**IDOT LETTING: JUNE 16, 2017** 

MO006 TOTAL SHEETS = 38

# CONSTRUCTION PLANS - FEBRUARY 17, 2017 CONSTRUCT AN ELECTRICAL VAULT AND INSTALL A PAPI ON RUNWAY END 3

CITY OF MONMOUTH
MONMOUTH MUNICIPAL AIRPORT (C66)
MONMOUTH, WARREN COUNTY, ILLINOIS

IDA PROJECT NO. C66-4265 SBG PROJECT NO. 3-17-SBGP-105 AND 3-17-SBGP-111

#### **SCOPE OF WORK**

THIS WORK SHALL CONSIST OF REMOVAL OF THE EXISTING ELECTRICAL VAULT AND INSTALLATION OF A NEW AIRPORT ELECTRICAL VAULT, WITH THE ASSOCIATED EQUIPMENT, HANDHOLES, MANHOLES, DUCT WORK AND CABLING. INCLUDED WITH THIS PROJECT WILL BE THE INSTALLATION OF A PAPI SYSTEM ON RUNWAY END 3 AND THE ASSOCIATED CABLING.

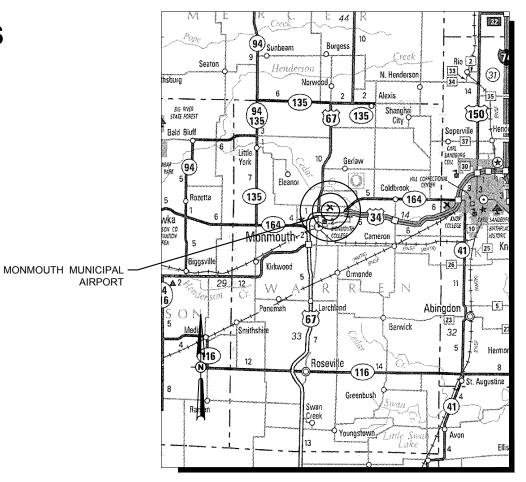
#### **PLANS PREPARED BY:**



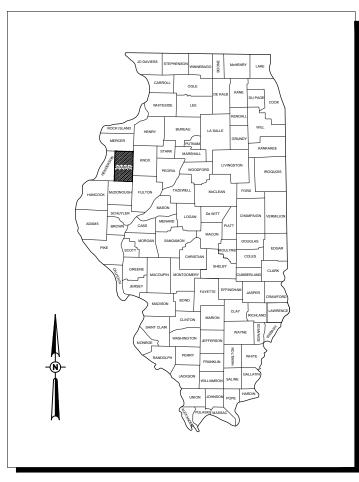
HANSON PROFESSIONAL SERVICES INC. 1525 South Sixth Street Springfield, Illinois 62703-2886 Telephone: 217.788.2450 Fax: 217.788.2503

#### 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.

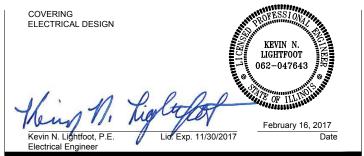


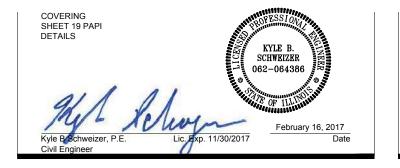




**LOCATION MAP** 









SUMMARY OF QUANTITIES					
ITEM NO.	DESCRIPTION	UNIT	TOTAL QUANTITY	AS-BUILT QUANTITY	
AR108086	1/C #6 XLP-USE	L.F.	4,870		
AR108158	1/C #8 5 KV UG CABLE IN UD	L.F.	2,870		
AR108656	3/C #6 600 V UG CABLE IN UD	L.F.	750		
AR109110	ERECT PREFABRICATED VAULT	L.S.	1		
AR109200	INSTALL ELECTRICAL EQUIPMENT	L.S.	1		
AR109901	REMOVE ELECTRICAL VAULT	L.S.	1		
AR110013	3" DIRECTIONAL BORE	L.F.	1,040		
AR110203	3" PVC DUCT, DIRECT BURY	L.F.	1,550		
AR115610	ELECTRICAL HANDHOLE	EA.	5		
AR125565	SPLICE CAN	EA.	3		
AR125620	ABBREVIATED PAPI (L-881 SYSTEM)	EA.	1		
AR150510	ENGINEER'S FIELD OFFICE	L.S.	1		
AR150520	MOBILIZATION	L.S.	1		
AR209510	CRUSHED AGGREGATE BASE COURSE	TON	15		

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7	EXISTING LIGHTING PLAN RWY. 3-21 STA. 14+00 TO STA. 28+00		
8	EXISTING LIGHTING PLAN RWY. 3-21 STA. 28+00 TO STA. 39+00		
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Offices Nationwide www.hanson-inc.com

Hanson Professional Services Inc. 1525 S. 6th Street Springfield, IL 62703 phone: 217-788-2450 fax: 217-788-2503

Illinois Licensed Professional Service Corporation #184-001084

Monmouth Municipal Airport 1320 North 11th Street Monmouth, IL 61462

CONSTRUCT AN ELECTRICAL VAULT AND INSTALL A PAPI ON RUNWAY END 3

IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

NO.	DATE	DES	CRIPT	ION
INO.	DATE	DES	DWN	REV
ISSUE: FEBRUARY 17, 2017				
PROJEC	T NO: 1	2A005	8D	

CAD FILE: G-002-FLP.DWG

DESIGN BY: KNL 01/21/2017

DRAWN BY: RAD 01/23/2017

REVIEWED BY: LDH 01/30/2017

SHEET TITLE

SUMMARY OF QUANTITIES AND INDEX TO SHEETS

#### **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 COMMÚNICATION 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.

#### **EROSION CONTROL**

THIS PROJECT WILL NOT DISTURB MORE THAN 1 ACRE OF LAND, THEREFORE A NPDES PERMIT WILL NOT BE REQUIRED.

#### HAUL ROUTE AND EQUIPMENT PARKING/MATERIAL STORAGE AREA

THE CONTRACTOR WILL USE THE DESIGNATED HAUL ROUTE AND EQUIPMENT PARKING/MATERIAL STORAGE AREA AS SHOWN ON THIS SHEET. THE PROPOSED PARKING/MATERIAL STORAGE AREA WILL BE NO GREATER THAN 40' X 150'. THE CONTRACTOR WILL BE REQUIRED TO MAINTAIN THE PROPOSED HAUL ROUTE AND STAGING AREA THROUGHOUT THE COURSE OF THE PROJECT. ANY AREAS DAMAGED OUTSIDE OF THESE AREAS WILL BE REPAIRED BY THE CONTRACTOR AND AT THE CONTRACTOR'S OWN EXPENSE. AT THE CONCLUSION OF THE PROJECT THE CONTRACTOR WILL RESTORE THE HAUL ROUTE AND STAGING AREA TO ITS PRE-CONSTRUCTION STATE. RESTORATION OF THE HAUL ROUTE AND STAGING AREA WILL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED. CONTRACTOR SHALL COORDINATE EQUIPMENT STORAGE WITH AIRPORT TENANTS UTILIZING ADJACENT RAMP AREA.

#### **LEGEND**

EXISTING IMPROVEMENTS EXISTING AIRPORT BUILDINGS PROPOSED HAUL ROUTE PROPOSED EQUIPMENT PARKING AND STORAGE AREA

PROPOSED AGGREGATE ROAD REMOVAL

---- EXISTING FENCE --- AIRPORT PROPERTY LINE

PROPOSED FENCE LINE (BY OTHERS – NOT IN CONTRACT)

▲▲▲ PROPOSED BARRICADES

J.U.L.I.E. INFORMATION

COUNTY WARREN MONMOUTH TOWNSHIP MONMOUTH SECTION NO. 20

> MONMOUTH MUNICIPAL AIRPORT 1300 N. 11TH STREET

ADDRESS MONMOUTH, ILLINOIS 61462

RUNWAY OBSTACLE FREE

AIRPORT PROPERTY LINE (TYP.) EXISTING EL. VAULT - CRITICAL POINT 4 PROPOSED EQUIPMENT PARKING AND STORAGE AREA (MAXIMUM HT. 25') CRITICAL POINT 1 CRITICAL POINT 3

**EXISTING** PROPOSED EL. VAULT AND CRANE CRITICAL POINT 2 EXISTING ROTATING BEACON/BUCKET TRUCK CRITICAL POINT 5

CONSTRUCTION ACCESS
AND HAUL ROUTE RIINWAY 3 ELEVATION-753' US ROUTE 34

PROPOSED FENCE -(BY OTHERS - NOT IN CONTRACT)

FAR PART 7

END OF

PLACE CLOSURE CROSS -DURING RUNWAY CLOSURE

(WHEN NECESSARY)

(TYP. EACH END)

HEIGHT OF CONSTRUCTION EQUIPMENT

THE MAXIMUM ANTICIPATED HEIGHT OF THE CONSTRUCTION EQUIPMENT WILL BE 70 FEET, WHICH IS EXPECTED TO BE A CRANE TO SET THE VAULT SHELTER (OR A BUCKET TRUCK TO WORK ON THE BEACON). THE MAXIMUM ANTICIPATED HEIGHT OF THE CONSTRUCTION EQUIPMENT AT ALL OTHER LOCATIONS WILL BE 25 FEET, WHICH IS EXPECTED TO BE A DUMP TRUCK, CONCRETE TRUCK OR A LINE TRUCK. THE CRANE SHALL BE USED DURING THE DAYLIGHT HOURS AND VFR CONDITIONS ONLY AND SHALL BE LOWERED WHEN NOT IN USE, DURING THE HOURS BETWEEN SUNSET AND SUNRISE, AND/OR DURING IFR WEATHER CONDITIONS. WHEN IN USE, THE CRANE SHALL BE MARKED WITH A 3' SQUARE

THIS WORK SHALL CONSIST OF REMOVAL OF THE EXISTING ELECTRICAL VAULT AND INSTALLATION OF A NEW AIRPORT ELECTRICAL VAULT, WITH THE ASSOCIATED EQUIPMENT, HANDHOLES, MANHOLES, DUCT WORK AND CABLING, INCLUDED WITH THIS PROJECT WILL BE THE INSTALLATION OF A PAPI SYSTEM ON RUNWAY END 3 AND THE ASSOCIATED CABLING.

#### PROPOSED SAFETY PLAN

- GENERAL THE MONMOUTH MUNICIPAL AIRPORT IS COMPRISED OF ONE RUNWAY. THE PROPOSED CONSTRUCTION WILL NECESSITATE CLOSING THIS RUNWAY. ANY TIME THE CONTRACTOR IS WORKING WITHIN 200' OF RUNWAY 3-21 CENTERLINE (RUNWAY OBJECT FREE ZONE), THAT RUNWAY WILL BE CLOSED. TO CLOSE A RUNWAY THE CONTRACTOR WILL TURN OFF THE RUNWAY LIGHTING CIRCUIT, TURN OFF ALL ASSOCIATED NAVAIDS AND PLACE CROSSES ON BOTH RUNWAY ENDS IN ACCORDANCE WITH THE DETAIL OF CROSS FOR CLOSED RUNWAY. WHEN RUNWAY 3-21 IS CLOSED IT WILL BE CLOSED ONLY FOR THE DURATION OF THE CONSTRUCTION WEEK. THE CONTRACTOR WILL BE ALLOWED TO CLOSE THE RUNWAY AT THE START OF THE CONSTRUCTION WEEK AND MUST RE-OPEN IT AT THE END OF THE CONSTRUCTION WEEK. THE CONTRACTOR SHALL BACKFILL ALL HOLES AND TRENCHES AT THE END OF EACH CONSTRUCTION WEEK AND MOVE ALL EQUIPMENT AND MATERIAL AT LEAST 250 FEET FROM THE RUNWAY CENTERLINE. PRIOR TO OPENING THE RUNWAY A REPRESENTATIVE OF THE AIRPORT, THE CONTRACTOR, AND THE RESIDENT ENGINEER/RESIDENT TECHNICIAN WILL INSPECT RUNWAY 3-21 TO BE SURE THE PAVEMENT IS CLEAN, ALL HOLES AND TRENCHES HAVE BEEN BACKFILLED, AND ALL EQUIPMENT AND MATERIALS ARE AT LEAST 250 FEET FROM THE RUNWAY CENTERLINE. ANY DEFICIENCIES NOTICED WILL BE CORRECTED BEFORE THE CONTRACTOR WILL BE ALLOWED TO RE-OPEN THE RUNWAY
- 2. IN ORDER TO RE-OPEN A RUNWAY THE CONTRACTOR, RESIDENT ENGINEER/RESIDENT TECHNICIAN AND A REPRESENTATIVE OF THE AIRPORT WILL INSPECT THE RUNWAY AND IF ALL PARTIES AGREE. THEN THE CONTRACTOR WILL ACTIVATE THE RUNWAY LIGHTING CIRCUIT, ACTIVATE ALL ASSOCIATED NAVAIDS AND REMOVE THE CROSSES. ALL WORK INCLUDED IN OPENING AND CLOSING THE RUNWAYS WILL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- 3. TAXIWAYS SHALL BE CLOSED, THROUGH USE OF LIGHTED BARRICADES, IF THE CONTRACTOR IS WORKING WITHIN 66' OF THE RESPECTIVE TAXIWAY CENTERLINE. (NO TAXIWAY SHALL REMAIN CLOSED FOR A LONGER DURATION THAN THREE CONSECUTIVE DAYS (72 HOURS). UNLESS THE RUNWAY IS
- 4. THE CONTRACTOR AND HIS EMPLOYEES WILL BE RESTRICTED TO THE WORK AREA AND ALL OTHER AREAS OF THE PROPERTY ARE "OFF LIMITS" TO THEM.
- 5. THE CONTRACTOR IS REQUIRED TO LIMIT THE USE OF CONSTRUCTION EQUIPMENT ON ANY NEARBY PAVEMENTS. ONLY EQUIPMENT NEEDED TO COMPLETE THE SPECIFIC WORK ON THE PAVEMENT WILL BE PERMITTED. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO EXISTING PAVEMENTS CAUSED BY HIS PERSONNEL OR EQUIPMENT.
- 6. IDENTIFICATION WHEN THE CONTRACTOR'S VEHICLES AND EQUIPMENT ARE ON THE AIRPORT THEY SHALL BE PROPERLY MARKED WITH THREE (3') FOOT SQUARE CHECKERED FLAGS (INTERNATIONAL ORANGE AND WHITE). THE CONTRACTOR WILL ALSO PROVIDE WORKERS WITH SOME TYPE OF TAG OR GARMENT TO IDENTIFY THE PERSON AS BEING PART OF THE CONSTRUCTION CREW.
- 7. RADIO CONTROL THE CONTRACTOR WILL BE REQUIRED TO BE IN TWO-WAY RADIO CONTACT (122.80 MHz.) WITH THE AIRPORT UNICOM. THIS WILL KEEP THE CONTRACTOR IN CONSTANT CONTACT WITH THE MONMOUTH MUNICIPAL AIRPORT AND ENABLE THE AIRPORT TO IMMEDIATELY CONTACT THE CONTRACTOR IN CASE OF AN AERONAUTIC EMERGENCY THAT WOULD REQUIRE ACTION BY THE CONTRACTOR AND/OR HIS PERSONNEL.
- 8. THE CONTRACTOR IS REQUIRED TO NOTIFY THE AIRPORT MANAGER, THROUGH THE RESIDENT ENGINEER/RESIDENT TECHNICIAN, A MINIMUM OF 7 DAYS PRIOR TO THE START OF CONSTRUCTION. THIS WILL ALLOW THE AIRPORT MANAGER SUFFICIENT TIME TO ISSUE ALL NECESSARY NOTAMS.
- 9. THE AIRPORT MANAGEMENT, OR DESIGNATED REPRESENTATIVE, WILL ISSUE ALL NOTICES TO AIRMEN (NOTAM) RELATED TO OPENING AND CLOSING PAVEMENTS THROUGHOUT THE PROJECT.
- 10. PRIOR TO THE ISSUANCE OF A CONSTRUCTION NOTICE-TO-PROCEED (NTP) BY THE ILLINOIS DIVISION OF AERONAUTICS, THE CONTRACTOR SHALL PREPARE AND SUBMIT A SAFETY PLAN COMPLIANCE DOCUMENT (SPCD) IN ACCORDANCE WITH FAA ADVISORY CIRCULAR 150/5370-2F, PARAGRAPH 204b, OR EQUIVALENT SECTION IN A SUBSEQUENT/CURRENT ISSUE. THE SPCD SHALL BE REVIEWED AND APPROVED BY THE AIRPORT MANAGER/DIRECTOR, WHO WILL THEN SUBMIT THE DOCUMENT TO THE ILLINOIS DIVISION OF AERONAUTICS FOR THEIR APPROVAL PRIOR TO NOTICE TO PROCEED.

CRITICAL POINT DATA						
POINT NO.	DESCRIPTION	LATITUDE	LONGITUDE	GROUND ELEV. (MSL)	EQUIP. HEIGHT (AGL)	EQUIP. ELEV. (MSL)
1	CONST. EQUIP.	40° 55' 36.27"	90° 38′ 07.46″	754.8'	25'	779.8'
2	CONST. EQUIP.	40° 55′ 34.10″	90° 38′ 08.16″	751.8'	70'	821.8'
3	CONST. EQUIP.	40° 55′ 38.70″	90° 37′ 57.81″	750.1	25'	775.1'
4	CONST. EQUIP.	40° 55′ 38.91″	90° 37′ 52.88″	750.6'	25'	775.6'
5	CONST. EQUIP.	40* 55' 33.96"	90° 38' 08.30"	751.7'	70'	821.7'

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Illinois Licensed Professional Service Corporation #184-001084

Monmouth Municipal Airport 1320 North 11th Street Monmouth, IL 61462

**CONSTRUCT AN ELECTRICAL VAULT** AND INSTALL A PAPI ON RUNWAY END 3

IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

	NO.	DATE	DESCRIPTION		
	NO.	DATE	DES	DWN	REV
į	ISSUE:	FEBRU/	ARY 17	7, 2017	
į	PROJEC	CT NO: 1	2A005	8D	
	CAD FIL	E: G-00	3-SFY	DWG	
	DESIGN BY: MLH 01/21/2017				
ı	DRAWN BY: RAD 01/23/2017				

PROPOSED SAFETY PLAN

REVIEWED BY: LDH 01/30/2017

SHEET TITLE

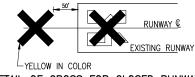
- ALL PROVISIONS OF THE LATEST EDITION OF FAA ADVISORY CIRCULAR AC 150/5370-2 (CURRENT EDITION),
  "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION", APPLY TO THIS CONTRACT, EXCEPT AS MODIFIED
  BY THIS SAFETY PLAN, OR AS MODIFIED BY THE OWNER THROUGH THE RESIDENT ENGINEER AT THE
  PRECONSTRUCTION CONFERENCE, OR DURING THE COURSE OF THE CONTRACT.
- 3. 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 PROJECT SAFETY PLANS.
- 4. 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 EQUIPMENT PARKING
  AND MATERIAL STORAGE AREA SHOWN ON THE PROPOSED SAFETY PLAN, EXCEPT AS OTHERWISE PROVIDED FOR
  AT THE PRECONSTRUCTION CONFERENCE.
- 5. 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 200' OF RUNWAY 3-21 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.
- 8. CLOSED AIRFIELD CONSTRUCTION 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 200' OF RUNWAY 3-21 CENTERLINE WHEN ACTIVE, WITHIN 66' OF AN ACTIVE TAXIWAY CENTERLINE, OR WITHIN 58' OF AN ACTIVE TAXI LANE CENTERLINE, WILL BE PERMITTED. OTHER TRENCHES SHALL BE MAINTAINED SAFE, I.E., BARRICADED OR COVERED WITH STEEL PLATES IN ALL OTHER APPEAS
- 10. 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.
- 11. 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
- 12. 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 SWEPT, PICKED UP AND REMOVED, OR PLACED INTO CLOSED CONTAINERS. ANY DAMAGE TO AIRPORT PROPERTY SHALL BE REPAIRED IMMEDIATELY AT NO COST TO THE OWNER.
- 13. 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.
- 15. ALL AIRCRAFT AND AIRPORT OPERATIONS HAVE THE RIGHT-OF-WAY. CONTRACTOR TO YIELD TO VEHICLES AND REMAIN CLEAR AT ALL TIMES.
- 16. 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.
- 17. CONTRACTOR SHALL MARK HAZARDOUS AREA WITH STEADY-BURNING OR FLASHING RED AND YELLOW LIGHTS DURING PERIODS OF LOW VISIBILITY AS REQUIRED.
- 18. 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.
- 19. 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.
- 20. CONTRACTOR SHALL NOT REMOVE THE BARRICADES WITHOUT THE APPROVAL BY THE AIRPORT MANAGER AND/OR RESIDENT ENGINEER/RESIDENT TECHNICIAN.
- 21. 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.
- 22. THE CONTRACTOR SHALL UTILIZE WATER AND/OR CHEMICALS APPROVED BY THE ENGINEER AS NECESSARY TO CONTROL DUST.
- 23. CONSTRUCTION EQUIPMENT OR CONSTRUCTION ACTIVITY WILL NOT BE PERMITTED WITHIN THE RUNWAY OBJECT FREE ZONE OF ANY ACTIVE RUNWAY CENTERLINE OR WITHIN THE OBJECT FREE AREA OF AN ACTIVE TAXIWAY OR APRON.
- 24. UNLESS SPECIFIED OTHERWISE, COST FOR THE ABOVE IS TO BE CONSIDERED INCIDENTAL TO THE PROJECT. SEPARATE PAYMENT SHALL NOT BE MADE.

#### 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.
- 2. 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
- 3. THE CONSTRUCTION ENTRANCES AS SHOWN ON THE PROPOSED 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 SHALL BE COORDINATED WITH THE RESIDENT ENGINEER/RESIDENT TECHNICIAN AND AIRPORT MANAGEMENT.
- 4. 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.
- 5. 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.
- 8. 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.
- 10. THE CONTRACTOR SHALL PROVIDE ONE SET OF REDLINED AS-BUILT DRAWINGS TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN AT THE COMPLETION OF THE PROJECT.
- 11. 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/RESIDENT TECHNICIAN 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.)
- 12. CONTRACTOR SHALL RESTORE TO ORIGINAL CONDITION ALL GRASS, STONE, OR PAVEMENT DISTURBED BY CONTRACTOR'S CONSTRUCTION OPERATIONS, 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.
- 13. 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 PROJECT REPRESENTATIVE IS TO BE INCLUDED IN THE COSTS OF PERFORMING THESE ITEMS.
- 14. APPROXIMATE LOCATIONS OF 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.
- 15. THE CONTRACTOR MUST AT ALL TIMES MAINTAIN PROPER DRAINAGE FOR ALL AREAS AFFECTED BY HIS WORK.

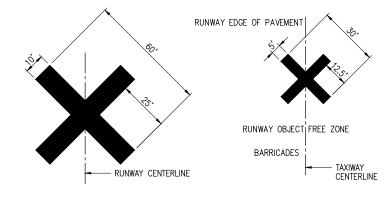
#### **BARRICADE NOTES**

- 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.
- 2. MODIFIED TYPE II BARRICADES SHALL BE SPACED END TO END THE WIDTH OF THE PAVEMENT IN 4' INCREMENTS. BARRICADES ARE TO BE SET BACK 66' FROM THE ACTIVE TAXIWAY CENTERLINE OR AS SHOWN ON THE PLANS.
- 3. 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.
- 4. THE LIGHTING SHALL BE MAINTAINED IN OPERATION DURING THE HOURS OF DARKNESS BETWEEN 1/2 HOUR AFTER SUNSET AND 1/2 HOUR BEFORE SUNRISE AND WHEN CONDITIONS EXIST WHICH TEND TO OBSCURE VISION.
- 5. BARRICADES SHALL BE SECURED TO THE GROUND BY APPROVED METHODS TO PREVENT MOVEMENT BY PROP WASH, JET BLAST OR OTHER WIND CURRENTS.
- 6. THE ONLY COLOR COMBINATION ON TYPE II 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.
- COST FOR PROVIDING, PLACING, MAINTAINING, AND REMOVING BARRICADES SHALL BE INCLUDED IN THE COST OF THE OTHER CONTRACT ITEMS.



DETAIL OF CROSS FOR CLOSED RUNWAY

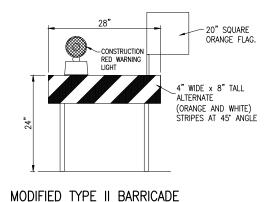
"NOT TO SCALE"



## TEMPORARY CLOSURE CROSS DETAIL

#### NOTE

- TEMPORARY "CLOSED RUNWAY" AND "CLOSED TAXIWAY" MARKINGS SHALL BE "AVIATION YELLOW"
- TEMPORARY "CLOSED RUNWAY" MARKINGS SHALL BE CONSTRUCTED OF PLYWOOD, DOUBLE-LAYERED SNOW FENCE OR APPROVED FABRIC AND SHALL BE SECURED TO PAVEMENT BY SANDBAGS OR OTHER APPROVED METHOD.
- 3. TEMPORARY "CLOSED RUNWAY" MARKINGS SHALL BE PLACED OVER THE RUNWAY DESIGNATION NUMBERS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- 4. TEMPORARY "CLOSED TAXIWAY" MARKINGS SHALL BE CONSTRUCTED USING TEMPORARY PAINT SUCH AS SEYMOUR TEMPORARY MARKER, PART NO. 20-636, OR AN EQUIVALENT PAINT FASILY REMOVED WITH WATER WITHOLIT DEFACING THE PAYEMENT
- TEMPORARY "CLOSED TAXIWAY" MARKINGS SHALL BE PLACED WHEN THE RUNWAY IS OPEN AND THE TAXIWAY IS CLOSED MORE THAN 72 HOURS. FOR THIS PROJECT TAXIWAY CLOSURES SHALL NOT EXCEED 72 HOURS CONTINUOUS UNLESS THE RUNWAY IS ALSO CLOSED.
- 6. THE PROPOSED CROSSES WILL BE PLACED EACH DAY THE RUNWAY OR TAXIWAY IS CLOSED AND REMOVED WHEN THE RUNWAY OR TAXIWAY IS RE-OPENED. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE PLACEMENT AND REMOVAL OF THE CROSSES. "CLOSED RUNWAY" AND "CLOSED TAXIWAY" MARKINGS SHALL NOT BE A PAY ITEM AND SHALL BE INCIDENTAL TO OTHER CONTRACT BID ITEMS.



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Monmouth Municipal Airport 1320 North 11th Street Monmouth, IL 61462

CONSTRUCT AN ELECTRICAL VAULT AND INSTALL A PAPI ON RUNWAY END 3

IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

NO.	DATE	DES	CRIPT	ION
INO.	DATE	DES	DWN	REV
ISSUE:	FEBRU/	ARY 17	7, 2017	
PROJEC	CT NO: 1	2A005	8D	
CAD FIL	E: G-00	4-SFY	.DWG	
DESIGN	BY: KN	L 01/2	21/201	7
DRAWN	RV. DAI	D 01/2	2/2017	7

PROPOSED SAFETY PLAN NOTES

REVIEWED BY: LDH 01/30/2017

SHEET TITLE

ELEC	CTRICAL LEGEND — ONE—LINE DIAGRAM		
-	—o— CABLE TERMINATOR/LUG		
***	TRANSFORMER		
_\_	DISCONNECT SWITCH		
-\=	FUSIBLE DISCONNECT SWITCH		
	CIRCUIT BREAKER		
<b>-^-</b> -	THERMAL MAGNETIC CIRCUIT BREAKER		
	FUSE		
<b>↓</b> ‡	TRANSIENT VOLTAGE SURGE SUPPRESSOR OR SURGE PROTECTOR DEVICE		
≢	GROUND — GROUND ROD, GROUNDING ELECTRODE, OR AT EARTH POTENTIAL		
Ø	INDICATING LIGHT		
(4)	MOTOR		
*	LOAD, MOTOR, # = HORSEPOWER		
	ELECTRIC UTILITY METER BASE		
•	JUNCTION BOX WITH SPLICE		
xxx	EQUIPMENT, XXX = DEVICE DESCRIPTION		
GND	GROUND BUS OR TERMINAL		
S/N	NEUTRAL BUS		
#	PANELBOARD WITH MAIN LUGS		
#	PANELBOARD WITH MAIN BREAKER		
<b>♣□≫</b> #	FUSE PANEL WITH MAIN FUSE PULLOUT		
<b>+</b>	DUPLEX RECEPTACLE 120V SINGLE PHASE GROUNDING TYPE		
	CONTROL STATION		
N EM	TRANSFER SWITCH		
G	ENGINE GENERATOR SET		

	ELECTRICAL LEGEND — SCHEMATIC
	NORMALLY OPEN (N.O.) CONTACT
<del>-1/-</del>	NORMALLY CLOSED (N.C.) CONTACT
<b>S*</b>	STARTER COIL, * = STARTER NUMBER
OL —J/	OVERLOAD RELAY CONTACT
©R*)	CONTROL RELAY, * = CONTROL RELAY NUMBER
R*	RELAY, * = RELAY NUMBER
<i>&gt;</i> °	TOGGLE SWITCH / 2 POSITION SWITCH
OFF AUTO	2-POSITION SELECTOR SWITCH
HAND T AUTO  O OOO  OOO	3-POSITION SELECTOR SWITCH (H-O-A SHOWN)
	2 POLE DISCONNECT SWITCH
	3 POLE DISCONNECT SWITCH
<b>&gt;</b>	PHOTOCELL
	TERMINAL BLOCK, * = TERMINAL NUMBER
	DEVICE TERMINAL, * = DEVICE TERMINAL NUMBER
	INTERNAL PANEL WIRING
	FIELD WIRING
	FUSE
GND	GROUND BUS OR TERMINAL
S/N	NEUTRAL BUS
#	GROUND, GROUND ROD, GROUND BUS
0 0	Industrial control relay or Lighting contactor
+ + + + + + + + + + + + + + + + + + +	S1 CUTOUT HANDLE REMOVED
→ 1 → 1 → 1 → 1 → 1 → 1 → 1 → 1 → 1 → 1	S1 CUTOUT HANDLE INSERTED
₽-	N.O. THERMAL SWITCH
Ţ	N.C. THERMAL SWITCH
(W)	L-830 SERIES ISOLATION TRANSFORMER

	ELECTRICAL ABBREVIATIONS		
A.F.F.	ABOVE FINISHED FLOOR		
A, AMP	AMPERES		
ATS	AUTOMATIC TRANSFER SWITCH		
AWG	AMERICAN WIRE GAUGE		
BKR	BREAKER		
С	CONDUIT		
СВ	CIRCUIT BREAKER		
СКТ	CIRCUIT		
CR	CONTROL RELAY		
cu	COPPER		
DPDT	DOUBLE POLE DOUBLE THROW		
DPST	DOUBLE POLE SINGLE THROW		
ЕМ	EMERGENCY		
EMT	ELECTRICAL METALLIC TUBING		
ENCL	ENCLOSURE		
EP	EXPLOSION PROOF		
ES	EMERGENCY STOP		
ETL	INTERTEK - ELECTRICAL TESTING LABS		
ETM	ELAPSE TIME METER		
GFCI	GROUND FAULT CIRCUIT INTERRUPTER		
GFI	GROUND FAULT INTERRUPTER		
GND	GROUND		
GRSC	GALVANIZED RIGID STEEL CONDUIT		
HID	HIGH INTENSITY DISCHARGE		
HOA	HAND OFF AUTOMATIC		
HP	HORSEPOWER		
HPS	HIGH PRESSURE SODIUM		
J	JUNCTION BOX		
KVA	KILOVOLT AMPERE(S)		
KW	KILOWATTS		
LC	LIGHTING CONTACTOR		
LTFMC	LIQUID TIGHT FLEXIBLE METAL CONDUIT (UL LISTED)		
LTG	LIGHTING		
LP	LIGHTING PANEL		
MAX	MAXIMUM		
MCB	MAIN CIRCUIT BREAKER		
МСМ	THOUSAND CIRCULAR MIL		
MDP	MAIN DISTRIBUTION PANEL		
MFR	MANUFACTURER		
МН	METAL HALIDE		
MIN	MINIMUM		
MLO	MAIN LUGS ONLY		
NEC	NATIONAL ELECTRICAL CODE (NFPA 70)		
NC	NORMALLY CLOSED		
NO	NORMALLY OPEN		
NTS	NOT TO SCALE		
OHE	OVERHEAD ELECTRIC		
lΩ	I OVERLOAD		

OVERLOAD

OI

ELECTRICAL ABBREVIATIONS (CONTINUED)			
PB	PULL BOX		
PC PHOTO CELL			
PDB	POWER DISTRIBUTION BLOCK		
PNL	PANEL		
RCPT	RECEPTACLE		
R	RELAY		
S	STARTER		
SPD	SURGE PROTECTION DEVICE		
SPST	SINGLE POLE SINGLE THROW		
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR		
TYP	TYPICAL		
UG	UNDERGROUND		
UGE	UNDERGROUND ELECTRIC		
UL	UNDERWRITER'S LABORATORIES		
٧	VOLTS		
W/	WITH		
<b>W</b> /0	WITHOUT		
WP	WEATHER PROOF		
XFER	TRANSFER		
XFMR	TRANSFORMER		
AIRPO	DRT EQUIPMENT/FACILITY ABBREVIATIONS		
ASOS	AUTOMATED SURFACE OBSERVING SYSTEM		
ATCT	AIR TRAFFIC CONTROL TOWER		
AWOS	AUTOMATED WEATHER OBSERVING SYSTEM		

ASOS	AUTOMATED SURFACE OBSERVING SYSTEM
ATCT	AIR TRAFFIC CONTROL TOWER
AWOS	AUTOMATED WEATHER OBSERVING SYSTEM
CCR	CONSTANT CURRENT REGULATOR
DME	DISTANCE MEASURING EQUIPMENT
FAR	FEDERAL AVIATION REGULATION
GS	GLIDE SLOPE FACILITY
HIRL	HIGH INTENSITY RUNWAY LIGHT
ILS	INSTRUMENT LANDING SYSTEM
IM	INNER MARKER
LIR	LOW IMPACT-RESISTANT
LOC	LOCALIZER FACILITY
MALS	MEDIUM INTENSITY APPROACH LIGHTING SYSTEM
MALSR	MEDIUM INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATING LIGHTS
	WITH RUNWAT ALIGNMENT INDICATING LIGHTS
MIRL	MEDIUM INTENSITY RUNWAY LIGHT
MIRL MITL	
	MEDIUM INTENSITY RUNWAY LIGHT
MITL	MEDIUM INTENSITY RUNWAY LIGHT MEDIUM INTENSITY TAXIWAY LIGHT
MITL	MEDIUM INTENSITY RUNWAY LIGHT MEDIUM INTENSITY TAXIWAY LIGHT NON-DIRECTIONAL BEACON
MITL NDB PAPI	MEDIUM INTENSITY RUNWAY LIGHT MEDIUM INTENSITY TAXIWAY LIGHT NON-DIRECTIONAL BEACON PRECISION APPROACH PATH INDICATOR
MITL NDB PAPI PLASI	MEDIUM INTENSITY RUNWAY LIGHT  MEDIUM INTENSITY TAXIWAY LIGHT  NON-DIRECTIONAL BEACON  PRECISION APPROACH PATH INDICATOR  PULSE LIGHT APPROACH SLOPE INDICATOR
MITL  NDB  PAPI  PLASI  RAIL	MEDIUM INTENSITY RUNWAY LIGHT MEDIUM INTENSITY TAXIWAY LIGHT NON-DIRECTIONAL BEACON PRECISION APPROACH PATH INDICATOR PULSE LIGHT APPROACH SLOPE INDICATOR RUNWAY ALIGNMENT INDICATING LIGHTS
MITL  NDB  PAPI  PLASI  RAIL  REIL	MEDIUM INTENSITY RUNWAY LIGHT MEDIUM INTENSITY TAXIWAY LIGHT NON-DIRECTIONAL BEACON PRECISION APPROACH PATH INDICATOR PULSE LIGHT APPROACH SLOPE INDICATOR RUNWAY ALIGNMENT INDICATING LIGHTS RUNWAY END IDENTIFIER LIGHT
MITL NDB PAPI PLASI RAIL REIL	MEDIUM INTENSITY RUNWAY LIGHT MEDIUM INTENSITY TAXIWAY LIGHT NON-DIRECTIONAL BEACON PRECISION APPROACH PATH INDICATOR PULSE LIGHT APPROACH SLOPE INDICATOR RUNWAY ALIGNMENT INDICATING LIGHTS RUNWAY END IDENTIFIER LIGHT RUNWAY VISUAL RANGE
MITL NDB PAPI PLASI RAIL REIL RVR	MEDIUM INTENSITY RUNWAY LIGHT MEDIUM INTENSITY TAXIWAY LIGHT NON-DIRECTIONAL BEACON PRECISION APPROACH PATH INDICATOR PULSE LIGHT APPROACH SLOPE INDICATOR RUNWAY ALIGNMENT INDICATING LIGHTS RUNWAY END IDENTIFIER LIGHT RUNWAY VISUAL RANGE VISUAL APPROACH DESCENT INDICATOR

WIND CONE

WC

## NOTES:

- 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
- 2. CONTRACTOR SHALL KEEP A COPY OF THE LATEST NEC IN FORCE ON SITE AT ALL TIMES DURING/CONSTRUCTION FOR USE AS A
- 3. 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).
- 4. COLOR CODE PHASE AND NEUTRAL CONDUCTOR INSULATION FOR NO. 6 AWG OR SMALLER. PROVIDE COLORED INSULATION OR COLORED MARKING TAPE FOR PHASE AND NEUTRAL CONDUCTORS FOR NO. 4 AWG AND LARGER. INSULATED GROUND CONDUCTORS SHALL HAVE GREEN COLORED INSULATION FOR ALL CONDUCTOR AWG AND/OR KCMIL TO COMPLY WITH NEC 250.119. NEUTRAL CONDUCTORS SHALL HAVE WHITE COLORED INSULATION FOR NO. 6 AWG AND SMALLER TO MEET THE REQUIREMENTS OF NEC 200.6. STANDARD COLORS FOR POWER WIRING AND BRANCH CIRCUITS SHALL BE AS FOLLOWS:

120/240 VAC.	1 PHASE, 3 WIRE
PHÁSE A	BLACK
PHASE B	RED
NEUTRAL	WHITE
GROUND	GREEN

- 5. SEE RESPECTIVE SITE PLANS FOR SITE LEGEND INFORMATION.
- 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 NFC 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 LIFMC THAT IS NOT UL LISTED. CONFIRM LIFMC BEARS THE UL LABEL PRIOR TO INSTALLATION.
- 7. 6.ALL ENCLOSURES RATED NEMA 4, 4X SHALL HAVE WATERTIGHT HUBS AT CONDUIT ENTRANCES UL LISTED NEMA 4, 4X FOR THE RESPECTIVE ENCLOSURE, TO MAINTAIN THE NEMA 4,
- 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, TAXI SIGN, NAVAID, OR OTHER
- 9. HIGH VOLTAGE CIRCUITS (AIRFIELD LIGHTING 5000 VOLT SERIES CIRCUITS AND OTHER CIRCUITS RATED ABOVE 600 VOLTS) AND LOW VOLTAGE CIRCUITS (RATED 600 VOLTS AND BELOW) SHALL NOT BE INSTALLED IN THE SAME WIREWAY, CONDUIT, DUCT, RACEWAY, JUNCTION STRUCTURE OR HANDHOLE.



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Professional Service Corporation #184-001084

Monmouth Municipal Airport 1320 North 11th Street Monmouth, IL 61462

CONSTRUCT AN **ELECTRICAL VAULT** AND INSTALL A PAPI ON RUNWAY END 3

IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

	NO.	DATE	DESCRIPTION		
	INO.	DATE	DES	DWN	REV
ISSUE: FEBRUARY 17, 2017					
i	PROJEC	CT NO: 1	2A005	8D	

CAD FILE: E-001-LGND.DWG DESIGN BY: KNL 01/21/2017 DRAWN BY: RAD 01/23/2017

REVIEWED BY: LDH 01/30/2017

SHEET TITLE

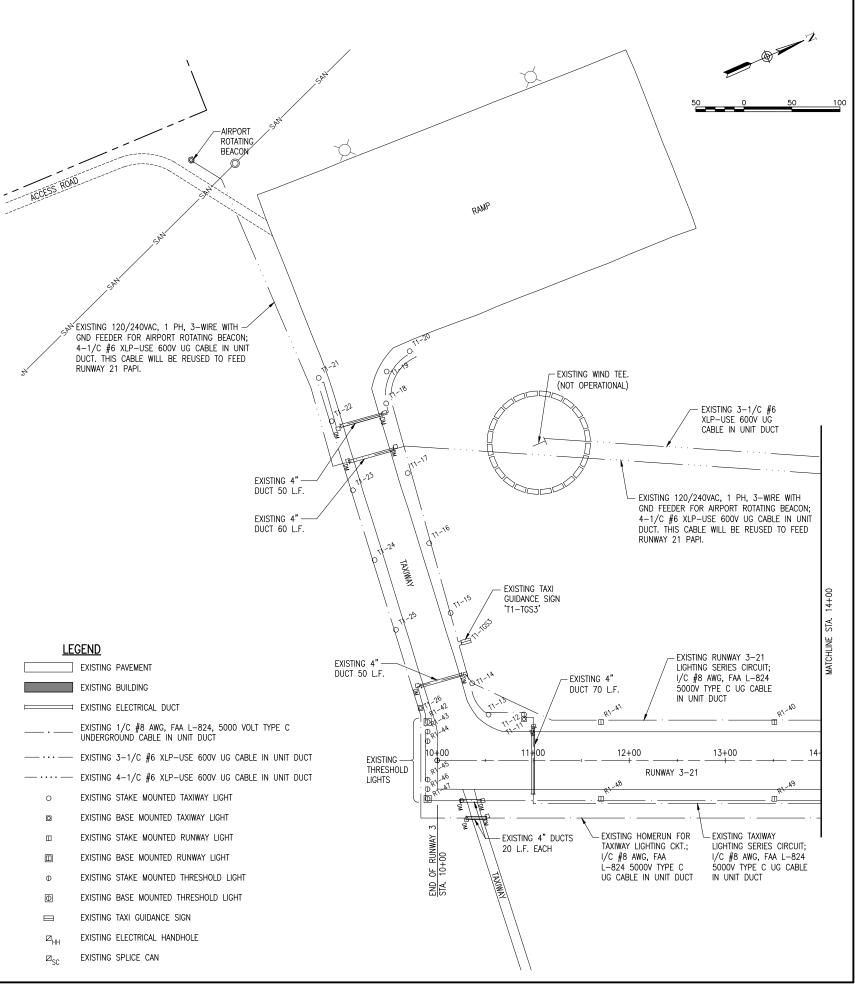
**ELECTRICAL LEGEND** AND ABBREVIATIONS



- 3. CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF FAA AC NO. 150/5370-2F (OR MOST CURRENT ISSUE) "OPERATIONAL SAFETY ON AIRPORT DURING CONSTRUCTION".
- 4. CONTRACTOR SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF NFPA 70E STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE.
- THE CONTRACTOR IS ENCOURAGED TO INSPECT EACH EXISTING LIGHT. TAXI GUIDANCE SIGN AND NAVAIDS PRIOR TO CONSTRUCTION WORK AND IDENTIFY TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN ANY DAMAGED OR INOPERATING PARTS. DAMAGE CAUSED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE CONTRACT.
- 6. THE EXISTING DUCTS AND CABLES ASSOCIATED WITH AIRFIELD LIGHTING WORK, RELOCATIONS, AND/OR CABLE OR DUCT REPLACEMENTS SHALL BE ABANDONED IN PLACE UNLESS IT CONFLICTS WITH THE INSTALLATION OF THE VAULT, AIRFIELD LIGHT, SIGN, NAVAIDS, DUCT, CABLE, HANDHOLE, MANHOLE, SITE WORK, PAVEMENT OR OTHER WORK, THEN IT SHALL BE DISCONNECTED, 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
- 7. THE CONTRACTOR IS REQUIRED TO FILL IN ALL HOLES AND DEPRESSIONS RESULTING FROM THE REMOVAL AND/OR RELOCATION WORK WITH EARTH FROM WITHIN THE CONSTRUCTION LIMITS. THE AREAS SHALL BE COMPACTED TO PREVENT FUTURE SETTLEMENT AND FERTILIZED, SEEDED, AND MULCHED IN ACCORDANCE WITH ITEMS 901 AND 908 RESPECTIVELY.
- WHEN A RUNWAY IS CLOSED, THE RESPECTIVE RUNWAY LIGHTING AND NAVAIDS FOR THAT RUNWAY SHALL BE SHUT OFF.
- ALL ABOVE GROUND 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, - OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION, PART 218, PARAGRAPH c.
- 10. CONTRACTOR SHALL CONFIRM RESPECTIVE AIRFIELD LIGHTING NAVAID, AND OTHER CIRCUITS.
- 11. NO CONNECTION TO AN ACTIVE LIGHTING CIRCUIT WILL BE BROKEN UNTIL THE CIRCUIT HAS BEEN TURNED OFF IN ACCORDANCE WITH 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 UTILIT 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.





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IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

NO.	DATE	DESCRIPTION		
NO.	DATE	DES	DWN	REV
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PROJECT NO: 12A0058D				
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DESIGN BY: KNL 04/22/2013				

DRAWN BY: BAK 04/22/2013 REVIEWED BY: LDH 01/30/2017

SHEET TITLE

**EXISTING LIGHTING** PLAN TWY. & RWY. 3-21 STA. 10+00 TO STA. 14+00



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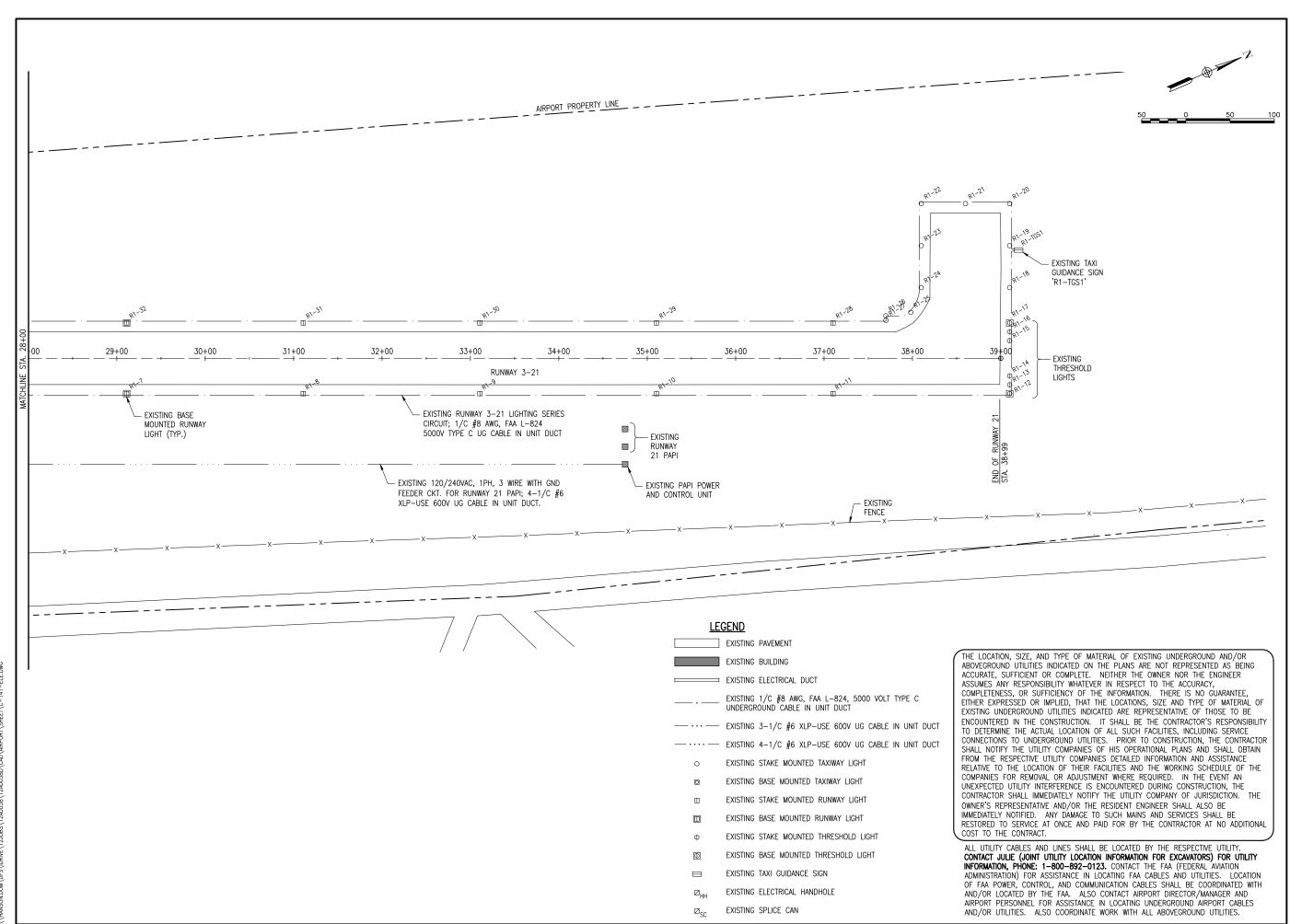
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ISSUE:	FEBRU/	ARY 17	7, 2017			
PROJEC	CT NO: 1	2A005	8D			
CAD FILE: C-141-ELE.DWG						
DESIGN BY: KNL 04/22/2013						
DRAWN	DRAWN BY: BAK 04/22/2013					

SHEET TITLE

EXISTING LIGHTING PLAN RWY. 3-21 STA. 14+00 TO STA. 28+00



Hanson Professional Services Inc. 1525 S. 6th Street Springfield, IL 62703 phone: 217-788-2450 fax: 217-788-2503

Illinois Licensed Professional Service Corporation #184-001084

Monmouth Municipal Airport 1320 North 11th Street Monmouth, IL 61462

CONSTRUCT AN **ELECTRICAL VAULT** AND INSTALL A PAPI ON RUNWAY END 3

IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

NO.	DATE	DESCRIPTION			
NO.	DATE	DES	DWN	REV	
SSUE: FEBRUARY 17, 2017					
ROJECT NO: 12A0058D					

CAD FILE: C-141-ELE.DWG DESIGN BY: KNL 04/22/2013 DRAWN BY: BAK 04/22/2013

REVIEWED BY: LDH 01/30/2017

SHEET TITLE

**EXISTING LIGHTING** PLAN RWY, 3-21 STA. 28+00 TO STA. 39+00

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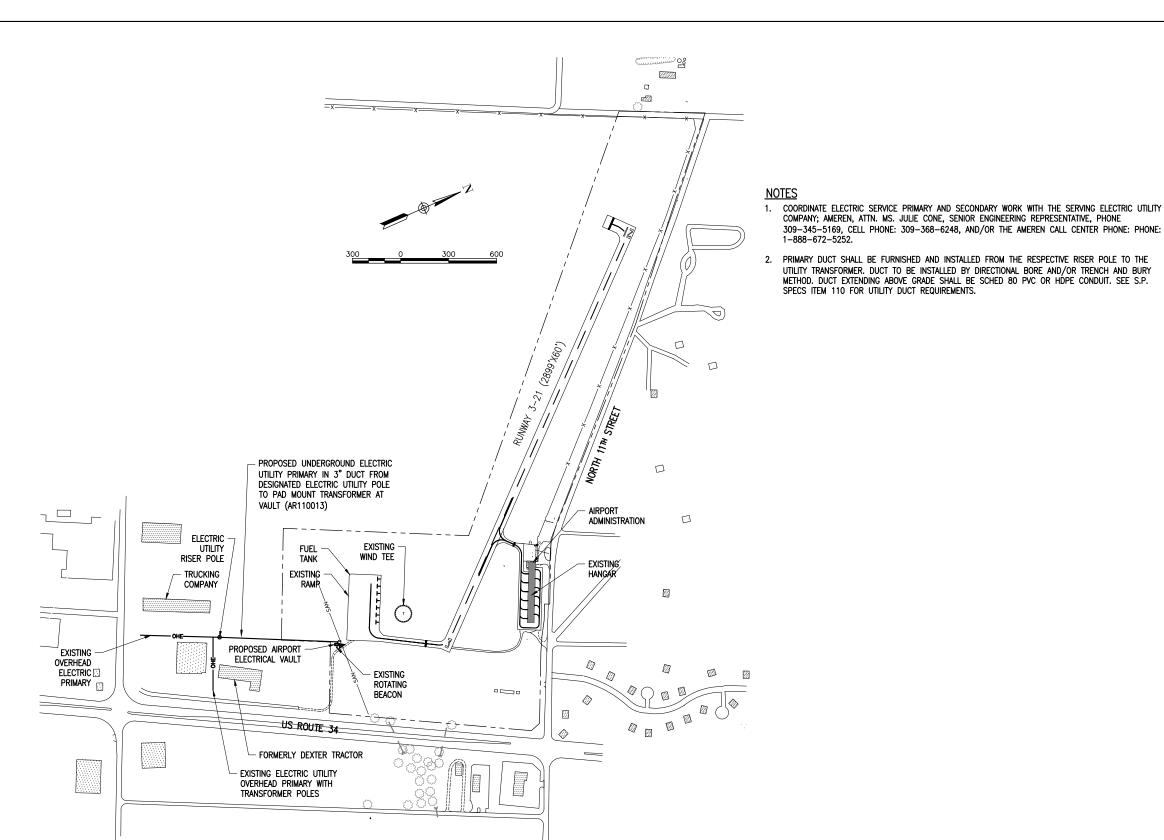


DESIGN BY: KNL 1/21/2017 DRAWN BY: CWS 1/25/2017

REVIEWED BY: LDH 01/30/2017

SHEET TITLE

**EXISTING ELECTRICAL ONE** LINE FOR VAULT AND **AIRFIELD** 





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CONSTRUCT AN **ELECTRICAL VAULT** AND INSTALL A PAPI ON RUNWAY END 3

IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

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Ì	PROJECT NO: 12A0058D				

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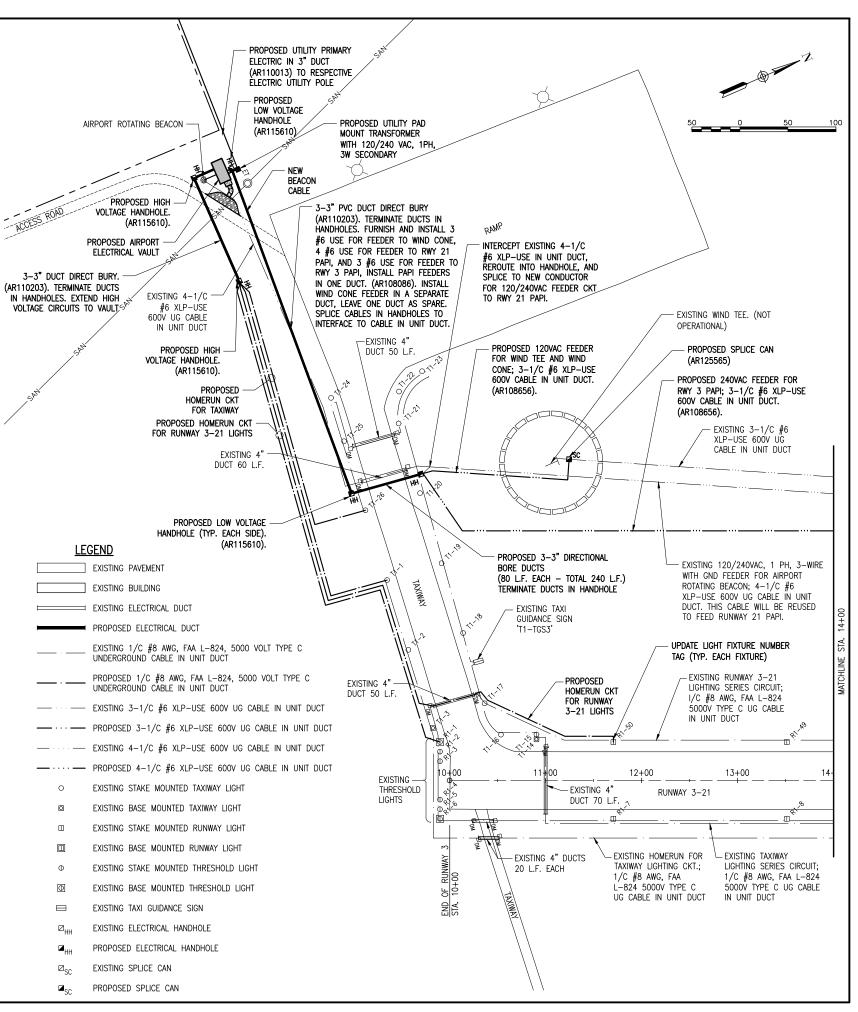
SHEET TITLE

PROPOSED SITE **PLAN** 

- 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.
- 3. CONTRACTOR SHALL COORDINATE & CONFIRM ELECTRIC SERVICE WORK WITH THE SERVING ELECTRIC UTILITY COMPANY & THE CITY OF
- 4. 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 CABLE FOR RUNWAY AND TAXIWAY LIGHTING SHALL BE INSTALLED APPROXIMATELY 12' FROM THE PAVEMENT EDGE WITH HOMERUNS ROUTED AS DETAILED ON THE RESPECTIVE PLANS. 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 (AR108158), OR DUCT AS DETAILED HEREIN
- 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.
- 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
- 10. EXISTING AIRFIELD LIGHTING CABLES (SCHEDULED TO BE ABANDONED AND/OR REPLACED) IN AREAS OF NEW WORK SHALL BE DISCONNECTED & REMOVED WHERE IN CONFLICT WITH NEW CONSTRUCTION. IN OTHER AREAS CABLES MAY BE ABANDONED IN PLACE.
- 11. 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. THIS WORK WILL BE CONSIDERED AS AN INCIDENTAL ITEM AND NO ADDITIONAL COMPENSATION
- 12. 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 COORDINATION OF THE
- 13. EXISTING LIGHT FIXTURE NUMBER TAGS SHALL BE RELOCATED ON AIRFIELD LIGHT FIXTURES TO CORRESPOND TO THE RESPECTIVE HOMERUN CIRCUIT ROUTING TO THE NEW VAULT. SEE PLANS FOR UPDATED LIGHT FIXTURE NUMBER DESIGNATIONS.
- 14. NO CONNECTION TO AN ACTIVE LIGHTING CIRCUIT WILL BE BROKEN UNTIL THE CIRCUIT HAS BEEN TURNED OFF IN ACCORDANCE WITH 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 UTILIT 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.



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**CONSTRUCT AN ELECTRICAL VAULT** AND INSTALL A PAPI ON RUNWAY END 3

IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

NO.	DATE	DESCRIPTION			
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SSUE: FEBRUARY 17, 2017					
PROJECT NO: 12A0058D					
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DESIGN BY: KNL 04/22/13 DRAWN BY: RAD 01/26/17 REVIEWED BY: LDH 01/30/2017

SHEET TITLE

PROPOSED LIGHTING PLAN TWY. & RWY. 3-21 STA. 10+00 TO STA. 14+00



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	DESIGN BY: KNL 04/22/13					
ı	DRAWN BY: RAD 01/26/17					

SHEET TITLE

AND/OR UTILITIES. ALSO COORDINATE WORK WITH ALL ABOVEGROUND UTILITIES.

PROPOSED LIGHTING PLAN RWY, 3-21 STA. 14+00 TO STA. 28+00



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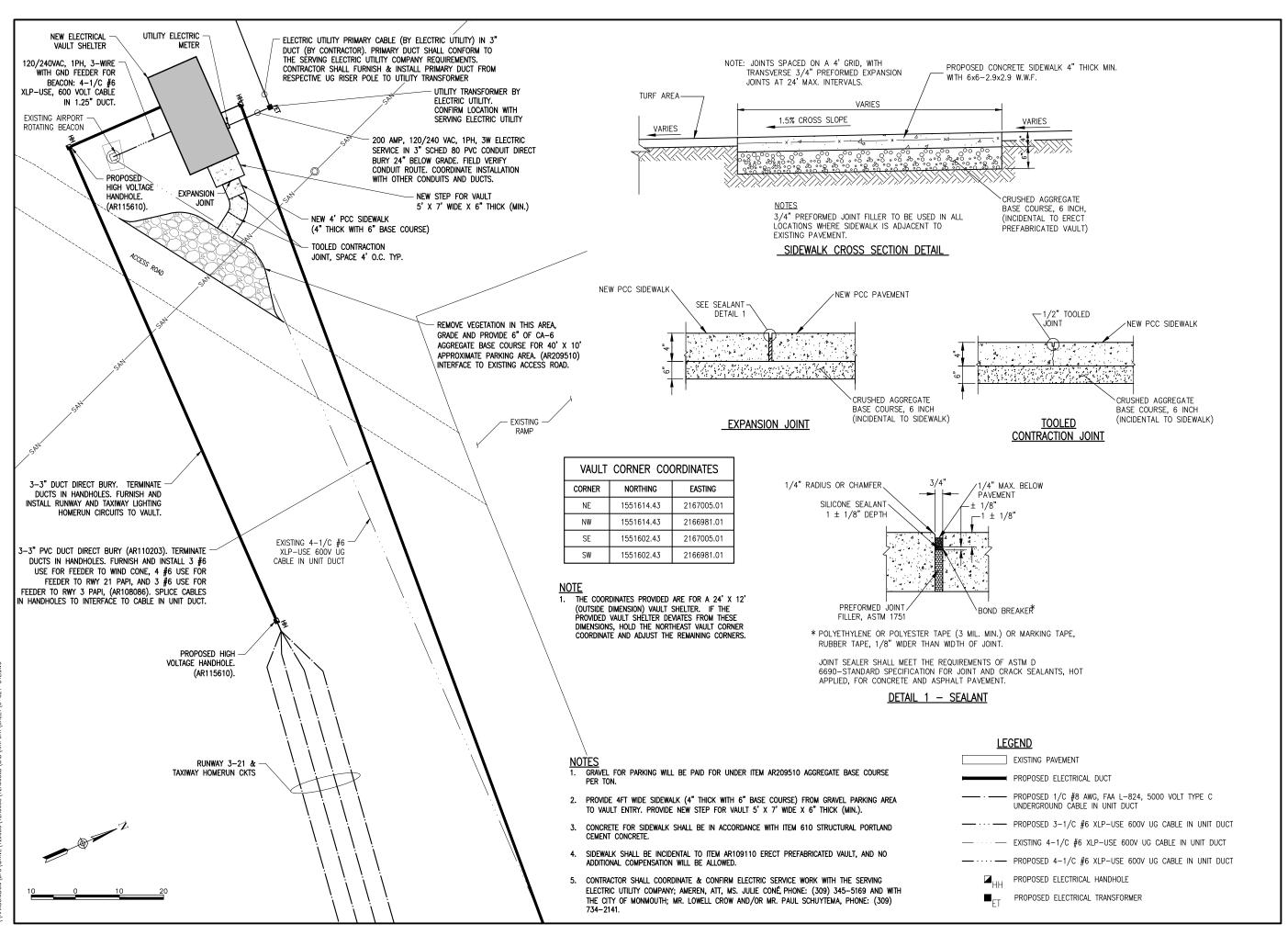
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PROPOSED LIGHTING PLAN RWY. 3-21 STA.28+00 TO STA. 39+00



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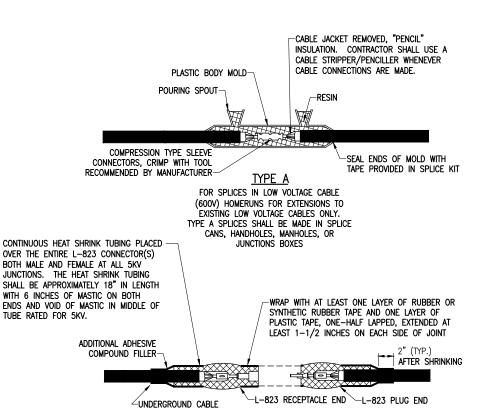
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SHEET TITLE

PROPOSED VAULT SITE PLAN AND SIDEWALK DETAIL

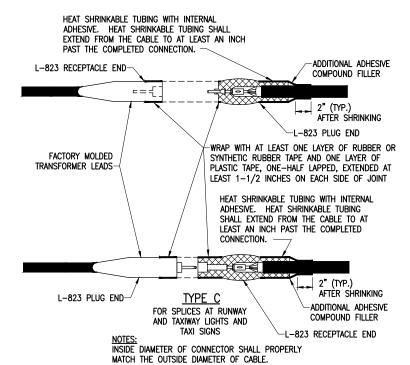


FOR SPLICES AT JUNCTION OF HOMERUN

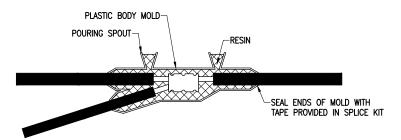
WITH LOOP CIRCUIT AND FOR SPLICES IN

HOMERUNS TO EXISTING CABLES

SPEC. L-824, TYPICAL

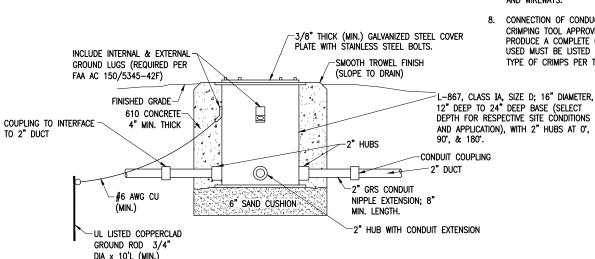


CABLE SPLICES (NOT TO SCALE)



#### 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.



#### NOTES FOR SPLICE CAN DETAIL:

SPLICE CAN DETAIL

(NOT TO SCALE)

- 1. SPLICE CANS SHALL CONFORM TO THE REQUIREMENTS OF FAA AC 150/5345-42F, OR MOST CURRENT ISSUE IN FORCE, FOR TYPE L-867, CLASS IA, 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 150/5345-42G.
- 3. APPLY AN OXIDE-INHIBITING, ANTI-SEIZING COMPOUND TO ALL SCREWS, NUTS, AND ALL PLACES WHERE METAL COMES INTO CONTACT WITH METAL.
- 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.

- SPLICE DETAILS ARE PROVIDED FOR NEW WORK AND TO ASSIST IN REPAIRS OF ACCIDENTAL OR UNEXPECTED INTERRUPTIONS AND/OR CUTS TO AIRFIELD LIGHTING
- 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 SPLICER 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 150/5370G-10G ITEM L-108.
- 4. WHEN PREPARING CABLE FOR SPLICES, THE CONTRACTOR SHALL USE A CABLE STRIPPER/PENCILLER WHENEVER CABLE CONNECTIONS ARE MADE.
- 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 AND FAA AC 150/5370-10G ITEM L-108, HIGH VOLTAGE ELECTRICAL INSULATING TAPE SHALL BE 3M SCOTCH 23, 3M SCOTCH 13OC OR APPROVED EQUIVALENT, AND VINYL ELECTRICAL TAPE SHALL BE 3M SCOTCH 88 OR APPROVED EQUIVALENT. TAPES MUST BE RATED SUITABLE FOR THE APPLICATION.
- PROVIDE CABLE TAGS TO IDENTIFY THE RESPECTIVE CIRCUITS ALL POINTS OF ACCESS INCLUDING L-867 BASES, L-868 BASES, HANDHOLES, MANHOLES, JUNCTION BOXES,
- 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.

IDA No.: C66-4265 SBG No.:

**CONSTRUCT AN** 

**ELECTRICAL VAULT** 

ON RUNWAY END 3

AND INSTALL A PAPI

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3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

DESCRIPTION NO. DATE DES DWN REV ISSUE: FEBRUARY 17, 2017 PROJECT NO: 12A0058D CAD FILE: E-501-ELEC.DWG

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SHEET TITLE

AIRFIELD LIGHTING CABLE SPLICE **DETAILS** 

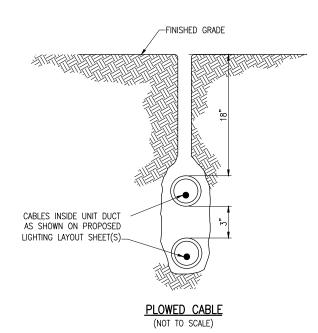
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#### CONDUIT IN TRENCH - NON-PAVEMENT AREAS

"NOT TO SCALE"

#### NOTES:

- 1. 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.
- 3. 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.
- 4. 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, HANDHOLF OR MANHOLF
- 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.
- 6. ALL DISTURBED SURFACES SHALL BE RESTORED TO THEIR ORIGINAL CONDITION. <u>COST IS INCIDENTAL TO TRENCH</u>.



PRESTAMPED OR CHISELED ON THE JOB

(%" HIGH LETTERING MIN.)

18" R.

3/16" R.

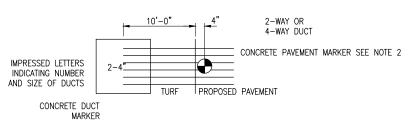
INDICATES NUMBER AND SIZE OF DUCT BANK

# 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.
- 2. 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.
- 4. CONCRETE CABLE MARKERS AND DUCT MARKERS SHALL HAVE LETTERS 4" HIGH, 3" WIDE WITH WIDTH OF STROKE ½" AND ½" DEEP. ALL LETTERS, NUMBERS AND ARROWS TO BE IMPRESSED.
- 5. EMPLOY THE FOLLOWING METHODS WERE ADDITIONAL SPACE TO FIT LEGEND IS REQUIRED:
  - A. REDUCE LETTER SIZE TO 3" HIGH, 2" WIDE.
  - B. INCREASE THE MARKER SIZE TO 30" X 30". C. PROVIDE ADDITIONAL MARKERS PLACED SIDE BY SIDE.

NOTE: DUCTS INSTALLED BY BORING METHOD SHALL NOT DISTURB THE RESPECTIVE PAVEMENT IMPRESSED LETTERS AND DIRECTIONAL ARROW, CONCRETE ADJUST TO CABLE LAYOUT CABLE MARKER 2'-0" FINISHED GRADE CABLE MARKER TURF CABLE MARKERS IMPRESSED NUMBERS NOTING -NUMBER & SIZE OF DUCTS. ADJUST FOR RESPECTIVE CONCRETE QUANTITY & SIZE OF DUCTS DUCT MARKER

> DUCT MARKER

TURF DUCT MARKERS

"NOT TO SCALE"

ADJUST FOR RESPECTIVE

PAVEMENT EDGE-

DUCT MARKER

LOCATION OF DUCT TERMINATION

SURFACE COURSE.

BASE COURSE

- #10 PULL WIRE COIL A MINIMUM OF 3' AT DUCT ENDS.

UNDERGROUND ELECTRICAL DUCT

(NOT TO SCALE)

INSTALL APPROVED PLUGS IN END OF DUCTS NOT USED.

NFW DUCT

-24" MIN. BELOW BOTTOM OF PAVEMENT FOR

FINISHED GRADE

DUCTS INSTALLED BY BORING METHOD.

MARKER



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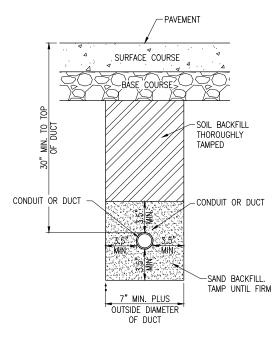
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CONDUIT TRENCH DETAILS

SHEET TITLE





## CONDUIT IN TRENCH - PAVEMENT AREAS

"NOT TO SCALE"

#### NOTES:

- 1. DIMENSIONS FOR COVERAGE AND SEPARATION BETWEEN DUCTS ARE MINIMUM.
- TRENCHES WITH MORE THAN TWO CONDUITS OR DUCTS SHALL BE INCREASED 3" IN WIDTH PLUS DIAMETER OF RESPECTIVE DUCT FOR EACH ADDITIONAL CONDUIT, OR DUCT; IF SPECIFIED ON PLANS TWO PARALLEL TRENCHES MAY BE CONSTRUCTED.
- 3. DEPTH OF TRENCHES SHALL BE AS SHOWN ABOVE UNLESS OTHERWISE SPECIFIED ON THE PLANS. MINIMUM COVER REQUIREMENTS FOR DUCTS LOCATED IN TURF AREAS IS 18". MINIMUM COVER REQUIREMENTS FOR DUCTS LOCATED BELOW PAVEMENT IS 30". MINIMUM COVER REQUIREMENTS FOR DUCTS LOCATED IN AREAS SUBJECT TO FARMING IS 42". 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.
- 4. 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
- 5. DUCT AND CONDUIT INTERFACE TO HANDHOLES OR MANHOLES WILL BE CONSIDERED INCIDENTAL TO THE RESPECTIVE DUCT WORK.
- 6. ALL DISTURBED SURFACES SHALL BE RESTORED TO THEIR ORIGINAL CONDITION. <u>COST IS INCIDENTAL TO TRENCH.</u>

#### 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/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.
- 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).
- 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 (FÉDERAL 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.
- 5. 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 PROJECT REPRESENTATIVE AND THE AIRPORT MANAGER.
- 6. 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 RESIDENT ENGINEER/RESIDENT PROJECT REPRESENTATIVE AT THE CONTRACTOR'S EXPENSE. THE RESIDENT ENGINEER/RESIDENT PROJECT REPRESENTATIVE AND OWNER SHALL BE NOTIFIED IMMEDIATELY IF ANY CABLES OR OTHER LITHITIES 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.
- 8. 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/EXISTING UNDERGROUND IMPROVEMENTS.
- 9. CONDUITS FOR 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.

- 10. 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.
- 12. 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 ENCASEMENT SHALL BE 30" IN AREAS UNDER ROADWAYS. WHERE DETAILED ON THE PLANS OR WHERE REQUIRED TO AVOID OBSTRUCTIONS, DUCTS SHALL BE BURIED DEEPER.
- 13. WHERE CONCRETE—ENCASED DUCT INTERFACES TO AN ELECTRICAL HANDHOLE OR MANHOLE, THE CONCRETE ENCASEMENT SHALL BE INSTALLED UP TO THE RESPECTIVE HANDHOLE OR MANHOLE. PROVIDE BUSHINGS OR BELLS AT CONDUIT TERMINATIONS IN ELECTRICAL HANDHOLES OR MANHOLES.
- 14. 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.
- 15. A PULL WIRE SHALL BE INSTALLED IN EACH CONDUIT OR DUCT TO BE LEFT VACANT.
- 16. 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.
- 17. CONTROL CABLES SHALL BE RUN IN SEPARATE DUCTS FROM POWER CABLES.
- 18. HOMERUN CABLES FOR A RESPECTIVE CIRCUIT SHALL BE INSTALLED IN THE SAME RACEWAY OR DUCT.
- 19. 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.
- 20. CONTRACTOR SHALL COORDINATE DUCT MARKING WITH AIRPORT.
- 21. 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.



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CONSTRUCT AN ELECTRICAL VAULT AND INSTALL A PAPI ON RUNWAY END 3

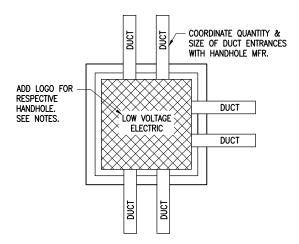
IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

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į	PROJECT NO: 12A0058D					
	CAD FILE: E-505-ELEC.DWG					
	DESIGN BY: KNL 1/21/2017					
ı	DRAWN BY: CWS 1/24/2017					

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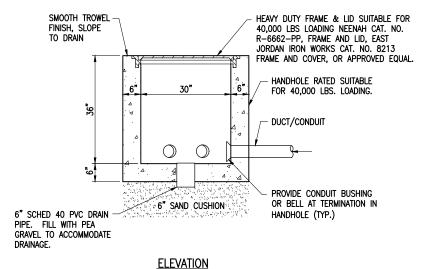
DUCT DETAILS AND INSTALLATION NOTES

"NOT TO SCALE"



#### LOW VOLTAGE HANDHOLE PLAN

"NOT TO SCALE"



#### NOTES:

1. 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.

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- HANDHOLES SHALL BE PRECAST. PRECAST MANUFACTURERS MUST BE ON THE IDOT (ILLINOIS DEPT. OF TRANSPORTATION) APPROVED LIST OF CERTIFIED PRECAST CONCRETE PRODUCERS.
- 3. FRAMES AND LIDS (CASTINGS) SHALL BE MADE IN THE USA TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCES REQUIREMENTS.
- 4. 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.
- 7. HANDHOLES WILL BE PAID FOR UNDER ITEM AR115610 ELECTRICAL HANDHOLE PER EACH.

ELECTRICAL HANDHOLE
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CONSTRUCT AN ELECTRICAL VAULT AND INSTALL A PAPI ON RUNWAY END 3

IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

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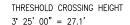
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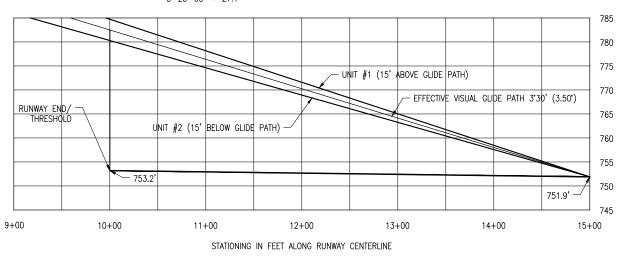
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ELECTRICAL HANDHOLE DETAILS

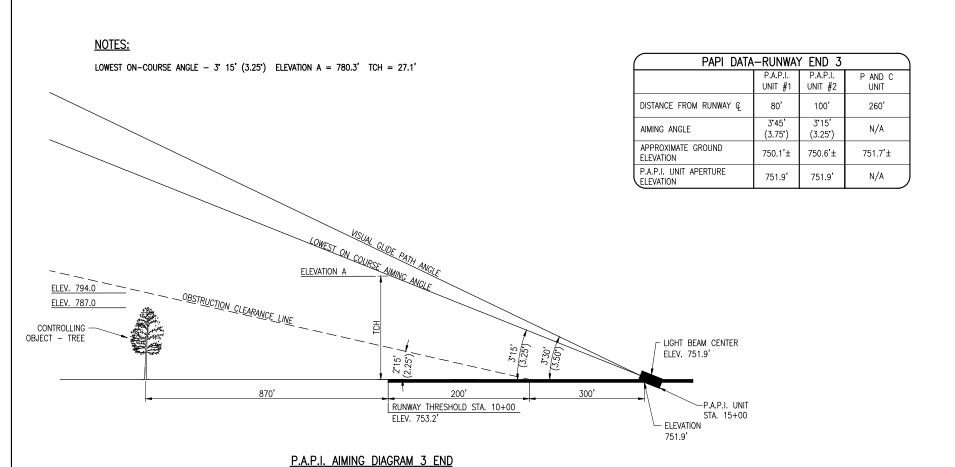
#### PAPI NOTES

- THE PROPOSED PRECISION APPROACH PATH INDICATOR (PAPI) SYSTEM WILL BE PLACED AT THE LOCATION SHOWN ON PROPOSED ELECTRICAL PLAN SHEETS.
- THE PROPOSED CONCRETE FOUNDATION PIERS SHALL BE AS DETAILED ON THE "PAPI FOUNDATION DETAILS" SHEET.
- EACH PAPI UNIT SHALL BE CONSTRUCTED SUCH THAT THE BEAM CENTERS WILL BE WITHIN ±1" OF FLEVATION 751.9'
- 4. 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).
- 5. PER FAA AC 150/5340-30H, PART 7.5 DESIGN, d. PAPI, (11) STYLE A PAPI SYSTEMS, (b) LOCATION OF THE POWER CONTROL UNIT (PCU), THE PCU MUST BE LOCATED AS FAR FROM THE RUNWAY AS POSSIBLE FOR MINIMUM OBSTRUCTION TO AIRCRAFT. IF THE PCU IS INTEGRAL WITH A LIGHT UNIT IT MUST BE PLACED FARTHEST FROM THE RUNWAY. IF THE PCU IS A SEPARATE UNIT, IT MUST BE MOUNTED AT THE MINIMUM POSSIBLE HEIGHT, AND LOCATED OUTSIDE THE RSA. IF THE PCU CANNOT BE LOCATED OUTSIDE THE RSA, IT MUST BE MOUNTED WITH FRANGIBLE COUPLINGS AND BREAKAWAY CABLING. PER FAA AC 150/5300-13A, PART 309 OBJECTS NON-ESSENTIAL FOR AIR NAVIGATION OR AIRCRAFT GROUND MANEUVERING PURPOSES MUST NOT BE PLACED IN THE ROFA. PER DIRECTION FROM FAA AND IDA IF THE PAPI PCU IS NOT AN APPROVED FIXED BY FUNCTION DEVICE IT SHALL BE LOCATED OUTSIDE THE ROFA.
- THE PAPI INSTALLATION WILL BE PAID FOR UNDER ITEM AR125620 ABBREVIATED PAPI (L-881 SYSTEM) PER EACH.

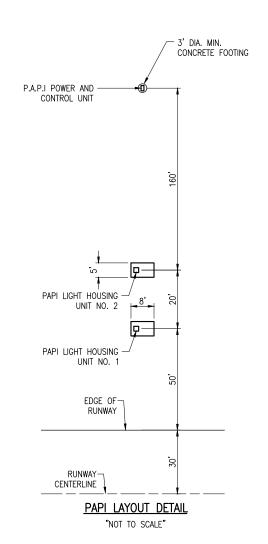




#### RUNWAY CENTERLINE PROFILE



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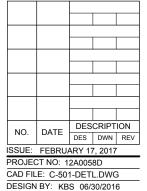
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CONSTRUCT AN ELECTRICAL VAULT AND INSTALL A PAPI ON RUNWAY END 3

IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006



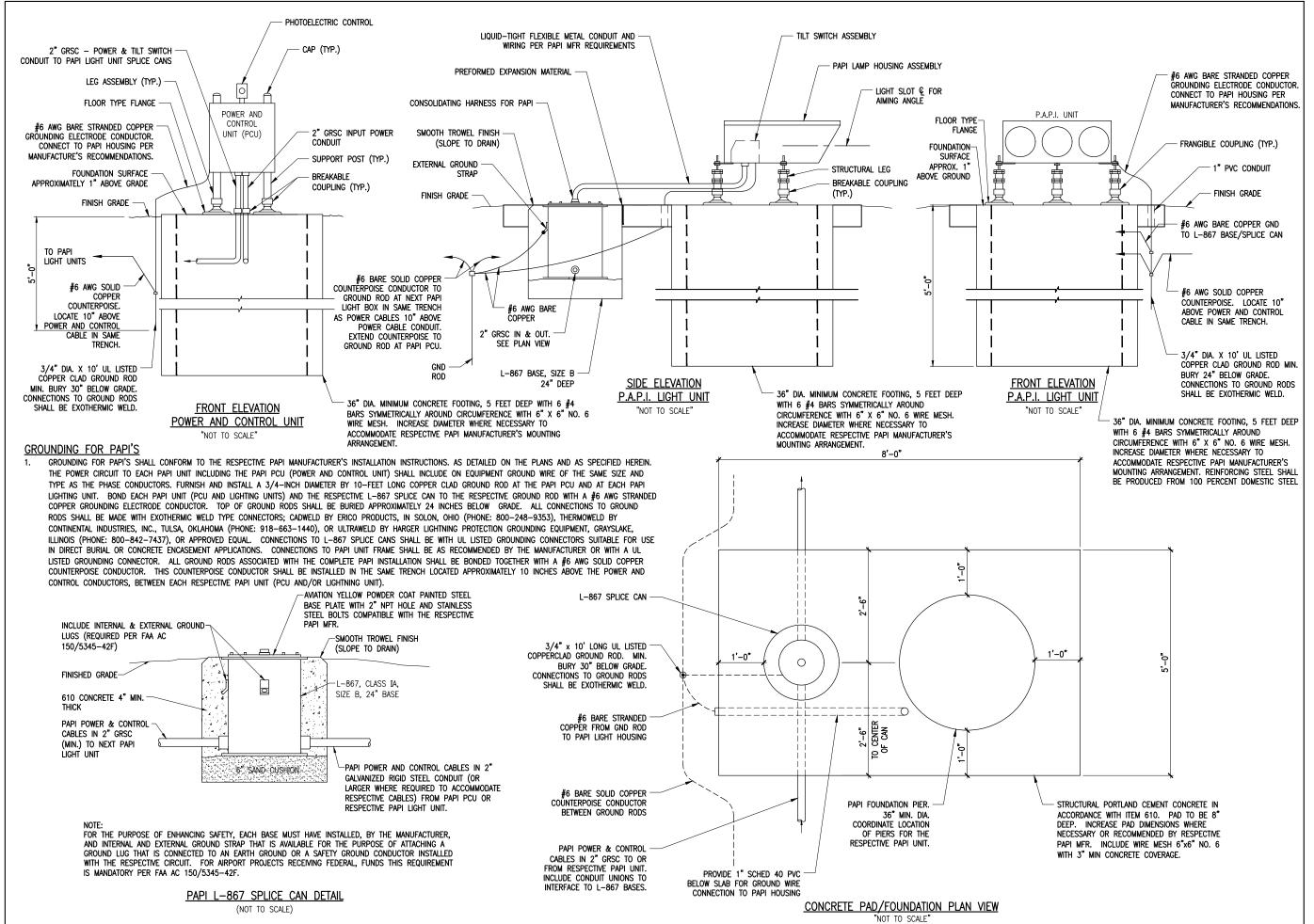
REVIEWED BY: MLH 01/30/2017

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DRAWN BY: MLH 01/28/2017

PROPOSED PAPI DETAILS AND NOTES RUNWAY END 3





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IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

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PAPI FOUNDATION DETAILS

DRAWN BY: CWS 1/25/2017

- 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 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.
- 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
- 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
- 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.
- 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.
- 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 DETAILED DESCRIPTION OF THE OVERALL EQUIPMENT AND ITS INDIVIDUAL
  - THEORY OF OPERATION INCLUDING THE FUNCTION OF EACH COMPONENT.
  - INSTALLATION INSTRUCTION.
  - START-UP INSTRUCTIONS.
  - PREVENTATIVE MAINTENANCE REQUIREMENTS.
  - CHART FOR TROUBLE-SHOOTING.
  - 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
  - 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.
  - SAFETY INSTRUCTIONS.

## POWER AND CONTROL NOTES

- 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
- 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).
- ALL BRANCH CIRCUIT CONDUCTORS CONNECTED TO A PARTICULAR PHASE SHALL BE IDENTIFIED WITH THE SAME COLOR. THE COLOR CODING SHALL BE EXTENDED
- IN CONTROL WIRING THE SAME COLOR SHALL BE USED THROUGHOUT THE SYSTEM FOR THE SAME FUNCTION, SUCH AS 10%, 30%, 100% BRIGHTNESS CONTROL,
- LOW VOLTAGE (600 V.) AND HIGH VOLTAGE (5000 V.) CONDUCTORS SHALL BE
- NEATLY LACE WIRING IN DISTRIBUTION PANELS, WIREWAYS, SWITCHES AND JUNCTION/PULL BOXES.
- THE MINIMUM SIZE OF PULL/JUNCTION BOXES, REGARDLESS OF THE QUANTITY AND SIZE OF THE CONDUCTORS SHOWN, SHALL BE AS FOLLOWS:
  - 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.
  - 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.
- 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.
- EQUIPMENT CABINETS SHALL NOT BE USED AS PULL/JUNCTION BOXES. ONLY WIRING TERMINATING AT THE EQUIPMENT SHALL BE BROUGHT INTO THESE
- SPLICES AND JUNCTION POINTS SHALL BE PERMITTED ONLY IN JUNCTION BOXES, DUCTS EQUIPPED WITH REMOVABLE COVERS, AND AT EASILY ACCESSIBLE
- CIRCUIT BREAKERS IN POWER DISTRIBUTION PANEL(S) SHALL BE THERMAL—MAGNETIC MOLDED CASE, PERMANENT TRIP WITH 100 AMPERE, MINIMUM
- 12. DUAL LUGS SHALL BE USED WHERE TWO (2) WIRES, SIZE NO. 6 OR LARGER, ARE TO BE CONNECTED TO THE SAME TERMINAL.
- 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.
- 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.

- 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
- 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.
- 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.
- USE CONDUIT BUSHINGS AT EACH CONDUIT TERMINATION. WHERE NO. 4 AWG OR LARGER UNDERGROUND WIRE IS INSTALLED, USE INSULATED BUSHINGS.
- 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 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
- 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.
  - THE ENCLOSURE(S) SHALL HAVE AMPLE SPACE FOR THE CIRCUIT COMPONENTS, TERMINAL BLOCKS AND INCOMING AND INTERNAL WIRING.
  - ALL CONTROL CONDUCTOR TERMINATIONS SHALL BE OF THE OPEN-EYE CONNECTOR/SCREW TYPE. SOLDERED CLOSED-EYE TERMINATIONS, OR TERMINATIONS WITHOUT CONNECTORS ARE NOT ACCEPTABLE
  - 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
  - ACCESS TO, OR REMOVAL OF A CIRCUIT COMPONENT OR TERMINAL BLOCK WILL NOT REQUIRE THE REMOVAL OF ANY OTHER CIRCUIT COMPONENT OR
  - EACH CIRCUIT COMPONENT SHALL BE CLEARLY IDENTIFIED INDICATING ITS CORRESPONDING NUMBER SHOWN ON THE DRAWINGS AND ITS FUNCTION.
  - A COMPLETE WIRING DIAGRAM SHALL BE MOUNTED ON THE INSIDE OF THE COVER. THE DIAGRAM SHALL REPRESENT EACH CONDUCTOR BY A SEPARATE
  - THE DIAGRAM SHALL IDENTIFY EACH CIRCUIT COMPONENT AN NUMBERING AND COLOR OF EACH TERMINAL CONDUCTOR AND TERMINAL.
  - ALL WIRING SHALL BE NEATLY TRAINED AND LACED.
  - MINIMUM WIRE SIZE SHALL BE NO. 12 AWG.
- 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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SHEET TITLE

**ELECTRICAL NOTES** SHEET 1

- NO COMPONENTS OF PRIMARY CIRCUIT SUCH AS CABLE, CONNECTORS AND TRANSFORMERS SHALL BE BROUGHT ABOVE GROUND AT EDGE LIGHTS, SIGNS, REIL, PAPI ETC
- THERE SHALL BE NO EXPOSED POWER/CONTROL CABLES BETWEEN THE POINT WHERE THEY LEAVE THE UNDERGROUND (DEB OR L-867 BASES) AND WHERE THEY ENTER THE EQUIPMENT (SUCH AS TAXIWAY SIGNS, PAPI, REIL, ETC.) ENCLOSURES. THESE CABLES SHALL BE ENCLOSED IN RIGID CONDUIT OR IN FLEXIBLE, WATERTIGHT CONDUIT WITH BREAKABLE COUPLING(S) AT THE GRADE OR THE HOUSING COVER, AS SHOWN IN APPLICABLE DETAILS.
- 4. THE JOINTS OF THE L-823 PRIMARY CONNECTORS SHALL BE WRAPPED WITH AT LEAST ONE LAYER OF RUBBER OR SYNTHETIC RUBBER TAPE AND ONE LAYER OF PLASTIC TAPE, ONE-HALF LAPPED, EXTENDING AT LEAST 1-1/2 INCHES ON EACH SIDE OF THE JOINT, AS SHOWN ON AIRFIELD LIGHTING CABLE SPLICE DETAILS.
- THE CABLE ENTRANCE INTO THE FIELD-ATTACHED L-823 CONNECTORS SHALL BE ENCLOSED BY A HEAT-SHRINKABLE TUBING WITH CONTINUOUS INTERNAL ADHESIVE, AS SHOWN ON AIRFIFLD LIGHTING CABLE SPLICE DETAILS.
- L-823 TYPE II, TWO-CONDUCTOR SECONDARY CONNECTORS SHALL BE CLASS 'A' (FACTORY MOLDED).
- THERE SHALL BE NO SPLICES IN THE SECONDARY CABLE(S) WITHIN THE STEMS OF A RUNWAY/TAXIWAY EDGE/THRESHOLD LIGHTING FIXTURE AND THE WIREWAYS LEADING TO TAXIWAY SIGNS AND PAPI/REIL EQUIPMENT.
- ELECTRICAL INSULATING GREASE SHALL BE APPLIED WITHIN THE L-823, SECONDARY, TWO CONDUCTOR CONNECTORS TO PREVENT WATER ENTRANCE. THESE CONNECTORS SHALL NOT BE TAPED.
- DEB ISOLATION TRANSFORMERS SHALL BE BURIED AT A DEPTH OF TEN (10") INCHES ON A LINE CROSSING THE LIGHT AND PERPENDICULAR TO THE RUNWAY/TAXIWAY CENTERLINE AT A LOCATION TWELVE (12") INCHES FROM THE LIGHT OPPOSITE FROM THE RUNWAY/TAXIWAY.
- 10. A SLACK OF THREE (3') FEET, MINIMUM, PLUS DEPTH OF BASE CAN (IF APPLICABLE), SHALL BE PROVIDED IN THE PRIMARY CABLE AT EACH TRANSFORMER/CONNECTOR TERMINATION. AT STAKE—MOUNTED LIGHTS, THE SLACK SHALL BE LOOSELY COILED IMMEDIATELY BELOW THE ISOLATION TRANSFORMER. THERE SHALL BE NO ADDITIONAL PAYMENT FOR CABLE SLACK AND THEREFORE THE QUANTITY OF PROPOSED CABLE SLACK HAS NOT BEEN INCLUDED IN THE RESPECTIVE CABLE PAY ITEMS
- 11. DIRECTION OF PRIMARY CABLES SHALL BE IDENTIFIED BY COLOR CODING AS FOLLOWS: WHEN FACING LIGHT WITH BACK TO PAVEMENT, CABLE TO THE LEFT IS CODED RED AND CABLE TO RIGHT IS CODED BLUE. THIS APPLIES TO STAKE MOUNTED LIGHTS AND BASE MOUNTED LIGHTS WHERE THE BASE HAS ONLY ONE ENTRANCE.
- 12. L-867 BASES SHALL BE SIZE B, 24" DEEP, CLASS I, UNLESS OTHERWISE NOTED.
- 13. BASE MOUNTED BREAKABLE COUPLINGS SHALL NOT HAVE WEEP HOLES TO THE OUTSIDE. PLUGGED UP HOLES SHALL NOT BE ACCEPTABLE. IT SHALL BE A 1/4" DIAMETER, MINIMUM, OR EQUIVALENT OPENING FOR DRAINAGE FROM THE SPACE AROUND THE SECONDARY CONNECTOR INTO THE L—867 BASE.
- 14. THE ELEVATION OF THE BREAKABLE COUPLING GROOVE SHALL NOT EXCEED 1-1/2" ABOVE THE EDGE OF THE COVER IN CASE OF BASE MOUNTED COUPLINGS, OR THE TOP OF THE STAKE IN CASE OF STAKE MOUNTED COUPLINGS.
- 15. WHERE THE BREAKABLE COUPLING IS NOT AN INTEGRAL PART OF THE LIGHT FIXTURE STEM OR MOUNTING LEG, A BEAD OF SILICON SEAL SHALL BE APPLIED COMPLETELY AROUND LIGHT STEM OR WIREWAY AT BREAKABLE COUPLING TO PROVIDE A WATERTIGHT SEAL
- 16. TOPS OF THE STAKES SUPPORTING LIGHT FIXTURES SHALL BE FLUSH WITH THE SURROUNDING GRADE.
- 17. PLASTIC LIGHTING FIXTURE COMPONENTS, SUCH AS LAMP HEADS, STEMS, BREAKABLE COUPLINGS, BASE COVERS, BRACKETS, STAKES, SHALL NOT BE ACCEPTABLE.
- 18. THE TOLERANCE FOR THE HEIGHT OF RUNWAY/TAXIWAY EDGE LIGHTS SHALL BE: ONE (1) INCH. IN CASE OF STAKE MOUNTED LIGHTS, THE SPECIFIED LIGHTING FIXTURE HEIGHT SHALL BE MEASURED BETWEEN THE TOP OF THE STAKE AND THE TOP OF THE LENS. IN CASE OF BASE MOUNTED LIGHTS, THE SPECIFIED LIGHTING FIXTURE HEIGHT SHALL BE MEASURED BETWEEN THE TOP OF THE BASE FLANGE AND THE TOP OF THE LENS, THUS INCLUDING THE BASE COVER, THE FRANGIBLE COUPLING, THE STEM, THE LAMP HOUSING AND THE LENS.
- 19. THE TOLERANCE FOR THE LATERAL SPACING (LIGHT LANE TO RUNWAY/TAXIWAY CENTERLINE) OF RUNWAY/TAXIWAY EDGE LIGHTS SHALL BE ONE (1) INCH. THIS ALSO APPLIES AT INTERSECTIONS TO LATERAL SPACING BETWEEN LIGHTS OF A RUNWAY/TAXIWAY AND THE INTERSECTING RUNWAY/TAXIWAY.

- ENTRANCES INTO L-867 BASES SHALL HAVE CONDUIT COUPLINGS OR REDUCERS TO INTERFACE UNIT DUCT/CONDUIT TO L-867 BASE HUBS, OR SHALL BE SEALED WITH HEAT SHRINK.
- GALVANIZED/PAINTED EQUIPMENT/COMPONENT SURFACES SHALL NOT BE DAMAGED BY DRILLING, FILING, ETC. DRAIN HOLES IN METAL TRANSFORMER HOUSINGS SHALL BE MADE BEFORE GALVANIZING.
- 22. EDGE LIGHT NUMBERING TAGS SHALL BE FACING THE PAVEMENT.
- 3. CABLE/SPLICE/DUCT MARKERS SHALL BE PRECAST CONCRETE OF THE SIZE SHOWN. LETTERS/NUMBERS/ARROWS FOR THE LEGEND TO BE IMPRESSED INTO THE TOPS OF THE MARKERS SHALL BE PRE-ASSEMBLED AND SECURED IN THE MOLD BEFORE THE CONCRETE IS POURED. LEGEND INSCRIBED BY HAND IN WET CONCRETE SHALL NOT BE ACCEPTABLE.
- 24. ALL UNDERGROUND CABLE RUNS SHALL BE IDENTIFIED BY CABLE MARKERS AT 200 FEET MAXIMUM SPACING, WITH AN ADDITIONAL MARKER AT EACH CHANGE OF DIRECTION OF THE CABLE RUN. CABLE MARKERS SHALL BE INSTALLED IMMEDIATELY ABOVE THE CABLES.
- THERE SHALL BE NO SPLICES BETWEEN THE ISOLATION TRANSFORMERS. L-823 CONNECTORS ARE ALLOWED AT TRANSFORMER CONNECTIONS ONLY, UNLESS OTHERWISE SHOWN
- APPLY AN OXIDE INHIBITING, ANTI-SEIZING COMPOUND TO ALL SCREWS, NUTS AND BREAKAGE COUPLING THREADS.
- 27. LOCATIONS OF ENDS OF ALL UNDERGROUND DUCTS SHALL BE IDENTIFIED BY DUCT MARKERS
- 28. WHERE A PARALLEL, CONSTANT VOLTAGE PAPI SYSTEM IS PROVIDED, THE "T" SPLICES SHALL BE OF THE CAST TYPE.
- CONCRETE USED FOR SLABS, FOOTINGS, BACKFILL AROUND TRANSFORMER HOUSINGS, MARKINGS, ETC. SHALL BE 3500 PSI, AIR-ENTRAINED.
- 30. ALL POWER AND CONTROL CABLES IN MAN/HAND HOLES SHALL BE TAGGED. USE EMBOSSED COPPER STRIPS TO BE ATTACHED AT BOTH ENDS TO THE CABLE BY THE USE OF PLASTIC STRAPS. MINIMUM OF TWO TAGS SHALL BE PROVIDED ON EACH CABLE IN A MAN/HAND HOLE—ONE AT THE CABLE ENTRANCE AND ONE AT THE CABLE EXIT.
- 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. 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 ABOVE GROUND UTILITIES.
- 32. WHEN PREPARING CABLE FOR SPLICES, THE CONTRACTOR SHALL USE A CABLE STRIPPER/PENCILLER WHENEVER CABLE CONNECTIONS ARE MADE.

#### **GROUNDING NOTES FOR PAPI'S**

- GROUNDING FOR PAPI'S SHALL CONFORM TO THE RESPECTIVE PAPI MANUFACTURER'S INSTALLATION INSTRUCTIONS, AS DETAILED ON THE PLANS AND AS SPECIFIED HEREIN. THE POWER CIRCUIT TO EACH PAPI UNIT SHALL INCLUDE AN EQUIPMENT GROUND WIRE OF THE SAME SIZE AND TYPE AS THE PHASE CONDUCTORS. FURNISH AND INSTALL A 3/4-INCH DIAMETER BY 10-FEET LONG COPPER CLAD GROUND ROD AT EACH PAPI 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 ERICO PRODUCTS, IN SOLON, OHIO (PHONE: 800-248-9353), THERMOWELD BY CONTINENTAL INDUSTRIES, INC., TULSA, OKLAHOMA (PHONE: 918-663-1440), OR ULTRAWELD BY HARGER LIGHTNING PROTECTION GROUNDING EQUIPMENT, GRAYSLAKE, ILLINOIS (PHONE: 800-842-7437), OR APPROVED EQUAL. CONNECTIONS TO L-867 SPLICE CANS SHALL BE WITH UL LISTED GROUNDING CONNECTORS SUITABLE FOR USE IN DIRECT BURIAL OR CONCRETE ENCASEMENT APPLICATIONS. CONNECTIONS TO PAPI UNIT FRAME SHALL BE AS RECOMMENDED BY THE MANUFACTURER OR WITH A UL LISTED GROUNDING CONNECTOR. ALL GROUND RODS ASSOCIATED WITH THE COMPLETE PAPI INSTALLATION SHALL BE BONDED 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.
- CLEAN ALL METAL SURFACES BEFORE MAKING GROUND CONNECTIONS. METALLIC SURFACES TO BE JOINED SHALL BE PREPARED BY THE REMOVAL OF ALL NON-CONDUCTIVE MATERIAL PER 2014 NATIONAL ELECTRICAL CODE ARTICLE 250-12.
- PER FAA 150/5340-30H THE RESISTANCE TO GROUND OF THE RESPECTIVE MOUNTING STAKE OR LIGHT BASE (WITH GROUND ROD CONNECTED) MUST BE 25 OHMS OR LESS.
- STEEL USED TO MANUFACTURE GROUND RODS SHALL BE 100% DOMESTIC STEEL.
- 5. 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.

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IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

ELECTRICAL NOTES SHEET 2

DRAWN BY: CWS 1/25/2017

#2 AWG BARE STR. CU. TO VAULT

SCALE 1/2"=1'-0" [FULL-SIZE (22x34)]

TO LOW VOLTAGE

HANDHOLE

1 ELECTRIC SERVICE CONDUCTORS AND

ELECTRIC SERVICE CONDUCTORS IN 3" SCHED 80 PVC FROM UTILITY TRANSFORMER, SEE "PROPOSED ELECTRICAL ONE-LINE DIAGRAM FOR VAULT AND AIRFIELD".

VAULT SERVICE & MAIN DISTRIBUTION PANELBOARD

KEYED NOTES

3 AC SURGE PROTECTIVE DEVICE, SEE "PROPOSED ELECTRICAL ONE-LINE DIAGRAM FOR VAULT AND AIRFIELD."

LIGHTING CONTACTOR PANEL. SEE AIRFIELD LIGHTING WIRING SCHEMATIC AND LIGHTING CONTACTOR PANEL DETAIL.

L-854 RADIO CONTROL UNIT. EXTEND GRSC & RADIO ANTENNA CABLE AND MOUNT ANTENNA ABOVE THE ADJACENT HANGAR BUILDING ROOF AS REQUIRED FOR PROPER OPERATION. BOND GRSC AT BLDG EXTERIOR TO GND RING WITH #2 AWG BARE CU. PROVIDE 1" SCHEDULE 40 PVC TO PROTECT GND WIRE. GRSC WITH ANTENNA CABLE SHALL TRANSITION TO SCHED 40 PVC AT ENTRY TO VAULT.

RADIO RELAY INTERFACE PANEL WITH PHOTOCELL BYPASS SWITCH FOR AIRFIELD LIGHTING SYSTEM. SEE AIRFIELD LIGHTING WIRING SCHEMATIC FOR WIRING REQUIREMENTS. MOUNT PHOTOCELL ABOVE ROOF. FIELD VERIFY LOCATION FOR PROPER CONTROL AND OPERATION. BOND GRSC AT BLDG EXTERIOR TO GND RING WITH #2 AWG BARE CU. PROVIDE 1" SCHEDULE 40 PVC TO PROTECT GND WIRE. GRSC WITH PHOTOCELL CABLE SHALL TRANSITION TO SCHEDULE 40 PVC AT ENTRY TO VAULT.

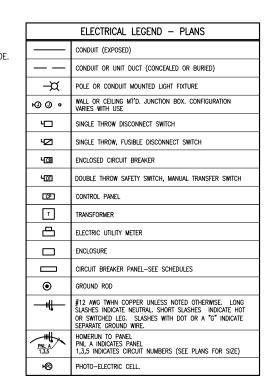
60 AMP, 240 VAC, 2P DOUBLE THROW NOT FUSIBLE SAFETY SWITCH FOR RUNWAY CCR'S.

ELECTRIC WALL HEATER EH-1, 3000 WATT, 240 VAC, 1 PHASE, SUITABLE FOR SURFACE MOUNTING WITH INTEGRAL THERMOSTAT, Q-MARK MODEL CWH3407, MARLEY ENGINEERED PRODUCTS MODEL CWH3407F, OR APPROVED EQUAL HEATER SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY

9 ELECTRIC WALL HEATER EH-2 3000 WATT, 240 VAC, 1 PHASE, SUITABLE FOR SURFACE MOUNTING WITH INTEGRAL THERMOSTAT, Q-MARK MODEL CWH3407, MARLEY ENGINEERED PRODUCTS MODEL CWH3407F, OR APPROVED EQUAL. HEATER SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN REQUIREMENT. 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.

- EXHAUST FAN EF-1, 3000 CFM (MINIMUM) AT .25" STATIC PRESSURE WITH 1/3 HP (MINIMUM), 120 VAC MOTOR, COOK MODEL 20S10D, CARNES MODEL LÚDL20P2A1CS20FC, OR APPROVED EQUIAL. INCLUDE WALL HOUSING WITH GUARD, GRAVITY BACK DRAFT DAMPER, ALUMINUM WEATHER-HOOD PAINTED TO MATCH BUILDING EXTERIOR, STAINLESS STEEL INSECT SCREEN, AND FRACTIONAL HP ELECTRICAL DISCONNECT. INSTALL FAN AS HIGH AS REASONABLE. 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 REQUIREMENT.
- INTAKE LOUVER L-1, 24" WIDE BY 48" HIGH INTAKE LOUVER WITH STAINLESS INSECT SCREEN. 120 VAC MOTORIZED DAMPER WITH LIMIT SWITCH, KYNAR 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 REQUIREMENT.
- 6" BY 6" LOW VOLTAGE WIREWAY. LABEL "LOW VOLTAGE" EVERY 4 FEET. INSTALL ABOVE HIGH VOLTAGE WIREWAY.
- [13] 6" BY 6" HIGH VOLTAGE WIREWAY. LABEL "HIGH VOLTAGE" EVERY 4 FEET. INSTALL BELOW LOW VOLTAGE WIREWAY.
- 14 NEW RUNWAY 3-21 CONSTANT CURRENT REGULATOR. SEE GENERAL NOTE 1.
- BACKUP/SPARE CONSTANT CURRENT REGULATOR FOR RUNWAY 3-21 RELOCATED FROM EXISTING VAULT. SEE GENERAL 23
- NEW TAXIWAY CONSTANT CURRENT REGULATOR. SEE GENERAL NOTE 1. 16

ENTRANCE PAD/STEP CONSTRUCTED OF 6" CONCRETE SLAB W/6X6-W5XW5 WELDED WIRE FABRIC ON A COMPACTED SUBGRADE MINIMUM DIMENSIONS OF PAD WILL BE 7'Wx5'Dx6"H SLOPED AT A MIN OF 0.5"/FT AWAY FROM THE VAULT ENTRANCE. PCC USED TO CONSTRUCT THE PAD WILL CONFORM TO ITEM 610. ALL MATERIALS, LABOR AND FOLIPMENT LISED TO CONSTRUCT THE PAD INCLUDING ANY GRADING REQUIRED WILL BE CONSIDERED INCIDENTAL TO THE CONSTRUCTION OF THE PROPOSED FLECTRICAL VAULT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED. COORDINATE WITH ENTRY TO VAULT. VAULT FLOOR ELEVATION TO BE APPROXIMATELY 6 INCHES ABOVE PAD/STEP.



**GENERAL NOTES** 

3/4" x 10' L. UL LISTED COPPER CLAD

- 1. 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 SCHEMATIC" FOR CCR OUTPUT WIRING REQUIREMENTS. SEE "AIRFIFLD LIGHTING WIRING SCHEMATIC" FOR CCR CONTROL WIRING REQUIREMENTS. PROVIDE 5 FEET MINIMUM CLEAR WORKING SPACE IN FRONT OF EACH CCR AND EACH SERIES PLUG CUTOUT.
- CONSTANT CURRENT REGULATORS AND THEIR RESPECTIVE SERIES PLUG CUTOUTS SHALL BE CLEARLY LABELED TO IDENTIFY THE RESPECTIVE REGULATOR DESIGNATION, RUNWAY OR TAXIWAY SERVED. POWER SOURCE OR CIRCUIT. AND VOLTAGE SYSTEM.
- 3. SEE ELEVATION VIEWS FOR ADDITIONAL INFORMATION ON PROPOSED EQUIPMENT
- 4. COORDINATE CONDUIT & SLEEVE ENTRANCES THROUGH FLOOR SLAB AND WALLS.
- 5. VAULT FOUNDATION PIERS SHALL BE SIZED IN ACCORDANCE WITH THE RESPECTIVE VAULT SHELTER MANUFACTURER AND EXTEND 5 FEET MINIMUM BELOW FINISHED GRADE.
- 18 TRANSFER PAIR SERIES PLUG CUTOUTS (TYPE S-1) FOR RUNWAY LIGHTING WITH ENCLOSURE. SEE GENERAL NOTES 1 & 2.
- 19 SERIES PLUG CUTOUT (TYPE S-1) FOR TAXIWAY LIGHTING WITH ENCLOSURE. SEE GENERAL
- 3-3" PVC COATED GRSC WITH PVC COATED GRSC ELBOWS FROM HIGH VOLTAGE WIREWAY TO HIGH VOLTAGE HANDHOLE.
- 3-3" PVC COATED GRSC WITH PVC COATED GRSC ELBOWS AT VAULT FROM LOW VOLTAGE WIREWAY TO LOW VOLTAGE MANHOLE #1. COORDINATE LOCATION WITH BUILDING FOUNDATION/PIERS.
- 4" THICK CONCRETE PAD WITH 6x6-2.9x2.9 W.W.F. AND 6" CRUSHED COMPACTED AGGREGATE BASE COURSE, COORDINATE WITH PIER FOUNDATIONS. PROVIDE 1/2" TOOLED JOINTS THAT INTERSECT PIER FOUNDATIONS. PROPOSED PAD WILL COVER ENTIRE AREA BENEATH VAULT STRUCTURE AS WELL AS 18" AROUND THE PERIMETER OF THE BUILDING EDGE. THE CONCRETE PAD WILL BE CONSIDERED INCIDENTAL TO THE INSTALLATION OF THE PROPOSED FLECTRICAL VAULT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- 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 R.C. FIRES. IN THE VALUE SHELTER, PER NEPA 10 "Portable fire extinguishers" class c are for fires that involve energized electrical FOLIPMENT, FIRE EXTINGUISHERS SHALL BE MADE IN THE LINITED STATES OF AMERICA TO COMPLY WITH BUY AMERICAN REQUIREMENT. FIRE EXTINGUISHER TYPE CO2 SHALL BE AMEREX MODEL 330 BUCKEYE MODEL 10CD ANSUL SENTRY 10 MODEL CD10A-1 OR APPROVED FOLIAL FIRE EXTINGUISHER DRY CHEMICAL TYPE ABC SHALL BE AMEREX MODEL B456, BUCKEYE MODEL 10-TALL-ARC OR APPROVED FOLIAL PROVIDE WALL MOUNTING BRACKET FOR FACH FIRE EXTINGUISHER. CONFIRM MODEL NUMBERS WITH THE RESPECTIVE FIRE EXTINGUISHER MANUFACTURER.



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**CONSTRUCT AN ELECTRICAL VAULT** AND INSTALL A PAPI ON RUNWAY END 3

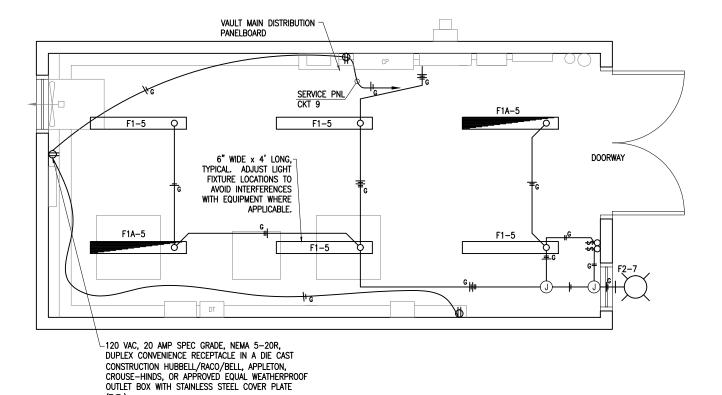
IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

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PROPOSED AIRPORT VAULT EQUIPMENT **PLAN** 

REVIEWED BY: LDH 01/30/2017

SHEET TITLE



- NOTES
  1. 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.
- 3. ADJUST RECEPTACLE LOCATIONS WHERE NECESSARY TO ACCOMODATE
- 4. TEST EMERGENCY LIGHTING AND CONFIRM PROPER OPERATION.
- 5. "USPOM" SUFFIX ON LITHONIA LIGHT FIXTURE CATALOG NUMBERS INDICATES UNITED STATES POINT OF MANUFACTURE.

N	VAULT LIGHTING AND RECEPTACLE PLAN
$\Box$	SCALE 1/2"=1'-0" [FULL-SIZE (22x34)] 1 0 2 4 FEET

	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-431-840-4-UNV- EMLED, H.E. WILLIAMS 96-4-L40-840-HIAFR- DRY-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 (1P65 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-L2B-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.

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CONSTRUCT AN **ELECTRICAL VAULT** AND INSTALL A PAPI ON RUNWAY END 3

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SHEET TITLE

PROPOSED AIRPORT VAULT LIGHTING AND RECEPTACLE PLAN

NOTES

WITH EQUIPMENT LAYOUT AND VAULT FOUNDATION.

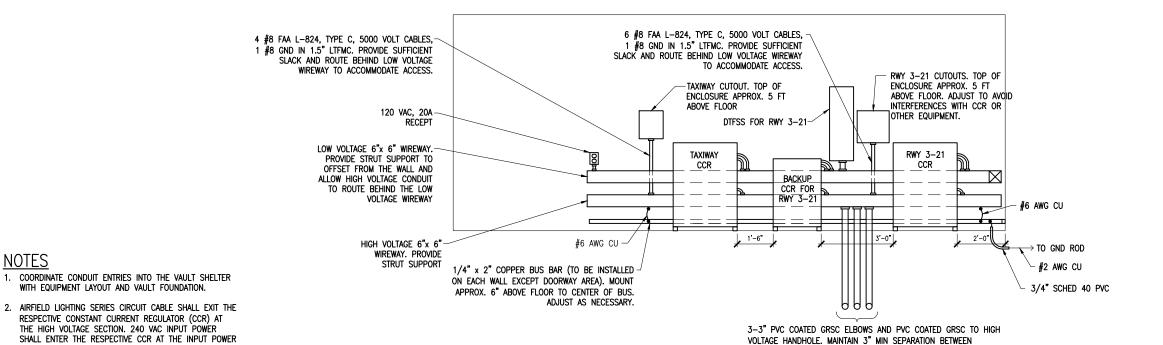
SECTIONS. CONTROL CIRCUITS SHALL ENTER THE

REQUIREMENTS WITH EACH RESPECTIVE CCR

MANUFACTURER'S INSTRUCTIONS.

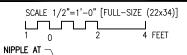
RESPECTIVE CCR AT THE CONTROL SECTION. MAINTAIN

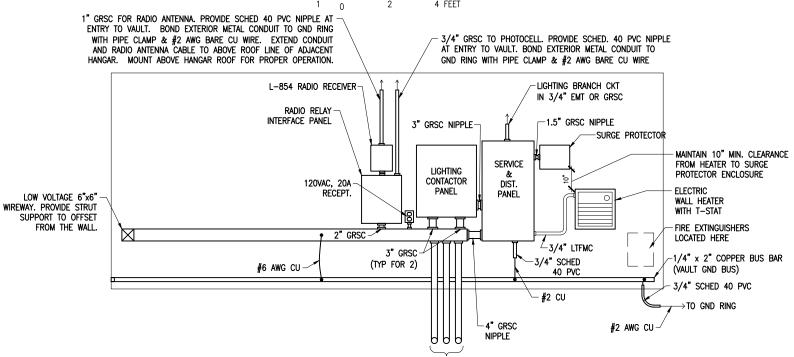
THE SEPARATION OF LOW VOLTAGE CIRCUITS FROM HIGH VOLTAGE CIRCUITS, CONFIRM CCR INSTALLATION



FOUNDATIONS AND INTERFACE TO HIGH VOLTAGE HANDHOLE. VAULT SOUTH WALL ELEVATION

CONDUITS COORDINATE LOCATIONS WITH VAULT FLOOR AND





VAULT NORTH WALL ELEVATION

3-3" PVC COATED GRSC ELBOWS AND PVC COATED GRSC TO LOW VOLTAGE HANDHOLE. MAINTAIN 3" MIN SEPARATION BETWEEN CONDUITS COORDINATE

LOCATIONS WITH VAULT FLOOR AND FOUNDATIONS AND INTERFACE TO LOW VOLTAGE HANDHOLE

SCALE 1/2"=1'-0" [FULL-SIZE (22x34)] 



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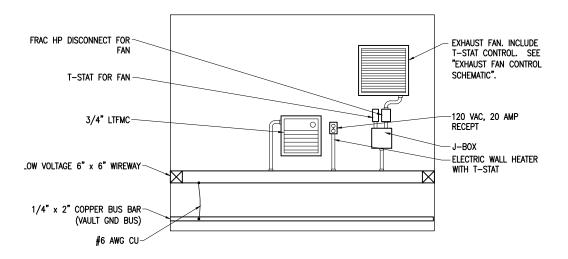
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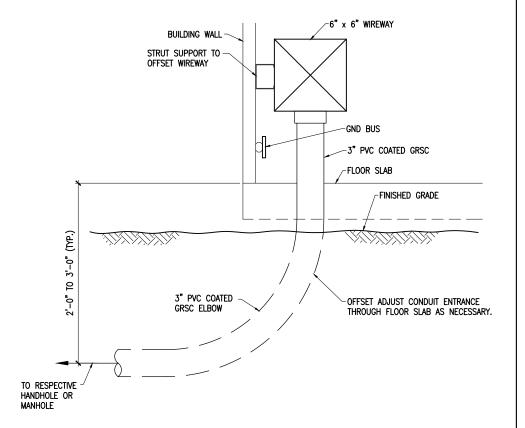
DESIGN BY: KNL 1/21/2017 DRAWN BY: CWS 1/24/2017 REVIEWED BY: LDH 01/30/2017

SHEET TITLE

PROPOSED AIRPORT **VAULT ELEVATIONS** (SHEET 1)







# CONDUIT ENTRANCE DETAIL SCALE 1 1/2"=1'-0"

NOTES:

1. CONDUITS EXITING THE VAULT FOR AIRFIELD LIGHTING AND NAVAIDS CIRCUITS SHALL BE PVC COATED GALVANIZED RIGID STEEL CONDUIT WITH FIELD APPLIED ASPHALT BASED PAINT COATING.

1. CONDUITS EXITING THE VAULT FOR AIRFIELD LIGHTING AND NAVAIDS CIRCUITS SHALL BE PVC COATED GALVANIZED RIGID STEEL CONDUIT WITH FIELD APPLIED ASPHALT BASED PAINT COATING. THIS REQUIREMENT IS TO COMPLY WITH FAA AC 150/5340-30H, CHAPTER 13, PART 13.2 POWER DISTRIBUTION, ITEM e, WHICH STATES IN THE LAST SENTENCE, "BRING THE PRIMARY SERIES CABLES FROM THE REGULATORS AND VARIOUS OTHER FEEDERS OUT OF THE VAULT IN COATED RIGID STEEL GALVANIZED CONDUIT OR PVC CONDUIT, A MINIMUM OF 2 FEET BELOW GRADE." RIGID STEEL CONDUIT SHALL BE PRODUCED FROM DOMESTIC STEEL.



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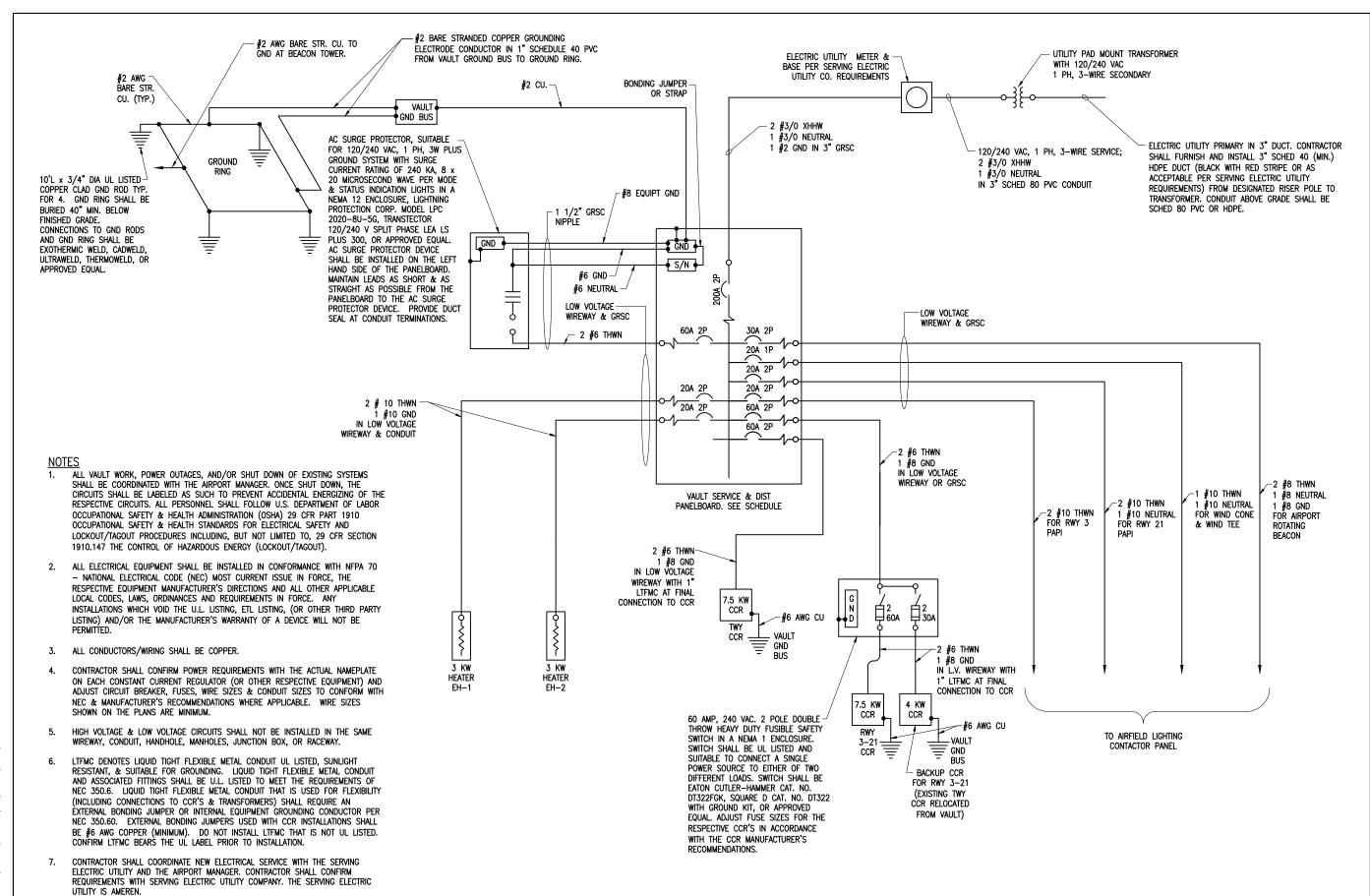
SHEET TITLE

PROPOSED AIRPORT VAULT WALL **ELEVATIONS (SHEET** 



DUCT FOR ELECTRIC UTILITY PRIMARY WILL BE PAID FOR UNDER ITEM AR110013 3"

DIRECTIONAL BORE PER L.F. ALL OTHER WORK SHOWN ON THIS SHEET SHALL BE PAID FOR UNDER ITEM AR109200 INSTALL ELECTRICAL EQUIPMENT PER LUMP SUM.



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DESCRIPTION NO. DATE DES DWN REV ISSUE: FEBRUARY 17, 2017

PROJECT NO: 12A0058D

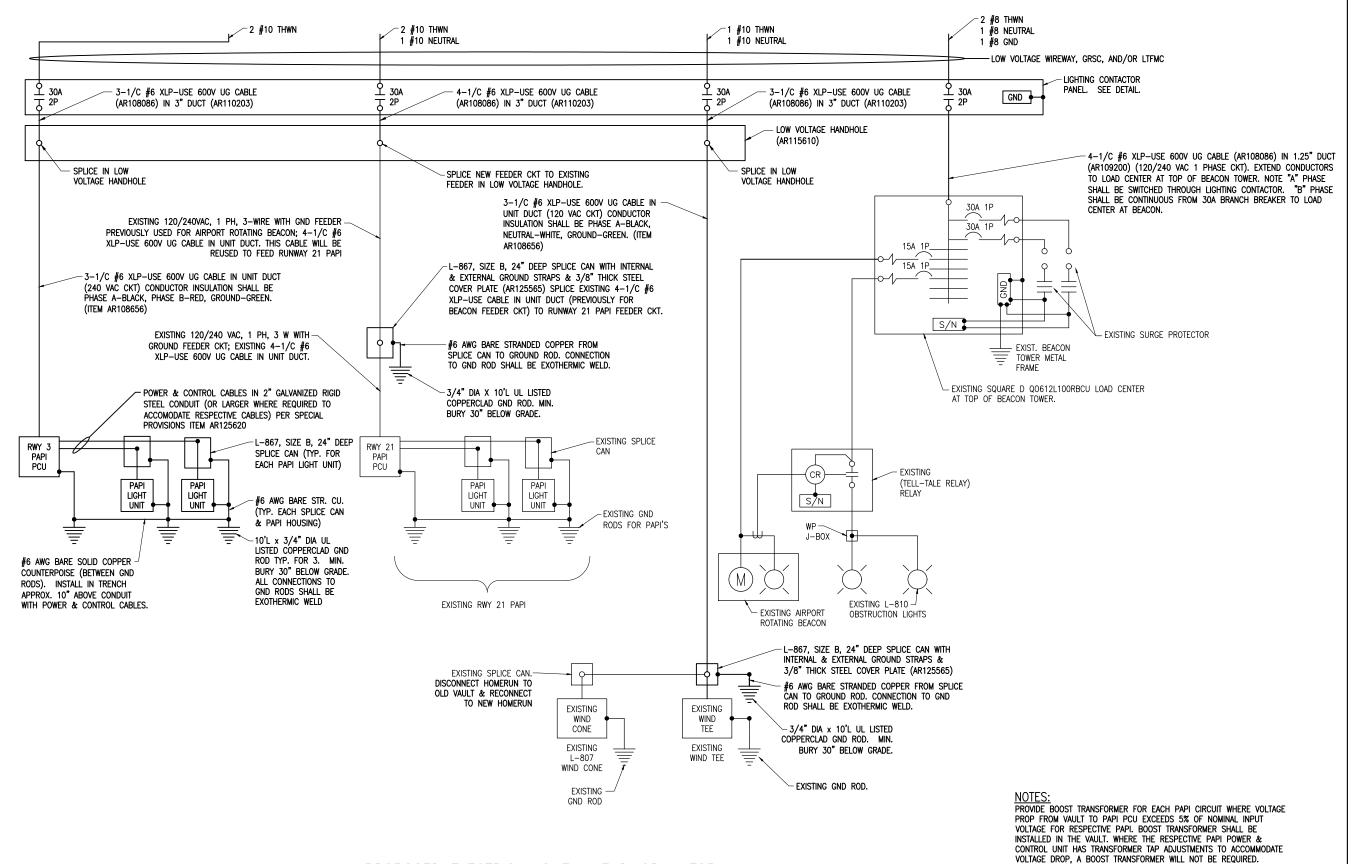
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REVIEWED BY: LDH 01/30/2017

SHEET TITLE

**PROPOSED ELECTRICAL ONE** LINE FOR VAULT & **AIRFIELD - SHEET 1** 

PROPOSED ELECTRICAL ONE-LINE DIAGRAM FOR VAULT AND AIRFIELD





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DRAWN BY: CWS 1/25/2017 REVIEWED BY: LDH 01/30/2017

SHEET TITLE

PROPOSED ELECTRICAL ONE LINE FOR VAULT & AIRFIELD - SHEET 2

225AMP, 120/240VAC, 1 PHASE, 3 WIRE 42 CIRCUIT PANELBOARD WITH 200AMP, 2 POLE MAIN BREAKER RATED 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 CAT. NO. NQ42L2C WITH COPPER NEUTRAL & COPPER GROUND BAR KIT, EQUIVALENT PANELBOARD BY CUTLER-HAMMER, OR APPROVED EQUAL.

#### NOTES

- 1. PANELBOARD BUSSES SHALL BE COPPER. NEUTRAL SHALL BE COPPER. EQUIPMENT GROUND BAR SHALL BE COPPER.
- 2. 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 SERVICE & DIST. PANEL, 120/240 VAC, 1PH, 3W". INCLUDE
  ADDITIONAL LEGEND PLATE FOR THE VAULT MAIN BREAKER LABELED "SERVICE DISCONNECT".
- 4. 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.
- 6. FOR A BOTTOM FEED PANELBOARD, MOVE AC SURGE PROTECTOR BREAKER DOWN TO POSITIONS 39 AND 41.



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REVIEWED BY: LDH 01/30/2017

SHEET TITLE

VAULT PANELBOARD SCHEDULE

SURGE

PROTECTOR

## AIRFIELD LIGHTING CONTROL WIRING SCHEMATIC

#### NOTES:

CCI

CC

B10

B30

B100

CCI

CC

B10

B30

B100

CCI

CC

B10

B30

B100

PAPI CONTACTOR

PAPI CONTACTOR

RWY 3-21

FAA L-828

CCR

SPARE

FAA L-828

CCR FOR

RWY 3-21

TXY

CCR

TO HOA SELECTOR SWITCH FOR RWY 3

TO HOA SELECTOR SWITCH FOR RWY 21

AIRPORT ROTATING BEACON CONTACTOR

TO HOA SELECTOR SWITCH FOR

TO HOA SELECTOR SWITCH FOR

WIND CONE & WIND TEE

FAA L-828

- 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 REQUIREMENT AND THE "BUY AMERICAN ACT". RELAY INTERFACE CONTROL PANEL SHALL BE A SEPARATE PANEL. DO NOT COMBINE WITH LIGHTING CONTACTOR PANEL.
- 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
- IN THE AUTOMATIC MODE OF OPERATION THE RUNWAY 3-21 CONSTANT CURRENT REGULATORS (PRIMARY UNIT & SPARE UNIT) SHALL BE CONTROLLED BY THE PHOTOCELL & THE L-854 RADIO CONTROL UNIT IN THE FOLLOWING MANNER: PHOTOCELL - 10% BRIGHTNESS & ACTIVATE RADIO CONTROL

5 CLICKS - 30% BRIGHTNESS 7 CLICKS - 100% BRIGHTNESS

IN THE AUTOMATIC MODE OF OPERATION THE TAXIWAY CIRCUIT WILL BE CONTROLLED BY THE PHOTOCELL & THE L-854 RADIO CONTROL UNIT IN THE FOLLOWING MANNERS

PHOTOCELL -10% BRIGHTNESS & ACTIVATE RADIO CONTROL

-30% BRIGHTNESS -100% BRIGHTNESS

THE RUNWAY 3-21 PAPI CIRCUITS WILL BE CONTROLLED IN THE AUTOMATIC MODE BY THE L-854 RADIO CONTROL UNIT IN THE FOLLOWING MANNER. CONFIRM CONTROL WITH AIRPORT MANAGER.

3 CLICKS - ON

5 CLICKS - REMAIN ON

7 CLICKS - REMAIN ON

- THE RADIO OVERRIDE SWITCH WILL ACTIVATE L-854 RADIO CONTROL 24 HOURS PER DAY IN THE "RADIO ON" POSITION. THE PHOTOCELL WILL ACTIVATE RADIO CONTROL IN THE "PHOTOCELL ACTIVATE RADIO" POSITION
- IN THE AUTOMATIC MODE OF OPERATION THE WIND CONE & WIND TEE SHALL BE ACTIVATED BY THE PHOTOCELL OR PHOTOCELL BYPASS SWITCH.
- IN THE AUTOMATIC MODE OF OPERATION THE AIRPORT ROTATING BEACON SHALL BE ACTIVATED BY THE PHOTOCELL OR PHOTOCELL BYPASS SWITCH.
- EQUIPMENT GROUND WIRES SHALL BE INCLUDED WITH EACH BRANCH CIRCUIT & EACH CONTROL CIRCUIT.
- 11. INCLUDE PHOTOCELL BYPASS SWITCH.
- SURGE PROTECTOR SHALL BE UL LISTED PER UL 1449, SUITABLE FOR 120 VAC, 1 PH, 2 WIRE PLUS GROUND SYSTEM WITH SURGE CURRENT RATING OF 40 KA (MIN.), 8x20 MICROSECOND WAVE, AND STATUS INDICATION LIGHTS IN A WEATHERPROOF HOUSING, JOSLYN MODEL 1260-21, SQUARE D CAT. NO. SDSA1175T, OR APPROVED EQUAL. MAINTAIN LEADS AS SHORT & AS STRAIGHT AS POSSIBLE. INCLUDE MOUNTING BRACKET.
- INCLUDE EQUIPMENT GROUND BAR, ILSCO 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 THE CONTROL WIRING TO EACH CONSTANT CURRENT REGULATOR SHALL BE CONSISTENT FOR ALL REGULATORS. COLOR CODING SHALL BE AS FOLLOWS:

10% -ORANGE

30% -YFII OW 100% -BLUE

NEUTRAL -WHITE EQUIPT. GND -GREEN

ALSO TAG THE CONTROL WIRES WITH THE RESPECTIVE DESIGNATION (CC, 10%, 30%, 100%)

16. "N" DESIGNATES NEUTRAL CONNECTION OR NEUTRAL CONDUTOR.

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DESIGN	DESIGN BY: KNL 1/21/2017					

SHEET TITLE

AIRFIELD LIGHTING **CONTROL WIRING SCHEMATIC** 

DRAWN BY: CWS 1/25/2017

REVIEWED BY: LDH 01/30/2017

L1

GND

NEUTRAL -

→ GND 🖣

120 VAC POWER

FROM VAULT

DISTRIBUTION



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NEUTRAL

М

FAN

MOTOR

' М •

DAMPER

MOTOR

DAMPER

LIMIT

SWITCH

(WHERE

APPLICABLE)

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REVIEWED BY: LDH 01/30/2017

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SHEET TITLE

LIGHTING CONTACTOR SCHEMATIC

NOTES

SEE NOTE 7

EXHAUST FAN CONTROL SCHEMATIC

#14 AWG THWN (TYP.

FOR PANEL INTERNAL

CONTROL WIRING)

 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.

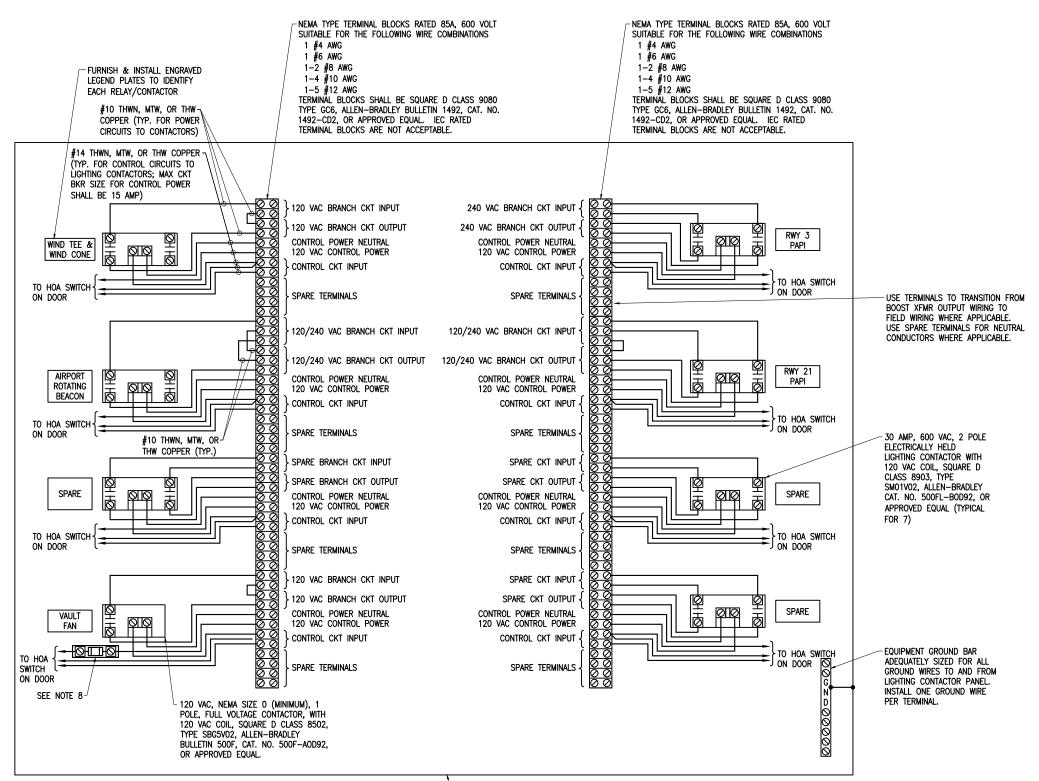
-120 VAC, NEMA SIZE 0 (MINIMUM), 1 POLE, FULL VOLTAGE CONTACTOR, SQUARE D CLASS

BULLETIN 500F CAT. NO. 500F-AOD92, OR

8502, TYPE SB05V02, ALLEN-BRADLEY

APPROVED EQUAL.

- 2. INPUT CONTROL CIRCUIT WIRING SHALL BE #12 AWG COPPER THWN.
- 3. 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.
- 4. 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 POTATING BEACON
- 5. PROVIDE #10 AWG COPPER BONDING JUMPER FROM PANEL ENCLOSURE FRAME TO ENCLOSURE DOOR.
- 6. 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").
- 7. 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.
- 8. 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.





- 15 AMP & 20 AMP INPUT POWER/BRANCH CIRCUITS SHALL BE #10 AWG COPPER THWN FROM THE RESPECTIVE POWER SOURCE TO THE LIGHTING CONTACTOR PANEL. 30 AMP INPUT POWER/BRANCH CIRCUITS SHALL BE #8 AWG COPPER THWN (MIN.) FROM THE RESPECTIVE POWER SOURCE TO THE LIGHTING CONTACTOR PANEL.
- 2. INPUT CONTROL CIRCUITS 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.
- 6. 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").
- SEE "LIGHTING CONTACTOR SCHEMATIC" AND "EXHAUST FAN CONTROL SCHEMATIC" FOR ADDITIONAL INFORMATION ON WIRING.
- 8. FUSING FOR FAN CIRCUIT 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.
- INCLUDE LEGEND PLATE ON CONTROL PANEL ENCLOSURE OUTER DOOR LABELED "NOTICE: CONTACTORS HAVE REMOTE LOCATED CONTROLS AND MAY ACTIVATE AT ANY TIME".
- 120/240 VAC PHASE "A" CONDUCTORS SHALL HAVE BLACK COLORED INSULATION. 120/240 VAC PHASE "B" CONDUCTORS SHALL HAVE RED COLORED INSULATION. NEUTRAL CONDUCTORS SHALL HAVE WHITE COLORED INSULATION. INSULATED EQUIPMENT GROUND WIRES SHALL HAVE GREEN COLORED INSULATION.
- 11. CONTROL PANEL FOR AIRFIELD NAVAIDS & VAULT FAN SHALL BE MANUFACTURED BY A UL 508 INDUSTRIAL CONTROL PANEL BUILDER OR AN FAA APPROVED L-821 PANEL BUILDER, AND SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCE REQUIREMENTS. WHERE THE CONTROL PANEL IS MANUFACTURED BY AN L-821 PANEL BUILDER IT SHALL BE LABELED AS AN L-821 PANEL.
- 12. CONTROL PANEL FOR AIRFIELD NAVAIDS & VAULT FAN SHALL BE SEPARATE FROM THE RELAY INTERFACE CONTROL PANEL.



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CONSTRUCT AN ELECTRICAL VAULT AND INSTALL A PAPI ON RUNWAY END 3

IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

NO.	DATE	DESCRIPTION				
NO.		DES	DWN	REV		
ISSUE:	FEBRU/	ARY 17	7, 2017			
PROJEC	T NO: 1	2A005	8D			
CAD FIL	E: E-603	3-ELE	C.DWG	<del></del>		
DESIGN BY: KNL 1/21/2017						
DRAWN BY: CWS 1/25/2017						

LIGHTING CONTACTOR PANEL DETAIL

REVIEWED BY: LDH 01/30/2017

SHEET TITLE

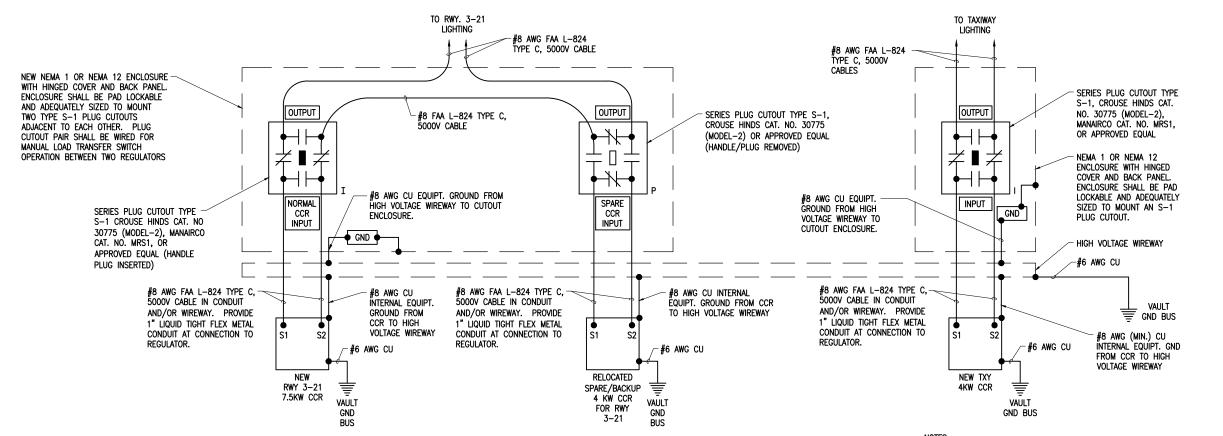
CONTROL PANEL FOR AIRFIELD NAVAIDS AND VAULT FAN

NEMA 12 ENCLOSURE WITH HINGED DOOR SIZED AS REQUIRED TO HOUSE LIGHTING CONTACTORS,

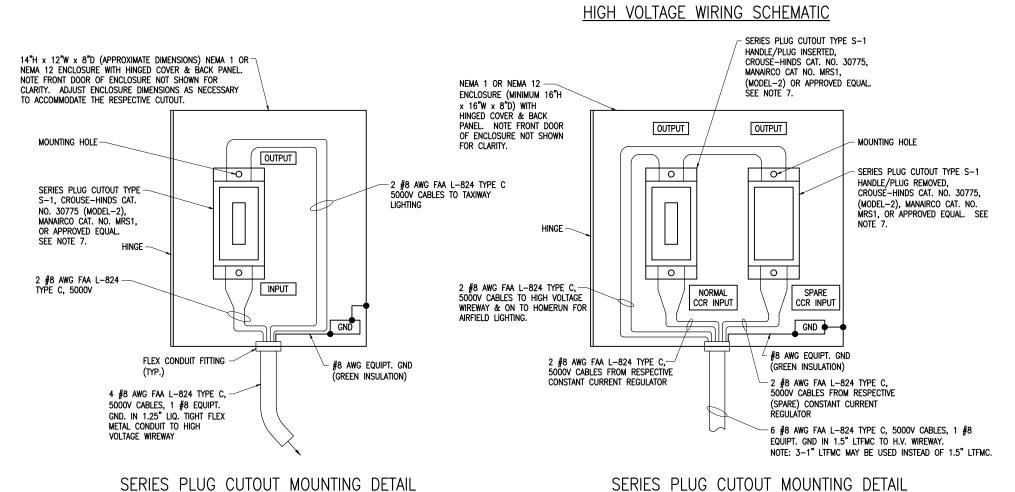
TERMINAL BLOCKS, WIRING & INTERFACE TO EXISTING CONDUITS, MINIMUM  $36\text{"H} \times 24\text{"W} \times 8\text{"D}$  AS

MANUFACTURED BY HOFFMAN, SAGINAW CONTROL &

ENGINEERING, OR APPROVED EQUAL.



FOR RUNWAY CIRCUIT



FOR TAXIWAY CIRCUIT

#### <u>NOTES</u>

- 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
- 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 SUNLICHT 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. CUTOUTS SHALL BE SUITABLE FOR MANUAL TRANSFER OPERATION (ONE SERIES CIRCUIT LOOP WITH THE CAPABILITY OF BEING POWERED FROM EITHER OF TWO CONSTANT CURRENT REGULATOR POWER SOURCES). 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.

#### **LEGEND**

- DENOTES PLUG CUTOUT WITH PLUG INSERTED
- DENOTES PLUG CUTOUT WITH PLUG PULLED

"CCR" DENOTES CONSTANT CURRENT REGULATOR

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CONSTRUCT AN ELECTRICAL VAULT AND INSTALL A PAPI ON RUNWAY END 3

IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

NO.	DATE	DES	CRIPT	ION	
NO.		DES	DWN	REV	
ISSUE: FEBRUARY 17, 2017					
PROJECT NO: 12A0058D					
CAD FILE: E-605-SCM.DWG					
DESIGN BY: KNL 1/21/2017					
DRAWN	BY: CW	S 1/25	/2017		

HIGH VOLTAGE
WIRING SCHEMATIC

REVIEWED BY: LDH 01/30/2017

SHEET TITLE

LEGEND PLATE SCHEDULE (CONTINUED)				
DEVICE	LABEL			
RADIO RELAY INTERFACE PANEL	RADIO RELAY INTERFACE PANEL			
MANUAL TRANSFER SWITCH FOR RUNWAY 3-21 NORMAL CCR AND SPARE/BACKUP CCR	Transfer Switch for Runway 3–21 Constant Current Regulators			
MANUAL TRANSFER SWITCH FOR RUNWAY 3-21 NORMAL CCR AND SPARE/BACKUP CCR - NORMAL SWITCH POSITION	NORMAL CCR			
MANUAL TRANSFER SWITCH FOR RUNWAY 3-21 NORMAL CCR AND SPARE/BACKUP CCR - BACKUP SWITCH POSITION	SPARE/BACKUP CCR			
CONTROL 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			
RUNWAY 3 PAPI POWER & CONTROL UNIT	RUNWAY 21 PAPI PCU 240 VAC, 1 PH FED FROM VAULT			

DIRECTIONS TO TRANSFER RUNWAY 3-21 LIGHTING FROM NORMAL CCR TO SPARE/BACKUP CCR.

- SHUT OFF INPUT POWER (CIRCUIT BREAKER) TO BOTH RWY 3-21 CCR'S & TURN CCR SELECTOR SWITCHES TO OFF.
- OPERATE MANUAL TRANSFER SWITCH FOR RWY 3-21 AND MOVE HANDLE FROM "NORMAL" POSITION TO "SPARE/BACKUP" POSITION.
- . PULL CUTOUT HANDLE FROM NORMAL CCR UNIT & INSERT INTO SPARE CCR CUTOUT.
- GO TO RADIO RELAY INTERFACE PANEL & TURN "RWY 3-21 CCR TRANSFER" SELECTOR SWITCH FROM "NORMAL" TO "SPARE" POSITION.
- TURN ON INPUT POWER (CIRCUIT BREAKER) TO SPARE RWY 3-21 CCR.
- 5. TURN SELECTOR SWITCH ON SPARE CCR TO "REMOTE" POSITION.

PROVIDE PLACARD OR LEGEND PLATE FOR RUNWAY CONSTANT CURRENT REGULATOR PAIR AS NOTED ABOVE: LETTERING TO BE MIN. 1/4" HIGH, BLACK ON WHITE BACKGROUND. LOCATE PLACARD ABOVE OR ADJACENT TO CUTOUT ENCLOSURE FOR RESPECTIVE RUNWAY.

RUNWAY 3-21 CCR TRANSFER PROCEDURE PLACARD DETAIL

#### 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".
- 3. PROVIDE LABELS FOR THE DOUBLE THROW FUSIBLE SAFETY SWITCH THAT IDENTIFY THE FUSE SIZE FOR EACH CONSTANT CURRENT REGULATOR, EXAMPLE: "FUSE FOR 4 KW SPARE/BACKUP CCR SHALL BE 30 AMP", & "FUSE FOR 7.5 KW CCR SHALL BE 50 AMP". CONFIRM FUSE SIZES WITH RESPECTIVE CCR MANUFACTURER AND PROJECT ENGINEER.
- FAULT CURRENT INFORMATION TO BE PROVIDED BY SERVING ELECTRIC UTILITY COMPANY. CONTACT PROJECT ENGINEER TO CONFIRM FAULT CURRENT CALCULATIONS.



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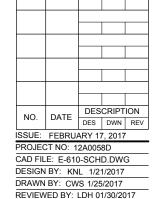
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CONSTRUCT AN ELECTRICAL VAULT AND INSTALL A PAPI ON RUNWAY END 3

IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006



SHEET TITLE

LEGEND PLATE SCHEDULES



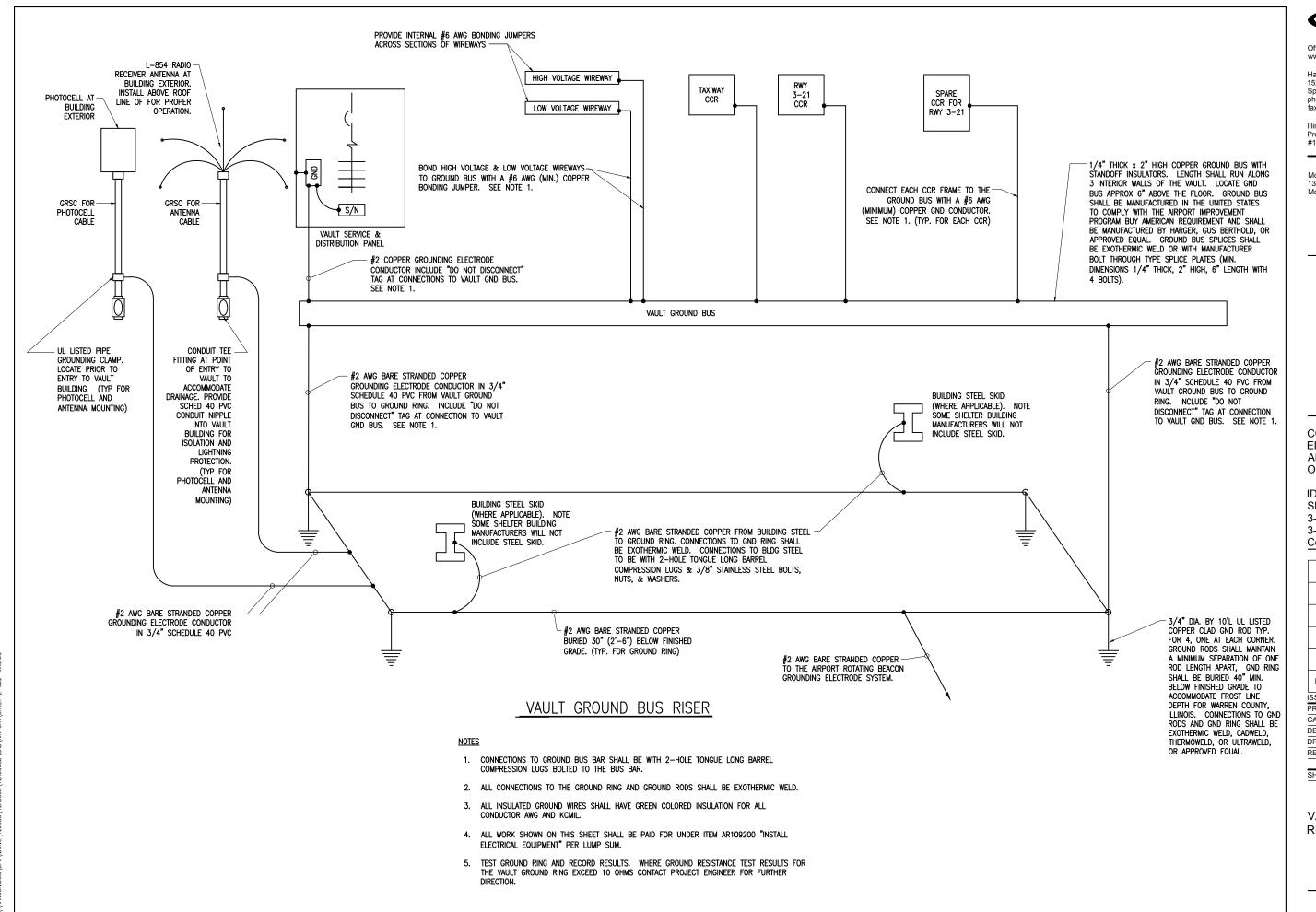
"DANGER — HIGH VOLTAGE KEEP OUT" SIGN

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"H 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".





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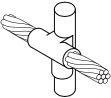
NO.	DATE	DESCRIPTION			
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OJECT NO: 12A0058D					
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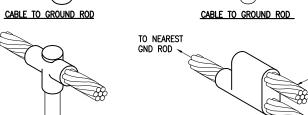
DESIGN BY: KNL 1/21/2017 DRAWN BY: CWS 1/25/2017

REVIEWED BY: LDH 01/30/2017

SHEET TITLE

**VAULT GROUND BUS RISER** 



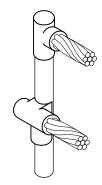


CABLE TO CABLE HORIZONTAL PARALLEL TAP

TAP CONDUCTOR SHALL BE

TOWARDS THE NEAREST GROUND

ROUTED IN THE DIRECTION



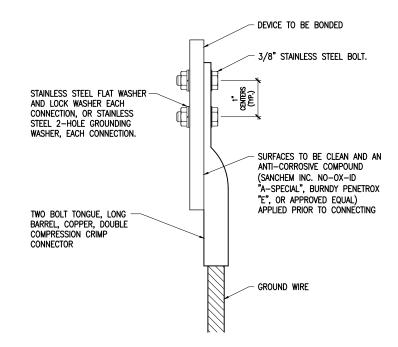
CABLE TO GROUND ROD

CABLES TO GROUND ROD

### **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.
- 2. 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.
- 3. 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.

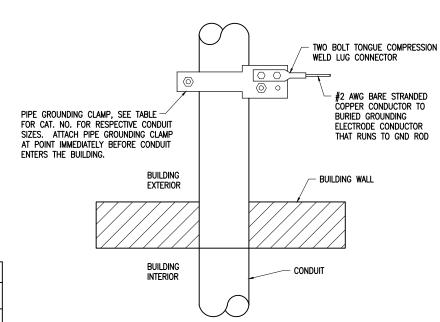
## EXOTHERMIC WELD DETAILS



2 HOLE LONG BARREL COMPRESSION LUG TABLE (OR APPROVED EQUAL)					
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		

- ALL CONNECTIONS TO GROUND BUS BAR SHALL BE WITH 2 HOLE TONGUE LONG BARREL COMPRESSION LUGS BOLTED TO THE BUS BAR.
- 2. 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.
- 3. 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.
- 4. 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



PIPE GROUNDING CLAMP TABLE				
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"		

- EXTERIOR CONDUIT GROUNDING IS REQUIRED FOR THE PHOTOCELL CONDUIT, RADIO ANTENNA CONDUIT, & OTHER CONDUITS EXTENDING TO
- 2. CONNECTIONS TO BURIED GROUNDING ELECTRODE CONDUCTOR SHALL

EXTERIOR CONDUIT GROUNDING DETAIL

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**CONSTRUCT AN ELECTRICAL VAULT** AND INSTALL A PAPI ON RUNWAY END 3

IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

NO.	DATE	DESCRIPTION			
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SSUE: FEBRUARY 17, 2017					
PROJECT NO: 12A0058D					
CAD FILE: E-504-GND.DWG					

SHEET TITLE

**GROUNDING DETAILS** 

DESIGN BY: KNL 1/21/2017

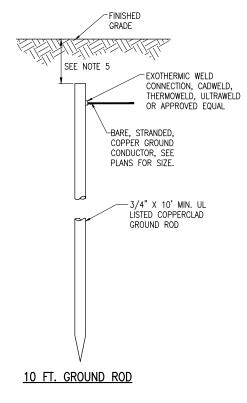
REVIEWED BY: LDH 01/30/2017

DRAWN BY: CWS 1/25/2017

- 2. FURNISH AND INSTALL GROUND RODS AS DETAILED HEREIN. GROUND RODS FOR PAPI UNITS, AND SPLICE CANS SHALL BE MINIMUM 3/4-IN. DIAMETER BY 10-FT LONG, UL-LISTED COPPER CLAD WITH 10-MIL MINIMUM COPPER COATING. GROUND RODS FOR OTHER APPLICATIONS SHALL BE MINIMUM 3/4-IN. DIAMETER BY 10-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, THERMOWELD BY CONTINENTAL INDUSTRIES, OR 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.
- 3. 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 PROJECT FNGINFER.
- 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 PENETROX E, OR APPROVED EQUAL.
- METALLIC SURFACES TO BE JOINED SHALL BE PREPARED BY THE REMOVAL OF ALL NON-CONDUCTIVE MATERIAL, PER 2014 NATIONAL ELECTRICAL CODE ARTICLE 250-12. ALL COPPER BUS BARS MUST BE CLEANED PRIOR TO MAKING CONNECTIONS TO REMOVE SURFACE OXIDATION.
- 7. 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
- 8. 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.
- 10. 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.
- 11. EACH NEW FEEDER CIRCUIT AND/OR BRANCH CIRCUIT SHALL INCLUDE AN EQUIPMENT GROUND WIRE. METAL RACEWAY OR CONDUIT SHALL NOT MEET THIS REQUIRMENT. THE EQUIPMENT GROUND WIRE FROM EQUIPMENT SHALL NOT BE SMALLER THAN ALLOWED BY 2014 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, THEY SHALL BE IDENTIFIED BY THE COLOR GREEN, AND SHALL BE THE SAME INSULATION TYPE AS THE PHASE CONDUCTORS.

12. 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 2014 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 2014 NEC 250-102.
- 13. 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.
- 14. 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 CONNECTED TO SERVICE GROUND.
- 15. 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.
- 6. 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, OR APPROVED EQUAL.
- 17. BOND ALL NONCURRENT-CARRYING PARTS OF METAL EQUIPMENT TO GROUND SYSTEM.
- 18. BUILDING STRUCTURAL STEEL SYSTEM SHALL BE BONDED TO ELECTRICAL GROUND
- 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 ENCIRCLE 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 ENCIRCLING 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 GIRDLED 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.
- 20. 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 2014 NEC 250—102. NOTE THIS DOES NOT APPLY TO AC EQUIPMENT GROUNDING CONDUCTORS RUN WITH AC CIRCUITS.
- 21. 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.
- 22. 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.



#### <u>Notes</u>

- 1. 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.
- 3. 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 WARREN 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, PAPI POWER AND CONTROL UNITS, PAPI LIGHT HOUSING UNITS, AND SPLICE CANS SHALL BE A MINIMUM 3/4-INCH DIAMETER BY 10-FT LONG UL LISTED COPPER CLAD.

GROUND RODS
(NOT TO SCALE)



Offices Nationwide

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Monmouth Municipal Airport 1320 North 11th Street Monmouth, IL 61462

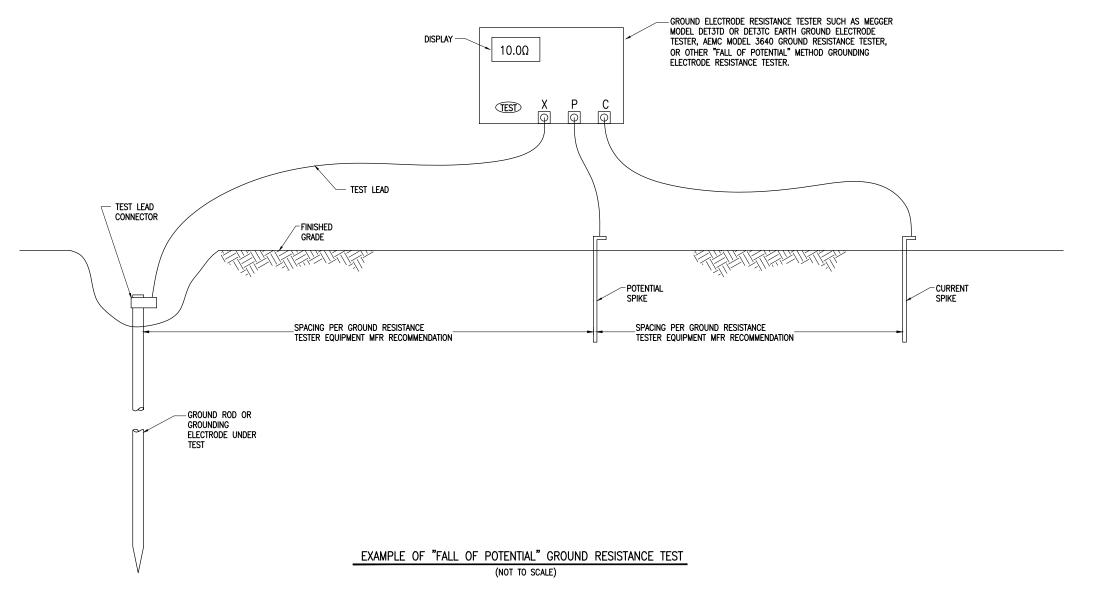
IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

NO.	DATE	DESCRIPTION			
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SUE: FEBRUARY 17, 2017					
OJECT NO: 12A0058D					
D FILE: E-004-NOTE.DWG					
SIGN BY: KNL 1/21/2017					

**GROUNDING NOTES** 

DRAWN BY: CWS 1/25/2017

SHEET TITLE



#### <u>NOTES</u>

- 1. 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.
- 2. 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.
- GROUND RESISTANCE TEST SHALL BE CONDUCTED IN ACCORDANCE WITH THE RESPECTIVE GROUND ELECTRODE RESISTANCE TESTING EQUIPMENT MANUFACTURER'S
- 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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CONSTRUCT AN **ELECTRICAL VAULT** AND INSTALL A PAPI ON RUNWAY END 3

IDA No.: C66-4265 SBG No.: 3-17-SBGP-105 AND 3-17-SBGP-111 Contract No. MO006

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	ISSUE: FEBRUARY 17, 2017				
i	PROJECT NO: 12A0058D				

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DESIGN BY: KNL 1/21/2017 DRAWN BY: CWS 1/25/2017

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SHEET TITLE

GROUND RESISTANCE **TESTING DETAILS**