

ITEM NO. 02A

IDOT LETTING: JANUARY 15, 2016

MA027  
TOTAL SHEETS = 34

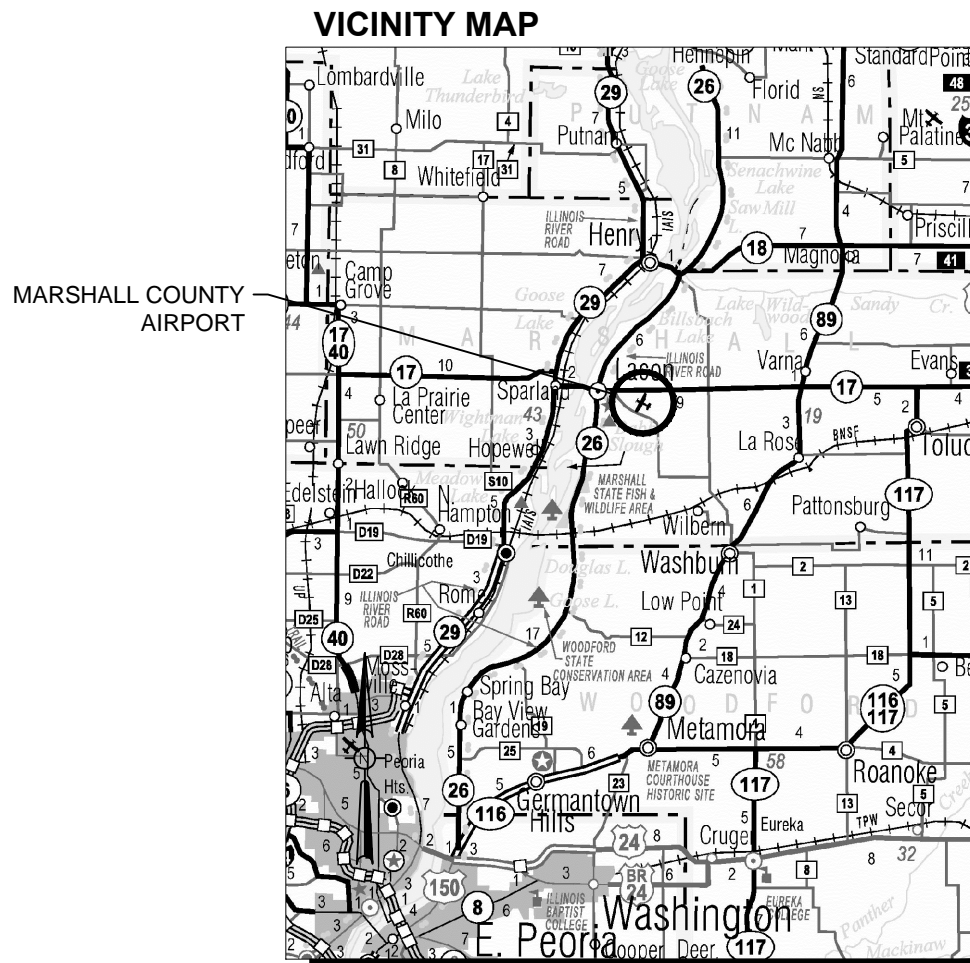
# CONSTRUCTION PLANS

# REHABILITATE PAVEMENT AND LIGHTING ON RUNWAY 18-36

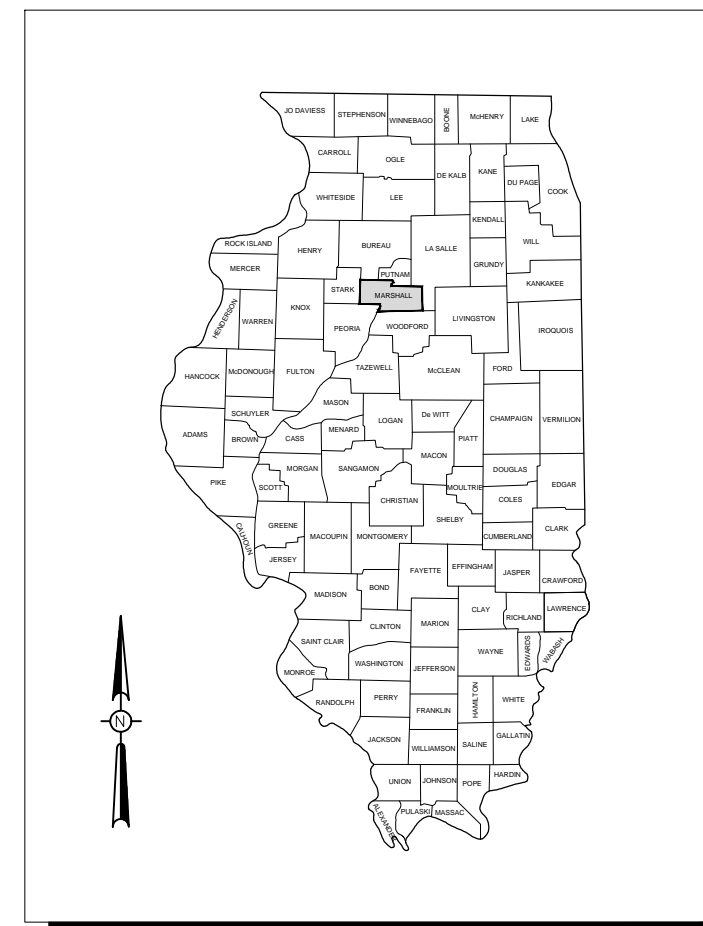
MARSHALL COUNTY AIRPORT BOARD  
MARSHALL COUNTY AIRPORT (C75)  
LACON, MARSHALL COUNTY, ILLINOIS

IDA PROJECT NO. C75-4437  
SBG PROJECT NO. 3-17-SBGP-120

VICINITY MAP



LOCATION MAP



**NOTICE TO CONTRACTORS AND BIDDERS**

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

No.	Issue/Description	Sheets Changed	Date	By

COVERING  
CIVIL DESIGN

**KYLE B. SCHWEIZER**  
062-064386  
LICENSED PROFESSIONAL ENGINEER  
STATE OF ILLINOIS

*Kyle B. Schweizer*  
Kyle B. Schweizer, P.E.  
Project Engineer  
Lic. Exp. 11/30/2017  
16 NOV 2015  
Date

COVERING  
ELECTRICAL DESIGN

**KEVIN N. LIGHTFOOT**  
062-047643  
LICENSED PROFESSIONAL ENGINEER  
STATE OF ILLINOIS

*Kevin N. Lightfoot*  
Kevin N. Lightfoot, P.E.  
Electrical Engineer  
Lic. Exp. 11/30/2017  
16 NOV 2015  
Date

**MARSHALL COUNTY AIRPORT BOARD**  
MARSHALL COUNTY AIRPORT BOARD  
P.O. Box 248  
Lacon, Illinois 61540-2048

*Charles L. Allen* 11/16/2015  
Charles L. Allen  
President  
Date



SUMMARY OF QUANTITIES - BASE BID

ITEM NO.	DESCRIPTION	UNIT	TOTAL QUANTITY	AS-BUILT QUANTITY
AR107812	L-807 W C-12' INTERNALLY LIT	EA.	1	
AR108158	1/C #8 5 KV UG CABLE IN UD	L.F.	6,633	
AR108756	1/C #6 GROUND	L.F.	5,778	
AR110013	3" DIRECTIONAL BORE	L.F.	300	
AR110610	ELECTRICAL HANDHOLE	EA.	8	
AR125410	MITL-STAKE MOUNTED	EA.	34	
AR125415	MITL-BASE MOUNTED	EA.	6	
AR125445	TAXI GUIDANCE SIGN, 5 CHARACTER	EA.	3	
AR125446	TAXI GUIDANCE SIGN, 6 CHARACTER	EA.	1	
AR125505	MIRL, STAKE MOUNTED	EA.	16	
AR125510	MIRL, BASE MOUNTED	EA.	6	
AR125540	MI THRESHOLD LIGHT STAKE MTD	EA.	12	
AR125565	SPLICE CAN	EA.	1	
AR150510	ENGINEER'S FIELD OFFICE	L.S.	1	
AR150520	MOBILIZATION	L.S.	1	
AR150540	HAUL ROUTE	L.S.	1	
AR152480	SHOULDER ADJUSTMENT	S.Y.	3,008	
AR201661	CLEAN & SEAL BITUMINOUS CRACKS	L.F.	4,000	
AR401655	BUTT JOINT CONSTRUCTION	S.Y.	2,005	
AR401910	REMOVE & REPLACE BIT. PAVEMENT	S.Y.	481	
AR402622	POROUS FRICTION COURSE, 0.10'	S.Y.	15,157	
AR603510	BITUMINOUS TACK COAT	GAL.	3,790	
AR620520	PAVEMENT MARKING-WATERBORNE	S.F.	14,213	
AR620525	PAVEMENT MARKING-BLACK BORDER	S.F.	4,927	
AR620900	PAVEMENT MARKING REMOVAL	S.F.	3,400	
AR800476	REMOVE AIRFIELD LIGHTING	L.S.	1	

SUMMARY OF QUANTITIES - LED ADDITIVE ALTERNATE

ITEM NO.	DESCRIPTION	UNIT	TOTAL QUANTITY	AS-BUILT QUANTITY
AS800413	MIRL LED UPGRADE	EA.	22	
AS800414	MI THRESHOLD LIGHT LED UPGRADE	EA.	12	
AS800592	MITL LED UPGRADE	EA.	40	
AS800593	5 CHARACTER SIGN LED UPGRADE	EA.	3	
AS800595	6 CHARACTER SIGN LED UPGRADE	EA.	1	

INDEX TO SHEETS

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7	PROPOSED CONSTRUCTION PLAN
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33	HIGH VOLTAGE WIRING SCHEMATIC
34	HIGH VOLTAGE WIRING SCHEMATIC CONTINUED

REHAB PAVEMENT  
AND LIGHTING ON  
RWY 18/36

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

Contract No. MA027

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: NOVEMBER 16, 2015  
PROJECT NO: 14A00046  
CAD FILE: C-002-SOQ.DWG  
DESIGN BY: CAH 12/03/2014  
DRAWN BY: CAH 12/03/2014  
REVIEWED BY: KBS 08/26/2015

SHEET TITLE

SUMMARY OF  
QUANTITIES & INDEX  
TO SHEETS

**GENERAL NOTES**

1. THE SCOPE OF WORK SHEET IS INTENDED ONLY AS A GENERAL DESCRIPTION OF WORK ITEMS AND THEIR APPROXIMATE LOCATIONS AND LIMITS, FOR THE PURPOSE OF UNDERSTANDING THE SCOPE OF THE PROJECT. THIS SHEET SHALL NOT BE USED AS A CONSTRUCTION PLAN. REFER TO THE FOLLOWING PLAN SHEETS AND ASSOCIATED CONTRACT DOCUMENTS FOR DETAILED CONSTRUCTION REQUIREMENTS, LOCATIONS, AND ITEMS OF WORK.
2. **PROJECT DESCRIPTION:** THIS PROJECT SHALL CONSIST OF REHABILITATION OF PAVEMENT AND LIGHTING ON RUNWAY 18-36 AT THE MARSHALL COUNTY AIRPORT. ASSOCIATED WORK ITEMS INCLUDE, CLEANING AND SEALING OF BITUMINOUS CRACKS, PAVEMENT REPAIRS, APPLICATION OF A POROUS FRICTION COURSE (0.10' THICKNESS), PAVEMENT MARKING, SHOULDER ADJUSTMENT, REMOVAL AND REPLACEMENT OF THE MEDIUM INTENSITY RUNWAY LIGHTING SYSTEM ON RUNWAY 18-36, INSTALLATION OF A MEDIUM INTENSITY TAXIWAY LIGHTING SYSTEM ON TAXIWAY "A" AND "B", INSTALLATION OF TAXI GUIDANCE SIGNS.
3. THE PROJECT PAY ITEMS ARE INTENDED TO BE INCLUSIVE OF ALL WORK TO BE PERFORMED AS SHOWN IN THESE PLANS. ALL INCIDENTAL WORK REQUIRED TO COMPLETE THE PROJECT TO THE SATISFACTION OF THE RESIDENT ENGINEER/RESIDENT TECHNICIAN IS TO BE INCLUDED IN THE COSTS OF PERFORMING THESE ITEMS. 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.
4. THE RULES, REGULATIONS, AND SPECIFICATIONS ENUMERATED 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, IF APPROVED BY THE ENGINEER.
5. ACCESS TO THE SITE SHALL BE RESTRICTED EXCLUSIVELY TO THE DESIGNATED CONSTRUCTION ENTRANCE, STAGING AREA, AND HAUL ROUTE. NO EQUIPMENT OR PERSONNEL SHALL BE PERMITTED OUTSIDE THE GENERAL PROJECT AREA.
6. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT AND KEEP CLEAN OF DEBRIS ALL EXISTING AIRFIELD AND ROADWAY PAVEMENTS AT ALL TIMES. ANY DAMAGE TO EXISTING UTILITY, DRAINAGE, AND PAVEMENT STRUCTURES SHALL BE IMMEDIATELY REPAIRED AT NO ADDITIONAL COST TO THE CONTRACT.
7. THE CONTRACTOR IS REQUIRED TO PROVIDE THEIR OWN RESTROOM FACILITIES.
8. THE OWNER SHALL HAVE THE RIGHT OF FIRST REFUSAL FOR ALL SALVAGEABLE MATERIAL REMOVED ON THE PROJECT.
9. 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 EQUIPMENT OR PERSONNEL.
10. THE CONTRACTOR SHALL MAINTAIN ONE SET OF PRELIMINARY REDLINED RECORD DRAWINGS AND PROVIDE TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN AT THE COMPLETION OF THE PROJECT FOR INCORPORATION INTO THE OFFICIAL RECORD DRAWINGS.
11. THE CONTRACTOR SHALL NOTE THAT SOME 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 DISTURBED BY CONSTRUCTION ACTIVITY WHICH HAVE BEEN PREVIOUSLY FARMED OR ARE DESIGNATED TO BE FARMED AFTER THE PROJECT COMPLETION SHALL BE CHISEL PLOWED OR OTHERWISE SCARIFIED TO RETURN THE AREA TO A REASONABLE TILLABLE CONDITION (IF SO PERMITTED BY THE AIRPORT MANAGER) AS AN INCIDENTAL COST TO THE PROJECT.
12. 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 AUTHORITIES FOR THE PURPOSE OF LOCATING AND PROTECTING EXISTING UNDERGROUND UTILITIES.
14. THE LOCATION OF THE ENGINEER'S FIELD OFFICE WILL BE DETERMINED AT THE PRE-CONSTRUCTION MEETING.
15. **NPDES PERMIT** - THIS PROJECT WILL NOT DISTURB MORE THAN 1 ACRE, THEREFORE NO NPDES PERMIT IS REQUIRED.
16. **STAGING AREA** - AT THE START OF THE PROJECT THE CONTRACTOR SHALL DELIVER AND PLACE A MINIMUM OF TWO TANDEM LOADS OF IDOT CA-6 AGGREGATE AT THE DESIGNATED CONSTRUCTION ENTRANCE TO BE LEFT IN PLACE PERMANENTLY. COST IS INCIDENTAL TO HAUL ROUTE AND MOBILIZATION PAY ITEMS.
17. **MATERIAL CERTIFICATIONS** - MATERIAL TO BE INCORPORATED INTO THE PROJECT **CANNOT** BE USED WITHOUT PRIOR APPROVAL. ALL MATERIAL TO BE USED IN THE PROJECT MUST BE SUBMITTED TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN FOR APPROVAL. USE OF MATERIAL WITHOUT PRIOR APPROVAL AND ULTIMATELY DETERMINED TO BE UNACCEPTABLE BY THE ILLINOIS DIVISION OF AERONAUTICS ARE SUBJECT TO REMOVAL AND/OR NON-PAYMENT.
18. **CERTIFIED PAYROLLS** - THE RESIDENT ENGINEER/RESIDENT TECHNICIAN **CANNOT** FORWARD A CONSTRUCTION REPORT FOR PAYMENT TO THE IDOT-DIVISION OF AERONAUTICS FOR PROCESSING UNTIL **ALL** CERTIFIED PAYROLLS FOR THAT PERIOD HAVE BEEN RECEIVED.

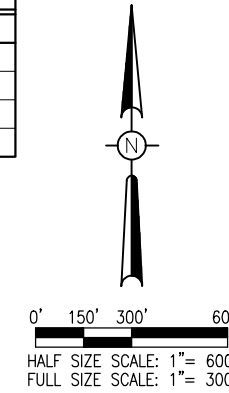
**UTILITY NOTE**

THE LOCATION, SIZE, AND TYPE OF MATERIAL OF EXISTING UNDERGROUND AND/OR ABOVEGROUND UTILITIES INDICATED ON THE PLANS ARE NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY WHATSOEVER IN RESPECT TO THE ACCURACY, COMPLETENESS, OR SUFFICIENCY OF THE INFORMATION. THERE IS NO GUARANTEE, EITHER EXPRESSED OR IMPLIED, THAT THE LOCATIONS, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ARE REPRESENTATIVE OF THOSE TO BE ENCOUNTERED IN THE CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES OF HIS OPERATIONAL PLANS AND SHALL OBTAIN FROM THE RESPECTIVE UTILITY COMPANIES DETAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF THEIR FACILITIES AND THE WORKING SCHEDULE OF THE COMPANIES FOR REMOVAL OR ADJUSTMENT WHERE REQUIRED. IN THE EVENT AN UNEXPECTED UTILITY INTERFERENCE IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY COMPANY OF JURISDICTION. THE OWNER'S REPRESENTATIVE AND/OR THE RESIDENT ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY DAMAGE TO SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT. ALL UTILITY CABLES AND LINES SHALL BE LOCATED BY THE RESPECTIVE UTILITY. **CONTACT JULIE (JOINT UTILITY LOCATION INFORMATION FOR EXCAVATORS) FOR UTILITY INFORMATION, PHONE: 1-800-892-0123.** CONTACT THE FAA (FEDERAL AVIATION ADMINISTRATION) FOR ASSISTANCE IN LOCATING FAA CABLES AND UTILITIES. LOCATION OF FAA POWER, CONTROL, AND COMMUNICATION CABLES SHALL BE COORDINATED WITH AND/OR LOCATED BY THE FAA. ALSO CONTACT AIRPORT DIRECTOR/MANAGER AND AIRPORT PERSONNEL FOR ASSISTANCE IN LOCATING UNDERGROUND AIRPORT CABLES AND/OR UTILITIES. ALSO COORDINATE WORK WITH ALL ABOVEGROUND UTILITIES.

HORIZONTAL AND VERTICAL CONTROL DATA				
NO.	DESCRIPTION	NORTHING	EASTING	ELEV.
△	"LACPORT" NGS MONUMENT	1,585,214.74	2,512,982.03	565.35
△	"LACPORT AZ" NGS MONUMENT	1,587,067.62	2,510,579.20	536.53
	RUNWAY 18/36 ALIGNMENT STA. 102+30.00	1,585,160.19	2,512,104.33	
	RUNWAY 18/36 ALIGNMENT STA. 124+28.74	1,587,358.70	2,512,136.45	

**SURVEY NOTES**

1. ALL COORDINATE VALUES SHOWN IN TABLE ARE BASED ON ILLINOIS STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD 83 (2011). ALL ELEVATIONS ARE REFERENCED TO NAVD 88.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION LAYOUT AND ANY EXTENSION OF THE CONTROL NETWORK NEEDED TO PROPERLY COMPLETE THE WORK.

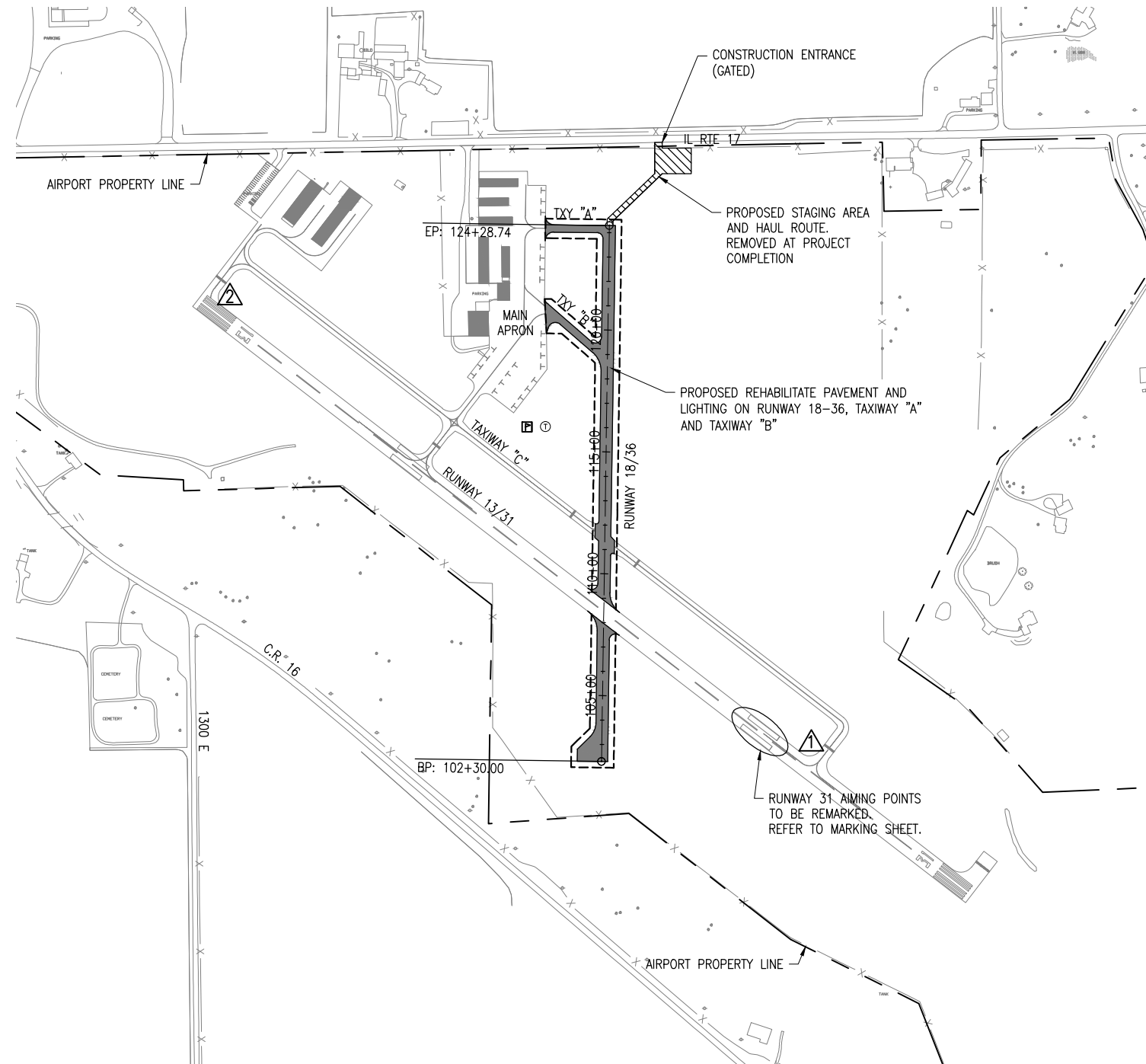


**LEGEND**

- EXISTING AIRFIELD PAVEMENT
- EXISTING BUILDINGS
- PROJECT AREA
- PROPOSED HAUL ROUTE AND STAGING AREA
- SURVEY CONTROL POINT

**J.U.L.I.E. INFORMATION**

COUNTY \_\_\_\_\_ MARSHALL  
 CITY \_\_\_\_\_ LACON  
 TOWNSHIP \_\_\_\_\_ HOPEWELL  
 SECTION NO. \_\_\_\_\_ 31  
 ADDRESS \_\_\_\_\_ MARSHALL COUNTY AIRPORT  
 LACON, ILLINOIS 61540



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



Marshall County Airport  
 1315 Illinois 17  
 Lacon, Illinois 61540  
 phone: 309-246-2870

**REHAB PAVEMENT  
 AND LIGHTING ON  
 RWY 18/36**

IDA No: C75-4437  
 SBG No: 3-17-SBGP-120

Contract No. MA027

NO.	DATE	DESCRIPTION			
			DES	DWN	REV

ISSUE: NOVEMBER 16, 2015  
 PROJECT NO: 14A00046  
 CAD FILE: C-003-SOW.DWG  
 DESIGN BY: KBS 06/15/2015  
 DRAWN BY: CAH 06/16/2015  
 REVIEWED BY: KBS 08/26/2015

SHEET TITLE

**PROPOSED SCOPE  
 OF WORK PLAN &  
 GENERAL NOTES**

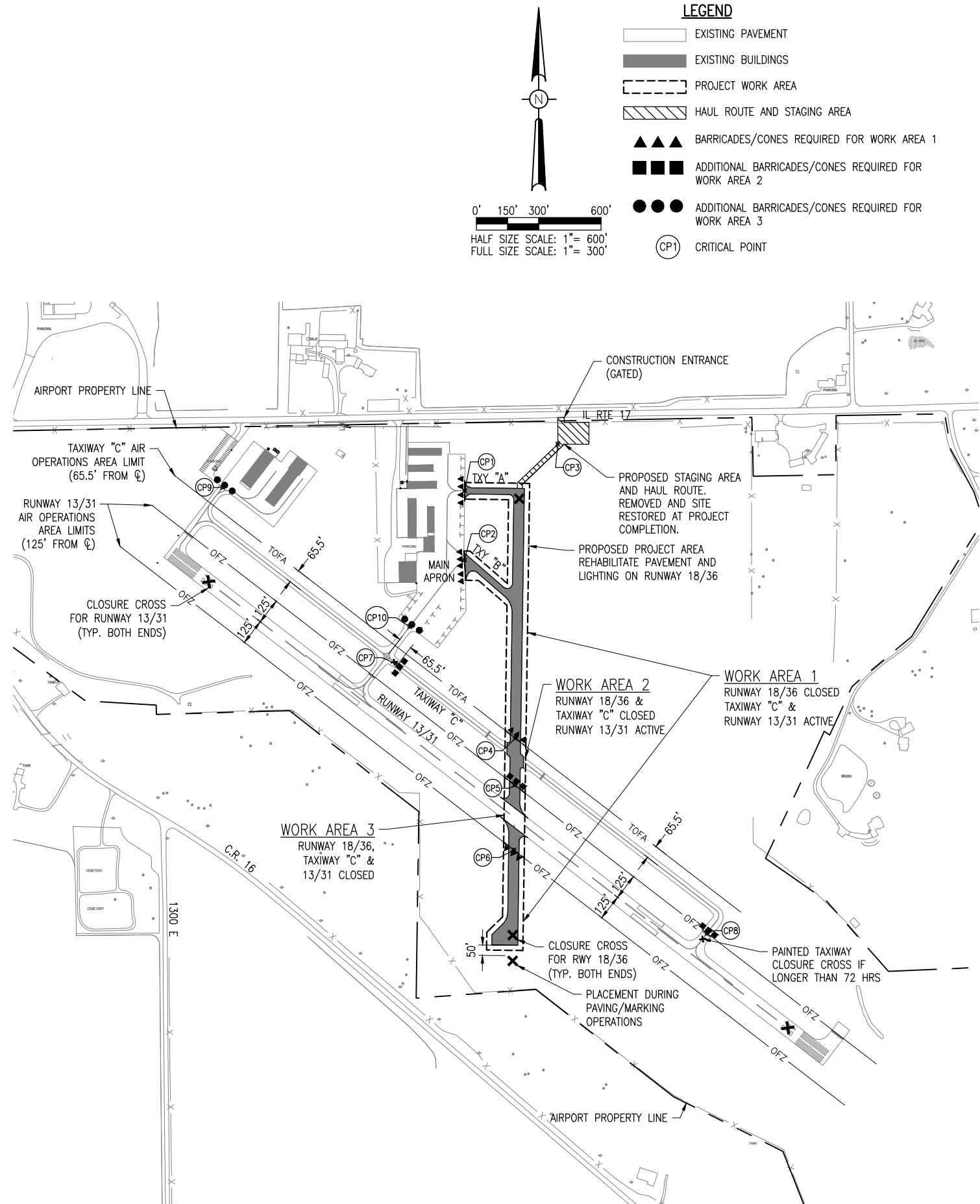
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**CONSTRUCTION SAFETY AND PHASING PLAN**

- GENERAL** – THE MARSHALL COUNTY AIRPORT IS COMPRISED OF TWO PAVED RUNWAYS. THE PROPOSED CONSTRUCTION WILL NECESSITATE CLOSING DIFFERENT AREAS OF THE AIRFIELD AT DIFFERENT TIMES DEPENDING ON WHERE THE WORK IS BEING PERFORMED. RUNWAY 18/36 AND THE ASSOCIATED TAXIWAYS "A" AND "B" WILL BE CLOSED FOR THE DURATION OF THE PROJECT.
- PROJECT DESCRIPTION:** THIS PROJECT SHALL CONSIST OF REHABILITATION OF PAVEMENT AND LIGHTING ON RUNWAY 18-36 AT THE MARSHALL COUNTY AIRPORT. ASSOCIATED WORK ITEMS INCLUDE, CLEANING AND SEALING OF BITUMINOUS CRACKS, PAVEMENT REPAIRS, APPLICATION OF A POROUS FRICTION COURSE (0.10' THICKNESS), PAVEMENT MARKING, SHOULDER ADJUSTMENT, REMOVAL AND REPLACEMENT OF THE MEDIUM INTENSITY RUNWAY LIGHTING SYSTEM ON RUNWAY 18-36, INSTALLATION OF A MEDIUM INTENSITY TAXIWAY LIGHTING SYSTEM ON TAXIWAY "A" AND "B", INSTALLATION OF TAXI GUIDANCE SIGNS.
- AIR OPERATIONS AREA** – AT NO TIME MAY THE CONTRACTOR WORK INSIDE THE AIR OPERATIONS AREA (AOA) WHILE IT IS ACTIVE. ANY WORK DONE INSIDE THESE AREAS WILL REQUIRE TEMPORARY CLOSURE OF THE APPLICABLE RUNWAY OR TAXIWAY. THE AOA FOR RUNWAY 13/31 IS GOVERNED BY THE OBSTACLE FREE ZONE (OFZ) TO A WIDTH OF 125' FROM THE RUNWAY CENTERLINE. THE AOA FOR TAXIWAY "C" IS GOVERNED BY THE TAXIWAY OBJECT FREE AREA (TOFA) TO A WIDTH OF 65.5' FROM THE TAXIWAY CENTERLINE. THE CONTRACTOR SHALL STAKE THESE LIMITS WITH FLAGGED LATHES IN THE PROJECT AREA PRIOR TO THE START OF WORK.
- WORK AREAS**
  - WORK AREA 1** – THIS AREA WILL REMAIN CLOSED FOR THE PROJECT DURATION. IN ORDER TO ACCESS THE SOUTH END OF RUNWAY 18/36, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE AN ESCORT IN CONSTANT TWO-WAY RADIO CONTACT WITH THE MARSHALL COUNTY AIRPORT UNICOM (122.8 MHz) BEFORE ANY VEHICLES, EQUIPMENT, OR PERSONNEL ARE ALLOWED TO CROSS RUNWAY 13/31 WHILE ACTIVE. RUNWAY 13/31 SHALL BE CLOSED DURING CONTINUOUS HAULING OPERATIONS FOR PAVING.
  - WORK AREA 2** – WORK IN THIS AREA REQUIRES THE ADDITIONAL CLOSURE OF TAXIWAY "C".
  - WORK AREA 3** – WORK IN THIS AREA REQUIRES THE ADDITIONAL CLOSURES OF TAXIWAY "C" AND RUNWAY 13/31. RUNWAY 13/31 CLOSURES WILL ONLY BE PERMITTED IN BLOCKS OF FOUR HOURS. NO OVERNIGHT OR WEEKEND CLOSURES WILL BE PERMITTED UNLESS APPROVED BY THE AIRPORT MANAGER.
- ALL RUNWAY/TAXIWAY CLOSURES SHALL BE COORDINATED WITH THE AIRPORT MANAGER A MINIMUM OF 72 HOURS BEFORE THE DESIRED CLOSING TIME. THE AIRPORT MANAGER HAS COMPLETE AUTHORITY IN DETERMINING WHEN THE RUNWAY/TAXIWAY MAY BE CLOSED.
  - RUNWAY/TAXIWAY CLOSURE PROCEDURES:**
    - CONTACT THE AIRPORT MANAGEMENT OR ASSIGNED REPRESENTATIVE A MINIMUM OF 72 HOURS BEFORE THE DESIRED CLOSING TIME.
    - ISSUANCE OF NOTAM AND DEACTIVATION OF THE APPLICABLE AIRFIELD LIGHTING AND NAVAIDS BY THE AIRPORT MANAGEMENT AND/OR FAA.
    - PLACEMENT OF CROSSES AND LIGHTED BARRICADES.

**ONLY AT THE TIME THAT ALL OF THE ABOVE ARE COMPLETED MAY ANY CONSTRUCTION OPERATIONS BEGIN WITHIN THE RUNWAY/TAXIWAY AIR OPERATIONS AREA.**
  - RUNWAY/TAXIWAY RE-OPENING PROCEDURES:**
    - ENSURE ALL PERSONNEL, EQUIPMENT AND MATERIALS ARE CLEAR OF THE AIR OPERATIONS AREA.
    - INSPECT THE AREA FOR LOOSE OR TRACKED DEBRIS, PAVEMENT DROP-OFFS, AND OPEN TRENCHES
    - REMOVE LIGHTED BARRICADES AND CROSSES.
    - NOTIFY THE AIRPORT MANAGEMENT OR REPRESENTATIVE TO CANCEL THE NOTAM.
    - ACTIVATION OF THE AIRFIELD LIGHTING AND NAVAIDS AND CANCELLATION OF THE NOTAM BY THE AIRPORT MANAGEMENT AND/OR FAA.
- REFER TO THE CONSTRUCTION SAFETY NOTES & DETAILS SHEET FOR ADDITIONAL SAFETY INFORMATION.

CRITICAL POINTS						
POINT #	DESCRIPTION	WORK AREA	LATITUDE	LONGITUDE	GRND. ELEV. (MSL)	HEIGHT (AGL)
1	CONST. EQUIP.	ALL	N041° 01' 21.230"	W089° 23' 11.089"	555.0	15
2	CONST. EQUIP.	ALL	N041° 01' 17.924"	W089° 23' 11.142"	555.0	15
3	CONST. EQUIP.	ALL	N041° 01' 23.409"	W089° 23' 05.222"	554.0	15
4	CONST. EQUIP.	1	N041° 01' 09.434"	W089° 23' 08.042"	554.0	15
5	CONST. EQUIP.	2	N041° 01' 07.207"	W089° 23' 08.110"	552.0	15
6	CONST. EQUIP.	1,2	N041° 01' 04.123"	W089° 23' 08.206"	549.0	15
7	BARRICADE	2	N041° 01' 12.990"	W089° 23' 15.402"	549.5	N/A
8	BARRICADE	2	N041° 01' 00.076"	W089° 22' 56.125"	567.0	N/A
9	BARRICADE	3	N041° 01' 21.489"	W089° 23' 26.299"	538.0	N/A
10	BARRICADE	3	N041° 01' 14.784"	W089° 23' 14.626"	551.0	N/A



REHAB PAVEMENT  
AND LIGHTING ON  
RWY 18/36

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

Contract No. MA027

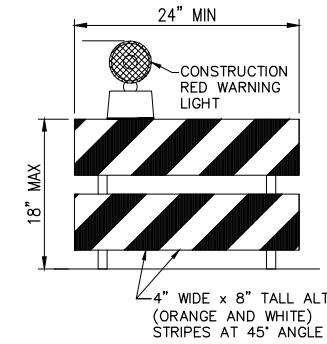

NO.	DATE	DESCRIPTION		
		DES	DWN	REV
ISSUE: NOVEMBER 16, 2015				
PROJECT NO: 14A00046				
CAD FILE: C-004-SFY.DWG				
DESIGN BY: KBS 06/15/2015				
DRAWN BY: CAH 06/16/2015				
REVIEWED BY: KBS 08/26/2015				

SHEET TITLE

CONSTRUCTION  
SAFETY PLAN

**CONSTRUCTION SAFETY AND PHASING NOTES**

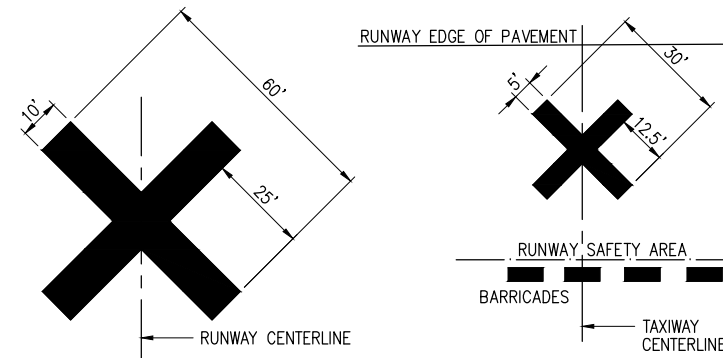
- ALL PROVISIONS OF THE LATEST EDITION OF FAA ADVISORY CIRCULAR AC 150/5370-2 (CURRENT EDITION), "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION", APPLY TO THIS CONTRACT, EXCEPT AS MODIFIED BY THIS SAFETY PLAN, OR AS MODIFIED BY THE OWNER THROUGH THE RESIDENT ENGINEER/TECHNICIAN.
- ALL COSTS ASSOCIATED WITH THE WORK AND MATERIALS INVOLVING CONSTRUCTION SAFETY & PHASING AS SHOWN OR DESCRIBED IN THE CONTRACT DOCUMENTS, OR AS OTHERWISE DIRECTED BY THE RESIDENT ENGINEER/TECHNICIAN OR AIRPORT MANAGER THROUGHOUT THE PROJECT, **SHALL BE INCIDENTAL TO THE CONTRACT.**
- AIRFIELD SAFETY ASSURANCE** - AIRFIELD SAFETY SHALL BE HELD PARAMOUNT AT ALL TIMES. ANY INDIVIDUALS RESPONSIBLE FOR INCURSIONS OR POTENTIAL INCURSIONS WITH AIR TRAFFIC DUE TO NON-COMPLIANCE WITH REQUIREMENTS SET FOR IN THESE PLANS, SPECIFICATIONS, SPECIAL PROVISIONS, AND FAA ADVISORY CIRCULAR 150/5370-2F WILL BE SUBJECT TO AN IMMEDIATE SUSPENSION OF DRIVING PRIVILEGES ON THE AIRPORT OR A COMPLETE RESTRICTION OF ACCESS TO THE AIRFIELD ALTOGETHER. THE AIRPORT MANAGER OR RESIDENT ENGINEER/TECHNICIAN MAY STOP THE WORK AT ANY TIME THEY BELIEVE AIRFIELD SAFETY IS BEING COMPROMISED.
- THE CONTRACTOR SHALL PROVIDE THE AIRPORT MANAGER AND RESIDENT ENGINEER/TECHNICIAN WITH CONTACT INFORMATION FOR A PERSON ON CALL 24 HOURS A DAY FOR EMERGENCY MAINTENANCE OF BARRICADES AND HAZARD LIGHTING.
- ALL CONSTRUCTION EQUIPMENT OPERATING IN THE PRESCRIBED CONSTRUCTION AREA IS REQUIRED TO DISPLAY A CHECKERBOARD FLAG PROPERLY LOCATED OR A ROTATING BEACON (STROBE) AS SPECIFIED IN AC 150/5210-5, "PAINTING, MARKING, AND LIGHTING OF VEHICLES USED ON AN AIRPORT" (CURRENT EDITION).
- CLOSED AIRFIELD WORK AREAS, OPEN TRENCHES, AND OTHER HAZARDOUS AREAS 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 18" (EXCLUSIVE OF SUPPLEMENTARY LIGHTS AND FLAGS) ON THE TAXIWAYS AND COMPLY WITH ADVISORY CIRCULAR 150/5370-2, LATEST EDITION. CONTRACTOR SHALL NIGHT CHECK BARRICADES DAILY FOR PROPER OPERATION.
- NO PAVEMENT EDGE DROP-OFFS GREATER THAN 3" ARE ALLOWED TO REMAIN ON ANY ACTIVE AIRFIELD PAVEMENT AREA. TEMPORARY EARTH SHOULDERS SHALL BE PLACED IF AN INCOMPLETE AREA IS TO BE REOPENED TO AIRCRAFT TRAFFIC.
- AIRPORT SECURITY** - AIRPORT SECURITY WILL BE MAINTAINED AT ALL TIMES. NO CONTRACTOR PERSONNEL OR EQUIPMENT WILL BE PERMITTED OUTSIDE OF THE CONSTRUCTION LIMITS DEPICTED ON THESE PLANS. PERSONAL VEHICLES OF CONTRACTOR EMPLOYEES SHALL BE PARKED IN THE DESIGNATED STAGING AREA AND ARE NOT ALLOWED ACCESS ON THE SITE. THE CONTRACTOR WILL CLOSE AND LOCK THE GATE AT THE DESIGNATED CONSTRUCTION ENTRANCE AT THE END OF EACH DAY.
- NO CONSTRUCTION EQUIPMENT GREATER THAN 15' TALL WILL BE PERMITTED ON THE AIRPORT WITHOUT THE APPROVAL OF THE AIRPORT MANAGER AND AIRSPACE APPROVAL BY THE FAA.
- 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 SWEEPED, PICKED UP AND REMOVED, OR PLACED INTO CLOSED CONTAINERS. ANY DAMAGE TO AIRPORT PROPERTY SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
- EACH CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND MAINTAINING AIRPORT LIGHTING AND NAVIGATIONAL ELECTRICAL SYSTEMS DURING CONSTRUCTION. A CONTACT PERSON AND TELEPHONE NUMBER FOR 24 HOUR EMERGENCY IMMEDIATE REPAIR SHALL BE SUBMITTED TO THE AIRPORT MANAGER AND ENGINEER. HAUL ROUTES CROSSING PAVEMENT, DRAINAGE, MISCELLANEOUS STRUCTURES AND/OR AIRFIELD CABLES SHALL BE PROTECTED FROM DAMAGE.
- ALL AIRCRAFT AND AIRPORT OPERATIONS HAVE THE RIGHT-OF-WAY. CONTRACTOR TO YIELD TO VEHICLES AND REMAIN CLEAR AT ALL TIMES.
- THE CONTRACTOR SHALL UTILIZE WATER AND/OR CHEMICALS APPROVED BY THE RESIDENT ENGINEER AS NECESSARY TO CONTROL DUST.
- RADIO CONTROL** - THE CONTRACTOR WILL BE REQUIRED TO REMAIN CONSTANT TWO-WAY RADIO CONTACT WITH THE MARSHALL COUNTY AIRPORT UNICOM (122.8 MHz) AT ALL TIMES WHILE HE HAS PERSONNEL OR EQUIPMENT ON THE AIRFIELD.



**LOW PROFILE BARRICADE EXAMPLE**  
NOT TO SCALE

**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.
- LOW PROFILE BARRICADES SHALL BE SPACED END TO END THE WIDTH OF THE PAVEMENT IN 4' INCREMENTS AS DIRECTED BY THE ENGINEER. BARRICADES ARE TO BE SET BACK 66' FROM THE ACTIVE TAXIWAY CENTERLINE OR AS SHOWN ON THE PLANS.
- CONSTRUCTION RED WARNING LIGHT: THESE ARE PORTABLE, LENS DIRECTED, ENCLOSED LIGHTS. THE COLOR OF THE LIGHT EMITTED SHALL BE RED. THEY MAY BE USED IN EITHER A STEADY BURN (TYPE C) OR LOW INTENSITY FLASHING MODE (TYPE A) UNLESS NOTED OTHERWISE.
- THE LIGHTING SHALL BE MAINTAINED IN OPERATION DURING THE HOURS OF DARKNESS BETWEEN 1/2 HOUR AFTER SUNSET AND 1/2 HOUR BEFORE SUNRISE AND WHEN CONDITIONS EXIST WHICH TEND TO OBSCURE VISION.
- BARRICADES SHALL BE SECURED TO THE GROUND BY APPROVED METHODS TO PREVENT MOVEMENT BY PROP WASH, JET BLAST OR OTHER WIND CURRENTS.
- THE ONLY COLOR COMBINATION ON LOW PROFILE 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.



**TEMPORARY CLOSURE CROSS DETAIL**  
NOT TO SCALE

**TEMPORARY CLOSURE CROSS NOTES**

- 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.
- TEMPORARY CLOSED RUNWAY MARKINGS SHALL BE PLACED OVER THE RUNWAY DESIGNATION NUMBERS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- TEMPORARY CLOSED TAXIWAY MARKINGS SHALL BE PLACED WHEN AN ADJACENT RUNWAY IS OPEN AND THE TAXIWAY IS CLOSED MORE THAN 72 HOURS. THE CLOSED TAXIWAY MARKINGS SHALL BE PLACED AS SHOWN ON THIS SHEET. MARKINGS SHALL BE CONSTRUCTED USING TEMPORARY PAINT SUCH AS SEYMOUR TEMPORARY MARKER, PART NO. 20-636, OR AN EQUIVALENT PAINT EASILY REMOVED WITH WATER WITHOUT DEFACING THE PAVEMENT.
- 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.

**REHAB PAVEMENT  
AND LIGHTING ON  
RWY 18/36**

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

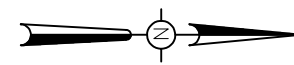
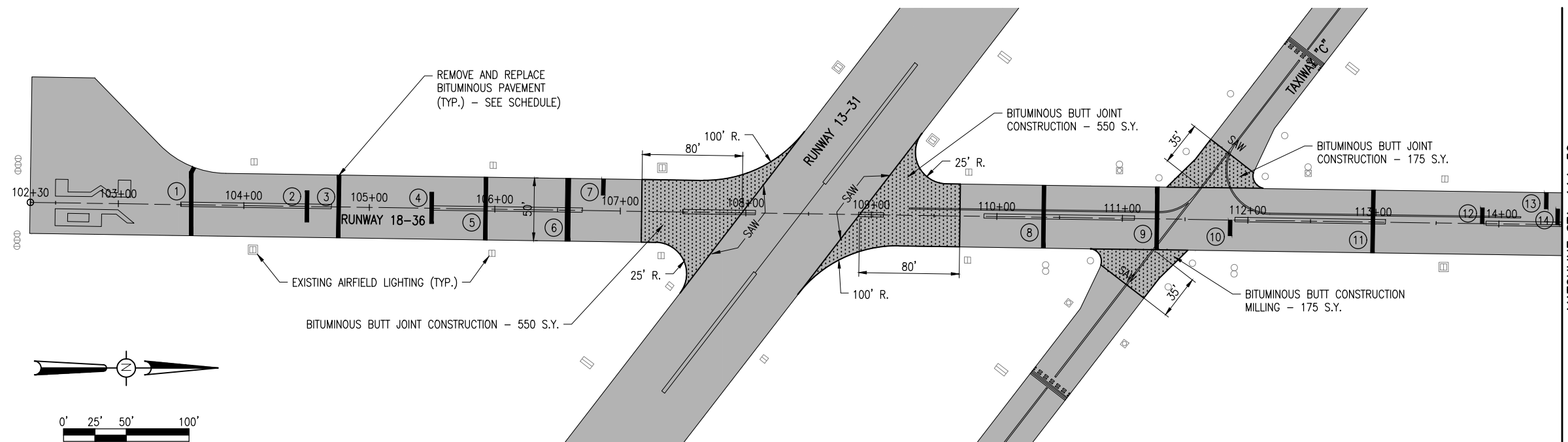
Contract No. MA027

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: NOVEMBER 16, 2015  
PROJECT NO: 14A00046  
CAD FILE: C-004-SFY.DWG  
DESIGN BY: KBS 06/15/2015  
DRAWN BY: CAH 06/16/2015  
REVIEWED BY: KBS 08/26/2015

SHEET TITLE

**CONSTRUCTION  
SAFETY NOTES &  
DETAILS**

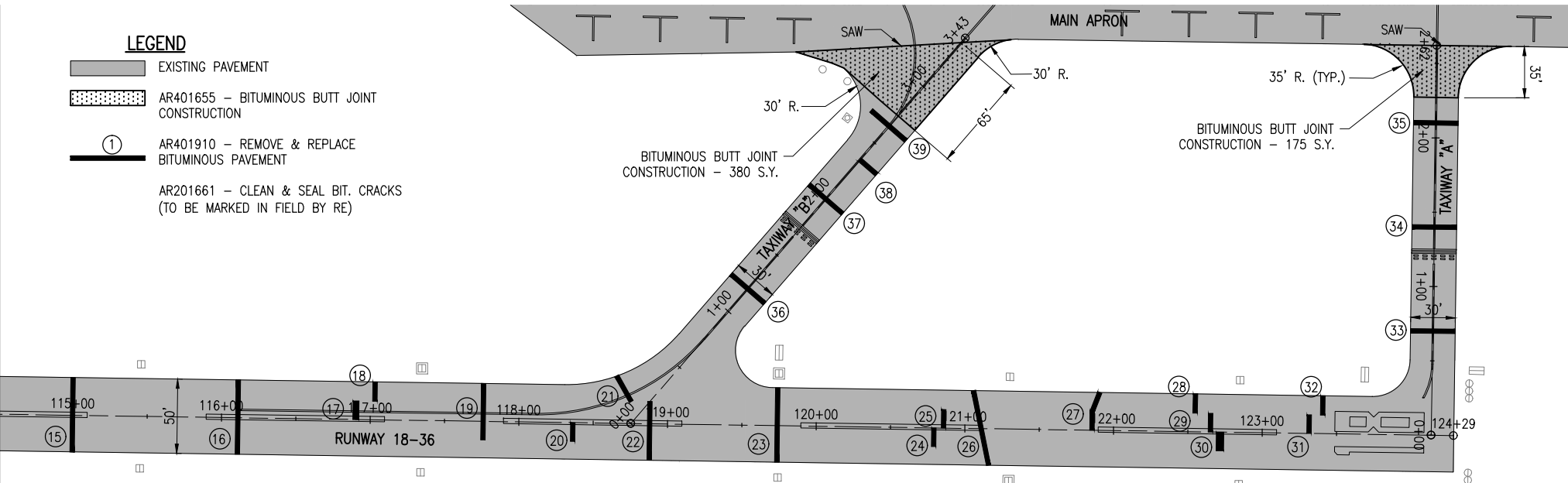


0' 25' 50' 100'  
HALF SIZE SCALE: 1" = 100'  
FULL SIZE SCALE: 1" = 50'

MATCHLINE STA. 114+50

MATCHLINE STA. 114+50

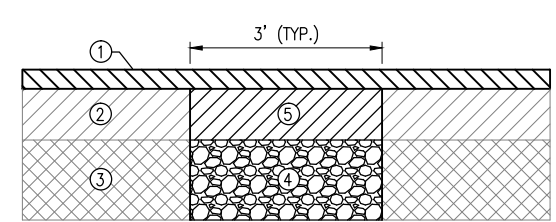
- LEGEND**
- EXISTING PAVEMENT
  - AR401655 - BITUMINOUS BUTT JOINT CONSTRUCTION
  - AR401910 - REMOVE & REPLACE BITUMINOUS PAVEMENT
  - AR201661 - CLEAN & SEAL BIT. CRACKS (TO BE MARKED IN FIELD BY RE)



PAVEMENT PATCHING SCHEDULE				
REPAIR NO.	SIZE (W X L)	AREA (S.Y.)	APPROX. STA.	ALIGNMENT
1	3 X 55	18.33	103+60	RUNWAY 18-36
2	3 X 25	8.33	104+50	RUNWAY 18-36
3	3 X 50	16.67	104+75	RUNWAY 18-36
4	3 X 25	8.33	105+45	RUNWAY 18-36
5	3 X 50	16.67	105+90	RUNWAY 18-36
6	4 X 50	22.22	106+55	RUNWAY 18-36
7	3 X 12.5	4.17	106+85	RUNWAY 18-36
8	3 X 50	16.67	110+40	RUNWAY 18-36
9	3 X 50	16.67	111+30	RUNWAY 18-36
10	3 X 12.5	4.17	111+85	RUNWAY 18-36
11	3 X 50	16.67	113+00	RUNWAY 18-36
12	3 X 12.5	4.17	113+85	RUNWAY 18-36
13	3 X 12.5	4.17	114+40	RUNWAY 18-36
14	3 X 12.5	4.17	114+50	RUNWAY 18-36
15	3 X 50	16.67	115+00	RUNWAY 18-36
16	3 X 50	16.67	116+10	RUNWAY 18-36
17	4 X 12.5	5.56	116+90	RUNWAY 18-36
18	3 X 12.5	4.17	117+00	RUNWAY 18-36
19	3 X 37.5	12.5	117+75	RUNWAY 18-36
20	3 X 12.5	4.17	118+35	RUNWAY 18-36
21	3 X 20	6.67	118+65	RUNWAY 18-36
22	3 X 40	13.33	118+85	RUNWAY 18-36
23	3 X 50	16.67	119+70	RUNWAY 18-36
24	3 X 12.5	4.17	120+75	RUNWAY 18-36
25	3 X 12.5	4.17	120+80	RUNWAY 18-36
26	3 X 51	17	121+05	RUNWAY 18-36
27	3 X 26	8.67	121+80	RUNWAY 18-36
28	3 X 12.5	4.17	122+55	RUNWAY 18-36
29	3 X 12.5	4.17	122+70	RUNWAY 18-36
30	5 X 12.5	6.94	122+65	RUNWAY 18-36
31	3 X 12.5	4.17	123+35	RUNWAY 18-36
32	3 X 12.5	4.17	123+40	RUNWAY 18-36
33	3 X 30	10	0+70	TAXIWAY "A"
34	3 X 30	10	1+40	TAXIWAY "A"
35	3 X 30	10	2+10	TAXIWAY "A"
36	3 X 30	10	1+20	TAXIWAY "B"
37	3 X 30	10	1+95	TAXIWAY "B"
38	3 X 15	5	2+30	TAXIWAY "B"
39	3 X 31	10.33	2+60	TAXIWAY "B"

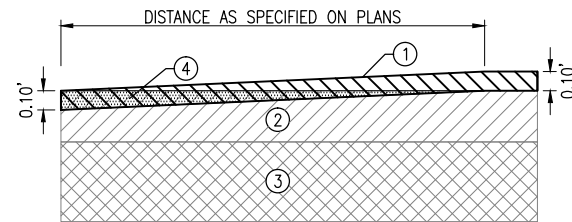
**PAVEMENT PREPARATION NOTES**

1. THE EXISTING PAVEMENT CONDITIONS AND CRACKS WERE EVALUATED DURING A SITE VISIT IN SPRING 2015. THE EXACT LIMITS AND QUANTITIES FOR CRACK CLEANING AND SEALING, BITUMINOUS PAVEMENT REMOVAL AND REPLACEMENT (PATCHING), AND BUTT JOINT MILLING SHALL BE LAID OUT AND MEASURED FOR PAYMENT BY THE RESIDENT ENGINEER/TECHNICIAN.
2. AT THE TIME OF CONSTRUCTION THE RESIDENT ENGINEER/TECHNICIAN MAY IDENTIFY ISOLATED AREAS OF RUNWAY 13/31 ALSO IN NEED OF CRACK CLEANING AND SEALING. RUNWAY 13/31 SHALL BE CLOSED DURING WORK IN THOSE AREAS.
3. AN ADDITIONAL 100 S.Y. OF "REMOVE AND REPLACE BIT. PAVEMENT" QUANTITY HAS BEEN INCLUDED FOR USE AS THE RESIDENT ENGINEER/TECHNICIAN DETERMINES NECESSARY.
4. ALL PAVEMENT PATCHES AND BUTT JOINTS SHALL BE SAWED OR MILLED TO ESTABLISH A TRUE VERTICAL FACE ALONG ADJACENT EDGES. COSTS FOR SAWING ARE INCIDENTAL TO THE APPLICABLE PAY ITEM.
5. ALL REMOVAL OR WASTE MATERIALS SHALL BE DISPOSED OF OFFSITE.
6. ANY ADJACENT PAVEMENT DAMAGED BY THE CONTRACTOR DURING MILLING OR PATCHING OPERATIONS SHALL BE REPAIRED OR REPLACED AT THEIR EXPENSE.
7. THE FINAL LIFT OF BITUMINOUS SURFACE COURSE IN THE PATCHES SHALL BE PLACED MECHANICALLY WITH A PAVER OR PAVING ATTACHMENT TO ENSURE THE PATCH IS FLUSH WITH THE EXISTING PAVEMENT. VARIATIONS GREATER THAN 1/8" SHALL BE CORRECTED.



**REMOVE & REPLACE BIT. PAVEMENT DETAIL**

- 1 PROPOSED POROUS FRICTION COURSE, 0.10' DEPTH
- 2 EXISTING BITUMINOUS PAVEMENT (4" AVG.)
- 3 EXISTING RECYCLED BITUMINOUS BASE COURSE (10" AVG.)
- 4 PROPOSED AGGREGATE SUBBASE - IDOT CA-6 (10" AVG.)
- 5 PROPOSED BITUMINOUS SURFACE COURSE (4") - 2 LIFTS



**BUTT JOINT CONSTRUCTION DETAIL**

- 1 PROPOSED POROUS FRICTION COURSE, 0.10' DEPTH
- 2 EXISTING BITUMINOUS PAVEMENT
- 3 EXISTING SUBBASE
- 4 VARIABLE-DEPTH BITUMINOUS PAVEMENT MILLING

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**REHAB PAVEMENT AND LIGHTING ON RWY 18/36**

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

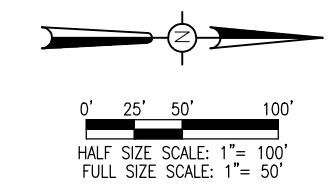
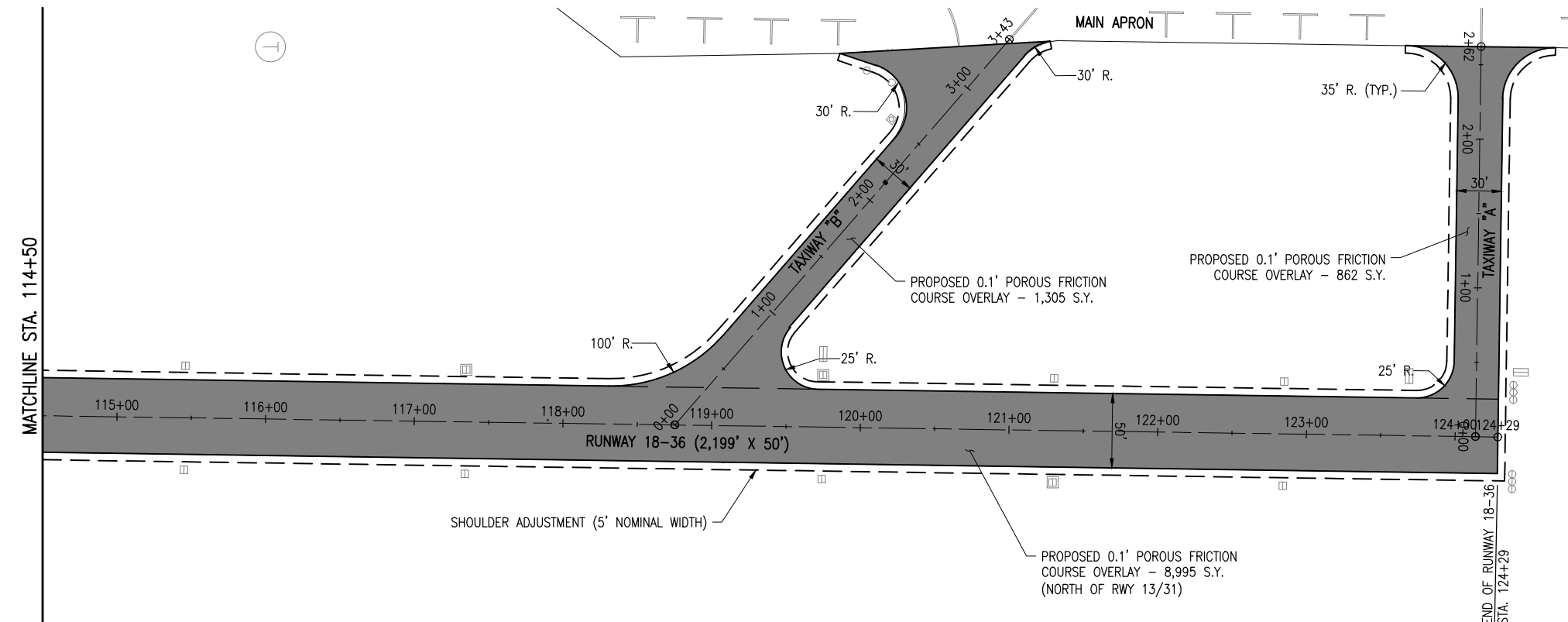
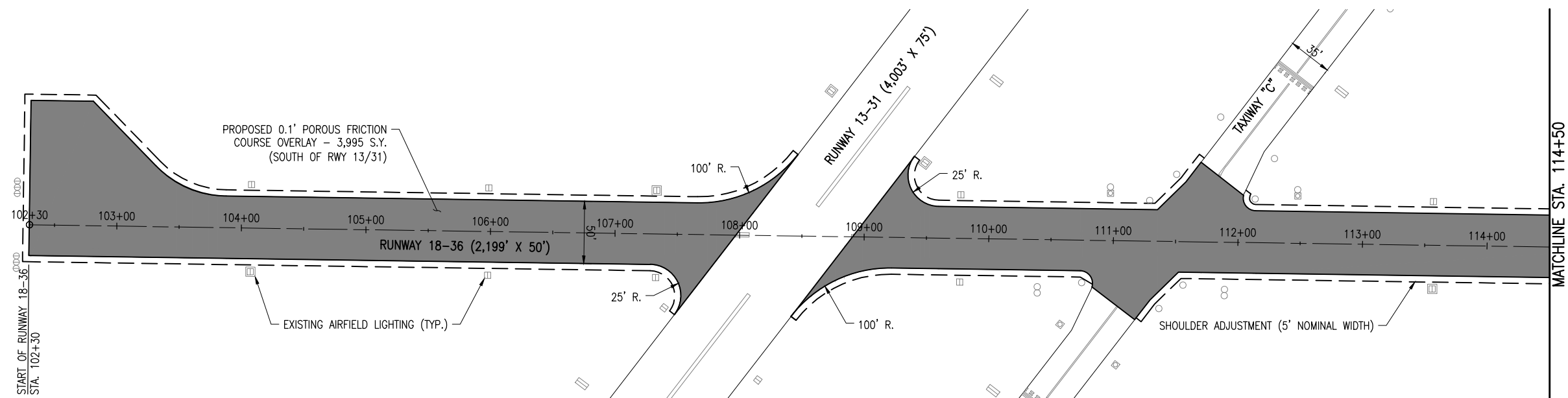
Contract No. MA027

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: NOVEMBER 16, 2015  
PROJECT NO: 14A00046  
CAD FILE: C-111-PRP.DWG  
DESIGN BY: CAH 04/27/2015  
DRAWN BY: CAH 04/27/2015  
REVIEWED BY: KBS 08/26/2015

SHEET TITLE

**PAVEMENT PREPARATION PLAN**

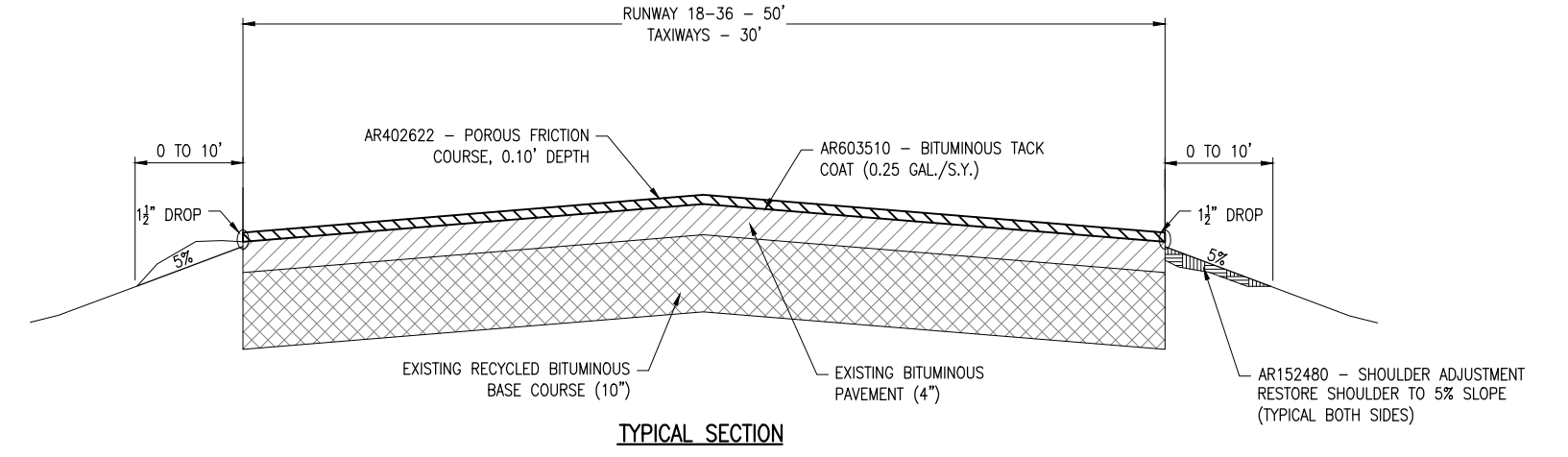


**LEGEND**

	EXISTING PAVEMENT
	AR402622 - POROUS FRICTION COURSE, 0.10' DEPTH
	AR152480 - SHOULDER ADJUSTMENT

- PAVING NOTES:**
- REFER TO PAVEMENT PREPARATION SHEET FOR BUTT JOINT LOCATIONS AND DETAIL.
  - BITUMINOUS TACK COAT APPLICATION RATES MAY BE ADJUSTED BY THE RESIDENT ENGINEER/TECHNICIAN UPON INSPECTION.
  - AREAS WORN FROM HAULING OPERATIONS SHALL BE RETACKED.
  - THE RESIDENT ENGINEER/TECHNICIAN SHALL APPROVE THE CURED SURFACE PRIOR TO PLACING OF THE POROUS FRICTION COURSE.

- SHOULDER ADJUSTMENT NOTES**
- SHOULDER ADJUSTMENT WILL BE PERFORMED ADJACENT TO ALL PAVEMENT OVERLAY AREAS TO A WIDTH AS NEED OF UP TO 10 FEET IN ORDER TO RESTORE THE SHOULDER SLOPE.
  - ALL EARTH FILL MATERIAL SHALL BE QUALITY TOPSOIL FROM OFFSITE.
  - ALL SHOULDER ADJUSTMENT AREAS SHALL BE SEEDED AND MULCHED IN ACCORDANCE WITH ITEMS 901 AND 908.
  - COSTS OF ALL TOPSOILING, SEEDING, FERTILIZING, AND MULCHING SHALL BE INCLUDED IN THE SHOULDER ADJUSTMENT PAY ITEM.



**REHAB PAVEMENT AND LIGHTING ON RWY 18/36**

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

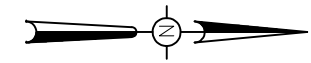
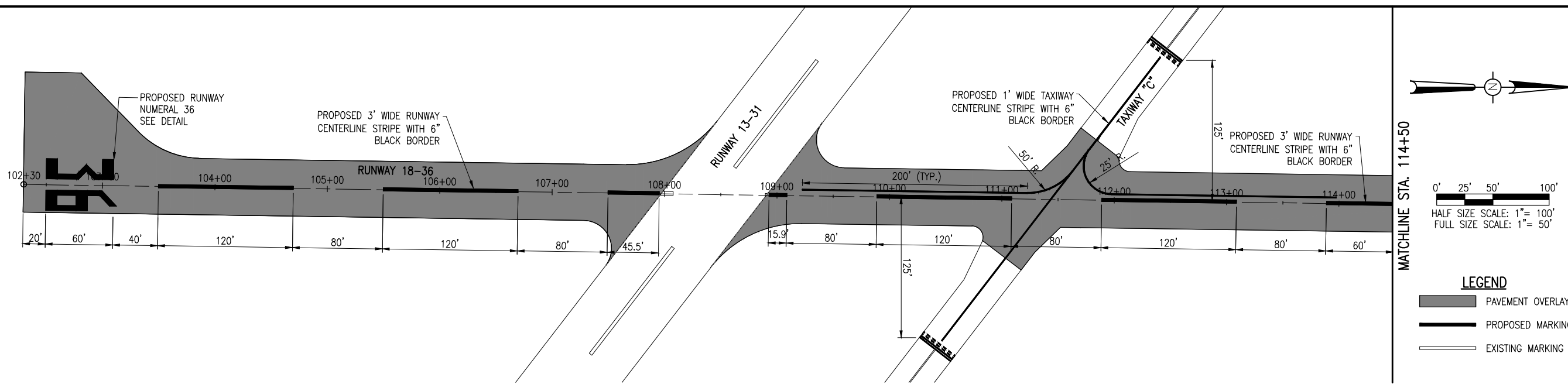
Contract No. MA027

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: NOVEMBER 16, 2015  
PROJECT NO: 14A00046  
CAD FILE: C-121-CON.DWG  
DESIGN BY: CAH 05/05/2015  
DRAWN BY: CAH 05/05/2015  
REVIEWED BY: KBS 08/26/2015

SHEET TITLE

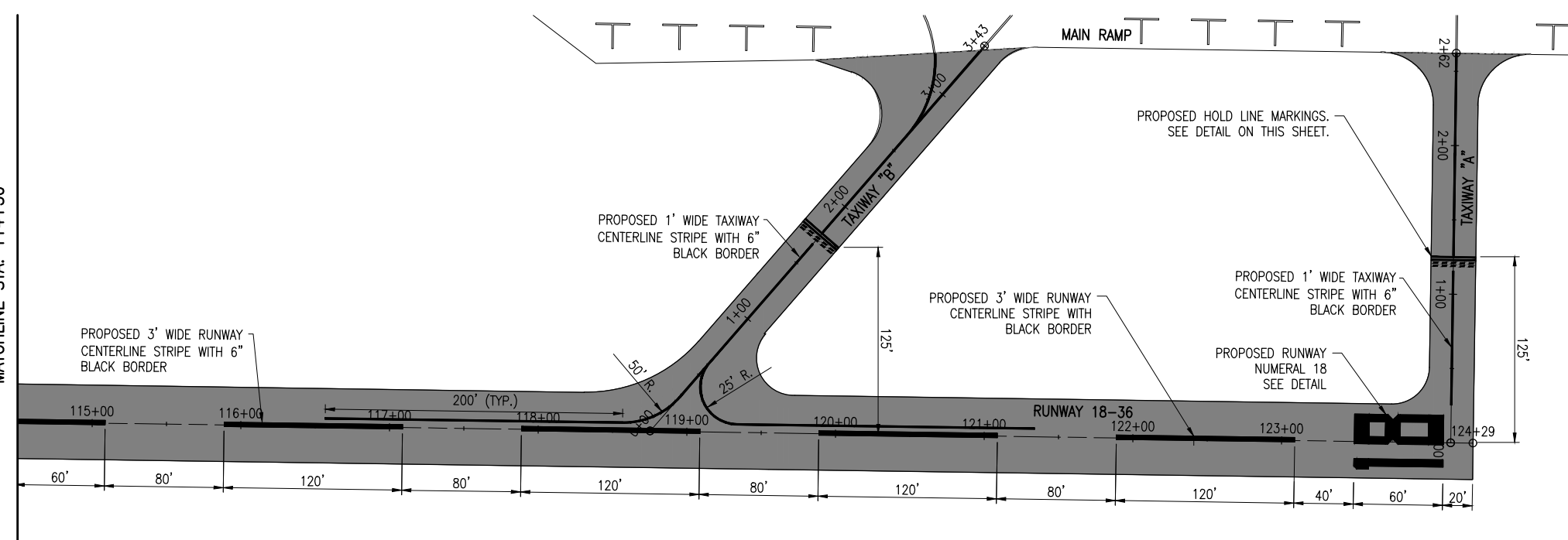
**PROPOSED CONSTRUCTION PLAN**



0' 25' 50' 100'  
HALF SIZE SCALE: 1" = 100'  
FULL SIZE SCALE: 1" = 50'

**LEGEND**

	PAVEMENT OVERLAY
	PROPOSED MARKING
	EXISTING MARKING

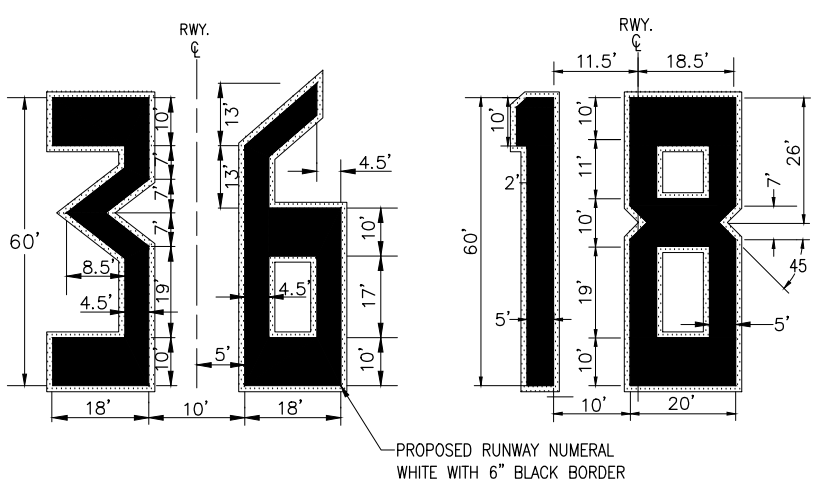


**MARKING QUANTITIES (S.F.)**

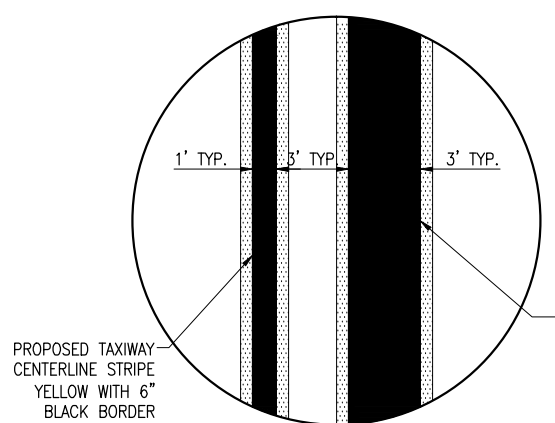
DESCRIPTION	WHITE	YELLOW	BLACK	REMOVAL
RUNWAY CENTERLINE STRIPE	3,424		1,186	
NUMBER 1	318		67	
NUMBER 3	570		100	
NUMBER 6	638		110	
NUMBER 8	875		128	
HOLD LINES		388	652	
TAXIWAY CENTERLINE		2,000	2,000	
RUNWAY 31 AIMING POINTS	6,000		684	3,400
<b>TOTAL QUANTITY (S.F.)</b>	<b>11,825</b>	<b>2,388</b>	<b>4,927</b>	<b>3,400</b>

**MARKING NOTES**

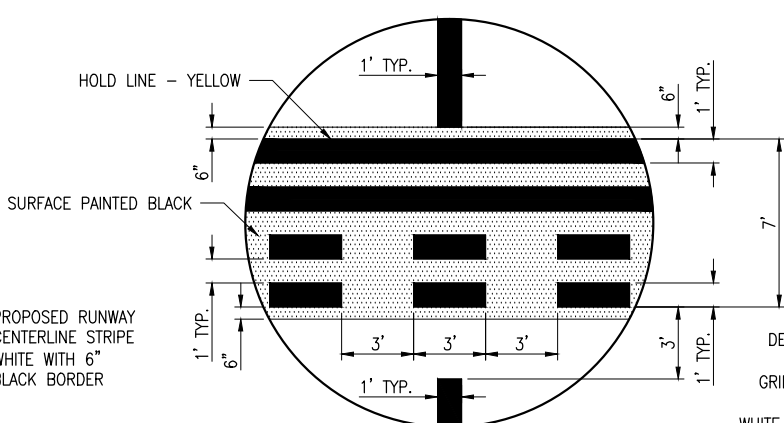
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYOUT OF ALL PROPOSED MARKINGS.
2. AN FAA WAIVER WILL BE REQUIRED FOR THE YELLOW PAINT. THE CONTRACTOR/PAINT MANUFACTURER WILL OBTAIN AND SEND THE WAIVER TO THE PROJECT ENGINEER AS PART OF THE CONTRACTOR'S SHOP DRAWING SUBMITTAL PROCESS.
3. MEASUREMENT FOR PAYMENT OF THE "BLACK BORDER" ITEM SHALL ONLY APPLY TO THAT WHICH IS VISIBLE AT THE COMPLETION OF THE MARKING AND AS SHOWN IN THE DETAILS.
4. GLASS BEADS SHALL BE REQUIRED ON THE SECOND APPLICATION OF YELLOW AND WHITE MARKING. REFER TO THE SPECIFICATIONS FOR GLASS BEAD AND MARKING APPLICATION RATES.
5. CUT-OFF SHEETS WILL BE REQUIRED TO ENSURE STRAIGHT EDGES.



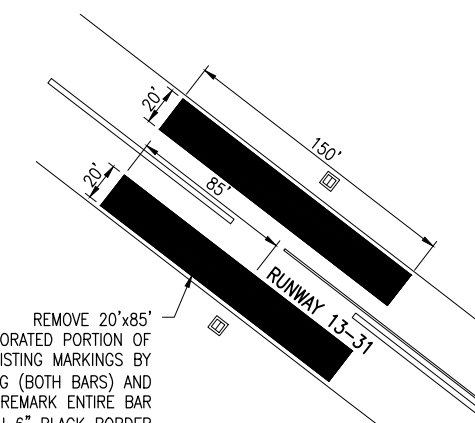
**PROPOSED NUMERAL DETAILS**  
NOT TO SCALE



**TAXIWAY CENTERLINE LEAD-IN DETAIL**  
NOT TO SCALE



**HOLDING POSITION DETAIL**  
NOT TO SCALE



**RUNWAY 31 AIMING POINTS**  
1" = 50' (FULL SIZE SCALE)

**REHAB PAVEMENT AND LIGHTING ON RWY 18/36**

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

Contract No. MA027

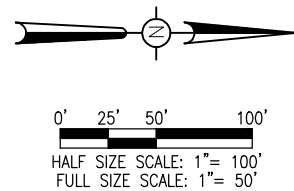
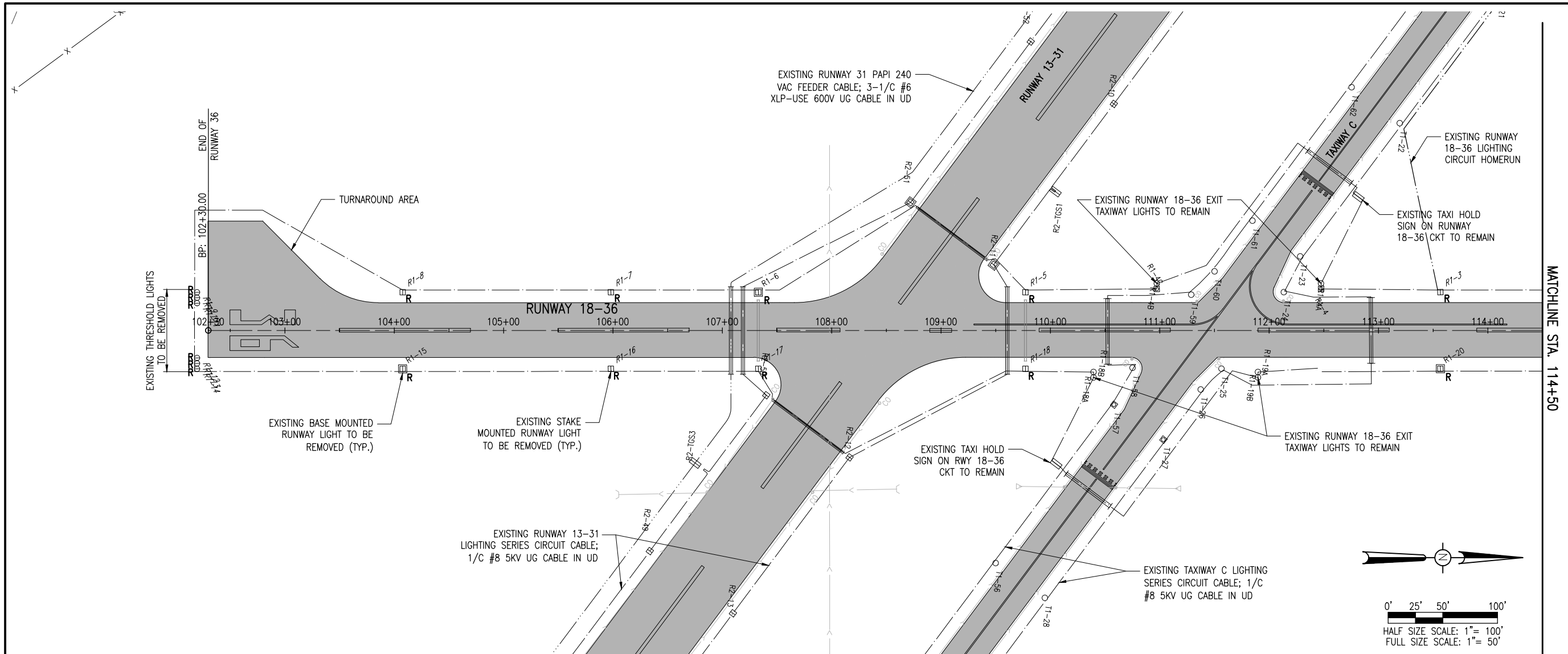
NO.	DATE	DESCRIPTION

ISSUE: NOVEMBER 16, 2015  
PROJECT NO: 14A00046  
CAD FILE: C-131-MRK.DWG  
DESIGN BY: CAH 04/28/2015  
DRAWN BY: CAH 04/28/2015  
REVIEWED BY: KBS 08/26/2015

SHEET TITLE

**MARKING PLAN & DETAILS**





**LEGEND**

- EXISTING PAVEMENT
- EXISTING BUILDING
- EXISTING MARKING
- EXISTING ELECTRICAL DUCT
- EXISTING ELECTRICAL CABLES
- EXISTING STORM SEWER/UNDERDRAIN
- EXISTING STAKE MOUNTED TAXIWAY LIGHT
- EXISTING STAKE MOUNTED TAXIWAY LIGHT TO BE REMOVED
- EXISTING BASE MOUNTED TAXIWAY LIGHT
- EXISTING BASE MOUNTED TAXIWAY LIGHT TO BE REMOVED
- EXISTING STAKE MOUNTED RUNWAY LIGHT
- EXISTING STAKE MOUNTED RUNWAY LIGHT TO BE REMOVED
- EXISTING BASE MOUNTED RUNWAY LIGHT
- EXISTING BASE MOUNTED RUNWAY LIGHT TO BE REMOVED
- EXISTING STAKE MOUNTED RUNWAY THRESHOLD LIGHT TO BE REMOVED
- EXISTING TAXI GUIDANCE SIGN
- EXISTING TAXI GUIDANCE SIGN TO BE REMOVED
- EXISTING ELECTRICAL HANDHOLE
- EXISTING ELECTRICAL MANHOLE

THE LOCATION, SIZE, AND TYPE OF MATERIAL OF EXISTING UNDERGROUND AND/OR ABOVEGROUND UTILITIES INDICATED ON THE PLANS ARE NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY WHATEVER IN RESPECT TO THE ACCURACY, COMPLETENESS, OR SUFFICIENCY OF THE INFORMATION. THERE IS NO GUARANTEE, EITHER EXPRESSED OR IMPLIED, THAT THE LOCATIONS, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ARE REPRESENTATIVE OF THOSE TO BE ENCOUNTERED IN THE CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES OF HIS OPERATIONAL PLANS AND SHALL OBTAIN FROM THE RESPECTIVE UTILITY COMPANIES DETAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF THEIR FACILITIES AND THE WORKING SCHEDULE OF THE COMPANIES FOR REMOVAL OR ADJUSTMENT WHERE REQUIRED. IN THE EVENT AN UNEXPECTED UTILITY INTERFERENCE IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY COMPANY OF JURISDICTION. THE OWNER'S REPRESENTATIVE AND/OR THE RESIDENT ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY DAMAGE TO SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT.

ALL UTILITY CABLES AND LINES SHALL BE LOCATED BY THE RESPECTIVE UTILITY. **CONTACT JULIE (JOINT UTILITY LOCATION INFORMATION FOR EXCAVATORS) FOR UTILITY INFORMATION, PHONE: 1-800-892-0123.** CONTACT THE FAA (FEDERAL AVIATION ADMINISTRATION) FOR ASSISTANCE IN LOCATING FAA CABLES AND UTILITIES. LOCATION OF FAA POWER, CONTROL, AND COMMUNICATION CABLES SHALL BE COORDINATED WITH AND/OR LOCATED BY THE FAA. ALSO CONTACT AIRPORT DIRECTOR/MANAGER AND AIRPORT PERSONNEL FOR ASSISTANCE IN LOCATING UNDERGROUND AIRPORT CABLES AND/OR UTILITIES. ALSO COORDINATE WORK WITH ALL ABOVEGROUND UTILITIES.

**AIRFIELD LIGHTING REMOVAL NOTES**

1. ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT DIRECTOR/MANAGER. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
2. CONTRACTOR SHALL EXAMINE THE SITE TO DETERMINE THE EXTENT OF THE WORK. CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL FIELD VERIFY RESPECTIVE CIRCUITS AND POWER SOURCES PRIOR TO REMOVING OR DISCONNECTING THE RESPECTIVE AIRFIELD LIGHTING, TAXI SIGN, NAVAID, OR OTHER DEVICE.
3. CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF FAA AC NO. 150/5370-2F (OR MOST CURRENT ISSUE) "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION".
4. CONTRACTOR SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF NFPA 70E - STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE.
5. THE EXISTING AIRFIELD LIGHTS AND THEIR ISOLATED TRANSFORMERS DESIGNATED FOR REMOVAL SHALL BE REMOVED AND TURNED OVER TO THE AIRPORT. THE CONCRETE LIGHT BASES SHALL BE REMOVED AND DISPOSED OF, OFF THE AIRPORT SITE IN A LEGAL MANNER. REMOVAL OF THE EXISTING AIRFIELD LIGHTS WILL BE PAID FOR UNDER ITEM AR800476 REMOVE AIRFIELD LIGHTING PER LUMP SUM.
6. THE EXISTING TAXI GUIDANCE SIGNS, AND THEIR ISOLATED TRANSFORMERS DESIGNATED FOR REMOVAL SHALL BE REMOVED AND TURNED OVER TO THE AIRPORT. THE CONCRETE FOUNDATIONS SHALL BE REMOVED AND DISPOSED OF, OFF THE AIRPORT SITE IN A LEGAL MANNER. REMOVAL OF THE EXISTING TAXI GUIDANCE SIGNS WILL BE PAID FOR UNDER ITEM AR800476 REMOVE AIRFIELD LIGHTING PER LUMP SUM.
7. THE EXISTING AIRFIELD LIGHTING CABLES ASSOCIATED WITH AIRFIELD LIGHTING REMOVALS SHALL BE ABANDONED IN PLACE UNLESS IT CONFLICTS WITH THE INSTALLATION OF A PROPOSED LIGHT OR CABLE, PAVEMENT, OR OTHER WORK, THEN IT SHALL BE REMOVED AND DISPOSED OF OFF SITE AT NO ADDITIONAL COST TO THE CONTRACT. CONTRACTOR MAY REMOVE ABANDONED CABLES AT NO ADDITIONAL COST TO THE CONTRACT AND SHALL HAVE THE SALVAGE RIGHTS TO ABANDONED CABLES.
8. ALL ABOVEGROUND JUMPERS SHALL BE IN A DUCT WITH ALL CONNECTIONS SEALED. THE CONTRACTOR SHALL SECURE, IDENTIFY AND PLACE ALL TEMPORARY EXPOSED WIRING IN CONDUIT, DUCT, OR UNIT DUCT TO PREVENT ELECTROCUTION AND FIRE IGNITION SOURCES AS PER THE REQUIREMENTS OF FAA 150/5370-2F, OPERATION SAFETY ON AIRPORTS DURING CONSTRUCTION, SECTION 218, c.
9. THE CONTRACTOR IS REQUIRED TO FILL IN ALL HOLES AND DEPRESSIONS RESULTING FROM THE LIGHT, AND/OR BASE REMOVAL 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.
10. WHEN A RESPECTIVE RUNWAY IS CLOSED THE NAVAIDS FOR THAT RUNWAY SHALL BE SHUT OFF.
11. CONTRACTOR SHALL CONFIRM RESPECTIVE LIGHTS TO BE REMOVED WITH RESIDENT ENGINEER/RESIDENT TECHNICIAN PRIOR TO REMOVAL.
12. NO CONNECTION TO AN ACTIVE LIGHTING CIRCUIT SHALL BE BROKEN UNTIL THE CIRCUIT HAS BEEN TURNED OFF IN ACCORDANCE WITH THE ABOVE NOTE 1.

REHAB PAVEMENT AND LIGHTING ON RWY 18/36

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

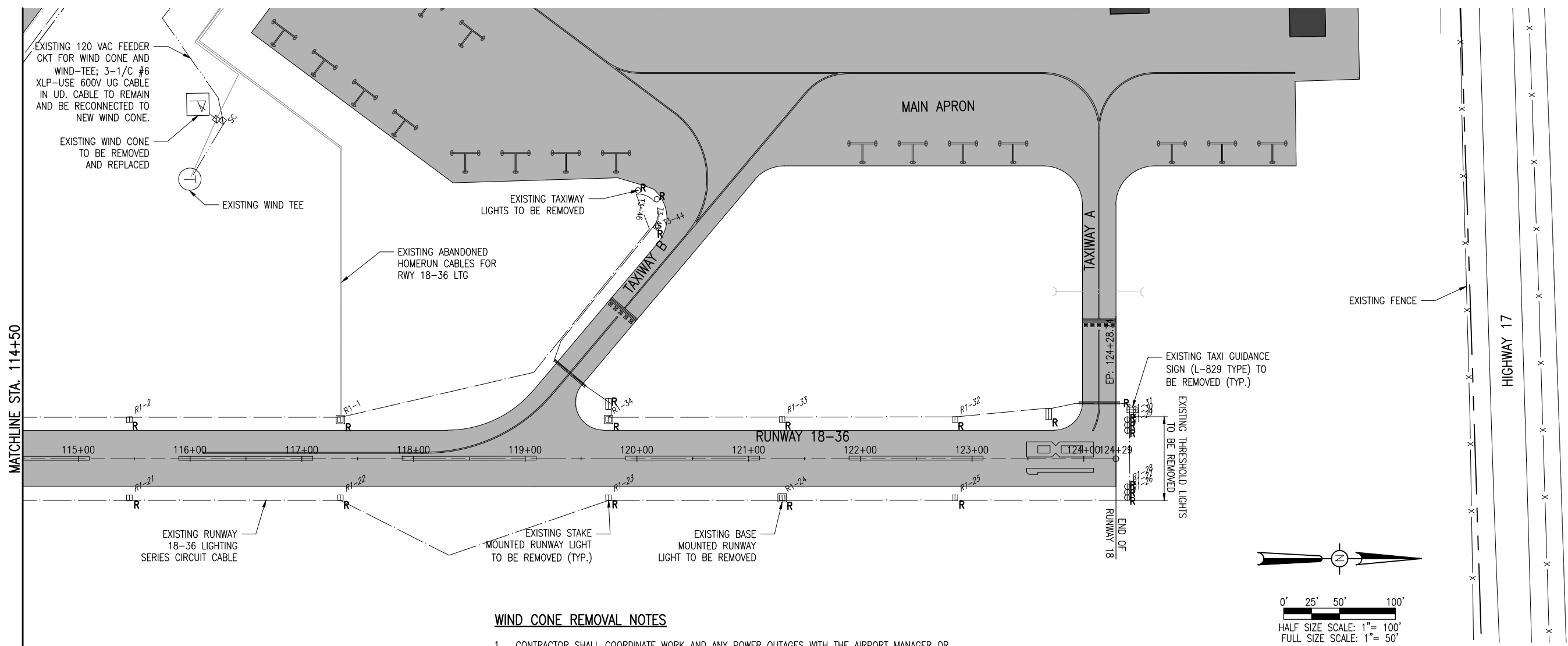
Contract No. MA027

NO.	DATE	DESCRIPTION
		DES   DWN   REV

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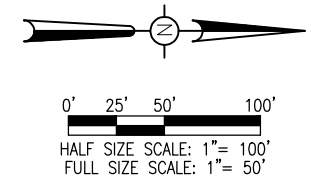
SHEET TITLE

EXISTING ELECTRICAL PLAN  
STA 102+20 TO  
STA 114+50



MATCHLINE STA. 114+50

HIGHWAY 17



**LEGEND**

	EXISTING PAVEMENT
	EXISTING BUILDING
	EXISTING MARKING
	EXISTING ELECTRICAL DUCT
	EXISTING ELECTRICAL CABLES
	EXISTING STORM SEWER/UNDERDRAIN
	EXISTING STAKE MOUNTED TAXIWAY LIGHT
	EXISTING STAKE MOUNTED TAXIWAY LIGHT TO BE REMOVED
	EXISTING BASE MOUNTED TAXIWAY LIGHT
	EXISTING BASE MOUNTED TAXIWAY LIGHT TO BE REMOVED
	EXISTING STAKE MOUNTED RUNWAY LIGHT
	EXISTING STAKE MOUNTED RUNWAY LIGHT TO BE REMOVED
	EXISTING BASE MOUNTED RUNWAY LIGHT
	EXISTING BASE MOUNTED RUNWAY LIGHT TO BE REMOVED
	EXISTING STAKE MOUNTED RUNWAY THRESHOLD LIGHT TO BE REMOVED
	EXISTING TAXI GUIDANCE SIGN
	EXISTING TAXI GUIDANCE SIGN TO BE REMOVED
	EXISTING ELECTRICAL HANDHOLE
	EXISTING ELECTRICAL MANHOLE

**WIND CONE REMOVAL NOTES**

- CONTRACTOR SHALL COORDINATE WORK AND ANY POWER OUTAGES WITH THE AIRPORT MANAGER OR RESPECTIVE AIRPORT PERSONNEL. ANY SHUTDOWN OF EXISTING SYSTEMS SHALL BE SCHEDULED WITH AND APPROVED BY THE AIRPORT MANAGER PRIOR TO SHUTDOWN. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY AND HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES, INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- CONTRACTOR SHALL EXAMINE THE SITE TO DETERMINE THE EXTENT OF THE WORK. CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL FIELD VERIFY RESPECTIVE CIRCUITS AND POWER SOURCES PRIOR TO REMOVING OR DISCONNECTING THE RESPECTIVE AIRFIELD LIGHTING, NAVAIDS, OR OTHER DEVICE.
- CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF FAA AC NO. 150/5370-2F (OR MOST CURRENT ISSUE) "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION".
- CONTRACTOR SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF NFPA 70E - STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE.
- POWER FOR THE WIND CONE SHALL BE DISCONNECTED AT THE RESPECTIVE POWER SOURCE PRIOR TO REMOVING THE RESPECTIVE WIND CONE. POWER FOR THE EXISTING PRIMARY WIND CONE IS UNDERSTOOD TO BE POWERED FROM THE AIRPORT ELECTRICAL VAULT. THE POWER FEED FOR THE WIND CONE ALSO POWERS THE WIND TEE. PROVIDE TEMPORARY CONNECTIONS TO ACCOMMODATE KEEPING THE WIND TEE IN OPERATION WHEN THE WIND CONE IS REMOVED. CONTRACTOR SHALL FIELD VERIFY TO CONFIRM THE RESPECTIVE POWER SOURCE FOR THE WIND CONE.
- THE CONTRACTOR SHALL COORDINATE THE REMOVAL OF THE EXISTING WIND CONE WITH THE INSTALLATION OF THE NEW LIGHTED WIND CONE TO MINIMIZE THE TIME WHEN THE AIRPORT IS WITHOUT A WIND CONE. THE CONTRACTOR SHALL ALSO COORDINATE WITH AND NOTIFY THE AIRPORT MANAGER AND THE RESIDENT ENGINEER/RESIDENT TECHNICIAN AND PROVIDE A SCHEDULE FOR THE WIND CONE REMOVAL AND THE NEW WIND CONE INSTALLATION. THE CONTRACTOR WILL TURN THE WIND CONE AND SUPPORT POLE OVER TO THE AIRPORT MANAGER. THE CONCRETE BASE/FOUNDATION WILL BE DISPOSED OF OFF THE AIRPORT SITE, IN A LEGAL MANNER, AT THE EXPENSE OF THE CONTRACTOR.
- THE NEW WIND CONE SHALL BE INSTALLED AT THE SAME LOCATION AS THE EXISTING WIND CONE. A NEW FOUNDATION SHALL BE FURNISHED AND INSTALLED AS DETAILED HEREIN. RESTORATION WORK WILL BE CONSIDERED INCIDENTAL TO THE WIND CONE REMOVAL AND NEW WIND CONE INSTALLATION.
- THE REMOVAL OF THE EXISTING WIND CONE WILL BE PAID FOR UNDER:  
ITEM AR800476 REMOVE AIRFIELD LIGHTING PER LUMP SUM

**REHAB PAVEMENT AND LIGHTING ON RWY 18/36**

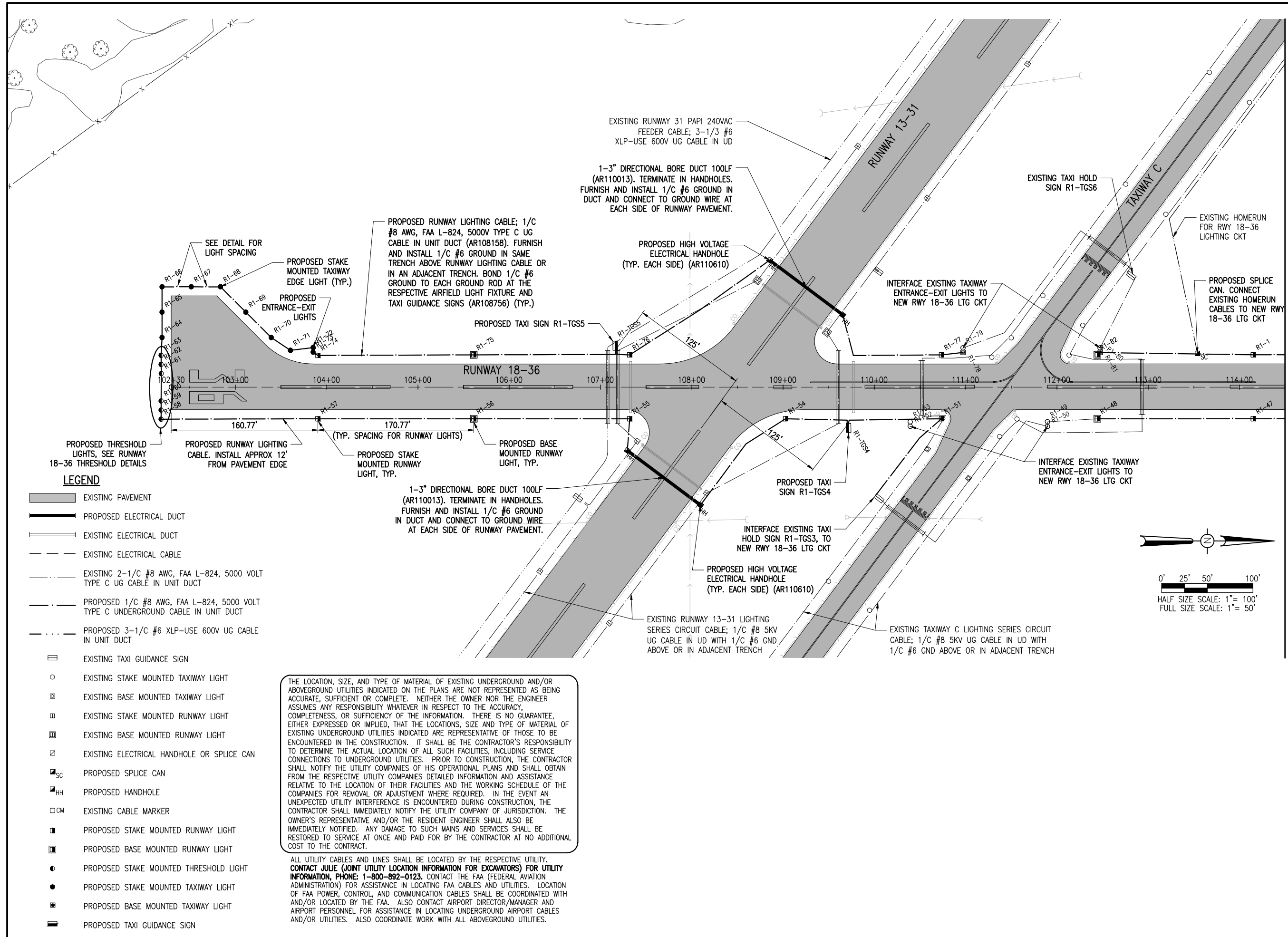
IDA No: C75-4437  
SBG No: 3-17-SBGP-120

Contract No. MA027

NO.	DATE	DESCRIPTION		
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DRAWN BY: JRH 06/17/2015  
REVIEWED BY: KNL 07/02/2015  
SHEET TITLE

**EXISTING ELECTRICAL PLAN STA 114+50 TO STA 124+29**

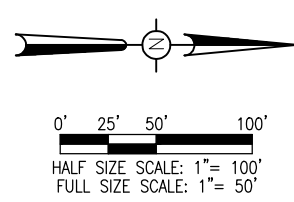


**LEGEND**

- EXISTING PAVEMENT
- PROPOSED ELECTRICAL DUCT
- EXISTING ELECTRICAL DUCT
- EXISTING ELECTRICAL CABLE
- EXISTING 2-1/C #8 AWG, FAA L-824, 5000 VOLT TYPE C UG CABLE IN UNIT DUCT
- PROPOSED 1/C #8 AWG, FAA L-824, 5000 VOLT TYPE C UNDERGROUND CABLE IN UNIT DUCT
- PROPOSED 3-1/C #6 XLP-USE 600V UG CABLE IN UNIT DUCT
- EXISTING TAXI GUIDANCE SIGN
- EXISTING STAKE MOUNTED TAXIWAY LIGHT
- EXISTING BASE MOUNTED TAXIWAY LIGHT
- EXISTING STAKE MOUNTED RUNWAY LIGHT
- EXISTING BASE MOUNTED RUNWAY LIGHT
- EXISTING ELECTRICAL HANDHOLE OR SPLICE CAN
- PROPOSED SPLICE CAN
- PROPOSED HANDHOLE
- EXISTING CABLE MARKER
- PROPOSED STAKE MOUNTED RUNWAY LIGHT
- PROPOSED BASE MOUNTED RUNWAY LIGHT
- PROPOSED STAKE MOUNTED THRESHOLD LIGHT
- PROPOSED STAKE MOUNTED TAXIWAY LIGHT
- PROPOSED BASE MOUNTED TAXIWAY LIGHT
- PROPOSED TAXI GUIDANCE SIGN

THE LOCATION, SIZE, AND TYPE OF MATERIAL OF EXISTING UNDERGROUND AND/OR ABOVEGROUND UTILITIES INDICATED ON THE PLANS ARE NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY WHATSOEVER IN RESPECT TO THE ACCURACY, COMPLETENESS, OR SUFFICIENCY OF THE INFORMATION. THERE IS NO GUARANTEE, EITHER EXPRESSED OR IMPLIED, THAT THE LOCATIONS, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ARE REPRESENTATIVE OF THOSE TO BE ENCOUNTERED IN THE CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES OF HIS OPERATIONAL PLANS AND SHALL OBTAIN FROM THE RESPECTIVE UTILITY COMPANIES DETAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF THEIR FACILITIES AND THE WORKING SCHEDULE OF THE COMPANIES FOR REMOVAL OR ADJUSTMENT WHERE REQUIRED. IN THE EVENT AN UNEXPECTED UTILITY INTERFERENCE IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY COMPANY OF JURISDICTION. THE OWNER'S REPRESENTATIVE AND/OR THE RESIDENT ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY DAMAGE TO SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT.

ALL UTILITY CABLES AND LINES SHALL BE LOCATED BY THE RESPECTIVE UTILITY. CONTACT JULIE (JOINT UTILITY LOCATION INFORMATION FOR EXCAVATORS) FOR UTILITY INFORMATION, PHONE: 1-800-892-0123. CONTACT THE FAA (FEDERAL AVIATION ADMINISTRATION) FOR ASSISTANCE IN LOCATING FAA CABLES AND UTILITIES. LOCATION OF FAA POWER, CONTROL, AND COMMUNICATION CABLES SHALL BE COORDINATED WITH AND/OR LOCATED BY THE FAA. ALSO CONTACT AIRPORT DIRECTOR/MANAGER AND AIRPORT PERSONNEL FOR ASSISTANCE IN LOCATING UNDERGROUND AIRPORT CABLES AND/OR UTILITIES. ALSO COORDINATE WORK WITH ALL ABOVEGROUND UTILITIES.



REHAB PAVEMENT AND LIGHTING ON RWY 18/36

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

Contract No. MA027

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REVIEWED BY: KNL 07/02/2015

SHEET TITLE

PROPOSED ELECTRICAL PLAN  
STA 102+20 TO STA 114+50



MATCHLINE STA. 114+50

HIGHWAY 17

PROPOSED L-807 PRIMARY LIGHTED WIND CONE STA 116+23, 304'LT. SEE DETAIL. (AR107812)

EXISTING SPLICE CAN. FURNISH AND INSTALL 3-1/C #6 XLP-USE IN 2" SCHED 40 PVC OR HDPE DUCT FROM SPLICE CAN TO PROPOSED WIND CONE. (INCIDENTAL TO AR107812)

EXISTING WIND TEE

SEE RADIUS DETAIL "B"

SEE RADIUS DETAIL "C"

SEE RADIUS DETAIL "F"

SEE RADIUS DETAIL "G"

SEE RADIUS DETAIL "A"

PROPOSED TAXI SIGN R1-TGS1 AT HOLDLINE

PROPOSED HIGH VOLTAGE ELECTRICAL HANDHOLE. (TYP. EACH SIDE) (AR110610)

PROPOSED BASE MOUNTED TAXIWAY EDGE LIGHT (TYP.)

PROPOSED TAXI SIGN R1-TGS2

PROPOSED STAKE MOUNTED TAXIWAY LIGHT (TYP.)

PROPOSED THRESHOLD LIGHTS, SEE RUNWAY 18-36 THRESHOLD DETAILS

1-3" DIRECTIONAL BORE DUCT 50 L.F. (AR110013). TERMINATE IN HANDHOLES. FURNISH AND INSTALL 1/C #6 GROUND IN DUCT AND CONNECT TO GROUND WIRE AT EACH SIDE OF TAXIWAY PAVEMENT.

SEE RADIUS DETAIL "E"

PROPOSED STAKE MOUNTED RUNWAY EDGE LIGHT (TYP.)

SEE RADIUS DETAIL "D"

PROPOSED BASE MOUNTED RUNWAY EDGE LIGHT (TYP.)

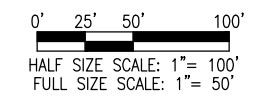
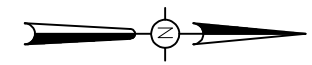
**LEGEND**

- EXISTING PAVEMENT
- PROPOSED ELECTRICAL DUCT
- EXISTING ELECTRICAL DUCT
- EXISTING ELECTRICAL CABLE
- EXISTING 2-1/C #8 AWG, FAA L-824, 5000 VOLT TYPE C UG CABLE IN UNIT DUCT
- PROPOSED 1/C #8 AWG, FAA L-824, 5000 VOLT TYPE C UNDERGROUND CABLE IN UNIT DUCT
- PROPOSED 3-1/C #6 XLP-USE 600V UG CABLE IN UNIT DUCT
- EXISTING TAXI GUIDANCE SIGN
- EXISTING STAKE MOUNTED TAXIWAY LIGHT
- EXISTING BASE MOUNTED TAXIWAY LIGHT
- EXISTING STAKE MOUNTED RUNWAY LIGHT
- EXISTING BASE MOUNTED RUNWAY LIGHT
- EXISTING ELECTRICAL HANDHOLE OR SPLICE CAN
- PROPOSED SPLICE CAN
- PROPOSED HANDHOLE
- EXISTING CABLE MARKER
- PROPOSED STAKE MOUNTED RUNWAY LIGHT
- PROPOSED BASE MOUNTED RUNWAY LIGHT
- PROPOSED STAKE MOUNTED THRESHOLD LIGHT
- PROPOSED STAKE MOUNTED TAXIWAY LIGHT
- PROPOSED BASE MOUNTED TAXIWAY LIGHT
- PROPOSED TAXI GUIDANCE SIGN

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

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.

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REHAB PAVEMENT AND LIGHTING ON RWY 18/36

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

Contract No. MA027


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SHEET TITLE

PROPOSED ELECTRICAL PLAN STA 114+50 TO STA 124+29

**REHAB PAVEMENT  
AND LIGHTING ON  
RWY 18/36**

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

Contract No. MA027

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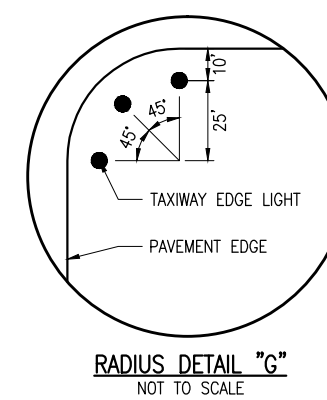
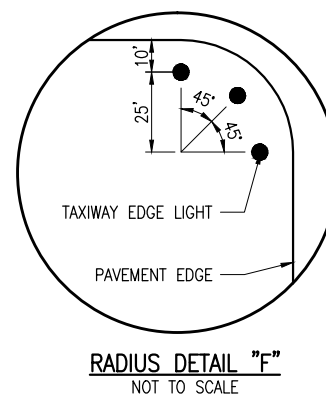
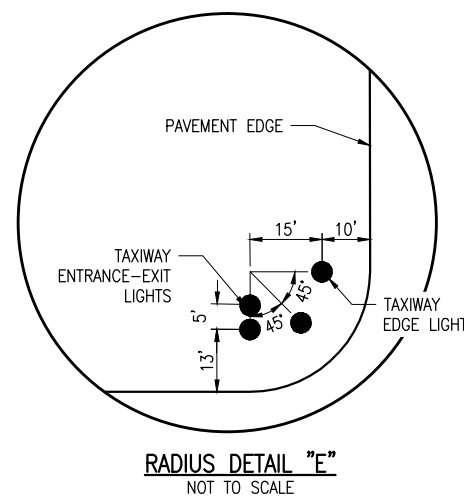
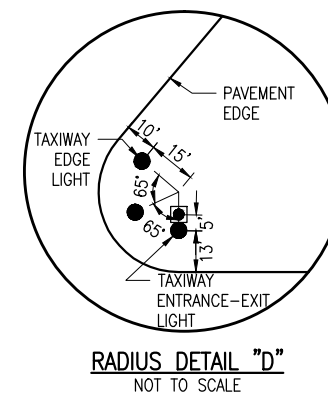
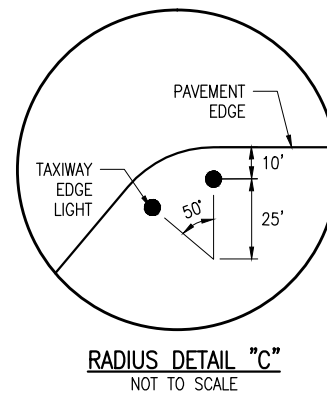
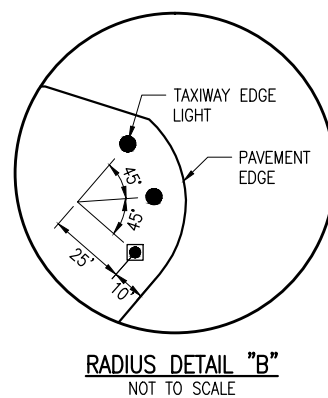
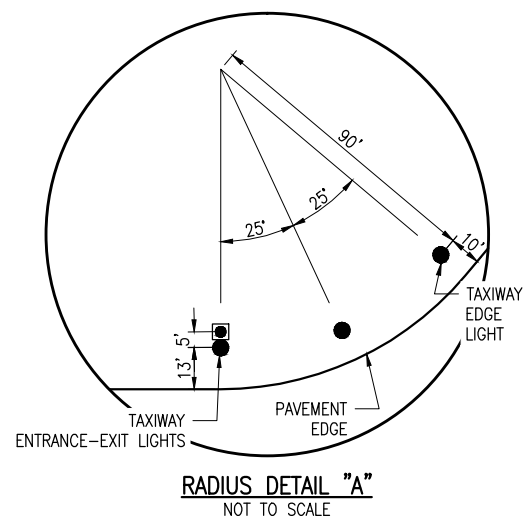
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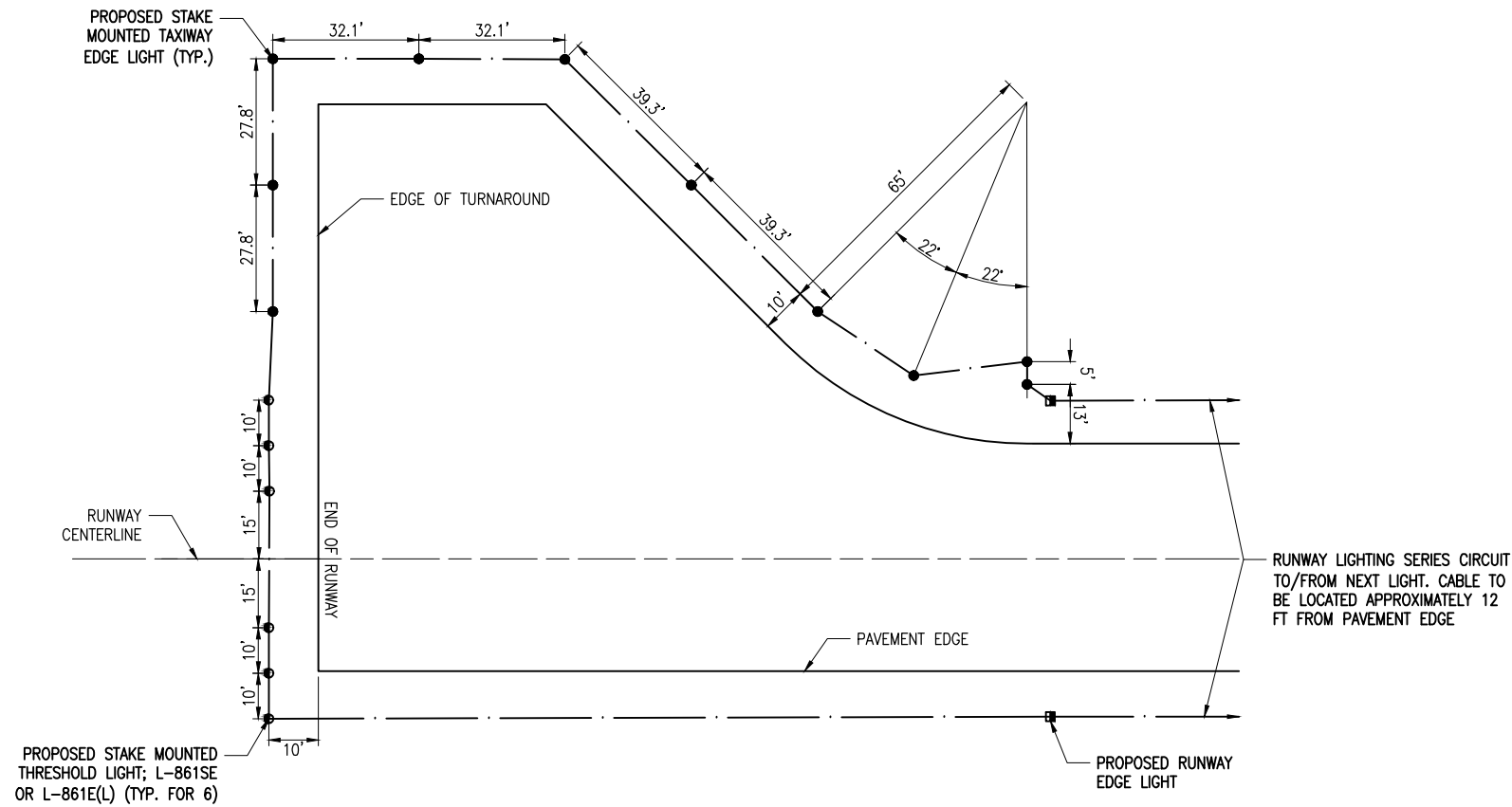
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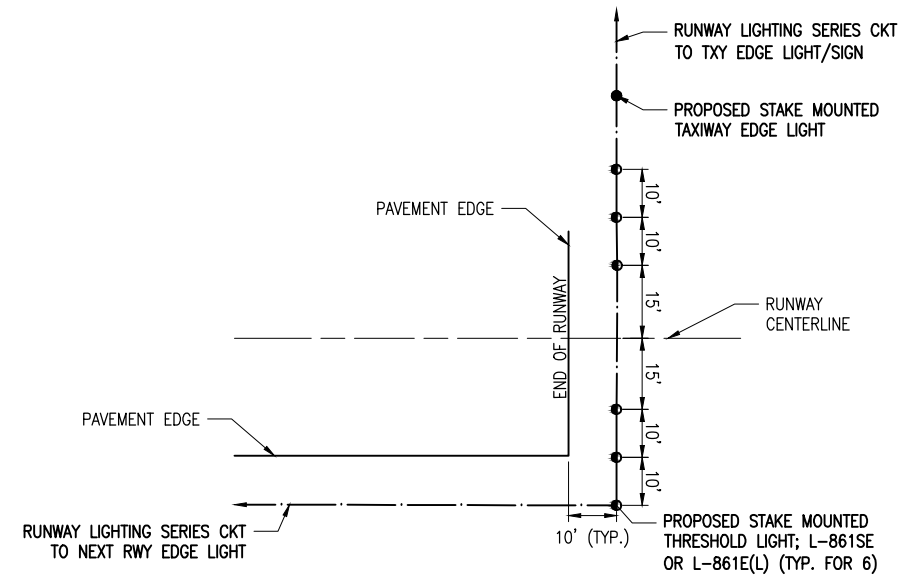
SHEET TITLE

**RADIUS DETAILS**





**PROPOSED RUNWAY 36 END THRESHOLD LIGHT DETAIL**  
SCALE 1"=20' (FOR 22"x34" SHEET)



**PROPOSED RUNWAY 18 END THRESHOLD LIGHT DETAIL**  
SCALE 1"=20' (FOR 22"x34" SHEET)

REHAB PAVEMENT  
AND LIGHTING ON  
RWY 18/36

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

Contract No. MA027


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SHEET TITLE

RUNWAY 18-36  
THRESHOLD DETAILS

**AIRFIELD LIGHTING NOTES**

- ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT DIRECTOR/MANAGER. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL FIELD VERIFY RESPECTIVE CIRCUITS AND POWER SOURCES PRIOR TO REMOVING OR DISCONNECTING THE RESPECTIVE AIRFIELD LIGHTING, NAVAID, OR OTHER DEVICE.
- PROPOSED AIRFIELD LIGHTS, TAXIWAY LIGHTS, GUIDANCE SIGNS, OTHER AIRFIELD LIGHTING, SPLICE CANS, HANDHOLES, MANHOLES, ELECTRICAL DUCTS, AND CABLE SHALL BE INSTALLED AT THE LOCATIONS SHOWN AND IN COMPLIANCE WITH THE SPECIFICATIONS, SPECIAL PROVISIONS, RESPECTIVE DETAILS, AND MANUFACTURER'S RECOMMENDATIONS.
- PROPOSED TAXI GUIDANCE SIGNS SHALL BE LOCATED SUCH THAT THE CLOSEST SIDE OF THE SIGN IS 15' FROM THE PAVEMENT EDGE, UNLESS SHOWN OTHERWISE.
- PROPOSED CABLE FOR RUNWAY AND TAXIWAY LIGHTING SHALL BE INSTALLED APPROXIMATELY 12' FROM THE PAVEMENT EDGE. CABLES SHALL BE PLACED A MINIMUM OF 18" BELOW FINISHED GRADE.
- THE PROPOSED RUNWAY AND TAXIWAY LIGHTING CABLE SHALL BE 1/C, #8 AWG, FAA L-824, 5000 VOLT, TYPE C UNDERGROUND CABLE IN UNIT DUCT.
- IN AREAS WHERE THERE IS A CONGESTION OF CABLES OR WHERE THE PROPOSED CABLE CROSSES AN EXISTING CABLE, THE CONTRACTOR IS REQUIRED TO HAND DIG THE TRENCH NECESSARY FOR THE PROPOSED CABLE. AT OTHER LOCATIONS, THE PROPOSED CABLE MAY BE TRENCHED OR PLOWED INTO PLACE. HAND DIGGING, TRENCHING AND/OR PLOWING WILL BE CONSIDERED INCIDENTAL TO THE PROPOSED CABLES AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- PROPOSED AIRFIELD LIGHTS WILL BE FITTED WITH LENSES IN ACCORDANCE WITH THE LIGHT LENSE SCHEDULE.
- ALL PROPOSED AIRFIELD LIGHTS, AND TAXI GUIDANCE SIGNS AND EXISTING AIRFIELD LIGHTS ON RUNWAY 18-36 CIRCUIT, SHALL BE TAGGED BY THE CONTRACTOR IN ACCORDANCE WITH THE LIGHT NUMBERS SHOWN ON THESE CONSTRUCTION DRAWINGS. TAGS FOR THE PROPOSED LIGHTS AND EXISTING LIGHTS SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- SEE "TAXI GUIDANCE SIGN SCHEDULE" FOR INFO ON SIGN LEGENDS.
- RUNWAY EXIT/TAXIWAY ENTRANCE LIGHTS (TAXIWAY LIGHTS TO DEFINE THE THROAT OR ENTRANCE INTO THE INTERSECTING TAXIWAY ROUTE) SHALL BE CONNECTED TO THE RESPECTIVE RUNWAY SERIES CIRCUIT TO BE ILLUMINATED WHEN THE RUNWAY EDGE LIGHTS ARE ON TO COMPLY WITH FAA AC 150/5340-30H, CHAPTER 2, PART 2.1.4b(4).
- HOLDING POSITION SIGNS FOR RUNWAYS SHALL BE CONNECTED TO THE RESPECTIVE RUNWAY SERIES CIRCUIT TO BE ILLUMINATED WHEN THE ASSOCIATED RUNWAY LIGHTS ARE ILLUMINATED TO COMPLY WITH FAA AC 150/5340-18F, CHAPTER 1, PART 15 "SIGN OPERATION".
- THE CONTRACTOR SHALL SECURE, IDENTIFY AND PLACE ALL TEMPORARY EXPOSED WIRING IN CONDUIT, DUCT OR UNIT DUCT TO PREVENT ELECTROCUTION AND FIRE IGNITION SOURCES AS PER THE REQUIREMENTS OF FAA AC 150/5370-2F, PART 218, PARAGRAPH C. ALL LABOR, MATERIALS, AND TIME NECESSARY TO COMPLY WITH THIS REQUIREMENT SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- HOMERUN CABLES FOR A RESPECTIVE CIRCUIT THAT ARE INSTALLED IN CONDUIT OR DUCT SHALL BE RUN TOGETHER IN THE SAME RACEWAY OR DUCT.
- EXISTING AIRFIELD LIGHTING CABLES (SCHEDULED FOR REPLACEMENT) IN AREAS OF NEW WORK SHALL BE DISCONNECTED & REMOVED WHERE IN CONFLICT WITH NEW CONSTRUCTION. IN OTHER AREAS CABLES MAY BE ABANDONED IN PLACE.
- THE CONTRACTOR IS REQUIRED TO FILL IN ALL HOLES AND DEPRESSIONS RESULTING FROM THE NEW WORK, WITH EARTH MATERIAL. THE AREAS SHALL BE COMPACTED TO PREVENT FUTURE SETTLEMENT AND FERTILIZED, SEED, AND MULCHED IN ACCORDANCE WITH ITEMS 901 AND 908 RESPECTIVELY.
- FURNISH AND INSTALL A #6 AWG BARE SOLID COPPER GROUND AND BOND IT TO EACH GROUND ROD AT THE RESPECTIVE AIRFIELD LIGHT FIXTURES AND TAXI GUIDANCE SIGNS. THE #6 AWG GROUND SHALL BE DIRECT BURIAL IN TRENCH APPROXIMATELY 12 TO 18 IN. BELOW GRADE. THE GROUND CONDUCTOR MAY BE INSTALLED ABOVE THE #8 FAA L-824, 5,000-VOLT CABLE IN UNIT DUCT OR IN AN ADJACENT TRENCH. THE #6 AWG GROUND SHALL BE CONNECTED TO EACH RESPECTIVE GROUND ROD WITH AN EXOTHERMIC WELD CONNECTION. THE COMPLETED GROUND WIRE INSTALLED WILL PROVIDE A GROUND RING SYSTEM FOR THE RESPECTIVE AIRFIELD LIGHTING CIRCUIT. THE GROUND WIRE WILL NOT BE INSTALLED WITH THE HOMERUN CABLES FOR THE RESPECTIVE AIRFIELD LIGHTING CIRCUIT. THE #6 AWG BARE SOLID COPPED GROUND WILL BE PAID FOR UNDER ITEM AR108756 1/C #6 GROUND PER LINEAL FOOT.
- IN THE EVENT THAT OTHER CONSTRUCTION PROJECTS ARE IN PROGRESS AT THE AIRPORT AT THE SAME TIME AS THIS PROJECT, THE CONTRACTOR WILL BE REQUIRED TO COOPERATE WITH ALL OTHER CONTRACTORS AND THE AIRPORT MANAGER IN THE COORDINATION OF THE WORK.
- NO CONNECTION TO AN ACTIVE LIGHTING CIRCUIT WILL BE BROKEN UNTIL THE CIRCUIT HAS BEEN TURNED OFF IN ACCORDANCE WITH NOTE 1.

LIGHT LENS SCHEDULE			
LIGHT NUMBERS	LENS	ORIENTATION	FIXTURE TYPE
R1-1 TO R1-3	CLEAR-WHITE	---	L-861 OR L-861(L)
R1-5 TO R1-20	BLUE	---	L-861T OR L-861T(L)
R1-21 TO R1-22	CLEAR-WHITE	---	L-861 OR L-861(L)
R1-23 TO R1-35	BLUE	---	L-861T OR L-861T(L)
R1-36 TO R1-41	RED/GREEN	RED SIDE FACING SOUTH (TOWARD THRESHOLD)	L-8615E OR L-861E(L)
R1-42 TO R1-48	CLEAR-WHITE	---	L-861 OR L-861(L)
R1-49 TO R1-50	BLUE	---	EXISTING L-861T(L)
R1-51	CLEAR-WHITE	---	L-861 OR L-861(L)
R1-52 TO R1-53	BLUE	---	EXISTING L-861T(L)
R1-54 TO R1-57	CLEAR-WHITE	---	L-861 OR L-861(L)
R1-58 TO R1-63	RED/GREEN	RED SIDE FACING NORTH (TOWARD THRESHOLD)	L-8615E OR L-861E(L)
R1-64 TO R1-73	BLUE	---	L-861T OR L-861T(L)
R1-74 TO R1-77	CLEAR-WHITE	---	L-861 OR L-861(L)
R1-78 TO R1-81	BLUE	---	EXISTING L-861T(L)
R1-82	CLEAR-WHITE	---	L-861 OR L-861(L)

TAXI GUIDANCE SIGN SCHEDULE			
SIGN NUMBERS	LOCATION	SIDE A	SIDE B
R1-TGS1	TAXIWAY B INTERSECTION WITH RUNWAY 18-36 AT HOLD LINE (125 FEET FROM RUNWAY 18-36 CENTERLINE)		
R1-TGS2	TAXIWAY A INTERSECTION WITH RUNWAY 18 AT HOLD LINE (125 FEET FROM RUNWAY 18-36 CENTERLINE)		
R1-TGS4	RUNWAY 18 INTERSECTION WITH RUNWAY 31-13, LOCATE 125 FEET FROM RUNWAY 31-13 CENTERLINE		
R1-TGS5	RUNWAY 36 INTERSECTION WITH RUNWAY 13-31, LOCATE 125 FEET FROM RUNWAY 13-31 CENTERLINE		

**TAXI GUIDANCE SIGN SCHEDULE**

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

**TAXI GUIDANCE SIGN NOTES**

- THE PROPOSED TAXI GUIDANCE SIGNS SHALL CONFORM TO ADVISORY CIRCULAR 150/5345-44J (OR LATEST ISSUE IN FORCE) AND BE FAA-APPROVED FOR TYPE L-858Y OR L-858Y(L) DIRECTION, DESTINATION, AND BOUNDARY SIGNS (BLACK LEGEND ON YELLOW BACKGROUND); TYPE L-858R OR L-858R(L) MANDATORY INSTRUCTION SIGN (BLACK OUTLINE ON OUTSIDE EDGE OF WHITE LEGEND ON RED BACKGROUND); AND/OR TYPE L-858L OR L-858L(L) LOCATION SIGN (YELLOW LEGEND AND BORDER ON BLACK BACKGROUND).
- THE SIGNS SHALL BE SIZE 1, 18-IN. SIGN FACE WITH A 12-IN. LEGEND; STYLE 2, POWERED FROM A 4.8 TO 6.6 AMP SERIES LIGHTING CIRCUIT; CLASS 2, FOR OPERATION FROM -40 DEGREES F TO 131 DEGREES F; MODE 2, TO WITHSTAND WIND LOADS OF 200 M.P.H., BASE-MOUNTED, DOUBLE-SIDED, AS SPECIFIED ON THE PLANS.
- WHERE TAXI GUIDANCE SIGNS HAVE LED (LIGHT EMITTING DIODE) TYPE ILLUMINATION THEY SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF FAA ENGINEERING BRIEF NO. 67D LIGHT SOURCES OTHER THAN INCANDESCENT AND XENON FOR AIRPORT AND OBSTRUCTION LIGHTING FIXTURES.
- THE PROPOSED TAXI GUIDANCE SIGNS SHALL BE LOCATED SUCH THAT THE CLOSEST SIDE OF THE SIGN IS 15' FROM THE PAVEMENT EDGE OR RESPECTIVE RUNWAY SURFACE EDGE.
- ALL PROPOSED TAXI GUIDANCE SIGNS SHALL BE TAGGED BY THE CONTRACTOR IN ACCORDANCE WITH THE SIGN NUMBERS SHOWN ON THESE CONSTRUCTION DRAWINGS.
- THE PROPOSED LIGHTED TAXI GUIDANCE SIGNS WILL BE PAID FOR UNDER THE FOLLOWING ITEMS:  
 AR125445 TAXI GUIDANCE SIGN, 5 CHARACTER \_\_\_\_\_ PER EACH.  
 AR125446 TAXI GUIDANCE SIGN, 6 CHARACTER \_\_\_\_\_ PER EACH.  
 AND ADDITIVE ALTERNATIVES FOR UPGRADE TO LED TYPE ILLUMINATION  
 AS800593 5-CHARACTER SIGN LED UPGRADE \_\_\_\_\_ PER EACH  
 AS800595 6-CHARACTER SIGN LED UPGRADE \_\_\_\_\_ PER EACH



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REHAB PAVEMENT  
AND LIGHTING ON  
RWY 18/36

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

Contract No. MA027

NO.	DATE	DESCRIPTION
		DES   DWN   REV

ISSUE: NOVEMBER 16, 2015  
 PROJECT NO: 14A00046  
 CAD FILE: E-641-SCHED.DWG  
 DESIGN BY: KNL 06/11/2015  
 DRAWN BY: JRH 06/11/2015  
 REVIEWED BY: KNL 07/02/2015

SHEET TITLE

AIRFIELD LIGHTING  
NOTES AND  
SCHEDULES

NOV 28, 2015 2:50 PM SCHWEO1286  
RW4\DESIGN\4614\40046D\CAD\AIRPORT\TSHEETE-641-SCHED.DWG

LIGHT LOCATION TABLE FOR RUNWAY 18-36 CIRCUIT			
LIGHT NUMBER	NORTHING	EASTING	GROUND RESISTANCE
R1-1	1586345.67	2512086.20	
R1-2	1586516.42	2512088.69	
R1-3	1586687.17	2512091.17	
R1-4	1586761.24	2512089.26	
R1-5	1586761.32	2512084.26	
R1-6	1586799.26	2512084.41	
R1-7	1586830.47	2512061.25	
R1-8	1586851.82	2512036.66	
R1-TGS1	1586899.34	2511974.29	
R1-9	1586943.69	2511930.83	
R1-10	1586949.86	2511913.50	
R1-11	1586941.90	2511896.91	
R1-12	1587065.79	2511880.02	
R1-13	1587046.54	2511888.63	
R1-14	1587013.94	2511926.19	
R1-15	1586981.32	2511963.75	
R1-16	1586935.45	2512016.60	
R1-17	1586889.58	2512069.44	
R1-18	1586887.21	2512085.40	
R1-19	1586900.80	2512086.29	
R1-20	1586900.73	2512091.29	
R1-21	1587028.68	2512096.13	
R1-22	1587199.43	2512098.61	
R1-23	1587304.30	2512097.13	
R1-24	1587304.37	2512092.14	
R1-25	1587314.93	2512095.90	
R1-26	1587319.47	2512085.36	
R1-27	1587320.75	2511997.04	
R1-28	1587322.03	2511908.73	
R1-29	1587314.97	2511890.95	
R1-30	1587297.40	2511883.37	
R1-31	1587397.39	2511884.82	
R1-32	1587379.61	2511891.89	
R1-33	1587372.03	2511909.46	
R1-34	1587370.75	2511997.77	
R1-TGS2	1587375.55	2512011.16	
R1-35	1587369.47	2512086.08	
R1-36	1587369.25	2512101.44	
R1-37	1587369.10	2512111.44	
R1-38	1587369.12	2512121.44	
R1-39	1587368.52	2512151.44	
R1-40	1587368.38	2512161.43	
R1-41	1587368.23	2512171.43	

LIGHT LOCATION TABLE FOR RUNWAY 18-36 CIRCUIT			
LIGHT NUMBER	NORTHING	EASTING	GROUND RESISTANCE
R1-42	1587198.41	2512168.61	
R1-43	1587027.66	2512166.12	
R1-44	1586856.91	2512163.64	
R1-45	1586686.16	2512161.16	
R1-46	1586515.41	2512158.68	
R1-47	1586344.65	2512156.20	
R1-48	1586173.90	2512153.72	
R1-51	1586003.15	2512151.23	
R1-TGS4	1585900.53	2512154.75	
R1-54	1585832.40	2512148.75	
R1-55	1585661.65	2512146.27	
R1-56	1585490.90	2512143.78	
R1-57	1585320.14	2512141.31	
R1-58	1585148.46	2512139.26	
R1-59	1585148.61	2512129.26	
R1-60	1585148.75	2512119.26	
R1-61	1585149.35	2512089.27	
R1-62	1585149.33	2512079.26	
R1-63	1585149.48	2512069.27	
R1-64	1585150.68	2512049.80	
R1-65	1585151.08	2512022.05	
R1-66	1585151.49	2511994.30	
R1-67	1585183.55	2511994.75	
R1-68	1585215.62	2511995.22	
R1-69	1585242.98	2512023.38	
R1-70	1585270.33	2512051.54	
R1-71	1585291.21	2512065.93	
R1-72	1585316.13	2512063.24	
R1-73	1585316.05	2512068.24	
R1-74	1585321.16	2512071.95	
R1-75	1585491.91	2512073.80	
R1-TGS5	1585646.98	2512071.04	
R1-76	1585662.66	2512076.28	
R1-77	1586004.16	2512081.24	
R1-82	1586174.92	2512083.72	

**NOTES**

- CONTRACTOR SHALL TEST AND RECORD THE EARTH GROUND RESISTANCE FOR THE GROUND ROD AT EACH AIRFIELD LIGHT FIXTURE AND EACH TAXI GUIDANCE SIGN.



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#184-001084



Marshall County Airport  
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Lacon, Illinois 61540  
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**REHAB PAVEMENT  
AND LIGHTING ON  
RWY 18/36**

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

Contract No. MA027

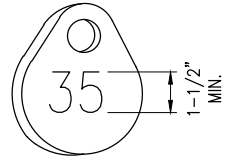
NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: NOVEMBER 16, 2015  
PROJECT NO: 14A00046  
CAD FILE: E-641-SCHED.DWG  
DESIGN BY: KNL 06/11/2015  
DRAWN BY: JRH 06/11/2015  
REVIEWED BY: KNL 07/02/2015

SHEET TITLE

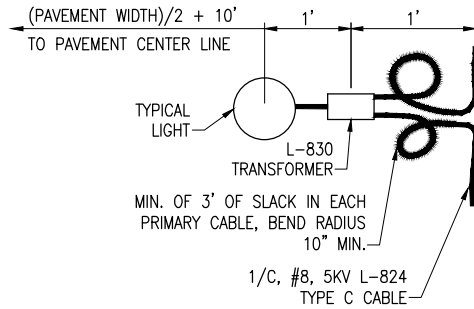
**LIGHT LOCATION  
TABLE**



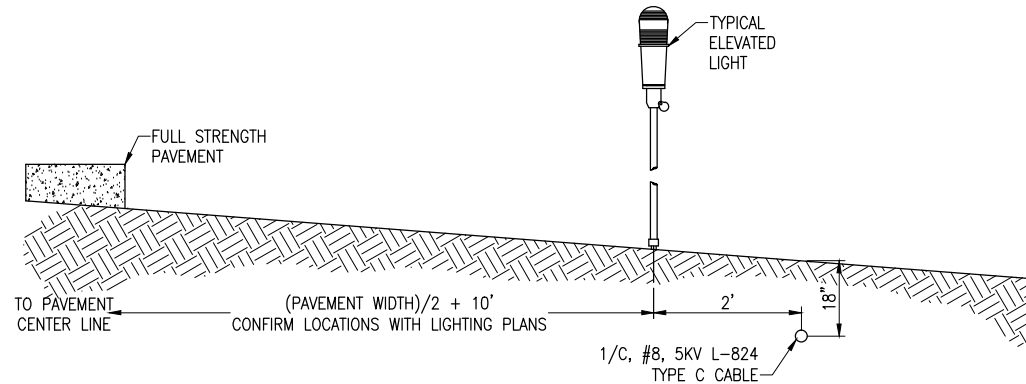


**NUMBERING TAG DETAIL**  
(NOT TO SCALE)

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



**PLAN VIEW**



**PROFILE VIEW**

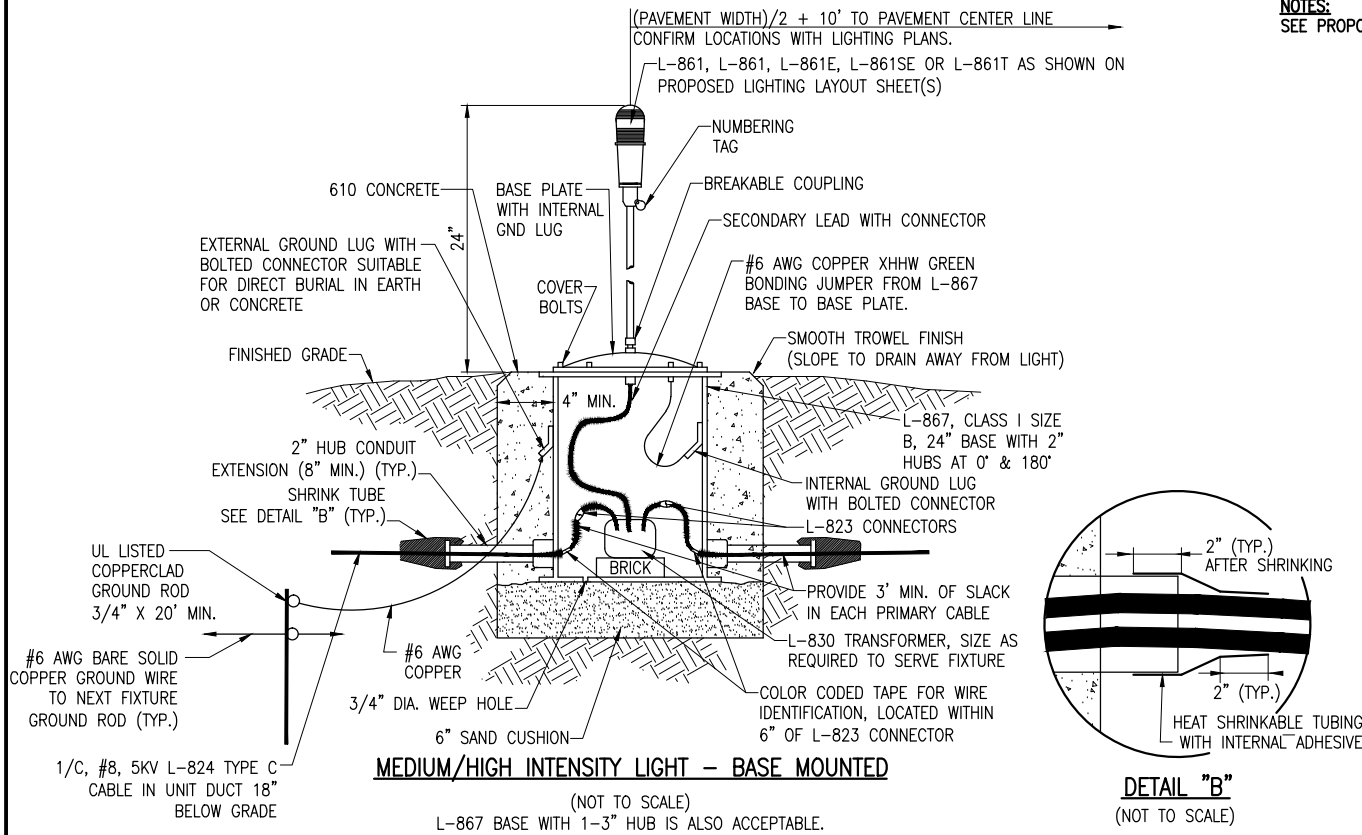
**LIGHT AND CABLE INSTALLATION DETAIL**  
(NOT TO SCALE)

**NOTES:**

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

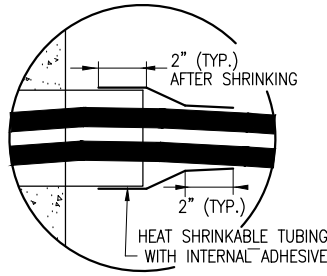
PER FAA AC 150/5340-30H DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, A LIGHT BASE GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. A LIGHT BASE GROUND SHALL BE INSTALLED AT EACH STAKE MOUNTED LIGHT AND EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED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

**NOTES:**  
SEE PROPOSED LIGHTING LAYOUT SHEET FOR LIGHT LOCATIONS.

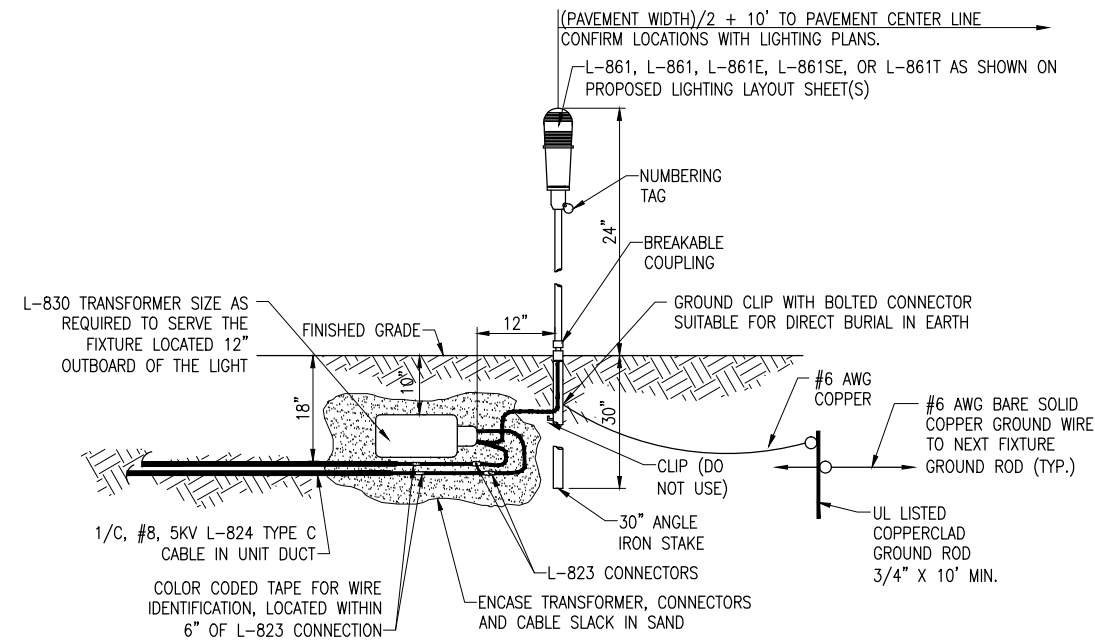


**MEDIUM/HIGH INTENSITY LIGHT - BASE MOUNTED**

(NOT TO SCALE)  
L-867 BASE WITH 1-3" HUB IS ALSO ACCEPTABLE.



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



**MEDIUM INTENSITY LIGHT - STAKE MOUNTED**

(NOT TO SCALE)

REHAB PAVEMENT  
AND LIGHTING ON  
RWY 18/36

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

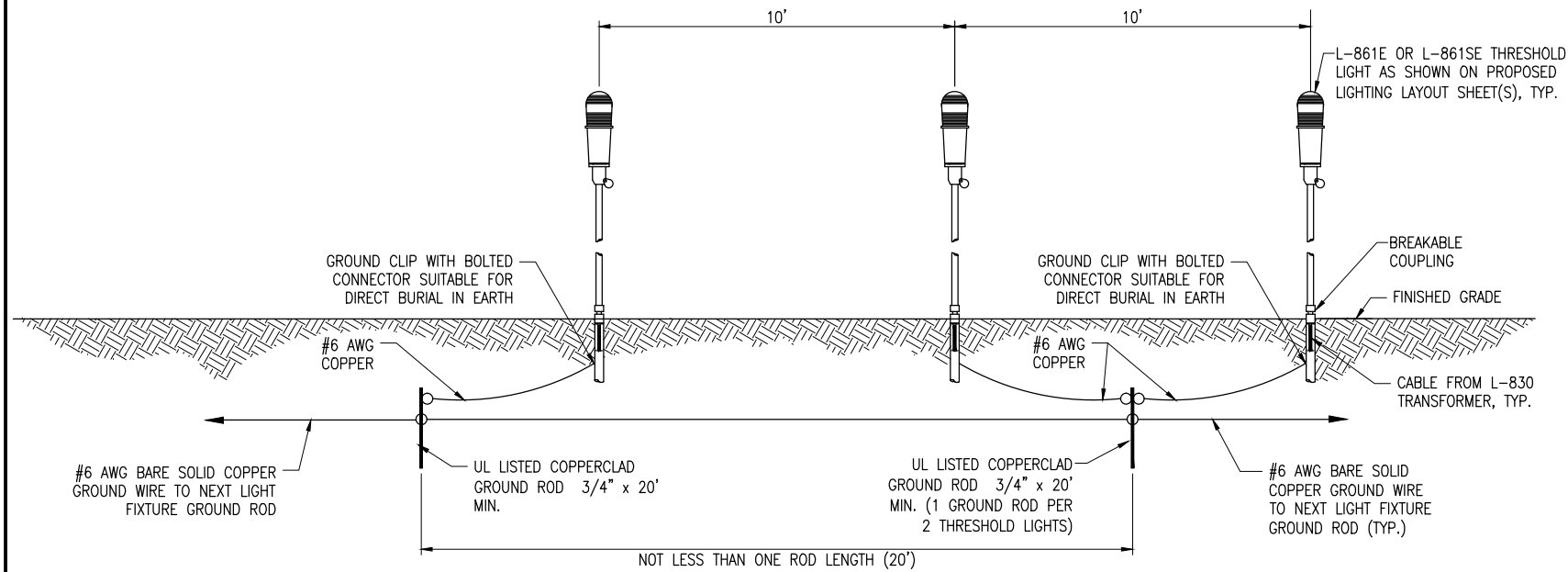
Contract No. MA027

NO.	DATE	DESCRIPTION

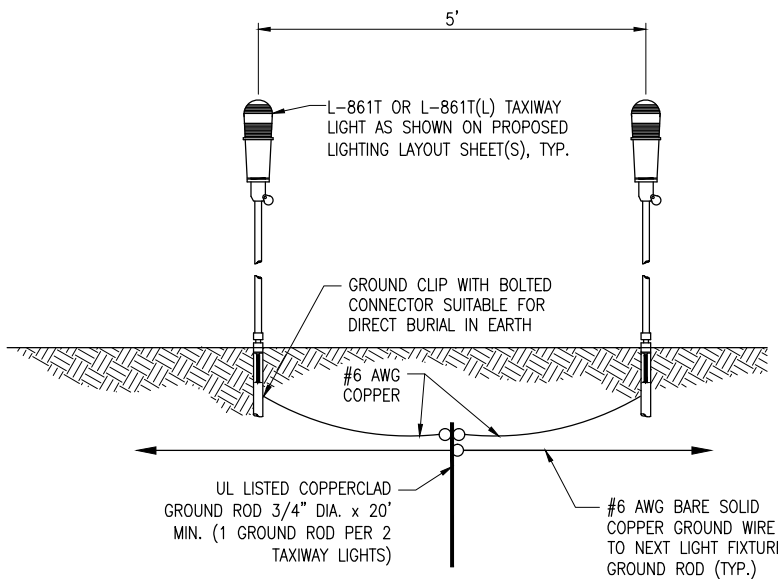
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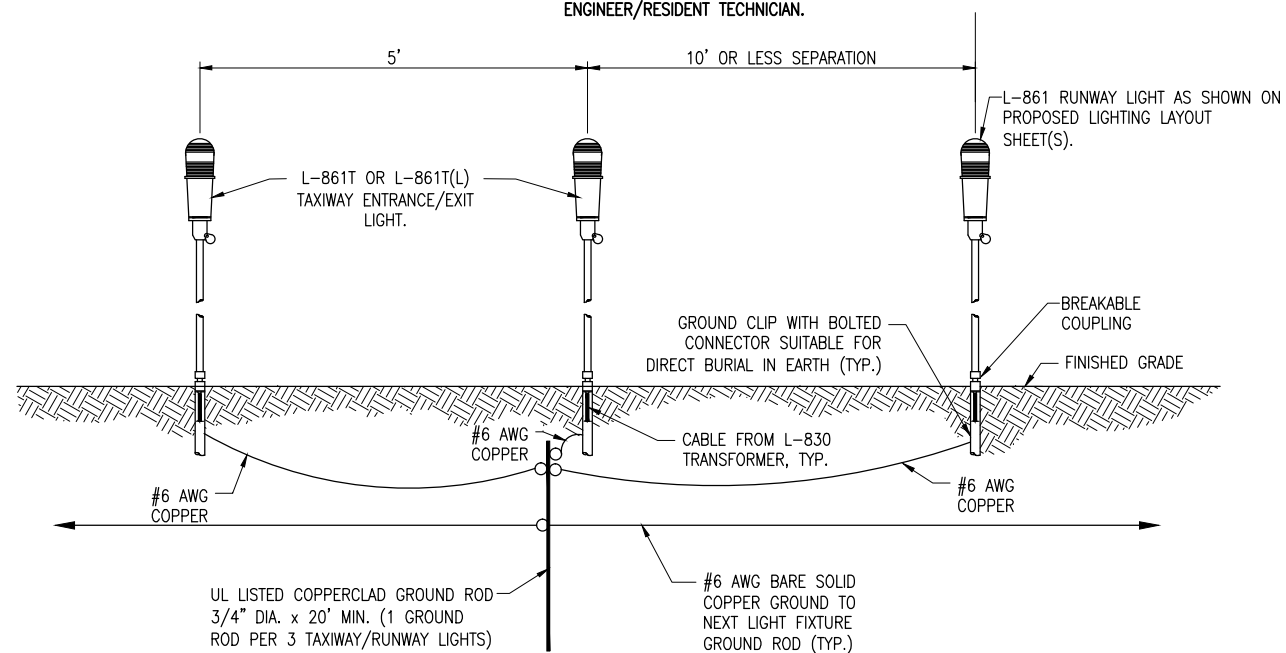
**AIRFIELD LIGHTING  
DETAILS SHEET 1**



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



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



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

**NOTES**

- GROUNDING FOR RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS SHALL BE AS DETAILED ON THE PLANS AND AS SPECIFIED HEREIN. PER FAA AC 150/5340-30H DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, CHAPTER 12, PART 12.6; A GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. THE PURPOSE OF THE LIGHT BASE GROUND IS TO PROVIDE A DEGREE OF PROTECTION FOR MAINTENANCE PERSONNEL FROM POSSIBLE CONTACT WITH AN ENERGIZED LIGHT BASE OR MOUNTING STAKE THAT MAY RESULT FROM A SHORTED POWER CABLE OR ISOLATION TRANSFORMER. A LIGHT BASE GROUND SHALL BE INSTALLED AT EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. A LIGHT BASE GROUND SHALL ALSO BE INSTALLED AT EACH STAKE MOUNTED LIGHT FIXTURE. A LIGHT BASE GROUND SHALL BE INSTALLED AND CONNECTED TO THE METAL FRAME OF EACH TAXI GUIDANCE SIGN AS DETAILED ON THE PLANS AND IN ACCORDANCE WITH THE RESPECTIVE TAXI GUIDANCE SIGN MANUFACTURER RECOMMENDATIONS. THE LIGHT BASE GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR BONDED TO THE GROUND LUG ON THE RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND A 3/4-INCH DIAMETER BY 20-FOOT LONG (MINIMUM) UL LISTED COPPER CLAD GROUND ROD. (TWO 3/4-INCH DIAMETER BY 10-FOOT LONG, UL LISTED COPPERCLAD GROUND RODS COUPLED TOGETHER). 20-FOOT LONG GROUND RODS ARE REQUIRED DUE TO POOR RESISTANCE OF THE SOIL AT THE RESPECTIVE SITE. CONNECTIONS TO GROUND LUGS ON THE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE SHALL BE WITH A UL LISTED GROUNDING CONNECTOR SUITABLE FOR DIRECT BURIAL IN EARTH OR CONCRETE. CONNECTIONS TO GROUND RODS SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY ERICO PRODUCTS, INC., SOLON, OHIO, (PHONE: 800-248-9353), THERMOWELD BY CONTINENTAL INDUSTRIES, INC., TULSA, OKLAHOMA (PHONE: 918-663-1440), ULTRAWELD BY HARGER, GRAYSLAKE, ILLINOIS (PHONE: 800-842-7437), OR APPROVED EQUAL. EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS. TOP OF GROUND RODS SHALL BE BURIED 12 INCHES MINIMUM BELOW GRADE, UNLESS SPECIFIED OTHERWISE HEREIN, FOR RESPECTIVE APPLICATIONS.
- FOR BASE MOUNTED LIGHT FIXTURES THE LIGHT FIXTURE MUST BE BONDED TO THE LIGHT BASE INTERNAL GROUND LUG VIA A #6 AWG STRANDED COPPER WIRE RATED FOR 600 VOLTS WITH GREEN XHHW INSULATION OR A BRAIDED GROUND STRAP OF EQUIVALENT CURRENT RATING. THE GROUND WIRE LENGTH MUST BE SUFFICIENT TO ALLOW THE REMOVAL OF THE LIGHT FIXTURE FROM THE LIGHT BASE FOR ROUTINE MAINTENANCE. SEE THE LIGHT FIXTURE MANUFACTURER'S INSTRUCTIONS FOR PROPER METHODS OF ATTACHING A BONDING WIRE.
- FURNISH AND INSTALL A #6 AWG BARE SOLID COPPER GROUND AND BOND IT TO EACH GROUND ROD AT THE RESPECTIVE AIRFIELD LIGHT FIXTURES AND TAXI GUIDANCE SIGNS. THE #6 AWG GROUND SHALL BE DIRECT BURIAL IN TRENCH APPROXIMATELY 12 TO 18 INCHES BELOW GRADE. THE GROUND CONDUCTOR MAY BE INSTALLED ABOVE THE #8 FAA L-824, 5000-VOLT CABLE IN UNIT DUCT OR IN AN ADJACENT TRENCH. THE #6 AWG GROUND SHALL BE CONNECTED TO EACH RESPECTIVE GROUND ROD WITH AN EXOTHERMIC WELD CONNECTION. THE COMPLETED GROUND WIRE INSTALLED WILL PROVIDE A GROUND RING SYSTEM FOR THE RESPECTIVE AIRFIELD LIGHTING CIRCUIT. THE GROUND WIRE WILL NOT BE INSTALLED WITH THE HOMERUN CABLES. THE #6 AWG BARE SOLID COPPER GROUND WILL BE PAID FOR UNDER ITEM AR108756 1/C #6 GROUND PER LINEAR FOOT.
- FOR TAXIWAY LIGHTS THAT ARE SPACED WITH LESS THAN 10 FEET OF SEPARATION BETWEEN THEM PROVIDE ONE 3/4-INCH DIAMETER BY 20-FOOT LONG GROUND ROD PER TWO ADJACENT TAXIWAY LIGHTS.
- FOR RUNWAY THRESHOLD LIGHTS THAT ARE SPACED WITH 10 FEET OF SEPARATION BETWEEN THEM, PROVIDE ONE 3/4-INCH DIAMETER BY 20-FOOT LONG GROUND ROD PER TWO ADJACENT THRESHOLD LIGHTS. LOCATE GROUND ROD MIDWAY BETWEEN THE TWO THRESHOLD LIGHTS.
- STEEL USED TO MANUFACTURE GROUND RODS SHALL BE 100% DOMESTIC STEEL.
- FOR EACH GROUNDING ELECTRODE SYSTEM, THE CONTRACTOR SHALL TEST THE MADE ELECTRODE GROUND SYSTEM WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUNDING SYSTEMS. TEST RESULTS SHALL BE RECORDED FOR EACH GROUNDING ELECTRODE SYSTEM. IF GROUND RESISTANCE EXCEEDS 25 OHMS, CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION. COPIES OF THE GROUND SYSTEM TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN.

REHAB PAVEMENT  
AND LIGHTING ON  
RWY 18/36

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

Contract No. MA027


NO.	DATE	DESCRIPTION		
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ISSUE: NOVEMBER 16, 2015

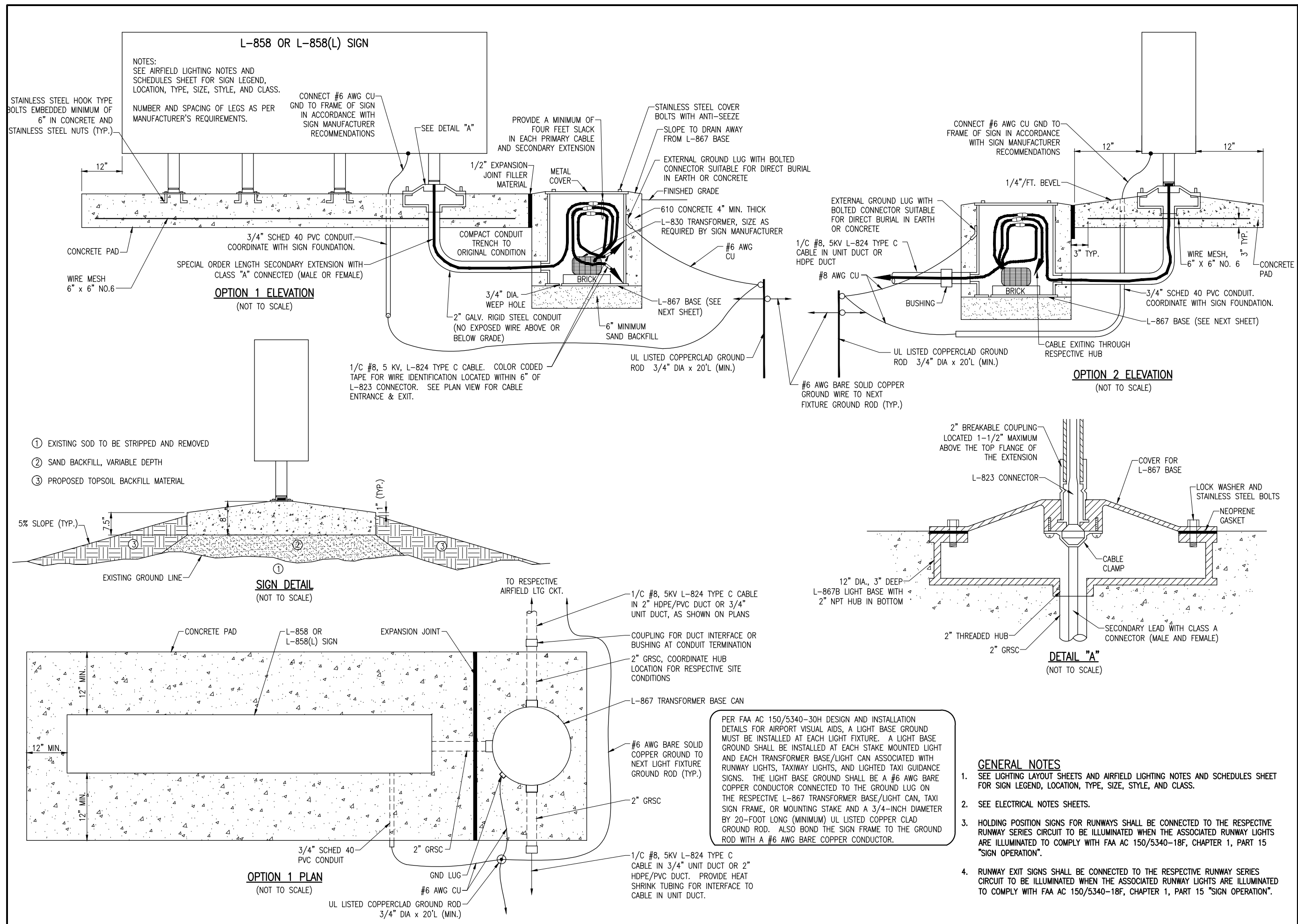
PROJECT NO: 14A00046  
CAD FILE: E-501-ELEC.DWG

DESIGN BY: KNL 05/19/2015  
DRAWN BY: JRH 06/08/2015

REVIEWED BY: KNL 07/02/2015

SHEET TITLE

AIRFIELD LIGHTING  
DETAILS SHEET 2



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REHAB PAVEMENT  
AND LIGHTING ON  
RWY 18/36

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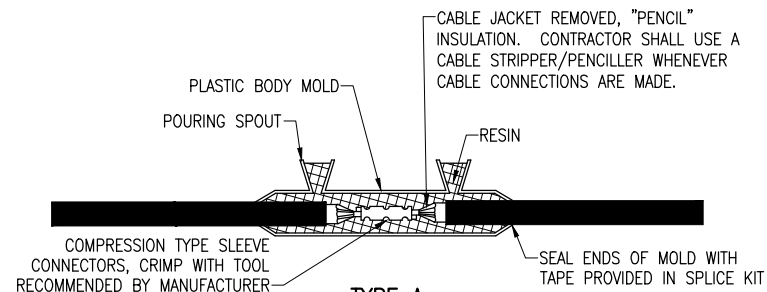
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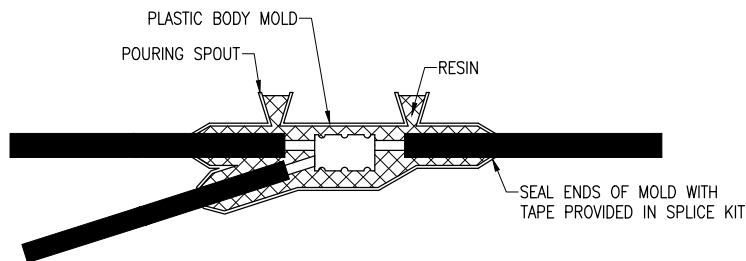
SHEET TITLE

TAXI GUIDANCE SIGN  
DETAILS



**TYPE A**

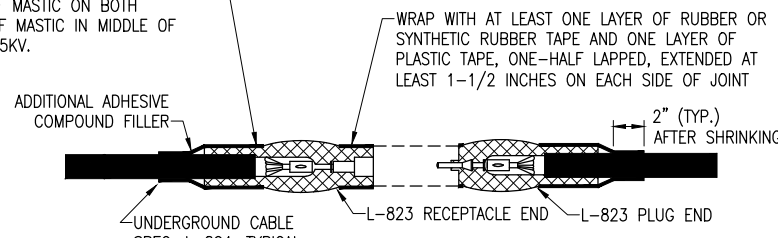
FOR SPLICES IN LOW VOLTAGE CABLE (600V) HOMERUNS FOR EXTENSIONS TO EXISTING LOW VOLTAGE CABLES ONLY. TYPE A SPLICES SHALL BE MADE IN SPLICE CANS, HANDHOLES, MANHOLES, OR JUNCTIONS BOXES



**LOW VOLTAGE UNDERGROUND TAP SPLICE**

FOR TAP SPLICES IN LOW VOLTAGE (600V) CABLE. SPLICES SHALL BE RATED AND LISTED SUITABLE FOR DIRECT BURIAL LOCATIONS. FOR SPLICES UP TO #2 AWG CONDUCTOR, SPLICES SHALL BE 3M SCOTCHCAST 82-B1 POWER CABLE TAP SPLICE KIT OR APPROVED EQUAL.

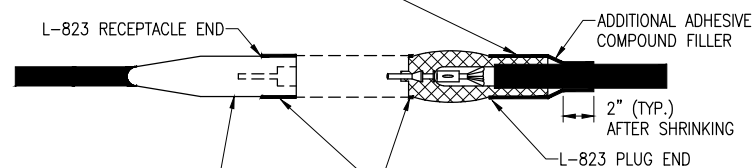
CONTINUOUS HEAT SHRINK TUBING PLACED OVER THE ENTIRE L-823 CONNECTOR(S) BOTH MALE AND FEMALE AT ALL 5KV JUNCTIONS. THE HEAT SHRINK TUBING SHALL BE APPROXIMATELY 18" IN LENGTH WITH 6 INCHES OF MASTIC ON BOTH ENDS AND VOID OF MASTIC IN MIDDLE OF TUBE RATED FOR 5KV.



**TYPE B**

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

HEAT SHRINKABLE TUBING WITH INTERNAL ADHESIVE. HEAT SHRINKABLE TUBING SHALL EXTEND FROM THE CABLE TO AT LEAST AN INCH PAST THE COMPLETED CONNECTION.

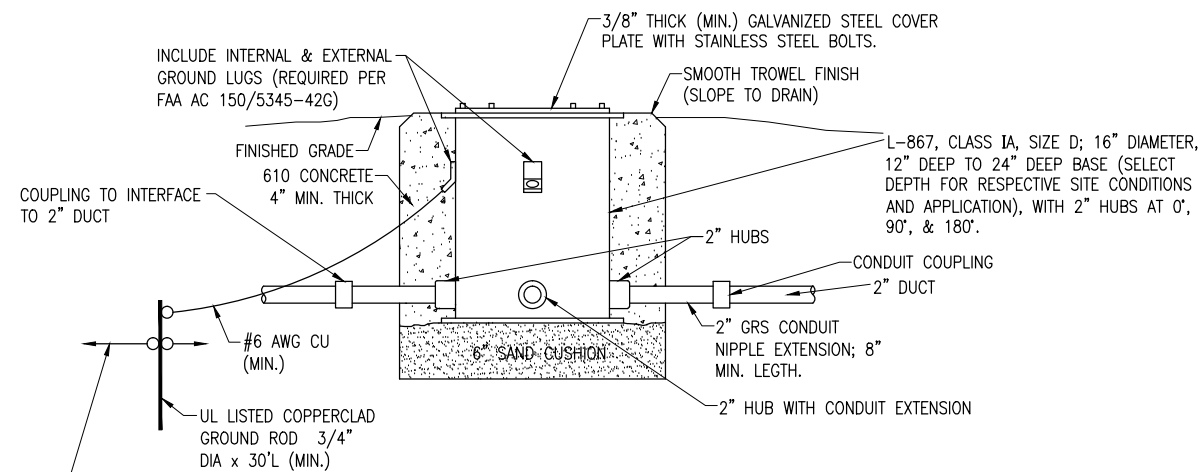


**TYPE C**

FOR SPLICES AT RUNWAY AND TAXIWAY LIGHTS AND TAXI SIGNS

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

**CABLE SPLICES**  
(NOT TO SCALE)



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

#6 AWG BARE SOLID COPPER GROUND WIRE TO NEXT AIRFIELD LIGHT FIXTURE GROUND ROD FOR AIRFIELD LIGHTING SERIES CIRCUIT APPLICATIONS. FOR VOLTAGE FEEDER APPLICATIONS EXTEND GROUND WIRE TO RESPECTIVE NAVAID (EXAMPLE; WIND CONE, WIND TEE, PAPI) WHERE SPLICE CAN IS LOCATED WITHIN 50 FT OF RESPECTIVE NAVAID.

**NOTES:**

- SPLICE DETAILS ARE PROVIDED FOR NEW WORK AND TO ASSIST IN REPAIRS OF ACCIDENTAL OR UNEXPECTED INTERRUPTIONS AND/OR CUTS TO AIRFIELD LIGHTING CABLES.
- 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.
- EVERY AIRFIELD LIGHTING CABLE SPICER SHALL BE QUALIFIED IN MAKING CABLE SPLICES AND TERMINATIONS ON CABLES RATED AT AND/OR ABOVE 5,000 VOLTS AC.
- 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.

**NOTE:**  
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.

**REHAB PAVEMENT AND LIGHTING ON RWY 18/36**

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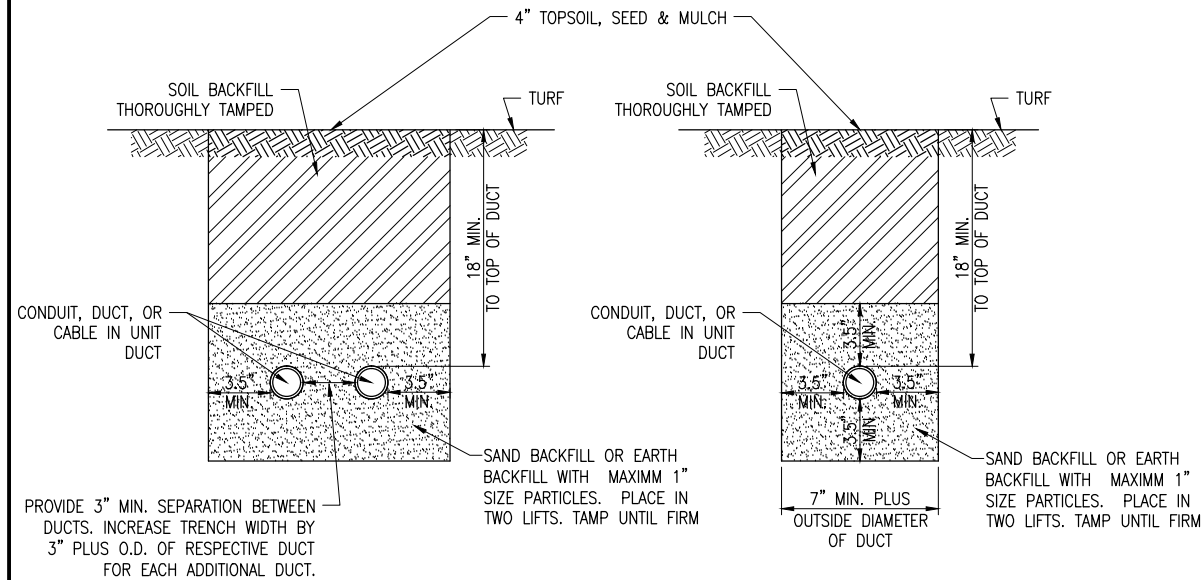
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SHEET TITLE

**AIRFIELD LIGHTING CABLE SPLICE DETAILS**

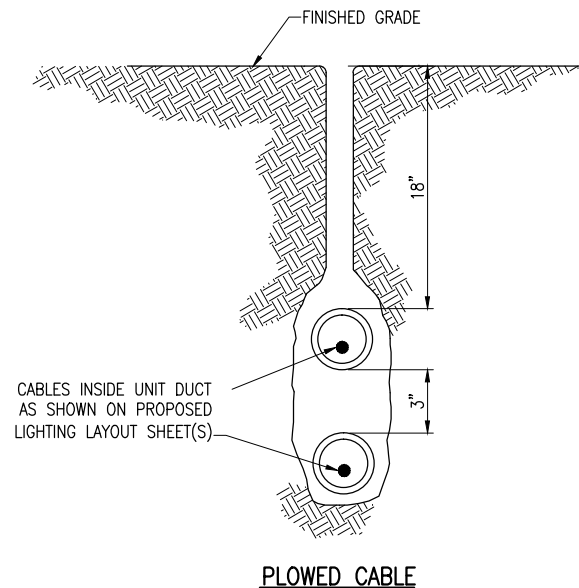


**CONDUIT IN TRENCH – NON-PAVEMENT AREAS**

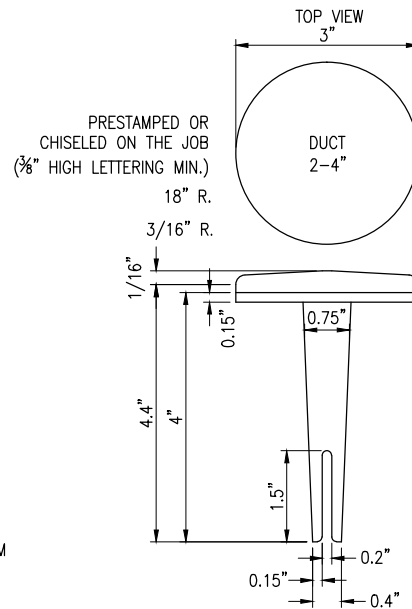
"NOT TO SCALE"

**NOTES:**

1. DIMENSIONS FOR COVERAGE AND SEPARATION BETWEEN DUCTS ARE MINIMUM.
2. 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. 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 MANHOLE.
5. DUCT INTERFACE TO HANDHOLES, MANHOLES, SPLICE CANS, OR OTHER JUNCTION STRUCTURES WILL BE CONSIDERED INCIDENTAL TO THE RESPECTIVE CABLE IN UNIT DUCT PAY ITEM OR RESPECTIVE DUCT PAY ITEM.
6. ALL DISTURBED SURFACES SHALL BE RESTORED TO THEIR ORIGINAL CONDITION. COST IS INCIDENTAL TO TRENCH.



**PLOWED CABLE**



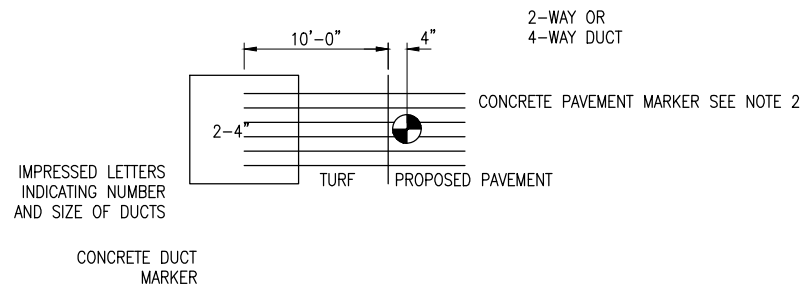
INDICATES NUMBER AND SIZE OF DUCT BANK

**BITUMINOUS PAVEMENT DUCT MARKERS**

"NOT TO SCALE"

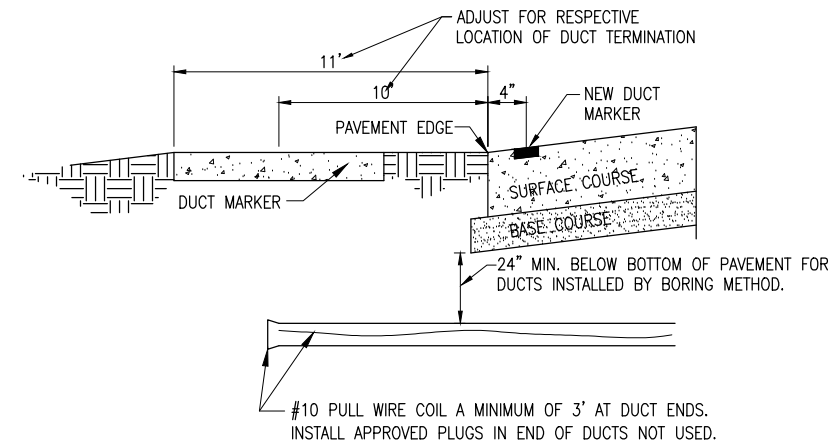
**NOTES:**

1. TOP OF MARKER SHALL BE FLUSH WITH FINISHED PAVEMENT SURFACE. MARKER MAY BE INSTALLED IN A DRILLED HOLE AND SECURED WITH EPOXY GLUE.
2. BRASS DUCT MARKERS ARE AVAILABLE FROM G&S FOUNDRY & MANUFACTURING CO., INC., 210 KASKASKIA DRIVE, RED BUD, IL 62278, PHONE: (618)-282-4114



**DUCT MARKER DETAIL**

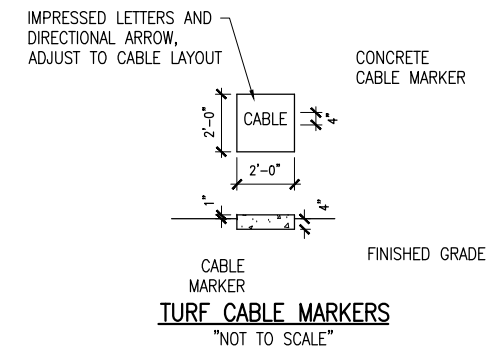
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**UNDERGROUND ELECTRICAL DUCT**

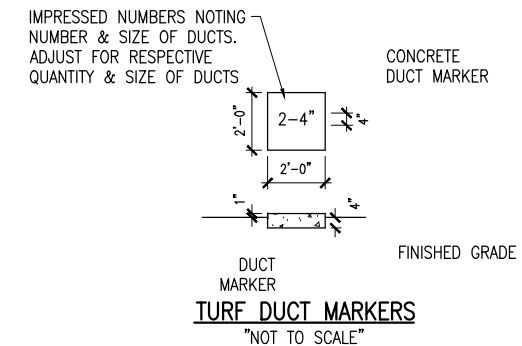
(NOT TO SCALE)

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



**TURF CABLE MARKERS**

"NOT TO SCALE"



**TURF DUCT MARKERS**

"NOT TO SCALE"

**CABLE & DUCT MARKER NOTES:**

1. 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.
3. 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 1/2" AND 1/4" DEEP. ALL LETTERS, NUMBERS AND ARROWS TO BE IMPRESSED.
5. EMPLOY THE FOLLOWING METHODS WHERE 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.

REHAB PAVEMENT AND LIGHTING ON RWY 18/36

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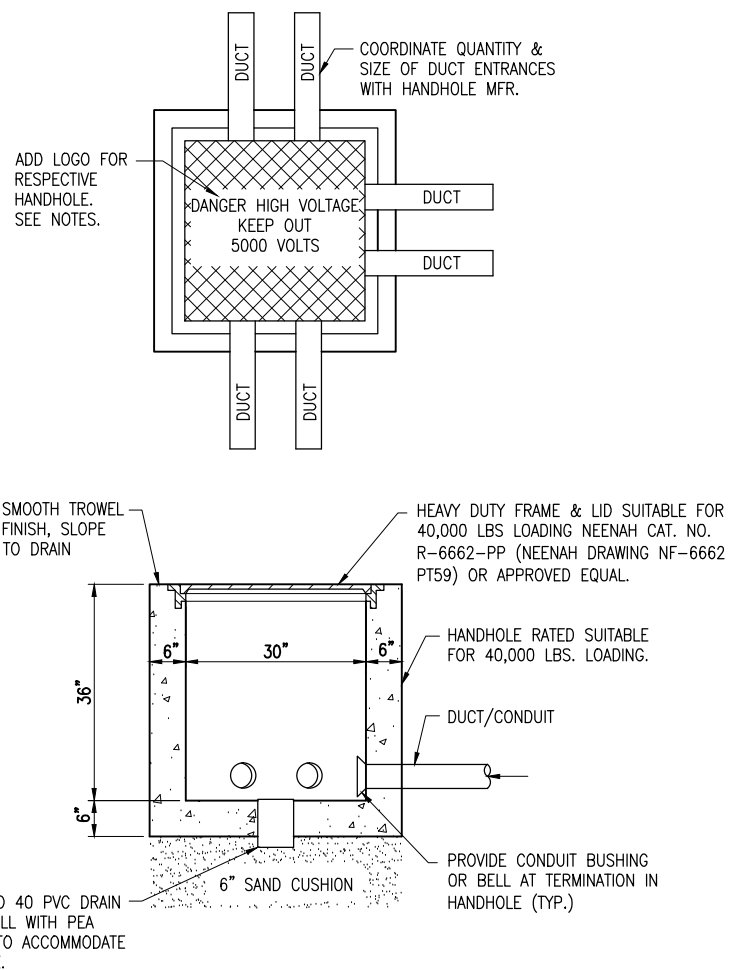
SHEET TITLE

CONDUIT TRENCH DETAILS

**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.
- CONTRACTOR SHALL COORDINATE WORK AND ANY POWER OUTAGES AND/OR SHUT DOWN OF SYSTEMS WITH THE RESPECTIVE FACILITY OWNER PERSONNEL AND THE AIRPORT MANAGER/DIRECTOR. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- THE LOCATION, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND AND/OR ABOVEGROUND UTILITIES INDICATED ON THE PLANS IS NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY WHATEVER IN RESPECT TO ACCURACY, COMPLETENESS, OR SUFFICIENCY OF THE INFORMATION. THERE IS NO GUARANTEE EITHER EXPRESSED OR IMPLIED, THAT THE LOCATIONS, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ARE REPRESENTATIVE OF THOSE TO BE ENCOUNTERED IN THE CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES OF HIS OPERATIONAL PLANS AND SHALL OBTAIN FROM THE RESPECTIVE UTILITY COMPANIES DETAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF THEIR FACILITIES AND THE WORKING SCHEDULE OF THE COMPANIES FOR REMOVAL OR ADJUSTMENT WHERE REQUIRED. IN THE EVENT AN UNEXPECTED UTILITY INTERFERENCE IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY COMPANY OF JURISDICTION. THE OWNER'S REPRESENTATIVE AND/OR THE RESIDENT ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY DAMAGE TO SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT. ALL UTILITY CABLES AND LINES SHALL BE LOCATED BY THE RESPECTIVE UTILITY. **CONTACT JULIE (JOINT UTILITY LOCATION INFORMATION FOR EXCAVATORS) FOR UTILITY INFORMATION, PHONE: 1-800-892-0123.** CONTACT THE FAA (FEDERAL AVIATION ADMINISTRATION) FOR ASSISTANCE IN LOCATING FAA CABLES AND UTILITIES. ALSO CONTACT AIRPORT DIRECTOR/MANAGER AND AIRPORT PERSONNEL FOR ASSISTANCE IN LOCATING UNDERGROUND AIRPORT CABLES AND/OR UTILITIES. ALSO COORDINATE WORK WITH ALL ABOVEGROUND UTILITIES.
- ADJUSTMENTS TO DUCT BANK ROUTES MIGHT BE REQUIRED TO ACCOMMODATE EXISTING SITE CONDITIONS AND UNDERGROUND LINES AND UTILITIES. CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL COORDINATE DUCT ROUTE ADJUSTMENTS WITH THE RESIDENT ENGINEER/ RESIDENT PROJECT REPRESENTATIVE AND THE AIRPORT MANAGER.
- CONTRACTOR SHALL LOCATE AND MARK ALL EXISTING CABLES, LINES, OR UTILITIES WITHIN 10 FT OF PROPOSED EXCAVATING/TRENCHING AREA. ANY CABLES, LINES, AND UTILITIES FOUND INTERFERING WITH PROPOSED EXCAVATION OR CABLE/TRENCHING SHALL BE HAND DUG AND EXPOSED. ANY DAMAGED CABLES OR OTHER UTILITIES SHALL BE IMMEDIATELY REPAIRED TO THE SATISFACTION OF THE 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 UTILITIES ARE DAMAGED.
- PAYMENT FOR LOCATING AND MARKING UNDERGROUND UTILITIES AND CABLES WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE CONSIDERED INCIDENTAL TO THE RESPECTIVE DUCT INSTALLATION.
- THE CONTRACTOR WILL DETERMINE IF THERE IS A CONFLICT BETWEEN THE INSTALLATION OF THE PROPOSED ELECTRICAL DUCTS AND ANY EXISTING UTILITIES. HE WILL MAKE ALL NECESSARY ADJUSTMENTS IN DEPTH OF INSTALLATION TO AVOID ANY AND ALL PROPOSED/EXISTING UNDERGROUND IMPROVEMENTS.
- 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.

- CONDUITS FOR DIRECTIONAL BORING SHALL BE SCHEDULE 40 PVC CONDUIT OR SCHEDULE 80 PVC CONDUIT, UL-LISTED, RATED FOR 90°C CABLE-CONFORMING TO NEMA STANDARD TC-2 AND UL 651 AND SUITABLE FOR DIRECTIONAL BORING INSTALLATION, SCHEDULE 80 HDPE CONDUIT, UL-LISTED, CONFORMING TO NEMA STANDARD TC-7 AND UL 651B AND SUITABLE FOR DIRECTIONAL BORING INSTALLATION, OR WALL TYPE SDR 13.5 OR SDR 11 HDPE CONDUIT MANUFACTURED IN ACCORDANCE WITH ASTM D-3350 (SPECIFICATION OF POLYETHYLENE PLASTICS PIPE AND FITTINGS MATERIALS) AND ASTM F2160 (STANDARD SPECIFICATION FOR SOLID WALL, HIGH-DENSITY POLYETHYLENE CONDUIT BASED ON CONTROLLED OUTSIDE DIAMETER), AND SUITABLE FOR DIRECTIONAL BORING INSTALLATION. PER NEC 300.5 (K), RACEWAYS INSTALLED USING DIRECTIONAL BORING EQUIPMENT SHALL BE APPROVED FOR THE PURPOSE.
- INSTALLATION OF CONDUIT AND DUCTS SHALL CONFORM TO ITEM 110 AIRPORT UNDERGROUND ELECTRICAL DUCT BANKS AND CONDUITS.
- DUCTS INSTALLED IN TRENCH SHALL BE INSTALLED 18 IN. MINIMUM BELOW GRADE IN TURF AREAS NOT SUBJECT TO FARMING. DUCTS LOCATED IN AREAS SUBJECT TO FARMING SHALL BE 42 IN. MINIMUM BELOW GRADE. MINIMUM DEPTH OF TOP OF DUCT ENCASEMENT SHALL BE 42" IN AREAS UNDER ROADWAYS. WHERE DETAILED ON THE PLANS OR WHERE REQUIRED TO AVOID OBSTRUCTIONS, DUCTS SHALL BE BURIED DEEPER.
- WHERE CONCRETE-ENCASED DUCT INTERFACES TO AN ELECTRICAL HANDHOLE OR MANHOLE, THE CONCRETE ENCASEMENT SHALL BE INSTALLED UP TO THE RESPECTIVE HANDHOLE OR MANHOLE. PROVIDE BUSHINGS OR BELLS AT CONDUIT TERMINATIONS IN ELECTRICAL HANDHOLES OR MANHOLES.
- UNDERGROUND DUCTS INSTALLED BY DIRECTIONAL-BORING METHOD SHALL BE INSTALLED IN A MANNER THAT WILL NOT DAMAGE ANY EXISTING UNDERGROUND UTILITIES, AND SHALL NOT DISTURB OR DAMAGE THE RESPECTIVE PAVEMENT OR ROADWAY SURFACE. DUCTS SHALL BE DIRECTIONAL-BORED AT THE LOCATIONS SHOWN ON THE CONSTRUCTION PLANS. THE DUCTS WILL BE BORED AT A MINIMUM DEPTH OF 42 IN. BELOW THE RESPECTIVE PAVEMENT IT IS BEING BORED UNDER.
- A PULL WIRE SHALL BE INSTALLED IN EACH CONDUIT OR DUCT TO BE LEFT VACANT.
- HIGH VOLTAGE CIRCUITS (AIRFIELD LIGHTING 5000 VOLT SERIES CIRCUITS AND/OR OTHER CIRCUITS RATED ABOVE 600 VOLTS) AND LOW VOLTAGE CIRCUITS (RATED 600 VOLTS AND BELOW) SHALL NOT BE INSTALLED IN THE SAME RACEWAY, CONDUIT, DUCT, HANDHOLE, OR MANHOLE.
- CONTROL CABLES SHALL BE RUN IN SEPARATE DUCTS FROM POWER CABLES.
- HOMERUN CABLES FOR A RESPECTIVE CIRCUIT SHALL BE INSTALLED IN THE SAME RACEWAY OR DUCT.
- COORDINATE DUCT INTERFACE TO MANHOLES AND HANDHOLES. FIELD CUT OPENINGS FOR CONDUITS AND DUCTS TO INTERFACE TO MANHOLES AND/OR HANDHOLES. CUT WALL OF RESPECTIVE HANDHOLE OR MANHOLE WITH A TOOL DESIGNED FOR MATERIAL TO BE CUT. SIZE HOLES FOR RESPECTIVE DUCTS, CONDUITS, AND TERMINATION FITTINGS AND SEAL AROUND PENETRATIONS. ALL CORING, INTERFACE, CUTTING, AND SEALING WILL BE CONSIDERED INCIDENTAL TO THE RESPECTIVE DUCT INSTALLATION AND/OR RESPECTIVE HANDHOLE/MANHOLE INSTALLATION.
- CONTRACTOR SHALL COORDINATE DUCT MARKING WITH AIRPORT.
- ALL POWER AND CONTROL CABLES IN HANDHOLES, MANHOLES, AND JUNCTION BOXES SHALL BE TAGGED TO IDENTIFY THE RESPECTIVE CABLE. A MINIMUM OF TWO TAGS SHALL BE PROVIDED ON EACH CABLE IN A MANHOLE; ONE AT THE CABLE ENTRANCE AND ONE AT THE CABLE EXIT. CABLE TAGS SHALL BE STAMPED BRASS TAGS OR OTHER WEATHERPROOF/WATERPROOF CORROSION RESISTANT MATERIAL.



**ELECTRICAL HANDHOLE**  
"NOT TO SCALE"

**NOTES:**

- LIDS FOR LOW VOLTAGE HANDHOLES CONTAINING CIRCUITS RATED 600 VOLTS AND BELOW SHALL BE LABELED "LOW VOLTAGE". LIDS FOR HIGH VOLTAGE HANDHOLES CONTAINING AIRFIELD LIGHTING 5000 VOLT SERIES CIRCUIT WIRING SHALL BE LABELED "DANGER HIGH VOLTAGE KEEP OUT 5000 VOLTS" TO COMPLY WITH NEC ARTICLE 300.45 "WARNING SIGNS" AND NEC ARTICLE 314.30(D) "COVERS". COORDINATE LETTERING WITH MFR. HANDHOLES PROVIDED WITH THE WRONG LIDS SHALL HAVE THE LIDS REPLACED WITH THE CORRECT LIDS AT NO ADDITIONAL COST TO THE CONTRACT.
- HANDHOLES MAY BE CAST IN PLACE OR PRECAST. PRECAST MANUFACTURERS MUST BE ON THE IDOT (ILLINOIS DEPT. OF TRANSPORTATION) APPROVED LIST OF CERTIFIED PRECAST CONCRETE PRODUCERS.
- 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.
- INCLUDE CERTIFICATION OF MANUFACTURE IN THE UNITED STATES OF AMERICA WITH HANDHOLE SHOP DRAWING SUBMITTAL.

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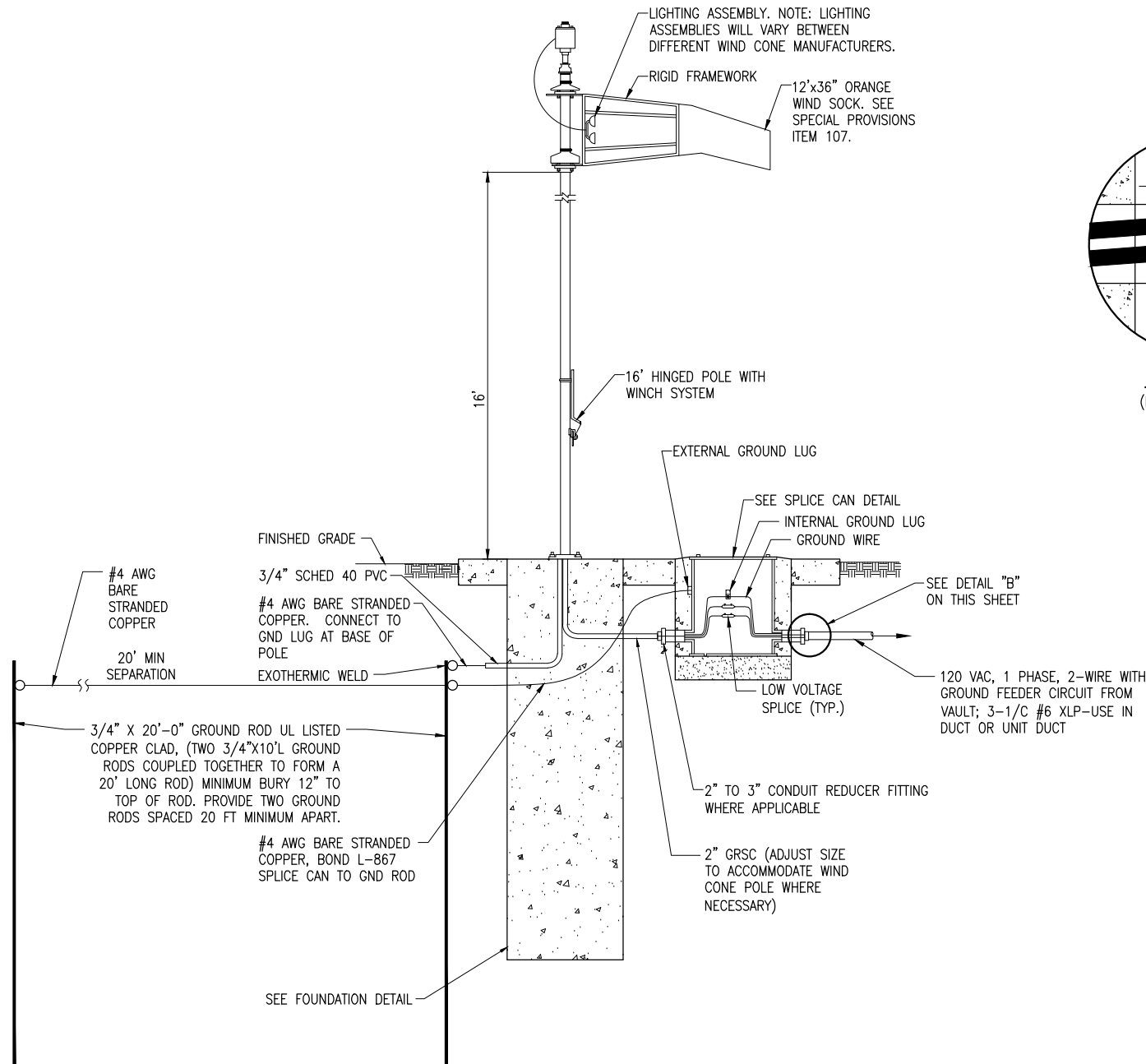
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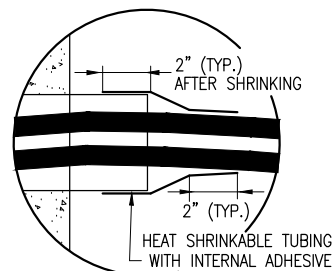
**ELECTRICAL HANDHOLE DETAIL & DUCT BANK NOTES**



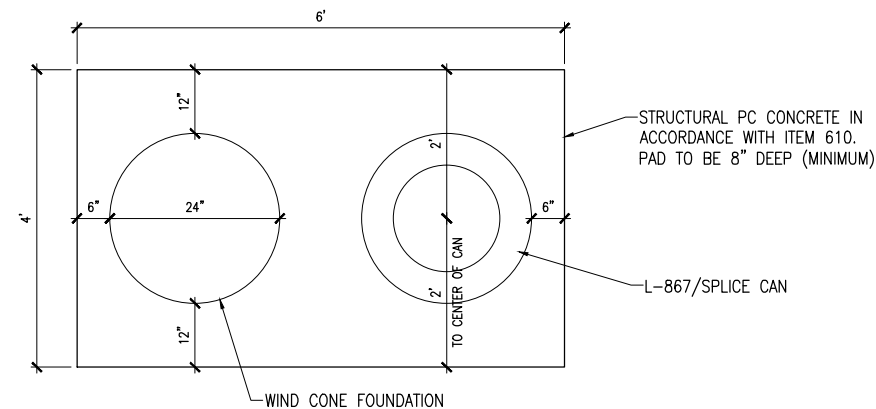
**NOTES**

1. WIND CONE SHALL BE FAA APPROVED IN ACCORDANCE WITH FAA AC 150/5345-27E, TYPE L-807(L), STYLE I-B; INTERNALLY LIGHTED, SIZE 2; 12 FEET IN LENGTH BY 36-INCH IN THROAT DIAMETER SUITABLE FOR OPERATION ON A 120 VAC, 1 PHASE, 2-WIRE POWER SUPPLY. WIND SOCK SHALL BE ORANGE IN COLOR.
2. L-807(L) WIND CONE WILL BE PAID FOR UNDER ITEM AR107812 L-807 WC-12' INTERNALLY LIT PER EACH. SPLICE CAN FOR WIND CONE WILL BE INCIDENTAL TO THE RESPECTIVE WIND CONE PAY ITEM.
3. REBAR SHALL BE MANUFACTURED FROM 100% DOMESTIC STEEL TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN REQUIREMENTS AND THE STEEL PRODUCTS PROCUREMENT ACT. INCLUDE CERTIFICATION OF 100% DOMESTIC STEEL WITH SHOP DRAWING SUBMITTAL.

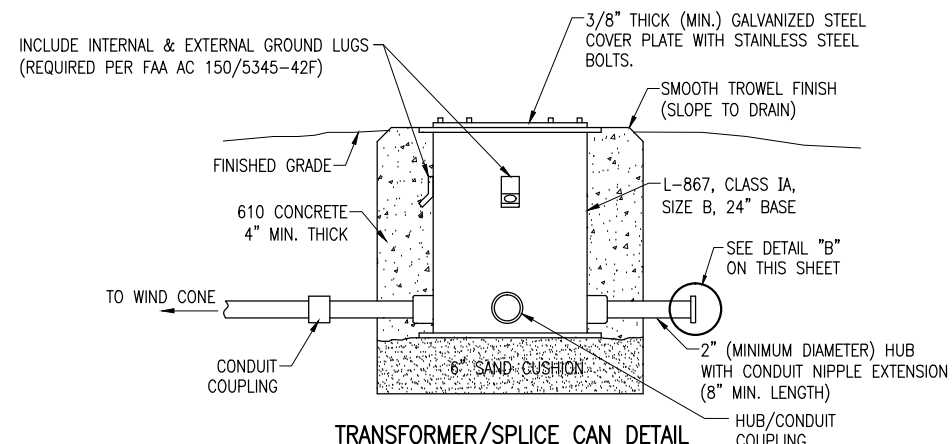
**INTERNALLY LIGHTED L-807 WIND CONE**  
"NOT TO SCALE"



**DETAIL "B"**  
"NOT TO SCALE"



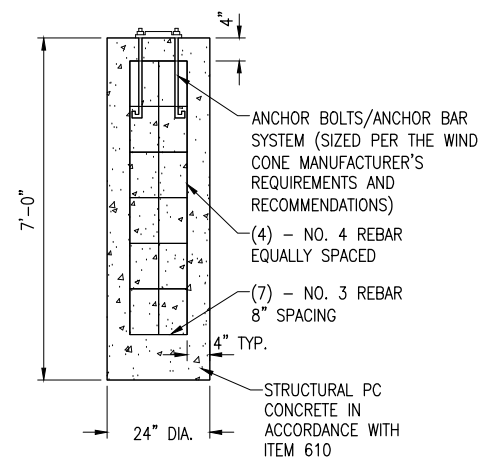
**CONCRETE PAD PLAN VIEW**  
"NOT TO SCALE"



**TRANSFORMER/SPLICE CAN DETAIL**  
"NOT TO SCALE"

**NOTES:**

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



**FOUNDATION DETAIL**  
"NOT TO SCALE"

**REHAB PAVEMENT AND LIGHTING ON RWY 18/36**

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

Contract No. MA027

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: NOVEMBER 16, 2015  
PROJECT NO: 14A00046  
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DESIGN BY: KNL 05/20/2015  
DRAWN BY: JRH 06/08/2015  
REVIEWED BY: KNL 07/02/2015

SHEET TITLE

**L-807 WIND CONE ELEVATION DETAIL**

**GENERAL NOTES**

1. ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 – NATIONAL ELECTRICAL CODE (NEC) MOST CURRENT ISSUE IN FORCE, THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES, AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L. LISTING, ETL/INTERTEK TESTING SERVICES VERIFICATION/LISTING (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE PERMITTED.
2. CONTRACTOR SHALL KEEP A COPY OF THE LATEST NEC IN FORCE ON SITE AT ALL TIMES DURING CONSTRUCTION FOR USE AS A REFERENCE.
3. CONTRACTOR SHALL COORDINATE WORK AND ANY POWER OUTAGES AND/OR SHUT DOWN OF SYSTEMS WITH THE RESPECTIVE FACILITY OWNER PERSONNEL AND THE AIRPORT MANAGER/DIRECTOR. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
4. THE CONTRACTOR SHALL ASCERTAIN THAT ALL LIGHTING SYSTEM COMPONENTS FURNISHED BY HIM, INCLUDING FAA APPROVED EQUIPMENT, ARE COMPATIBLE IN ALL RESPECTS WITH EACH OTHER AND THE REMAINDER OF THE NEW/EXISTING SYSTEM. ANY NONCOMPATIBLE COMPONENTS FURNISHED BY THIS CONTRACTOR SHALL BE REPLACED BY HIM AT NO ADDITIONAL COST TO THE AIRPORT SPONSOR WITH A SIMILAR UNIT, APPROVED BY THE ENGINEER (DIFFERENT MODEL OR DIFFERENT MANUFACTURER) THAT IS COMPATIBLE WITH THE REMAINDER OF THE AIRPORT LIGHTING SYSTEM.
5. IN CASE THE CONTRACTOR ELECTS TO FURNISH AND INSTALL AIRPORT LIGHTING EQUIPMENT REQUIRING ADDITIONAL WIRING, TRANSFORMERS, ADAPTORS, MOUNTINGS, ETC., TO THOSE SHOWN ON THE DRAWINGS AND/OR LISTED IN THE SPECIFICATION, ANY COST FOR THESE ITEMS SHALL BE INCIDENTAL TO THE EQUIPMENT COST.
6. THE CONTRACTOR INSTALLED EQUIPMENT (INCLUDING FAA APPROVED) SHALL NOT GENERATE ANY ELECTROMAGNETIC INTERFERENCE IN THE EXISTING AND/OR NEW COMMUNICATIONS, WEATHER, AIR NAVIGATION, AND AIR TRAFFIC CONTROL EQUIPMENT. ANY EQUIPMENT GENERATING SUCH INTERFERENCE SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST WITH THE EQUIPMENT MEETING THE APPLICABLE SPECIFICATIONS AND NOT GENERATING ANY INTERFERENCE.
7. WHEN A SPECIFIC TYPE, STYLE, CLASS, ETC. OF FAA APPROVED EQUIPMENT IS SPECIFIED ONLY THAT TYPE, STYLE, CLASS, WILL BE ACCEPTABLE, EVEN THOUGH EQUIPMENT OF OTHER TYPES STYLES, CLASSES, ETC. MAY BE APPROVED.
8. ANY AND ALL INSTRUCTIONS FROM THE RESIDENT ENGINEER/RESIDENT TECHNICIAN TO THE CONTRACTOR REGARDING CHANGES IN OR DEVIATIONS FROM THE PLANS AND SPECIFICATIONS SHALL BE IN WRITING WITH COPIES SENT TO THE AIRPORT SPONSOR AND THE ILLINOIS DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS. THE CONTRACTOR SHALL NOT ACCEPT ANY VERBAL INSTRUCTIONS FROM THE RESIDENT ENGINEER/RESIDENT TECHNICIAN REGARDING ANY CHANGES FROM THE PLANS AND SPECIFICATIONS.
9. A MINIMUM OF THREE COPIES OF THE INSTRUCTION BOOK SHALL BE SUPPLIED WITH EACH DIFFERENT TYPE OF EQUIPMENT. THE BOOKS DESCRIBING A MORE SOPHISTICATED TYPE OF EQUIPMENT, SUCH AS REGULATORS, PAPI, REIL, ETC. AS A MINIMUM SHALL CONTAIN THE FOLLOWING:
  - A. A DETAILED DESCRIPTION OF THE OVERALL EQUIPMENT AND ITS INDIVIDUAL COMPONENTS.
  - B. THEORY OF OPERATION INCLUDING THE FUNCTION OF EACH COMPONENT.
  - C. INSTALLATION INSTRUCTION.
  - D. START-UP INSTRUCTIONS.
  - E. PREVENTATIVE MAINTENANCE REQUIREMENTS.
  - F. CHART FOR TROUBLE-SHOOTING.
  - G. COMPLETE POWER AND CONTROL DETAILED WIRING DIAGRAM(S), SHOWING EACH CONDUCTOR/CONNECTION/COMPONENT – "BLACK" BOXES ARE NOT ACCEPTABLE. THE DIAGRAM OF THE NARRATIVE SHALL SHOW VOLTAGE/CURRENTS/WAVE SHAPES AT STRATEGIC LOCATIONS TO BE USED WHEN CHECKING AND/OR TROUBLE-SHOOTING THE EQUIPMENT. WHEN THE EQUIPMENT HAS SEVERAL MODES OF OPERATION, SUCH AS SEVERAL BRIGHTNESS STEPS, THESE PARAMETERS SHALL BE INDICATED FOR ALL DIFFERENT MODES.
  - H. PARTS LIST WHICH WILL INCLUDE ALL MAJOR AND MINOR COMPONENTS SUCH AS RESISTORS, DIODES, ETC. IT SHALL INCLUDE A COMPLETE NOMENCLATURE OF EACH COMPONENT AND, IF APPLICABLE, THE NAME OF ITS MANUFACTURER AND THE CATALOG NUMBER.
  - I. SAFETY INSTRUCTIONS.

**POWER AND CONTROL NOTES**

1. PROVIDE LEGEND PLATES FOR ALL ELECTRICAL EQUIPMENT TO IDENTIFY FUNCTION, CIRCUIT VOLTAGE AND PHASE. WHERE THE EQUIPMENT CONTAINS FUSES, ALSO IDENTIFY THE FUSE OR FUSE LINK AMPERE RATING. WHERE THE EQUIPMENT DOES NOT HAVE SUFFICIENT AREA TO INSTALL LEGEND PLATES, THE LEGEND PLATES SHALL BE INSTALLED ON THE WALL NEXT TO THE UNIT. LEGEND PLATES SHALL BE WEATHERPROOF ENGRAVED PLASTIC OR PHENOLIC MATERIAL, 1/4" HIGH BLACK LETTERS ON A WHITE BACKGROUND UNLESS NOTED OTHERWISE. SECURE WITH WEATHERPROOF ADHESIVE AND MACHINE SCREWS. FURNISH ADDITIONAL LEGEND PLATES WHERE REQUIRED BY CODE, FOR ADDITIONAL EQUIPMENT, AS DETAILED HEREIN ON THE PLANS, AND AS NOTED IN THE SPECIAL PROVISION SPECIFICATIONS.
2. COLOR CODE ALL PHASE WIRING BY THE USE OF COLORED WIRE INSULATION AND/OR COLORED TAPE. WHERE TAPE IS USED, THE WIRE INSULATION SHALL BE BLACK. BLACK AND RED SHALL BE USED FOR PHASE CONDUCTORS ON 120/240VAC SINGLE-PHASE, THREE WIRE SYSTEMS AND BLACK, ORANGE (FOR HIGH LEG) AND BLUE SHALL BE USED FOR PHASE CONDUCTORS ON 240/120VAC THREE-PHASE, FOUR WIRE SYSTEMS. NEUTRAL CONDUCTORS, SIZE NO. 6 AWG OR SMALLER, SHALL BE IDENTIFIED BY A CONTINUOUS WHITE OR NATURAL GRAY OUTER FINISH ALONG ITS ENTIRE LENGTH. NEUTRAL CONDUCTORS LARGER THAN NO. 6 AWG SHALL BE IDENTIFIED EITHER BY A CONTINUOUS WHITE OR NATURAL GRAY OUTER FINISH ALONG ITS ENTIRE LENGTH OR BY THE USE OF WHITE TAPE AT ITS TERMINATIONS AND INSIDE ACCESSIBLE WIREWAYS. INSULATED GROUND CONDUCTORS SHALL HAVE GREEN COLORED INSULATION FOR ALL CONDUCTOR SIZES (AWG OR KCMIL).
3. ALL BRANCH CIRCUIT CONDUCTORS CONNECTED TO A PARTICULAR PHASE SHALL BE IDENTIFIED WITH THE SAME COLOR. THE COLOR CODING SHALL BE EXTENDED TO THE POINT OF UTILIZATION.
4. IN CONTROL WIRING THE SAME COLOR SHALL BE USED THROUGHOUT THE SYSTEM FOR THE SAME FUNCTION, SUCH AS 10%, 30%, 100% BRIGHTNESS CONTROL, ETC.
5. LOW VOLTAGE (600 V.) AND HIGH VOLTAGE (5000 V.) CONDUCTORS SHALL BE INSTALLED IN SEPARATE WIREWAYS.
6. NEATLY LACE WIRING IN DISTRIBUTION PANELS, WIREWAYS, SWITCHES AND JUNCTION/PULL BOXES.
7. THE MINIMUM SIZE OF PULL/JUNCTION BOXES, REGARDLESS OF THE QUANTITY AND SIZE OF THE CONDUCTORS SHOWN, SHALL BE AS FOLLOWS:
  - A. IN STRAIGHT PULLS THE LENGTH OF THE BOX SHALL NOT BE LESS THAN EIGHT TIMES THE TRADE DIAMETER OF THE LARGER CONDUIT. THE TOTAL AREA (INCLUDING THE CONDUIT CROSS-SECTIONAL AREA) OF A BOX END SHALL BE AT LEAST 3 TIMES GREATER THAN THE TOTAL TRADE CROSS-SECTIONAL AREA OF THE CONDUITS TERMINATING AT THE END.
  - B. IN ANGLE PULLS OR 'U' PULLS THE DISTANCE BETWEEN EACH CONDUIT ENTRY INSIDE THE BOX AND THE OPPOSITE WALL OF THE BOX SHALL NOT BE LESS THAN SIX (6) TIMES THE TRADE DIAMETER OF THE LARGEST CONDUIT. THIS DISTANCE SHALL BE INCREASED FOR ADDITIONAL ENTRIES BY THE AMOUNT OF THE SUM OF THE DIAMETERS OF ALL OTHER CONDUIT ENTRIES ON THE SAME WALL AS THE BOX. THE DISTANCE BETWEEN CONDUIT ENTRIES ENCLOSING THE SAME CONDUCTOR SHALL NOT BE LESS THAN SIX TIMES THE TRADE DIAMETER OF THE LARGEST CONDUIT.
8. A RUN OF CONDUIT BETWEEN TERMINATIONS AT EQUIPMENT ENCLOSURES, SQUARE DUCTS AND PULL/JUNCTION BOXES, SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF FOUR QUARTER BENDS (360 DEGREES TOTAL), INCLUDING THOSE BENDS LOCATED IMMEDIATELY AT THE TERMINATIONS, CAST, CONDUIT TYPE OUTLETS SHALL NOT BE TREATED AS PULL/JUNCTION BOXES.
9. EQUIPMENT CABINETS SHALL NOT BE USED AS PULL/JUNCTION BOXES. ONLY WIRING TERMINATING AT THE EQUIPMENT SHALL BE BROUGHT INTO THESE ENCLOSURES.
10. SPLICES AND JUNCTION POINTS SHALL BE PERMITTED ONLY IN JUNCTION BOXES, DUCTS EQUIPPED WITH REMOVABLE COVERS, AND AT EASILY ACCESSIBLE LOCATIONS.
11. CIRCUIT BREAKERS IN POWER DISTRIBUTION PANEL(S) SHALL BE THERMAL-MAGNETIC MOLDED CASE, PERMANENT TRIP WITH 100 AMPERE, MINIMUM FRAME.
12. DUAL LUGS SHALL BE USED WHERE TWO (2) WIRES, SIZE NO. 6 OR LARGER, ARE TO BE CONNECTED TO THE SAME TERMINAL.
13. ALL INTERIOR WALL MOUNTED EQUIPMENT ENCLOSURES SHALL BE MOUNTED ON HOT DIPPED GALVANIZED STEEL STRUT SUPPORT, OR STAINLESS STEEL STRUT SUPPORT, WITH CORROSION RESISTANT HARDWARE.
14. SUPPORT FOR EXTERIOR MOUNTED EQUIPMENT SHALL USE HOT DIPPED GALVANIZED STEEL STRUT SUPPORT OR STAINLESS STEEL STRUT SUPPORT WITH STAINLESS STEEL HARDWARE. PROVIDE ZINC RICH PAINT APPLIED TO FIELD CUTS OF GALVANIZED STEEL SUPPORT TO MINIMIZE THE POTENTIAL FOR CORROSION PER THE RESPECTIVE STRUT SUPPORT MANUFACTURER'S RECOMMENDATIONS.
15. CONDUITS FOR ELECTRIC SERVICE ENTRANCE AND FEEDERS SHALL BE AS DETAILED HEREIN ON THE PLANS. WHERE GALVANIZED RIGID STEEL CONDUIT IS SPECIFIED IT SHALL HAVE THREADED FITTINGS. SET SCREW TYPE FITTINGS WILL NOT BE ACCEPTABLE. CONDUITS FOR UNDERGROUND APPLICATIONS SHALL BE AS DETAILED HEREIN. CONDUITS FOR GROUNDING ELECTRODE CONDUCTORS OR INDIVIDUAL GROUNDING CONDUCTORS SHALL BE SCHEDULE 40 OR SCHEDULE 80 PVC.
16. PROVIDE LIQUID TIGHT FLEXIBLE METAL CONDUIT AT CONNECTIONS TO EQUIPMENT SUBJECT TO VIBRATION OR WHERE FLEXIBILITY IS REQUIRED. LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE U.L. LISTED TO MEET THE REQUIREMENTS OF NEC 350.6, SUITABLE FOR GROUNDING, SUNLIGHT RESISTANT, AND RESISTANT TO OIL, GASOLINE, AND GREASE. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO MOTORS, TRANSFORMERS, & CONSTANT CURRENT REGULATORS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. DO NOT INSTALL LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS NOT U.L. LISTED. CONFIRM LIQUID-TIGHT FLEXIBLE METAL CONDUIT BEARS THE UL LABEL PRIOR TO INSTALLING IT.
17. UNLESS OTHERWISE SHOWN, ALL EXPOSED CONDUITS SHALL BE RUN PARALLEL TO OR AT RIGHT ANGLES WITH THE LINES OF THE STRUCTURE.
18. ALL STEEL CONDUITS, FITTINGS, NUTS, BOLTS, ETC. SHALL BE GALVANIZED.
19. USE CONDUIT BUSHINGS AT EACH CONDUIT TERMINATION. WHERE NO. 4 AWG OR LARGER UNDERGROUND WIRE IS INSTALLED, USE INSULATED BUSHINGS.
20. USE DOUBLE LOCK NUTS AT EACH CONDUIT TERMINATION.
21. WRAP ALL PRIMARY AND SECONDARY POWER TRANSFORMER CONNECTIONS WITH SUFFICIENT LAYERS OF INSULATING TAPE (3M SCOTCH 23 ALL-VOLTAGE SPLICING TAPE, 3M SCOTCH 130C LINERLESS RUBBER SPLICING TAPE, OR APPROVED EQUAL) AND COVER WITH VINYL ELECTRICAL TAPE (3M SCOTCH 88 VINYL ELECTRICAL TAPE OR APPROVED EQUAL) FOR FULL VALUE OF CABLE INSULATION VOLTAGE.
22. UNLESS OTHERWISE NOTED, ALL SINGLE CONDUCTOR CONTROL WIRING SHALL BE NO. 12 AWG. COPPER MINIMUM.
23. THE FOLLOWING SHALL APPLY TO RELAY/CONTACTOR PANELS/ENCLOSURES:
  - A. FOR INTERIOR LOCATIONS ALL COMPONENTS SHALL BE MOUNTED IN NEMA 12 (DUST TIGHT) ENCLOSURE(S) WITH VERTICALLY HINGED COVERS. FOR EXTERIOR/OUTDOOR LOCATIONS ALL COMPONENTS SHALL BE MOUNTED IN NEMA 4X STAINLESS STEEL ENCLOSURE(S) WITH VERTICALLY HINGED COVERS. ALL CONDUIT ENTRIES INTO NEMA 4, 4X ENCLOSURES SHALL HAVE NEMA 4 HUBS LISTED SUITABLE FOR THE RESPECTIVE ENCLOSURE TO MAINTAIN THE NEMA 4, 4X RATING OF THE ENCLOSURE.
  - B. THE ENCLOSURE(S) SHALL HAVE AMPLE SPACE FOR THE CIRCUIT COMPONENTS, TERMINAL BLOCKS AND INCOMING AND INTERNAL WIRING.
  - C. ALL CONTROL CONDUCTOR TERMINATIONS SHALL BE OF THE OPEN-EYE CONNECTOR/SCREW TYPE. SOLDERED CLOSED-EYE TERMINATIONS, OR TERMINATIONS WITHOUT CONNECTORS ARE NOT ACCEPTABLE.
  - D. WHEN THE ENCLOSURE COVER IS OPENED, ALL CIRCUIT COMPONENTS, WIRING AND TERMINALS SHALL BE EXPOSED AND ACCESSIBLE WITHOUT REMOVAL OF ANY PANELS, COVERS, ETC., EXCEPT THOSE COVERING HIGH VOLTAGE COMPONENTS.
  - E. ACCESS TO, OR REMOVAL OF A CIRCUIT COMPONENT OR TERMINAL BLOCK WILL NOT REQUIRE THE REMOVAL OF ANY OTHER CIRCUIT COMPONENT OR TERMINAL BLOCK.
  - F. EACH CIRCUIT COMPONENT SHALL BE CLEARLY IDENTIFIED INDICATING ITS CORRESPONDING NUMBER SHOWN ON THE DRAWINGS AND ITS FUNCTION.
  - G. A COMPLETE WIRING DIAGRAM SHALL BE MOUNTED ON THE INSIDE OF THE COVER. THE DIAGRAM SHALL REPRESENT EACH CONDUCTOR BY A SEPARATE LINE.
  - H. THE DIAGRAM SHALL IDENTIFY EACH CIRCUIT COMPONENT AN NUMBERING AND COLOR OF EACH TERMINAL CONDUCTOR AND TERMINAL.
  - I. ALL WIRING SHALL BE NEATLY TRAINED AND LACED.
  - J. MINIMUM WIRE SIZE SHALL BE NO. 12 AWG.
24. FURNISH & INSTALL A WEATHERPROOF WARNING LABEL FOR EACH METER SOCKET, SERVICE DISCONNECT, SAFETY SWITCH, CUTOFF, 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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**REHAB PAVEMENT AND LIGHTING ON RWY 18/36**

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

Contract No. MA027

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

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DRAWN BY: JRH 05/22/2015  
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SHEET TITLE

**ELECTRICAL NOTES SHEET 1**



**AIRFIELD LIGHTING NOTES**

- UNLESS OTHERWISE NOTED, ALL UNDERGROUND AIRFIELD LIGHTING SERIES CIRCUIT CONDUCTORS WHETHER DEB OR IN DUCT/CONDUIT SHALL BE FAA APPROVED 5000 VOLT L-824 TYPE. ALL UNDERGROUND FIELD POWER LOW VOLTAGE (600 VOLT & BELOW) CIRCUIT CONDUCTORS WHETHER DEB OR IN DUCT/CONDUIT SHALL BE UL LISTED 600 VOLT, TYPE XLP-USE-2 COPPER CONDUCTORS. CONDUCTOR SIZES SHALL BE AS SPECIFIED, HEREIN.
- 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.
- 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 ELECTRICAL DETAILS SHEET 1.
- 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 ELECTRICAL DETAILS SHEET 1.
- 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.
- 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.
- 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.
- L-867 BASES SHALL BE SIZE B, 24" DEEP, CLASS I, UNLESS OTHERWISE NOTED.
- 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.
- 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.
- 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.
- TOPS OF THE STAKES SUPPORTING LIGHT FIXTURES SHALL BE FLUSH WITH THE SURROUNDING GRADE.
- PLASTIC LIGHTING FIXTURE COMPONENTS, SUCH AS LAMP HEADS, STEMS, BREAKABLE COUPLINGS, BASE COVERS, BRACKETS, STAKES, SHALL NOT BE ACCEPTABLE.
- 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.
- 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 AS SHOWN IN DETAIL "B" ON ELECTRICAL DETAILS SHEET 1.
- GALVANIZED/PAINTED EQUIPMENT/COMPONENT SURFACES SHALL NOT BE DAMAGED BY DRILLING, FILING, ETC. DRAIN HOLES IN METAL TRANSFORMER HOUSINGS SHALL BE MADE BEFORE GALVANIZING.
- EDGE LIGHT NUMBERING TAGS SHALL BE FACING THE PAVEMENT.
- 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.
- 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.
- LOCATIONS OF ENDS OF ALL UNDERGROUND DUCTS SHALL BE IDENTIFIED BY DUCT MARKERS.
- 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.
- 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 WHATSOEVER 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.
- WHEN PREPARING CABLE FOR SPLICES, THE CONTRACTOR SHALL USE A CABLE STRIPPER/PENCILLER WHENEVER CABLE CONNECTIONS ARE MADE.

**GROUNDING NOTES FOR AIRFIELD LIGHTING**

- GROUNDING FOR RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS SHALL BE AS DETAILED ON THE PLANS AND AS SPECIFIED HEREIN. PER FAA AC 150/5340-30H DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, CHAPTER 12, PART 12.6; A GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. THE PURPOSE OF THE LIGHT BASE GROUND IS TO PROVIDE A DEGREE OF PROTECTION FOR MAINTENANCE PERSONNEL FROM POSSIBLE CONTACT WITH AN ENERGIZED LIGHT BASE OR MOUNTING STAKE THAT MAY RESULT FROM A SHORTED POWER CABLE OR ISOLATION TRANSFORMER. A LIGHT BASE GROUND SHALL BE INSTALLED AT EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. A LIGHT BASE GROUND SHALL ALSO BE INSTALLED AT EACH STAKE MOUNTED LIGHT FIXTURE. A LIGHT BASE GROUND SHALL BE INSTALLED AND CONNECTED TO THE METAL FRAME OF EACH TAXI GUIDANCE SIGN AS DETAILED ON THE PLANS AND IN ACCORDANCE WITH THE RESPECTIVE TAXI GUIDANCE SIGN MANUFACTURER RECOMMENDATIONS. THE LIGHT BASE GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR BONDED TO THE GROUND LUG ON THE RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND A 3/4-INCH DIAMETER BY 20-FEET LONG (MINIMUM) UL LISTED COPPER CLAD GROUND ROD. (TWO 3/4-INCH DIAMETER BY 10-FEET LONG, UL LISTED COPPERCLAD GROUND RODS COUPLED TOGETHER). 20-FEET LONG GROUND RODS ARE REQUIRED DUE TO POOR RESISTANCE OF THE SOIL AT THE RESPECTIVE SITE. CONNECTIONS TO GROUND LUGS ON THE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE SHALL BE WITH A UL LISTED GROUNDING CONNECTOR SUITABLE FOR DIRECT BURIAL IN EARTH OR CONCRETE. CONNECTIONS TO GROUND RODS SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY ERICO PRODUCTS, INC., SOLON, OHIO, (PHONE: 800-248-9353), THERMOWELD BY CONTINENTAL INDUSTRIES, INC., TULSA, OKLAHOMA (PHONE: 918-663-1440), ULTRAWELD BY HARGER, GRAYSLAKE, ILLINOIS (PHONE: 800-842-7437), OR APPROVED EQUAL. EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS. TOP OF GROUND RODS SHALL BE BURIED 12 INCHES MINIMUM BELOW GRADE, UNLESS SPECIFIED OTHERWISE HEREIN, FOR RESPECTIVE APPLICATIONS.
- FURNISH AND INSTALL A #6 AWG BARE SOLID COPPER GROUND AND BOND IT TO EACH GROUND ROD AT THE RESPECTIVE AIRFIELD LIGHT FIXTURES AND TAXI GUIDANCE SIGNS. THE #6 AWG GROUND SHALL BE DIRECT BURIAL IN TRENCH APPROXIMATELY 12 TO 18 INCHES BELOW BELOW GRADE. THE GROUND CONDUCTOR MAY BE INSTALLED ABOVE THE #8 FAA L-824, 5000-VOLT CABLE IN UNIT DUCT OR IN AN ADJACENT TRENCH. THE #6 AWG GROUND SHALL BE CONNECTED TO EACH RESPECTIVE GROUND ROD WITH AN EXOTHERMIC WELD CONNECTION. THE COMPLETED GROUND WIRE INSTALLED WILL PROVIDE A GROUND RING SYSTEM FOR THE RESPECTIVE AIRFIELD LIGHTING CIRCUIT. THE GROUND WIRE WILL NOT BE INSTALLED WITH THE HOMERUN CABLES. THE #6 AWG BARE SOLID COPPER GROUND WILL BE PAID FOR UNDER ITEM AR108756 1/C #6 GROUND PER LINEAR FOOT.
- FOR BASE MOUNTED LIGHT FIXTURES THE LIGHT FIXTURE MUST BE BONDED TO THE LIGHT BASE INTERNAL GROUND LUG VIA A #6 AWG STRANDED COPPER WIRE RATED FOR 600 VOLTS WITH GREEN XHHW INSULATION OR A BRAIDED GROUND STRAP OF EQUIVALENT CURRENT RATING. THE GROUND WIRE LENGTH MUST BE SUFFICIENT TO ALLOW THE REMOVAL OF THE LIGHT FIXTURE FROM THE LIGHT BASE FOR ROUTING MAINTENANCE. SEE THE LIGHT FIXTURE MANUFACTURER'S INSTRUCTIONS FOR PROPER METHODS OF ATTACHING BONDING WIRE.
- 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.
- GROUND RODS SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN REQUIREMENTS AND THE STEEL PRODUCTS PROCUREMENT ACT. STEEL USED TO MANUFACTURER GROUND RODS SHALL BE 100 PERCENT DOMESTIC STEEL.
- FOR EACH AIRFIELD LIGHT FIXTURE, TAXI GUIDANCE SIGN, 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.



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**REHAB PAVEMENT AND LIGHTING ON RWY 18/36**

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

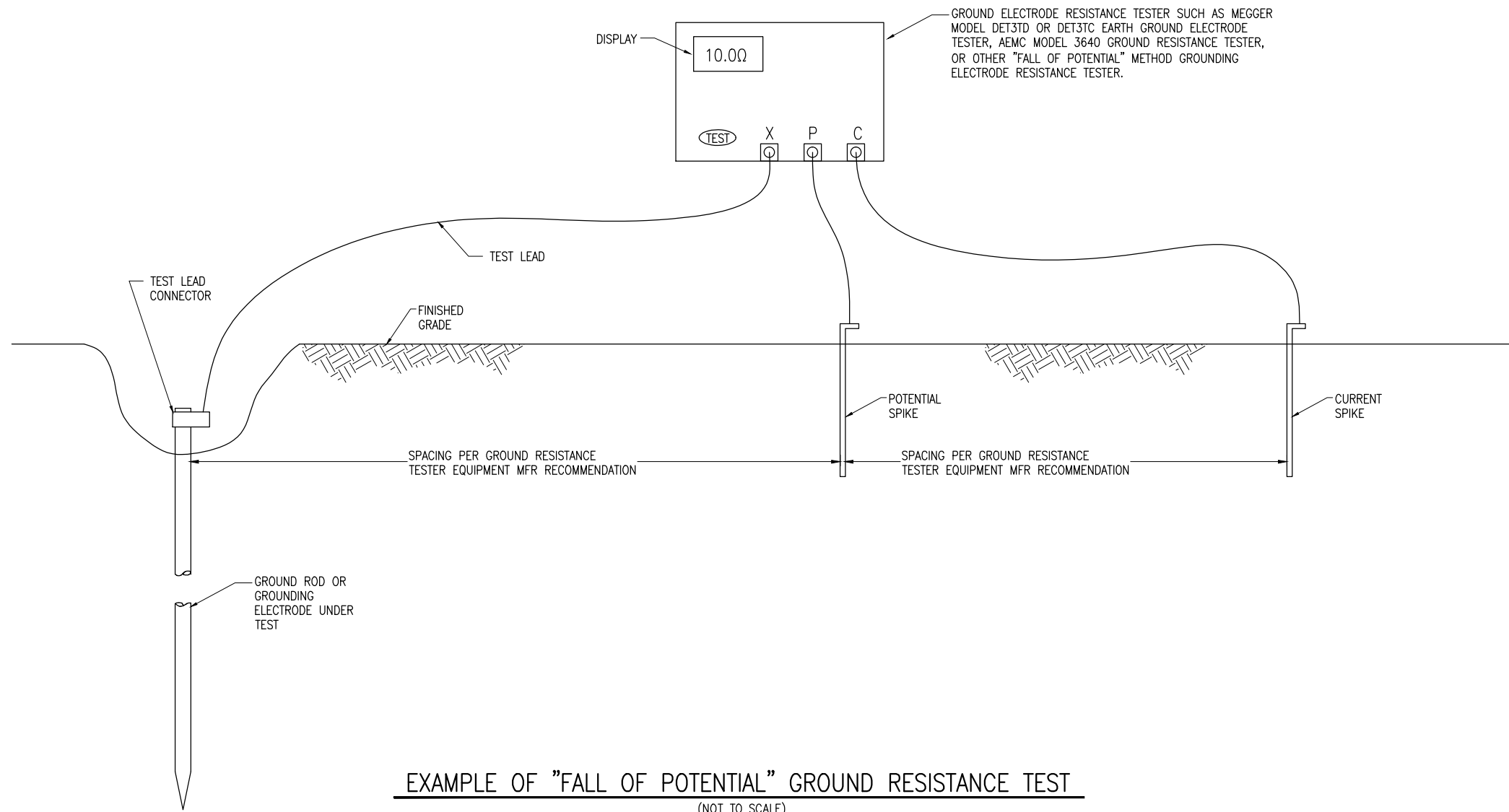
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**ELECTRICAL NOTES SHEET 2**



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

**NOTES**

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, 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.
3. GROUND RESISTANCE TEST SHALL BE CONDUCTED IN ACCORDANCE WITH THE RESPECTIVE GROUND ELECTRODE RESISTANCE TESTING EQUIPMENT MANUFACTURER'S INSTRUCTIONS.
4. RECORD SITE CONDITIONS DURING TESTS.
5. "FALL OF POTENTIAL" TYPE GROUND ELECTRODE RESISTANCE TESTER IS RECOMMENDED FOR TESTING INDIVIDUAL STAND ALONE GROUND RODS.

REHAB PAVEMENT  
AND LIGHTING ON  
RWY 18/36

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

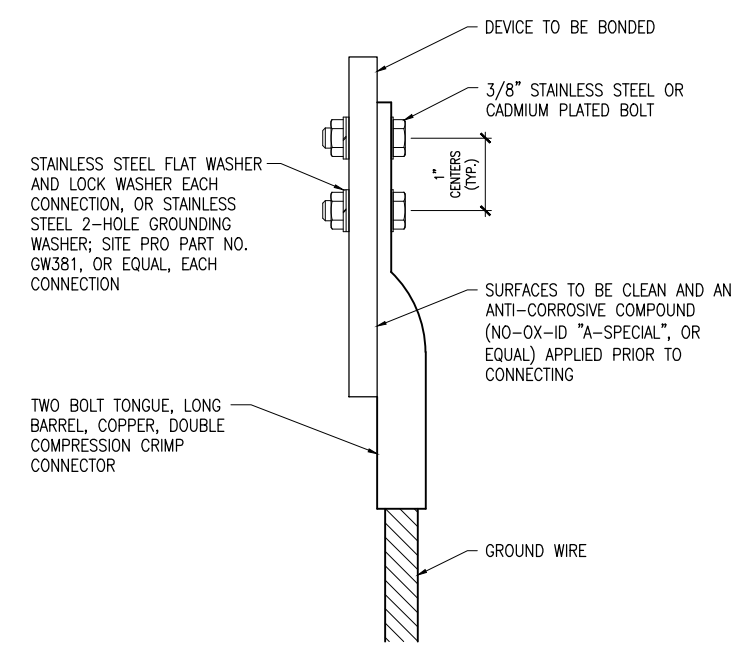
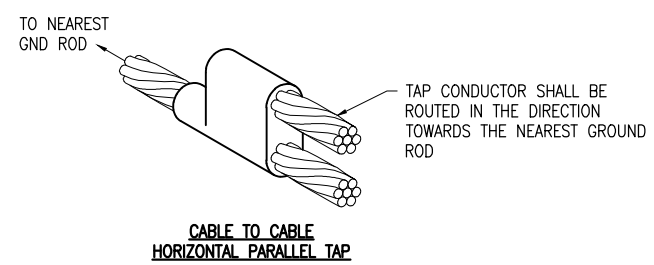
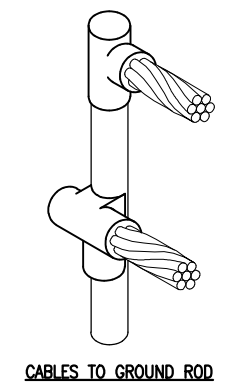
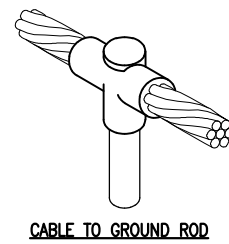
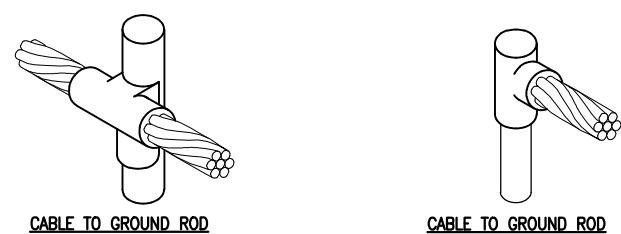
Contract No. MA027

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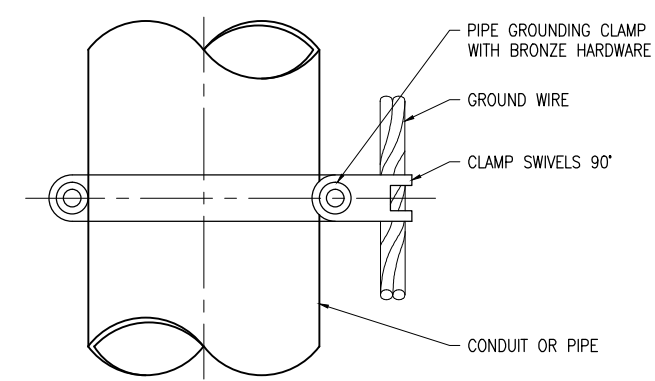
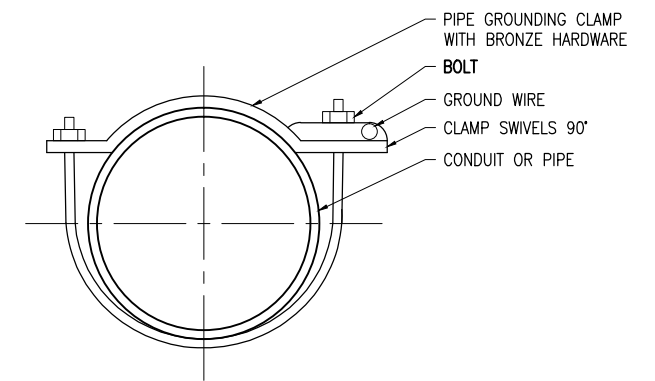
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GROUND  
RESISTANCE  
TESTING DETAILS



2 HOLE LONG BARREL COMPRESSION LUG TABLE			
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



PIPE GROUNDING CLAMP TABLE	
BURNDY CAT. NO.	PIPE SIZE
GAR3902-BU	1/2" - 1"
GAR3903-BU	1 1/4" - 2"
GAR3904-BU	2 1/2" - 3 1/2"
GAR3905-BU	4" - 5"
GAR3906-BU	6"

**NOTES**

- PIPE GROUNDING CLAMPS SHALL HAVE BRONZE HARDWARE, BE CORROSION RESISTANT, SUITABLE FOR DIRECT BURIAL IN EARTH OR CONCRETE, & UL467 LISTED.

**PIPE/CONDUIT GROUNDING CLAMP DETAIL**

**DETAIL NOTES**

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

**EXOTHERMIC WELD DETAILS**

**NOTES**

- ALL CONNECTIONS TO GROUND BUS BAR SHALL BE WITH 2 HOLE TONGUE LONG BARREL COMPRESSION LUGS BOLTED TO THE BUS BAR.
- GROUND WIRE CONNECTIONS TO EQUIPMENT SHALL BE WITH 2 HOLE TONGUE LONG BARREL COMPRESSION LUGS BOLTED TO THE DEVICE OR WITH THE RESPECTIVE EQUIPT MANUFACTURER'S LUG OR TERMINAL WHERE APPLICABLE.
- GROUNDING ELECTRODE CONDUCTORS, BONDING JUMPERS, & INDIVIDUAL GROUND WIRES SHALL NOT BE INSTALLED IN METAL CONDUIT. WHERE PLASTIC CONDUIT IS USED FOR INDIVIDUAL GROUND WIRES, DO NOT COMPLETELY ENCIRCLE THE CONDUIT WITH FERROUS AND/OR MAGNETIC MATERIALS. WHERE METAL CLAMPS ARE INSTALLED USE NYLON BOLTS, NUTS, WASHERS, & SPACERS TO INTERRUPT A COMPLETE METALLIC APTH FROM ENCIRCLING THE CONDUIT.
- ALL CONNECTIONS SHALL BE COATED WITH A CORROSION PREVENTATIVE COMPOUND (SANCHEM INC. NO-OX-ID "A-SPECIAL", BURNDY PENETROX E, OR 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**

**REHAB PAVEMENT AND LIGHTING ON RWY 18/36**

IDA No: C75-4437  
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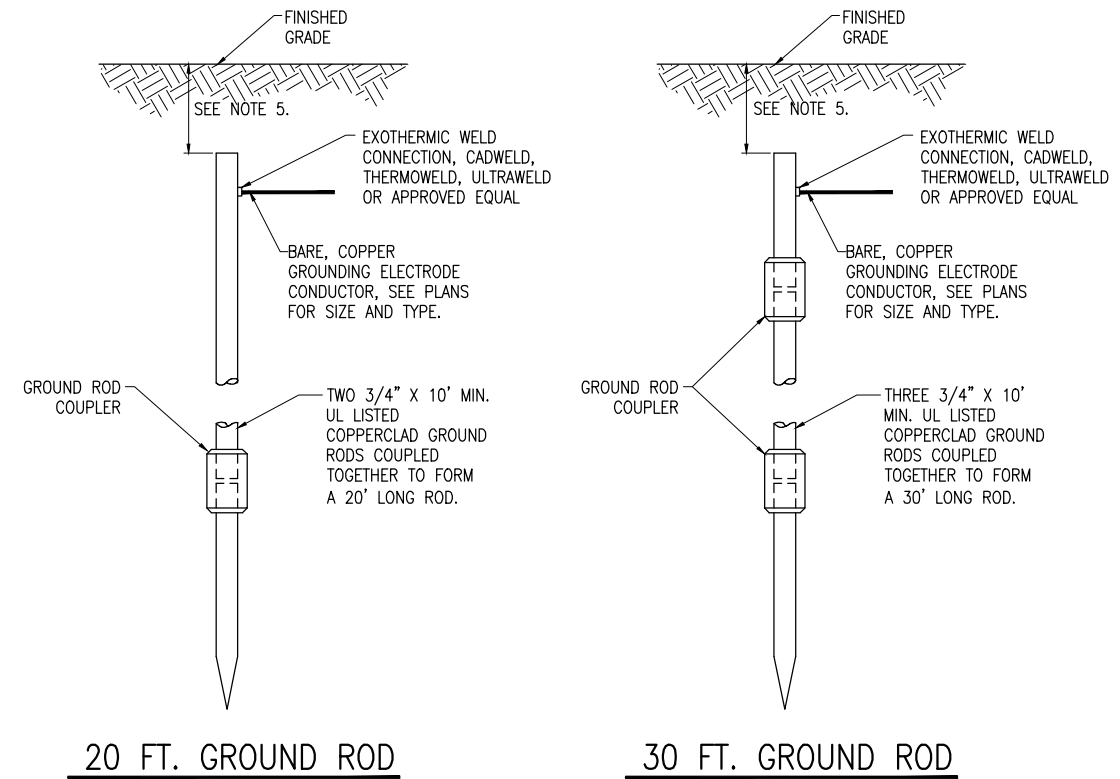
SHEET TITLE

**GROUNDING DETAILS**

**GROUNDING NOTES**

- THE CONTRACTOR SHALL FURNISH AND INSTALL ALL GROUNDING AS MAY BE NECESSARY OR REQUIRED TO MAKE A COMPLETE GROUNDING SYSTEM AS REQUIRED BY THE LATEST NATIONAL ELECTRICAL CODE (NFPA 70) IN FORCE AND FAA-STD-019e (LIGHTNING AND SURGE PROTECTION, GROUNDING, BONDING, AND SHIELDING REQUIREMENTS FOR FACILITIES AND ELECTRONIC EQUIPMENT). THE RELIABILITY OF THE GROUNDING SYSTEM IS DEPENDENT ON CAREFUL, PROPER INSTALLATION AND CHOICE OF MATERIALS. IMPROPER PREPARATION OF SURFACES TO BE JOINED TO MAKE AN ELECTRICAL PATH, LOOSE JOINTS OR CORROSION CAN INTRODUCE IMPEDANCE THAT WILL SERIOUSLY IMPAIR THE ABILITY OF THE GROUND PATH TO PROTECT PERSONNEL AND EQUIPMENT AND TO ABSORB TRANSIENTS THAT CAN CAUSE NOISE IN COMMUNICATIONS CIRCUITS. THE FOLLOWING FUNCTIONS ARE PARTICULARLY IMPORTANT TO ENSURE A RELIABLE GROUND SYSTEM:
- FURNISH AND INSTALL GROUND RODS AS DETAILED HEREIN. GROUND RODS FOR AIRFIELD LIGHTING (RUNWAY LIGHTING, TAXIWAY LIGHTING, & TAXI GUIDANCE SIGNS) SHALL BE MINIMUM 3/4-IN. DIAMETER BY 20-FT LONG, UL-LISTED COPPER CLAD WITH 10-MIL MINIMUM COPPER COATING (TWO 3/4-IN. DIAMETER BY 10-FT LONG, UL-LISTED, COPPER CLAD GROUND RODS COUPLED TOGETHER). GROUND RODS FOR OTHER APPLICATIONS SHALL BE MINIMUM 3/4-IN. DIAMETER BY 30-FT LONG, UL-LISTED, COPPER CLAD WITH 10-MIL MINIMUM COPPER COATING. GROUND RODS SHALL BE SPACED OR AS DETAILED ON THE RESPECTIVE PLANS, AND IN NO CASE SPACED LESS THAN ONE ROD LENGTH APART. ALL CONNECTIONS TO GROUND RODS AND THE GROUND RING SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY ERICO PRODUCTS, INC., SOLON, OHIO, (PHONE 1-800-248-9353), THERMOWELD BY CONTINENTAL INDUSTRIES, INC., TULSA, OKLAHOMA (PHONE 918-663-1440), ULTRAWELD BY HARGER, GRAYSLAKE, ILLINOIS (PHONE 1-800-842-7437), OR APPROVED EQUAL. EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS OR AT BURIED GROUNDING ELECTRODE CONDUCTORS.
- CONTRACTOR SHALL TEST EACH MADE ELECTRODE GROUND ROD/GROUND FIELD/GROUND RING WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUND FIELD SYSTEMS. IF GROUND RESISTANCE EXCEEDS 25 OHMS, CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION. COPIES OF GROUND ROD TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN.
- 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 EQUAL.
- METALLIC SURFACES TO BE JOINED SHALL BE PREPARED BY THE REMOVAL OF ALL NON-CONDUCTIVE MATERIAL, PER 2015 NATIONAL ELECTRICAL CODE ARTICLE 250-12. ALL COPPER BUS BARS MUST BE CLEANED PRIOR TO MAKING CONNECTIONS TO REMOVE SURFACE OXIDATION.
- METALLIC RACEWAY FITTINGS SHALL BE MADE UP TIGHT TO PROVIDE A PERMANENT LOW IMPEDANCE PATH FOR ALL CIRCUITS. METAL CONDUIT TERMINATIONS IN ENCLOSURES SHALL BE BONDED TO THE ENCLOSURE WITH UL-LISTED FITTINGS SUITABLE FOR GROUNDING. PROVIDE GROUNDING BUSHINGS WITH BONDING JUMPERS FOR ALL METAL CONDUITS ENTERING SERVICE EQUIPMENT (METER BASE, CT CABINET, MAIN SERVICE BREAKER ENCLOSURE, ETC.). PROVIDE GROUNDING BUSHINGS WITH BONDING JUMPERS FOR ALL METAL CONDUITS ENTERING AN ENCLOSURE THROUGH CONCENTRIC OR ECCENTRIC KNOCKOUTS THAT ARE PUNCHED OR OTHERWISE FORMED SO AS TO IMPAIR THE ELECTRICAL CONNECTION TO GROUND. STANDARD LOCKNUTS OR BUSHINGS SHALL NOT BE THE SOLE MEANS FOR BONDING WHERE A CONDUIT ENTERS AN ENCLOSURE THROUGH A CONCENTRIC OR ECCENTRIC KNOCKOUT
- ALL CONNECTIONS, LOCATED ABOVE GRADE, BETWEEN THE DIFFERENT TYPES OF GROUNDING CONDUCTORS SHALL BE MADE USING UL-LISTED DOUBLE COMPRESSION CRIMP TYPE CONNECTORS OR UL-LISTED BOLTED GROUND CONNECTORS. FOR GROUND CONNECTIONS TO ENCLOSURES, CASES AND FRAMES OF ELECTRICAL EQUIPMENT NOT SUPPLIED WITH GROUND LUGS THE CONTRACTOR SHALL DRILL REQUIRED HOLES FOR MOUNTING A BOLTED GROUND CONNECTOR. ALL BOLTED GROUND CONNECTORS SHALL BE BURNDY, THOMAS AND BETTS, OR EQUAL. TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUES IN UL STANDARD 486A TO ASSURE PERMANENT AND EFFECTIVE GROUNDING.
- ALL METAL EQUIPMENT ENCLOSURES, CONDUITS, CABINETS, BOXES, RECEPTACLES, MOTORS, ETC. SHALL BE BONDED TO THE RESPECTIVE GROUNDING SYSTEM.
- PROVIDE ALL BOXES FOR PROPOSED OUTLETS, SWITCHES, CIRCUIT BREAKERS, ETC. WITH GROUNDING SCREWS. PROVIDE ALL PANELBOARD, SWITCHGEAR, ETC., ENCLOSURES WITH GROUNDING BARS WITH INDIVIDUAL SCREWS, LUGS, CLAMPS, ETC., FOR EACH OF THE GROUNDING CONDUCTORS THAT ENTER THEIR RESPECTIVE ENCLOSURES.
- EACH NEW FEEDER CIRCUIT AND/OR BRANCH CIRCUIT SHALL INCLUDE AN EQUIPMENT GROUND WIRE. METAL RACEWAY OR CONDUIT SHALL NOT MEET THIS REQUIREMENT. THE EQUIPMENT GROUND WIRE FROM EQUIPMENT SHALL NOT BE SMALLER THAN ALLOWED BY 2015 NEC TABLE 250-122 'MINIMUM SIZE CONDUCTORS OR GROUNDING RACEWAY AND EQUIPMENT.' WHEN CONDUCTORS ARE ADJUSTED IN SIZE TO COMPENSATE FOR VOLTAGE DROP, EQUIPMENT-GROUNDING CONDUCTORS SHALL BE ADJUSTED PROPORTIONATELY ACCORDING TO CIRCULAR MIL AREA. ALL EQUIPMENT GROUND WIRES SHALL BE COPPER, EITHER BARE OR INSULATED GREEN IN COLOR. WHERE THE EQUIPMENT GROUNDING CONDUCTORS ARE INSULATED, THEY SHALL BE IDENTIFIED BY THE COLOR GREEN, AND SHALL BE THE SAME INSULATION TYPE AS THE PHASE CONDUCTORS.

- ALL EXTERIOR METAL CONDUIT, WHERE NOT ELECTRICALLY CONTINUOUS BECAUSE OF MANHOLES, HANDHOLES, NON-METALLIC JUNCTION BOXES, ETC., SHALL BE BONDED TO ALL OTHER METAL CONDUIT IN THE RESPECTIVE DUCT RUN, AND AT EACH END, WITH A COPPER-BONDING JUMPER SIZED IN CONFORMANCE WITH 2015 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 2015 NEC 250-102.
- IT IS THE INTENT OF THIS SPECIFICATION THAT ALL MOTOR FRAMES, PUMP BASES ELECTRICAL EQUIPMENT ENCLOSURES, PANEL HOUSINGS, CONDUITS, BOXES, ETC. HAVE A CONTINUOUS COPPER WIRE GROUND CONNECTION AND SHALL BE POSITIVELY BONDED TO THE RESPECTIVE GROUNDING SYSTEM. CONDUIT CONNECTORS WILL NOT BE CONSIDERED AS ADEQUATE GROUNDING.
- PROVIDE A POSITIVE GROUND BOND FOR ALL OUTLET BOXES, ELECTRICAL EQUIPMENT ENCLOSURES, GROUNDING RECEPTACLES, TOGGLE SWITCHES, ETC. INSTALL A GROUNDING CONDUCTOR IN ALL WIRE AND CABLE RACEWAYS. GROUND CONDUCTOR TO HAVE 600-VOLT INSULATION AND BE IDENTIFIED BY A CONTINUOUS GREEN COLOR COATING. THEY SHALL BE USED SOLELY FOR GROUNDING PURPOSES AND BE ENTIRELY SEPARATE FROM WHITE GROUNDED NEUTRAL CONDUCTOR, EXCEPT AT SUPPLY SIDE OF SERVICE DISCONNECTING MEANS, WHERE GROUNDING AND NEUTRAL SYSTEMS ARE TO BE CONNECTED TO SERVICE GROUND.
- EACH AND ALL GROUNDED CASED AND METAL PARTS ASSOCIATED WITH ELECTRICAL EQUIPMENT SHALL BE TESTED FOR CONTINUITY OF CONNECTION WITH GROUND BUS SYSTEM BY CONTRACTOR IN PRESENCE OF OWNER'S REPRESENTATIVE.
- ALL CONNECTIONS BETWEEN THE DIFFERENT TYPES OF GROUNDING CONDUCTORS ABOVE GRADE SHALL BE MADE USING BOLTED GROUND CONNECTORS. GROUND LUGS SHALL BE PROVIDED IN ALL ENCLOSURES AND WIRING TERMINATION JUNCTION BOXES. EQUIPMENT GROUNDS AND GROUNDING CONDUCTOR SHALL BE CONNECTED TO THESE GROUND LUGS. FOR GROUND CONNECTIONS TO ENCLOSURES, CASES AND FRAMES OF ELECTRICAL EQUIPMENT NOT SUPPLIED WITH GROUND LUGS THE CONTRACTOR SHALL DRILL REQUIRED HOLES FOR MOUNTING A BOLTED GROUND CONNECTOR. ALL BOLTED GROUND CONNECTORS SHALL BE BURNDY, OR EQUAL.
- BOND ALL NONCURRENT-CARRYING PARTS OF METAL EQUIPMENT TO GROUND SYSTEM.
- BUILDING STRUCTURAL STEEL SYSTEM SHALL BE BONDED TO ELECTRICAL GROUND SYSTEM.
- INSTALL GROUNDING ELECTRODE CONDUCTORS, LIGHTNING PROTECTION DOWN CONDUCTORS AND SEPARATE GROUND CONDUCTORS IN SCHEDULE 40 OR SCHEDULE 80 PVC CONDUIT OR EXPOSED WHERE ACCEPTABLE TO LOCAL CODES. WHERE GROUNDING ELECTRODE CONDUCTORS, LIGHTNING PROTECTION DOWN CONDUCTORS OR INDIVIDUAL GROUND CONDUCTORS ARE RUN IN PVC CONDUIT, DO NOT COMPLETELY 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.
- 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 2015 NEC 250-102. NOTE THIS DOES NOT APPLY TO AC EQUIPMENT GROUNDING CONDUCTORS RUN WITH AC CIRCUITS.
- WHERE A CONFLICT IS DETERMINED WITH RESPECT TO GROUNDING REQUIREMENTS PER MANUFACTURER INSTALLATION INSTRUCTIONS, NEC, AND/OR THE CONTRACT DOCUMENTS, CONTACT THE RESIDENT ENGINEER OR PROJECT ENGINEER FOR FURTHER DIRECTIONS.
- GROUND RODS SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN REQUIREMENTS AND THE STEEL PRODUCTS PROCUREMENT ACT. STEEL USED TO MANUFACTURER GROUND RODS SHALL BE 100 PERCENT DOMESTIC STEEL.



**GROUND RODS**  
(NOT TO SCALE)

**NOTES**

- TYPE AND MINIMUM NUMBER OF GROUND RODS SHALL BE AS SPECIFIED ON THE PLAN.
- THE RESISTANCE TO GROUND OF THE GROUNDING SYSTEM SHALL NOT EXCEED 25 OHMS.
- COST OF GROUND RODS IS INCIDENTAL TO THE ASSOCIATED ITEMS REQUIRING GROUNDING UNLESS OTHERWISE SPECIFIED. GROUND RODS FOR VAULT WILL BE CONSIDERED INCIDENTAL TO ITEM AR109200.
- 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 SHALL BE 12" MINIMUM BELOW GRADE UNLESS DETAILED OTHERWISE HEREIN.
- GROUND RODS FOR WIND CONE SHALL BE 3/4-IN DIAMETER BY 20 FT LONG. TWO GROUND RODS SPACED MINIMUM 20 FT APART (ONE ROD LENGTH APART) SHALL BE FURNISHED AND INSTALLED FOR THE WIND CONE.
- GROUND RODS FOR INDIVIDUAL SPLICE CANS SHALL BE 3/4-IN DIAMETER BY 30 FT LONG.

**REHAB PAVEMENT AND LIGHTING ON RWY 18/36**

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

Contract No. MA027

NO.	DATE	DESCRIPTION		
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DRAWN BY: JRH 06/08/2015

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SHEET TITLE

**GROUNDING NOTES**



ELECTRICAL LEGEND – ONE-LINE DIAGRAM	
	CABLE TERMINATOR/LUG
	TRANSFORMER
	DISCONNECT SWITCH
	FUSIBLE DISCONNECT SWITCH
	CIRCUIT BREAKER
	THERMAL MAGNETIC CIRCUIT BREAKER
	FUSE
	TRANSIENT VOLTAGE SURGE SUPPRESSOR OR SURGE PROTECTOR DEVICE
	GROUND – GROUND ROD, GROUNDING ELECTRODE, OR AT EARTH POTENTIAL
	INDICATING LIGHT
	MOTOR
	LOAD, MOTOR, # = HORSEPOWER
	ELECTRIC UTILITY METER BASE
	JUNCTION BOX WITH SPLICE
	EQUIPMENT, XXX = DEVICE DESCRIPTION
	GROUND BUS OR TERMINAL
	NEUTRAL BUS
	PANELBOARD WITH MAIN LUGS
	PANELBOARD WITH MAIN BREAKER
	FUSE PANEL WITH MAIN FUSE PULLOUT
	DUPLEX RECEPTACLE 120V SINGLE PHASE GROUNDING TYPE
	CONTROL STATION
	TRANSFER SWITCH
	ENGINE GENERATOR SET

ELECTRICAL LEGEND – SCHEMATIC	
	NORMALLY OPEN (N.O.) CONTACT
	NORMALLY CLOSED (N.C.) CONTACT
	STARTER COIL, * = STARTER NUMBER
	OVERLOAD RELAY CONTACT
	CONTROL RELAY, * = CONTROL RELAY NUMBER
	RELAY, * = RELAY NUMBER
	TOGGLE SWITCH / 2 POSITION SWITCH
	2-POSITION SELECTOR SWITCH
	3-POSITION SELECTOR SWITCH (H-O-A SHOWN)
	2 POLE DISCONNECT SWITCH
	3 POLE DISCONNECT SWITCH
	PHOTOCELL
	TERMINAL BLOCK, * = TERMINAL NUMBER
	DEVICE TERMINAL, * = DEVICE TERMINAL NUMBER
	INTERNAL PANEL WIRING
	FIELD WIRING
	FUSE
	GROUND BUS OR TERMINAL
	NEUTRAL BUS
	GROUND, GROUND ROD, GROUND BUS
	INDUSTRIAL CONTROL RELAY OR LIGHTING CONTACTOR
	S1 CUTOUT HANDLE REMOVED
	S1 CUTOUT HANDLE INSERTED
	N.O. THERMAL SWITCH
	N.C. THERMAL SWITCH
	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
C	CONDUIT
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CR	CONTROL RELAY
CU	COPPER
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
EM	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
MCM	THOUSAND CIRCULAR MIL
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MH	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
OL	OVERLOAD

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
V	VOLTS
W/	WITH
W/O	WITHOUT
WP	WEATHER PROOF
XFER	TRANSFER
XFMR	TRANSFORMER

AIRPORT EQUIPMENT/FACILITY ABBREVIATIONS	
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
MIRL	MEDIUM INTENSITY RUNWAY LIGHT
MITL	MEDIUM INTENSITY TAXIWAY LIGHT
NDB	NON-DIRECTIONAL BEACON
PAPI	PRECISION APPROACH PATH INDICATOR
PLASI	PULSE LIGHT APPROACH SLOPE INDICATOR
RAIL	RUNWAY ALIGNMENT INDICATING LIGHTS
REIL	RUNWAY END IDENTIFIER LIGHT
RVR	RUNWAY VISUAL RANGE
VADI	VISUAL APPROACH DESCENT INDICATOR
VASI	VISUAL APPROACH SLOPE INDICATOR
VOR	VERY HIGH FREQUENCY OMNIDIRECTIONAL RANGE FACILITY
WC	WIND CONE

**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, ETL/INTERTEK TESTING SERVICES VERIFICATION/LISTING (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE PERMITTED.
- 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).
- 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  
PHASE A      BLACK  
PHASE B      RED  
NEUTRAL      WHITE  
GROUND      GREEN
- 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 NEC 350.6. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO CCR'S & TRANSFORMERS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. EXTERNAL BONDING JUMPERS USED WITH CCR INSTALLATIONS SHALL BE #6 AWG COPPER (MINIMUM). DO NOT INSTALL LTFMC THAT IS NOT UL LISTED. CONFIRM LTFMC BEARS THE UL LABEL PRIOR TO INSTALLATION.
- 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, 4X RATING.
- 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 WIREWAY, CONDUIT, DUCT, OR HANDHOLE.
- CONTRACTOR SHALL EXAMINE THE SITE AND VAULT TO DETERMINE EXISTING SITE CONDITIONS.

**REHAB PAVEMENT AND LIGHTING ON RWY 18/36**

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

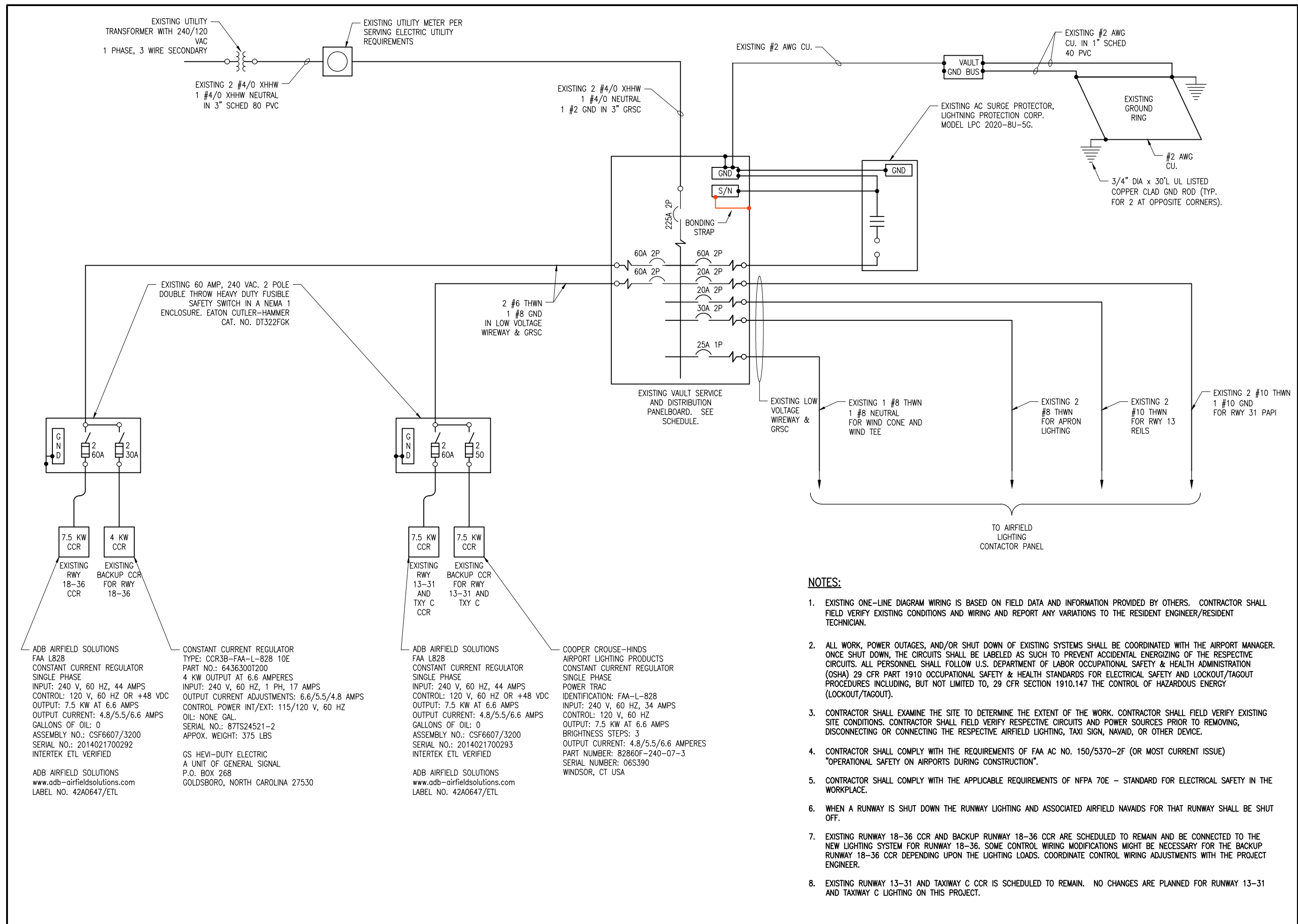
Contract No. MA027

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SHEET TITLE

**ELECTRICAL LEGEND & ABBREVIATIONS**



**NOTES:**

- EXISTING ONE-LINE DIAGRAM WIRING IS BASED ON FIELD DATA AND INFORMATION PROVIDED BY OTHERS. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS AND WIRING AND REPORT ANY VARIATIONS TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN.
- ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- CONTRACTOR SHALL EXAMINE THE SITE TO DETERMINE THE EXTENT OF THE WORK. CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL FIELD VERIFY RESPECTIVE CIRCUITS AND POWER SOURCES PRIOR TO REMOVING, DISCONNECTING OR CONNECTING THE RESPECTIVE AIRFIELD LIGHTING, TAXI SIGN, NAVAID, OR OTHER DEVICE.
- CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF FAA AC NO. 150/5370-2F (OR MOST CURRENT ISSUE) "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION".
- CONTRACTOR SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF NFPA 70E - STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE.
- WHEN A RUNWAY IS SHUT DOWN THE RUNWAY LIGHTING AND ASSOCIATED AIRFIELD NAVAIDS FOR THAT RUNWAY SHALL BE SHUT OFF.
- EXISTING RUNWAY 18-36 CCR AND BACKUP RUNWAY 18-36 CCR ARE SCHEDULED TO REMAIN AND BE CONNECTED TO THE NEW LIGHTING SYSTEM FOR RUNWAY 18-36. SOME CONTROL WIRING MODIFICATIONS MIGHT BE NECESSARY FOR THE BACKUP RUNWAY 18-36 CCR DEPENDING UPON THE LIGHTING LOADS. COORDINATE CONTROL WIRING ADJUSTMENTS WITH THE PROJECT ENGINEER.
- EXISTING RUNWAY 13-31 AND TAXIWAY C CCR IS SCHEDULED TO REMAIN. NO CHANGES ARE PLANNED FOR RUNWAY 13-31 AND TAXIWAY C LIGHTING ON THIS PROJECT.

**REHAB PAVEMENT AND LIGHTING ON RWY 18/36**

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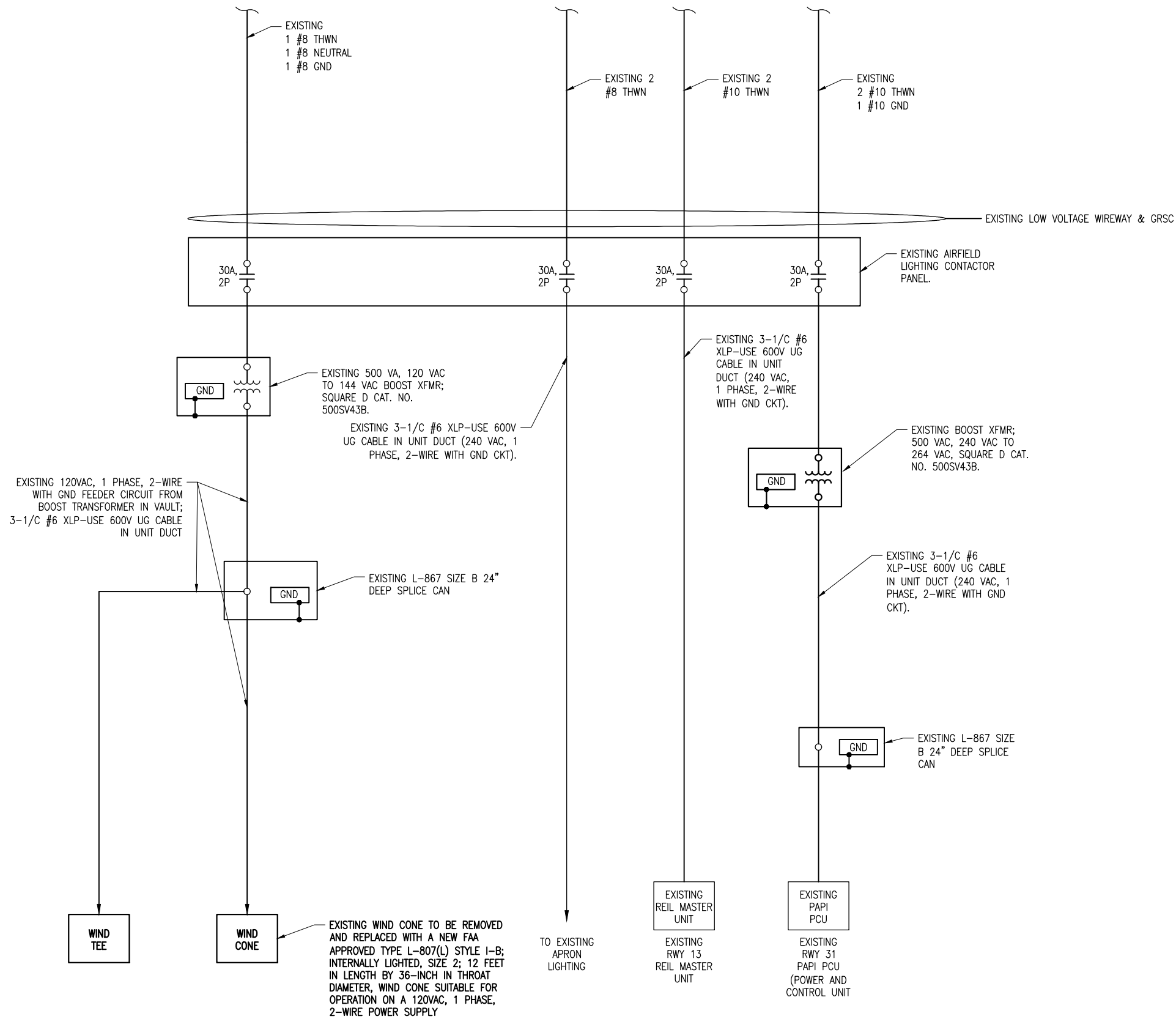
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SHEET TITLE

**EXISTING ELECTRICAL ONE-LINE FOR VAULT & AIRFIELD**



**REHAB PAVEMENT AND LIGHTING ON RWY 18/36**

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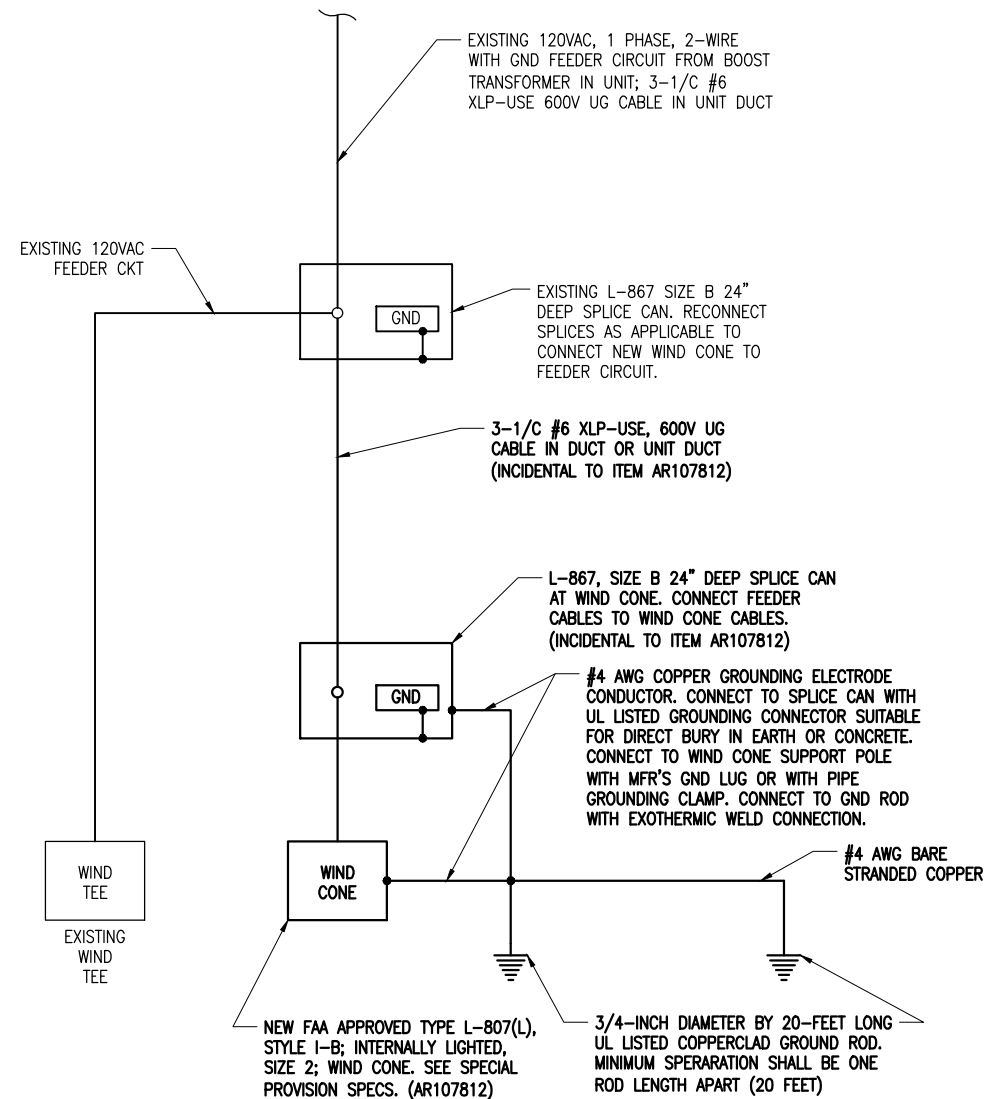
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SHEET TITLE

**EXISTING ELECTRICAL ONE-LINE FOR VAULT & AIRFIELD CONTINUED**



**NOTES:**

1. 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).
2. ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 - NATIONAL ELECTRICAL CODE (NEC) MOST CURRENT ISSUE IN FORCE, THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L. LISTING, ETL/INTERTEK TESTING SERVICES VERIFICATION/LISTING, (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE PERMITTED.
3. ALL CONDUCTORS/WIRING SHALL BE COPPER.
4. EQUIPMENT AND MATERIALS NOT LABELED AS EXISTING ARE NEW.

REHAB PAVEMENT  
AND LIGHTING ON  
RWY 18/36

IDA No: C75-4437  
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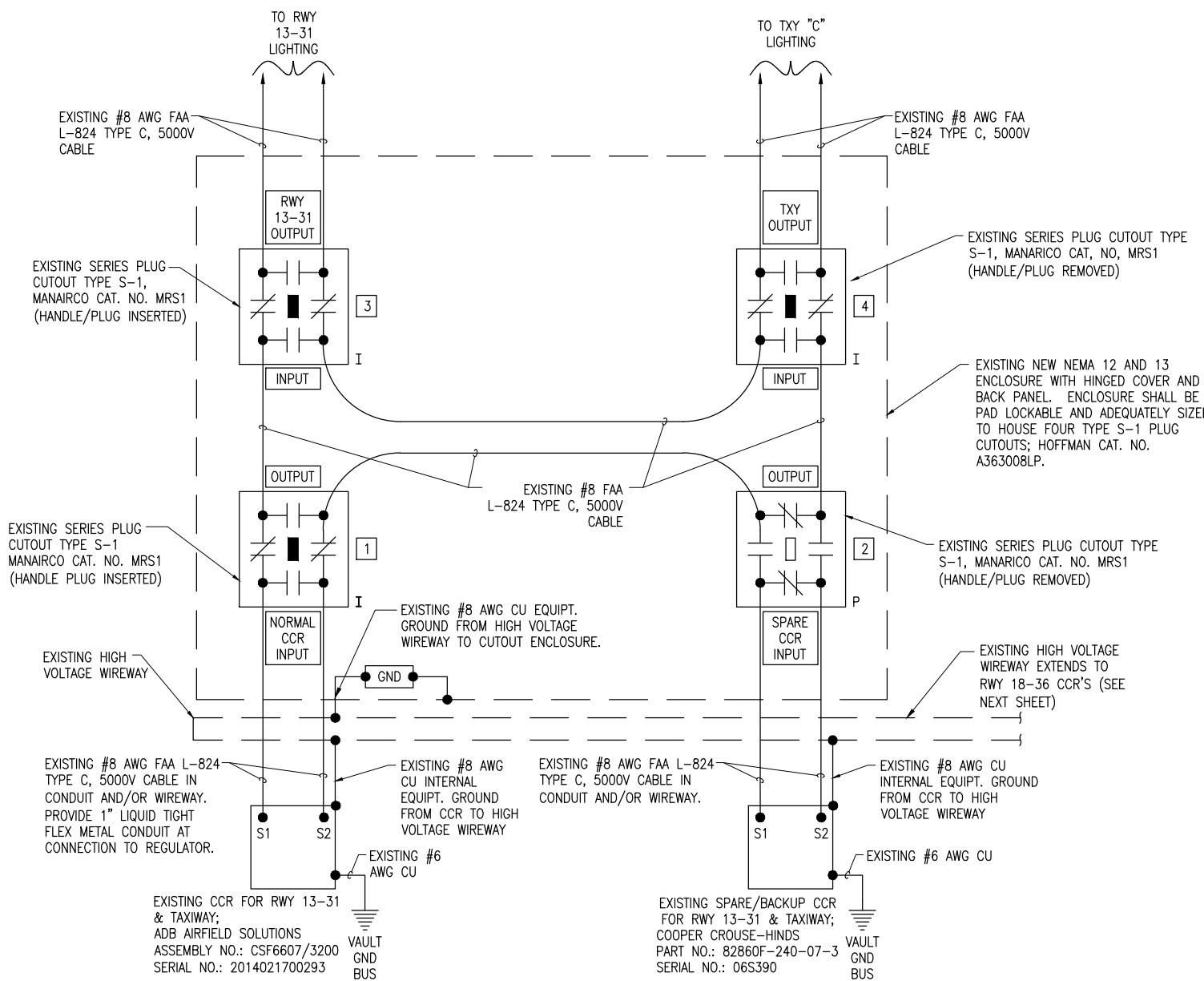
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SHEET TITLE

PROPOSED  
ELECTRICAL  
ONE-LINE DIAGRAM  
FOR WIND CONE





**EXISTING HIGH VOLTAGE WIRING SCHEMATIC FOR RUNWAY 13-31 & TAXIWAY**

NOT TO SCALE

**NOTES:**

- ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER/DIRECTOR AND RESIDENT ENGINEER/RESIDENT PROJECT REPRESENTATIVE. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- CONTRACTOR SHALL EXAMINE THE SITE TO CONFIRM AND FIELD VERIFY EXISTING SITE CONDITIONS.
- THE RESPECTIVE PERSONNEL PERFORMING AIRFIELD LIGHTING WORK, VAULT WORK, AND/OR TESTS SHALL BE FAMILIAR WITH, AND QUALIFIED TO WORK ON, 5000 VOLT AIRFIELD LIGHTING SERIES CIRCUITS, CONSTANT CURRENT REGULATORS, AND ASSOCIATED AIRPORT ELECTRICAL VAULT EQUIPMENT.
- CONTRACTOR SHALL EXERCISE CAUTION, PRACTICE SAFETY, AND DISCONNECT THE SERIES CIRCUITS FROM THE RESPECTIVE CONSTANT CURRENT REGULATORS, AS APPLICABLE WHEN PERFORMING WORK ON THE AIRFIELD LIGHTING OR WORK THAT MIGHT AFFECT THE AIRFIELD LIGHTING. CONTRACTOR SHALL MAKE NECESSARY ARRANGEMENTS TO DISCONNECT POWER AND LOCKOUT CIRCUITS FOR PROTECTION OF PERSONNEL.
- MEGGER TEST AND RECORD EXISTING SERIES CIRCUITS PRIOR TO CABLE WORK AND AGAIN AFTER AIRFIELD LIGHTING MODIFICATIONS, ADDITIONS, AND/OR UPGRADES HAVE BEEN COMPLETED. ALSO TEST AND RECORD SERIES CIRCUIT LOOP RESISTANCE.
- RUNWAY 13-31 AND TAXIWAY "C" CCR, BACKUP CCR FOR RUNWAY 13-31 AND TAXIWAY C, RUNWAY 18-36 CCR, BACKUP CCR FOR RUNWAY 18-36, AND THE ASSOCIATED CUTOUTS ARE EXISTING.
- ALL CCR'S SHALL BE TESTED FOR PROPER OPERATION BEFORE REMOVAL WORK, MODIFICATIONS, AND/OR ADDITIONS AND AFTER THE NEW CABLES AND LIGHTING SYSTEM MODIFICATIONS AND ADDITIONS HAVE BEEN COMPLETED. CONTRACTOR SHALL TEST AND RECORD THE INPUT CURRENT AND OUTPUT CURRENT FOR EACH CONSTANT CURRENT REGULATOR IN THE AUTOMATIC AND MANUAL MODES OF OPERATIONS. CONTRACTOR SHALL REPORT CONCERNS AND/OR DEFICIENCIES TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN. TEST RESULTS SHALL BE PROVIDED TO THE PROJECT ENGINEER AND RESIDENT ENGINEER/RESIDENT TECHNICIAN.
- HIGH VOLTAGE CIRCUITS (AIRFIELD LIGHTING 5000 VOLT SERIES CIRCUITS AND/OR OTHER CIRCUITS RATED ABOVE 600 VOLTS) & LOW VOLTAGE CIRCUITS (RATED 600 VOLTS AND BELOW) SHALL NOT BE INSTALLED IN THE SAME RACEWAY, WIREWAY, HANDHOLE, OR MANHOLE.
- SPLICES FOR RUNWAY AND TAXIWAY SERIES CIRCUITS SHALL BE FAA APPROVED TYPE L-823 CONNECTORS AND SHALL BE INSTALLED IN HIGH VOLTAGE HANDHOLES, HIGH VOLTAGE MANHOLES, SPLICE CANS OR HIGH VOLTAGE ENCLOSURES.

REHAB PAVEMENT  
AND LIGHTING ON  
RWY 18/36

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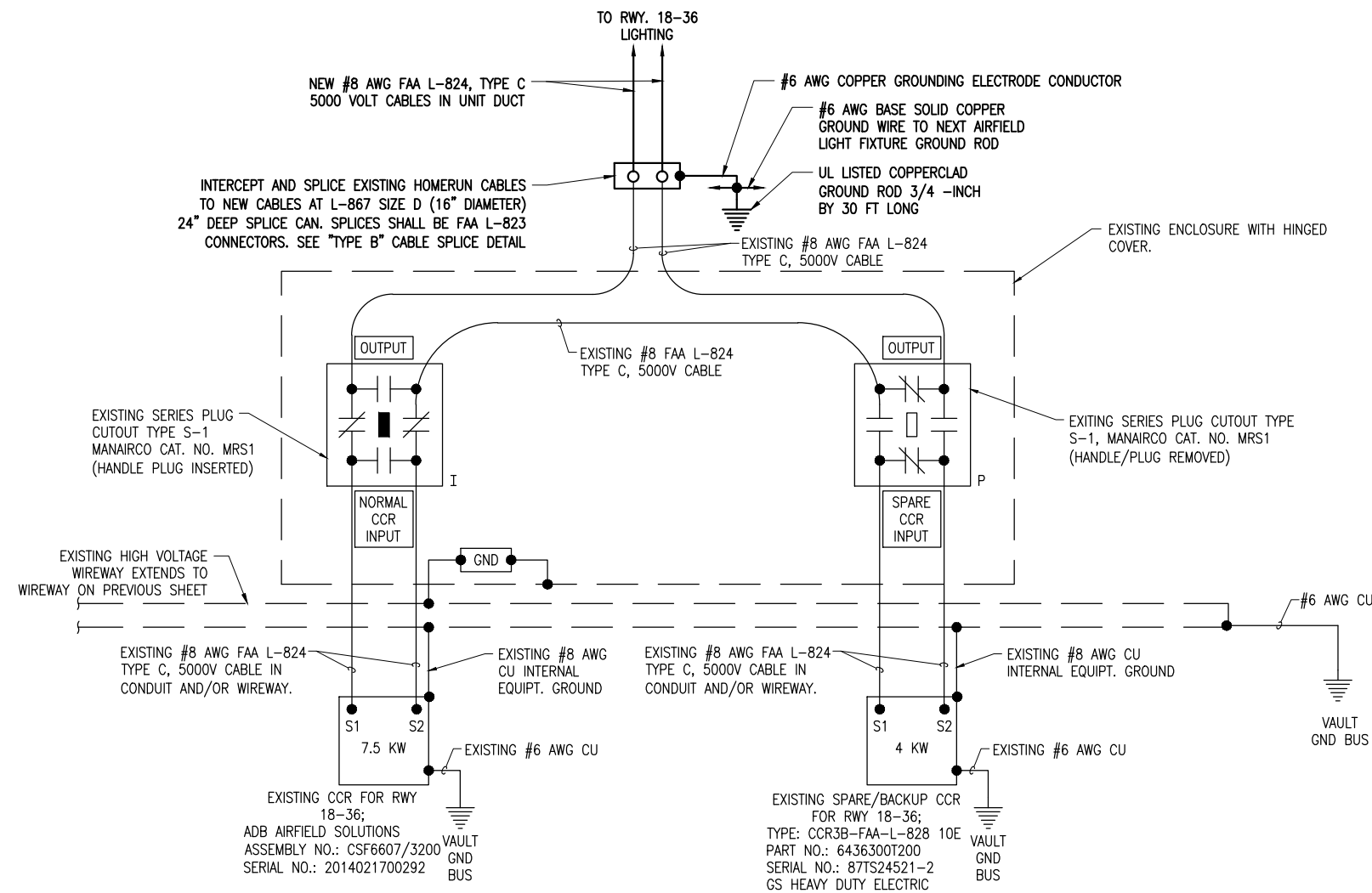
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SHEET TITLE

HIGH VOLTAGE  
WIRING SCHEMATIC

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



**HIGH VOLTAGE WIRING SCHEMATIC FOR RUNWAY 18-36**

NOT TO SCALE

**NOTES**

1. SEE "HIGH VOLTAGE WIRING SCHEMATIC" SHEET FOR NOTES.

REHAB PAVEMENT  
AND LIGHTING ON  
RWY 18/36

IDA No: C75-4437  
SBG No: 3-17-SBGP-120

Contract No. MA027

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: NOVEMBER 16, 2015  
PROJECT NO: 14A00046  
CAD FILE: E-601-LIN.DWG  
DESIGN BY: KNL 05/20/2015  
DRAWN BY: JRH 06/09/2015  
REVIEWED BY: KNL 07/02/2015

SHEET TITLE

HIGH VOLTAGE  
WIRING SCHEMATIC  
CONTINUED

**LEGEND**

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