENCH. THE #6 AWG GROUND SHALL BE CONNECTED TO EACH RESPECTIVE GROUND ROD WITH AN EXOTHERMIC WELD CONNECTION. THE COMPLETED GROUND WIRE INSTALLED WILL PROVIDE A GROUND RING SYSTEM FOR THE RESPECTIVE AIRFIELD LIGHTING CIRCUIT. THE GROUND WIRE WILL NOT BE INSTALLED WITH THE HOMERUN CABLES. THE #6 AWG BARE SOLID COPPER GROUND WILL BE PAID FOR UNDER ITEM AR108756 1/C #6 GROUND PER LINEAR FOOT.
- FOR TAXIWAY LIGHTS THAT ARE SPACED WITH LESS THAN 10 FEET OF SEPARATION BETWEEN THEM PROVIDE ONE 3/4-INCH DIAMETER BY 20-FOOT LONG GROUND ROD PER TWO ADJACENT TAXIWAY LIGHTS.
- FOR RUNWAY THRESHOLD LIGHTS THAT ARE SPACED WITH 10 FEET OF SEPARATION BETWEEN THEM, PROVIDE ONE 3/4-INCH DIAMETER BY 20-FOOT LONG GROUND ROD PER TWO ADJACENT THRESHOLD LIGHTS. LOCATE GROUND ROD MIDWAY BETWEEN THE TWO THRESHOLD LIGHTS.
- STEEL USED TO MANUFACTURE GROUND RODS SHALL BE 100% DOMESTIC STEEL. TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCE REQUIREMENTS AND THE STEEL PRODUCTS PROCUREMENT ACT.
- FOR EACH GROUNDING ELECTRODE SYSTEM, THE CONTRACTOR SHALL TEST THE MADE ELECTRODE GROUND SYSTEM WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUNDING SYSTEMS. TEST RESULTS SHALL BE RECORDED FOR EACH GROUNDING ELECTRODE SYSTEM. IF GROUND RESISTANCE EXCEEDS 25 OHMS, CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION. COPIES OF THE GROUND SYSTEM TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN, AND THE PROJECT ENGINEER.



**GROUNDING DETAIL FOR THRESHOLD LIGHTS**  
 (NOT TO SCALE)



**GROUNDING DETAIL FOR ADJACENT TAXIWAY LIGHTS**  
 (NOT TO SCALE)



**GROUNDING DETAIL FOR ADJACENT RUNWAY AND TAXIWAY LIGHTS**  
 (NOT TO SCALE)





REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

IL Proj. No.: C15-4578

SBG No: 3-17-SBGP-133/139

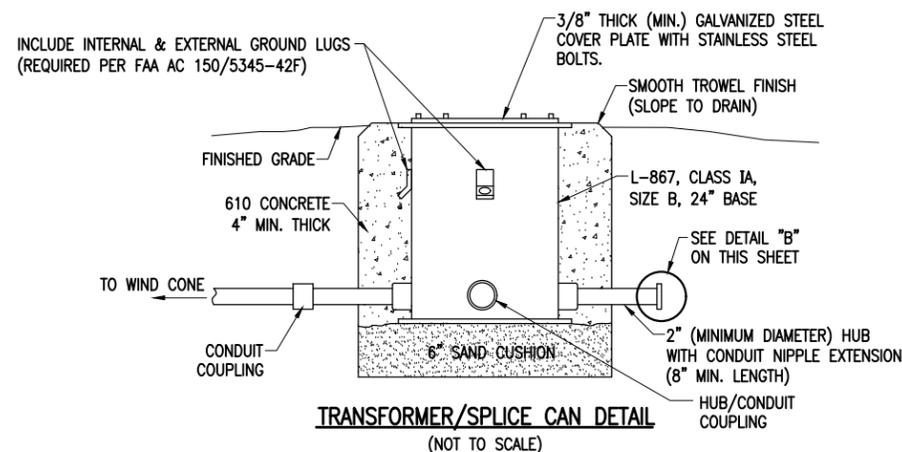
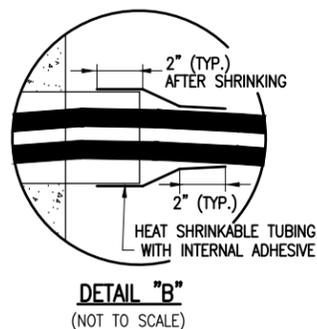
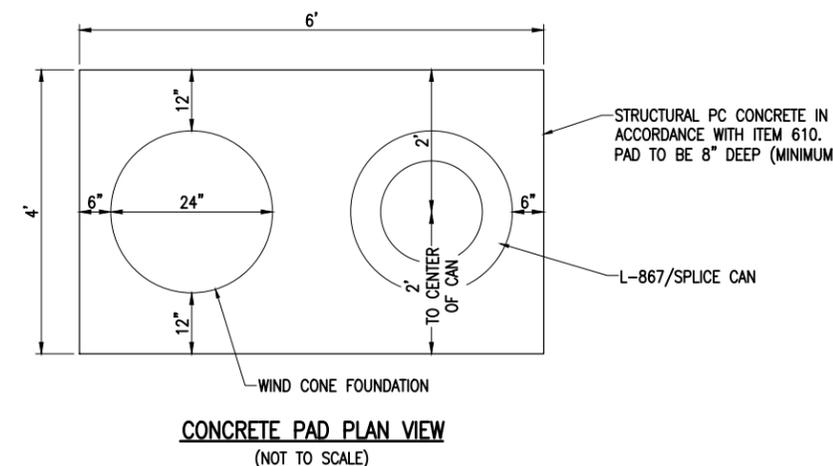
Contract No. PN010

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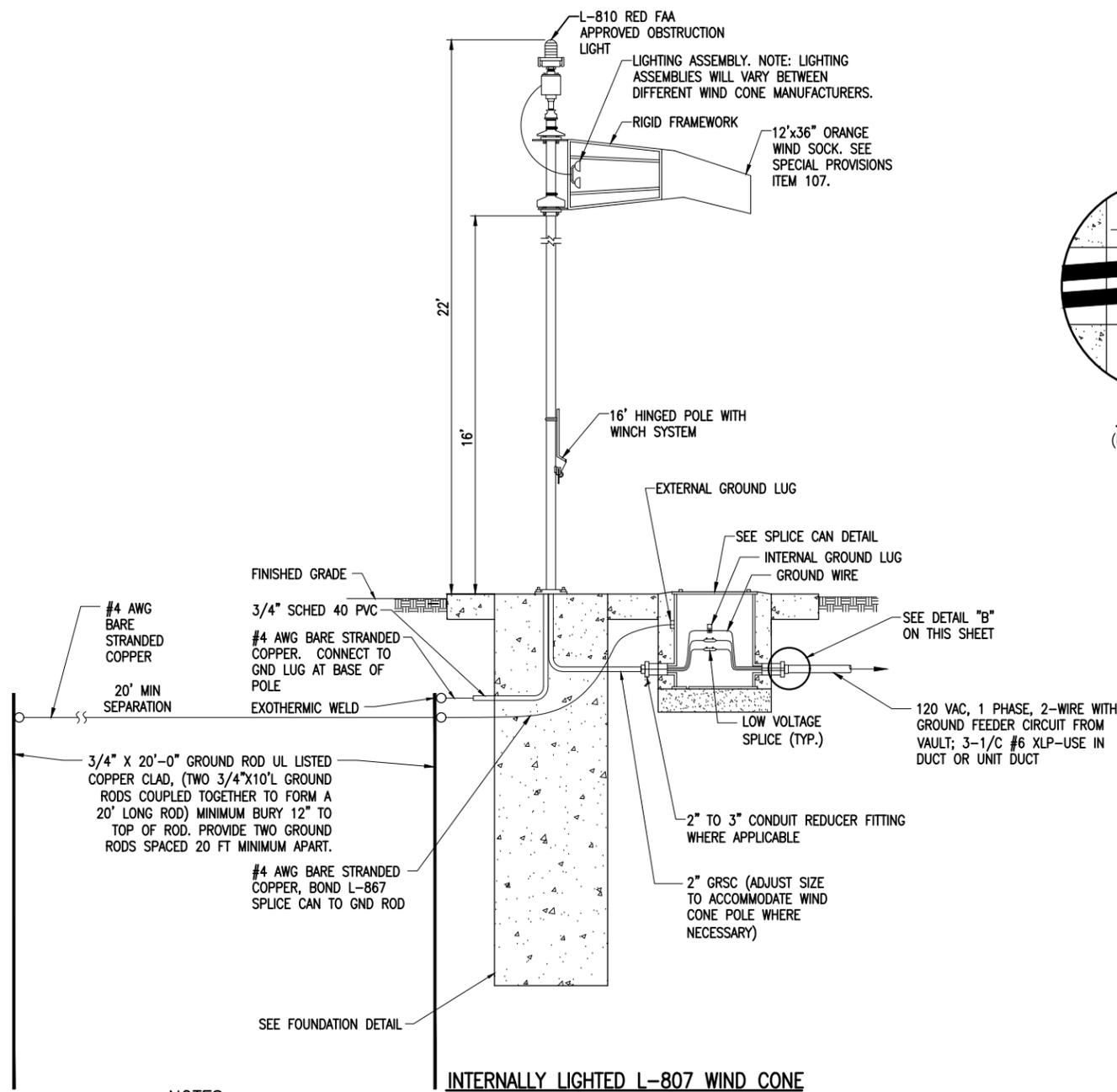
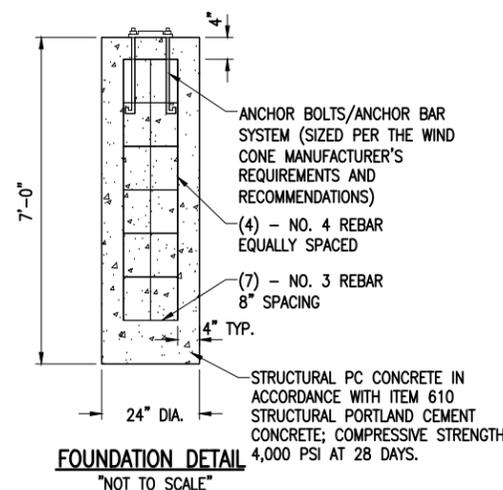
ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: E-504-ELEC.DWG  
 DESIGN BY: KNL 07/12/2017  
 DRAWN BY: CWS 07/21/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

L-807 WIND CONE ELEVATION DETAIL



- NOTES:
1. INCLUDE INTERNAL AND EXTERNAL GROUND LUGS.
  2. L-867 CAN FOR WIND CONE SHALL HAVE 2" HUB AT 0°, 2" HUB AT 90°, AND 2" HUB AT 180°. 3" HUBS ARE ALSO ACCEPTABLE.



NOTES

1. ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE OWNER. 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 & 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).
2. CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL FIELD VERIFY RESPECTIVE CIRCUITS AND POWER SOURCES PRIOR TO REMOVING, DISCONNECTING, INSTALLING, OR RECONNECTING THE RESPECTIVE AIRFIELD LIGHTING, NAVAID, OR OTHER DEVICE.
3. WIND CONE SHALL BE FAA APPROVED IN ACCORDANCE WITH FAA AC 150/5345-27 (CURRENT ISSUE IN EFFECT), TYPE L-807(L), STYLE I-B; INTERNALLY LIGHTED, SIZE 2; 12 FEET IN LENGTH BY 36-INCH IN THROAT DIAMETER SUITABLE FOR OPERATION ON A 120 VAC, 1 PHASE, 2-WIRE POWER SUPPLY. WIND SOCK SHALL BE ORANGE IN COLOR.
4. L-807(L) WIND CONE WILL BE PAID FOR UNDER ITEM AS107812 L-807 WC-12' INTERNALLY LIT PER EACH. SPLICE CAN FOR WIND CONE WILL BE INCIDENTAL TO THE RESPECTIVE WIND CONE PAY ITEM.
5. REBAR SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615 OR ASTM A706, GRADE 60 AND SHALL BE MANUFACTURED FROM 100% DOMESTIC STEEL TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN REQUIREMENTS AND THE STEEL PRODUCTS PROCUREMENT ACT. INCLUDE CERTIFICATION OF 100% DOMESTIC STEEL WITH SHOP DRAWING SUBMITTAL.
6. FOR EACH GROUNDING ELECTRODE SYSTEM (GROUND ROD) THE CONTRACTOR SHALL TEST THE MADE ELECTRODE GROUNDING SYSTEM WITH A INSTRUMENT THAT IS SPECIFICALLY DESIGNED FOR TESTING GROUNDING SYSTEMS. TEST RESULTS SHALL BE RECORDED FOR EACH GROUNDING ELECTRODE SYSTEM. IF GROUND RESISTANCE EXCEEDS 25 OHMS, CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION. COPIES OF THE GROUND SYSTEM TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN AND THE PROJECT ENGINEER.
7. RESTORE TURF AREAS AFFECTED BY WIND CONE INSTALLATION.



PEKIN MUNICIPAL AIRPORT  
111 South Capitol Street  
Peke, Illinois 61554  
Telephone: 309.477.2300

REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

IL Proj. No.: C15-4578

SBG No:  
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Contract No. PN010

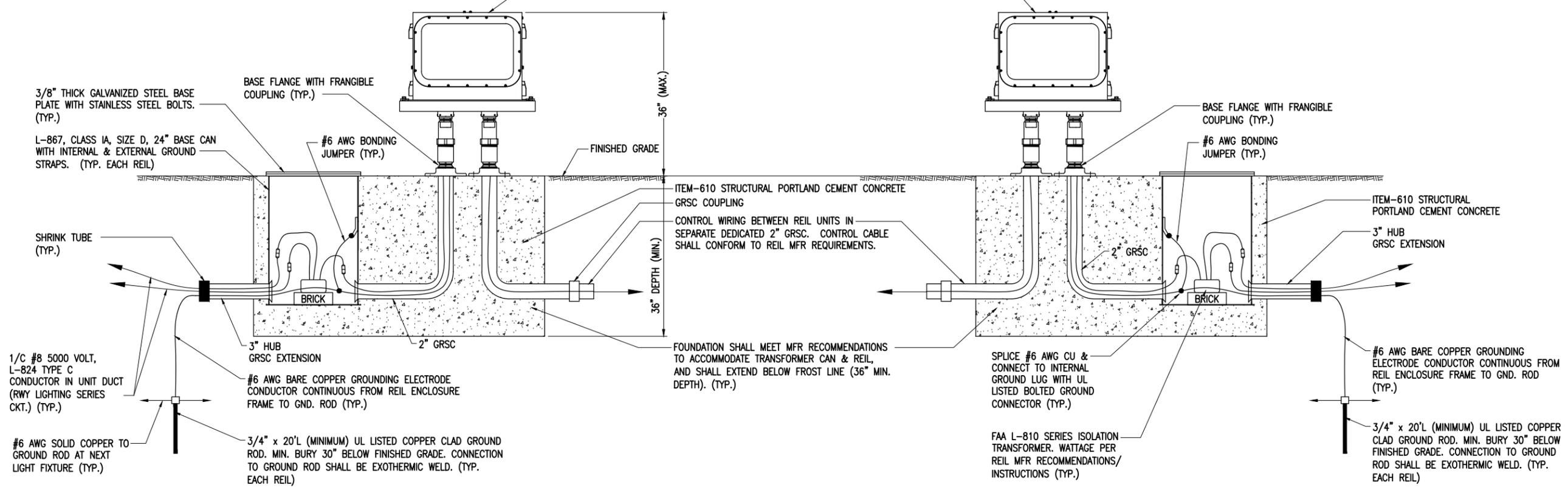

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DRAWN BY: CWS 07/21/2017  
REVIEWED BY: BSS 08/21/2017

SHEET TITLE

REIL DETAILS AND NOTES

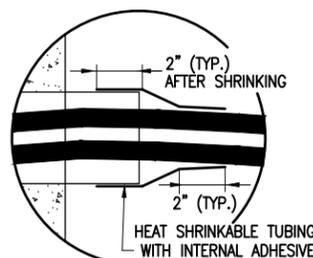
L-849(L) TYPE I, STYLE A L.E.D. (LIGHT EMITTING DIODE) REIL UNIT. THE ELEVATION OF BOTH UNITS MUST BE WITHIN 3 FT. OF A HORIZONTAL PLANE THROUGH THE RUNWAY CENTERLINE, WITH THE MAXIMUM HEIGHT ABOVE GROUND LIMITED TO 3 FT. (PER FAA AC 150/5340-30G, PART 7.4, PARAGRAPH B. "REIL")



REIL INSTALLATION DETAIL  
NOT TO SCALE

REIL NOTES

- REILS SHALL BE FAA APPROVED CONFORMING TO FAA AC 150/5345-51B "SPECIFICATION FOR DISCHARGE-TYPE FLASHING LIGHT EQUIPMENT", L-849(L) TYPE I REIL POWERED BY CONSTANT CURRENT 6.6 AMP POWER SUPPLY, STYLE A - UNIDIRECTIONAL, HIGH INTENSITY, ONE BRIGHTNESS STEP. SEE SPECIAL PROVISION SPECS AR125610 FOR ADDITIONAL REQUIREMENTS ON REILS.
- REILS SHALL BE AIMED AT ANGLE 10 DEGREES VERTICALLY AND TOED OUT 15 DEGREES FROM THE LINE PARALLEL TO THE RUNWAY CENTERLINE.
- ANY AND ALL TRENCHES AND DISTURBED AREAS WILL BE BACKFILLED AND RESTORED TO A SMOOTH GRADE AND SEEDED TO THE SATISFACTION OF THE ENGINEER. ALL TRENCH SETTLEMENT SHALL BE CORRECTED FOR A PERIOD OF ONE YEAR. RESTORATION, GRADING, SEEDING, AND MULCHING OF AREAS DISTURBED DURING THE REIL INSTALLATION AND ASSOCIATED CABLE WILL BE INCIDENTAL TO THE INSTALLATION OF THE REILS.
- GROUNDING FOR REILS.** GROUNDING FOR REILS SHALL CONFORM TO THE RESPECTIVE REIL MANUFACTURER'S INSTALLATION INSTRUCTIONS, AS DETAILED ON THE PLANS, AND AS SPECIFIED HEREIN. FURNISH AND INSTALL A 3/4-INCH DIAMETER BY 20-FOOT LONG COPPER CLAD GROUND ROD AT EACH REIL UNIT. GROUND RODS SHALL BE BURIED 30" MINIMUM BELOW GRADE. BOND EACH REIL UNIT HOUSING AND THE REIL BASE CAN TO THE RESPECTIVE GROUND ROD IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS WITH A #6 AWG BARE SOLID OR STRANDED (PER REIL MANUFACTURER REQUIREMENTS) COPPER GROUNDING ELECTRODE CONDUCTOR. ALL CONNECTIONS TO GROUND RODS SHALL BE EXOTHERMIC WELD AS MANUFACTURED BY CADWELD, THERMOWELD, ULTRAWELD, OR APPROVED EQUAL. CONNECTIONS TO REIL UNIT FRAMES SHALL BE AS RECOMMENDED BY THE MANUFACTURER OR WITH UL LISTED GROUNDING CONNECTORS. CONNECTIONS TO THE BASE / TRANSFORMER CAN SHALL BE WITH UL LISTED BOLTED CONNECTOR OR ONE-HOLE COMPRESSION LUG & 3/8" STAINLESS STEEL BOLTS, NUTS, & WASHERS.
- PRIOR TO FINAL ACCEPTANCE AND ACTIVATION, THE COMPLETED REIL INSTALLATION WILL REQUIRE A FLIGHT CHECK TO BE SCHEDULED AND CONDUCTED BY THE FAA AND/OR IDA. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO HAVE A REPRESENTATIVE PRESENT TO MAKE ANY NECESSARY ADJUSTMENTS IN THE INSTALLATION AND/OR AIMING OF THE REIL UNITS FOR THE FLIGHT SYSTEM CHECKS. **NOTE: THE FAA WILL PAY THE COSTS FOR ONE FLIGHT CHECK. IN THE EVENT THAT ADDITIONAL FLIGHT CHECKS ARE REQUIRED, THE COST ASSOCIATED WITH THE ADDITIONAL FLIGHT CHECKS WILL BE THE RESPONSIBILITY OF AND PAID FOR BY THE CONTRACTOR. FAA HAS NOTED THE ESTIMATED COST FOR AN ADDITIONAL FLIGHT CHECK FOR THE REILS WILL BE APPROXIMATELY \$5,000.00.**



DETAIL "B"  
(NOT TO SCALE)





REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

IL Proj. No.: C15-4578

SBG No:  
 3-17-SBG-133/139

Contract No. PN010

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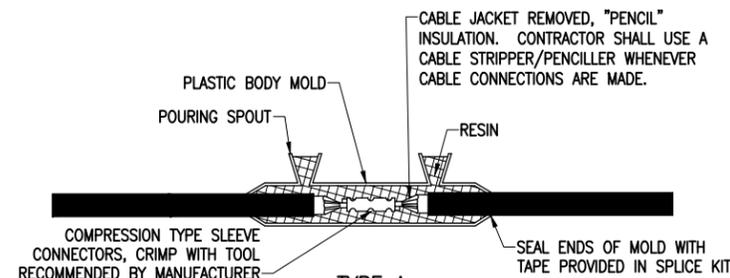
ISSUE: 09/22/2017  
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SHEET TITLE

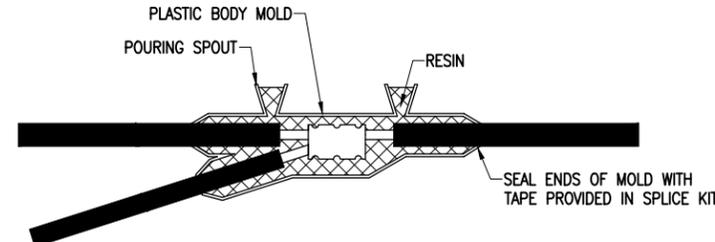
AIRFIELD LIGHTING  
 CABLE SPLICE  
 DETAILS

**NOTES:**

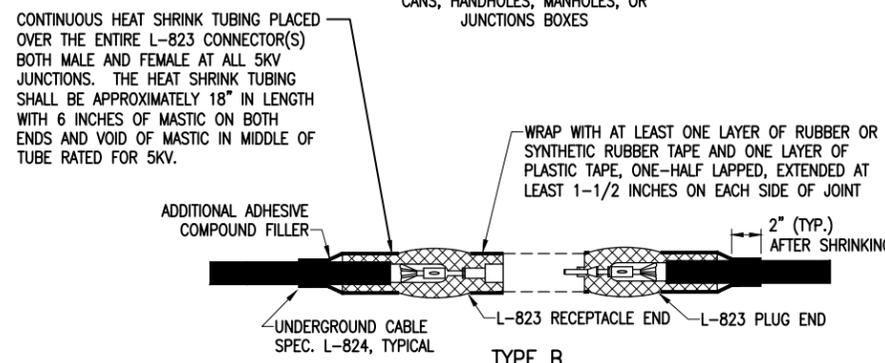
1. SPLICE DETAILS ARE PROVIDED FOR NEW WORK AND TO ASSIST IN REPAIRS OF ACCIDENTAL OR UNEXPECTED INTERRUPTIONS AND/OR CUTS TO AIRFIELD LIGHTING CABLES.
2. CONTRACTOR SHALL KEEP ON HAND A MINIMUM OF 10 SETS OF SPLICE KITS FOR L-823 CONNECTORS AND A MINIMUM OF 10 SETS OF TYPE A LOW VOLTAGE SPLICE KITS TO ACCOMMODATE REPAIRS.
3. EVERY AIRFIELD LIGHTING CABLE SPICER SHALL BE QUALIFIED IN MAKING CABLE SPLICES AND TERMINATIONS ON CABLES RATED AT AND/OR ABOVE 5,000 VOLTS AC TO COMPLY WITH THE REQUIREMENTS OF FAA 150/5370-10G ITEM L-108.
4. WHEN PREPARING CABLE FOR SPLICES, THE CONTRACTOR SHALL USE A CABLE STRIPPER/PENCILLER WHENEVER CABLE CONNECTIONS ARE MADE.
5. INSIDE DIAMETER OF RESPECTIVE CABLE CONNECTOR SHALL PROPERLY MATCH OUTSIDE DIAMETER OF CABLE.
6. WRAP ALL PRIMARY AND SECONDARY POWER CONNECTIONS WITH SUFFICIENT LAYERS OF HIGH VOLTAGE ELECTRICAL INSULATING TAPE (RUBBER SPLICING TAPE SUITABLE FOR PRIMARY ELECTRICAL INSULATION FOR SPLICING CABLE FROM 600 VOLTS TO 69,000 VOLTS) AND COVER WITH VINYL ELECTRICAL TAPE (ALL-WEATHER VINYL INSULATING TAPE SUITABLE FOR PROTECTIVE JACKETING FOR HIGH-VOLTAGE CABLE SPLICES AND REPAIRS) FOR FULL VALUE OF CABLE INSULATION VOLTAGE. PER ILLINOIS STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS ITEM 108, ITEM 125, AND FAA AC 150/5370-10G ITEM L-108, HIGH VOLTAGE ELECTRICAL INSULATING TAPE SHALL BE 3M SCOTCH 23, 3M SCOTCH 130C OR APPROVED EQUIVALENT, AND VINYL ELECTRICAL TAPE SHALL BE 3M SCOTCH 88 OR APPROVED EQUIVALENT. TAPES MUST BE RATED SUITABLE FOR THE APPLICATION.
7. PROVIDE CABLE TAGS TO IDENTIFY THE RESPECTIVE CIRCUITS ALL POINTS OF ACCESS INCLUDING L-867 BASES, L-868 BASES, HANDHOLES, MANHOLES, JUNCTION BOXES, AND WIREWAYS.
8. CONNECTION OF CONDUCTORS MUST BE MADE BY USING CRIMP CONNECTORS AND A CRIMPING TOOL APPROVED BY THE CONNECTOR/LUG MANUFACTURER. THE TOOL MUST PRODUCE A COMPLETE CRIMP BEFORE IT CAN BE REMOVED. THE CRIMPING TOOL USED MUST BE LISTED BY THE L-823 KIT MANUFACTURER. MAKE THE NUMBER AND TYPE OF CRIMPS PER THE KIT MANUFACTURER'S INSTRUCTIONS.



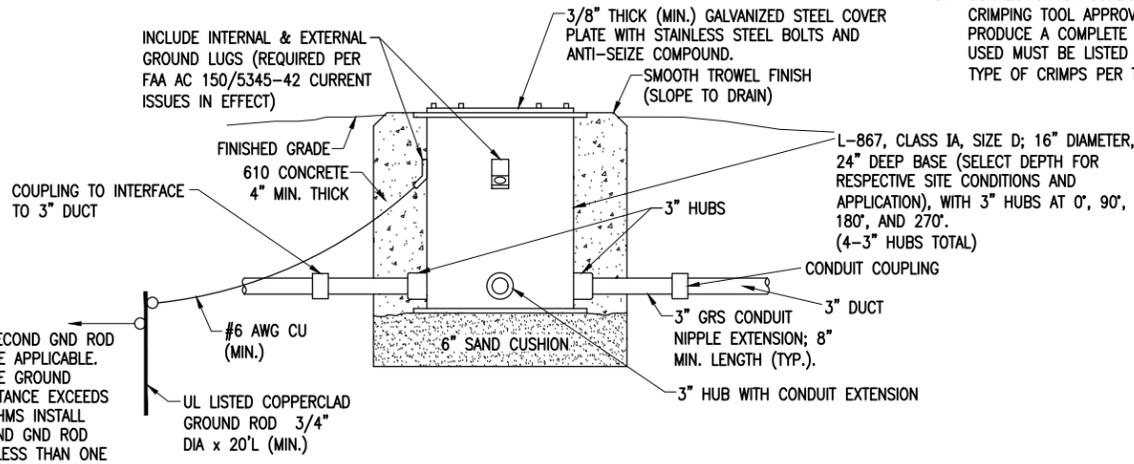
**TYPE A**  
 FOR SPLICES IN LOW VOLTAGE CABLE (600V) HOMERUNS FOR EXTENSIONS TO EXISTING LOW VOLTAGE CABLES ONLY. TYPE A SPLICES SHALL BE MADE IN SPLICE CANS, HANDHOLES, MANHOLES, OR JUNCTIONS BOXES



**LOW VOLTAGE UNDERGROUND TAP SPLICE**  
 FOR TAP SPLICES IN LOW VOLTAGE (600V) CABLE. SPLICES SHALL BE RATED AND LISTED SUITABLE FOR DIRECT BURIAL LOCATIONS. FOR SPLICES UP TO #2 AWG CONDUCTOR, SPLICES SHALL BE WYE RESIN TYPE POWER CABLE TAP SPLICE KIT SUITABLE FOR THE RESPECTIVE CABLES AND RESPECTIVE APPLICATION.

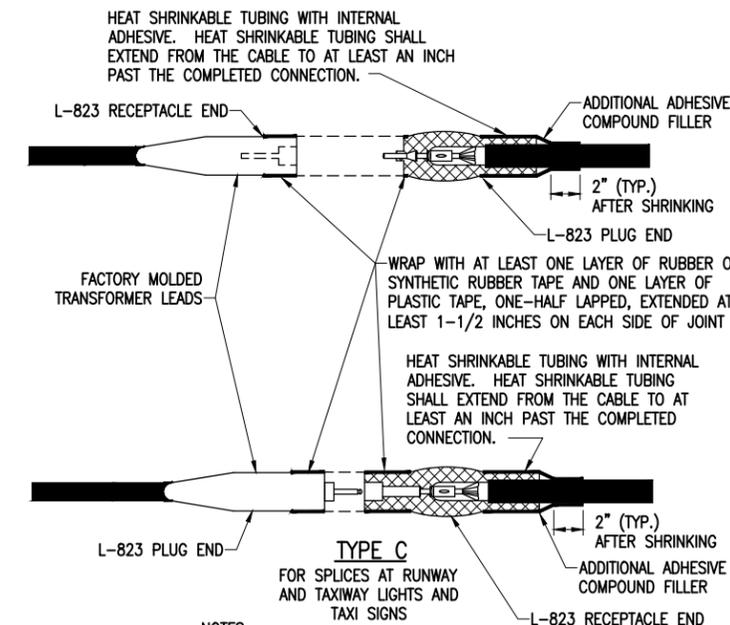


**TYPE B**  
 FOR SPLICES AT JUNCTION OF HOMERUN WITH LOOP CIRCUIT AND FOR SPLICES IN HOMERUNS TO EXISTING CABLES



**SPLICE CAN DETAIL**  
 (NOT TO SCALE)

- NOTES FOR SPLICE CAN DETAIL:**
1. SPLICE CANS SHALL CONFORM TO THE REQUIREMENTS OF FAA AC 150/5345-42 (CURRENT ISSUES IN EFFECT), FOR TYPE L-867, CLASS 1A, SIZE D, (16 IN. NOMINAL DIAMETER), AND 24 IN. DEEP AND/OR AS DETAILED ON THE PLANS. EACH SPLICE CAN SHALL INCLUDE INTERNAL AND EXTERNAL GROUND LUGS TO ACCOMMODATE THE RESPECTIVE APPLICATIONS. SPLICE CANS AND/OR JUNCTION CANS SHALL HAVE GALVANIZED STEEL COVERS, 3/8-INCH THICK (MINIMUM), WITH STAINLESS STEEL BOLTS.
  2. FOR THE PURPOSE OF ENHANCING SAFETY, EACH BASE MUST HAVE INSTALLED, BY THE MANUFACTURER, AN INTERNAL AND EXTERNAL GROUND STRAP THAT IS AVAILABLE FOR THE PURPOSE OF ATTACHING A GROUND LUG THAT IS CONNECTED TO AN EARTH GROUND OR A SAFETY GROUND CONDUCTOR INSTALLED WITH THE RESPECTIVE CIRCUIT. FOR AIRPORT PROJECTS RECEIVING FEDERAL FUNDS THIS REQUIREMENT IS MANDATORY PER FAA AC 150/5345-42 (CURRENT ISSUES IN EFFECT).
  3. APPLY AN OXIDE-INHIBITING, ANTI-SEIZING COMPOUND TO ALL SCREWS, NUTS, AND ALL PLACES WHERE METAL COMES INTO CONTACT WITH METAL.
  4. THE CONCRETE USED IN THE CONSTRUCTION OF THE BASES FOR THE AIRFIELD LIGHTING CANS SHALL BE IN ACCORDANCE WITH ITEM 610 STRUCTURAL PORTLAND CEMENT CONCRETE.
  5. LIDS FOR THE SPLICE CANS CONTAINING HIGH VOLTAGE AIRFIELD LIGHTING CABLES SHALL INCLUDE MINIMUM 1/2-INCH HIGH LETTERING LABELED "DANGER HIGH VOLTAGE KEEP OUT" TO COMPLY WITH NEC ARTICLE 300.45 "WARNING SIGNS" AND NEC ARTICLE 314.71(E) "SUITABLE COVERS". THIS WILL NEED TO BE COORDINATED WITH THE SPLICE CAN MANUFACTURER.
  6. LIDS FOR THE SPLICE CANS CONTAINING LOW VOLTAGE CABLES (RATED 600 VOLTS AND BELOW) WILL BE ACCEPTABLE TO USE BLANK COVERS.



**TYPE C**  
 FOR SPLICES AT RUNWAY AND TAXIWAY LIGHTS AND TAXI SIGNS

**NOTES:**  
 INSIDE DIAMETER OF CONNECTOR SHALL PROPERLY MATCH THE OUTSIDE DIAMETER OF CABLE.

**CABLE SPLICES**  
 (NOT TO SCALE)

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REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

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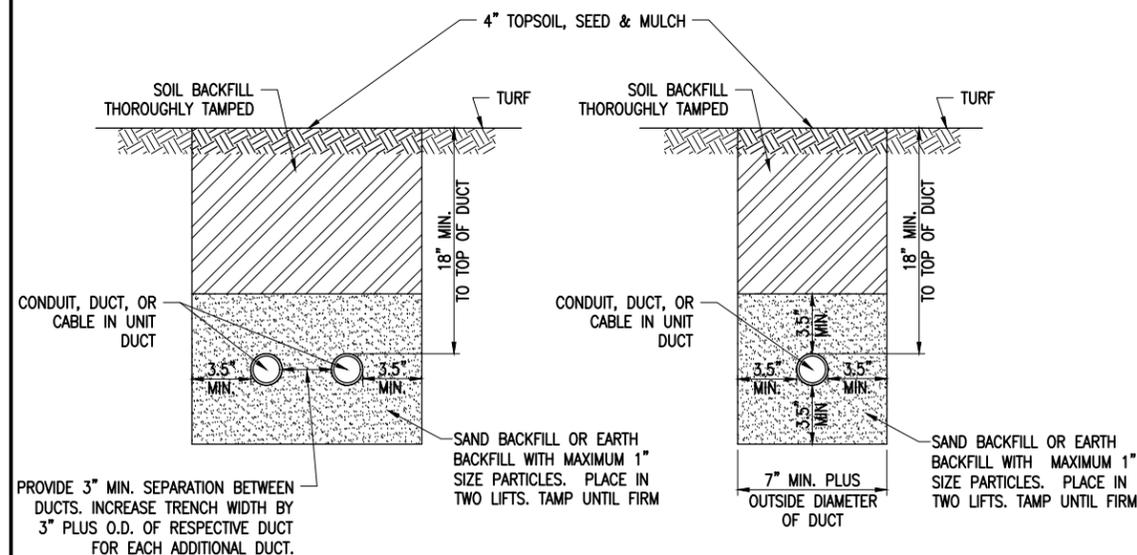
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 DESIGN BY: KNL 07/12/2017  
 DRAWN BY: CWS 07/21/2017  
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SHEET TITLE

CONDUIT TRENCH DETAILS

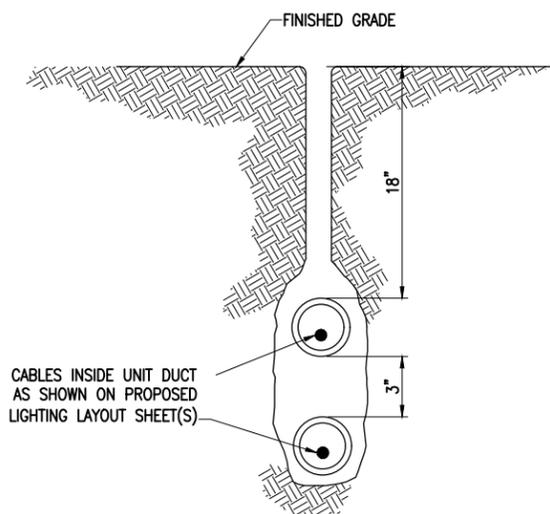


**CONDUIT IN TRENCH – NON-PAVEMENT AREAS**

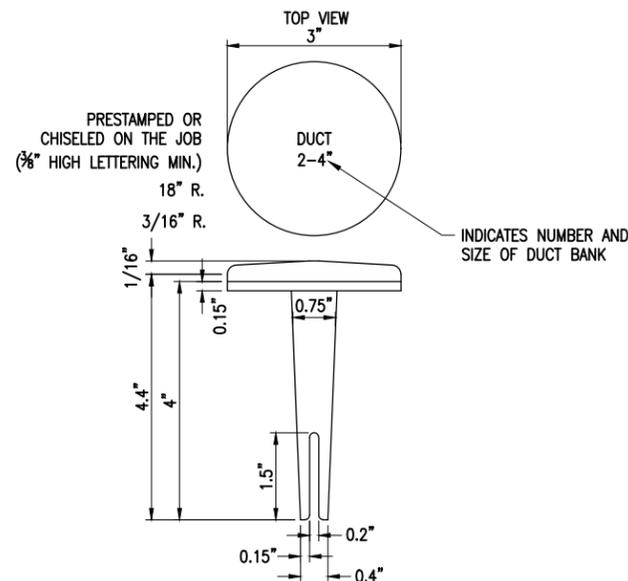
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**NOTES:**

- DIMENSIONS FOR COVERAGE AND SEPARATION BETWEEN DUCTS ARE MINIMUM.
- TRENCHES WITH MORE THAN TWO DUCTS OR CABLE IN UNIT DUCTS SHALL BE INCREASED 3" IN WIDTH PLUS DIAMETER OF RESPECTIVE DUCT FOR EACH ADDITIONAL CONDUIT, DUCT, OR CABLE IN UNIT DUCT; IF SPECIFIED ON PLANS TWO PARALLEL TRENCHES MAY BE CONSTRUCTED.
- DEPTH OF TRENCHES SHALL BE AS SHOWN ABOVE UNLESS OTHERWISE SPECIFIED ON THE PLANS. MINIMUM COVER REQUIREMENTS FOR CABLES AND DUCTS AT AIRPORT RUNWAYS AND ADJACENT AREAS WHERE TRESPASSING IS PROHIBITED IS 18 INCHES PER NEC 300.5 AND 300.50. MINIMUM COVER REQUIREMENTS FOR DUCTS LOCATED BELOW PAVEMENT OR ROADWAYS IS 30". COVER IS DEFINED AS THE SHORTEST DISTANCE IN INCHES MEASURED BETWEEN A POINT ON THE TOP SURFACE OF ANY DIRECT-BURIED CONDUCTOR, CABLE, CONDUIT, OR OTHER RACEWAY AND THE TOP SURFACE OF FINISHED GRADE, CONCRETE OR SIMILAR COVER.
- HIGH VOLTAGE CIRCUITS (AIRFIELD LIGHTING 5000 VOLT SERIES CIRCUITS AND/OR OTHER CIRCUITS RATED ABOVE 600 VOLTS) AND LOW VOLTAGE CIRCUITS (RATED 600 VOLTS AND BELOW) SHALL NOT BE INSTALLED IN THE SAME RACEWAY, CONDUIT, DUCT, HANDHOLE, OR MANHOLE.
- CONDUIT, DUCT, CABLE, AND/OR CABLE IN UNIT DUCT INTERFACE TO HANDHOLES, MANHOLES, SPLICE CANS, OR OTHER JUNCTION STRUCTURES WILL BE CONSIDERED INCIDENTAL TO THE RESPECTIVE CABLE PAY ITEM OR RESPECTIVE DUCT PAY ITEM.
- ALL DISTURBED SURFACES SHALL BE RESTORED TO THEIR ORIGINAL CONDITION. COST IS INCIDENTAL TO TRENCH.



**PLOWED CABLE**  
 (NOT TO SCALE)

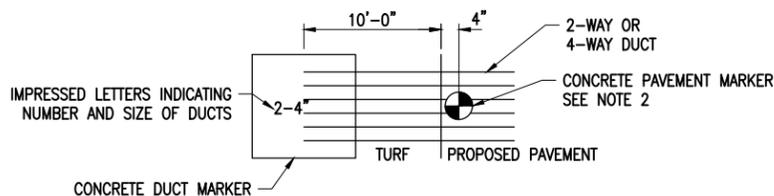


**BITUMINOUS PAVEMENT DUCT MARKERS**

"NOT TO SCALE"

**NOTES:**

- TOP OF MARKER SHALL BE FLUSH WITH FINISHED PAVEMENT SURFACE. MARKER MAY BE INSTALLED IN A DRILLED HOLE AND SECURED WITH EPOXY GLUE.
- BRASS DUCT MARKERS ARE AVAILABLE FROM G&S FOUNDRY & MANUFACTURING CO., INC., 210 KASKASKIA DRIVE, RED BUD, IL 62278, PHONE: (618)-282-4114, SURV-KAP, 3225 E. 47TH ST., TUCSON, AZ 85713, PHONE: (520) 622-6011, OR OTHER EQUIVALENT MANUFACTURERS.

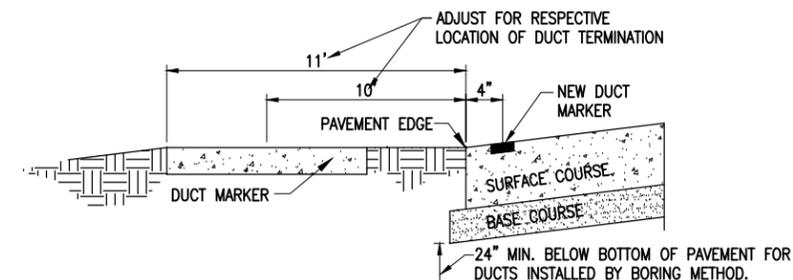


**DUCT MARKER DETAIL**

"NOT TO SCALE"

**CABLE & DUCT MARKER NOTES:**

- THE COST OF ALL TURF AND PAVEMENT DUCT MARKERS SHALL BE INCIDENTAL TO THE DUCT. THE COST OF ALL CABLE MARKERS SHALL BE INCIDENTAL TO THE CABLE.
- BITUMINOUS PAVEMENT DUCT MARKER AND CONCRETE DUCT MARKER TO BE PROVIDED AT EACH END OF EACH DUCT AS SHOWN ON THE LOCATION PLAN. FOR CONCRETE PAVEMENT, THE LETTER "D" SHALL BE IMPRESSED IN THE PAVEMENT INSTEAD OF THE MARKER. THE LETTER SHALL BE FORMED AS DESCRIBED IN NOTE 4.
- CABLE MARKERS SHALL BE PLACED AT CHANGES OF DIRECTION AND APPROXIMATELY EVERY 200' ALONG CABLE RUNS.
- CONCRETE CABLE MARKERS AND DUCT MARKERS SHALL HAVE LETTERS 4" HIGH, 3" WIDE WITH WIDTH OF STROKE 1/2" AND 1/4" DEEP. ALL LETTERS, NUMBERS AND ARROWS TO BE IMPRESSED.
- EMPLOY THE FOLLOWING METHODS WERE ADDITIONAL SPACE TO FIT LEGEND IS REQUIRED:
  - REDUCE LETTER SIZE TO 3" HIGH, 2" WIDE.
  - INCREASE THE MARKER SIZE TO 30" X 30".
  - PROVIDE ADDITIONAL MARKERS PLACED SIDE BY SIDE.

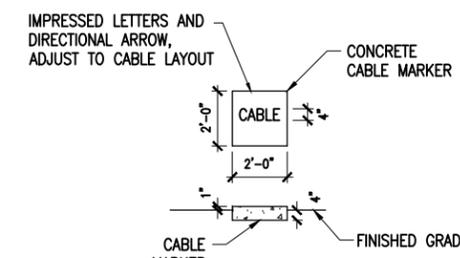


ADJUST FOR RESPECTIVE LOCATION OF DUCT TERMINATION  
 NEW DUCT MARKER  
 SURFACE COURSE  
 BASE COURSE  
 24" MIN. BELOW BOTTOM OF PAVEMENT FOR DUCTS INSTALLED BY BORING METHOD.

**UNDERGROUND ELECTRICAL DUCT**

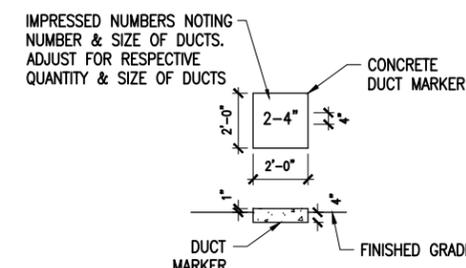
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NOTE: DUCTS INSTALLED BY BORING METHOD SHALL NOT DISTURB THE RESPECTIVE PAVEMENT SURFACE.



**TURF CABLE MARKERS**

"NOT TO SCALE"



**TURF DUCT MARKERS**

"NOT TO SCALE"



REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

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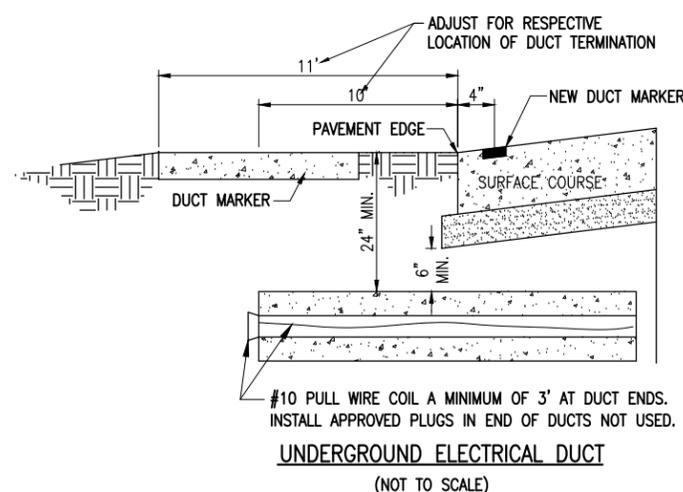
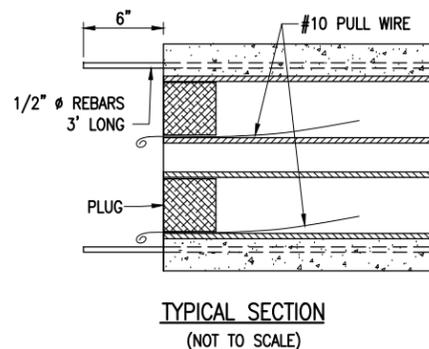
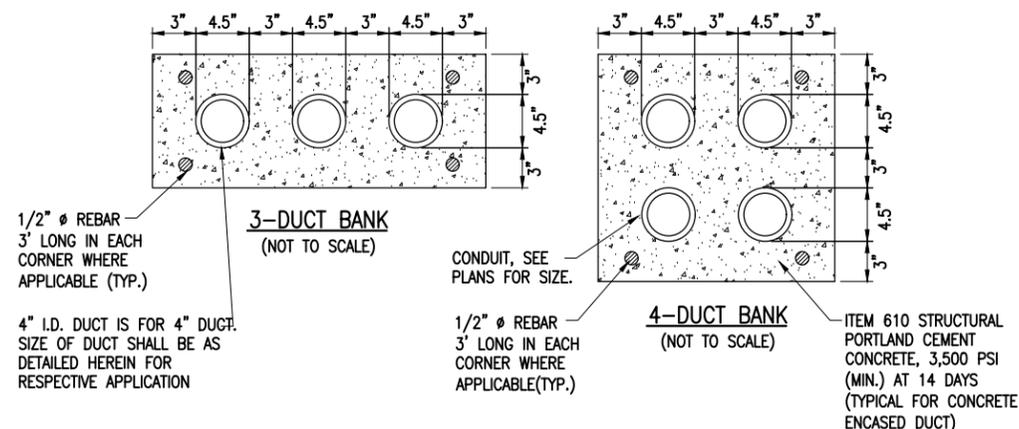
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SHEET TITLE

DUCT BANK DETAILS AND NOTES

## DUCT INSTALLATION NOTES

- ALL ELECTRICAL EQUIPMENT AND MATERIALS SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 - NATIONAL ELECTRICAL CODE (NEC) MOST CURRENT ISSUE IN FORCE, THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES, AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L. LISTING, INTERTEK TESTING SERVICES VERIFICATION/ETL LISTING (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE PERMITTED.
- CONTRACTOR SHALL KEEP A COPY OF THE LATEST NEC IN FORCE ON SITE AT ALL TIMES DURING CONSTRUCTION FOR USE AS A REFERENCE.
- CONTRACTOR SHALL COORDINATE WORK AND ANY POWER OUTAGES AND/OR SHUT DOWN OF SYSTEMS WITH THE RESPECTIVE FACILITY OWNER PERSONNEL AND THE AIRPORT MANAGER/DIRECTOR. 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 & 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).
- THE LOCATION, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND AND/OR ABOVEGROUND UTILITIES INDICATED ON THE PLANS IS NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY WHATEVER IN RESPECT TO 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 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. 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.
- ADJUSTMENTS TO DUCT BANK ROUTES MIGHT BE REQUIRED TO ACCOMMODATE EXISTING SITE CONDITIONS AND UNDERGROUND LINES AND UTILITIES. CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL COORDINATE DUCT ROUTE ADJUSTMENTS WITH THE RESIDENT ENGINEER/ RESIDENT TECHNICIAN AND THE AIRPORT MANAGER.
- CONTRACTOR SHALL LOCATE AND MARK ALL EXISTING CABLES, LINES, OR UTILITIES WITHIN 10 FT OF PROPOSED EXCAVATING/TRENCHING AREA. ANY CABLES, LINES, AND UTILITIES FOUND INTERFERING WITH PROPOSED EXCAVATION OR CABLE/TRENCHING SHALL BE HAND DUG AND EXPOSED. ANY DAMAGED CABLES OR OTHER UTILITIES SHALL BE IMMEDIATELY REPAIRED TO THE SATISFACTION OF THE RESPECTIVE OWNER'S REPRESENTATIVE AT THE CONTRACTOR'S EXPENSE. THE RESIDENT ENGINEER/RESIDENT TECHNICIAN AND OWNER SHALL BE NOTIFIED IMMEDIATELY IF ANY CABLES OR OTHER UTILITIES ARE DAMAGED.
- PAYMENT FOR LOCATING AND MARKING UNDERGROUND UTILITIES AND CABLES WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE CONSIDERED INCIDENTAL TO THE RESPECTIVE DUCT INSTALLATION.
- THE CONTRACTOR WILL DETERMINE IF THERE IS A CONFLICT BETWEEN THE INSTALLATION OF THE PROPOSED ELECTRICAL DUCTS AND ANY EXISTING UTILITIES. HE WILL MAKE ALL NECESSARY ADJUSTMENTS IN DEPTH OF INSTALLATION TO AVOID ANY AND ALL PROPOSED UNDERGROUND IMPROVEMENTS
- CONDUITS FOR DIRECT BURIAL OR CONCRETE ENCASED DUCT BANK SHALL BE SCHEDULE 40 PVC CONDUIT, UL-LISTED, RATED FOR 90°C CABLE-CONFORMING TO NEMA STANDARD TC-2 AND UL 651, LISTED SUITABLE FOR UNDERGROUND USE EITHER DIRECT-BURIED OR ENCASED IN CONCRETE, OR SCHEDULE 40 (MINIMUM) HDPE CONDUIT, UL LISTED, CONFORMING TO NEMA STANDARD TC-7 AND UL 651B AND LISTED SUITABLE FOR UNDERGROUND USE; EITHER DIRECT BURY OR ENCASED IN CONCRETE.
- CONDUITS FOR DIRECTIONAL BORING SHALL BE SCHEDULE 40 PVC CONDUIT OR SCHEDULE 80 PVC CONDUIT, UL-LISTED, RATED FOR 90°C CABLE-CONFORMING TO NEMA STANDARD TC-2 AND UL 651 AND SUITABLE FOR DIRECTIONAL BORING INSTALLATION, SCHEDULE 80 HDPE CONDUIT, UL-LISTED, CONFORMING TO NEMA STANDARD TC-7 AND UL 651B AND SUITABLE FOR DIRECTIONAL BORING INSTALLATION, OR WALL TYPE SDR 13.5 OR SDR 11 HDPE CONDUIT MANUFACTURED IN ACCORDANCE WITH ASTM D-3350 (SPECIFICATION OF POLYETHYLENE PLASTICS PIPE AND FITTINGS MATERIALS) AND ASTM F2160 (STANDARD SPECIFICATION FOR SOLID WALL, HIGH-DENSITY POLYETHYLENE CONDUIT BASED ON CONTROLLED OUTSIDE DIAMETER), AND SUITABLE FOR DIRECTIONAL BORING INSTALLATION. PER NEC 300.5 (K), RACEWAYS INSTALLED USING DIRECTIONAL BORING EQUIPMENT SHALL BE APPROVED FOR THE PURPOSE.
- INSTALLATION OF CONDUIT AND DUCTS SHALL CONFORM TO ITEM 110 AIRPORT UNDERGROUND ELECTRICAL DUCT BANKS AND CONDUITS.
- DUCTS INSTALLED IN TRENCH SHALL BE INSTALLED 18 IN. MINIMUM BELOW GRADE IN TURF AREAS NOT SUBJECT TO FARMING. DUCTS LOCATED IN AREAS SUBJECT TO FARMING SHALL BE 42 IN. MINIMUM BELOW GRADE. MINIMUM DEPTH OF TOP OF DUCT ENCASUREMENT SHALL BE 42" IN AREAS UNDER ROADWAYS. WHERE DETAILED ON THE PLANS OR WHERE REQUIRED TO AVOID OBSTRUCTIONS, DUCTS SHALL BE BURIED DEEPER.
- WHERE CONCRETE-ENCASED DUCT INTERFACES TO AN ELECTRICAL HANDHOLE OR MANHOLE, THE CONCRETE ENCASUREMENT SHALL BE INSTALLED UP TO THE RESPECTIVE HANDHOLE OR MANHOLE. PROVIDE BUSHINGS OR BELLS AT CONDUIT TERMINATIONS IN ELECTRICAL HANDHOLES OR MANHOLES.
- UNDERGROUND DUCTS INSTALLED BY DIRECTIONAL-BORING METHOD SHALL BE INSTALLED IN A MANNER THAT WILL NOT DAMAGE ANY EXISTING UNDERGROUND UTILITIES, AND SHALL NOT DISTURB OR DAMAGE THE RESPECTIVE PAVEMENT OR ROADWAY SURFACE. DUCTS SHALL BE DIRECTIONAL-BORED AT THE LOCATIONS SHOWN ON THE CONSTRUCTION PLANS. THE DUCTS WILL BE BORED AT A MINIMUM DEPTH OF 42 IN. BELOW THE RESPECTIVE PAVEMENT IT IS BEING BORED UNDER.
- A PULL WIRE SHALL BE INSTALLED IN EACH CONDUIT OR DUCT TO BE LEFT VACANT.
- HIGH VOLTAGE CIRCUITS (AIRFIELD LIGHTING 5000 VOLT SERIES CIRCUITS AND/OR OTHER CIRCUITS RATED ABOVE 600 VOLTS) AND LOW VOLTAGE CIRCUITS (RATED 600 VOLTS AND BELOW) SHALL NOT BE INSTALLED IN THE SAME RACEWAY, CONDUIT, DUCT, HANDHOLE, OR MANHOLE.
- CONTROL CABLES SHALL BE RUN IN SEPARATE DUCTS FROM POWER CABLES.
- HOMERUN CABLES FOR A RESPECTIVE CIRCUIT SHALL BE INSTALLED IN THE SAME RACEWAY OR DUCT.
- COORDINATE DUCT INTERFACE TO MANHOLES AND HANDHOLES. FIELD CUT OPENINGS FOR CONDUITS AND DUCTS TO INTERFACE TO MANHOLES AND/OR HANDHOLES. CUT WALL OF RESPECTIVE HANDHOLE OR MANHOLE WITH A TOOL DESIGNED FOR MATERIAL TO BE CUT. SIZE HOLES FOR RESPECTIVE DUCTS, CONDUITS, AND TERMINATION FITTINGS AND SEAL AROUND PENETRATIONS. ALL CORING, INTERFACE, CUTTING, AND SEALING WILL BE CONSIDERED INCIDENTAL TO THE RESPECTIVE DUCT INSTALLATION AND/OR RESPECTIVE HANDHOLE/MANHOLE INSTALLATION.
- CONTRACTOR SHALL COORDINATE DUCT MARKING WITH AIRPORT.
- ALL POWER AND CONTROL CABLES IN HANDHOLES, MANHOLES, AND JUNCTION BOXES SHALL BE TAGGED TO IDENTIFY THE RESPECTIVE CABLE. A MINIMUM OF TWO TAGS SHALL BE PROVIDED ON EACH CABLE IN A MANHOLE; ONE AT THE CABLE ENTRANCE AND ONE AT THE CABLE EXIT. CABLE TAGS SHALL BE STAMPED BRASS TAGS OR OTHER WEATHERPROOF/WATERPROOF CORROSION RESISTANT MATERIAL.



## DUCT BANK NOTES:

- DIMENSIONS FOR CONCRETE COVERAGE AND SEPARATION BETWEEN DUCTS ARE MINIMUM.
- INCLUDE DUCT SPACERS AS MANUFACTURED BY UNDERGROUND DEVICES INC., CARLON, OR APPROVED EQUAL TO MAINTAIN PROPER SEPARATION OF CONDUITS.
- PROVIDE REBAR WHERE APPLICABLE TO ACCOMMODATE INTERFACE OF CONCRETE ENCASED DUCT BANKS TERMINATING IN HANDHOLE OR MANHOLE. PROVIDE REBAR REINFORCEMENT WHERE DUCT BANK IS LOCATED BELOW PAVEMENT. REBAR SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 706, GRADE 60, OR ASTM A615, GRADE 60.



REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

IL Proj. No.: C15-4578

SBG No:  
3-17-SBGP-133/139

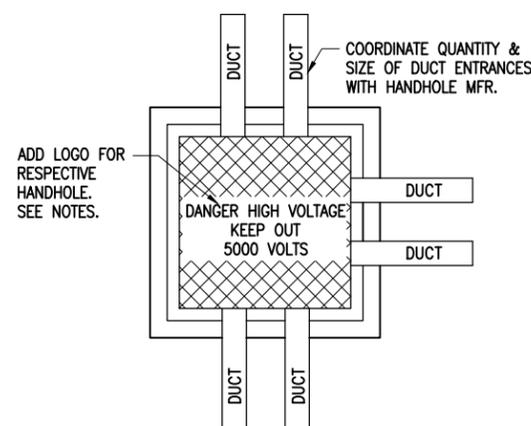
Contract No. PN010

NO.	DATE	DESCRIPTION		
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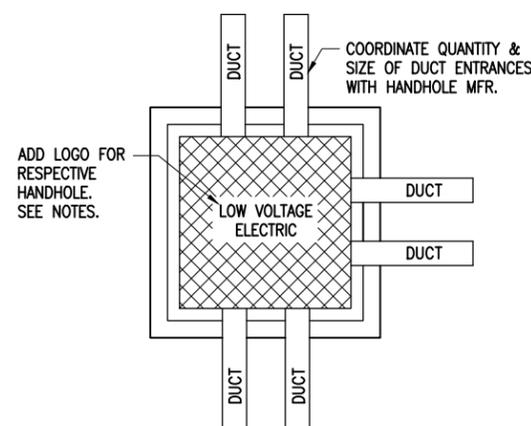
ISSUE: 09/22/2017  
PROJECT NO: 17A0002  
CAD FILE: E-510-DETL.DWG  
DESIGN BY: KNL 07/12/2017  
DRAWN BY: CWS 07/21/2017  
REVIEWED BY: BSS 08/21/2017

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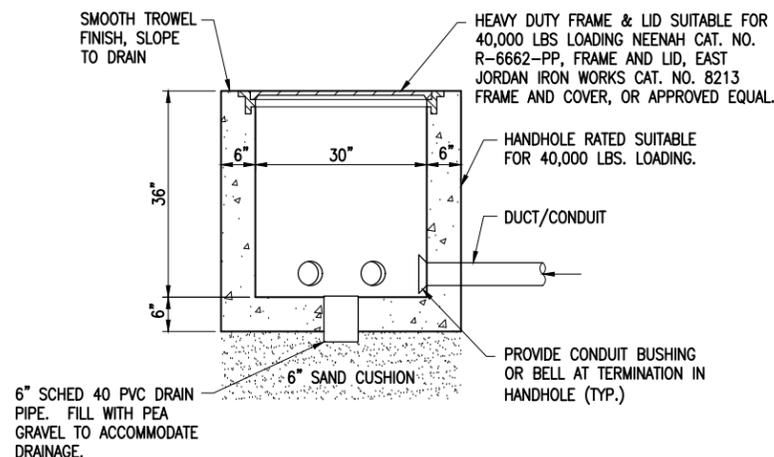
ELECTRICAL  
HANDHOLE DETAILS



**HIGH VOLTAGE HANDHOLE PLAN**  
"NOT TO SCALE"



**LOW VOLTAGE HANDHOLE PLAN**  
"NOT TO SCALE"



**ELEVATION**  
"NOT TO SCALE"

**NOTES:**

- HANDHOLE FRAME AND LID SHALL BE HEAVY DUTY SUITABLE OR 40,000 POUND LOADING. LIDS FOR LOW VOLTAGE HANDHOLES SHALL BE LABELED "LOW VOLTAGE ELECTRIC" TO COMPLY WITH NEC ARTICLE 314.30 (D) "COVERS". LIDS FOR HIGH VOLTAGE HANDHOLES CONTAINING AIRFIELD LIGHTING SERIES CIRCUIT WIRING SHALL BE LABELED "DANGER HIGH VOLTAGE KEEP OUT 5000 VOLTS" TO COMPLY WITH NEC ARTICLE 300.45 "WARNING SIGNS" AND NEC ARTICLE 314.30(D) "COVERS". COORDINATE LETTERING WITH MFR.
- HANDHOLES SHALL BE PRECAST. PRECAST MANUFACTURERS MUST BE ON THE IDOT (ILLINOIS DEPT. OF TRANSPORTATION) APPROVED LIST OF CERTIFIED PRECAST CONCRETE PRODUCERS.
- FRAMES AND LIDS (CASTINGS) SHALL BE MADE IN THE USA TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCES REQUIREMENTS.
- MINIMUM CONCRETE STRENGTH SHALL BE 4,500 PSI (MINIMUM) AFTER 28 DAYS.
- COORDINATE INSTALLATION OF HANDHOLES WITH RESPECTIVE FINISHED GRADE ELEVATIONS.
- ALL CORING, INTERFACE, AND LABOR ASSOCIATED WITH CONDUIT, DUCT, CABLE IN UNIT DUCT, AND/OR CABLE ENTRIES WILL BE CONSIDERED INCIDENTAL TO THE INSTALLATION OF THE HANDHOLE AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- HANDHOLES WILL BE PAID FOR UNDER ITEM AR115610 ELECTRICAL HANDHOLE PER EACH.

**ELECTRICAL HANDHOLE**  
"NOT TO SCALE"



REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

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 3-17-SBGP-133/139

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NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: E-511-DETL.DWG  
 DESIGN BY: KNL 07/12/2017  
 DRAWN BY: CWS 07/21/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

4'X4'X4' ELECTRICAL MANHOLE DETAILS

**PRECAST 4'x4'x4' ELECTRICAL MANHOLE NOTES**

1. 4'x4'x4' ELECTRICAL MANHOLE SHALL BE CONSTRUCTED TO MEET THE FOLLOWING:

**DESIGN CRITERIA:**

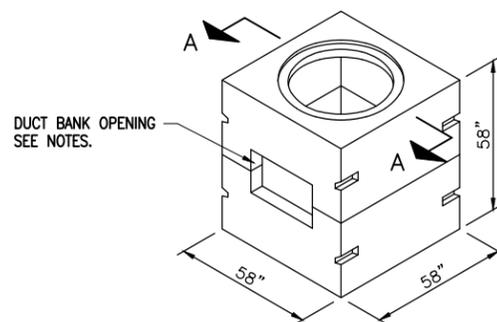
- 1) DESIGN SPECIFICATION: ACI 318, AASHTO LOAD FACTOR DESIGN METHOD, AND ASTM C858
- 2) DESIGN LOADING: AASHTO HS20 (32,000 LB/AXLE)
- 3) LIVE LOAD SURCHARGE: .5% OF THE WHEEL LOADING APPLIED TO 8'-0" OF DEPTH.
- 4) CONCRETE COMPRESSIVE STRENGTH:  $F'_c = 4500$  PSI
- 5) REINFORCING STEEL: ASTM A706,  $F_y = 60000$  PSI

**DESIGN ASSUMPTIONS:**

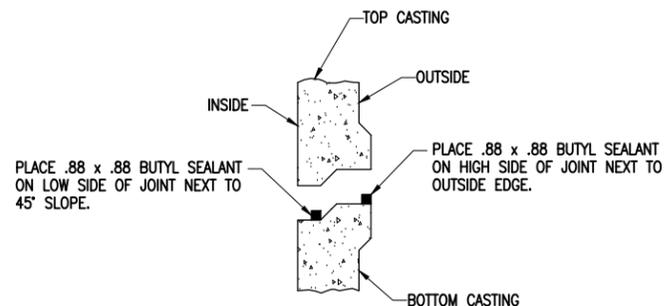
- 1) GROUND WATER LEVEL: 3'-6" BELOW GRADE.
- 2) EARTH COVER: 2'-0" MINIMUM TO 5'-0" MAXIMUM
- 3) LIVE LOAD IMPACT:
  - 2'-0" 1 = 20%
  - 2'-1" TO 2'-11" 1 = 10%
  - 3'-0" TO 5'-0" 1 = 0%
- 4) COEFFICIENT OF ACTIVE EARTH PRESSURE:  $K_a = 0.3$
- 5) SPECIFIC WEIGHT OF STD. AGGREGATE CONCRETE: 150 PCF
- 6) SPECIFIC WEIGHT OF DRY EARTH: 100 PCF
- 7) SPECIFIC WEIGHT OF SATURATED EARTH: 120 PCF
- 8) EQUIVALENT FLUID PRESSURE OF DRY EARTH: 30 PSF
- 9) EQUIVALENT FLUID PRESSURE OF SATURATED EARTH: 80 PSF

THE SUPPLIER SHALL PROVIDE CERTIFICATION THAT THE PRECAST MANHOLES MEET OR EXCEED THESE REQUIREMENTS PRIOR TO INSTALLATION.

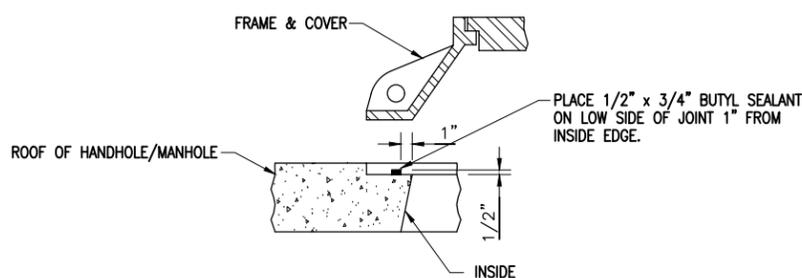
2. MANHOLE FRAME & LID SHALL BE CAPABLE OF WITHSTANDING MINIMUM 50,000 POUND LOADS. MANHOLE FRAME & LID SHALL BE NEENAH CATALOG NO. R-1640-C MANHOLE FRAME A SOLID LID, EAST JORDAN IRON WORKS CATALOG NO. 1825 FRAME AND COVER, OR APPROVED EQUAL. LID FOR LOW VOLTAGE MANHOLES SHALL BE LABELED "LOW VOLTAGE ELECTRIC" OR "OV-600V". LIDS FOR HIGH VOLTAGE MANHOLES CONTAINING AIRFIELD LIGHTING SERIES CIRCUIT WIRING SHALL BE LABELED "DANGER HIGH VOLTAGE KEEP OUT 5000 VOLTS" TO COMPLY WITH 2014 NEC ARTICLE 300.45 "WARNING SIGNS" AND 2014 NEC ARTICLE 314.30(D) "COVERS". COORDINATE LETTERING WITH MFR.
3. COORDINATE DUCT BANK INTERFACE & OPENINGS WITH THE MANHOLE MFR. CONTRACTOR SHALL SLOPE DUCT BANK TO PRECAST MANHOLE OPENINGS. ALL OPENINGS SHALL BE SEALED WATERTIGHT AFTER DUCT BANK INSTALLATION.
4. 4'x4'x4' MANHOLE SHALL BE MANUFACTURED BY A CONCRETE ELECTRICAL MANHOLE PRODUCER ON THE ILLINOIS DEPARTMENT OF TRANSPORTATION APPROVED LIST OF CERTIFIED PRECAST CONCRETE PRODUCERS..
5. 4'x4'x4' MANHOLE SHALL BE PAID FOR UNDER ITEM AR115710 ELECTRICAL MANHOLE PER EACH.
6. CABLE RACKS SHALL BE HEAVY DUTY CORROSION RESISTANT NYLON MATERIAL WITH CORROSION RESISTANT STAINLESS STEEL MOUNTING HARDWARE; UNDERGROUND DEVICES, INC. CAT. NO. 3SR1N, 3SR2N OR 3SR3N OR EQUAL. PROVIDE AT LEAST TWO TRIPLE HOOK CABLE RACKS ON EACH MANHOLE WALL, SPACED TO SUPPORT RESPECTIVE CABLES.
7. COORDINATE INSTALLATION OF MANHOLES WITH RESPECTIVE FINISHED GRADE ELEVATIONS.
8. INCLUDE FLOOR SUMP OR DRAINAGE PIPE.
9. ALL CORING, INTERFACE, AND LABOR ASSOCIATED WITH CONDUIT, DUCT, CABLE IN UNIT DUCT, AND/OR CABLE ENTRIES WILL BE CONSIDERED INCIDENTAL TO THE INSTALLATION OF THE MANHOLE AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
10. INCLUDE 2" MIN. SCHED. 40 PVC CONDUIT SLEEVE IN BOTTOM OF MANHOLE TO ACCOMMODATE GROUND ROD INSTALLATION.



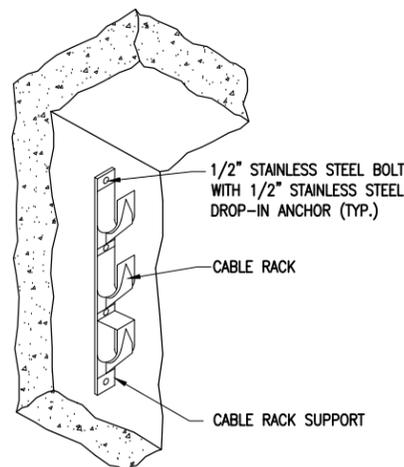
PRECAST 4'x4'x4' MANHOLE  
 N.T.S.



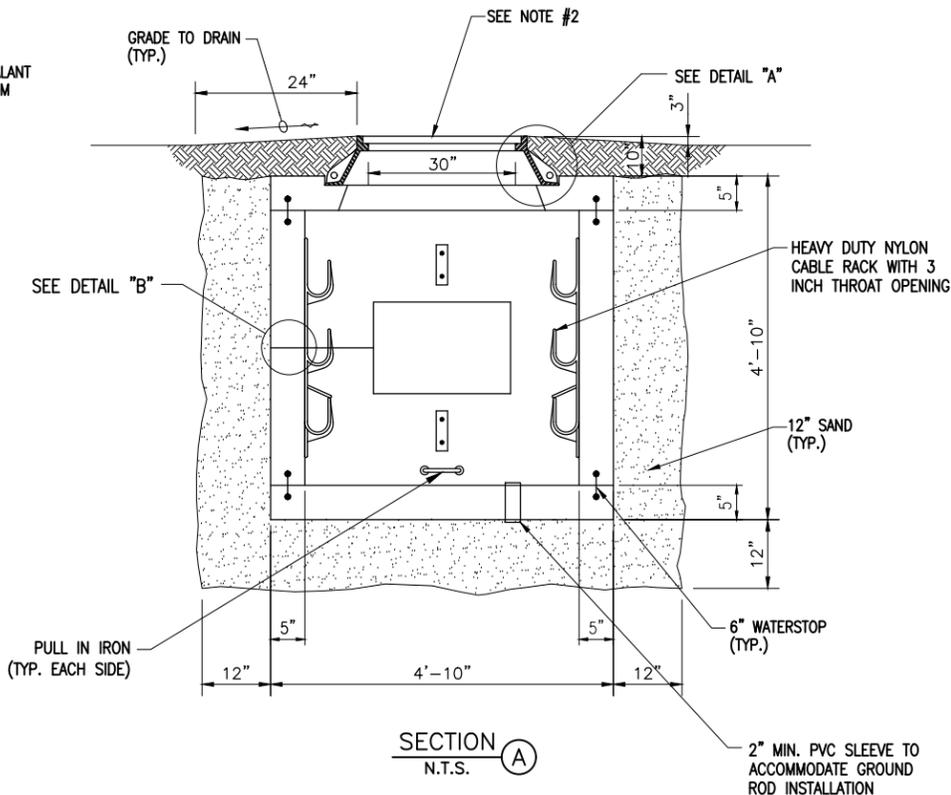
DETAIL B  
 N.T.S.



DETAIL A  
 N.T.S.



CABLE RACK  
 N.T.S.



SECTION A  
 N.T.S.

PRECAST 4' x 4' x 4' MANHOLE DETAILS  
 N.T.S. (NOT TO SCALE)



REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

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Contract No. PN010


NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: C-501-DETNEW.DWG  
 DESIGN BY: MLH 08/19/17  
 DRAWN BY: MLH 08/20/17  
 REVIEWED BY: BSS 08/21/2017

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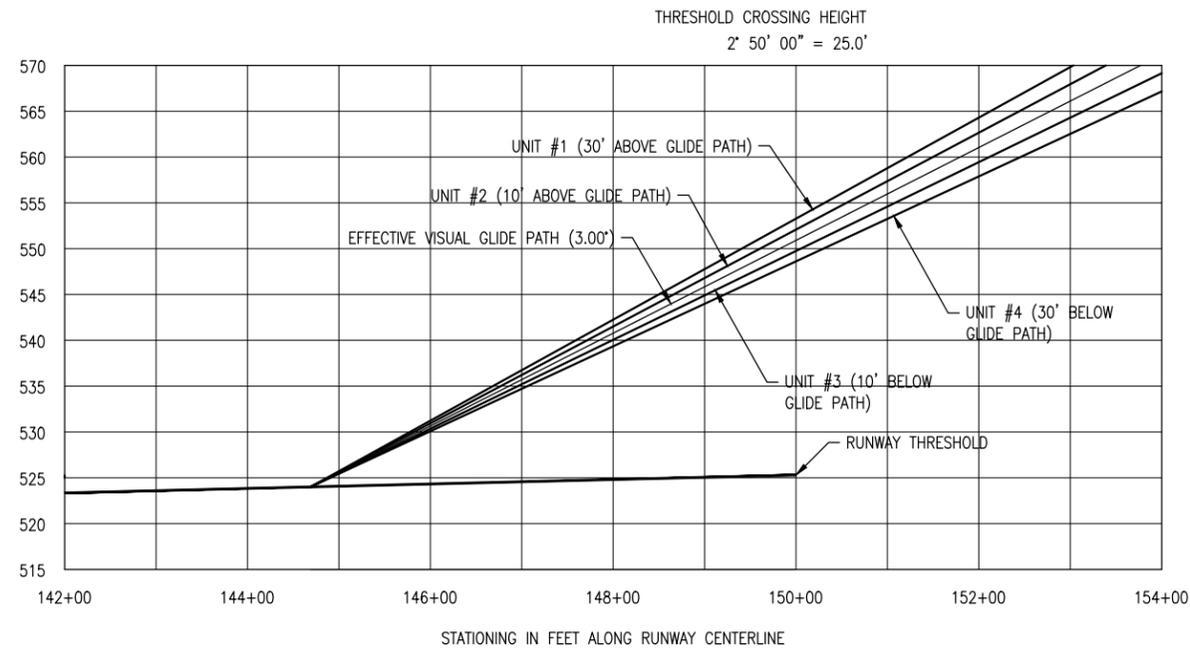
RUNWAY 27 PAPI DETAILS

**P.A.P.I. NOTES**

1. THE PROPOSED PRECISION APPROACH PATH INDICATOR (PAPI) SYSTEM WILL BE PLACED AT THE LOCATION SHOWN ON PROPOSED ELECTRICAL PLAN SHEETS.
2. THE PROPOSED CONCRETE FOUNDATION PIERS SHALL BE AS DETAILED ON THE "STYLE B PAPI FOUNDATION DETAILS" SHEET.
3. EACH PAPI UNIT SHALL BE CONSTRUCTED SUCH THAT THE BEAM CENTERS WILL BE WITHIN ±1" OF ELEVATION 524.00'
4. THE INBOARD LIGHT UNIT MUST NOT BE LESS THAN 50 FT. FROM THE RUNWAY EDGE (MEASURED TO THE EDGE OF THE LIGHT UNIT) OR TO OTHER RUNWAYS OR TAXIWAYS, AND THE PAPI LIGHT UNITS MUST HAVE A LATERAL SEPARATION OF 20 FT (MEASURED CENTER TO CENTER), IN ACCORDANCE WITH AC 150/5340-30H PART 7.5 DESIGN, d. PAPI, (7)(a) AND (7)(b).
5. THE PROPOSED PAPI SIGNAL SHALL BE VISIBLE FOR A 10 DEGREE ZONE ON EITHER SIDE OF THE RUNWAY CENTERLINE IN ACCORDANCE WITH FAA ADVISORY CIRCULAR 150/5340-30H, FIGURE 80. BAFFLES WILL BE REQUIRED TO SET THE LIMITS OF THE OBSTACLE CLEARANCE SURFACE TO 10 DEGREES EITHER SIDE OF THE RUNWAY CENTERLINE (20 DEGREES TOTAL) TO RESTRICT EXCESS HORIZONTAL LIGHT BEAM DISTRIBUTION, IN ACCORDANCE WITH FAA AC 150/5340-30H PART 7.7 INSTALLATION, f. PAPI, (7)(c).
6. TO ACCOMMODATE TREES THAT WERE IDENTIFIED 10.5' FROM THE OUTERMOST LHA, ADDITIONAL BAFFLES SHALL BE INSTALLED TO LIMIT THE VISIBLE LIGHT SIGNAL TO 6.5 DEGREES ON THE LEFT SIDE OF THE APPROACH (PILOT'S VIEWPOINT). THIS SHALL BE MEASURED FROM THE OUTERMOST LIGHT UNIT. EACH LIGHT UNIT SHALL HAVE THE SAME CUT-OFF RANGE. SEE 'LIGHT SIGNAL BAFFLE DETAIL' THIS SHEET. COORDINATE BAFFLE INSTALLATION WITH ENGINEER AND MANUFACTURER PRIOR TO ORDERING PAPI UNITS TO CONFIRM CORRECT BAFFLES FOR SELECTED MANUFACTURER.
7. THE 4-BOX PAPI INSTALLATION WILL BE PAID FOR UNDER ITEM: AR125615 PAPI (L-880 SYSTEM) PER EACH.

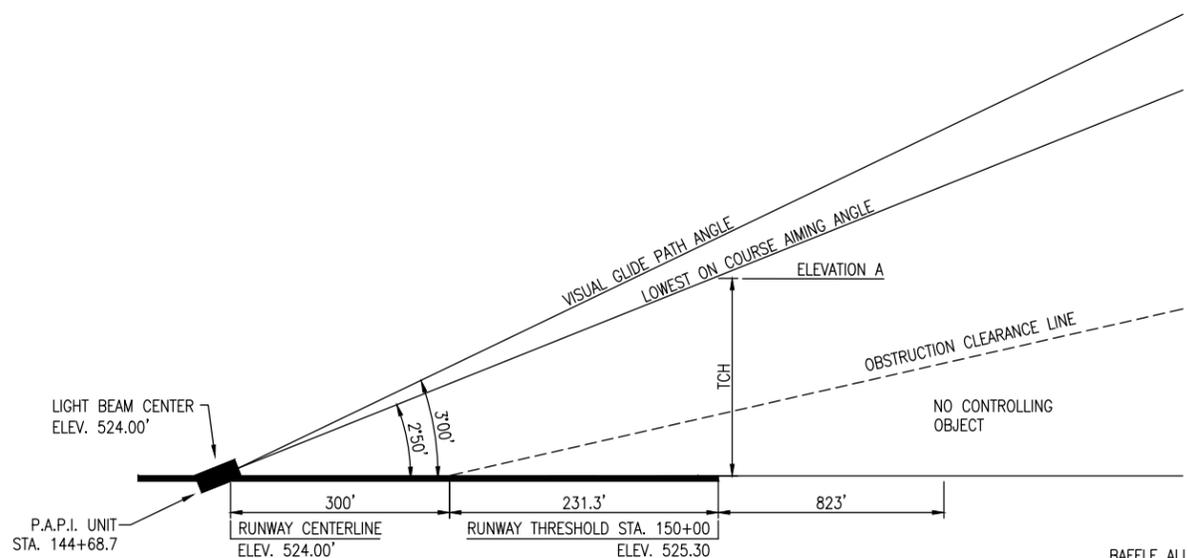
**NOTES**

LOWEST ON-COURSE ANGLE - 2° 50' ELEVATION A = 550.3' TCH = 25.0'

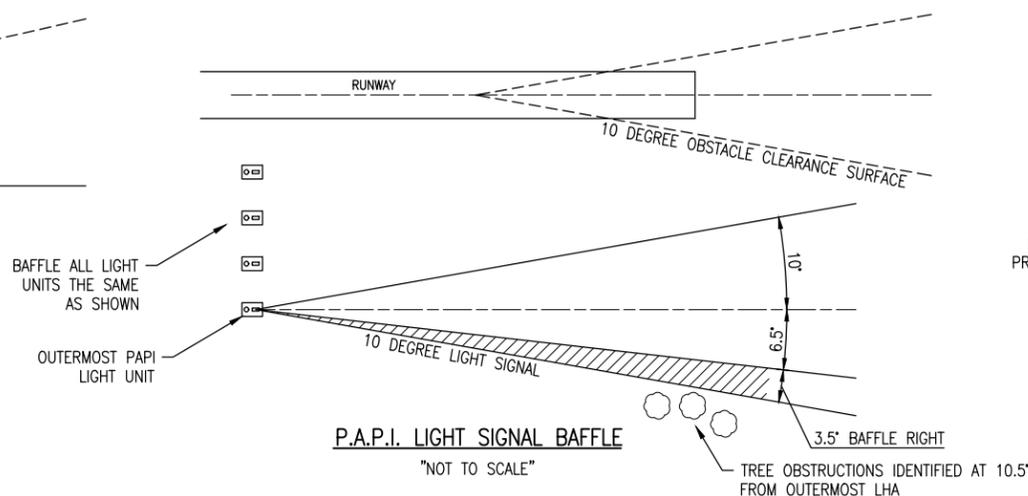


RUNWAY CENTERLINE PROFILE

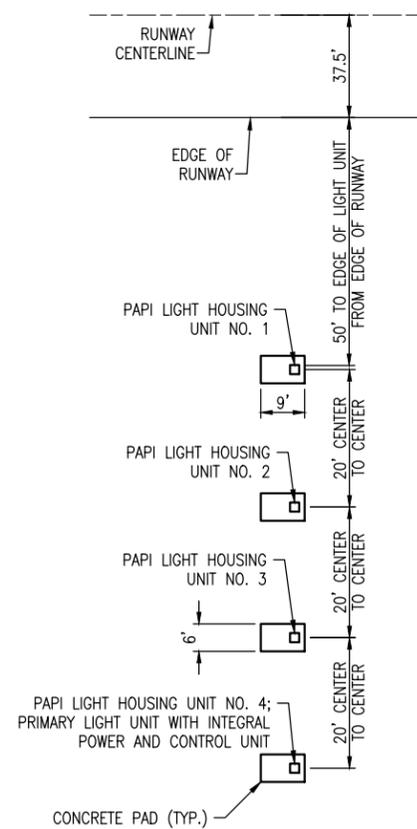
PAPI DATA-RUNWAY END 27				
	P.A.P.I. UNIT #1	P.A.P.I. UNIT #2	P.A.P.I. UNIT #3	P.A.P.I. UNIT #4
AIMING ANGLE	3°30'	3°10'	2°50'	2°30'
APPROXIMATE GROUND ELEVATION	521.6'	521.2'	520.8'	520.6'
P.A.P.I. UNIT APERTURE ELEVATION	524.00'	524.00'	524.00'	524.00'



P.A.P.I. AIMING DIAGRAM 27 END  
 "NOT TO SCALE"



P.A.P.I. LIGHT SIGNAL BAFFLE  
 "NOT TO SCALE"



P.A.P.I. LAYOUT DETAIL  
 "NOT TO SCALE"



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ISSUE: 09/22/2017

PROJECT NO: 17A0002

CAD FILE: C-502-DETNEW.DWG

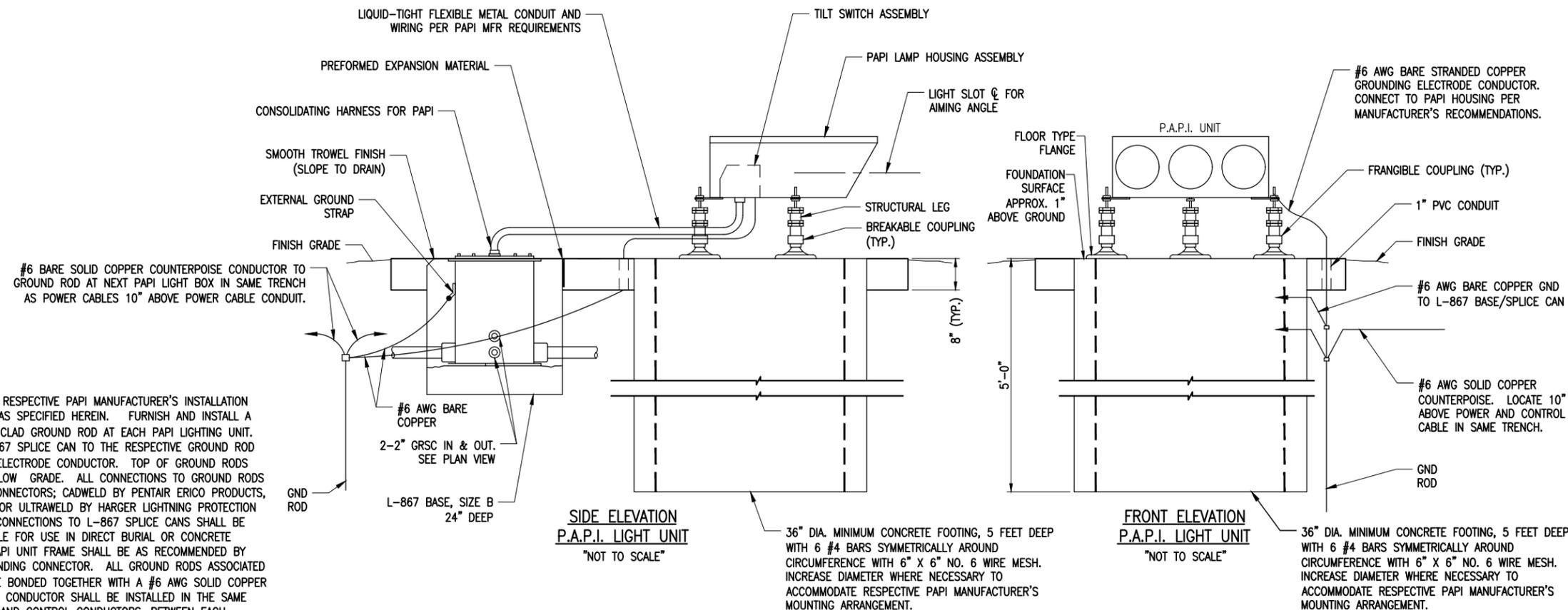
DESIGN BY: KNL 07/12/2017

DRAWN BY: CWS 07/21/2017

REVIEWED BY: BSS 08/21/2017

SHEET TITLE

STYLE B PAPI FOUNDATION DETAILS

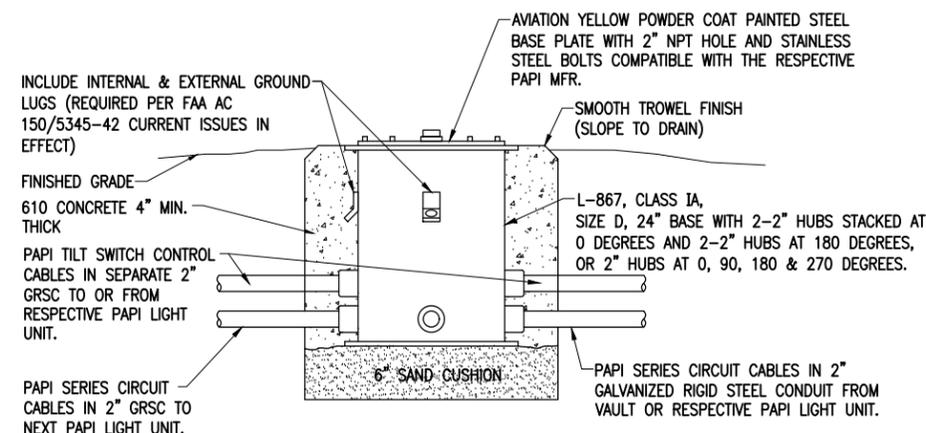


**SIDE ELEVATION  
 P.A.P.I. LIGHT UNIT**  
 "NOT TO SCALE"

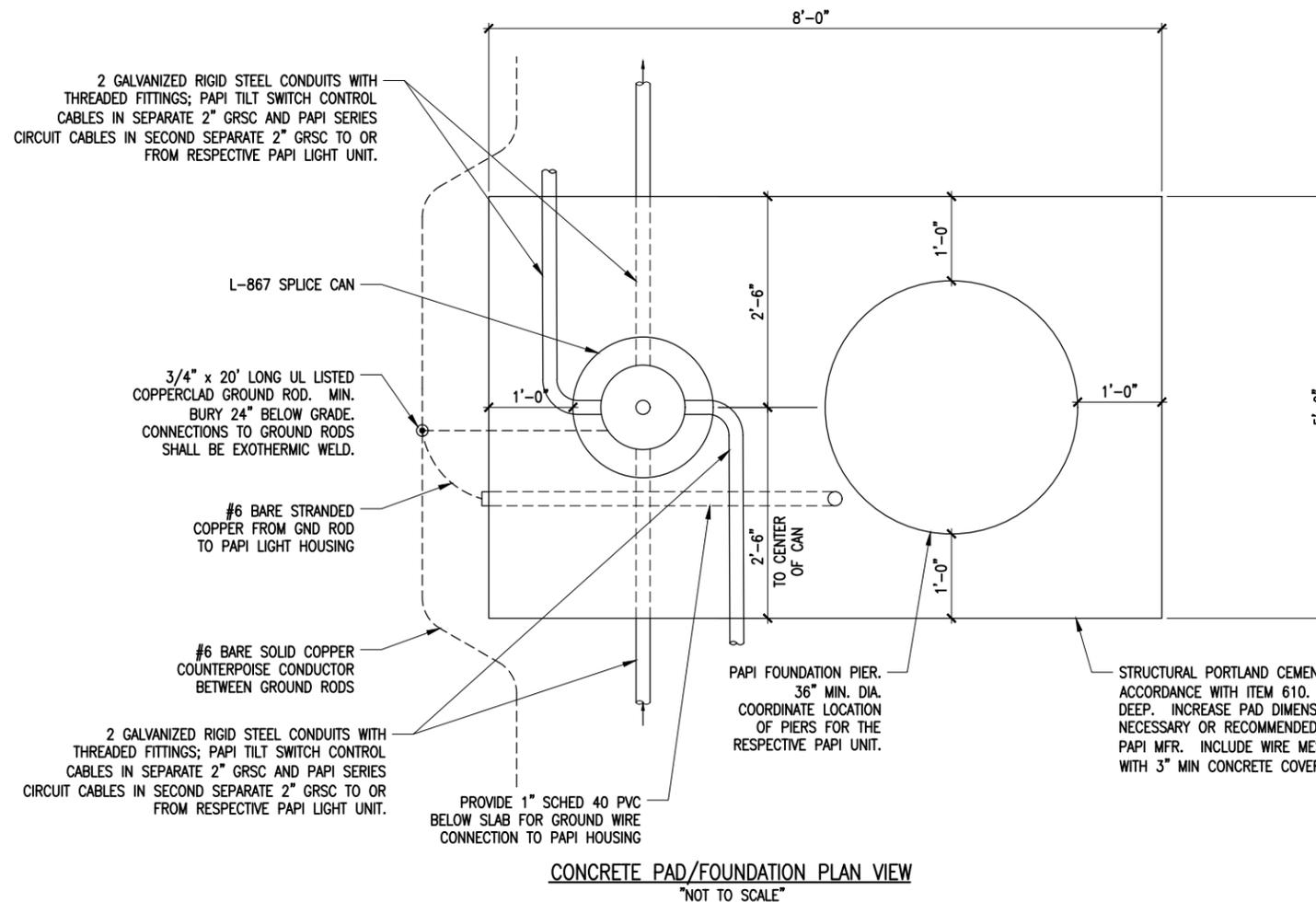
**FRONT ELEVATION  
 P.A.P.I. LIGHT UNIT**  
 "NOT TO SCALE"

**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. FURNISH AND INSTALL A 3/4-INCH DIAMETER BY 20-FOOT LONG COPPER CLAD GROUND ROD AT EACH PAPI LIGHTING UNIT. BOND EACH PAPI UNIT 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 PENTAIR ERICO PRODUCTS, THERMOWELD BY CONTINENTAL INDUSTRIES, INC., OR ULTRAWELD BY HARGER LIGHTNING PROTECTION GROUNDING EQUIPMENT, OR APPROVED EQUAL. CONNECTIONS TO L-867 SPLICE CANS SHALL BE WITH UL LISTED GROUNDING CONNECTORS SUITABLE FOR USE IN DIRECT BURIAL OR CONCRETE ENCASUREMENT 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 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.
- FOR EACH PAPI UNIT THE CONTRACTOR SHALL TEST THE MADE ELECTRODE GROUND SYSTEM WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUND SYSTEMS. TEST RESULTS SHALL BE RECORDED FOR EACH PAPI UNIT INSTALLATION. IF GROUND RESISTANCE EXCEEDS 25 OHMS, CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION. COPIES OF THE GROUND SYSTEM TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN, AND THE PROJECT ENGINEER.



**PAPI L-867 TRANSFORMER CAN DETAIL**  
 (NOT TO SCALE)



**CONCRETE PAD/FOUNDATION PLAN VIEW**  
 "NOT TO SCALE"

- NOTE:**
- FOR THE PURPOSE OF ENHANCING SAFETY, EACH BASE MUST HAVE INSTALLED, BY THE MANUFACTURER, AND INTERNAL AND EXTERNAL GROUND STRAP THAT IS AVAILABLE FOR THE PURPOSE OF ATTACHING A GROUND LUG THAT IS CONNECTED TO AN EARTH GROUND OR A SAFETY GROUND CONDUCTOR INSTALLED WITH THE RESPECTIVE CIRCUIT. FOR AIRPORT PROJECTS RECEIVING FEDERAL FUNDS THIS REQUIREMENT IS MANDATORY PER FAA AC 150/5345-42 (CURRENT ISSUE IN EFFECT).
  - PAPI TILT SWITCH CONTROL CONDUCTORS SHALL HAVE 3,000 VOLT (MINIMUM) RATED INSULATION AND SHALL BE SIZED IN ACCORDANCE WITH THE RESPECTIVE PAPI MANUFACTURER'S RECOMMENDATION, 3,000 VOLT MIL-W-16878 MILITARY HOOK-UP WIRE PVC OR XLPE WILL BE SUITABLE FOR TILT SWITCH CONTROL WIRING.

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**GENERAL NOTES**

1. ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 - NATIONAL ELECTRICAL CODE (NEC) MOST CURRENT ISSUE IN FORCE, THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES, AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L. LISTING, INTERTEK TESTING SERVICES VERIFICATION/ETL LISTING (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE PERMITTED.
2. CONTRACTOR SHALL KEEP A COPY OF THE LATEST NEC IN FORCE ON SITE AT ALL TIMES DURING CONSTRUCTION FOR USE AS A REFERENCE.
3. CONTRACTOR SHALL COORDINATE WORK AND ANY POWER OUTAGES AND/OR SHUT DOWN OF SYSTEMS WITH THE RESPECTIVE FACILITY OWNER PERSONNEL AND THE AIRPORT MANAGER/DIRECTOR. 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 & 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).
4. THE CONTRACTOR SHALL ASCERTAIN THAT ALL LIGHTING SYSTEM COMPONENTS FURNISHED BY HIM, INCLUDING FAA APPROVED EQUIPMENT, ARE COMPATIBLE IN ALL RESPECTS WITH EACH OTHER AND THE REMAINDER OF THE NEW/EXISTING SYSTEM. ANY NONCOMPATIBLE COMPONENTS FURNISHED BY THIS CONTRACTOR SHALL BE REPLACED BY HIM AT NO ADDITIONAL COST TO THE AIRPORT SPONSOR WITH A SIMILAR UNIT, APPROVED BY THE ENGINEER (DIFFERENT MODEL OR DIFFERENT MANUFACTURER) THAT IS COMPATIBLE WITH THE REMAINDER OF THE AIRPORT LIGHTING SYSTEM.
5. IN CASE THE CONTRACTOR ELECTS TO FURNISH AND INSTALL AIRPORT LIGHTING EQUIPMENT REQUIRING ADDITIONAL WIRING, TRANSFORMERS, ADAPTORS, MOUNTINGS, ETC., TO THOSE SHOWN ON THE DRAWINGS AND/OR LISTED IN THE SPECIFICATION, ANY COST FOR THESE ITEMS SHALL BE INCIDENTAL TO THE EQUIPMENT COST.
6. THE CONTRACTOR INSTALLED EQUIPMENT (INCLUDING FAA APPROVED) SHALL NOT GENERATE ANY ELECTROMAGNETIC INTERFERENCE IN THE EXISTING AND/OR NEW COMMUNICATIONS, WEATHER, AIR NAVIGATION, AND AIR TRAFFIC CONTROL EQUIPMENT. ANY EQUIPMENT GENERATING SUCH INTERFERENCE SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST WITH THE EQUIPMENT MEETING THE APPLICABLE SPECIFICATIONS AND NOT GENERATING ANY INTERFERENCE.
7. WHEN A SPECIFIC TYPE, STYLE, CLASS, ETC. OF FAA APPROVED EQUIPMENT IS SPECIFIED ONLY THAT TYPE, STYLE, CLASS, WILL BE ACCEPTABLE, EVEN THOUGH EQUIPMENT OF OTHER TYPES STYLES, CLASSES, ETC. MAY BE APPROVED.
8. ANY AND ALL INSTRUCTIONS FROM THE RESIDENT ENGINEER/RESIDENT TECHNICIAN TO THE CONTRACTOR REGARDING CHANGES IN OR DEVIATIONS FROM THE PLANS AND SPECIFICATIONS SHALL BE IN WRITING WITH COPIES SENT TO THE AIRPORT SPONSOR AND THE ILLINOIS DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS. THE CONTRACTOR SHALL NOT ACCEPT ANY VERBAL INSTRUCTIONS FROM THE RESIDENT ENGINEER/RESIDENT TECHNICIAN REGARDING ANY CHANGES FROM THE PLANS AND SPECIFICATIONS.
9. A MINIMUM OF THREE COPIES OF THE INSTRUCTION BOOK SHALL BE SUPPLIED WITH EACH DIFFERENT TYPE OF EQUIPMENT. THE BOOKS DESCRIBING A MORE SOPHISTICATED TYPE OF EQUIPMENT, SUCH AS REGULATORS, PAPI, REIL, ETC. AS A MINIMUM SHALL CONTAIN THE FOLLOWING:
  - A. A DETAILED DESCRIPTION OF THE OVERALL EQUIPMENT AND ITS INDIVIDUAL COMPONENTS.
  - B. THEORY OF OPERATION INCLUDING THE FUNCTION OF EACH COMPONENT.
  - C. INSTALLATION INSTRUCTION.
  - D. START-UP INSTRUCTIONS.
  - E. PREVENTATIVE MAINTENANCE REQUIREMENTS.
  - F. CHART FOR TROUBLE-SHOOTING.
  - G. COMPLETE POWER AND CONTROL DETAILED WIRING DIAGRAM(S), SHOWING EACH CONDUCTOR/CONNECTION/COMPONENT - "BLACK" BOXES ARE NOT ACCEPTABLE. THE DIAGRAM OF THE NARRATIVE SHALL SHOW VOLTAGE/CURRENTS/WAVE SHAPES AT STRATEGIC LOCATIONS TO BE USED WHEN CHECKING AND/OR TROUBLE-SHOOTING THE EQUIPMENT. WHEN THE EQUIPMENT HAS SEVERAL MODES OF OPERATION, SUCH AS SEVERAL BRIGHTNESS STEPS, THESE PARAMETERS SHALL BE INDICATED FOR ALL DIFFERENT MODES.
  - H. PARTS LIST WHICH WILL INCLUDE ALL MAJOR AND MINOR COMPONENTS SUCH AS RESISTORS, DIODES, ETC. IT SHALL INCLUDE A COMPLETE NOMENCLATURE OF EACH COMPONENT AND, IF APPLICABLE, THE NAME OF ITS MANUFACTURER AND THE CATALOG NUMBER.
  - I. SAFETY INSTRUCTIONS.

**POWER AND CONTROL NOTES**

1. PROVIDE LEGEND PLATES FOR ALL ELECTRICAL EQUIPMENT TO IDENTIFY FUNCTION, CIRCUIT VOLTAGE AND PHASE. WHERE THE EQUIPMENT CONTAINS FUSES, ALSO IDENTIFY THE FUSE OR FUSE LINK AMPERE RATING. WHERE THE EQUIPMENT DOES NOT HAVE SUFFICIENT AREA TO INSTALL LEGEND PLATES, THE LEGEND PLATES SHALL BE INSTALLED ON THE WALL NEXT TO THE UNIT. LEGEND PLATES SHALL BE WEATHERPROOF ENGRAVED PLASTIC OR PHENOLIC MATERIAL, 1/4" HIGH BLACK LETTERS ON A WHITE BACKGROUND UNLESS NOTED OTHERWISE. SECURE WITH WEATHERPROOF ADHESIVE AND MACHINE SCREWS. FURNISH ADDITIONAL LEGEND PLATES WHERE REQUIRED BY CODE, FOR ADDITIONAL EQUIPMENT, AS DETAILED HEREIN ON THE PLANS, AND AS NOTED IN THE SPECIAL PROVISION SPECIFICATIONS.
2. COLOR CODE ALL PHASE WIRING BY THE USE OF COLORED WIRE INSULATION AND/OR COLORED TAPE. WHERE TAPE IS USED, THE WIRE INSULATION SHALL BE BLACK. BLACK AND RED SHALL BE USED FOR PHASE CONDUCTORS ON 120/240VAC SINGLE-PHASE, THREE WIRE SYSTEMS AND BLACK, ORANGE (FOR HIGH LEG) AND BLUE SHALL BE USED FOR PHASE CONDUCTORS ON 240/120VAC THREE-PHASE, FOUR WIRE SYSTEMS. NEUTRAL CONDUCTORS, SIZE NO. 6 AWG OR SMALLER, SHALL BE IDENTIFIED BY A CONTINUOUS WHITE OR NATURAL GRAY OUTER FINISH ALONG ITS ENTIRE LENGTH. NEUTRAL CONDUCTORS LARGER THAN NO. 6 AWG SHALL BE IDENTIFIED EITHER BY A CONTINUOUS WHITE OR NATURAL GRAY OUTER FINISH ALONG ITS ENTIRE LENGTH OR BY THE USE OF WHITE TAPE AT ITS TERMINATIONS AND INSIDE ACCESSIBLE WIREWAYS. INSULATED GROUND CONDUCTORS SHALL HAVE GREEN COLORED INSULATION FOR ALL CONDUCTOR SIZES (AWG OR KCMIL).
3. ALL BRANCH CIRCUIT CONDUCTORS CONNECTED TO A PARTICULAR PHASE SHALL BE IDENTIFIED WITH THE SAME COLOR. THE COLOR CODING SHALL BE EXTENDED TO THE POINT OF UTILIZATION.
4. IN CONTROL WIRING THE SAME COLOR SHALL BE USED THROUGHOUT THE SYSTEM FOR THE SAME FUNCTION, SUCH AS 10%, 30%, 100% BRIGHTNESS CONTROL, ETC.
5. LOW VOLTAGE (600 V.) AND HIGH VOLTAGE (5000 V.) CONDUCTORS SHALL BE INSTALLED IN SEPARATE WIREWAYS.
6. NEATLY LACE WIRING IN DISTRIBUTION PANELS, WIREWAYS, SWITCHES AND JUNCTION/PULL BOXES.
7. THE MINIMUM SIZE OF PULL/JUNCTION BOXES, REGARDLESS OF THE QUANTITY AND SIZE OF THE CONDUCTORS SHOWN, SHALL BE AS FOLLOWS:
  - A. IN STRAIGHT PULLS THE LENGTH OF THE BOX SHALL NOT BE LESS THAN EIGHT TIMES THE TRADE DIAMETER OF THE LARGER CONDUIT. THE TOTAL AREA (INCLUDING THE CONDUIT CROSS-SECTIONAL AREA) OF A BOX END SHALL BE AT LEAST 3 TIMES GREATER THAN THE TOTAL TRADE CROSS-SECTIONAL AREA OF THE CONDUITS TERMINATING AT THE END.
  - B. IN ANGLE PULLS OR 'U' PULLS THE DISTANCE BETWEEN EACH CONDUIT ENTRY INSIDE THE BOX AND THE OPPOSITE WALL OF THE BOX SHALL NOT BE LESS THAN SIX (6) TIMES THE TRADE DIAMETER OF THE LARGEST CONDUIT. THIS DISTANCE SHALL BE INCREASED FOR ADDITIONAL ENTRIES BY THE AMOUNT OF THE SUM OF THE DIAMETERS OF ALL OTHER CONDUIT ENTRIES ON THE SAME WALL AS THE BOX. THE DISTANCE BETWEEN CONDUIT ENTRIES ENCLOSING THE SAME CONDUCTOR SHALL NOT BE LESS THAN SIX TIMES THE TRADE DIAMETER OF THE LARGEST CONDUIT.
8. A RUN OF CONDUIT BETWEEN TERMINATIONS AT EQUIPMENT ENCLOSURES, SQUARE DUCTS AND PULL/JUNCTION BOXES, SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF FOUR QUARTER BENDS (360 DEGREES TOTAL), INCLUDING THOSE BENDS LOCATED IMMEDIATELY AT THE TERMINATIONS, CAST, CONDUIT TYPE OUTLETS SHALL NOT BE TREATED AS PULL/JUNCTION BOXES.
9. EQUIPMENT CABINETS SHALL NOT BE USED AS PULL/JUNCTION BOXES. ONLY WIRING TERMINATING AT THE EQUIPMENT SHALL BE BROUGHT INTO THESE ENCLOSURES.
10. SPLICES AND JUNCTION POINTS SHALL BE PERMITTED ONLY IN JUNCTION BOXES, DUCTS EQUIPPED WITH REMOVABLE COVERS, AND AT EASILY ACCESSIBLE LOCATIONS.
11. CIRCUIT BREAKERS IN POWER DISTRIBUTION PANEL(S) SHALL BE THERMAL-MAGNETIC MOLDED CASE, PERMANENT TRIP WITH 100 AMPERE, MINIMUM FRAME.
12. DUAL LUGS SHALL BE USED WHERE TWO (2) WIRES, SIZE NO. 6 OR LARGER, ARE TO BE CONNECTED TO THE SAME TERMINAL.
13. ALL INTERIOR WALL MOUNTED EQUIPMENT ENCLOSURES SHALL BE MOUNTED ON HOT DIPPED GALVANIZED STEEL STRUT SUPPORT, OR STAINLESS STEEL STRUT SUPPORT, WITH CORROSION RESISTANT HARDWARE.
14. SUPPORT FOR EXTERIOR MOUNTED EQUIPMENT SHALL USE HOT DIPPED GALVANIZED STEEL STRUT SUPPORT OR STAINLESS STEEL STRUT SUPPORT WITH STAINLESS STEEL HARDWARE. PROVIDE ZINC RICH PAINT APPLIED TO FIELD CUTS OF GALVANIZED STEEL SUPPORT TO MINIMIZE THE POTENTIAL FOR CORROSION PER THE RESPECTIVE STRUT SUPPORT MANUFACTURER'S RECOMMENDATIONS.
15. CONDUITS FOR ELECTRIC SERVICE ENTRANCE AND FEEDERS SHALL BE AS DETAILED HEREIN ON THE PLANS. WHERE GALVANIZED RIGID STEEL CONDUIT IS SPECIFIED IT SHALL HAVE THREADED FITTINGS. SET SCREW TYPE FITTINGS WILL NOT BE ACCEPTABLE. CONDUITS FOR UNDERGROUND APPLICATIONS SHALL BE AS DETAILED HEREIN. CONDUITS FOR GROUNDING ELECTRODE CONDUCTORS OR INDIVIDUAL GROUNDING CONDUCTORS SHALL BE SCHEDULE 40 OR SCHEDULE 80 PVC.
16. PROVIDE LIQUID TIGHT FLEXIBLE METAL CONDUIT AT CONNECTIONS TO EQUIPMENT SUBJECT TO VIBRATION OR WHERE FLEXIBILITY IS REQUIRED. LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE U.L. LISTED TO MEET THE REQUIREMENTS OF NEC 350.6, SUITABLE FOR GROUNDING, SUNLIGHT RESISTANT, AND RESISTANT TO OIL, GASOLINE, AND GREASE. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO MOTORS, TRANSFORMERS, & CONSTANT CURRENT REGULATORS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. DO NOT INSTALL LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS NOT UL LISTED. CONFIRM LIQUID-TIGHT FLEXIBLE METAL CONDUIT BEARS THE UL LABEL PRIOR TO INSTALLING IT.
17. UNLESS OTHERWISE SHOWN, ALL EXPOSED CONDUITS SHALL BE RUN PARALLEL TO OR AT RIGHT ANGLES WITH THE LINES OF THE STRUCTURE.
18. ALL STEEL CONDUITS, FITTINGS, NUTS, BOLTS, ETC. SHALL BE GALVANIZED.
19. USE CONDUIT BUSHINGS AT EACH CONDUIT TERMINATION. WHERE NO. 4 AWG OR LARGER UNDERGROUND WIRE IS INSTALLED, USE INSULATED BUSHINGS.
20. USE DOUBLE LOCK NUTS AT EACH CONDUIT TERMINATION.
21. WRAP ALL PRIMARY AND SECONDARY POWER CONNECTIONS WITH SUFFICIENT LAYERS OF HIGH VOLTAGE ELECTRICAL INSULATING TAPE (RUBBER SPLICING TAPE SUITABLE FOR PRIMARY ELECTRICAL INSULATION FOR SPLICING CABLE FROM 600 VOLTS TO 69,000 VOLTS) AND COVER WITH VINYL ELECTRICAL TAPE (ALL-WEATHER VINYL INSULATING TAPE SUITABLE FOR PROTECTIVE JACKETING FOR HIGH-VOLTAGE CABLE SPLICES AND REPAIRS) FOR FULL VALUE OF CABLE INSULATION VOLTAGE. PER ILLINOIS STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS ITEM 108, ITEM 125 AND FAA AC 150/5370-10G ITEM L-108, HIGH VOLTAGE ELECTRICAL INSULATING TAPE SHALL BE 3M SCOTCH 23, 3M SCOTCH 130C OR APPROVED EQUIVALENT, AND VINYL ELECTRICAL TAPE SHALL BE 3M SCOTCH 88 OR APPROVED EQUIVALENT. TAPES MUST BE RATED SUITABLE FOR THE APPLICATION.
22. UNLESS OTHERWISE NOTED, ALL SINGLE CONDUCTOR CONTROL WIRING SHALL BE NO. 12 AWG. COPPER MINIMUM.
23. THE FOLLOWING SHALL APPLY TO RELAY/CONTACTOR PANELS/ENCLOSURES:
  - A. FOR INTERIOR LOCATIONS ALL COMPONENTS SHALL BE MOUNTED IN NEMA 12 (DUST TIGHT) ENCLOSURE(S) WITH VERTICALLY HINGED COVERS. FOR EXTERIOR/OUTDOOR LOCATIONS ALL COMPONENTS SHALL BE MOUNTED IN NEMA 4X STAINLESS STEEL ENCLOSURE(S) WITH VERTICALLY HINGED COVERS. ALL CONDUIT ENTRIES INTO NEMA 4, 4X ENCLOSURES SHALL HAVE NEMA 4 HUBS LISTED SUITABLE FOR THE RESPECTIVE ENCLOSURE TO MAINTAIN THE NEMA 4, 4X RATING OF THE ENCLOSURE.
  - B. THE ENCLOSURE(S) SHALL HAVE AMPLE SPACE FOR THE CIRCUIT COMPONENTS, TERMINAL BLOCKS AND INCOMING AND INTERNAL WIRING.
  - C. ALL CONTROL CONDUCTOR TERMINATIONS SHALL BE OF THE OPEN-EYE CONNECTOR/SCREW TYPE. SOLDERED CLOSED-EYE TERMINATIONS, OR TERMINATIONS WITHOUT CONNECTORS ARE NOT ACCEPTABLE.
  - D. WHEN THE ENCLOSURE COVER IS OPENED, ALL CIRCUIT COMPONENTS, WIRING AND TERMINALS SHALL BE EXPOSED AND ACCESSIBLE WITHOUT REMOVAL OF ANY PANELS, COVERS, ETC., EXCEPT THOSE COVERING HIGH VOLTAGE COMPONENTS.
  - E. ACCESS TO, OR REMOVAL OF A CIRCUIT COMPONENT OR TERMINAL BLOCK WILL NOT REQUIRE THE REMOVAL OF ANY OTHER CIRCUIT COMPONENT OR TERMINAL BLOCK.
  - F. EACH CIRCUIT COMPONENT SHALL BE CLEARLY IDENTIFIED INDICATING ITS CORRESPONDING NUMBER SHOWN ON THE DRAWINGS AND ITS FUNCTION.
  - G. A COMPLETE WIRING DIAGRAM SHALL BE MOUNTED ON THE INSIDE OF THE COVER. THE DIAGRAM SHALL REPRESENT EACH CONDUCTOR BY A SEPARATE LINE.
  - H. THE DIAGRAM SHALL IDENTIFY EACH CIRCUIT COMPONENT AN NUMBERING AND COLOR OF EACH TERMINAL CONDUCTOR AND TERMINAL.
  - I. ALL WIRING SHALL BE NEATLY TRAINED AND LACED.
  - J. MINIMUM WIRE SIZE SHALL BE NO. 12 AWG.
24. FURNISH & INSTALL A WEATHERPROOF WARNING LABEL FOR EACH METER SOCKET, SERVICE DISCONNECT, SAFETY SWITCH, CUTOUT, PANELBOARD, & CONTROL PANEL TO WARN PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS, PER THE REQUIREMENTS OF NEC 110.16 "ARC FLASH HAZARD WARNING".



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REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

IL Proj. No.: C15-4578

SBG No:  
 3-17-SBG-133/139

Contract No. PN010

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: E-002-NOTES.DWG  
 DESIGN BY: KNL 07/12/2017  
 DRAWN BY: CWS 07/21/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

ELECTRICAL NOTES  
 SHEET 1

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REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

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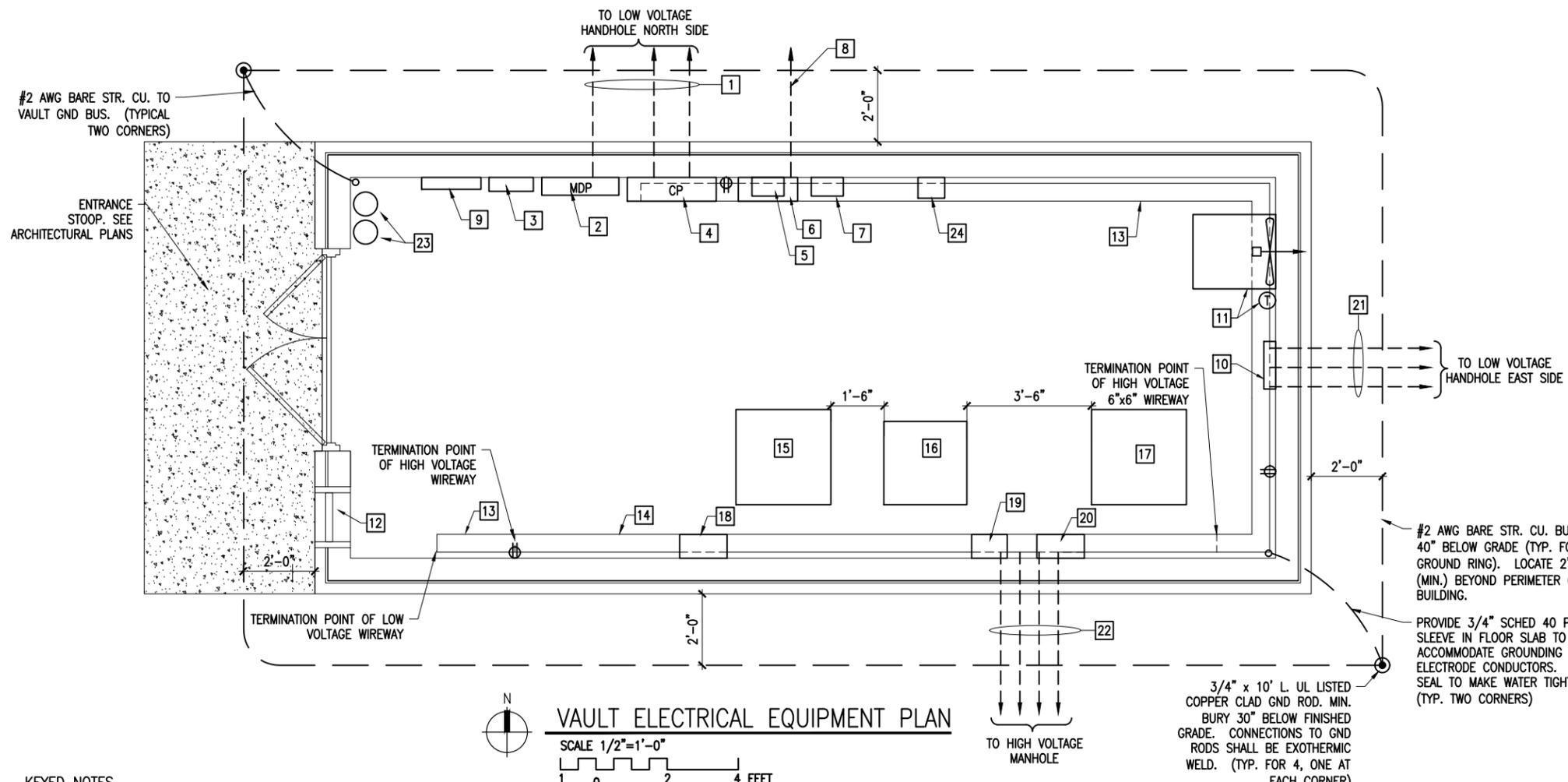
Contract No. PN010

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: E-101.DWG  
 DESIGN BY: KNL 08/08/2017  
 DRAWN BY: CWS 08/15/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

PROPOSED VAULT ELECTRICAL EQUIPMENT PLAN



**GENERAL NOTES**

- SEE "PROPOSED ELECTRICAL ONE-LINE FOR VAULT AND AIRFIELD" FOR LOW VOLTAGE INPUT POWER WIRING REQUIREMENTS TO CCR'S (CONSTANT CURRENT REGULATORS). SEE HIGH VOLTAGE WIRING SCHEMATICS FOR CCR OUTPUT WIRING REQUIREMENTS. SEE "AIRFIELD LIGHTING CONTROL WIRING SCHEMATIC" AND FOR CCR CONTROL WIRING REQUIREMENTS. PROVIDE 5 FEET MINIMUM CLEAR WORKING SPACE IN FRONT OF EACH CCR AND EACH SERIES PLUG CUTOFF.
- CONSTANT CURRENT REGULATORS AND THEIR RESPECTIVE SERIES PLUG CUTOFFS SHALL BE CLEARLY LABELED TO IDENTIFY THE RESPECTIVE REGULATOR DESIGNATION, AND RUNWAY OR TAXIWAY SERVED.
- SEE ELEVATION VIEWS FOR ADDITIONAL INFORMATION ON PROPOSED EQUIPMENT LAYOUTS.
- COORDINATE CONDUIT & SLEEVE ENTRANCES THROUGH FLOOR SLAB AND WALLS.

**KEYED NOTES**

- 3-3" PVC/HDPE DUCT FROM LOW VOLTAGE WIREWAY TO LOW VOLTAGE HANDHOLE ON NORTH SIDE. PROVIDE 3-3" PVC COATED GRSC WITH PVC COATED GRSC ELBOWS AT ENTRY TO VAULT. 3" GRSC AND ELBOWS WITH ASPHALT BASED PAINT IS ALSO ACCEPTABLE ONE CONDUIT SHALL BE FOR 120/240VAC, 1PH FEEDER TO VAULT MDP.
- VAULT MAIN DISTRIBUTION PANEL. SEE SCHEDULE.
- AC SURGE PROTECTION DEVICE.
- LIGHTING CONTACTOR PANEL. SEE "LIGHTING CONTACTOR PANEL DETAIL".
- L-854 RADIO CONTROL UNIT. EXTEND RADIO ANTENNA CABLE IN 1" GRSC ABOVE GRADE & 1" SCHED 40 PVC BELOW GRADE TO BEACON TOWER AND MOUNT ANTENNA ABOVE ROOF PEAK OF TERMINAL BUILDING FOR PROPER OPERATION. PROVIDE SCHED 40 PVC NIPPLE AT ENTRY TO VAULT FOR ISOLATION. BOND EXTERIOR METAL CONDUIT TO GND RING WITH PIPE CLAMP AND #2 AWG BARE CU BONDING CONDUCTOR.
- RADIO RELAY INTERFACE PANEL WITH PHOTOCELL BYPASS SWITCH FOR AIRFIELD LIGHTING SYSTEM. SEE "AIRFIELD LIGHTING CONTROL WIRING SCHEMATIC" FOR WIRING REQUIREMENTS. MOUNT PHOTOCELL ABOVE VAULT ROOF LEVEL. FIELD VERIFY LOCATION FOR PROPER CONTROL AND OPERATION. PROVIDE SCHED 40 PVC NIPPLE AT ENTRY TO VAULT FOR ISOLATION. BOND EXTERIOR METAL CONDUIT TO GND RING WITH PIPE CLAMP AND #2 AWG CU BONDING CONDUCTOR.
- RADIO RELAY INTERFACE PANEL FOR PAPI SYSTEMS. THIS PANEL MAY BE COMBINED WITH THE RADIO RELAY INTERFACE PANEL FOR AIRFIELD LIGHTING.
- REMOTE PHOTOCELL BYPASS WIRING IN 3/4" (MIN.) DUCT
- ELECTRIC WALL HEATER EH-1, 4000 WATT, 240 VAC, 1 PHASE, SUITABLE FOR SURFACE MOUNTING WITH INTEGRAL THERMOSTAT, Q-MARK MODEL CWH3404, MARLEY ENGINEERED PRODUCTS MODEL CWH3404F OR APPROVED EQUAL. HEATER SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCE REQUIREMENTS. LOCATE HEATER SUCH THAT IT IS NOT LESS THAN 8" FROM ADJACENT WALLS OR EQUIPMENT.
- ELECTRIC WALL HEATER EH-2 4000 WATT, 240 VAC, 1 PHASE, SUITABLE FOR SURFACE MOUNTING WITH INTEGRAL THERMOSTAT, Q-MARK MODEL CWH3404, MARLEY ENGINEERED PRODUCTS MODEL CWH3404F OR APPROVED EQUAL. HEATER SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCE REQUIREMENTS. BOTTOM OF HEATER SHALL BE 8" (MIN.) ABOVE THE UPPER ELECTRICAL WIREWAY. COORDINATE WITH CCR INSTALLATION & FAN INSTALLATION. LOCATE HEATER ON WALL SUCH THAT IT IS NOT DIRECTLY BEHIND CCR. LOCATE HEATER SUCH THAT IT IS NOT LESS THAN 8" FROM ADJACENT WALLS OR EQUIPMENT.
- EXHAUST FAN EF-1, 3000 CFM (MINIMUM) AT .25" STATIC PRESSURE WITH 3/4 HP, 120VAC MOTOR, COOK MODEL 20XW24D132, CARNES EQUIVALENT, OR APPROVED EQUAL. INCLUDE WALL HOUSING WITH GUARD, HEAVY DUTY BACK DRAFT DAMPER, ALUMINUM WEATHER-HOOD, STAINLESS STEEL INSECT SCREEN, AND FRACTIONAL HP ELECTRICAL DISCONNECT. INSTALL FAN TO COORDINATE WITH BUILDING. PROVIDE 120 VAC THERMOSTAT, AT 48" AFF. SEE EXHAUST FAN CONTROL SCHEMATIC FOR WIRING REQUIREMENTS. FAN SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCE REQUIREMENTS.
- INTAKE LOUVER L-1, 20" WIDE BY 64" HIGH INTAKE LOUVER WITH STAINLESS STEEL INSECT SCREEN, FLANGED FRAME, 120 VAC LOW LEAK MOTORIZED DAMPER WITH LIMIT SWITCH, KYMAR FINISH MATCHING BUILDING EXTERIOR, RUSKIN MODEL ELF375DX, LEADER INDUSTRIES MODEL 438-SD, OR APPROVED EQUAL. SEE EXHAUST FAN CONTROL SCHEMATIC FOR WIRING REQUIREMENTS. LOUVER / DAMPER SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCE REQUIREMENTS.
- 6" BY 6" LOW VOLTAGE WIREWAY. LABEL "LOW VOLTAGE" EVERY 6 FEET. INSTALL ABOVE HIGH VOLTAGE WIREWAY.
- 6" BY 6" HIGH VOLTAGE WIREWAY. LABEL "HIGH VOLTAGE" EVERY 6 FEET. INSTALL BELOW LOW VOLTAGE WIREWAY.
- NEW RUNWAY 9-27 CONSTANT CURRENT REGULATOR. SEE GENERAL NOTE 1.
- RELOCATED TAXIWAY CONSTANT CURRENT REGULATOR. SEE GENERAL NOTE 1.
- NEW PAPI CONSTANT CURRENT REGULATOR. SEE GENERAL NOTE 1.
- SERIES PLUG CUTOFF (TYPE S-1) WITH ENCLOSURE, FOR RUNWAY 9-27.
- SERIES PLUG CUTOFF (TYPE S-1) WITH ENCLOSURE, FOR TAXIWAY.
- SERIES PLUG CUTOFF (TYPE S-1) WITH ENCLOSURE FOR RUNWAY 27 PAPI.
- 3/4" x 10' L. UL LISTED COPPER CLAD GND ROD. MIN. BURY 30" BELOW FINISHED GRADE. CONNECTIONS TO GND RODS SHALL BE EXOTHERMIC WELD. (TYP. FOR 4, ONE AT EACH CORNER)
- 3-WAY 3" CONCRETE ENCASED DUCT FROM LOW VOLTAGE WIREWAY TO LOW VOLTAGE HANDHOLE ON EAST SIDE. PROVIDE 4-3" PVC COATED GRSC WITH PVC COATED GRSC ELBOWS AT ENTRY TO VAULT. 3" GRSC AND ELBOWS WITH ASPHALT BASED PAINT IS ALSO ACCEPTABLE.
- 4-WAY 3" CONCRETE ENCASED DUCT FROM HIGH VOLTAGE WIREWAY TO HIGH VOLTAGE MANHOLE ON SOUTH SIDE. PROVIDE 4-3" PVC COATED GRSC WITH PVC COATED GRSC ELBOWS AT ENTRY TO VAULT. 3" GRSC AND ELBOWS WITH ASPHALT BASED PAINT IS ALSO ACCEPTABLE.
- FURNISH AND INSTALL A UL RATED, 10 POUND CARBON DIOXIDE FIRE EXTINGUISHER SUITABLE FOR USE ON CLASS C FIRES AND A 10 POUND CLASS 4A:80B:C DRY CHEMICAL ABC FIRE EXTINGUISHER SUITABLE FOR USE ON CLASS A,B,C FIRES, IN THE VAULT SHELTER. PER NFPA 10 "PORTABLE FIRE EXTINGUISHERS" CLASS C ARE FOR FIRES THAT INVOLVE ENERGIZED ELECTRICAL EQUIPMENT. FIRE EXTINGUISHERS SHALL BE MADE IN THE UNITED STATES OF AMERICA TO COMPLY WITH BUY AMERICAN REQUIREMENT. FIRE EXTINGUISHER TYPE CO2 SHALL BE AMEREX MODEL 330, BUCKEY MODEL 10CD OR APPROVED EQUAL. FIRE EXTINGUISHER DRY CHEMICAL TYPE ABC SHALL BE AMEREX MODEL B456, BUCKEY MODEL 10-TALL-ABC, OR APPROVED EQUAL. PROVIDE WALL MOUNTING BRACKET FOR EACH FIRE EXTINGUISHER. CONFIRM MODEL NUMBERS WITH THE RESPECTIVE FIRE EXTINGUISHER MANUFACTURER.
- NEW 3KVA 240 VAC TO 480 VAC STEP-UP TRANSFORMER FOR RUNWAY 9 PAPI RELOCATED FROM OLD VAULT TO NEW VAULT, MAINTAIN 12" CLEARANCE ON BOTH SIDES, TOP, AND BOTTOM. PROVIDE LIQUID-TIGHT FLEX METAL CONDUIT FOR CONNECTION TO TRANSFORMER.

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PEKIN MUNICIPAL AIRPORT  
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REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

IL Proj. No.: C15-4578

SBG No:  
 3-17-SBG-133/139

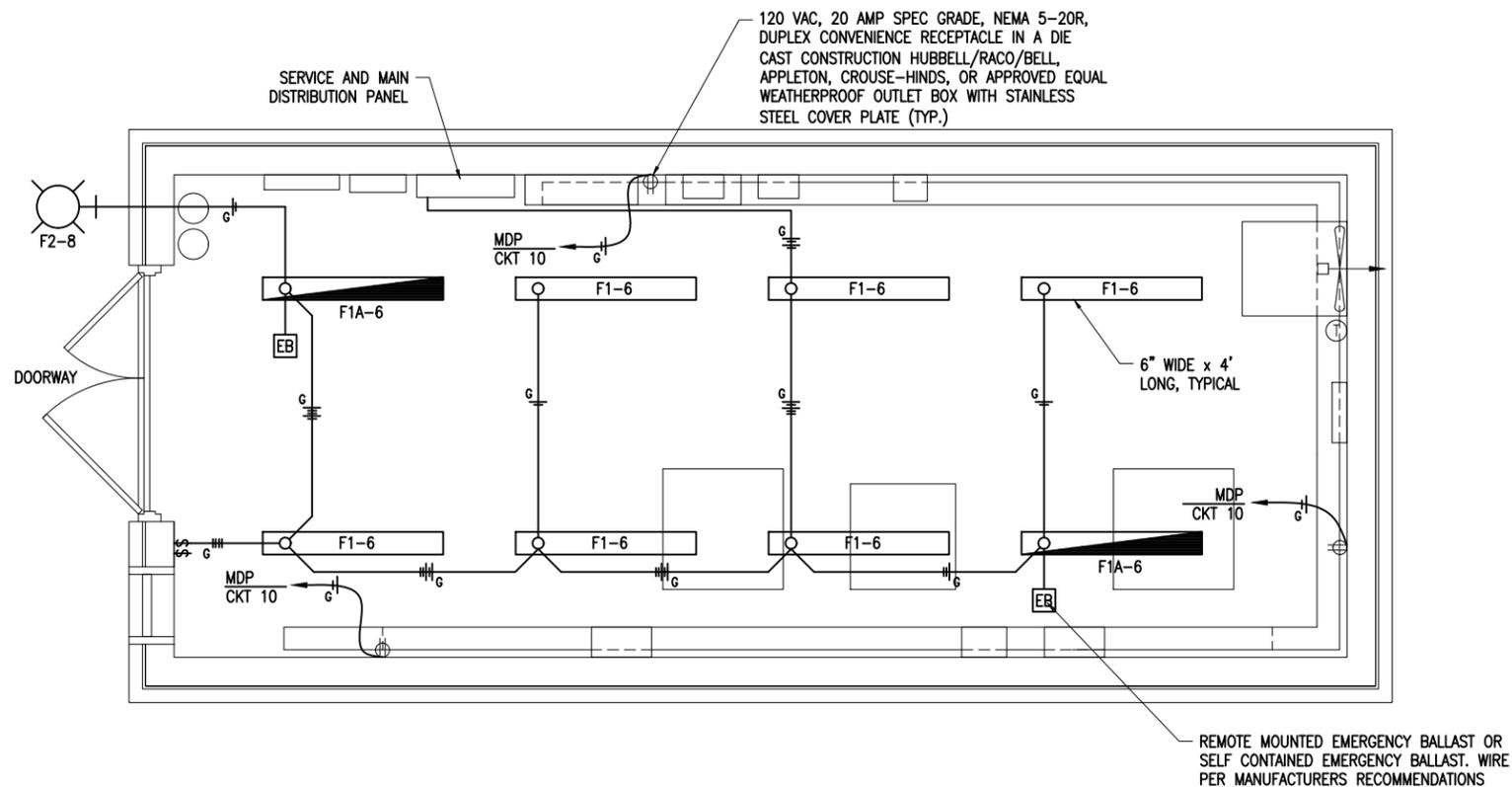
Contract No. PN010

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: E-102.DWG  
 DESIGN BY: KNL 08/08/2017  
 DRAWN BY: CWS 08/15/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

PROPOSED VAULT LIGHTING AND RECEPTACLE PLAN



NOTES

- 15 AMP & 20 AMP BRANCH CIRCUITS FOR LIGHTING & RECEPTACLES SHALL USE #12 AWG THWN (MIN.). EMT MAY BE USED FOR LIGHTING AND RECEPTACLE BRANCH CIRCUITS.
- LIGHT FIXTURES SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN REQUIREMENTS. PROVIDE CERTIFICATION OF MANUFACTURE IN THE UNITED STATES WITH SHOP DRAWINGS SUBMITTAL.
- ADJUST RECEPTACLE LOCATIONS WHERE NECESSARY TO ACCOMMODATE EQUIPMENT LAYOUT.
- TEST EMERGENCY LIGHTING AND CONFIRM PROPER OPERATION.
- "USPOM" SUFFIX ON LITHONIA LIGHT FIXTURE CATALOG NUMBERS INDICATES UNITED STATES POINT OF MANUFACTURE.

VAULT LIGHTING AND RECEPTACLE PLAN

SCALE 1/2"=1'-0"  
 1 0 2 4 FEET

ELECTRICAL LEGEND - PLANS	
	CONDUIT (EXPOSED)
	CONDUIT OR DUCT (CONCEALED OR BURIED)
	DUPLEX CONVENIENCE RECEPTACLE, 120V, 20 AMP SINGLE PHASE, NEMA 5-20R, GROUNDING TYPE.
	WALL OR CEILING MTD. JUNCTION BOX. CONFIGURATION VARIES WITH USE
	SINGLE THROW DISCONNECT SWITCH
	SINGLE THROW, FUSIBLE DISCONNECT SWITCH
	DOUBLE THROW SAFETY SWITCH, MANUAL TRANSFER SWITCH
	CONTROL PANEL
	MOTOR
	TRANSFORMER
	ELECTRIC UTILITY METER
	ENCLOSURE
	CIRCUIT BREAKER PANEL-SEE SCHEDULES
	GROUND ROD
	#12 AWG THWN COPPER UNLESS NOTED OTHERWISE. LONG SLASHES INDICATE NEUTRAL. SHORT SLASHES INDICATE HOT OR SWITCHED LEG. "G" OR SLASHES WITH DOT INDICATE SEPARATE GROUND WIRE.
	HOMERUN TO PANEL PNL A INDICATES PANEL 1,3,5 INDICATES CIRCUIT NUMBERS
	SURFACE MOUNTED FLUORESCENT FIXTURE. LETTER WITH NUMBER INDICATES FIXTURE TYPE. X= CIRCUIT NUMBER
	SURFACE MOUNTED FLUORESCENT FIXTURE WITH EMERGENCY BALLAST BATTERY BACKUP. LETTER WITH NUMBER INDICATES FIXTURE TYPE. X= CIRCUIT NUMBER
	WALL OR CEILING MTD. COMPACT FLOURESCENT OR HID FIXTURE.
	SINGLE POLE SWITCH

LIGHTING FIXTURE SCHEDULE						
FIXT. TYPE	DESCRIPTION	MANUFACTURER & CATALOG NO.	LAMPS/WATTS	VOLTS	MOUNTING	REMARKS
F1	4 FT. WET LOCATION LISTED ENCLOSED AND GASKETED INDUSTRIAL LED LIGHT FIXTURE, IMPACT RESISTANT, UV RESISTANT REINFORCED POLYESTER FIBERGLASS HOUSING, HIGH IMPACT ACRYLIC DIFFUSER.	LITHONIA: DMW2-L24-4000LM-AFL-WD-MVOLT-GZ1-40K-80CRI-USPOM, PHILIPS DAY BRITE DWA-43L-840-4-UNV H.E. WILLIAMS 96-4-L40-840-HIAFR-DRV-UNV, OR APPROVED EQUAL	LED, APPROX. 40 INPUT WATTS	120	SURFACE TO HARD CEILING	
F1A	SAME AS F1 EXCEPT PROVIDE AN EMERGENCY BATTERY PACK CAPABLE OF OPERATING THE LIGHT FIXTURE FOR 90 MINUTES.	LITHONIA: DMW2-L24-4000LM-AFL-WD-MVOLT-GZ1-40K-80CRI-USPOM WITH PS1050 BATTERY PACK, PHILIPS DAYBRITE DWA-43L-840-4-UNV-EMLED, H.E. WILLIAMS 96-4-L40-840-HIAFR-DRV-UNV WITH EMERGENCY DRIVER/BATTERY PACK, OR APPROVED EQUAL	LED, APPROX. 40 INPUT WATTS	120	SURFACE TO HARD CEILING	
F2	LED WALL LUMINAIRE SUITABLE FOR WET LOCATIONS, DIE CAST ALUMINUM HOUSING WITH POWDER COAT FINISH, HIGH-IMPACT POLYCARBONATE OR ACRYLIC LENS OR GLASS, SEALED AGAINST MOISTURE AND ENVIRONMENTAL CONTAMINANTS (IP65 RATED, UL1598 RATED OR EQUIVALENT)	LITHONIA: TWHLED-10C-1000-40K-T3M-MVOLT-DDBXD-USPOM, LUMECON LWP-DOC-25-DB-1-NW-F, H.E. WILLIAMS WPS2-L28-850, OR APPROVED EQUAL	LED, APPROX. 30 TO 40 INPUT WATTS	120	SURFACE TO WALL ABOVE INTAKE LOUVER APPROX. EVEN TO THE TOP OF DOOR FRAME. ADJUST FOR BUILDING CONDITIONS	CONNECT TO WALL SWITCH LOCATED ON THE INSIDE OF THE BUILDING.



REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

IL Proj. No.: C15-4578

SBG No:  
 3-17-SBG-133/139

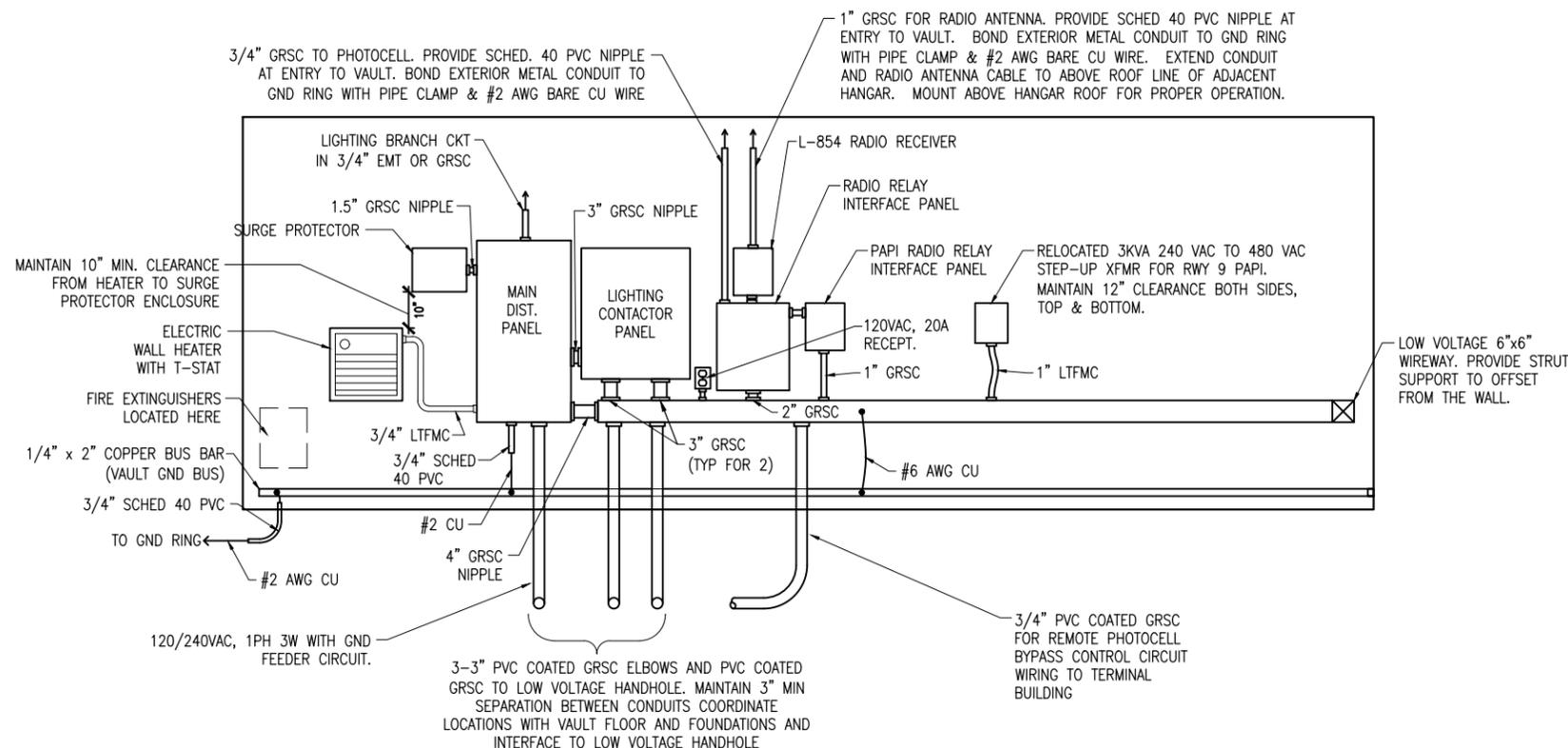
Contract No. PN010

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		DES	DWN	REV

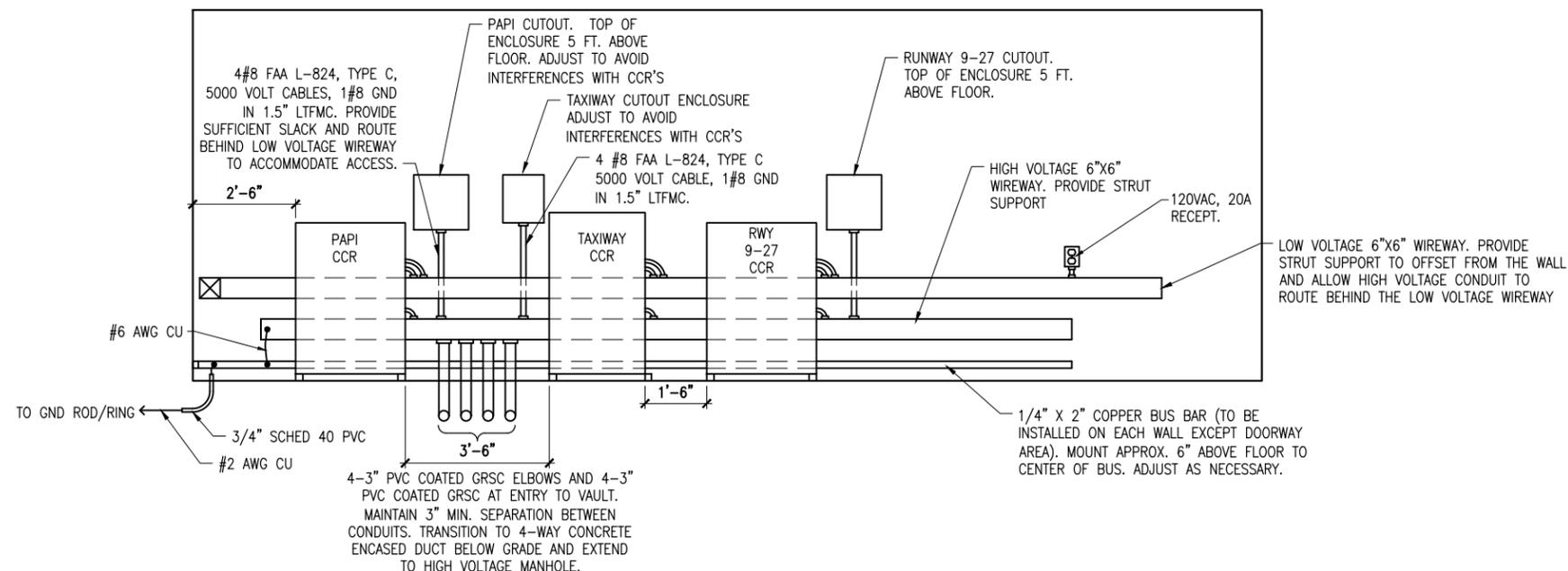
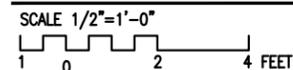
ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: E-201-VLT-ELEV.DWG  
 DESIGN BY: KNL 08/05/2017  
 DRAWN BY: CWS 08/09/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

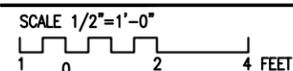
PROPOSED VAULT WALL ELEVATIONS (SHEET 1)



VAULT NORTH WALL ELEVATION



VAULT SOUTH WALL ELEVATION



NOTES

- COORDINATE CONDUIT ENTRIES INTO THE VAULT BUILDING WITH EQUIPMENT LAYOUT AND VAULT FOUNDATION.
- AIRFIELD LIGHTING SERIES CIRCUIT CABLE SHALL EXIT THE RESPECTIVE CONSTANT CURRENT REGULATOR (CCR) AT THE HIGH VOLTAGE SECTION. 240 VAC INPUT POWER SHALL ENTER THE RESPECTIVE CCR AT THE INPUT POWER SECTIONS. CONTROL CIRCUITS SHALL ENTER THE RESPECTIVE CCR AT THE CONTROL SECTION. MAINTAIN THE SEPARATION OF LOW VOLTAGE CIRCUITS FROM HIGH VOLTAGE CIRCUITS. CONFIRM CCR INSTALLATION REQUIREMENTS WITH EACH RESPECTIVE CCR MANUFACTURER'S INSTRUCTIONS.



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 3-17-SBGP-133/139

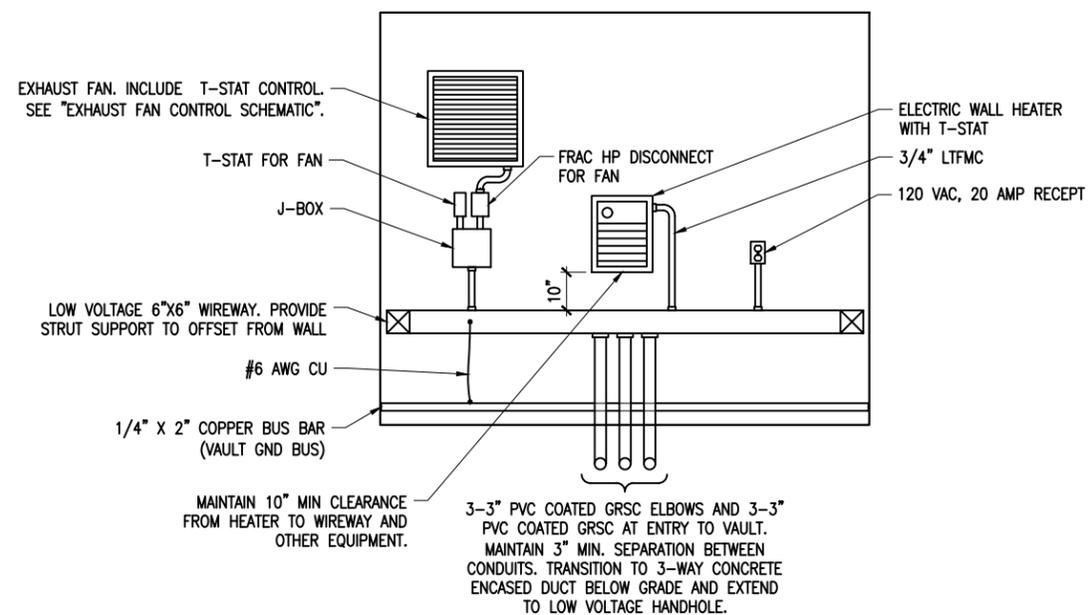
Contract No. PN010

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: E-202-VLT-ELEV.DWG  
 DESIGN BY: KNL 08/07/2017  
 DRAWN BY: CWS 08/10/2017  
 REVIEWED BY: BSS 08/21/2017

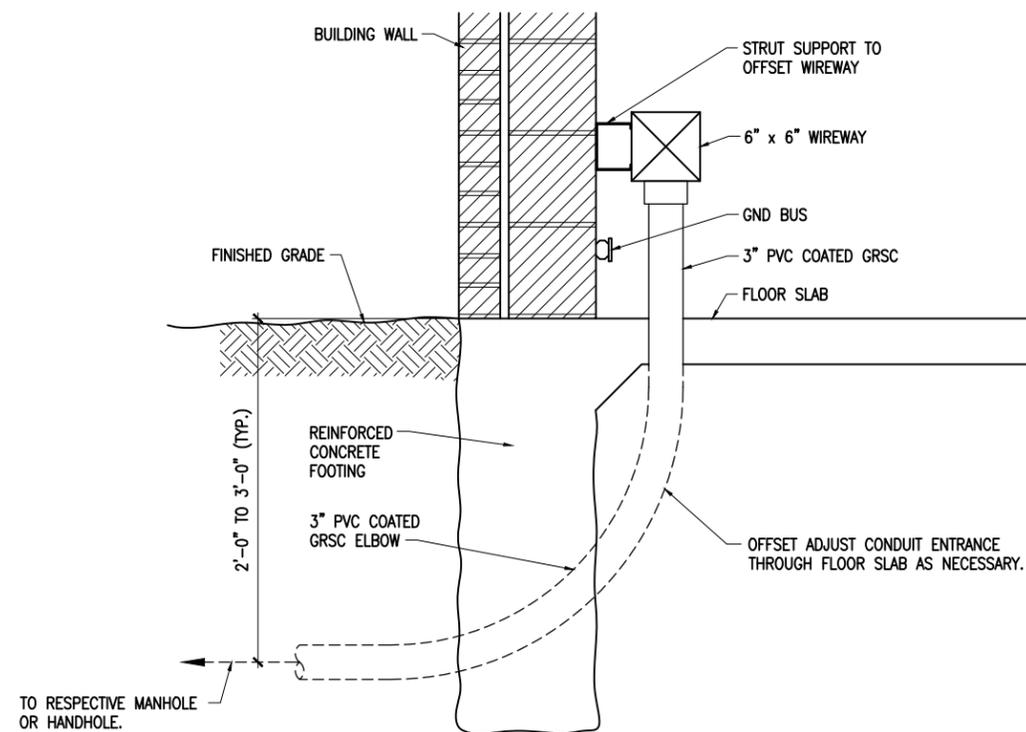
SHEET TITLE

PROPOSED VAULT WALL ELEVATIONS  
 (SHEET 2)



VAULT EAST WALL ELEVATION

SCALE 1/2"=1'-0"  
 1 0 2 4 FEET



CONDUIT ENTRANCE DETAIL

SCALE 1/2"=1'-0"  
 0.5 0 1 2 FEET



REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

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SBG No:  
 3-17-SBG-133/139

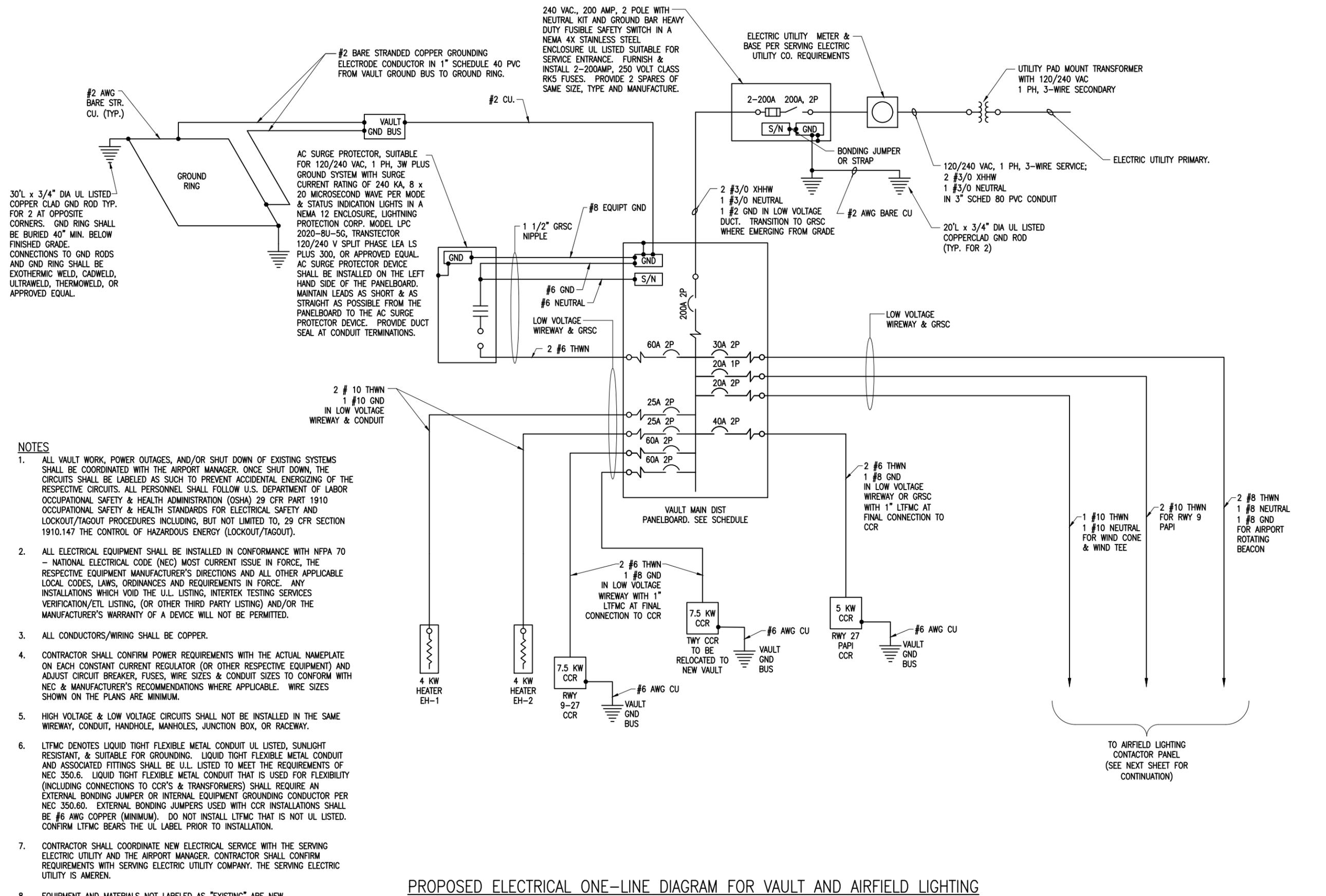
Contract No. PN010


NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: E-602-LINE.DWG  
 DESIGN BY: KNL 07/12/2017  
 DRAWN BY: CWS 07/31/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

PROPOSED ELECTRICAL ONE LINE FOR VAULT AND AIRFIELD - SHEET 1



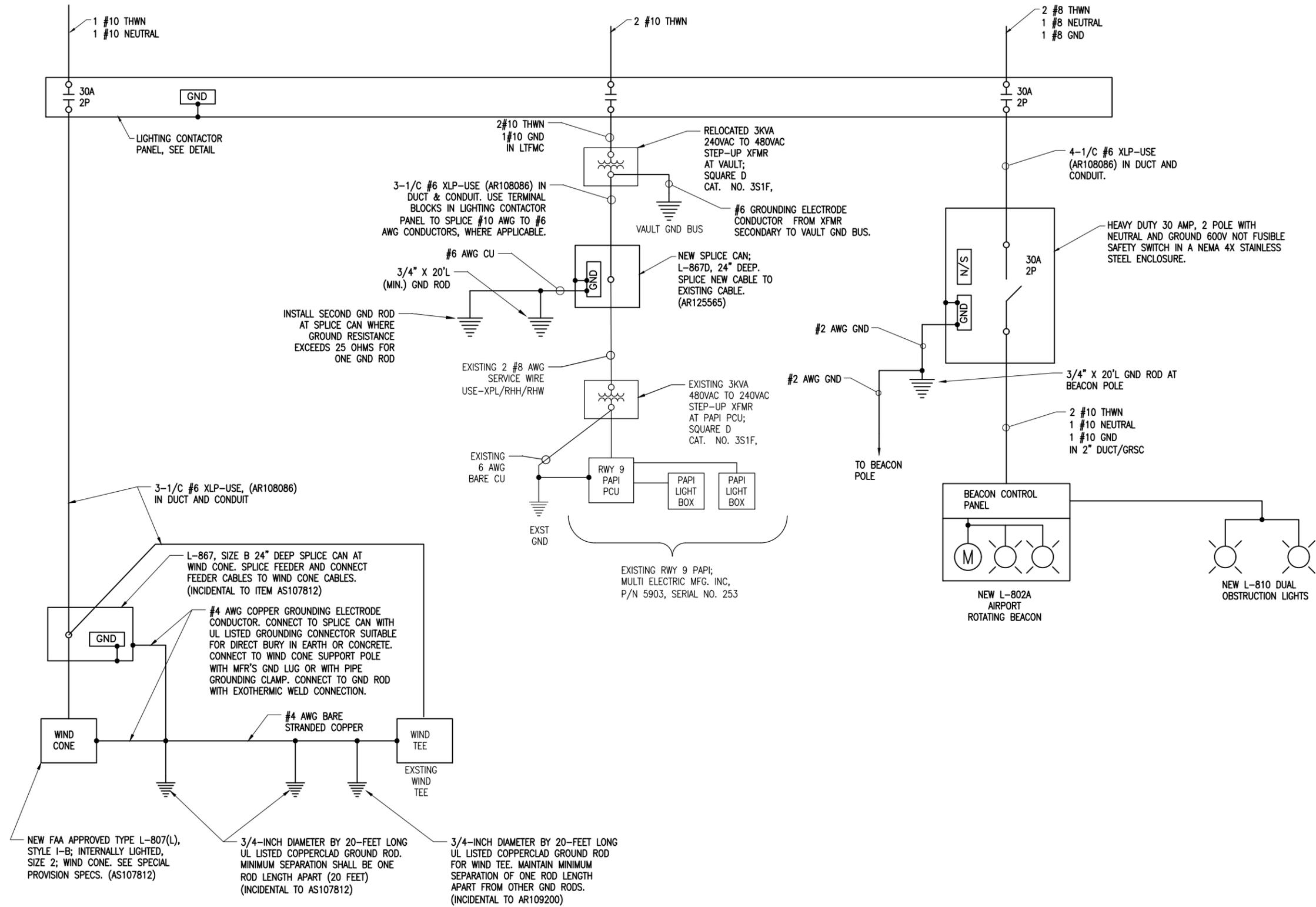
PROPOSED ELECTRICAL ONE-LINE DIAGRAM FOR VAULT AND AIRFIELD LIGHTING

NOTES

- ALL VAULT WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER. 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 & 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).
- ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 - NATIONAL ELECTRICAL CODE (NEC) MOST CURRENT ISSUE IN FORCE, THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L. LISTING, INTERTEK TESTING SERVICES VERIFICATION/ETL LISTING, (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE PERMITTED.
- ALL CONDUCTORS/WIRING SHALL BE COPPER.
- CONTRACTOR SHALL CONFIRM POWER REQUIREMENTS WITH THE ACTUAL NAMEPLATE ON EACH CONSTANT CURRENT REGULATOR (OR OTHER RESPECTIVE EQUIPMENT) AND ADJUST CIRCUIT BREAKER, FUSES, WIRE SIZES & CONDUIT SIZES TO CONFORM WITH NEC & MANUFACTURER'S RECOMMENDATIONS WHERE APPLICABLE. WIRE SIZES SHOWN ON THE PLANS ARE MINIMUM.
- HIGH VOLTAGE & LOW VOLTAGE CIRCUITS SHALL NOT BE INSTALLED IN THE SAME WIREWAY, CONDUIT, HANDHOLE, MANHOLES, JUNCTION BOX, OR RACEWAY.
- LTFMC DENOTES LIQUID TIGHT FLEXIBLE METAL CONDUIT UL LISTED, SUNLIGHT RESISTANT, & SUITABLE FOR GROUNDING. LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE U.L. LISTED TO MEET THE REQUIREMENTS OF NEC 350.6. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO CCR'S & TRANSFORMERS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. EXTERNAL BONDING JUMPERS USED WITH CCR INSTALLATIONS SHALL BE #6 AWG COPPER (MINIMUM). DO NOT INSTALL LTFMC THAT IS NOT UL LISTED. CONFIRM LTFMC BEARS THE UL LABEL PRIOR TO INSTALLATION.
- CONTRACTOR SHALL COORDINATE NEW ELECTRICAL SERVICE WITH THE SERVING ELECTRIC UTILITY AND THE AIRPORT MANAGER. CONTRACTOR SHALL CONFIRM REQUIREMENTS WITH SERVING ELECTRIC UTILITY COMPANY. THE SERVING ELECTRIC UTILITY IS AMEREN.
- EQUIPMENT AND MATERIALS NOT LABELED AS "EXISTING" ARE NEW.

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(SEE PREVIOUS SHEET FOR CONTINUATION)



PROPOSED ELECTRICAL ONE LINE DIAGRAM FOR AIRPORT VAULT & AIRFIELD LIGHTING (CONTINUED)



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REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

IL Proj. No.: C15-4578  
 SBG No: 3-17-SBGP-133/139  
 Contract No. PN010

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: E-603-LINENEW.DWG  
 DESIGN BY: KNL 07/12/2017  
 DRAWN BY: CWS 08/02/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

PROPOSED ELECTRICAL ONE LINE FOR VAULT AND AIRFIELD - SHEET 2

SEP 08 2017 3:41 PM SCHUB01446 I:\17JOBS\17A0002\17A0002\CAD\AIRPORT\SHSHEETE-603-LINENEW.DWG



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SBG No:

3-17-SBGP-133/139

Contract No. PN010

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

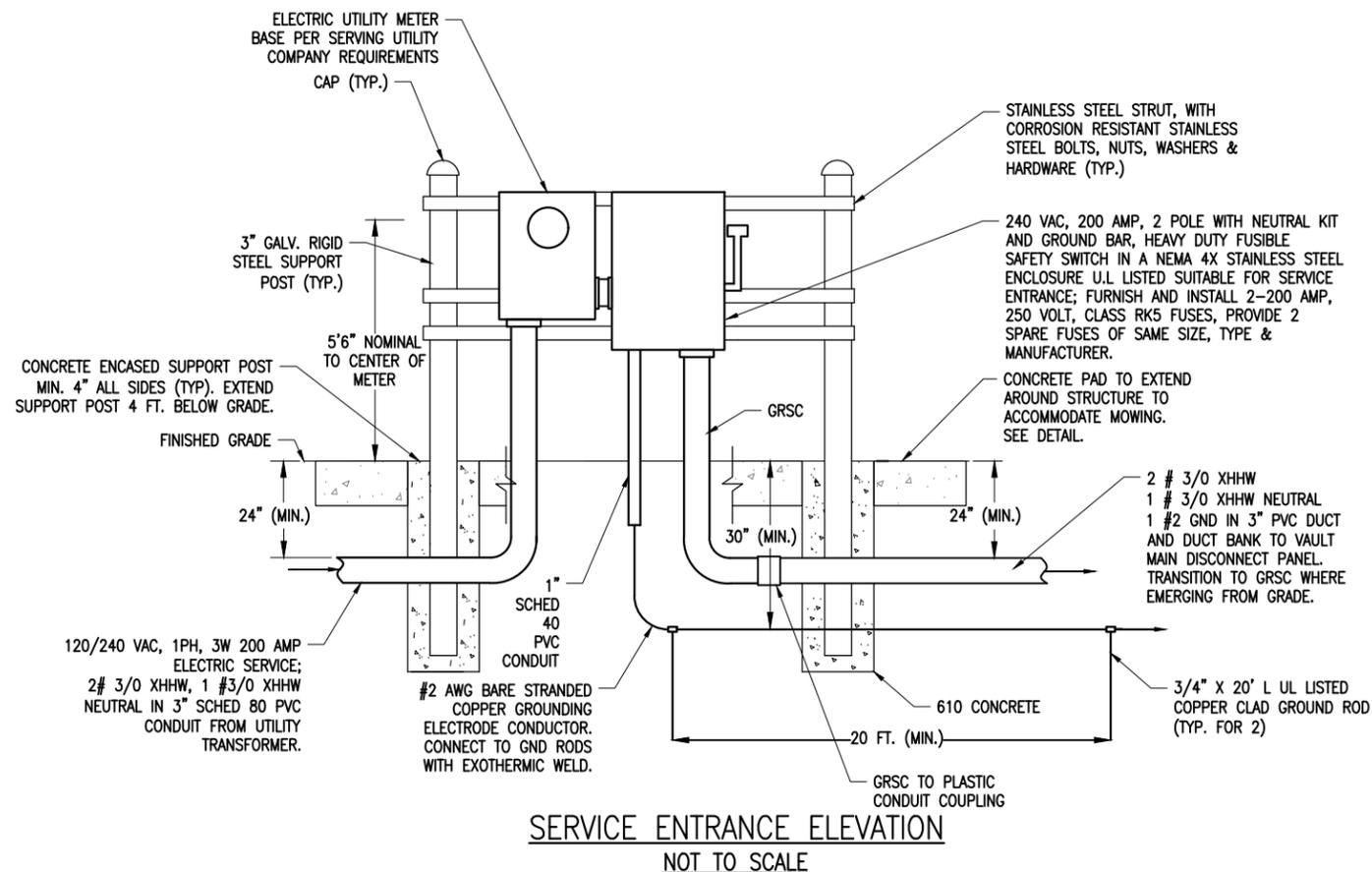
ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: E-514.DWG  
 DESIGN BY: KNL 07/12/2017  
 DRAWN BY: CWS 07/31/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

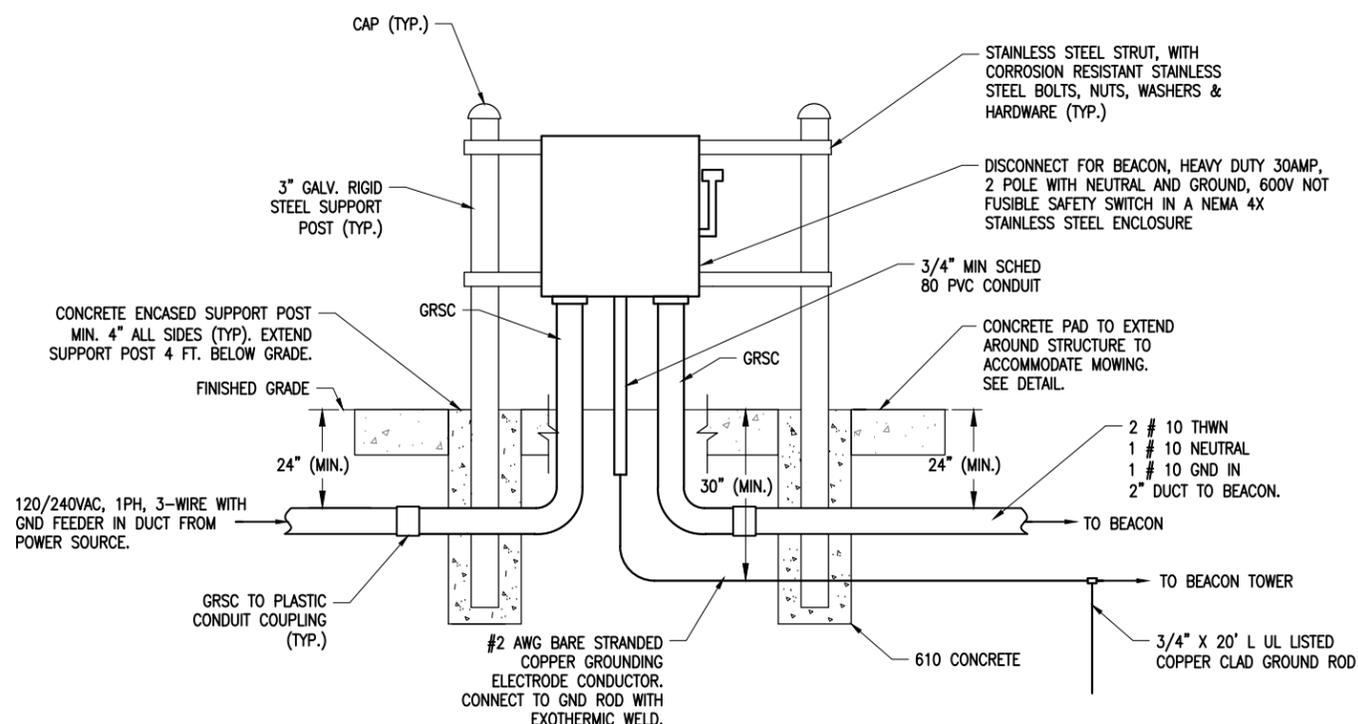
ELECTRIC SERVICE AND BEACON DISCONNECT ELEVATION DETAILS

NOTES:

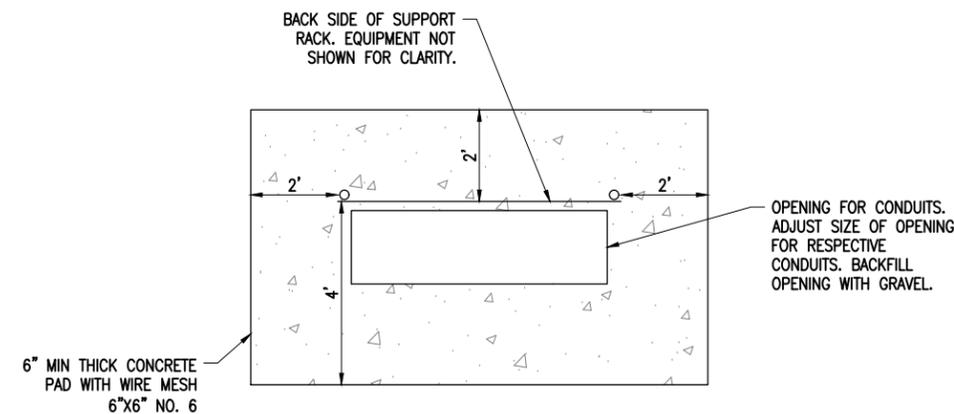
- ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER AND THE OPERATIONS SUPERINTENDENT. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & 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).
- ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 - NATIONAL ELECTRICAL CODE (NEC) MOST CURRENT ISSUE IN FORCE, THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L LISTING, ETL LISTING, (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE PERMITTED.
- CONTRACTOR SHALL COORDINATE NEW ELECTRICAL SERVICE WITH THE SERVING ELECTRIC UTILITY AND THE AIRPORT MANAGER. CONTRACTOR SHALL CONFIRM REQUIREMENTS WITH SERVING ELECTRIC UTILITY COMPANY. THE SERVING ELECTRIC UTILITY IS AMEREN. PHONE 1-800-755-5000 OR 1-888-672-5252. AMEREN DISTRIBUTION DESIGN SPECIALIST IS MR. SAM HEPPARD, PHONE: 309-444-7917, CELL PHONE: 309-210-7170.
- CONDUIT ENTRIES INTO NEMA 4, 4X ENCLOSURES SHALL HAVE NEMA 4, 4X HUBS TO MAINTAIN THE NEMA 4, 4X RATING OF THE ENCLOSURE.
- NEW ELECTRICAL SERVICE AND ASSOCIATED FEEDER CONDUCTORS FROM THE SERVICE DISCONNECT TO THE AIRPORT ELECTRICAL VAULT MAIN DISCONNECT PANEL WILL BE PAID FOR UNDER ITEM AR109200 INSTALL ELECTRICAL EQUIPMENT PER LUMP SUM.
- PROVIDE 6" MIN. THICK CONCRETE PAD EXTENDING 2' PERIMETER OF SUPPORT STRUCTURE.



SERVICE ENTRANCE ELEVATION  
 NOT TO SCALE



BEACON DISCONNECT ELEVATION  
 NOT TO SCALE



CONCRETE PAD DETAIL  
 NOT TO SCALE



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3-17-SBGP-133/139

Contract No. PN010

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: 09/22/2017  
PROJECT NO: 17A0002  
CAD FILE: E-604-SCHD.DWG  
DESIGN BY: KNL 07/12/2017  
DRAWN BY: CWS 07/31/2017  
REVIEWED BY: BSS 08/21/2017

SHEET TITLE

VAULT PANELBOARD SCHEDULE

VAULT MAIN DISTRIBUTION PANEL						
CKT #	DUTY	SIZE		SIZE	DUTY	CKT #
1	AC SURGE PROTECTOR	60A 2P		10A 1P	L-854 RADIO & CONTROL POWER	2
3				30A 1P	VAULT EXHAUST FAN	4
5	ELECTRIC HEATER EH-1	25A 2P		15A 1P	VAULT INTERIOR LIGHTS	6
7				15A 1P	VAULT EXTERIOR LIGHTS	8
9	ELECTRIC HEATER EH-2	25A 2P		20A 1P	RECEPTACLE	10
11				20A 1P	SPARE	12
13	RUNWAY 9-27 CCR	60A 2P		20A 2P	AIRPORT ROTATING BEACON	14
15						16
17	TAXIWAY CCR	60A 2P		20A 2P	RUNWAY 9 PAPI	18
19						20
21	SPARE	60A 2P		20A 1P	WIND CONE AND WIND TEE	22
23					BLANK	24
25	BLANK			40A 2P	RUNWAY 27 PAPI CCR	26
27	BLANK					28
29	BLANK			30A 2P	SPARE	30
31	BLANK					32
33	BLANK			15A 1P	SPARE	34
35	BLANK			20A 1P	SPARE	36
37	BLANK			25A 1P	SPARE	38
39	BLANK			30A 1P	SPARE	40
41	BLANK				BLANK	42

S/N      GND

225AMP, 120/240VAC, 1 PHASE, 3 WIRE 42 CIRCUIT PANELBOARD WITH 200AMP, 2 POLE MAIN BREAKER WITH 22,000 AIC AT 240VAC IN A NEMA 1 ENCLOSURE UL-LISTED SUITABLE FOR SERVICE ENTRANCE. PANELBOARD SHALL ACCOMMODATE FEEDER AND BRANCH BREAKERS UP TO 150AMP, 2 POLE FRAME & TRIP RATING. PANELBOARD SHALL BE SQUARE D NO. CAT. NO. NQ42L2C WITH COPPER NEUTRAL & COPPER GROUND BAR KIT, EQUIVALENT PANELBOARD BY EATON CUTLER HAMMER, OR APPROVED EQUAL.

**NOTES**

- PANELBOARD BUSSES SHALL BE COPPER. NEUTRAL SHALL BE COPPER. EQUIPMENT GROUND BAR SHALL BE COPPER.
- ALL BRANCH CIRCUIT & FEEDER BREAKERS SHALL BE BOLT-ON TYPE WITH 10,000 AIC AT 120/240 VAC.
- INCLUDE ENGRAVED, PHENOLIC OR PLASTIC LEGEND PLATE LABELED "VAULT DIST. PANEL B, 120/240 VAC, 1PH, 3W".
- PANELBOARD SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN REQUIREMENTS. PROVIDE CERTIFICATION OF MANUFACTURE IN THE UNITED STATES WITH SHOP DRAWING SUBMITTAL.
- CIRCUIT BREAKERS AND WIRING SHALL BE SIZED FOR THE ACTUAL EQUIPMENT FURNISHED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S RECOMMENDATION AND N.E.C. CONTRACTOR SHALL ADJUST CIRCUIT BREAKER SIZES & WIRING WHERE APPLICABLE TO CONFORM WITH THE MANUFACTURER'S RECOMMENDATIONS AND N.E.C.
- CONFIRM EXHAUST FAN MOTOR HORSEPOWER AND FULL LOAD AMPS AND SELECT PROPERLY SIZED CIRCUIT BREAKER IN ACCORDANCE WITH NEC 430.52
- FOR A BOTTOM FEED PANELBOARD, MOVE AC SURGE PROTECTOR BREAKER DOWN TO POSITIONS 39 AND 41.





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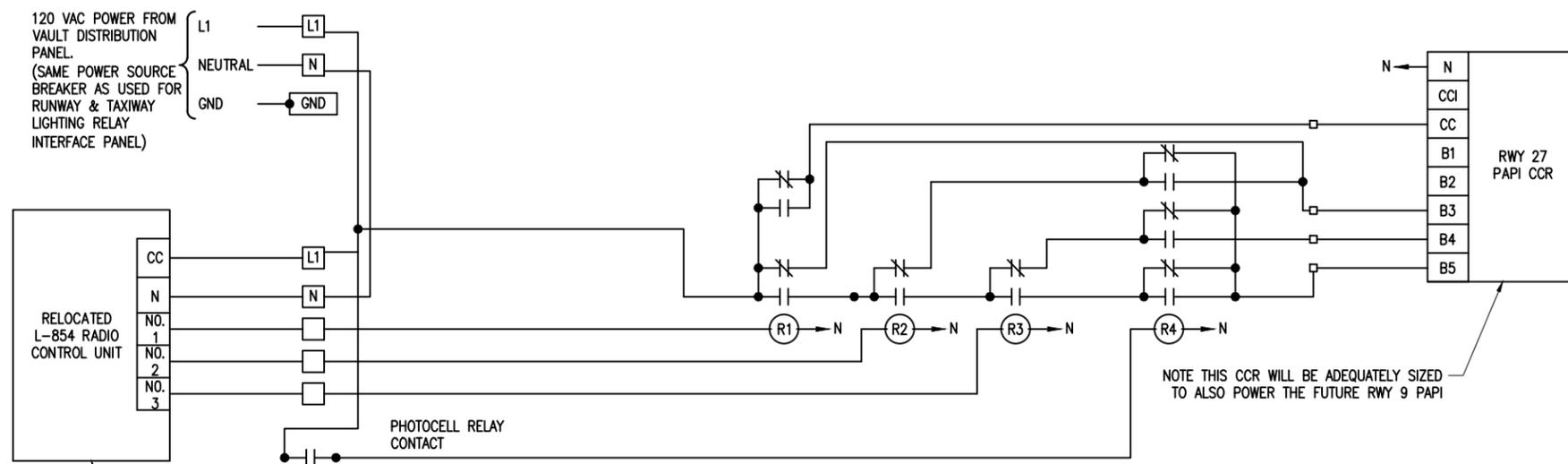
ISSUE: 09/22/2017  
PROJECT NO: 17A0002  
CAD FILE: E-606-SCM.DWG  
DESIGN BY: KNL 07/12/2017  
DRAWN BY: CWS 07/31/2017  
REVIEWED BY: BSS 08/21/2017

SHEET TITLE

PAPI CONTROL WIRING SCHEMATIC

NOTES:

- RELAY INTERFACE CONTROL PANEL SHALL BE MANUFACTURED BY AN FAA APPROVED L-821 PANEL BUILDER OR A UL 508 INDUSTRIAL CONTROL PANEL BUILDER, AND SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCES REQUIREMENT. RELAY INTERFACE CONTROL PANEL SHALL BE A SEPARATE PANEL. THE PAPI INTERFACE PANEL MAY BE COMBINED WITH THE RELAY INTERFACE CONTROL PANEL FOR AIRFIELD LIGHTING.
- PANEL SHALL BE IN A NEMA 12 ENCLOSURE WITH HINGED COVER. DRILL HOLE IN BOTTOM OF ENCLOSURE TO ALLOW CONDENSATION TO ESCAPE.
- EXTERNAL CONTROL CABLE SHALL BE NO. 12 AWG COPPER, 600 VOLT CABLE. ALL PANEL INTERIOR CONTROL CABLE SHALL BE MINIMUM 16 AWG, COPPER, 600 VOLT CABLE.
- IN THE AUTOMATIC MODE OF OPERATION THE RUNWAY 27 PAPI CONSTANT CURRENT REGULATOR SHALL BE CONTROLLED BY THE L-854 RADIO CONTROL UNIT IN THE FOLLOWING MANNER:  
  
PAPI RADIO CONTROL DAY MODE ILLUMINATION INTENSITY  
 IDLE PERIODS - PAPI ON AT 5% BRIGHTNESS  
 3 CLICKS - 100% BRIGHTNESS  
 5 CLICKS - REMAIN 100% BRIGHTNESS  
 7 CLICKS - REMAIN 100% BRIGHTNESS  
  
PAPI RADIO CONTROL NIGHT MODE ILLUMINATION INTENSITY  
 IDLE PERIODS - PAPI ON AT 5% BRIGHTNESS  
 3 CLICKS - 5% BRIGHTNESS  
 5 CLICKS - 25% BRIGHTNESS  
 7 CLICKS - 100% BRIGHTNESS
- EQUIPMENT GROUND WIRES SHALL BE INCLUDED WITH EACH BRANCH CIRCUIT & EACH CONTROL CIRCUIT.
- INCLUDE PHOTOCELL BYPASS SWITCH.
- INCLUDE EQUIPMENT GROUND BAR, ILS CO D167-12, SQUARE D 12 TERMINAL (MIN.) COPPER EQUIPMENT GROUND BAR KIT, OR APPROVED EQUAL.
- CONTROL RELAYS SHALL HAVE 10 AMP CONTACT RATINGS AT 240 VAC WITH 120 VAC COILS. PROVIDE 3 SPARE RELAYS FOR EACH TYPE USED IN THE RELAY INTERFACE PANEL.
- COLOR CODING FOR 5 STEP REGULATORS SHALL BE AS FOLLOWS:  
 CC -RED  
 B3 -ORANGE  
 B4 -YELLOW  
 B5 -BLUE  
 NEUTRAL -WHITE  
 EQUIPT. GND -GREEN  
 ALSO TAG THE CONTROL WIRES WITH THE RESPECTIVE DESIGNATION (CC, B3, B4, B5)
- "N" DESIGNATES NEUTRAL CONNECTION OR NEUTRAL CONDUCTOR.



PAPI CONTROL WIRING SCHEMATIC

SAME L-854 RADIO CONTROL UNIT AS USED FOR RUNWAY AND TAXIWAY LIGHTING CONTROL.



REPLACE AIRFIELD ELECTRICAL VAULT, REPLACE BEACON UNIT AND TOWER; RELOCATE REGULATOR; REPLACE REMAINING AIRFIELD LIGHTING, SIGNAGE AND NAVIGATIONAL AIDS

IL Proj. No.: C15-4578

SBG No:  
 3-17-SBGP-133/139

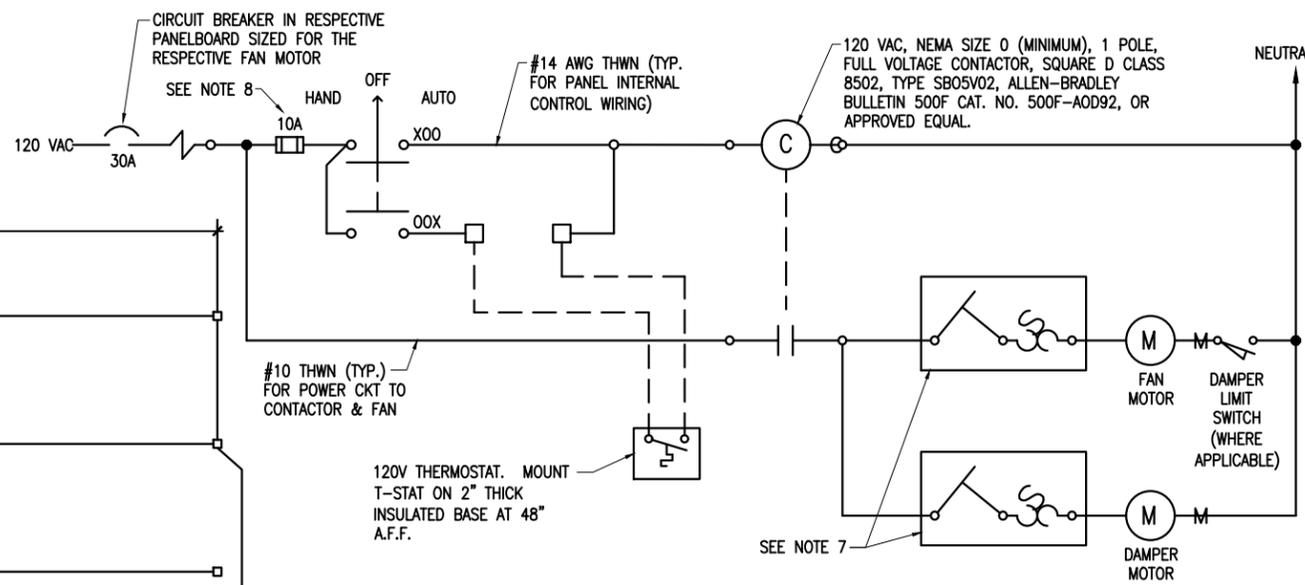
Contract No. PN010

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: E-607-SCM.DWG  
 DESIGN BY: KNL 07/12/2017  
 DRAWN BY: CWS 07/31/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

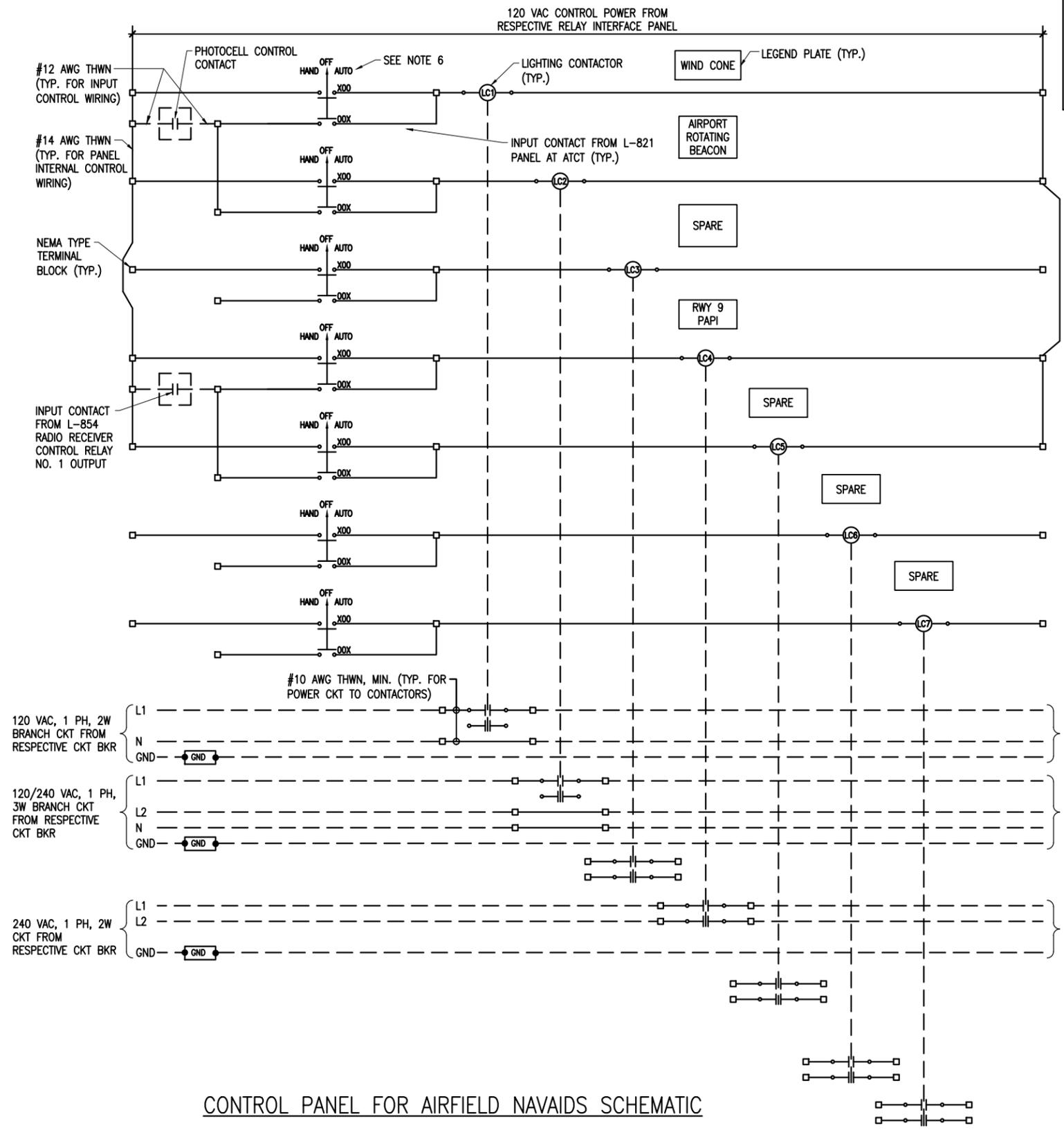
CONTROL PANEL FOR AIRFIELD NAVAIDS SCHEMATIC



EXHAUST FAN CONTROL SCHEMATIC

NOTES

- 15 AMP & 20 AMP INPUT POWER/BRANCH CIRCUITS SHALL BE #10 AWG COPPER THWN FROM THE RESPECTIVE POWER SOURCE TO THE LIGHTING CONTACTOR/RELAY PANEL. 25 AMP AND 30 AMP INPUT POWER/BRANCH CIRCUITS SHALL BE #8 AWG COPPER THWN (MIN.) FROM THE RESPECTIVE POWER SOURCE TO THE LIGHTING CONTACTOR/RELAY PANEL.
- INPUT CONTROL CIRCUIT WIRING SHALL BE #12 AWG COPPER THWN.
- FOR 120 VAC BRANCH CIRCUITS THE NEUTRAL CONDUCTOR SHALL NOT BE SWITCHED THROUGH THE RELAY CONTACTS. USE TERMINAL BLOCKS TO TRANSITION FROM VAULT BRANCH CIRCUIT WIRING TO FIELD WIRING.
- THE AIRPORT ROTATING BEACON CIRCUIT SHALL HAVE PHASE "A" SWITCHED THROUGH THE LIGHTING CONTACTOR. PHASE "B" SHALL BE UNSWITCHED FROM THE POWER SOURCE TO THE LOAD CENTER AT THE AIRPORT ROTATING BEACON.
- PROVIDE #10 AWG COPPER BONDING JUMPER FROM PANEL ENCLOSURE FRAME TO ENCLOSURE DOOR.
- PROVIDE 3-POSITION MAINTAINED CONTACT "HAND-OFF-AUTO" SELECTOR SWITCH FOR EACH LIGHTING CONTACTOR & MOUNT ON LIGHTING CONTACTOR PANEL ENCLOSURE DOOR. SELECTOR SWITCH SHALL BE SQUARE D CLASS 9001, TYPE KS43FBH13, ALLEN-BRADLEY CAT. NO. 800T-J2A, OR APPROVED EQUAL. INCLUDE LEGEND PLATE TO IDENTIFY THE DEVICE CONTROLLED (EX: "WIND CONE" OR "AIRPORT ROTATING BEACON").
- PROVIDE FRACTIONAL HORSEPOWER MOTOR MANUAL STARTER, WITH HANDLE/GUARD/LOCK OFF, IN NEMA 4 ENCLOSURE FOR FAN MOTOR & DAMPER MOTOR. INCLUDE MELTING ALLOY TYPE THERMAL OVERLOADS SIZED AS REQUIRED TO PROTECT THE RESPECTIVE MOTOR. 120 VAC MOTORS SHALL HAVE SINGLE POLE STARTERS.
- FUSING FOR CONTROL WIRING SHALL BE 10 AMP, 600 VAC, CLASS CC AS MANUFACTURED BY BUSSMANN, LITTLEFUSE, OR APPROVED EQUAL, WITH FUSE BLOCKS, WITH BOX LUG TERMINALS, SIZED AS REQUIRED FOR THE RESPECTIVE APPLICATION. INCLUDE HARDWARE FOR MOUNTING. PROVIDE ONE BOX (5 MINIMUM QUANTITY) OF EACH TYPE AND SIZE OF FUSE, UPON COMPLETION OF THE JOB FOR USE AS SPARES.



CONTROL PANEL FOR AIRFIELD NAVAIDS SCHEMATIC

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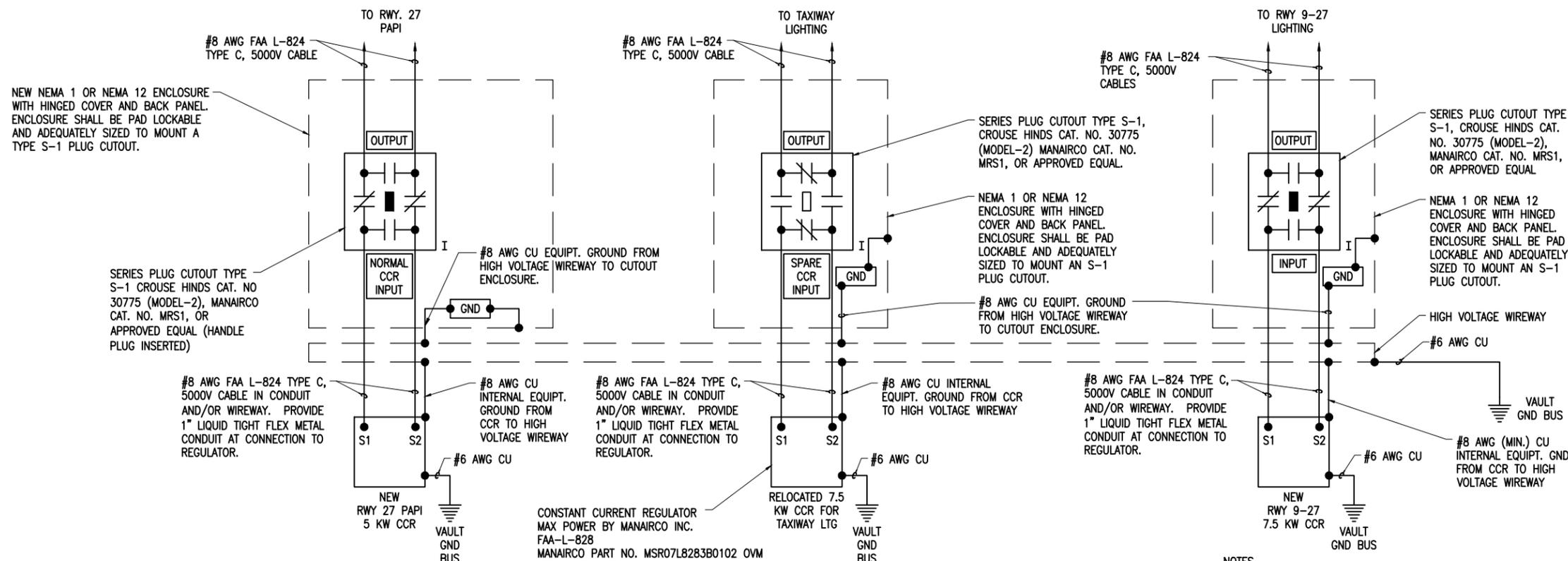
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ISSUE: 09/22/2017  
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 CAD FILE: E-609-SCM.DWG  
 DESIGN BY: KNL 07/12/2017  
 DRAWN BY: CWS 07/31/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

HIGH VOLTAGE WIRING SCHEMATIC



CONSTANT CURRENT REGULATOR  
 MAX POWER BY MANAIRCO INC.  
 FAA-L-828  
 MANAIRCO PART NO. MSR07L8283B0102 OVM  
 SERIAL NO. 1600619  
 MFR. DATE 4/17  
 WEIGHT; 600 LBS  
 ONE PHASE INPUT: 208/240VOLTS, 60HZ  
 INPUT AMPERES: 36/34  
 INTERNAL/EXTERNAL CONTROL: 120 VOLTS, 60 HZ  
 OUTPUT RATING 7.5/5.6/4.0 KW @ 1136/848/568 VOLTS AC  
 OUTPUT CURRENT STEPS: 4.8/5.5/6.6 AMPERS  
 MANAIRCO  
 P.O. BOX 111  
 MANSFIELD, OHIO 44901  
 MR180-5

HIGH VOLTAGE WIRING SCHEMATIC

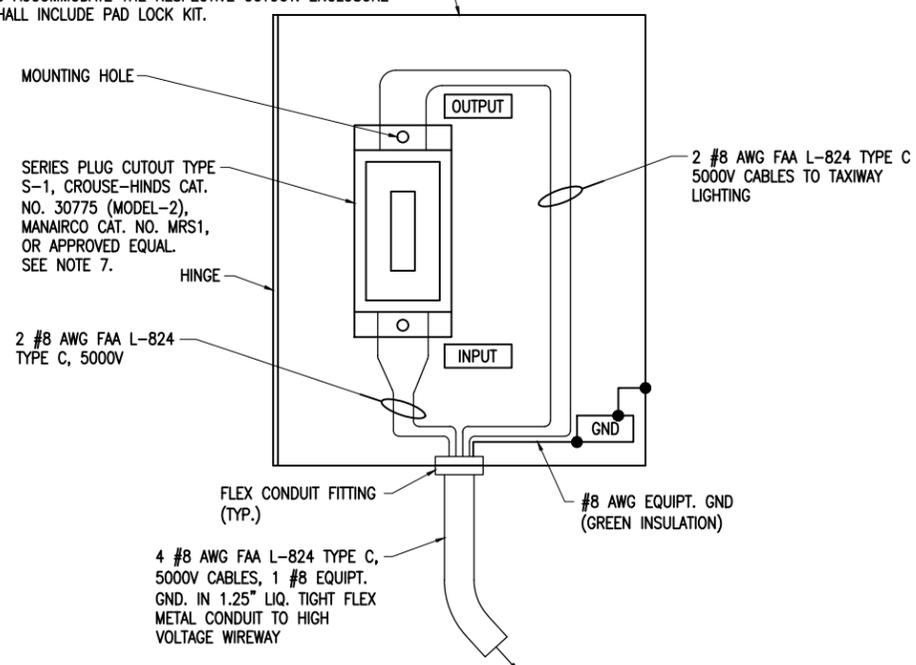
NOTES

1. PROVIDE PHENOLIC ENGRAVED LEGEND PLATES FOR EACH CONSTANT CURRENT REGULATOR (EXISTING & NEW) NOTING THE RUNWAY AND/OR TAXIWAY SERVED.
2. EACH PLUG CUTOUT CABINET SHALL BE FURNISHED WITH A PHENOLIC ENGRAVED LEGEND PLATE THAT IDENTIFIES THE RESPECTIVE RUNWAY OR TAXIWAY CIRCUIT OR REGULATOR. INCLUDE AN ADDITIONAL LEGEND PLATE LABELED "CAUTION OPERATE CUTOUTS WITH CCR SHUT OFF".
3. PROVIDE PHENOLIC ENGRAVED LEGEND PLATES FOR THE CUTOUTS TO IDENTIFY THE RESPECTIVE REGULATOR OUTPUT CONNECTION AND THE RESPECTIVE CIRCUIT LOAD CONNECTION.
4. BOND REGULATOR FRAME TO VAULT GROUND BUS WITH A DEDICATED #6 AWG BONDING JUMPER.
5. PROVIDE ADEQUATE WORKING SPACE IN FRONT OF EACH CUTOUT ENCLOSURE TO MEET NEC CLEARANCE REQUIREMENTS.
6. LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE U.L. LISTED TO MEET THE REQUIREMENTS OF NEC 350.6, SUITABLE FOR GROUNDING AND SUNLIGHT RESISTANT. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO CCR'S & TRANSFORMERS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. EXTERNAL BONDING JUMPERS USED WITH CCR INSTALLATIONS SHALL BE #6 AWG COPPER (MINIMUM). DO NOT INSTALL LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS NOT UL LISTED. CONFIRM LIQUID TIGHT FLEXIBLE METAL CONDUIT BEARS THE UL LABEL PRIOR TO INSTALLING IT.
7. SERIES PLUG CUTOUTS SHALL BE TYPE S-1, RATED 5000 VOLTS, 20-AMP. SERIES PLUG CUTOUTS SHALL BE RATED SUITABLE FOR NORMAL OPERATION WITH HANDLE REMOVED OR HANDLE INSERTED. CUTOUTS SHALL DISCONNECT THE INPUT FROM THE FROM THE OUTPUT, SHORT THE INPUT TERMINALS, AND SHORT THE OUTPUT TERMINALS WHEN THE HANDLE/PLUG IS REMOVED. SERIES PLUG CUTOUTS SHALL BE CROUSE-HINDS CAT. NO. 30775, MANAIRCO CAT. NO. MRS1, OR APPROVED EQUAL. THE RESPECTIVE MANUFACTURER SHALL CERTIFY IN WRITING THAT THEIR CUTOUT IS SUITABLE AND RATED FOR THE RESPECTIVE APPLICATION.
8. HIGH VOLTAGE & LOW VOLTAGE CIRCUITS SHALL NOT BE INSTALLED IN THE SAME WIREWAY. HIGH VOLTAGE WIRE SHALL ENTER EACH RESPECTIVE REGULATOR AT THE HIGH VOLTAGE SERIES CIRCUIT OUTPUT SECTION OF THE REGULATOR.
9. FURNISH & INSTALL A WARNING LABEL FOR EACH CUTOUT ENCLOSURES TO WARN PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS PER REQUIREMENTS OF NEC 110.16 "ARC-FLASH HAZARD WARNING".

LEGEND

- "I" DENOTES PLUG CUTOUT WITH PLUG INSERTED
- "P" DENOTES PLUG CUTOUT WITH PLUG PULLED
- "CCR" DENOTES CONSTANT CURRENT REGULATOR

14"H x 12"W x 8"D (APPROXIMATE DIMENSIONS) NEMA 1 OR NEMA 12 ENCLOSURE WITH HINGED COVER & BACK PANEL. NOTE FRONT DOOR OF ENCLOSURE NOT SHOWN FOR CLARITY. ADJUST ENCLOSURE DIMENSIONS AS NECESSARY TO ACCOMMODATE THE RESPECTIVE CUTOUT. ENCLOSURE SHALL INCLUDE PAD LOCK KIT.



SERIES PLUG CUTOUT MOUNTING DETAIL FOR TAXIWAY CIRCUIT, RUNWAY CIRCUIT, & PAPI CIRCUIT (TYPICAL FOR 3) NOT TO SCALE



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 3-17-SBGP-133/139

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 DESIGN BY: KNL 07/12/2017  
 DRAWN BY: CWS 07/31/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

LEGEND PLATE SCHEDULES

LEGEND PLATE SCHEDULE	
DEVICE	LABEL
SERVICE DISCONNECT	VAULT SERVICE DISCONNECT 120/240 VAC, 1 PH, 3W
SERVICE DISCONNECT	MAX AVAILABLE FAULT CURRENT CALCULATED TO BE _____ AMPS LINE TO LINE _____ AMPS LINE TO NEUTRAL ON (DATE)
VAULT DISTRIBUTION PANEL MAIN BREAKER	VAULT MAIN BREAKER
VAULT DISTRIBUTION PANELBOARD	VAULT MAIN DIST. PANEL 120/240VAC, 1PH, 3W
VAULT DISTRIBUTION PANELBOARD	CONDUCTOR COLOR CODING SHALL BE AS FOLLOWS: PHASE A - BLACK PHASE B - RED NEUTRAL - WHITE GROUND - GREEN
MAIN BREAKER IN VAULT PANEL	SERVICE DISCONNECT
RUNWAY 27 PAPI CCR	RWY 27 PAPI
TAXIWAY CCR	TAXIWAY
RUNWAY 9-27 CCR	RUNWAY 9-27
CUTOUT ENCLOSURE FOR RUNWAY 27 PAPI	RWY 27 PAPI CUTOUT
RUNWAY 27 PAPI CUTOUT INPUT SIDE CONNECTION	INPUT
RUNWAY 27 PAPI CUTOUT OUTPUT SIDE CONNECTION	OUTPUT
CUTOUT ENCLOSURE FOR TAXIWAY	TAXIWAY CUTOUT
TAXIWAY CUTOUT INPUT SIDE CONNECTION	INPUT
TAXIWAY CUTOUT OUTPUT SIDE CONNECTION	OUTPUT
CUTOUT ENCLOSURE FOR RUNWAY 9-27	RUNWAY 9-27 CUTOUTS
RUNWAY 9-27 CUTOUT INPUT SIDE CONNECTION	INPUT
RUNWAY 9-27 CUTOUT OUTPUT SIDE CONNECTION	OUTPUT
EACH CUTOUT ENCLOSURE (3 LEGEND PLATES)	CAUTION OPERATE CUTOUTS WITH CCR'S SHUT OFF

LEGEND PLATE SCHEDULE (CONTINUED)	
DEVICE	LABEL
RADIO RELAY INTERFACE PANEL	RADIO RELAY INTERFACE PANEL
WHERE PAPI RADIO INTERFACE PANEL IS SEPARATE PROVIDE LEGEND PLATE LABELED	PAPI RADIO RELAY INTERFACE PANEL
CONTACTOR PANEL FOR AIRFIELD NAVAIDS AND VAULT FAN	CONTACTOR PANEL FOR AIRFIELD NAVAIDS, & VAULT FAN
CONTACTOR PANEL FOR AIRFIELD NAVAIDS AND VAULT FAN	NOTICE CONTACTORS HAVE REMOTE LOCATED CONTROLS AND MAY ACTIVATE AT ANY TIME
LOW VOLTAGE WIREWAY (PROVIDE 8 LEGEND PLATES 1/2" HIGH BLACK LETTERS WHITE BACKGROUND)	LOW VOLTAGE
HIGH VOLTAGE WIREWAY (PROVIDE 4 LEGEND PLATES 1/2" HIGH BLACK LETTERS WHITE BACKGROUND)	HIGH VOLTAGE
VAULT GROUND BUS (PROVIDE 4 LEGEND PLATES 1/2" HIGH WHITE LETTERS GREEN BACKGROUND; INSTALL ABOVE OR BELOW GROUND BUS)	VAULT GROUND BUS
GROUNDING ELECTRODE CONDUCTORS TERMINATED ON VAULT GROUND BUS. (PROVIDE 3 LEGEND PLATES & SECURE TO CONDUCTORS WITH NYLON STRING OR CABLE TIES)	DO NOT DISCONNECT
REMOTE PHOTOCELL BYPASS SWITCH	PHOTOCELL BYPASS SWITCH



"DANGER - HIGH VOLTAGE KEEP OUT" SIGN

PROVIDE WARNING SIGN ON VAULT EXTERIOR DOORS LABELED "DANGER - HIGH VOLTAGE - KEEP OUT" PER THE REQUIREMENTS OF NEC 110.34 (C). PROVIDE MINIMUM OF 2 SIGNS (ONE ON EACH DOOR TO THE VAULT). SIGNS SHALL BE APPROXIMATELY 10" X 14"W.



"DANGER - HIGH VOLTAGE" SIGN

FURNISH AND INSTALL "DANGER - HIGH VOLTAGE" LABELS/SIGNS FOR EACH CUTOUT ENCLOSURE, EACH CONSTANT CURRENT REGULATOR, AND THE HIGH VOLTAGE WIREWAY, TO COMPLY WITH FAA AC 150/5340-26B "MAINTENANCE OF AIRPORT VISUAL AID FACILITIES". LABELS SHALL BE APPROXIMATELY 4" X 6" OR 5" X 7".

NOTES:

- LEGEND PLATES SHALL BE WEATHERPROOF ENGRAVED PLASTIC OR PHENOLIC MATERIAL, 1/4" HIGH BLACK LETTERS ON A WHITE BACKGROUND UNLESS NOTED OTHERWISE. SECURE WITH WEATHERPROOF ADHESIVE AND MACHINE SCREWS. FURNISH ADDITIONAL LEGEND PLATES WHERE REQUIRED BY CODE, FOR ADDITIONAL EQUIPMENT, AS DETAILED HEREIN ON THE PLANS, AND AS NOTED IN THE SPECIAL PROVISION SPECIFICATIONS.
- FURNISH & INSTALL A WEATHERPROOF WARNING LABEL FOR EACH SAFETY SWITCH, PANELBOARD, LOAD CENTER, CUTOUT, & CONTROL PANEL TO WARN PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS, PER THE REQUIREMENTS OF NEC 110.16 "ARC-FLASH HAZARD WARNING".
- FAULT CURRENT INFORMATION TO BE PROVIDED BY SERVING ELECTRIC UTILITY COMPANY. CONTACT PROJECT ENGINEER TO CONFIRM FAULT CURRENT CALCULATIONS.



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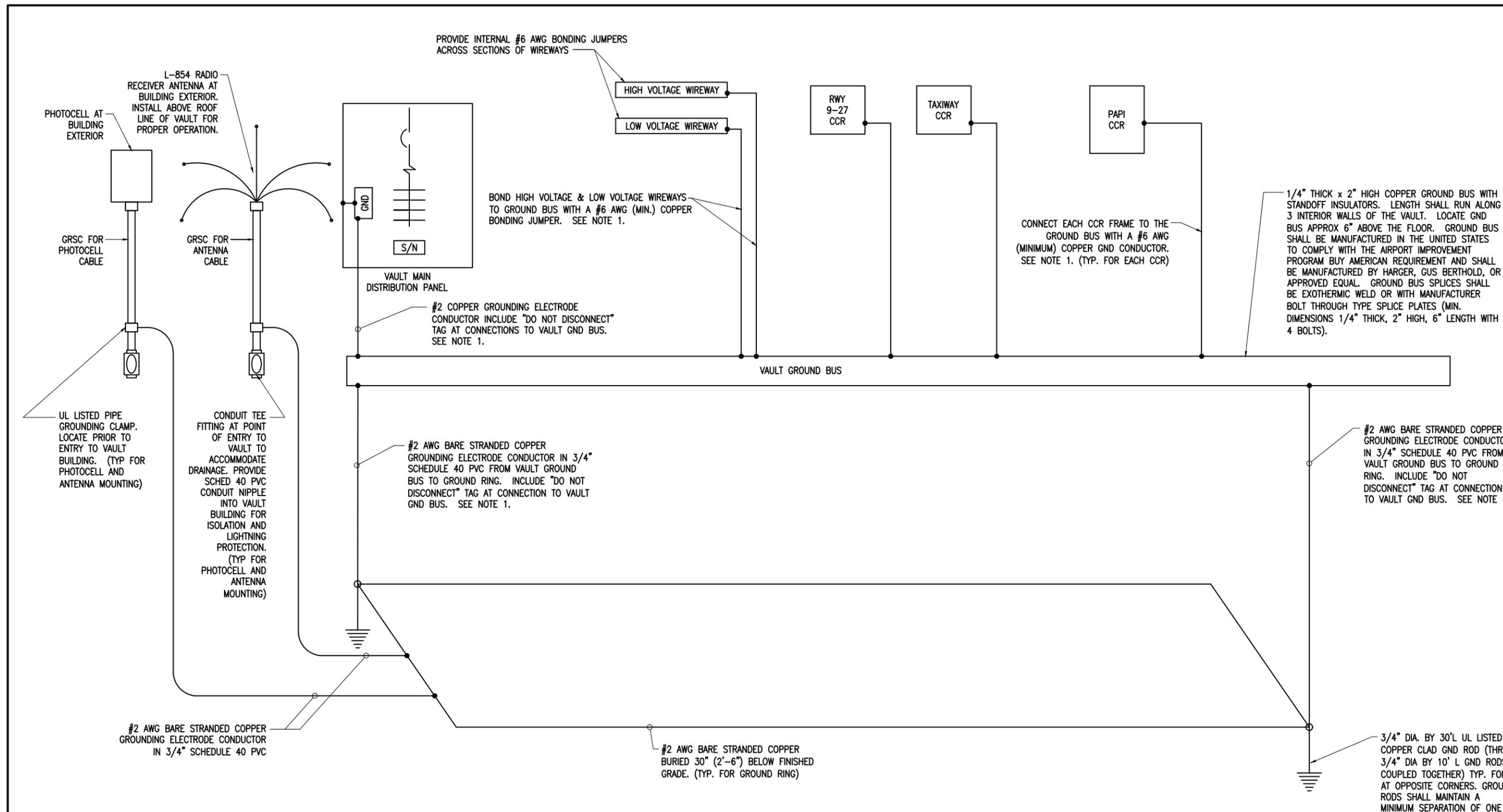
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NO.	DATE	DESCRIPTION		
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ISSUE: 09/22/2017  
PROJECT NO: 17A0002  
CAD FILE: E-611-DIA.DWG  
DESIGN BY: KNL 07/12/2017  
DRAWN BY: CWS 07/31/2017  
REVIEWED BY: BSS 08/21/2017

SHEET TITLE

VAULT GROUND BUS RISER



**VAULT GROUND BUS RISER**

- NOTES**
1. CONNECTIONS TO GROUND BUS BAR SHALL BE WITH 2-HOLE TONGUE LONG BARREL COMPRESSION LUGS BOLTED TO THE BUS BAR.
  2. ALL CONNECTIONS TO THE GROUND RING AND GROUND RODS SHALL BE EXOTHERMIC WELD.
  3. ALL INSULATED GROUND WIRES SHALL HAVE GREEN COLORED INSULATION FOR ALL CONDUCTOR AWG AND KCML.
  4. ALL WORK SHOWN ON THIS SHEET SHALL BE PAID FOR UNDER ITEM AR109200 "INSTALL ELECTRICAL EQUIPMENT" PER LUMP SUM.
  5. TEST GROUND RING AND RECORD RESULTS. WHERE GROUND RESISTANCE TEST RESULTS FOR THE VAULT GROUND RING EXCEED 10 OHMS CONTACT PROJECT ENGINEER FOR FURTHER DIRECTION.

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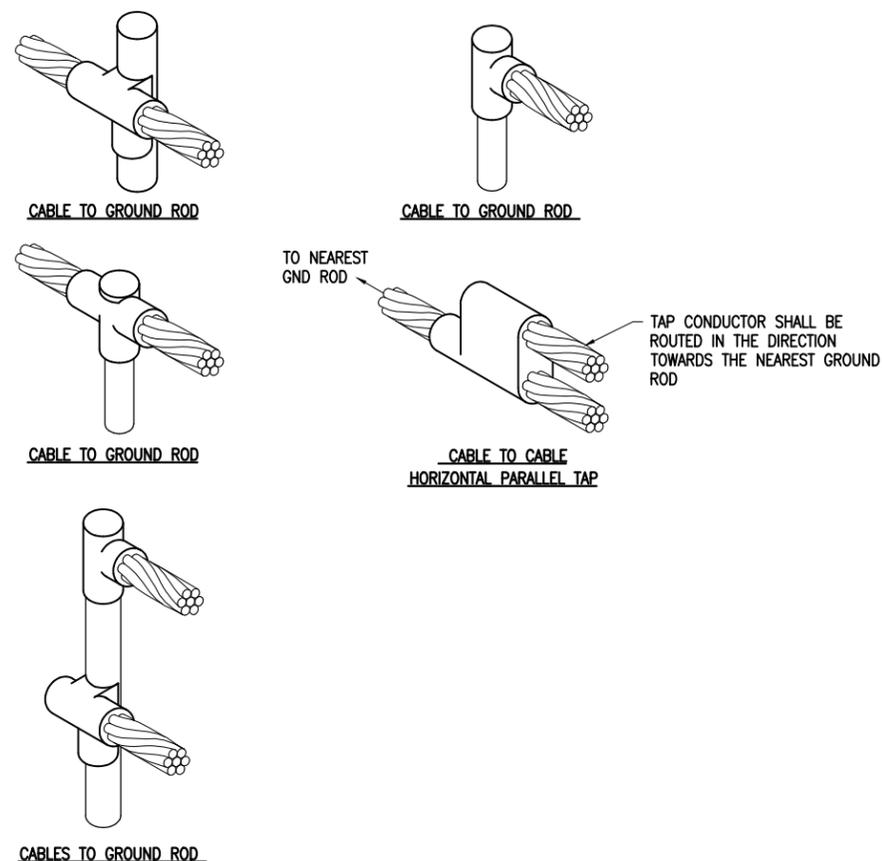
Contract No. PN010

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ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: E-512-DTL.DWG  
 DESIGN BY: KNL 07/12/2017  
 DRAWN BY: CWS 07/31/2017  
 REVIEWED BY: BSS 08/21/2017

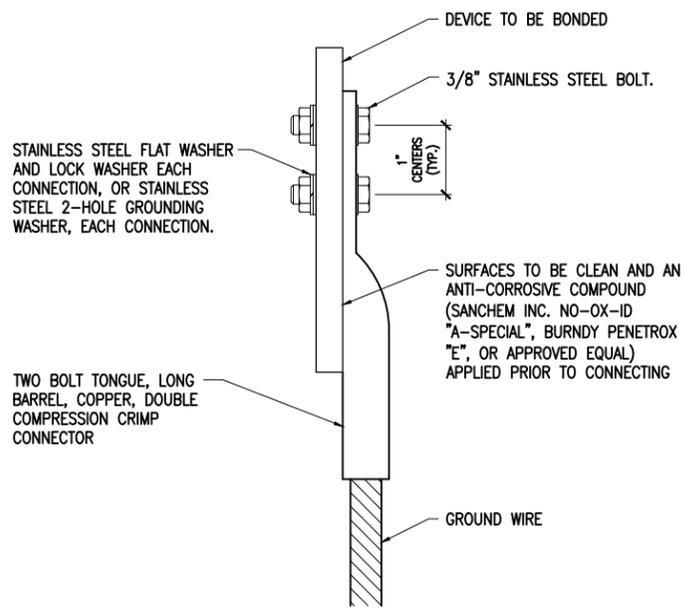
SHEET TITLE

GROUNDING DETAILS



TO NEAREST GND ROD

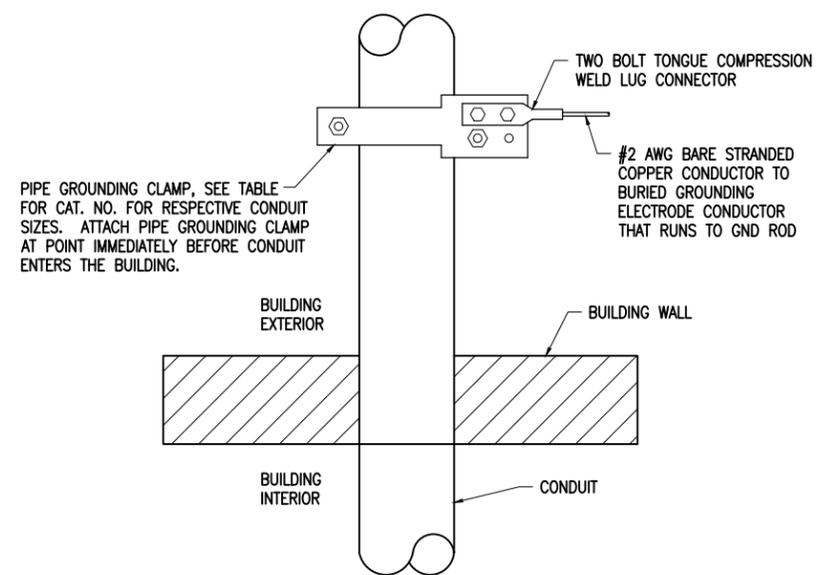
TAP CONDUCTOR SHALL BE ROUTED IN THE DIRECTION TOWARDS THE NEAREST GROUND ROD



WIRE SIZE	BURNDY CAT. NO.	THOMAS & BETTS CAT. NO.	PENN-UNION CAT. NO.
#8 AWG STRANDED	YA8C-2TC38	256-30695-1157	BBLU-8D-2TC38
#6 AWG SOLID	YA8C-2TC38 OR YGA6C-2TC38E2G1		
#6 AWG STRANDED	YA6C-2TC38	256-30695-1158	BBLU-6D-2TC38
#4 AWG STRANDED	YA4C-2TC38	256-30695-1159	BBLU-4D-2TC38
#2 AWG STRANDED	YA2C-2TC38	256-30695-1160	BBLU-2D-2TC38
#2 AWG SOLID	YA3C-2TC38	256-30695-1160	BBLU-3D-2TC38
#1/0 AWG STRANDED	YA25-2TC38	256-30695-1162	BBLU-1/0D-2TC38
#2/0 AWG STRANDED	YA26-2TC38	256-30695-1116	BBLU-2/0D-2TC38
#3/0 AWG STRANDED	YA27-2TC38	54816BE	BBLU-3/0D-2TC38
#4/0 AWG STRANDED	YA28-2TC38	256-30695-1117	BBLU-4/0D-2TC38

- NOTES**
- ALL CONNECTIONS TO GROUND BUS BAR SHALL BE WITH 2 HOLE LONG BARREL COMPRESSION LUGS BOLTED TO THE BUS BAR.
  - GROUND WIRE CONNECTIONS TO EQUIPMENT SHALL BE WITH 2 HOLE TONGUE LONG BARREL COMPRESSION LUGS BOLTED TO THE DEVICE OR WITH THE RESPECTIVE EQUIPT MANUFACTURER'S LUG OR TERMINAL WHERE APPLICABLE.
  - GROUNDING ELECTRODE CONDUCTORS, BONDING JUMPERS, & INDIVIDUAL GROUND WIRES SHALL NOT BE INSTALLED IN METAL CONDUIT. WHERE PLASTIC CONDUIT IS USED FOR INDIVIDUAL GROUND WIRES, DO NOT COMPLETELY ENCIRCLE THE CONDUIT WITH FERROUS AND/OR MAGNETIC MATERIALS. WHERE METAL CLAMPS ARE INSTALLED USE NYLON BOLTS, NUTS, WASHERS, & SPACERS TO INTERRUPT A COMPLETE METALLIC APTH FROM ENCIRCLING THE CONDUIT.
  - ALL CONNECTIONS SHALL BE COATED WITH A CORROSION PREVENTATIVE COMPOUND (SANCHEM INC. NO-OX-ID "A-SPECIAL", BURNDY PENETROX E, OR APPROVED EQUAL) BEFORE JOINING. ALL COPPER BUS BARS SHALL BE CLEANED PRIOR TO MAKING CONNECTIONS TO REMOVE SURFACE OXIDATION. CLEAN SURFACES, OF RESPECTIVE DEVICES TO BE BONDED, TO BARE METAL, PER NEC 250-12.

**GROUNDING LUG CONNECTION DETAIL**



HUBBELL ELECTRICAL CAT. NO.	BURNDY CAT. NO.	CONDUIT SIZE
GAR3902TC	GAR3902TC	1/2" - 1"
GAR3903TC	GAR3903TC	1 1/4" - 2"
GAR3904TC	GAR3904TC	2 1/2" - 3 1/2"
GAR3905TC	GAR3905TC	4" - 5"
GAR3906TC	GAR3906TC	6"
GAR3907TC	GAR3907TC	8"

- NOTES**
- EXTERIOR CONDUIT GROUNDING IS REQUIRED FOR THE PHOTOCCELL CONDUIT, RADIO ANTENNA CONDUIT, & OTHER CONDUITS EXTENDING TO THE ROOF LEVEL.
  - CONNECTIONS TO BURIED GROUNDING ELECTRODE CONDUCTOR SHALL BE EXOTHERMIC WELD.

**EXTERIOR CONDUIT GROUNDING DETAIL**

- DETAIL NOTES**
- ALL BELOW GRADE CONNECTIONS TO GROUND RODS & GROUND RING CONDUCTORS SHALL BE EXOTHERMIC WELD TYPE CONNECTIONS. EXOTHERMIC WELDS SHALL BE CADWELD AS MANUFACTURED BY PENTAIR ERICO PRODUCTS, ULTRAWELD AS MANUFACTURED BY HARGER LIGHTNING PROTECTION & GROUNDING EQUIPMENT, OR THERMOWELD AS MANUFACTURED BY CONTINENTAL INDUSTRIES OR APPROVED EQUAL. VERIFY PROPER SIZES, MOLDS, TYPES, AND REQUIREMENTS FOR THE RESPECTIVE APPLICATION WITH THE MANUFACTURER, AND INSTALL PER THEIR DIRECTIONS.
  - FOR APPLICATIONS TO GALVANIZED STEEL OR PAINTED STEEL, REMOVE GALVANIZING AND/OR PAINT & CLEAN THE SURFACE TO EXPOSE BARE STEEL BEFORE MAKING EXOTHERMIC WELD CONNECTION.
  - INDIVIDUAL GROUNDING ELECTRODE CONDUCTORS SHALL NOT BE INSTALLED IN METAL CONDUIT. INSTALL GROUNDING ELECTRODE CONDUCTORS IN SCHED 40 PVC CONDUIT AS REQUIRED IN FOUNDATIONS, FOR PROTECTION, WHERE ENTERING ENCLOSURES, ETC. WHERE PLASTIC CONDUIT IS USED FOR INDIVIDUAL GROUND WIRES, DO NOT COMPLETELY ENCIRCLE THE CONDUIT WITH FERROUS AND/OR MAGNETIC MATERIALS. WHERE METAL CLAMPS ARE INSTALLED USE NYLON BOLTS, NUTS, WASHERS, & SPACERS TO INTERRUPT A COMPLETE METALLIC PATH FROM ENCIRCLING THE CONDUIT.

**EXOTHERMIC WELD DETAILS**

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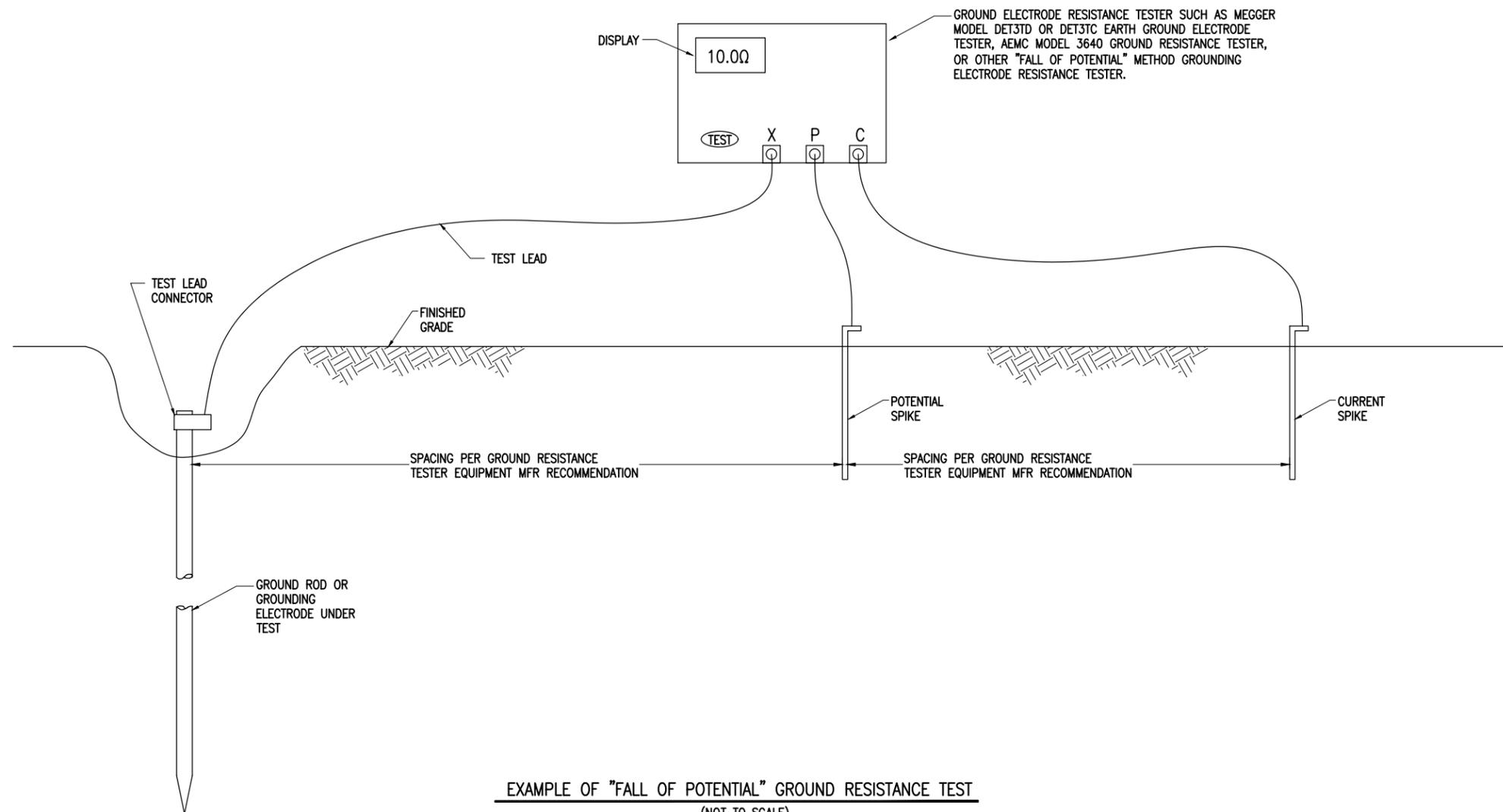
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 PROJECT NO: 17A0002  
 CAD FILE: E-513-DETL.DWG  
 DESIGN BY: KNL 07/12/2017  
 DRAWN BY: CWS 07/31/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

GROUND RESISTANCE TESTING DETAILS



EXAMPLE OF "FALL OF POTENTIAL" GROUND RESISTANCE TEST  
 (NOT TO SCALE)

NOTES

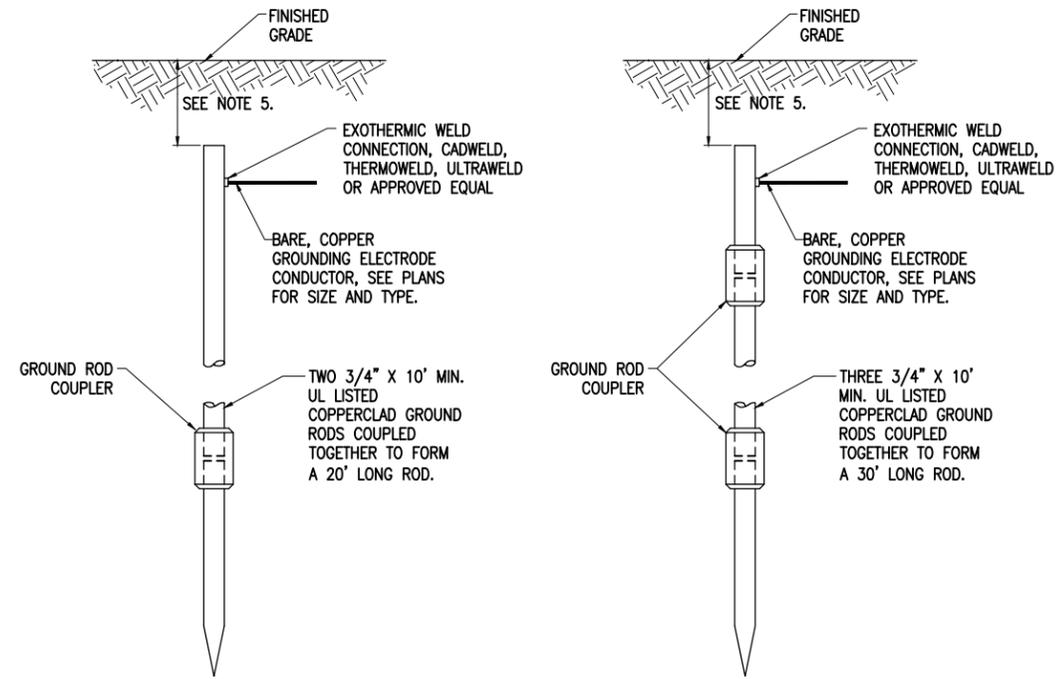
- CONTRACTOR SHALL TEST AND RECORD THE RESISTANCE FOR EACH MADE ELECTRODE GROUND ROD/GROUND FIELD/GROUND RING WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUNDING ELECTRODE SYSTEMS. IF GROUND RESISTANCE EXCEEDS 25 OHMS, CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION. COPIES OF GROUND ROD TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN, AND THE PROJECT ENGINEER.
- FOR EACH AIRFIELD LIGHT FIXTURE, TAXI GUIDANCE SIGN, SPLICE CAN AND NAVAID THE CONTRACTOR SHALL TEST THE MADE ELECTRODE GROUND SYSTEM WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUND SYSTEMS. TEST RESULTS SHALL BE RECORDED FOR EACH AIRFIELD LIGHT FIXTURE, TAXI GUIDANCE SIGN, AND NAVAIDS INSTALLATION. IF GROUND RESISTANCE EXCEEDS 25 OHMS, CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION. COPIES OF THE GROUND SYSTEM TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER / RESIDENT TECHNICIAN, AND THE PROJECT ENGINEER.
- GROUND RESISTANCE TEST SHALL BE CONDUCTED IN ACCORDANCE WITH THE RESPECTIVE GROUND ELECTRODE RESISTANCE TESTING EQUIPMENT MANUFACTURER'S INSTRUCTIONS.
- RECORD SITE CONDITIONS DURING TESTS.
- "FALL OF POTENTIAL" TYPE GROUND ELECTRODE RESISTANCE TESTER IS RECOMMENDED FOR TESTING INDIVIDUAL STAND ALONE GROUND RODS.

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**GROUNDING NOTES**

- THE CONTRACTOR SHALL FURNISH AND INSTALL ALL GROUNDING AS MAY BE NECESSARY OR REQUIRED TO MAKE A COMPLETE GROUNDING SYSTEM AS REQUIRED BY THE LATEST NATIONAL ELECTRICAL CODE (NFPA 70) IN FORCE AND FAA-STD-019e (LIGHTNING AND SURGE PROTECTION, GROUNDING, BONDING, AND SHIELDING REQUIREMENTS FOR FACILITIES AND ELECTRONIC EQUIPMENT). 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:
- FURNISH AND INSTALL GROUND RODS AS DETAILED HEREIN. GROUND RODS FOR AIRFIELD LIGHTING (RUNWAY LIGHTING, TAXIWAY LIGHTING, TAXI GUIDANCE SIGNS & NAVAIDS) SHALL BE MINIMUM 3/4-IN. DIAMETER BY 20-FT LONG, UL-LISTED COPPER CLAD WITH 10-MIL MINIMUM COPPER COATING (TWO 3/4-IN. DIAMETER BY 10-FT LONG, UL-LISTED, COPPER CLAD GROUND RODS COUPLED TOGETHER). GROUND RODS FOR OTHER APPLICATIONS SHALL BE MINIMUM 3/4-IN. DIAMETER BY 30-FT LONG, UL-LISTED, COPPER CLAD WITH 10-MIL MINIMUM COPPER COATING. GROUND RODS SHALL BE SPACED OR AS DETAILED ON THE RESPECTIVE PLANS, AND IN NO CASE SPACED LESS THAN ONE ROD LENGTH APART. ALL CONNECTIONS TO GROUND RODS AND THE GROUND RING SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY PENTAIR ERICO PRODUCTS, INC., THERMOWELD BY CONTINENTAL INDUSTRIES, INC., ULTRAWELD BY HARGER, 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.
- CONTRACTOR SHALL TEST EACH MADE ELECTRODE GROUND ROD/GROUND FIELD/GROUND RING WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUND FIELD SYSTEMS. IF GROUND RESISTANCE EXCEEDS 25 OHMS, CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION. COPIES OF GROUND ROD TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN, AND THE PROJECT ENGINEER.
- ALL PRODUCTS ASSOCIATED WITH THE GROUNDING SYSTEM SHALL BE UL-LISTED AND LABELED.
- ALL BOLTED OR MECHANICAL CONNECTIONS SHALL BE COATED WITH A CORROSION PREVENTATIVE COMPOUND BEFORE JOINING, SANCHEM INC. "NO-OX-ID "A-SPECIAL" COMPOUND, BURNDY PENTROX E, OR APPROVED EQUAL.
- METALLIC SURFACES TO BE JOINED SHALL BE PREPARED BY THE REMOVAL OF ALL NON-CONDUCTIVE MATERIAL, PER 2017 NATIONAL ELECTRICAL CODE ARTICLE 250-12. ALL COPPER BUS BARS MUST BE CLEANED PRIOR TO MAKING CONNECTIONS TO REMOVE SURFACE OXIDATION.
- 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.). 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
- ALL CONNECTIONS, LOCATED ABOVE GRADE, BETWEEN THE DIFFERENT TYPES OF GROUNDING CONDUCTORS SHALL BE MADE USING UL-LISTED DOUBLE COMPRESSION CRIMP TYPE 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.
- ALL METAL EQUIPMENT ENCLOSURES, CONDUITS, CABINETS, BOXES, RECEPTACLES, MOTORS, ETC. SHALL BE BONDED TO THE RESPECTIVE GROUNDING SYSTEM.
- PROVIDE ALL BOXES FOR PROPOSED OUTLETS, SWITCHES, CIRCUIT BREAKERS, ETC. WITH GROUNDING SCREWS. PROVIDE ALL PANELBOARD, SWITCHGEAR, ETC., ENCLOSURES WITH GROUNDING BARS WITH INDIVIDUAL SCREWS, LUGS, CLAMPS, ETC., FOR EACH OF THE GROUNDING CONDUCTORS THAT ENTER THEIR RESPECTIVE ENCLOSURES.
- 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 2017 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.

- ALL EXTERIOR METAL CONDUIT, WHERE NOT ELECTRICALLY CONTINUOUS BECAUSE OF MANHOLES, HANDHOLES, NON-METALLIC JUNCTION BOXES, ETC., SHALL BE BONDED TO ALL OTHER METAL CONDUIT IN THE RESPECTIVE DUCT RUN, AND AT EACH END, WITH A COPPER-BONDING JUMPER SIZED IN CONFORMANCE WITH 2017 NEC 250-102. WHERE METAL CONDUITS TERMINATE IN AN ENCLOSURE (SUCH AS A MOTOR CONTROL CENTER, SWITCHBOARD, ETC) WHERE THERE IS NOT ELECTRICAL CONTINUITY WITH THE CONDUIT AND THE RESPECTIVE ENCLOSURE, PROVIDE A BONDING JUMPER FROM THE RESPECTIVE ENCLOSURE GROUND BUS TO THE CONDUIT SIZED PER 2017 NEC 250-102.
- IT IS THE INTENT OF THIS SPECIFICATION THAT ALL MOTOR FRAMES, PUMP BASES ELECTRICAL EQUIPMENT ENCLOSURES, PANEL HOUSINGS, CONDUITS, BOXES, ETC. HAVE A CONTINUOUS COPPER WIRE GROUND CONNECTION AND SHALL BE POSITIVELY BONDED TO THE RESPECTIVE GROUNDING SYSTEM. CONDUIT CONNECTORS WILL NOT BE CONSIDERED AS ADEQUATE GROUNDING.
- PROVIDE A POSITIVE GROUND BOND FOR ALL OUTLET BOXES, ELECTRICAL EQUIPMENT ENCLOSURES, GROUNDING RECEPTACLES, TOGGLE SWITCHES, ETC. INSTALL A GROUNDING CONDUCTOR IN ALL WIRE AND CABLE RACEWAYS. GROUND CONDUCTOR TO HAVE 600-VOLT INSULATION AND BE IDENTIFIED BY A CONTINUOUS GREEN COLOR COATING. THEY SHALL BE USED SOLELY FOR GROUNDING PURPOSES AND BE ENTIRELY SEPARATE FROM WHITE GROUNDED NEUTRAL CONDUCTOR, EXCEPT AT SUPPLY SIDE OF SERVICE DISCONNECTING MEANS, WHERE GROUNDING AND NEUTRAL SYSTEMS ARE TO BE DISCONNECTED TO SERVICE GROUND.
- EACH AND ALL GROUNDED CASED AND METAL PARTS ASSOCIATED WITH ELECTRICAL EQUIPMENT SHALL BE TESTED FOR CONTINUITY OF CONNECTION WITH GROUND BUS SYSTEM BY CONTRACTOR IN PRESENCE OF OWNER'S REPRESENTATIVE.
- ALL CONNECTIONS BETWEEN THE DIFFERENT TYPES OF GROUNDING CONDUCTORS ABOVE GRADE SHALL BE MADE USING BOLTED GROUND CONNECTORS. GROUND LUGS SHALL BE PROVIDED IN ALL ENCLOSURES AND WIRING TERMINATION JUNCTION BOXES. EQUIPMENT GROUNDS AND GROUNDING CONDUCTOR SHALL BE CONNECTED TO THESE GROUND LUGS. 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 & BETTS OR APPROVED EQUAL.
- BOND ALL NONCURRENT-CARRYING PARTS OF METAL EQUIPMENT TO GROUND SYSTEM.
- BUILDING STRUCTURAL STEEL SYSTEM SHALL BE BONDED TO ELECTRICAL GROUND SYSTEM.
- INSTALL GROUNDING ELECTRODE CONDUCTORS, LIGHTNING PROTECTION DOWN CONDUCTORS AND SEPARATE GROUND CONDUCTORS IN SCHEDULE 40 OR SCHEDULE 80 PVC CONDUIT OR EXPOSED WHERE ACCEPTABLE TO LOCAL CODES. WHERE GROUNDING ELECTRODE CONDUCTORS, LIGHTNING PROTECTION DOWN CONDUCTORS OR INDIVIDUAL GROUND CONDUCTORS ARE RUN IN PVC CONDUIT, DO NOT COMPLETELY ENIRCLE CONDUIT WITH FERROUS AND/OR MAGNETIC MATERIALS. USE NON-METALLIC REINFORCED FIBERGLASS STRUT SUPPORT. WHERE METAL CONDUIT CLAMPS ARE INSTALLED, USE NYLON BOLTS, NUTS, WASHERS AND SPACERS TO INTERRUPT A COMPLETE METALLIC PATH FROM ENCLICLING THE CONDUIT. THIS IS REQUIRED TO AVOID GIRDLING OF GROUND CONDUCTORS. GIRDLING OF A GROUND CONDUCTOR IS THE RESULT OF PLACING THE CONDUCTOR IN A RING OF MAGNETIC MATERIAL. THIS RING COULD BE A METALLIC CONDUIT, U-BOLT OR STRUT SUPPORT PIPE CLAMP, OR OTHER SUPPORT HARDWARE. THE RESULT OF GIRDLING GROUND CONDUCTORS SIGNIFICANTLY INCREASES THE INDUCTIVE IMPEDANCE OF THE GROUND CONDUCTOR. INDUCTIVE AND CAPACITIVE IMPEDANCE IS A TYPE OF RESISTANCE THAT OPPOSES THE FLOW OF ALTERNATING CURRENT. ANY INCREASE IN THE IMPEDANCE OF A GROUND CONDUCTOR REDUCES ITS ABILITY TO EFFECTIVELY MITIGATE RADIO FREQUENCY NOISE IN THE GROUND SYSTEM. THE CONDITION WHERE A GROUND CONDUCTOR IS GIRDLING DURING A LIGHTNING STRIKE RESULTS IN PHENOMENA KNOWN AS SURGE IMPEDANCE LOADING. SURGE IMPEDANCE LOADING IS A RESULT OF VOLTAGE AND CURRENT REACHING 500,000 VOLTS AND 10,000 AMPS FOR A SHORT DURATION. GIRDLING FURTHER INCREASES THE IMPEDANCE AT LIGHTNING FREQUENCIES OF 100 KILOHERTZ TO 100 MEGAHERTZ. AT THESE POWER AND FREQUENCY LEVELS ANY INCREASE IN THE IMPEDANCE OF THE GROUND CONDUCTOR MUST BE CONTROLLED. DURING LIGHTNING DISCHARGE CONDITIONS A LOW INDUCTIVE IMPEDANCE PATH IS MORE IMPORTANT THAN A LOW DC RESISTANCE PATH.
- IF LOCAL CODES DICTATE THAT INDIVIDUAL GROUNDING CONDUCTORS MUST BE RUN IN METAL CONDUIT OR RACEWAY, THEN THE CONDUIT OR RACEWAY MUST BE BONDED AT EACH END OF THE RUN WITH A BONDING JUMPER SIZED EQUAL TO THE INDIVIDUAL GROUNDING CONDUCTOR OR AS REQUIRED BY 2017 NEC 250-102. NOTE THIS DOES NOT APPLY TO AC EQUIPMENT GROUNDING CONDUCTORS RUN WITH AC CIRCUITS.
- WHERE A CONFLICT IS DETERMINED WITH RESPECT TO GROUNDING REQUIREMENTS PER MANUFACTURER INSTALLATION INSTRUCTIONS, NEC, AND/OR THE CONTRACT DOCUMENTS, CONTACT THE RESIDENT ENGINEER OR PROJECT ENGINEER FOR FURTHER DIRECTIONS.
- GROUND RODS SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA FROM 100 PERCENT DOMESTIC STEEL TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN REQUIREMENTS AND THE STEEL PRODUCTS PROCUREMENT ACT.



**20 FT. GROUND ROD**

**30 FT. GROUND ROD**

**GROUND RODS**

(NOT TO SCALE)

**NOTES**

- TYPE AND MINIMUM NUMBER OF GROUND RODS SHALL BE AS SPECIFIED ON THE PLAN.
- THE RESISTANCE TO GROUND OF THE GROUNDING ELECTRODE SYSTEM FOR THE AIRPORT ELECTRICAL VAULT SHALL NOT EXCEED 10 OHMS. THE RESISTANCE TO GROUND OF THE GROUNDING ELECTRODES FOR AIRFIELD LIGHTING, NAVAIDS, AND SPLICE CANS SHALL NOT EXCEED 25 OHMS.
- COST OF GROUND RODS IS INCIDENTAL TO THE ASSOCIATED ITEMS REQUIRING GROUNDING UNLESS OTHERWISE SPECIFIED.
- GROUND RODS SHALL BE SPACED AS DETAILED ON THE PLANS AND SHALL NOT BE SPACED LESS THAN ONE ROD LENGTH APART.
- TOP OF GROUND RODS FOR VAULT GROUND RING SHALL BE 30" MIN. BELOW FINISHED GRADE. GROUND RING CONDUCTORS SHALL BE 40" MINIMUM BELOW GRADE TO BE BELOW THE FROST LINE FOR TAZEWELL COUNTY ILLINOIS. TOP OF GROUND RODS FOR OTHER APPLICATIONS SHALL BE 12" MINIMUM BELOW GRADE UNLESS DETAILED OTHERWISE HEREIN.
- GROUND RODS FOR VAULT GROUND RING SHALL BE A MINIMUM 3/4-INCH DIAMETER BY 30-FT LONG UL LISTED COPPER CLAD.
- GROUND RODS FOR PAPI UNITS SHALL BE 3/4 - INCH DIAMETER BY 20 FT LONG.
- GROUND RODS FOR WIND CONE SHALL BE 3/4-IN DIAMETER BY 20 FT LONG. TWO GROUND RODS SPACED MINIMUM 20 FT APART (ONE ROD LENGTH APART) SHALL BE FURNISHED AND INSTALLED FOR THE WIND CONE.
- GROUND RODS FOR INDIVIDUAL SPLICE CANS SHALL BE TWO 3/4-IN DIAMETER BY 20 FT LONG GROUND RODS SPACED MINIMUM OF 20 FT APART (ONE ROD LENGTH APART)



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IL Proj. No.: C15-4578

SBG No:  
 3-17-SBGP-133/139

Contract No. PN010

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: 09/22/2017  
 PROJECT NO: 17A0002  
 CAD FILE: E-004-GND.DWG  
 DESIGN BY: KNL 07/12/2017  
 DRAWN BY: CWS 07/31/2017  
 REVIEWED BY: BSS 08/21/2017

SHEET TITLE

**GROUNDING NOTES**