SH026 TOTAL SHEETS = 34

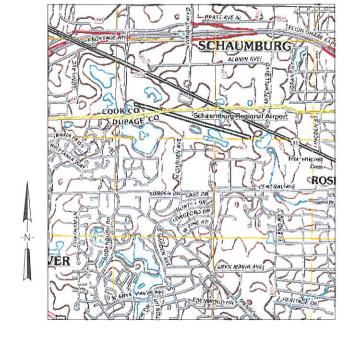
CONSTRUCTION PLANS

REHABILITATE AIRFIELD LIGHTS

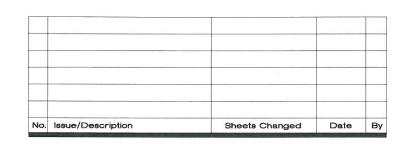
VILLAGE OF SCHAUMBURG SCHAUMBURG REGIONAL AIRPORT (06C) SCHAUMBURG, COOK AND DUPAGE COUNTY, ILLINOIS

SBG PROJECT NO. 3-17-0124-B30 IDA PROJECT NO. 06C-4161

VICINITY MAP

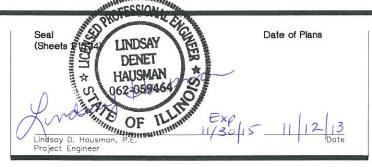






Seal (Sheets 16-33) COUERING ELECTRICAL DESIGN EXPIRES: 11/30/2015

How Goldford 11/12/2013







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SHEET NO.	TITLE
1	COVER SHEET
2	SHEET INDEX AND SUMMARY OF QUANTITIES
3	SITE PLAN AND GENERAL NOTES
4	CONSTRUCTION AND SAFETY NOTES AND DETAILS
5	STAGING PLAN
6	STORM WATER POLLUTION PREVENTION PLAN AND DETAILS
7	REMOVAL PLAN
8	REMOVAL PLAN
9	REMOVAL PLAN
10	REMOVAL PLAN
11	LIGHTING AND SIGNAGE PLAN
12	LIGHTING AND SIGNAGE PLAN
13	LIGHTING AND SIGNAGE PLAN
14	LIGHTING AND SIGNAGE PLAN
15	SIGN SCHEDULE
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26	AIRFIELD LIGHTING CONTROL WIRING SCHEMATIC
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28	LIGHTING CONTACTOR PANEL DETAIL
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30	SERIES PLUG CUTOUT INSTALLATION DETAILS
31	LEGEND PLATE SCHEDULES
32	GROUNDING DETAILS
33	GROUNDING NOTES
34	LANDSCAPING PLAN

BASE BID

	<u>=:::== =:=</u>			
	SUMMARY OF QUAI	NTITIES		
ITEM NO.	DESCRIPTION	UNIT	AS BID	RECORD PAID
AR108108	1/C #8 5 KV UG CABLE	LINEAR FOOT	535.0	
AR108158	1/C #8 5 KV UG CABLE IN UD	LINEAR FOOT	10,650.0	
AR108960	REMOVE CABLE	LINEAR FOOT	1,020.0	
AR109200	INSTALL ELECTRICAL EQUIPMENT	LUMP SUM	1.0	
AR125443	INSTALL ELECTRICAL EQUIPMENT	EACH	6.0	
AR125444	TAXI GUIDANCE SIGN, 4 CHARACTER	EACH	2.0	
AR125447	TAXI GUIDANCE SIGN, 7 CHARACTER	EACH	3.0	
AR125904	REMOVE TAXI GUIDANCE SIGN	EACH	11.0	
AR125922	REPLACE BASE MOUNTED LIGHT	EACH	82.0	
AR150510	ENGINEER'S FIELD OFFICE	LUMP SUM	1.0	
AR156510	SILT FENCE	LINEAR FOOT	375.0	
AR156520	INLET PROTECTION	EACH	19.0	
AR800930	REMOVE BASE MOUNTED LIGHT - LIGHT ONLY	EACH	82.0	
AR901510	SEEDING	ACRE	1.0	
AR905530	TOPSOILING	SQUARE YARD	2,370.0	
AR908510	MULCHING	ACRE	1.0	

ADDITIVE ALTERNATE NO. 1 - LOCAL ONLY

SUMMARY OF QUANTITIES					
ITEM NO.	DESCRIPTION	UNIT	AS BID	RECORD PAID	
AS800931	UPGRADE AIRFIELD SIGNS TO LED	LUMP SUM	1.0		

PAYMENT WILL BE MADE UNDER THE ITEM NUMBERS, DESCRIPTIONS AND UNITS NOTED IN THE ABOVE TABLE IN ACCORDANCE WITH THE BASIS OF PAYMENT FOR EACH RESPECTIVE WORK ITEM NOTED IN THE SPECIAL PROVISIONS, COMPLETED AND ACCEPTED BY THE ENGINEER.

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.

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REHABILITATE AIRFIELD LIGHTS

IDA No: 06C-4161 SBG No:3-17-0124-B30

Contract No: SH026

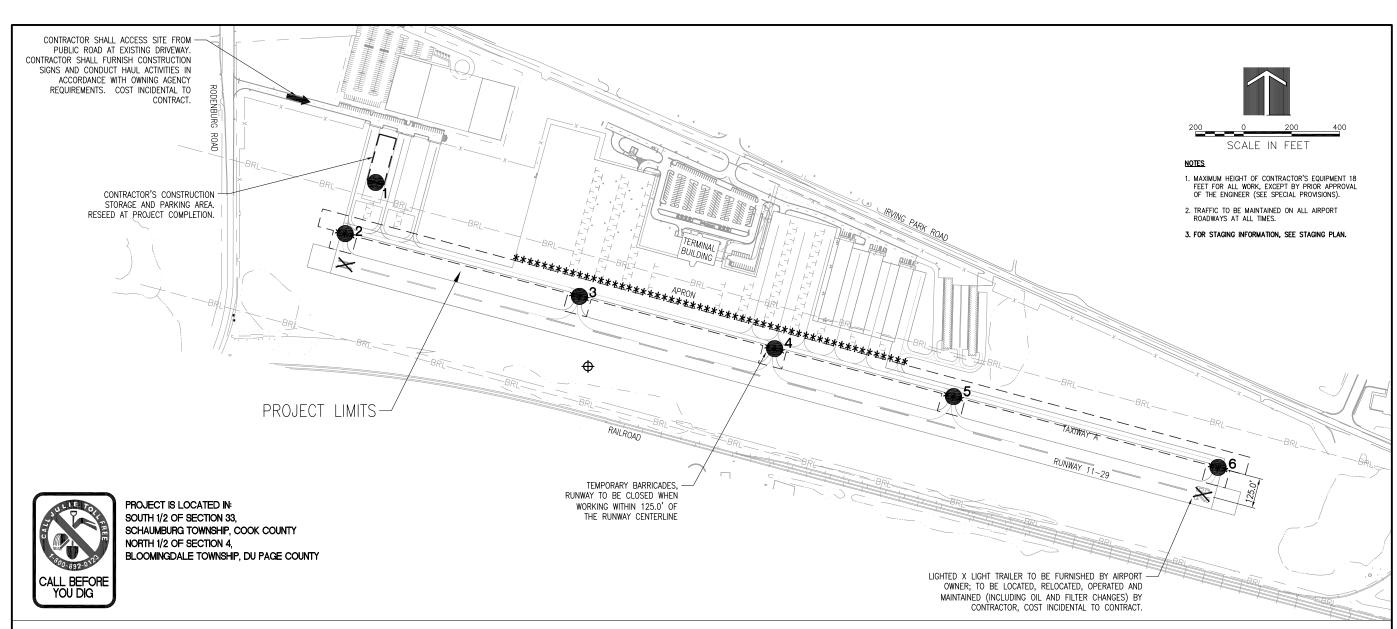
NO.	DATE	DESCRIPTION				
INO.	DATE	LAY	DWN	REV		
ISSUE: November 15, 2013						
PROJECT NO: 12A0156						

CAD FILE: 02-INDEX AND SOQ.DV LAYOUT BY: LDH 8/22/13 DRAWN BY: LDH 8/22/13

REVIEWED BY: RMH 11/14/13

SHEET TITLE

SHEET INDEX AND SUMMARY OF QUANTITIES



GENERAL NOTES

THIS PROJECT IS TO REHABILITATE THE AIRFIELD TAXIWAY LIGHTING AT SCHAUMBURG REGIONAL AIRPORT INCLUDING, AMONG OTHER INCIDENTAL WORK, THE FOLLOWING ITEMS

- PLACEMENT OF TEMPORARY SOIL EROSION CONTROL MEASURES.
- REMOVAL OF EXISTING TAXIWAY LIGHT FIXTURES AND AIRFIELD GUIDANCE SIGNS.
- INSTALLATION OF NEW AIRFIELD CABLE IN UNIT DUCT.
- INSTALLATION OF NEW TAXIWAY EDGE LIGHT FIXTURES AND AIRFIELD GUIDANCE SIGNS.
- PROVISION OF ASSOCIATED ELECTRICAL EQUIPMENT IN AND MODIFICATIONS TO EXISTING ELECTRICAL
- TOPSOILING, SEEDING AND MULCHING OF DISTURBED AREAS.
- AS ADDITIVE ALTERNATE ITEM NO. 1, PAY ITEM AS800931, "UPGRADE AIRFIELD SIGNS TO LED"SHALL BE TO FURNISH TYPE L-858(L) TAXI GUIDANCE SIGNS WITH LED (LIGHT EMITTING DIODE) ILLUMINATION IN PLACE OF TYPE L-858 TAXI GUIDANCE SIGNS WITH QUARTZ OR INCANDESCENT LAMPS. THE ADDITIVE ALTERNATE UPGRADE, IF SELECTED, WILL BE AWARDED CONCURRENT WITH THE BASE BID AWARD.

PROTECTION OF EXISTING AIRPORT FACILITIES

THE CONTRACTOR IS TO BE RESPONSIBLE FOR THE PROTECTION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES AND LIGHTING EQUIPMENT: DRIVEWAY AND ROAD PAVEMENT AND SHOULDERS; RUNWAY, TAXIWAY AND APRON PAVEMENTS AND SHOULDERS; RUNWAY, TAXIWAY AND AIRPORT LIGHTING EQUIPMENT; AND SEEDED AND TURFED AREAS THAT ARE UTILIZED IN OR AFFECTED BY THE CONTRACTOR'S ACTIVITIES. ITEMS DAMAGED THE CONTRACTOR ARE TO BE REPAIRED AT CONTRACTOR'S EXPENSE AND TO THE SATISFACTION OF AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE

IN ADDITION, WHEN CONDITIONS DICTATE OR AS DETERMINED BY THE AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE, THE CONTRACTOR SHALL BE REQUIRED TO USE A PICK-UP TYPE SWEEPER IN ALL ACTIVE CONSTRUCTION AIRFIELD PAYEMENT AREAS. THE CONTRACTOR WILL BE REQUIRED TO HAVE A SWEEPER AVAILABLE FOR USE AT ALL TIMES. THE COST OF SWEEPING SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.

CONTRACTOR'S ACCESS AND TEMPORARY FACILITIES

CONTRACTOR'S ACCESS TO THE PROJECT WHEN ON AIRPORT PROPERTY IS SHOWN ON THIS SHEET. CONTRACTOR'S ACCESS TO THE AIRPORT ITSELF IS TO BE PROVIDED BY PUBLIC RIGHTS-OF-WAY. THE CONTRACTOR IS TO SECURE ALL NECESSARY PERMITS FOR THE USE OF ANY PUBLIC RIGHTS-OF-WAY AND IS TO MAINTAIN TRAFFIC ON THESE PUBLIC ROADS AT ALL TIMES, WITH THE COSTS OF PERMITTING, CLEANING AND REPAIRING OF PAVEMENT DAMAGED BY CONTRACTOR'S ACTIVITIES INCIDENTAL TO THE CONTRACT. USE OF AND REPAIRS TO ANY PUBLIC FACILITIES ARE TO BE COMPLETED TO THE SATISFACTION

THE CONTRACTOR IS TO PROVIDE TEMPORARY CONSTRUCTION ROADS WITHIN THE CONSTRUCTION LIMIT LINES AS MAY BE REQUIRED BY HIS ACTIVITIES. HEAVY VEHICLES SHALL NOT CROSS EXISTING PAVEMENT SURFACES EXCEPT AS APPROVED BY THE AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE. ANY DAMAGE TO PAVEMENTS THAT MAY OCCUR BY THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE AND TO THE SATISFACTION OF THE AIRPORT MANAGER OR DESIGNATED

THE CONTRACTOR IS TO PROVIDE AN EQUIPMENT STORAGE AND PARKING AREA AT THE LOCATIONS SHOWN ON THIS SHEET. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE ACCESS ROADS AND THE STORAGE AREA DURING CONSTRUCTION AND TO RESTORE THE AREAS AT PROJECT COMPLETION TO CONDITIONS SUITABLE TO THE AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE. AT THE AIRPORT OWNERS'S DISCRETION, THE TEMPORARY FACILITIES MAY REMAIN, BUT THEY MUST BE LEFT IN CONDITIONS SUITABLE TO THE AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE. THE COST OF PROVIDING, MAINTAINING AND RESTORING THE TEMPORARY FACILITIES IS INCIDENTAL TO THE CONTRACT.

RESPONSIBILITY FOR EXISTING UTILITIES

THE LOCATION, SIZE AND/OR TYPE OF MATERIAL OF EXISTING UNDERGROUND OR OVERHEAD UTILITIES AS MAY BE INDICATED ON THESE CONSTRUCTION PLANS IS NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. NEITHER THE AIRPORT OWNER NOR THE PROJECT ENGINEER HAVE INDEPENDENTLY VERIFIED THIS INFORMATION AND NEITHER ASSUMES ANY RESPONSIBILITY WHATSOEVER IN RESPECT TO THE ACCURACY, SUFFICIENCY OR COMPLETENESS OF THE INFORMATION AND QUE NO EXPRESSED OR IMPLIED GUARANTEE THAT ANY CONDITIONS INDICATED ARE REPRESENTATIVE OF ACTUAL CONDITIONS TO BE ENCOUNTERED

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 ALL UTILITY COMPANIES AND AGENCIES OF HIS CONSTRUCTION PLANS AND SHALL OBTAIN FROM EACH PARTY DETAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF ALL UTILITIES AND THE WORKING SCHEDULE OF ANY REMOVALS OR ADJUSTMENTS REQUIRED OF THE UTILITY. THE CONTRACTOR SHALL CONTACT J.U.L.I.E. (PHONE 800-892-0123) TO ASSIST IN THE ABOVE.

THE CONTRACTOR SHALL PROTECT ANY FACILITIES TO THE SATISFACTION OF THE UTILITY ON OWNING-AGENCY WITH THE COST OF ANY REQUIRED PROTECTION TO BE INCIDENTAL TO THE CONTRACT. IN THE EVENT A UTILITY LINE OR SERVICE IS UNEXPECTEDLY ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE AND THE UTILITY COMPANY OR AGENCY OF JURISDICTION. ANY SUCH UTILITIES DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED TO SERVICE AT ONCE.

EXISTING BENCHMARKS

PROJECT BENCHMARKS ARE AS FOLLOWS:

N 1938845.83 E 1046571.08 ELEV. 793.26

OBJECT INFORMATION

ITEM NO.	DESCRIPTION	MOBILITY	GROUND ELEVATION	OBJECT ELEVATION	LATITUDE	LONGITUDE	RUNWAY 11-29 STATION	RUNWAY 11-29 OFFSET	RUNWAY 11-29 EXIS. EL.
1	CONTRACTOR'S STAGING AREA	MOVING	800.0	825.0	41*59'29.7787" N	88*06'26.4166" W	100+84.92	363.5	801.0
2	CONSTRUCTION EQUIPMENT	MOVING	800.5	825.5	41*59'27.6728" N	88'06'28.1054" W	100+17.50	125.0	801.0
3	CONSTRUCTION EQUIPMENT	MOVING	800.5	825.5	41°59'25.0701" N	88°06'15.1884" W	110+27.88	125.0	801.0
4	CONSTRUCTION EQUIPMENT	MOVING	800.5	825.5	41*59'22.8967" N	88'06'04.4258" W	118+69.88	125.0	801.0
5	CONSTRUCTION EQUIPMENT	MOVING	800.5	825.5	41*59'20.9045" N	88'05'54.5624" W	126+41.54	125.0	801.0
6	CONSTRUCTION EQUIPMENT	MOVING	800.5	825.5	41*59'17.9585" N	88°05'39.9790" W	137+82.50	125.0	801.0

RUNWAY END COORDINATES

DESCRIPTION	LATITUDE	LONGITUDE	RUNWAY STATION
RUNWAY 11 END	41'59'26.5310" N	88*06'28.7600" W	100+00
RUNWAY 29 END	41*59'16.7240" N	88°05'40.1880" W	138+00

NOTES

- 1. WORK MUST BE CONTROLLED.
- 2. MAXIMUM HEIGHT OF CONTRACTOR'S EQUIPMENT SHALL BE LIMITED TO A HEIGHT OF 25 FEET, EXCEPT BY PRIOR APPROVAL OF THE ENGINEER (SEE SPECIAL PROVISIONS)
- 3. TRAFFIC TO BE MAINTAINED ON ALL AIRPORT ROADWAYS AT ALL TIMES.
- 4. NO CLOSURES TO TAXIWAY, APRON, ROADWAY, AND AUTO PARKING SHALL BE CONDUCTED EXCEPT AS

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REHABILITATE **AIRFIELD LIGHTS**

IDA No: 06C-4161 SBG No:3-17-0124-B30

Contract No: SH026

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	NO.	DATE	DES	CRIPT	ION	
	NO.	DAIL	LAY	DWN	RE\	
IS	ISSUE: November 15, 2013					

PROJECT NO: 12A0156 CAD FILE: 03-SITEPLAN.DWG LAYOUT BY: LDH 8/22/13

DRAWN BY: LDH 8/22/13 REVIEWED BY: RMH 11/14/13

SHEET TITLE

SITE PLAN AND **GENERAL NOTES**

SEQUENCE OF CONSTRUCTION

TO MINIMIZE DISRUPTIONS TO AIRPORT OPERATIONS, CONSTRUCTION OPERATIONS MUST BE CONTROLLED THROUGHOUT THE PROJECT'S DURATION AND WORK MUST BE COMPLETED EXPEDITIOUSLY. A CONSTRUCTION STAGING PLAN DETAILING THE SEQUENCING OF THE CONTRACTOR'S WORK THROUGHOUT THE PROJECT IS INCLUDED IN THE PLANS. THE CONTRACTOR SHALL PROVIDE HIS WRITTEN ACCEPTANCE OF THE PROJECT CONSTRUCTION STAGING PLAN AT THE PRE-CONSTRUCTION CONFERENCE. ANY AND ALL CHANGES TO THE CONSTRUCTION STAGING PLAN THAT MAY BE REQUESTED BY THE CONTRACTOR MUST BE APPROVED BY THE PROJECT ENGINEER AND THE AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE SUFFICIENT ADVANCE NOTICE OF ANY PROPOSED STAGING CHANGE TO PERMIT CONSIDERATION AND APPROVAL BY THE PROJECT ENGINEER AND THE AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE. THE CONTRACTOR SHALL NOT BE ENTITLED TO ANY EXTRA COMPENSATION NOR EXTENSION TO THE CONTRACT TIME BECAUSE OF A STAGING CHANGE REQUEST NOR FOR ANY TIME NECESSARY IN RECEIVING THE REQUIRED APPROVALS.

LATHING AND WARNING TAP

THE PROJECT WILL REQUIRE THE PLACEMENT OF LATHING AND WARNING TAPE TO DELINEATE THE WORK AREA FROM ACTIVE AIRPORT OPERATIONS AREAS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE, PLACE AND MAINTAIN LATHING AND WARNING TAPE SHOWN ON THE STAGING PLAN ON SHEETS 5 AND IN DETAIL A, THIS SHEET, AND AS DIRECTED BY THE RESIDENT ENGINEER AND THE AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE. THE CONTRACTOR WILL FURNISH, PLACE, MAINTAIN AND RELOCATE THE LATHING AND WARNING TAPE AS REQUIRED. THE COST OF THESE ITEMS, AND THEIR MAINTENANCE, IS TO BE INCIDENTAL TO THE CONTRACT.

TEMPORARY BARRICADES ON AIRFIELD

THE PROJECT WILL REQUIRE THE PLACEMENT OF BARRICADES TO DELINEATE PORTIONS OF THE CONSTRUCTION AREA AND TO EFFECT TEMPORARY CLOSURES OF ACTIVE RUNWAYS, TAXWAYS AND APRONS. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO FURNISH, PLACE AND MAINTAIN BARRICADES AS SHOWN ON THE STAGING PLAN ON SHEETS 5 AND IN DETAIL B, THIS SHEET, AND AS DIRECTED BY THE RESIDENT ENGINEER AND AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE. THE COST OF THESE ITEMS, AND THEIR MAINTENANCE, IS TO BE INCIDENTAL TO THE CONTRACT. ANY WORK THAT REQUIRES PORTIONS OF AN ACTIVE TAXWAY OR APRON TO BE CLOSED MUST BE COMPLETED EXPEDITIOUSLY TO MINIMIZE DISRUPTION TO AIRCRAFT OFFRATIONS.

OPEN TRENCHES, EXCAVATIONS AND STOCKPILED MATERIAL AT THE CONSTRUCTION SITE SHALL BE DELINEATED WITH THE USE OF BARRICADES DURING HOURS OF RESTRICTED VISIBILITY AND/OR DARKNESS. NO OPEN TRENCHES OR DROPOFFS FROM PAVEMENT EDGES GREATER THAT 3 INCHES SHALL BE ALLOWED WITHIN AN ACTIVE TRANSHOY SAFETY AREA (RSA) OR AN ACTIVE TRAXIWAY SAFETY AREA (TSA). THE RSA IS DEFINED AS 60 FEET FROM THE RUNWAY 11–29 CENTERLINE AND 240 FEET FROM THE RUNWAY. THE TSA IS MEASURED AT 24.5 FEET FROM THE CATEGORY 1 TAXIWAY CENTERLINE. THE CONTRACTOR WILL HAVE STEEL PLATES ON—SITE TO ALLOW FOR THE RAPID COVERING OF TRENCHES IN AN ACTIVE TRAS OR TSA IN THE EVENT OF UNEXPORTED WITH STOPPAGES FOR WEATHER OR AIRPORT EMERGENCIES.

DIINMAY CLOSH

THE PROJECT WILL REQUIRE THE PLACEMENT, OPERATION AND MAINTENANCE OF RUNWAY CLOSURE MARKERS; SEE STAGING PLAN ON SHEET 5 AND DETAIL C, THIS SHEET. TO MINIMIZE DISRUPTION TO AIRCRAFT OPERATIONS ASSOCIATED WITH THE RUNWAY CLOSURE, CONSTRUCTION WORK MUST BE COMPLETED EXPEDITIOUSLY. RUNWAY CLOSINGS SHALL ONLY BE PERMITTED BY PRIOR AUTHORIZATION OF THE RESIDENT ENGINEER AND THE AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE.

RUNWAY CLOSURE MARKERS WILL BE FURNISHED BY THE AIRPORT AS SPECIFIED ON THIS SHEET AND IN THE SPECIAL PROVISIONS. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO INSTALL, RELOCATE AND MAINTAIN RUNWAY CLOSURE MARKERS AT THE LOCATIONS SHOWN IN THE PLAN, AND AS DIRECTED BY THE RESIDENT ENGINEER AND AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE. THE COST OF PLACING AND RELOCATING THESE ITEMS, AND THEIR MAINTENANCE (INCLUDING OIL AND FILTER CHANGES AND OTHER MAINTENANCE TASKS RECOMMENDED BY THE MANUFACTURER), IS TO BE INCIDENTAL TO THE CONTRACT.

THE AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE WILL DE-ENERGIZE AIRPORT/RUNWAY NAVAIDS, AND AIRFIELD LIGHTING POWER AND CONTROL CIRCUITS WHEN THE RUNWAY IS CLOSED.

VEHICULAR TRAFFIC CONTROL

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE AND PLACE ROAD WARNING SIGNS AND BARRICADES ON THE EXISTING ROADWAYS PRIOR TO THE START OF CONSTRUCTION IN THE VICINITY. THE CONTRACTOR SHALL PROVIDE, INSTALL AND RELOCATE THE ITEMS AS REQUIRED. THE COST OF THIS WORK IS TO BE INCIDENTAL TO THE CONTRACT.

THE CONTRACTOR SHALL SECURE ANY PERMITS FOR HAULING ON LOCAL STREET OR STATE HIGHWAYS AS REQUIRED.

CONTRACTOR SHALL PROVIDE, INSTALL AND REMOVE ALL TRAFFIC CONTROL ITEMS WHEN CONSTRUCTION ACTIVITIES ARE WITHIN 15 FEET OF AN ACTIVE ROADWAY EDGE OR AS REQUIRED BY THE SITE PLAN. COST OF THIS WORK IS TO BE INCIDENTAL TO THE CONTRACT.

AIRFIELD OPERATIONAL SAFETY DURING CONSTRUCTION

ALL CONSTRUCTION TRAFFIC AND PERSONNEL SHALL REMAIN WITHIN THE CONSTRUCTION LIMIT LINE SHOWN ON THE SITE PLAN FOR THE CURRENT WORK. CONTRACTOR'S PERSONNEL AND EQUIPMENT MUST REMAIN AT LEAST 125 FEET FROM THE CENTERLINE OF ACTIVE RUNWAYS, 240 FEET FROM THE END OF ACTIVE RUNWAYS, 44.5 FEET FROM ACTIVE CATEGORY I TAXIWAY CENTERLINES, AND 10 FEET FROM THE EDGE OF ACTIVE APPOINS

WHEN IT IS NECESSARY FOR CONSTRUCTION VEHICLES TO OPERATE ON OR WITHIN THESE LIMITS, THE RUNWAY, TAXIWAYS OR APRON MUST BE CLOSED. THE CONTRACTOR WILL PROVIDE POSITIVE CONTROL OF CONSTRUCTION VEHICLES USING RADIO—EQUIPPED FLAGGERS. ALL CONTRACTOR'S EQUIPMENT USED IN ACTIVE AIRPORT OPERATIONS AREAS SHALL BE EQUIPPED WITH A FAA—STANDARD FLAG, AS REFERENCED IN FAA AC 150/5370—2, CURRENT ISSUE. AIRCRAFT SHALL HAVE THE RIGHT—OF—WAY. CONSTRUCTION VEHICLES SHALL NOT CROSS AN ACTIVE RUNWAY. THE COST OF ALL TRAFFIC CONTROLT BOTH WITHIN AND OUTSIDE OF AIRPORT OPERATIONS AREAS, IS TO BE INCIDENTAL TO THE

WHEN NOT IN USE AND DURING NONWORKING HOURS, CONTRACTOR'S EQUIPMENT SHALL BE PARKED WITHIN THE CONTRACTOR'S EQUIPMENT STORAGE AND PARKING AREAS. THE EQUIPMENT STORAGE AND PARKING AREAS ARE TO BE LOCATED AS SHOWN ON THE SITE PLAN, SHEET 3. THE CONTRACTOR WILL BE RESPONSIBLE FOR MAINTAINING THE CONSTRUCTION ENTRANCE IN GOOD CONDITION. THE COST OF MAINTAINING THE CONSTRUCTION ENTRANCE IS TO BE INCIDENTAL TO THE CONTRACT.

AT NO TIME SHALL THE CONTRACTOR OPERATE OR PARK EQUIPMENT OR STOCKPILE MATERIAL SO AS TO OBSTRUCT AN AIRPORT IMAGINARY

BEFORE REOPENING TEMPORARILY CLOSED RUNWAYS, TAXIWAYS OR ROADWAYS, THE CONTRACTOR SHALL INSPECT AND CLEAN, AS NECESSARY, THE PAVEMENT TO ASSURE THAT NO MATERIALS OR OBJECTS THAT MAY DAMAGE AIRCRAFT OR VEHICLES REMAIN. ANY REQUIRED CLEANING SHALL BE TO THE SATISFACTION OF THE RESIDENT ENGINEER AND AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE AND IS INCIDENTAL TO THE CONTRACT.

ALL CONTRACTOR EQUIPMENT IS LIMITED TO A HEIGHT OF 18 FEET.

NOTIFICATIONS BY CONTRACTO

THE CONTRACTOR SHALL NOTIFY THE RESIDENT ENGINEER AND AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE 5 DAYS IN ADVANCE OF THE CONTRACTOR'S CLOSING OF ACTIVE RUNWAYS, TAXIWAYS AND APRONS. THE DATE, TIME AND SCHEDULED DURATION OF THE CLOSING MUST BE APPROVED BY THE RESIDENT ENGINEER AND THE AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE. THE CONTRACTOR SHALL NOTIFY THE RESIDENT ENGINEER AND AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE 72 HOURS IN ADVANCE OF THE CONTRACTOR'S CLOSING OF OTHER ACTIVE ROADWAYS, AIRFIELD OR ROADWAY LIGHTING CIRCUITS, OR OTHER AIRPORT FACILITIES.

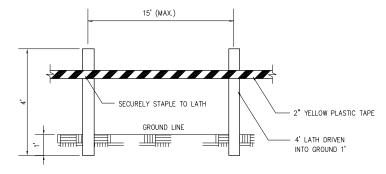
CONTRACTOR'S USE OF SIT

THE CONTRACTOR SHALL NOT OPERATE WITHIN, ENCROACH UPON OR OBSTRUCT AIRPORT OPERATIONAL AREAS, INCLUDING ACTIVE RUNWAY, TAXIWAYS AND APRON SAFETY AREAS, OBJECT AND OBSTACLE FREE ZONES, RUNWAY PROTECTION ZONES AND AIRPORT IMAGINARY SURFACES AS DEFINED IN FEDERAL AVIATION REGULATIONS (FAR) PART 77, "OBJECTS AFFECTING NAVIGABLE AIRSPACE".

THE CONTRACTOR IS RESPONSIBLE FOR RESTORATION OF THE WORK AREA PRIOR TO BEGINNING WORK AT A NEW LOCATION.

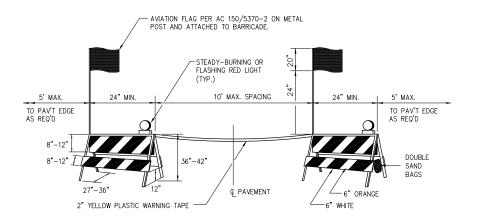
UTILITY OUTAGES AND SHUTDOWNS

THE CONTRACTOR SHALL PROVIDE 72 HOURS PRIOR NOTICE OF ANY OUTAGES OR SHUTDOWNS TO THE AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE AND THE AGENCY OWNING THE AFFECTED UTILITY. THE CONTRACTOR SHALL PROVIDE ANY TEMPORARY CONNECTIONS OR OTHER MEASURES AS MAY BE REQUIRED TO MAINTAIN SERVICE AS MAY BE REQUIRED BY THE OWNING AGENCY AT NO COST TO THE OWNER.



MATERIALS ARE TO BE APPROVED BY ENGINEER PRIOR TO INSTALLATION. COST OF MATERIALS, INSTALLATION, RELOCATION AND MAINTENANCE OF LATHING AND WARNING TAPE IS TO BE INCIDENTAL TO THE CONTRACT.

<u>DETAIL A</u> LATHING AND WARNING TAPE



BARRICADES ARE TO BE OF IDOT TYPE I. A STEADY-BURNING OR FLASHING RED LIGHT FACING PASSING TRAFFIC IS TO BE MOUNTED ABOVE THE TOP OF EACH BARRICADE FRAME. THE BARRICADE IS TO BE STABILIZED FROM WIND BY **DOUBLE SANDBAGS** PLACED ON THE FRAME OR OTHER METHODS APPROVED BY THE RESIDENT ENGINEER. NO PART OF THE REFLECTORIZED PORTION OF THE BARRICADE IS TO BE OBSTRUCTED IN ANY MANNER. COST OF FURNISHING, INSTALLING, RELOCATING, MAINTAINING AND REMOVING BARRICADES IS TO BE INCIDENTAL TO THE CONTRACT.

<u>DETAIL B</u> PAVEMENT BARRICADES



NOTES

- THE LIGHTED RUNWAY CLOSURE MARKERS WILL BE FURNISHED BY THE AIRPORT OWNER TO THE
 CONTRACTOR FOR THE CONTRACTOR'S USE. THE COST OF PLACING, OPERATING, MAINTAINING
 (INCLUDING OIL AND FILTER CHANGES AND OTHER MAINTENANCE TASKS RECOMMENDED BY THE
 MANUFACTURER) AND REMOVING THE LIGHTED RUNWAY CLOSURE MARKERS WILL BE INCIDENTAL TO
 THE CONTRACT
- 2. THE LIGHTED MARKERS SHALL BE PLACED OVER THE RUNWAY NUMERALS AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER.
- 3. LIGHTED MARKERS SHALL BE SECURED FROM WIND EFFECTS BY THE CONTRACTOR AS RECOMMENDED BY THE MANUFACTURER
- THE LIGHTED MARKERS SHALL BE IN PLACE AND OPERATING WHENEVER THE RUNWAY IS CLOSED AND REMOVED WHEN THE RUNWAY IS RE-OPENED.

<u>DETAIL C</u> LIGHTED RUNWAY CLOSURE MARKER



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REHABILITATE AIRFIELD LIGHTS

IDA No: 06C-4161 SBG No:3-17-0124-B30

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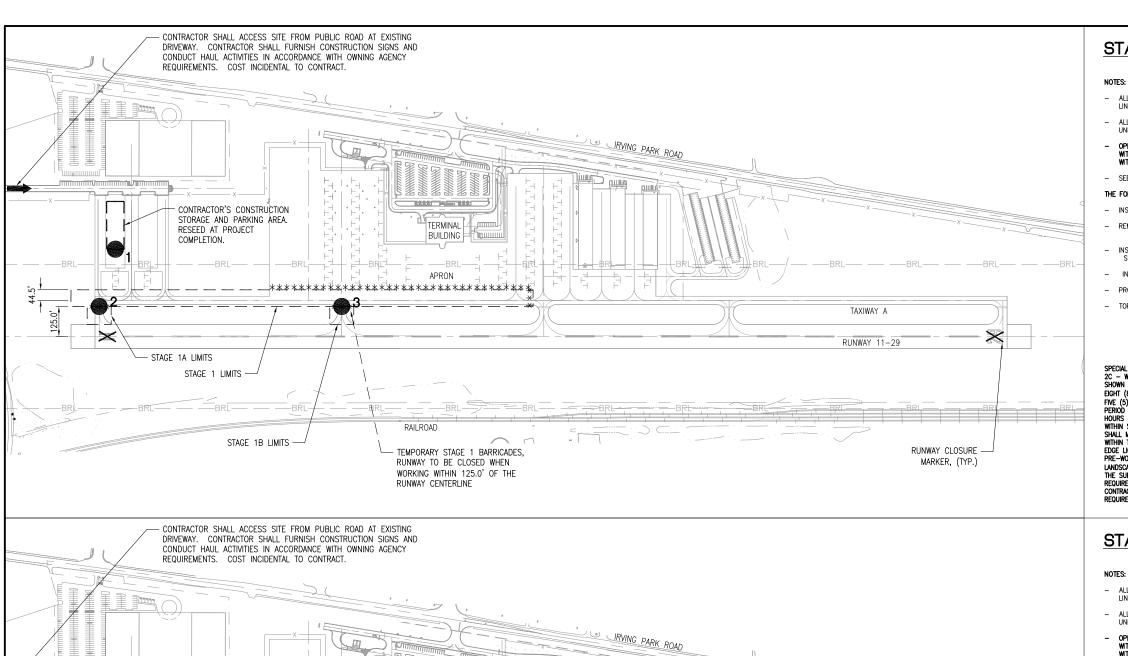
NO. DATE DESCRIPTION
LAY DWN REV
ISSUE: November 15, 2013
PROJECT NO: 12A0156
CAD FILE: 04-SAFETY NOTES.DWG
LAYOUT BY: LDH 8/22/13
DRAWN BY: LDH 8/22/13

CONSTRUCTION SAFETY NOTES AND DETAILS

SHEET TITLE

REVIEWED BY: RMH 11/14/13

DETAILS SHOWN ARE NOT TO SCALE



STAGE 2B LIMITS -

TEMPORARY STAGE 2 BARRICADES, RUNWAY TO BE CLOSED WHEN

WORKING WITHIN 125.0' OF THE RUNWAY CENTERLINE

STAGE 2 LIMITS

TAXIWAY A

STAGE 2C LIMITS

RUNWAY CLOSURE -

MARKER, (TYP.)

TERMINAL

BUILDING

APRON

STAGE 2A LIMITS -

STAGE 1

- ALL CONTRACTOR ACTIVITIES SHALL TAKE PLACE WITHIN CONSTRUCTION LIMIT LINES AS SHOWN.
- ALL CONSTRUCTION EQUIPMENT WILL BE LIMITED TO A HEIGHT OF 18 FEET UNLESS PRIOR APPROVAL GIVEN BY THE ENGINEER.
- OPERATIONS ON RUNWAY 11-29 SHALL ONLY BE AFFECTED WHILE WORKING WITHIN 125 FEET OF THE RUNWAY CENTERLINE, THIS INCLUDES ALL WORK WITHIN STAGE 1A AND 1B LIMITS.
- SEE CONSTRUCTION AND SAFETY NOTES, SHEET 4.

THE FOLLOWING ITEMS ARE TO BE COMPLETED IN STAGE 1:

- INSTALL EROSION CONTROL MEASURES FOR ENTIRE PROJECT AREA.
- REMOVAL OF EXISTING TAXIWAY LIGHTS AND GUIDANCE SIGNS WITHIN STAGE 1
- INSTALLATION OF NEW TAXIWAY LIGHTS AND GUIDANCE SIGNS WITHIN STAGE 1 LIMITS.
- INSTALLATION OF NEW AIRFIELD CABLE IN UNIT DUCT WITHIN STAGE 1 LIMITS.
- PROVISION OF ASSOCIATED VAULT WORK.
- TOPSOILING, SEEDING AND MULCHING WITHIN STAGE 1 LIMITS

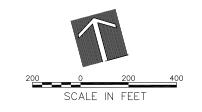
SPECIAL CONSIDERATIONS FOR SUB-STAGES 1A AND 1B AND SUB-STAGES 2A. 2B AND 2C — WORK IN SUB-STAGES 1A AND 1B AND SUB-STAGES 2A, 2B AND 2C, AS SHOWN IN THE STAGING PLAN, SHALL BE LIMITED TO A FOUR HOUR TIME FRAME WITHIN SHOWN IN THE STAGING PLAN, SHALL BE LIMITED TO A FOUR HOUR TIME FRAME WITHIN FIGHT (8) SEPARATE WORK DAYS (THREE (3) DAYS FOR SUB-STAGES 1A AND 1B, AND FIVE (5) DAYS FOR SUB-STAGES 2A, 2B AND 2C). EACH CONSECUTIVE 4—HOUR PERIOD WILL BE COORDINATED WITH AND PRIOR APPROVED BY THE AIRPORT OWNER, 4B HOURS IN ADVANCE OF EACH INTENDED CLOSURE, 10 FURTHER EXPEDITE THE WORK WITHIN SUB-STAGES 1A AND 1B AND SUB-STAGES 2A, 2B AND 2C, THE CONTRACTOR SHALL MAKE USE OF PRE-CAST SIGN BASES AND SPLICE CANS FOR ALL LOCATIONS WITHIN THESE SUB-STAGE LIMITS, AND SHALL PRE-ASSEMBLE EACH REPLACEMENT EDGE LIGHT FIXTURE TO THE EXTENT PRACTICABLE WITHIN THESE LIMITS, WITH SUCH PRE-WORK PERFORMED OTHER THAN DURING THE RUINWAY CLOSURE PERIOD. LANDSCAPING/RESTORATION SHALL BE PERFORMED CONCURRENT WITH THE WORK INSIDE THE SUB-STACE LIMITS. THE COSTS FOR THESE PRE-PREPARATIONS AND SCHEDULING REQUIREMENTS SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE CONTRACT COST. SEE SPECIAL PROVISIONS SECTION 80-09 FOR ADDITIONAL REQUIREMENTS FOR COMPLETING THE SUB-STAGES.

STAGE 2

- ALL CONTRACTOR ACTIVITIES SHALL TAKE PLACE WITHIN CONSTRUCTION LIMIT
- ALL CONSTRUCTION EQUIPMENT WILL BE LIMITED TO A HEIGHT OF 18 FEET UNLESS PRIOR APPROVAL GIVEN BY THE ENGINEER.
- OPERATIONS ON RUNWAY 11-29 SHALL ONLY BE AFFECTED WHILE WORKING WITHIN 125 FEET OF THE RUNWAY CENTERLINE, THIS INCLUDES ALL WORK WITHIN STAGE 2A, 2B AND 2C LIMITS.
- SEE CONSTRUCTION AND SAFETY NOTES, SHEET 4.

THE FOLLOWING ITEMS ARE TO BE COMPLETED IN STAGE 2:

- REMOVAL OF EXISTING TAXIWAY LIGHTS AND GUIDANCE SIGNS WITHIN STAGE 2
- INSTALLATION OF NEW TAXIWAY LIGHTS AND GUIDANCE SIGNS WITHIN STAGE 2 LIMITS.
- INSTALLATION OF NEW AIRFIELD CABLE IN UNIT DUCT WITHIN STAGE 2 LIMITS.
- PROVISION OF ASSOCIATED VAULT WORK.
- TOPSOILING, SEEDING AND MULCHING WITHIN STAGE 2 LIMITS



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REHABILITATE AIRFIELD LIGHTS

IDA No: 06C-4161 SBG No:3-17-0124-B30

Contract No: SH026

DESCRIPTION NO. DATE LAY DWN REV ISSUE: November 15, 2013

PROJECT NO: 12A0156 CAD FILE: 05-STAGINGPLAN.DWG

LAYOUT BY: LDH 8/26/13 DRAWN BY: LDH 8/26/13 REVIEWED BY: RMH 11/14/13

SHEET TITLE

CONSTRUCTION STAGING PLAN STAGE 1 AND 2

ma Jan

CONTRACTOR'S CONSTRUCTION STORAGE AND PARKING AREA.

RESEED AT PROJECT

COMPLETION.



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REHABILITATE AIRFIELD LIGHTS

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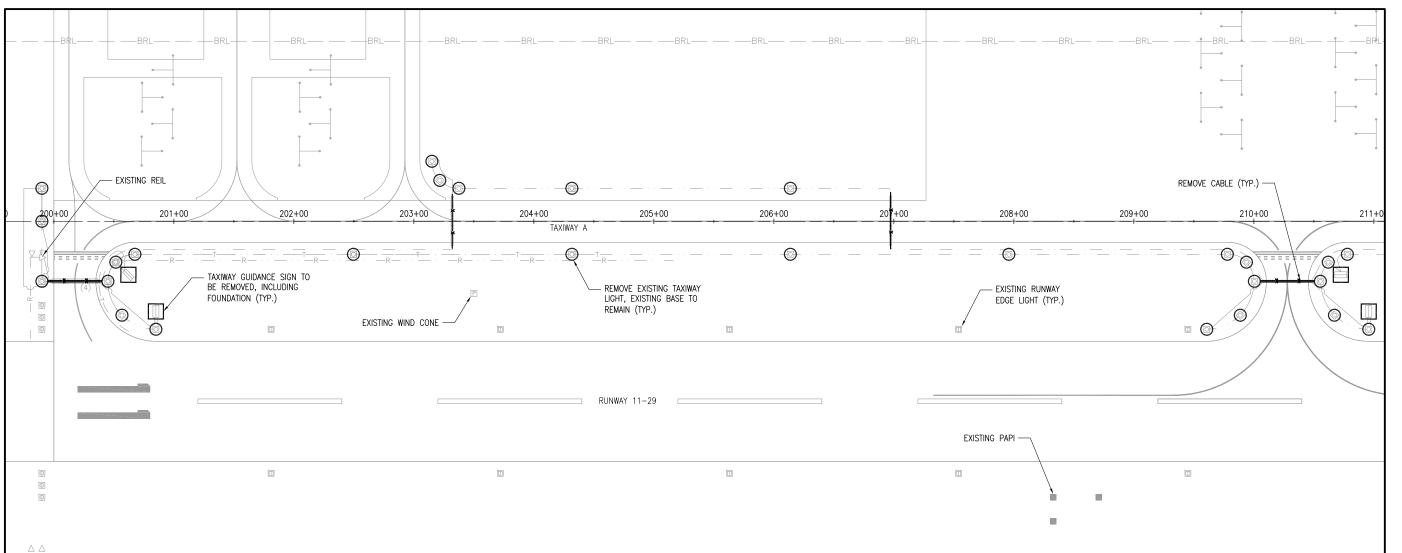
NO.	DATE	DES	CRIPT	ION		
NO.	DATE	LAY	DWN	REV		
ISSUE:	ISSUE: November 15, 2013					
DDO IECT NO. 4040450						

CAD FILE: 06-SWPPPLAN.DWG
LAYOUT BY: LDH 8/30/13
DRAWN BY: LDH 8/30/13
REVIEWED BY: RMH 11/14/13

REVIEWED BY: RMH 11/14/
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SHEET TITLE

STORM WATER
POLLUTION
PREVENTION PLAN



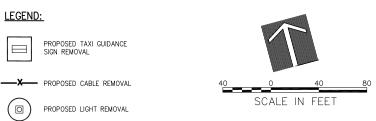
AIRFIELD LIGHTING REMOVAL NOTES

- 1. ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER OR DESIGNATED 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).
- 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, 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 (TAXIWAY) LIGHTS AND THEIR ISOLATING TRANSFORMERS DESIGNATED FOR REMOVAL SHALL BE REMOVED AND TURNED OVER TO THE AIRPORT. REMOVAL OF THE EXISTING AIRFIELD LIGHTS WILL BE PAID FOR UNDER ITEM AR800930 REMOVE BASE MOUNTED LIGHT LIGHT ONLY PER EACH.
- 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 AR125904.
- 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, SIGN, 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 QUANTITY OF LIGHTS TO BE REMOVED WITH RESIDENT ENGINEER/ RESIDENT PROJECT REPRESENTATIVE 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.

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 AIRPORT 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 AND THE WORKING SCHEDULE OF THE COMPANIES OF REMOVAL OR ADJUSTMENT WHERE REQUIRED. IN THE EVENT AND THE WORKING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY AND THE WORKING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY AND THE WORKING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY AND THE RESIDENT ENGINEER SHALL ALSO BE IMMEDIATELY NOTHFIED. 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. CONTACT AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE FOR ASSISTANCE IN LOCATING UNDERGROUND AIRPORT CABLES AND/OR UTILITIES. ALSO COORDINATE WORK WITH ALL ABOVE GROUND UTILITIES.



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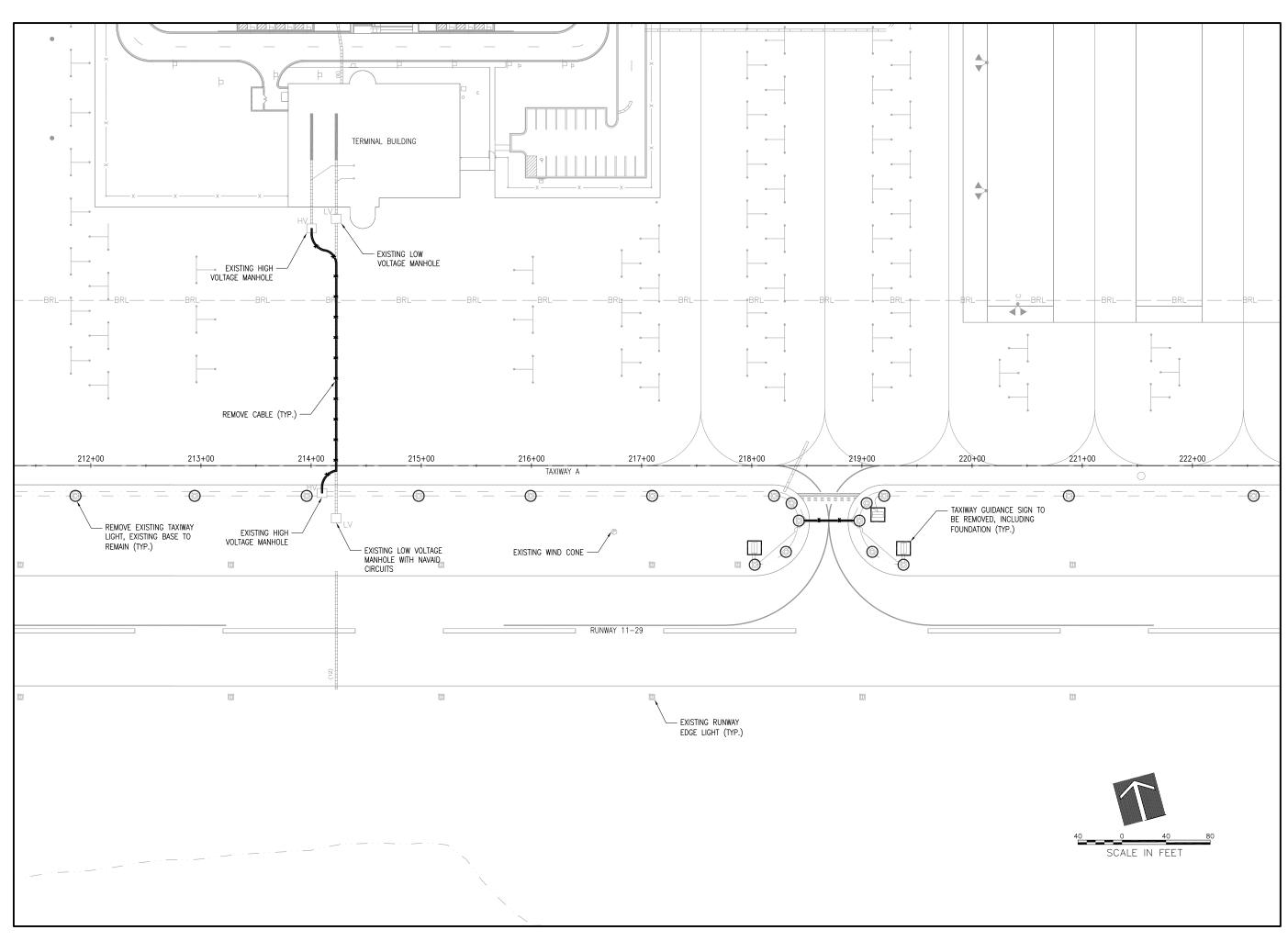
REHABILITATE AIRFIELD LIGHTS

IDA No: 06C-4161 SBG No:3-17-0124-B30

Contract No: SH026

NO.	DATE	DESCRIPTION					
NO.		LAY	DWN	REV			
ISSUE:	Novemb	er 15,	2013				
PROJEC	CT NO: 1	2A015	6				
CAD FIL	CAD FILE: 07-REMOVALPLAN.DWG						
LAYOUT	ГВҮ: LD	H 8/2	8/13				
DRAWN	BY: LDI	H 8/28	3/13				
REVIEW	/ED BV	KNI (2/17/13				

REMOVAL PLAN





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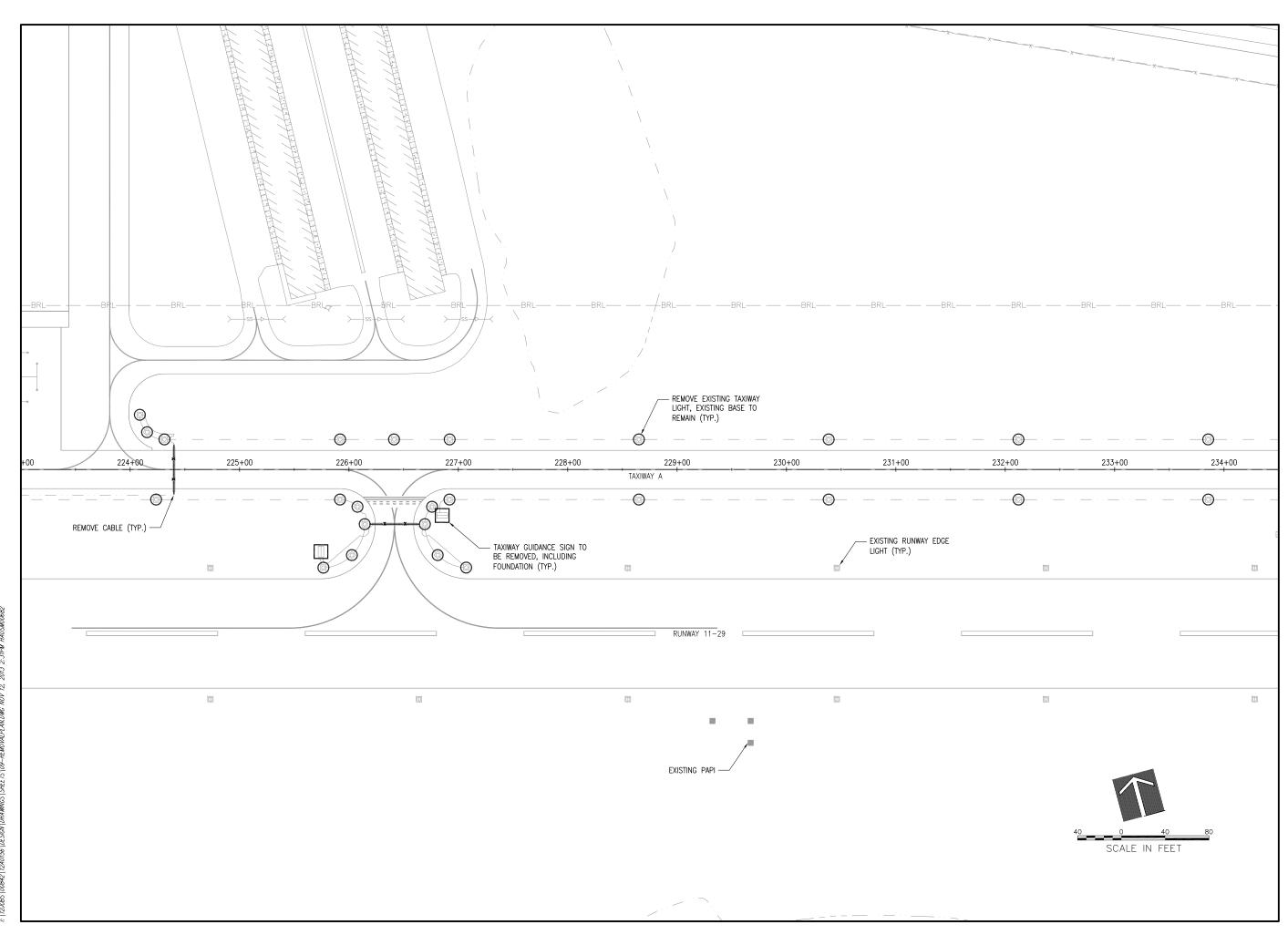
Contract No: SH026

NO.	DATE	DES	CRIPT	ION
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ISSUE: November 15, 2013				
PROJECT NO: 12A0156				

CAD FILE: 08-REMOVALPLAN.DWG LAYOUT BY: LDH 8/30/13 DRAWN BY: LDH 8/30/13 REVIEWED BY: KNL 9/17/13

SHEET TITLE

REMOVAL PLAN





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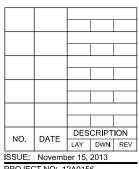


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REHABILITATE AIRFIELD LIGHTS

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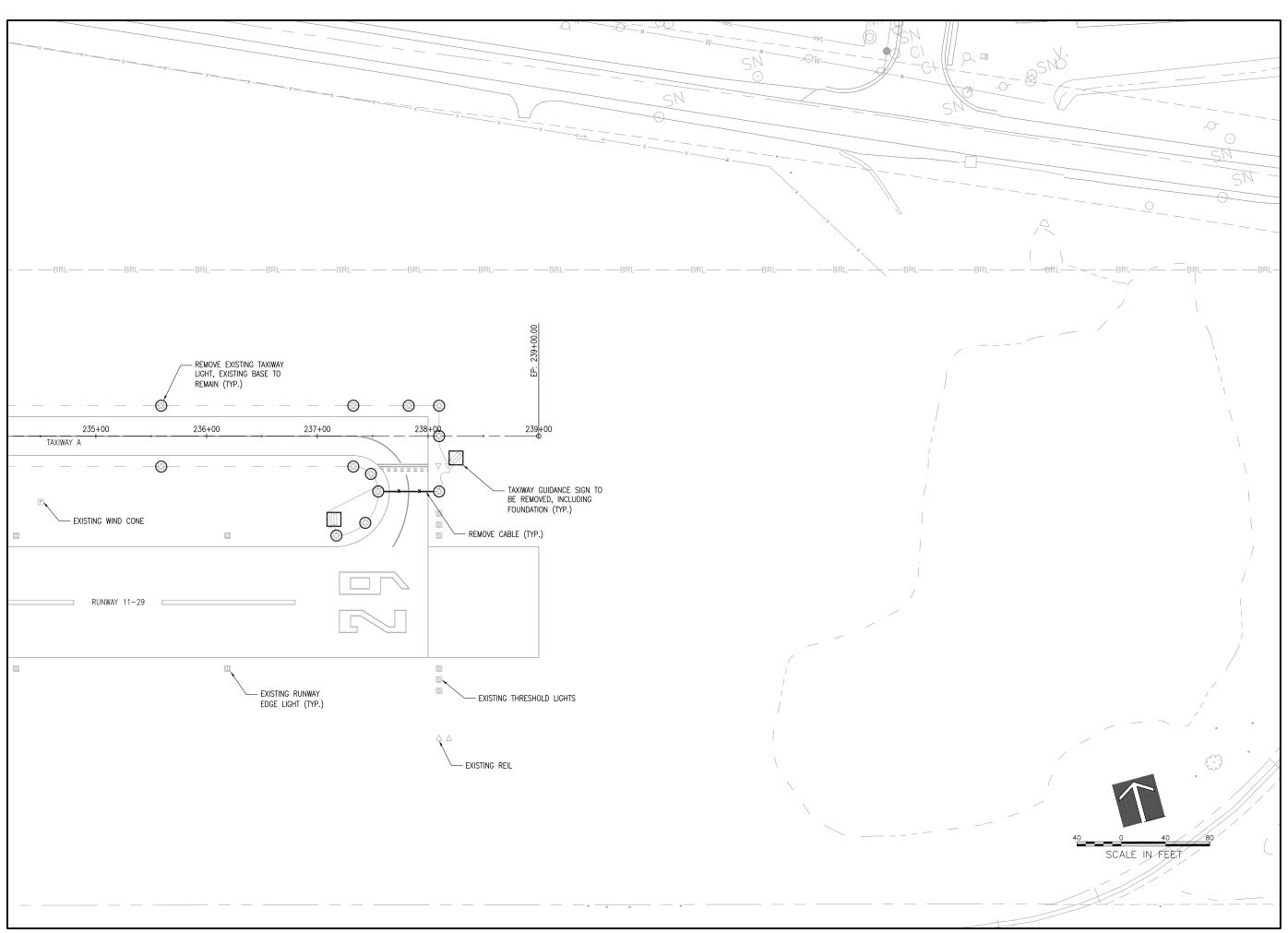


PROJECT NO: 12A0156
CAD FILE: 09-REMOVALPLAN.DWG
LAYOUT BY: LDH 8/30/13
DRAWN BY: LDH 8/30/13
REVIEWED BY: KNL 9/17/13

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REHABILITATE AIRFIELD LIGHTS

IDA No: 06C-4161 SBG No:3-17-0124-B30

Contract No: SH026

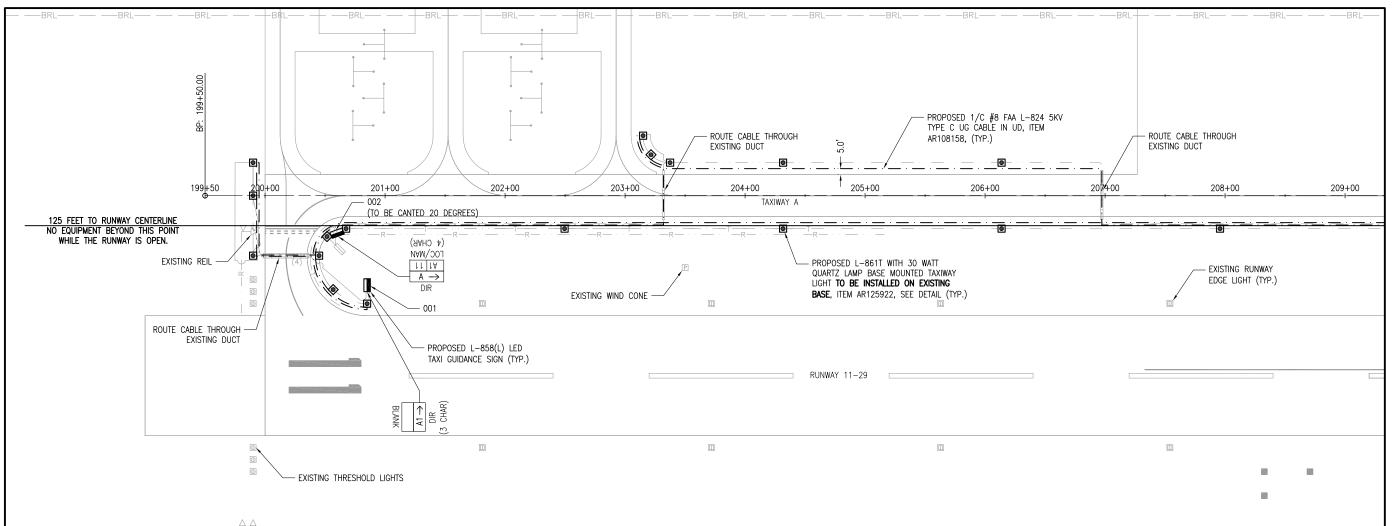
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ISSUE:	Novemb	er 15,	2013	
PROJECT NO: 12A0156				
CAD FILE: 10-REMOVALPLAN.DWG				
LAYOUT	FBY: LD	H 8/3	0/13	

REMOVAL PLAN

SHEET TITLE

DRAWN BY: LDH 8/30/13

REVIEWED BY: KNL 9/17/13



AIRFIELD LIGHTING NOTES

- 1. ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER OR DESIGNATED 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).
- 2. CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL FIELD VERIFY RESPECTIVE CIRCUITS AND POWER SOURCES PRIOR TO REMOVING OR DISCONNECTING THE RESPECTIVE AIRFIELD LIGHTING, NAVAID, OR OTHER DEVICE.
- 3. PROPOSED TAXIWAY LIGHTS SHALL BE PLACED ON THE EXISTING LIGHT BASE CANS AS DETAILED HEREIN. PROPOSED TAXI GUIDANCE SIGNS SHALL BE LOCATED SUCH THAT THE CLOSEST SIDE OF THE SIGN IS 20' FROM THE RESPECTIVE TAXIWAY EDGE, UNLESS SHOWN OTHERWISE.
- 4. PROPOSED TAXIWAY LIGHTS, GUIDANCE SIGNS, OTHER AIRFIELD LIGHTING, AND CABLE SHALL BE INSTALLED AT THE LOCATIONS SHOWN AND IN COMPLIANCE WITH THE SPECIFICATIONS, SPECIAL PROVISIONS, RESPECTIVE DETAILS, AND MANUFACTURER'S RECOMMENDATIONS.
- 5. PROPOSED CABLE FOR RUNWAY AND TAXIWAY LIGHTING SHALL BE INSTALLED APPROXIMATELY 5' FROM THE RESPECTIVE TAXIWAY EDGE OR PAVEMENT EDGE. CABLES SHALL BE PLACED A MINIMUM OF 18" BELOW FINISHED GRADE.
- 6. THE PROPOSED TAXIWAY LIGHTING CABLE SHALL BE 1/C, #8 AWG, FAA L-824, 5000 VOLT, TYPE C UNDERGROUND CABLE IN UNIT DUCT, OR DUCT.
- 7. 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.
- 8. ALL PROPOSED TAXIWAY LIGHTS WILL BE FITTED WITH 360° BLUE LENSES.
- 9. ALL PROPOSED TAXIWAY LIGHTS SHALL BE TAGGED BY THE CONTRACTOR IN ACCORDANCE WITH THE LIGHT NUMBERS SHOWN ON THESE CONSTRUCTION DRAWINGS.
- 10. SEE "TAXI GUIDANCE SIGN SCHEDULE" AND/OR RESPECTIVE TAXI SIGN DETAILS FOR INFO ON SIGN LEGENDS.
- 11. 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, 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.
- 12. HOMERUN CABLES FOR A RESPECTIVE CIRCUIT THAT ARE INSTALLED IN CONDUIT OR DUCT SHALL BE RUN TOGETHER IN THE SAME RACEWAY OR DUCT.
- 13. EXISTING AIRFIELD LIGHTING CABLES IN AREAS OF NEW WORK SHALL BE DISCONNECTED & REMOVED WHERE IN CONFLICT WITH NEW CONSTRUCTION. IN OTHER AREAS CABLES MAY BE ABANDONED IN PLACE, UNLESS DETAILED OTHERWISE TO REMOVE.
- 14. THE CONTRACTOR IS REQUIRED TO FILL IN ALL HOLES AND DEPRESSIONS RESULTING FROM THE NEW WORK, WITH EARTH MATERIAL. THE AREAS SHALL BE COMPACTED TO PREVENT FUTURE SETTLEMENT AND FERTILIZED, SEEDED, AND MULCHED IN ACCORDANCE WITH ITEMS 901 AND 908 RESPECTIVELY.
- 15. NO CONNECTION TO AN ACTIVE LIGHTING CIRCUIT WILL BE BROKEN UNTIL THE CIRCUIT HAS BEEN TURNED OFF IN ACCORDANCE WITH NOTE 1.

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PROPOSED LEGEND

L-858(L) AIRFIELD SIGN SIZE 1, STYLE 2, CLASS 2 WITH L-830 ISOLATION TRANSFORMER

OMNIDIRECTIONAL; BLUE

SERIES CIRCUIT LIGHTING CABLES; 1/C #8

AWG, FAA L-824, 5000 VOLT, TYPE C UG

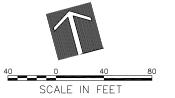
AWG, FAA L-824, 5000 VOLT, TYPE C ÜG CABLE IN UNIT DUCT

L-861T BASE MOUNTED TAXIWAY EDGE LIGHT,

EXISTING LEGEND

ELECTRICAL

____T. . . ____ ____T. _____ TELEPHONE _____G. GAS



<u>NOTE:</u>

SOME UTILITIES HAVE BEEN OMITTED FOR CLARITY.

LOC = LOCATION SIGN FACE, YELLOW ON BLACK MAN = MANDATORY SIGN FACE, WHITE ON RED DIR = DIRECTION SIGN FACE, BLACK ON YELLOW

NOTE: LOC LETTER IS ALWAYS THE FIRST CHARACTER ON THE SIGN FACE

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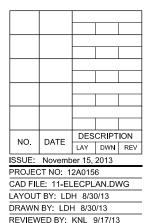


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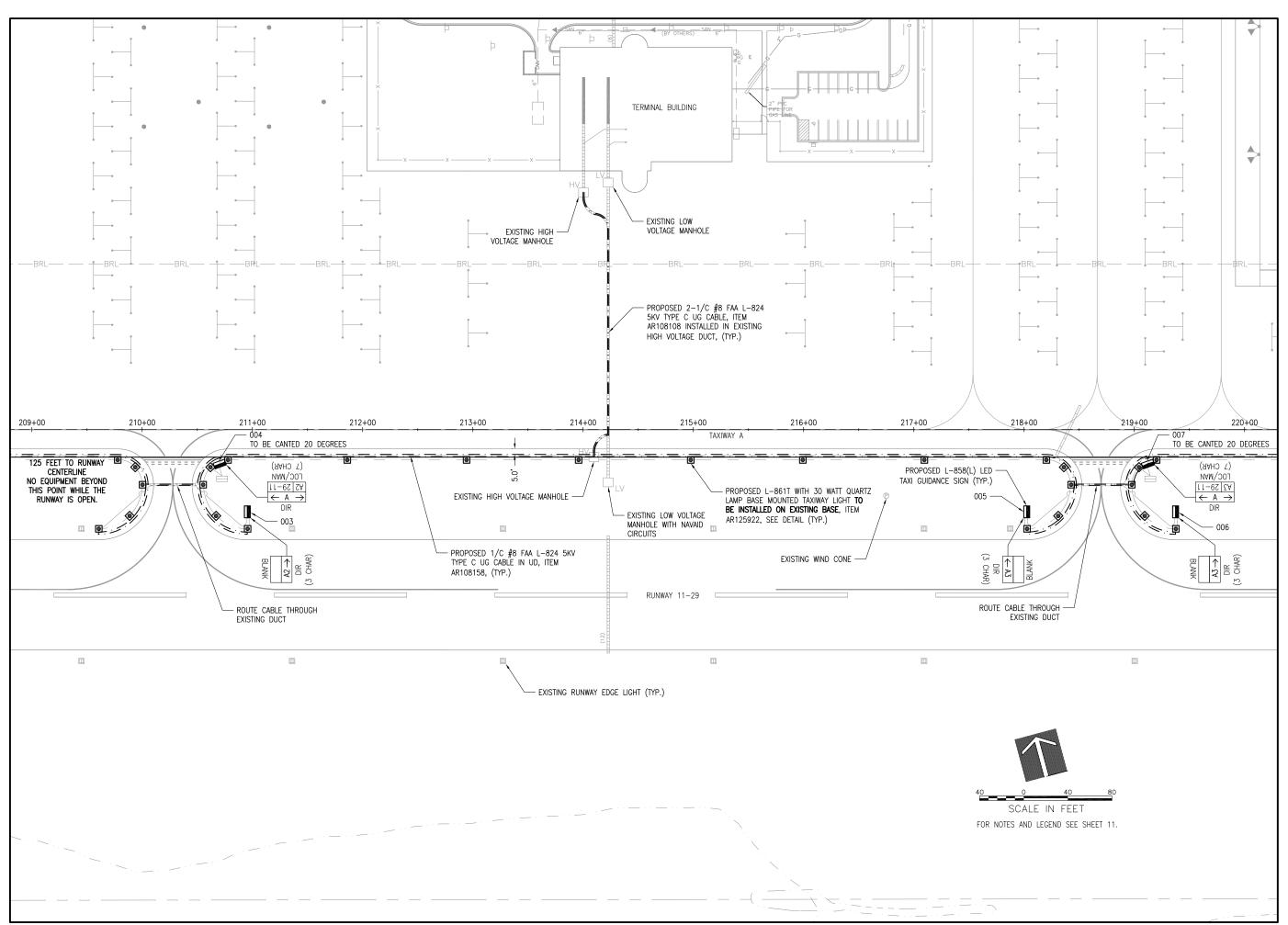
REHABILITATE AIRFIELD LIGHTS

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LIGHTING AND SIGNAGE PLAN



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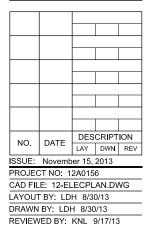


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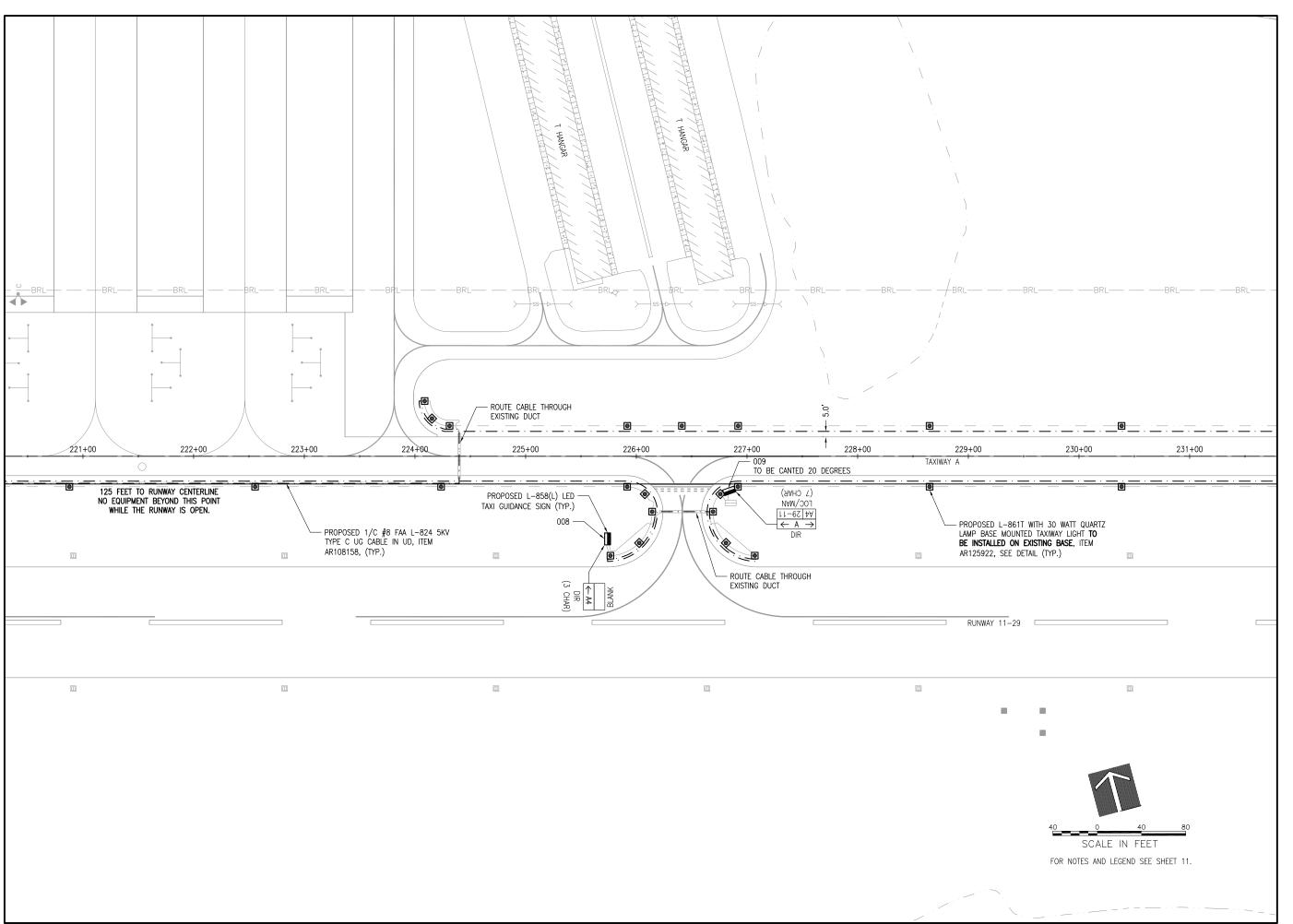
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LIGHTING AND SIGNAGE PLAN





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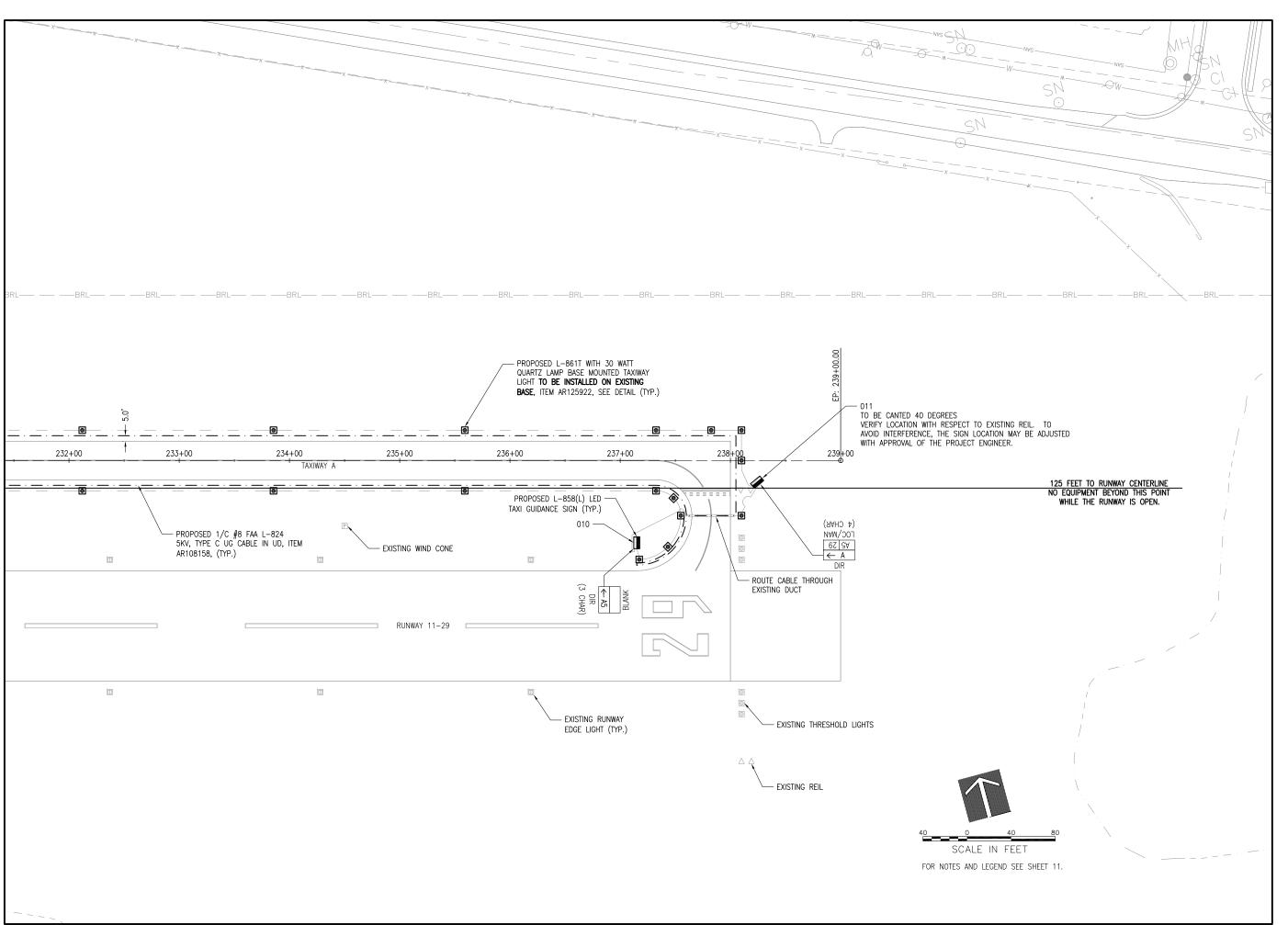
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	ISSUE: November 15, 2013					
i	PROJECT NO: 12A0156					

PROJECT NOVEMBER 15, 2013
PROJECT NO: 12A0156
CAD FILE: 13-ELECPLAN.DWG
LAYOUT BY: LDH 8/30/13
PRAWN BY: LDH 8/30/13
REVIEWED BY: KNL 9/17/13

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SHEET TITLE

LIGHTING AND SIGNAGE PLAN





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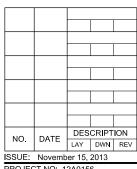


Schaumburg Regional Airport 905 Irving Park Road Schaumburg, IL 60193 Phone: 847-923-3863

REHABILITATE AIRFIELD LIGHTS

IDA No: 06C-4161 SBG No:3-17-0124-B30

Contract No: SH026



PROJECT NO: 12A0156 CAD FILE: 14-ELECPLAN.DWG LAYOUT BY: LDH 8/30/13 DRAWN BY: LDH 8/30/13 REVIEWED BY: KNL 9/17/13

SHEET TITLE

LIGHTING AND SIGNAGE PLAN

NO.	TAG ID	DESCRIPTION	ТҮРЕ	DIRECTION	SIDE A	SIDE B	STATION	OFFSE	т	NO.
001	14-1-001	Sign	L-858Y (L), Blank	Double Face	A1 →	Blank	200+85.00	80.00	RT	001
002	14-1-002	Sign	L-858L/R (L), L-858Y (L)	Double Face	A1 11	A→	200+54.93	33.10	RT	002
003	14-1-003	Sign	L-858Y (L), Blank	Double Face	A2 →	Blank	210+95.38	80.00	RT	003
004	14-1-004	Sign	L-858L/R (L), L-858Y (L)	Double Face	A2 29-11	←A→	210+65.31	33.10	RT	004
005	14-1-005	Sign	L-858Y (L), Blank	Double Face	← A3	Blank	218+02.38	80.00	RT	005
006	14-1-006	Sign	L-858Y (L), Blank	Double Face	A3 →	Blank	219+37.38	80.00	RT	006
007	14-1-007	Sign	L-858L/R (L), L-858Y (L)	Double Face	A3 29-11	← A →	219+07.31	33.10	RT	007
008	14-1-008	Sign	L-858Y (L), Blank	Double Face	← A4	Blank	225+74.04	80.00	RT	008
009	14-1-009	Sign	L-858L/R (L), L-858Y (L)	Double Face	A4 29-11	←A→	226+78.97	33.10	RT	009
010	14-1-010	Sign	L-858Y (L), Blank	Double Face	← A5	Blank	237+15.00	80.00	RT	010
011	14-1-011	Sign	L-858L/R (L), L-858Y (L)	Double Face	A5 29	←A	238+20.00	23.10	RT	011

NOTE: SIGNS ARE LOCATED TO THE MIDDLE OF THE FACE CLOSEST TO THE CENTERLINE.

TAXI GUIDANCE SIGN LEGEND

A TYPE L-858L OR L-858L(L) LOCATION SIGN - YELLOW LEGEND AND BORDER ON A BLACK BACKGROUND

11-29 TYPE L-858R OR L-858R(L) MANDATORY INSTRUCTION SIGN - BLACK OUTLINE ON OUTSIDE EDGE OF WHITE LEGEND ON A RED BACKGROUND

RAMP ↑ 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

- 1. THE PROPOSED LIGHTED 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).
- 2. 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.
- 3. 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.
- 4. THE PROPOSED TAXI GUIDANCE SIGNS WILL BE PAID FRO UNDER THE FOLLOWING ITEMS: AR125443 TAXI GUIDANCE SIGN, 3 CHARACTER -- PER EACH

AR125444 TAXI GUIDANCE SIGN, 4 CHARACTER -- PER EACH AR125447 TAXI GUIDANCE SIGN, 7 CHARACTER -- PER EACH

AND ADDITIVE ALTERNATE FOR UPGRADE TO LED TYPE ILLUMINATION:

AS800931 UPGRADE AIRFIELD SIGNS TO LED -- PER LUMP SUM
ITEM AS800931 SHALL BE THE TOTAL ADDITIONAL COST TO UPGRADE ALL OF THE TAXI GUIDANCE SIGNS TO TYPE L-858(L)

WITH LIGHT EMITTING DIODE (LED) TYPE ILLUMINATION.

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REHABILITATE AIRFIELD LIGHTS

IDA No: 06C-4161 SBG No:3-17-0124-B30

Contract No: SH026

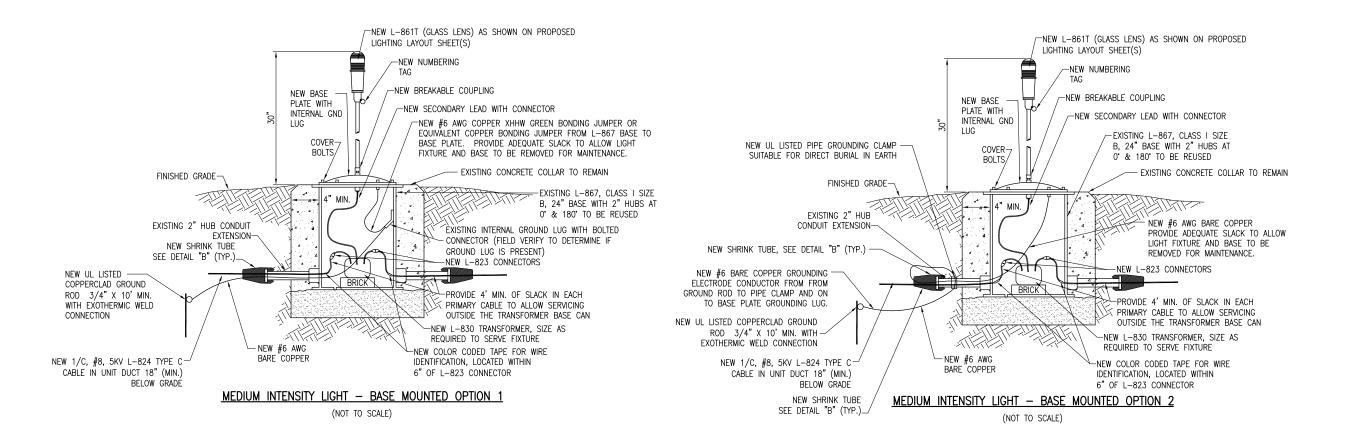
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	ISSUE: November 15, 2013				

PROJECT NO: 12A0156
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LAYOUT BY: LDH 9/3/13
DRAWN BY: LDH 9/3/13

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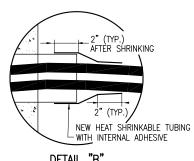
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SIGN SCHEDULE

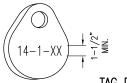


NOTES FOR AIRFIELD LIGHT FIXTURE DETAILS

- THE PROPOSED TAXIWAY EDGE LIGHTS SHALL BE TYPE L-861T (GLASS LENS), LIGHT FIXTURES WITH 30 WATT QUARTZ LAMPS MANUFACTURED IN ACCORDANCE TO FAA SPECIFICATION AC NO. 150/5345-46C, OR LATEST EDITION IN FORCE AND SHALL BE FAA APPROVED AND IN COMPLIANCE WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN REQUIREMENTS. ALL LIGHTS SHALL HAVE AN OVERALL HEIGHT OF 30 IN.
- LIGHT CANS FOR THE TAXIWAY LIGHT FIXTURES ARE EXISTING AND SHALL BE USED WITH THE REPLACEMENT TAXIWAY LIGHT FIXTURES. PROVIDE NEW LIGHT BASE PLATES SIZED AND COMPATIBLE WITH THE RESPECTIVE LIGHT BASES AND LIGHT FIXTURES WITH STAINLESS STEEL BOLTS. FIELD VERIFY EXISTING CONDITIONS TO DETERMINE GROUNDING METHOD FOR LIGHT FIXTURES AND BASES.
- PRIOR TO INSTALLING THE PROPOSED AIRFIELD LIGHT FIXTURES, APPLY AN OXIDE-INHIBITING, ANTI-SEIZING COMPOUND TO ALL SCREWS, NUTS, BREAKABLE COUPLING, AND ALL PLACES WHERE METAL COMES INTO CONTACT WITH METAL.
- SERIES CIRCUIT ISOLATION TRANSFORMERS FOR THE AIRFIELD LIGHTING AND TAXI GUIDANCE SIGNS SHALL BE MANUFACTURED TO FAA SPECIFICATION AC 150/5345-47B, AC 150/5345-47C, (OR CURRENT EDITION IN FORCE), AND SHALL BE FAA-APPROVED (ETL-CERTIFIED). SERIES CIRCUIT TRANSFORMER SHALL BE PROPERLY SIZED FOR THE RESPECTIVE AIRFIELD LIGHTING DEVICE, AND SHALL BE AS RECOMMENDED BY THE RESPECTIVE EQUIPMENT MANUFACTURER. CONFIRM PROPER TRANSFORMER SELECTION AND SIZING WITH THE RESPECTIVE EQUIPMENT MANUFACTURER.
- IDENTIFICATION TAGS SHALL BE ATTACHED TO EACH AIRFIELD LIGHT FIXTURE. ID TAG NUMBERING SHALL BE SEQUENTIAL FROM LOW STATION TO HIGH STATION (WEST TO EAST). CONTRACTOR TO VERIFY WITH RESIDENT ENGINEER.
- RUBBER AND PLASTIC ELECTRICAL TAPES SHALL BE SCOTCH ELECTRICAL TAPE NUMBERS 23 (2"WIDE) OR 130C (2"WIDE) AND 88 (1.5"WIDE) RESPECTIVELY, AS MANUFACTURED THE MINNESOTA MINING AND MANUFACTURING COMPANY, OR EQUIVALENT.



DETAIL "B" (NOT TO SCALE)



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

TAG DETAIL (NOT TO SCALE)

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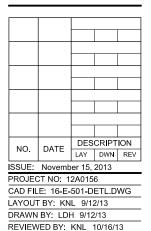


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REHABILITATE AIRFIELD LIGHTS

IDA No: 06C-4161 SBG No:3-17-0124-B30

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AIRFIELD LIGHT FIXTURE DETAILS

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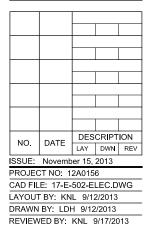


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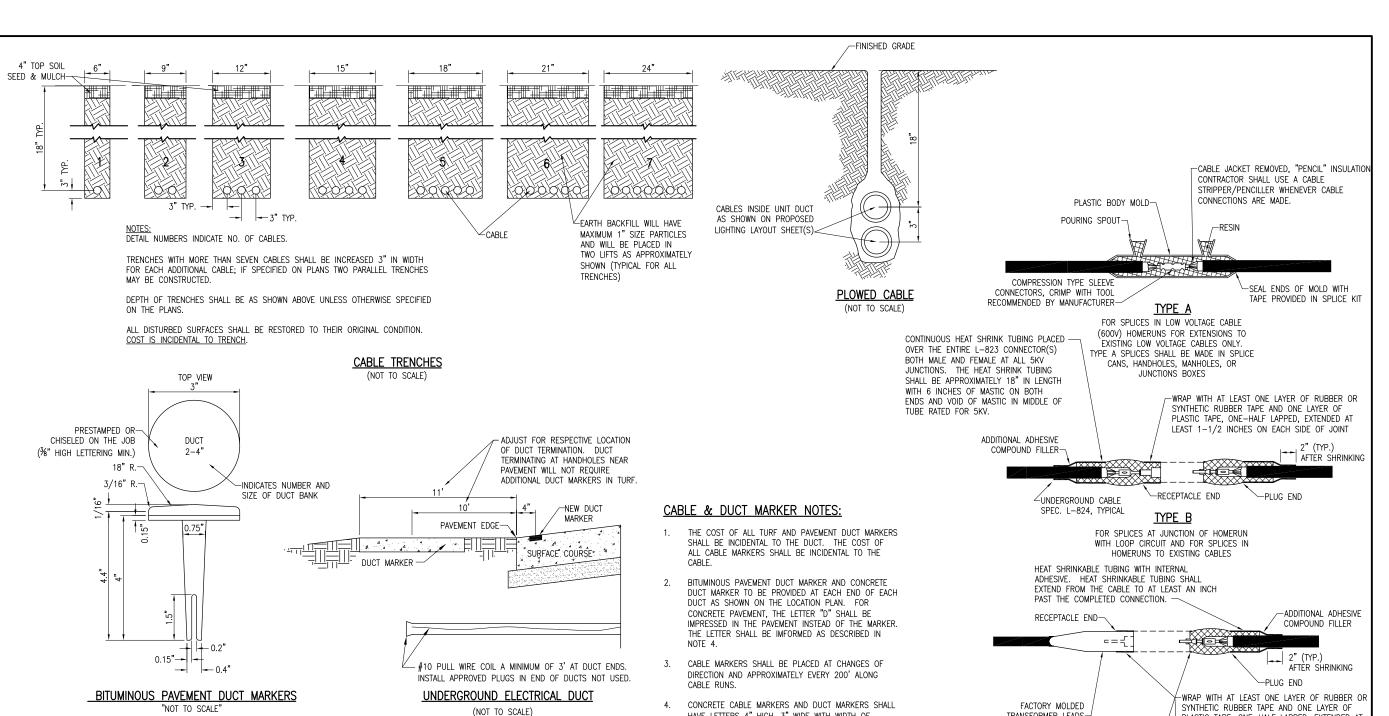
REHABILITATE AIRFIELD LIGHTS

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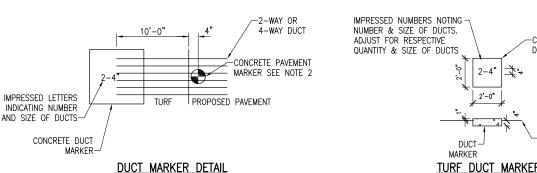


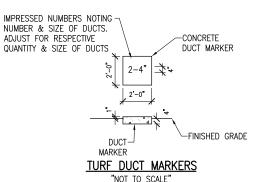
TAXI GUIDANCE SIGN DETAILS



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

"NOT TO SCALE

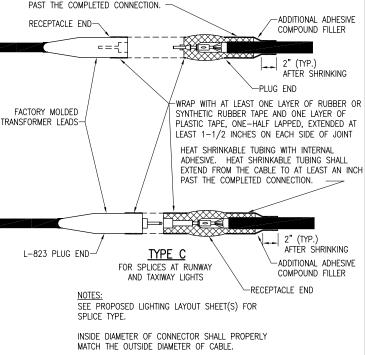




IMPRESSED LETTERS AND DIRECTIONAL ARROW, ADJUST TO CABLE LAYOUT -CONCRETE CABLE MARKER CABLE 2'-0" -FINISHED GRADE CABLE-MARKER TURF CABLE MARKERS

"NOT TO SCALE"

- HAVE LETTERS 4" HIGH, 3" WIDE WITH WIDTH OF STROKE 1/2" AND 1/4" DEEP. ALL LETTERS, NUMBERS AND ARROWS TO BE IMPRESSED
- EMPLOY THE FOLLOWING METHODS WHERE ADDITIONAL SPACE TO FIT LEGEND IS REQUIRED: A. REDUCE LETTER SIZE TO 3" HIGH BY 2" WIDE B. INCREASE MARKER SIZE TO 30" X 30" C. PROVIDE ADDITIONAL MARKERS PLACED SIDE BY SIDE



CABLE SPLICES

(NOT TO SCALE)

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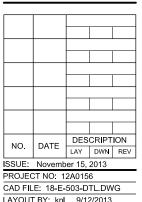


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REHABILITATE **AIRFIELD LIGHTS**

IDA No: 06C-4161 SBG No:3-17-0124-B30

Contract No: SH026



ELECTRICAL DETAILS

DRAWN BY: LDH 9/12/2013

SHEET TITLE

REVIEWED BY: KNL 9/17/2013

- 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 OR DESIGNATED 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).
- 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.
- 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.
- 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 PROJECT REPRESENTATIVE TO THE CONTRACTOR REGARDING CHANGES IN OR DEVIATIONS FROM THE PLANS AND SPECIFICATIONS SHALL BE IN WRITING WITH COPIES SENT TO THE AIRPORT OWNER AND THE ILLINOIS DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS. THE CONTRACTOR SHALL NOT ACCEPT ANY VERBAL INSTRUCTIONS FROM THE RESIDENT ENGINEER/RESIDENT PROJECT REPRESENTATIVE REGARDING ANY CHANGES FROM THE PLANS AND SPECIFICATIONS.
- A MINIMUM OF THREE COPIES OF THE INSTRUCTION BOOK SHALL BE SUPPLIED WITH EACH DIFFERENT TYPE OF EQUIPMENT. THE BOOKS DESCRIBING A MORE SOPHISTICATED TYPE OF EQUIPMENT, SUCH AS REGULATORS, PAPI, REIL, ETC. AS A MINIMUM SHALL CONTAIN THE FOLLOWING:
 - A. 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

- 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
- 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, RED AND BLUE SHALL BE USED FOR PHASE CONDUCTORS ON 208/120VAC THREE—PHASE, FOUR WIRE SYSTEMS. NEUTRAL CONDUCTORS, SIZE NO. 6 AWG OR SMALLER, SHALL BE IDENTIFIED BY A CONTINUOUS WHITE OUTER FINISH ALONG ITS ENTIRE LENGTH. NEUTRAL CONDUCTORS LARGER THAN NO. 6 AWG SHALL BE IDENTIFIED EITHER BY A CONTINUOUS WHITE OUTER FINISH ALONG ITS ENTIRE LENGTH OR BY THE USE OF WHITE TAPE AT ITS TERMINATIONS AND INSIDE ACCESSIBLE WIREWAYS. TO COMPLY WITH THE REQUIREMENTS OF NEC 200.6. INSULATED GROUND CONDUCTORS SHALL HAVE GREEN COLORED INSULATION FOR ALL CONDUCTOR SIZES (AWG OR KCMIL) TO COMPLY WITH THE REPOSED TO THE SYSTEM WITH THE PROJECT ENGINEER AND RESIDENT ENGINEER /RESIDENT PROJECT REPRESENTATIVE.
- 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 LITHIZATION.
- IN CONTROL WIRING THE SAME COLOR SHALL BE USED THROUGHOUT THE SYSTEM FOR THE SAME FUNCTION, SUCH AS 10%, 30%, 100% BRIGHTNESS CONTROL, ETC.
- LOW VOLTAGE (600 V.) AND HIGH VOLTAGE (5000 V.) CONDUCTORS SHALL BE INSTALLED IN SEPARATE WIREWAYS.
- 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.
- 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
- SPLICES AND JUNCTION POINTS SHALL BE PERMITTED ONLY IN JUNCTION BOXES, DUCTS EQUIPPED WITH REMOVABLE COVERS, AND AT EASILY ACCESSIBLE LOCATIONS.
- . CIRCUIT BREAKERS IN POWER DISTRIBUTION PANEL(S) SHALL BE THERMAL-MAGNETIC MOLDED CASE, PERMANENT TRIP WITH 100 AMPERE, MINIMUM FRAME.
- DUAL LUGS SHALL BE USED WHERE TWO (2) WIRES, SIZE NO. 6 OR LARGER, ARE TO BE CONNECTED TO THE SAME TERMINAL.
- ALL INTERIOR WALL MOUNTED EQUIPMENT ENCLOSURES SHALL BE MOUNTED ON HOT DIPPED GALVANIZED STEEL STRUT SUPPORT, OR STAINLESS STEEL STRUT SUPPORT, WITH CORROSION RESISTANT HARDWARE.
- 14. SUPPORT FOR EXTERIOR MOUNTED EQUIPMENT SHALL USE HOT DIPPED GALVANIZED STEEL STRUT SUPPORT OR STAINLESS STEEL STRUT SUPPORT WITH STAINLESS STEEL HARDWARE. PROVIDE ZINC RICH PAINT APPLIED TO FIELD CUTS OF GALVANIZED STEEL SUPPORT TO MINIMIZE THE POTENTIAL FOR CORROSION PER THE RESPECTIVE STRUT SUPPORT MANUFACTURER'S RECOMMENDATIONS.

- 15. CONDUITS FOR ELECTRIC SERVICE ENTRANCE AND FEEDERS SHALL BE AS DETAILED HEREIN ON THE PLANS. WHERE GALVANIZED RIGID STEEL CONDUIT IS SPECIFIED IT SHALL HAVE THREADED FITTINGS. SET SCREW TYPE FITTINGS WILL NOT BE ACCEPTABLE. CONDUITS FOR UNDERGROUND APPLICATIONS SHALL BE AS DETAILED HEREIN. CONDUITS FOR GROUNDING ELECTRODE CONDUCTORS OR INDIVIDUAL GROUNDING CONDUCTORS SHALL BE SCHEDULE 40 OR SCHEDULE 80 PVC.
- 16. PROVIDE LIQUID TIGHT FLEXIBLE METAL CONDUIT AT CONNECTIONS TO EQUIPMENT SUBJECT TO VIBRATION OR WHERE FLEXIBILITY IS REQUIRED. LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE U.L. LISTED TO MEET THE REQUIREMENTS OF NEC 350.6, SUITABLE FOR GROUNDING, SUNLIGHT RESISTANT, AND RESISTANT TO OIL, GASOLINE, AND GREASE. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO MOTORS, TRANSFORMERS, & CONSTANT CURRENT REGULATORS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. DO NOT INSTALL LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS NOT UL. LISTED. CONFIRM LIQUID—TIGHT FLEXIBLE METAL CONDUIT BEARS THE UL LABEL PRIOR TO INSTALLING IT.
- UNLESS OTHERWISE SHOWN, ALL EXPOSED CONDUITS SHALL BE RUN PARALLEL TO OR AT RIGHT ANGLES WITH THE LINES OF THE STRUCTURE.
- 18. ALL STEEL CONDUITS, FITTINGS, NUTS, BOLTS, ETC. SHALL BE GALVANIZED.
- USE CONDUIT BUSHINGS AT EACH CONDUIT TERMINATION. WHERE NO. 4 AWG OR LARGER UNDERGROUND WIRE IS INSTALLED, USE INSULATED BUSHINGS.
- USE DOUBLE LOCK NUTS AT EACH CONDUIT TERMINATION.
- 21. WRAP ALL PRIMARY AND SECONDARY POWER TRANSFORMER CONNECTIONS WITH SUFFICIENT LAYERS OF INSULATING TAPE (3M SCOTCH 23 ALL-VOLTAGE SPLICING TAPE, 3M SCOTCH 13OC 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.
- UNLESS OTHERWISE NOTED, ALL SINGLE CONDUCTOR CONTROL WIRING SHALL BE NO. 12 AWG. COPPER MINUMUM.
- 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 VOI TAGE 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 FACH TERMINAL CONDUCTOR AND TERMINAL.
 - I. ALL WIRING SHALL BE NEATLY TRAINED AND LACED.
 - J. MINIMUM WIRE SIZE SHALL BE NO. 12 AWG.
- 24. FURNISH & INSTALL A WEATHERPROOF WARNING LABEL FOR EACH METER SOCKET, SERVICE DISCONNECT, SAFETY SWITCH, CUTOUT, PANELBOARD, & CONTROL PANEL TO WARN PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS, PER THE REQUIREMENTS OF NEC 110.16 "FLASH PROTECTION".

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REVIEWED BY: KNL 9/17/2013
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SHEET TITLE

ELECTRICAL NOTES SHEET 1

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

- 20. 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.
- 21. GALVANIZED/PAINTED EQUIPMENT/COMPONENT SURFACES SHALL NOT BE DAMAGED BY DRILLING, FILING, ETC. DRAIN HOLES IN METAL TRANSFORMER HOUSINGS SHALL BE MADE BEFORE GALVANIZING.
- 22. FDGE LIGHT NUMBERING TAGS SHALL BE FACING THE PAVEMENT
- 23. CABLE/SPLICE/DUCT MARKERS SHALL BE PRECAST CONCRETE OF THE SIZE SHOWN. LETTERS/NUMBERS/ARROWS FOR THE LEGEND TO BE IMPRESSED INTO THE TOPS OF THE MARKERS SHALL BE PRE—ASSEMBLED AND SECURED IN THE MOLD BEFORE THE CONCRETE IS POURED. LEGEND INSCRIBED BY HAND IN WET CONCRETE SHALL NOT BE ACCEPTABLE.
- 24. ALL UNDERGROUND CABLE RUNS SHALL BE IDENTIFIED BY CABLE MARKERS AT 200 FEET MAXIMUM SPACING, WITH AN ADDITIONAL MARKER AT EACH CHANGE OF DIRECTION OF THE CABLE RUN. CABLE MARKERS SHALL BE INSTALLED IMMEDIATELY ABOVE THE CARLES
- THERE SHALL BE NO SPLICES BETWEEN THE ISOLATION TRANSFORMERS. L-823 CONNECTORS ARE ALLOWED AT TRANSFORMER CONNECTIONS ONLY, UNLESS OTHERWISE SHOWN
- 26. APPLY AN OXIDE INHIBITING, ANTI-SEIZING COMPOUND TO ALL SCREWS, NUTS AND BREAKAGE COUPLING THREADS
- 27. LOCATIONS OF ENDS OF ALL UNDERGROUND DUCTS SHALL BE IDENTIFIED BY DUCT MARKERS
- 28. WHERE A PARALLEL, CONSTANT VOLTAGE PAPI SYSTEM IS PROVIDED, THE "T" SPLICES SHALL BE OF THE CAST TYPE.
- CONCRETE USED FOR SLABS, FOOTINGS, BACKFILL AROUND TRANSFORMER HOUSINGS, MARKINGS. ETC. SHALL BE 3500 PSI. AIR—ENTRAINED.
- 30. ALL POWER AND CONTROL CABLES IN MAN/HAND HOLES SHALL BE TAGGED. USE EMBOSSED COPPER STRIPS TO BE ATTACHED AT BOTH ENDS TO THE CABLE BY THE USE OF PLASTIC STRAPS. MINIMUM OF TWO TAGS SHALL BE PROVIDED ON EACH CABLE IN A MAN/HAND HOLE—ONE AT THE CABLE ENTRANCE AND ONE AT THE CABLE EXIT.
- THE LOCATION, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND AND/OR ABOVEGROUND UTILITIES INDICATED ON THE PLANS IS NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. NEITHER THE AIRPORT OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY WHATEVER IN RESPECT TO ACCURACY, COMPLETENESS, OR SUFFICIENCY OF THE INFORMATION. THERE IS NO GUARANTEE EITHER EXPRESSED OR IMPLIED, THAT THE LOCATIONS, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ARE REPRESENTATIVE OF THOSE TO BE ENCOUNTERED IN THE CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES OF HIS OPERATIONAL PLANS AND SHALL OBTAIN FROM THE RESPECTIVE UTILITY COMPANIES DETAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF THEIR FACILITIES AND THE WORKING SCHEDULE OF THE COMPANIES FOR REMOVAL OR ADJUSTMENT WHERE REQUIRED. IN THE EVENT AN UNEXPECTED UTILITY INTERFERENCE IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY COMPANY OF JURISDICTION. THE OWNER'S REPRESENTATIVE AND/OR THE RESIDENT ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY DAMAGE TO SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT. ALL UTILITY CABLES AND LINES SHALL BE LOCATED BY THE RESPECTIVE UTILITY. CONTACT JULIE (JOINT UTILITY LOCATION INFORMATION FOR EXCAVATORS) FOR UTILITY INFORMATION, PHONE: 1-800-892-0123. CONTACT THE FAA (FEDERAL AVIATION ADMINISTRATION) FOR ASSISTANCE IN LOCATING FAA CABLES AND UTILITIES. LOCATION OF FAA POWER, CONTROL AND COMMUNICATION CABLES SHALL BE COORDINATED WITH AND/OR LOCATED BY THE FAA. ALSO CONTACT AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE FOR ASSISTANCE IN LOCATING UNDERGROUND AIRPORT CABLES AND/OR UTILITIES. ALSO COORDINATE WORK WITH ALL ABOVE GROUND UTILITIES.
- 32. WHEN PREPARING CABLE FOR SPLICES, THE CONTRACTOR SHALL USE A CABLE STRIPPER/PENCILLER WHENEVER CABLE CONNECTIONS ARE MADE.

GROUNDING NOTES FOR 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 150/5340-30G 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 CONNECTED TO THE GROUND LUG ON THE RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND A 3/4-INCH DIAMETER BY 10-FEET LONG (MINIMUM) UL LISTED COPPER CLAD GROUND ROD. 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 BURY 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 30 INCHES MINIMUM BELOW GRADE, UNLESS SPECIFIED OTHERWISE HEREIN, FOR RESPECTIVE APPLICATIONS.
- 2. 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 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 2011 NATIONAL ELECTRICAL CODE ARTICLE 250-12.
- PER FAA 150/5340-30G THE RESISTANCE TO GROUND OF THE RESPECTIVE MOUNTING STAKE OR LIGHT BASE (WITH GROUND ROD CONNECTED) MUST BE 25 OHMS OR LESS.
- 5. FOR TAXIWAY LIGHTS THAT ARE SPACED WITH LESS THAN 10 FEET OF SEPARATION BETWEEN THEM, PROVIDE ONE 3/4-INCH DIAMETER BY 10 FEET LONG GROUND ROD PER TWO ADJACENT TAXIWAY LIGHTS. LOCATE GROUND ROD MIDWAY BETWEEN THE TWO TAXIWAY LIGHTS.
- 6. FOR EACH AIRFIELD LIGHT FIXTURE, TAXI GUIDANCE SIGN, AND NAVAID THE CONTRACTOR SHALL TEST THE MADE ELECTRODE GROUND SYSTEM WITH AN INSTRUMENT SPECIFICALLY DESIGN FOR TESTING GROUND SYSTEMS. TEST RESULT 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 PROJECT ENGINEER.

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REHABILITATE AIRFIELD LIGHTS

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SHEET TITLE

ELECTRICAL NOTES SHEET 2

ELECTRICAL LEGEND — ONE—LINE DIAGRAM						
⊸	CABLE TERMINATOR/LUG					
***	TRANSFORMER					
__	DISCONNECT SWITCH					
<u></u>	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					
a	INDICATING LIGHT					
M	MOTOR					
(#)	LOAD, MOTOR, # = HORSEPOWER					
0	ELECTRIC UTILITY METER BASE					
•	JUNCTION BOX WITH SPLICE					
xxx	XXX EQUIPMENT, XXX = DEVICE DESCRIPTION					
GND	GROUND BUS OR TERMINAL					
S/N NEUTRAL BUS						
PANELBOARD WITH MAIN LUGS						
# 1	PANELBOARD WITH MAIN BREAKER					
* ₩□≫	FUSE PANEL WITH MAIN FUSE PULLOUT					
DUPLEX RECEPTACLE 120V SINGLE PHASE GROUNDING						
	CONTROL STATION					
N EM	TRANSFER SWTICH					
ENGINE GENERATOR SET						

	ELECTRICAL LEGEND — SCHEMATIC				
⊢ ⊢	NORMALLY OPEN (N.O.) CONTACT				
<u> </u>	NORMALLY CLOSED (N.C.) CONTACT				
(\$*)	STARTER COIL, * = STARTER NUMBER				
OL OL	OVERLOAD RELAY CONTACT				
<u>-</u> ∦ - (CR*)	CONTROL RELAY, * = CONTROL RELAY NUMBER				
(R*)	RELAY, * = RELAY NUMBER				
	TOGGLE SWITCH / 2 POSITION SWITCH				
OFF_ AUTO	TOOSEL SHITCH / 2 FOSHION SHITCH				
OFF AUTO	2-Position selector switch				
HAND FAUTO XOO OOX	3-POSITION SELECTOR SWITCH (H-O-A SHOWN)				
	2 POLE DISCONNECT SWITCH				
	3 POLE DISCONNECT SWITCH				
<u>~</u>	PHOTOCELL				
-8-	TERMINAL BLOCK, * = TERMINAL NUMBER				
	DEVICE TERMINAL, * = DEVICE TERMINAL NUMBER				
	INTERNAL PANEL WIRING				
	FIELD WIRING				
	FUSE				
GND	GROUND BUS OR TERMINAL				
S/N	NEUTRAL BUS				
#	GROUND, GROUND ROD, GROUND BUS				
0 0	INDUSTRIAL CONTROL RELAY OR LIGHTING CONTACTOR				
	S1 CUTOUT HANDLE REMOVED				
 	S1 CUTOUT HANDLE INSERTED				
2	N.O. THERMAL SWITCH				
-J	N.C. THERMAL SWITCH				
(m)	L-830 SERIES ISOLATION TRANSFORMER				

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

OVERLOAD

PB	PULL BOX		
PC	PHOTO CELL		
PDB	POWER DISTRIBUTION BLOCK		
PNL	PANEL		
RCPT	RECEPTACLE		
R	RELAY		
S	STARTER		
SPD	SURGE PROTECTION DEVICE		
SPST	SINGLE POLE SINGLE THROW		
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR		
TYP	TYPICAL		
UG	UNDERGROUND		
UGE	UNDERGROUND ELECTRIC		
UL	UNDERWRITER'S LABORATORIES		
٧	VOLTS		
W/	WITH		
W /0	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 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 OR DESIGNATED 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).
- 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

- 4. 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 LIFMC 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 AND LOW VOLTAGE CIRCUITS SHALL NOT BE INSTALLED IN THE SAME WIREWAY, CONDUIT, DUCT, OR HANDHOLE.



REHABILITATE AIRFIELD LIGHTS

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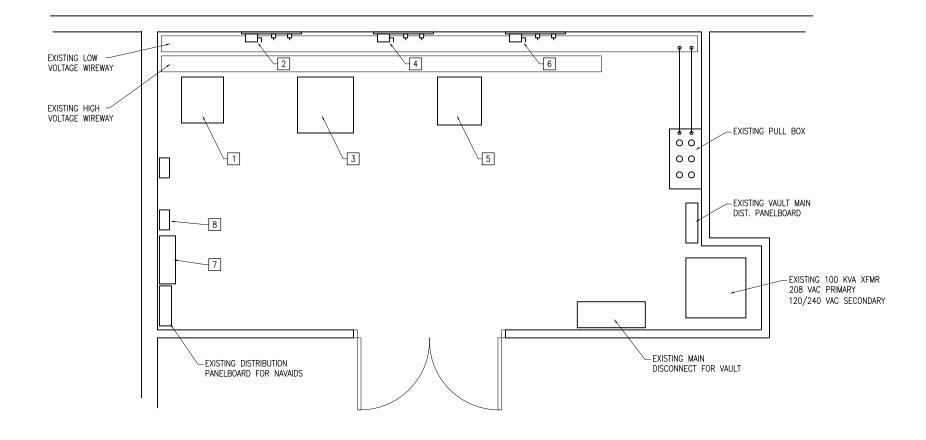
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SHEET TITLE

ELECTRICAL LEGEND AND ABBREVIATIONS



GENERAL NOTES

- ALL VAULT WORK, AND/OR POWER OUTAGES, SHALL BE COORDINATED WITH THE AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE AND THE RESIDENT ENGINEER/RESIDENT PROJECT REPRESENTATIVE.
- 2. CONTRACTOR SHALL EXAMINE THE SITE AND FIELD VERIFY EXISTING CONDITIONS.
- 3. ALL VAULT WORK, POWER OUTAGES AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER OR DESIGNATED 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 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).
- EQUIPMENT DESIGNATED FOR REMOVAL SHALL BE TURNED OVER TO THE AIRPORT.
 IN THE EVENT THE AIRPORT DOES NOT WANT THE RESPECTIVE EQUIPMENT, THE CONTRACTOR SHALL DISPOSE OF IT OFF SITE.
- EXISTING ABANDONED CABLES INSIDE VAULT SHALL BE REMOVED. EXISTING CABLES
 AND WIRING ASSOCIATED WITH SYSTEMS TO BE REMOVED AND/OR REPLACED SHALL
 BE REMOVED WHERE ACCESSIBLE.
- 6. EXISTING VAULT ROOM DIMENSIONS ARE APPROXIMATE BASED ON FIELD DATA.



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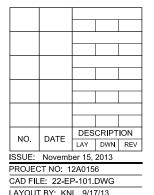


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REHABILITATE AIRFIELD LIGHTS

IDA No: 06C-4161 SBG No:3-17-0124-B30

Contract No: SH026



EXISTING FLOOR PLAN FOR VAULT

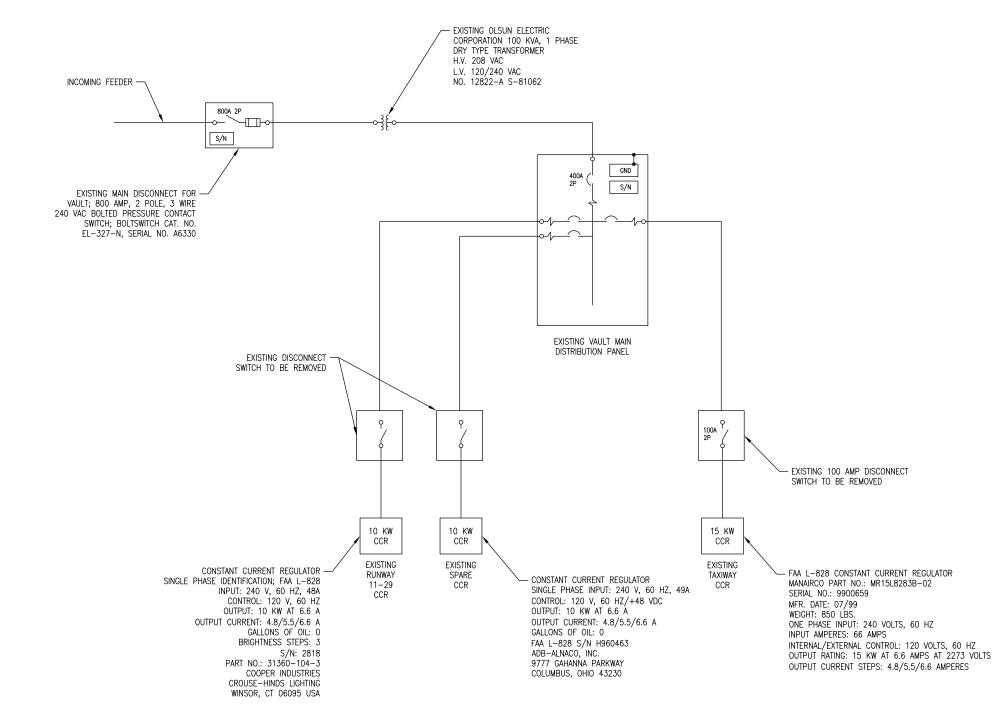
DRAWN BY: CWS 9/17/13
REVIEWED BY: KNL 10/16/13

SHEET TITLE

N EXISTING FLOOR PLAN FOR VAULT O 1' 2' 4' HALF SIZE SCALE: 1/4" = 1'-0" FULL SIZE SCALE: 1/2" = 1'-0"

KEYED NOTES

- EXISTING CCR FOR RUNWAY 11-29 LIGHTING; CROUSE-HINDS PART NO. 31360-104-3, 10kW UNIT TO BE DISCONNECTED AND RELOCATED TO STORAGE AREA.
- 2 EXISTING LOW VOLTAGE DISCONNECT AND HIGH VOLTAGE CUTOUTS WITH RUNWAY LIGHT FOR RUNWAY 11-29 LIGHTING CIRCUIT TO BE DISCONNECTED AND REMOVED.
- 3 EXISTING CCR FOR TAXIWAY LIGHTING; MANAIRCO PART NO MR15L8283B-02, 15KW UNIT TO BE DISCONNECTED AND REWIRED AS DETAILED HEREIN.
- EXISTING LOW VOLTAGE DISCONNECT AND HIGH VOLTAGE CUTOUTS WITH TAXIWAY LIGHT FOR TAXIWAY LIGHTING CIRCUIT TO BE DISCONNECTED AND REMOVED.
- [5] EXISTING SPARE CCR; ADB-ALNACO S/N H960463 10KW UNIT TO BE DISCONNECTED AND RELOCATED TO STORAGE AREA.
- [6] EXISTING LOW VOLTAGE DISCONNECT AND HIGH VOLTAGE CUTOUTS FOR SPARE CCR TO BE DISCONNECTED AND REMOVED.
- [7] EXISTING RELAY PANEL FOR NAVAIDS WITH L-821 CONTROL PANEL LOCATED BELOW TO BE DISCONNECTED, REMOVED, AND REPLACED WITH A NEW LIGHTING CONTACTOR
- 8 EXISTING L-854 RADIO RECEIVER TO REMAIN AND BE REWIRED AS DETAILED HEREIN.



NOTES

- ALL VAULT WORK, AND/OR POWER OUTAGES, SHALL BE COORDINATED WITH THE AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE AND THE RESIDENT ENGINEER/RESIDENT PROJECT REPRESENTATIVE.
- CONTRACTOR SHALL EXAMINE THE SITE AND FIELD VERIFY EXISTING CONDITIONS.
- ALL VAULT WORK, POWER OUTAGES AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER OR DESIGNATED 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 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).
- EQUIPMENT DESIGNATED FOR REMOVAL SHALL BE TURNED OVER TO THE AIRPORT. IN THE EVENT THE AIRPORT DOES NOT WANT THE RESPECTIVE EQUIPMENT, THE CONTRACTOR SHALL DISPOSE OF IT OFF SITE.
- EXISTING ABANDONED CABLES INSIDE VAULT SHALL BE REMOVED. EXISTING CABLES AND WIRING ASSOCIATED WITH SYSTEMS TO BE REMOVED AND/OR REPLACED SHALL BE REMOVED WHERE ACCESSIBLE.
- THE EXISTING CONSTANT CURRENT REGULATOR FOR THE TAXIWAY SHALL BE DISCONNECTED (INPUT POWER, OUTPUT POWER AND CONTROL WIRING) AND BE REWIRED AS DETAILED HEREIN.
- THE EXISTING CONSTANT CURRENT REGULATOR FOR RUNWAY 11-29 SHALL BE DISCONNECTED (INPUT POWER, OUTPUT POWER, AND CONTROL WIRING) AND RELOCATED TO A STORAGE AREA DESIGNATED BY THE AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE
- THE EXISTING SPARE CONSTANT CURRENT REGULATOR SHALL BE DISCONNECTED (INPUT POWER, OUTPUT POWER AND CONTROL WIRING) AND RELOCATED TO A STORAGE AREA DESIGNATED BY THE AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE
- THE EXISTING NAVAID CIRCUITS ARE NOT SHOWN ON THE ONE-LINE DIAGRAM. CONTRACTOR SHALL FIELD VERIFY AND CONFIRM THE EXISTING CIRCUITS AS APPLICABLE TO ACCOMMODATE NEW WORK.
- COORDINATE VAULT WORK TO MINIMIZE DOWNTIME OF AIRFIELD LIGHTING



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REHABILITATE AIRFIELD LIGHTS

IDA No: 06C-4161 SBG No:3-17-0124-B30

Contract No: SH026

NO DATE | DESCRIPTION | REV ISSUE: November 15, 2013 PROJECT NO: 12A0156

CAD FILE: 23-E-604 DWG

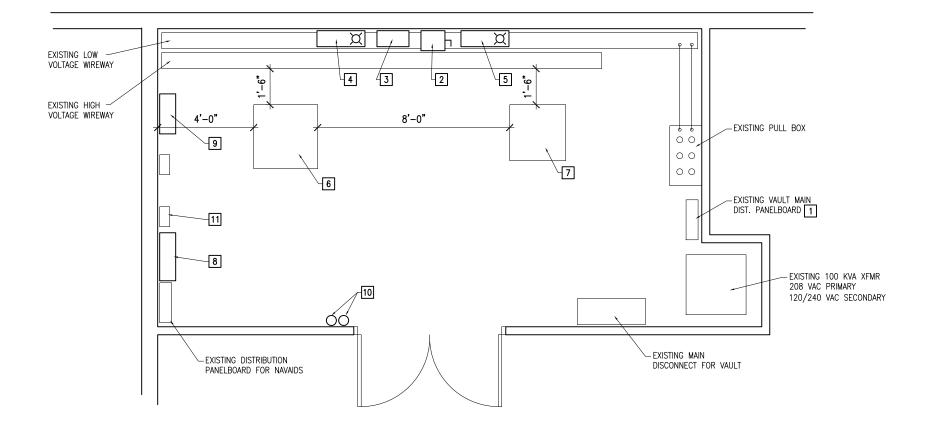
LAYOUT BY: KNI 9/13/13 DRAWN BY: LDH 9/13/13

REVIEWED BY: KNL 10/16/13

SHEET TITLE

EXISTING ELECTRICAL ONE-LINE FOR VAULT AND AIRFIELD

EXISTING ELECTRICAL ONE LINE DIAGRAM FOR VAULT AND AIRFIELD



N NEW FLOOR PLAN FOR VAULT O 1' 2' 4' HALF SIZE SCALE: 1/4" = 1'-0" FULL SIZE SCALE: 1/2" = 1'-0"

KEYED NOTES

- 1. FURNISH AND INSTALL A 100AMP, 2-POLE BOLT-ON BREAKER WITH 22,000 AIC AT 120/240 VAC FOR THE CCR FEEDER CIRCUIT.
- 2. NEW 200AMP, 240 VAC DOUBLE THROW FUSIBLE SAFETY SWITCH FOR THE CCR'S SEE GENERAL NOTE 1.
- 3. NEW TRANSFORMER PAIR CUTOUTS IN A NEMA 1 OR NEMA 12 ENCLOSURE WITH HINGED COVER AND PAD LOCKABLE FEATURE. SEE GENERAL NOTE 1.
- 4. NEW CUTOUTS FOR RUNWAY 11-29 LIGHTING IN A NEMA 1 OR NEMA 12 ENCLOSURE WITH HINGED COVER AND PAD LOCKABLE FEATURE. INCLUDE L-861 LIGHT FIXTURE FOR GROUND FAULT INDICATION. SEE GENERAL NOTE 1.
- 5. NEW CUTOUTS FOR TAXIWAY LIGHTING IN NEMA 1 OR NEMA 12 ENCLOSURE WITH HINGED COVER AND PAD LOCKABLE FEATURE. INCLUDE L-861 LIGHT FIXTURE FOR GROUND FAULT INDICATION. SEE GENERAL NOTE 1.
- 6. NEW 15 KW CCR FOR RUNWAY 11-29 AND TAXIWAY LIGHTING PRIMARY CCR. SEE
- 7. EXISTING MANAIRCO PART NO. MR15L8283B-02 CCR TO BE REWIRED FOR RUNWAY 11-29 AND TAXIWAY LIGHTING BACKUP/SPARE CCR. SEE GENERAL NOTE 1.
- B. NEW LIGHTING CONTACTOR CONTROL PANEL TO REPLACE EXISTING RELAY PANEL AND EXISTING L-821 CONTROL PANEL. SEE GENERAL NOTE 1.
- 9. NEW RADIO RELAY INTERFACE CONTROL PANEL FOR CCR'S.

- FURNISH AND INSTALL A UL RATED, 10 POUND CARBON DIOXIDE FIRE EXTINGUISHER SUITABLE FOR USE ON CLASS C FIRES AND A 10 POUND CLASS 4A:80B:C DRY CHEMICAL ABC FIRE EXTINGUISHER SUITABLE FOR USE ON CLASS A,B,C FIRES, IN THE VAULT. PER NFPA 10 "PORTABLE FIRE EXTINGUISHERS" CLASS C ARE FOR FIRES THAT INVOLVE ENERGIZED ELECTRICAL EQUIPMENT. FIRE EXTINGUISHERS SHALL BE MADE IN THE UNITED STATES OF AMERICA TO COMPLY WITH BUY AMERICAN REQUIREMENT. FIRE EXTINGUISHER TYPE CO2 SHALL BE AMEREX MODEL 330, ANSUL SENTRY 10 MODEL C010A-1 OR APPROVED EQUAL. FIRE EXTINGUISHER DRY CHEMICAL TYPE ABC SHALL BE AMEREX MODEL B456, OR APPROVED EQUAL. PROVIDE WALL MOUNTING BRACKET FOR EACH FIRE EXTINGUISHER. CONFIRM MODEL NUMBERS WITH THE RESPECTIVE FIRE EXTINGUISHER MANUFACTURER.
- 11. EXISTING L-854 RADIO RECEIVER.

GENERAL NOTES

- SEE "PROPOSED ELECTRICAL ONE-LINE DIAGRAM FOR VAULT AND AIRFIELD" FOR LOW VOLTAGE INPUT POWER WIRING REQUIREMENTS TO CCR'S (CONSTANT CURRENT REGULATORS), LIGHTING CONTACTOR PANEL, AND OTHER EQUIPMENT. SEE "HIGH VOLTAGE WIRING SCHEMATIC" FOR CCR OUTPUT WIRING REQUIREMENTS. SEE "AIRFIELD LIGHTING CONTROL WIRING SCHEMATIC" FOR CCR AND NAVAID CONTROL WIRING REQUIREMENTS.
- CONSTANT CURRENT REGULATORS AND THEIR RESPECTIVE SERIES PLUG CUTOUTS SHALL BE CLEARLY LABELED TO IDENTIFY THE RESPECTIVE REGULATOR DESIGNATION, RUNWAY OR TAXIWAY SERVED, POWER SOURCE OR CIRCUIT, AND VOLTAGE SYSTEM.
- MAINTAIN SEPARATION OF HIGH VOLTAGE WIRING FROM LOW VOLTAGE WIRING TO COMPLY WITH NEC 300.3(C)(2). HIGH VOLTAGE AND LOW VOLTAGE WIRING SHALL NOT BE INSTALLED IN THE SAME RACEWAY, CONDUIT, WIREWAY, PULL BOX, SPLICE CAN, HANDHOLE, OR MANHOLE.
- 4. THE CONTRACTOR SHALL SECURE, IDENTIFY AND PLACE ANY TEMPORARY EXPOSED WIRING IN CONDUIT TO PREVENT ELECTROCUTION AND FIRE IGNITION SOURCES AS PER THE REQUIREMENTS OF FFA AC 150/5370-2F OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION, PART 218, PARAGRAPH C.
- BOND EACH WIREWAY TO VAULT GROUND BUS WITH #6 AWG COPPER BONDING JUMPER.
- BOND EACH CCR FRAME/HOUSING TO VAULT GROUND BUS WITH #6 AWG COPPER BONDING JUMPER.
- MAINTAIN SEPARATION OF HIGH VOLTAGE AND LOW VOLTAGE CIRCUITS. LOW VOLTAGE WIRING SHALL ENTER THE RESPECTIVE CCR AT THE LOW VOLTAGE SECTION. HIGH VOLTAGE WIRING SHALL ENTER THE RESPECTIVE CCR AT THE HIGH VOLTAGE SECTION.
- 8. THE REGULATORS TO BE DISCONNECTED FROM THE CIRCUIT SHALL BE RELOCATED TO A STORAGE AREA DESIGNATED BY THE AIRPORT MANAGER OR DESIGNATED REPRESENTATIVE.

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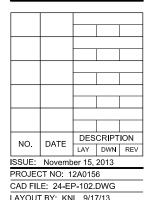


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REHABILITATE AIRFIELD LIGHTS

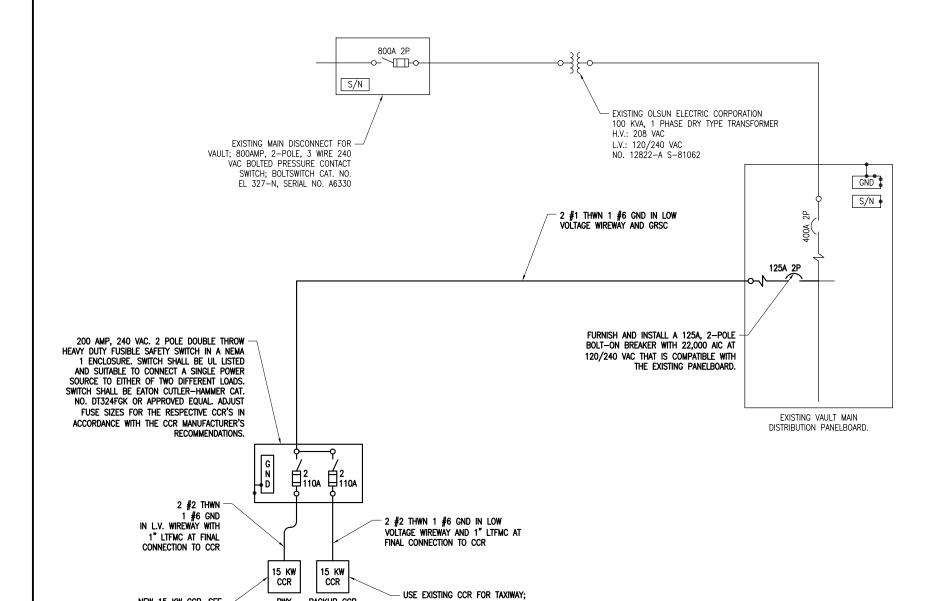
IDA No: 06C-4161 SBG No:3-17-0124-B30

Contract No: SH026



NEW FLOOR PLAN FOR VAULT

DRAWN BY: CWS 9/17/13
REVIEWED BY: KNL 10/16/13



BACKUP CCR

FOR RWY

11-29 AND

TAXIWAY

FAA L-828

SERIAL NO.: 990659

MFR. DATE: 07/99

weight: 850 lbs.

INPUT AMPERES: 66 AMPS

MANAIRCO PART NO.: MR15L8283B-02

ONE PHASE INPUT: 240 VOLTS, 60 HZ

INTERNAL/EXTERNAL CONTROL: 120 VOLTS, 60 HZ OUTPUT RATING: 15 KW AT 6.6 AMPS AT 2273 VOLTS

OUTPUT CURRENT STEPS: 4.8/5.5/6.6 AMPERES

RWY

11-29

AND

TAXIWAY

NFW 15 KW CCR. SFF

SPECIAL PROVISION

SPECS - 109

NEW ELECTRICAL ONE-LINE DIAGRAM FOR VAULT AND AIRFIELD

- ALL VAULT WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER OR DESIGNATED 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).
- 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 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.
- CONTRACTOR SHALL CONFIRM POWER REQUIREMENTS WITH THE ACTUAL NAMEPLATE ON EACH CONSTANT CURRENT REGULATOR (OR OTHER RESPECTIVE EQUIPMENT) AND ADJUST CIRCUIT BREAKER, WIRE SIZES & CONDUIT SIZES TO CONFORM WITH NEC & MANUFACTURER'S RECOMMENDATIONS WHERE APPLICABLE. WIRE SIZES SHOWN ON THE PLANS ARE MINIMUM.
- HIGH VOLTAGE & LOW VOLTAGE CIRCUITS SHALL NOT BE INSTALLED IN THE SAME WIREWAY, CONDUIT, HANDHOLE, MANHOLES, JUNCTION BOX, OR RACEWAY.
- LIFMC 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 LIFMC THAT IS NOT UL LISTED. CONFIRM LTFMC BEARS THE UL LABEL PRIOR TO INSTALLATION.
- CONFIRM VAULT TRANSFORMER SECONDARY IS PROPERLY GROUNDED. CORRECT WHERE APPLICABLE. CONTACT PROJECT ENGINEER
- ALL WORK SHOWN ON THIS SHEET SHALL BE PAID FOR UNDER ITEM AR109200 INSTALL ELECTRICAL EQUIPMENT PER LUMP SUM.



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REHABILITATE AIRFIELD LIGHTS

IDA No: 06C-4161 SBG No:3-17-0124-B30

Contract No: SH026

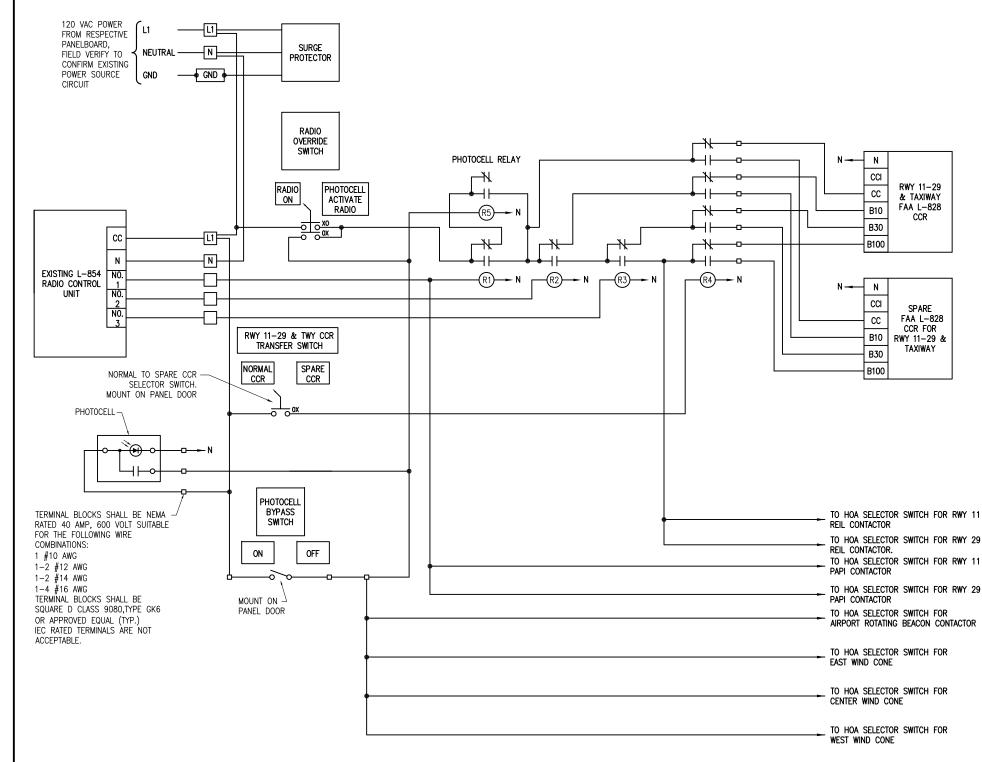
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ISSUE: November 15, 2013				
PROJECT NO: 12A0156				

CAD FILE: 25-E-601-LIN.DWG LAYOUT BY: KNI 9/12/13 DRAWN BY: LDH 9/12/13

REVIEWED BY: KNL 10/16/13

SHEET TITLE

NEW ELECTRICAL ONE-LINE FOR VAULT & AIRFIELD LIGHTING



AIRFIELD LIGHTING CONTROL WIRING SCHEMATIC

NOTES:

- . RELAY INTERFACE CONTROL PANEL SHALL BE MANUFACTURED BY AN FAA APPROVED L-821 PANEL BUILDER OR A UL 508 INDUSTRIAL CONTROL PANEL BUILDER, AND SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCE REQUIREMENTS. WHERE THE RELAY INTERFACE PANEL IS MADE BY AN L-821 PANEL BUILDER IT SHALL BE LABELED AS AN L-821 PANEL. RELAY INTERFACE CONTROL PANEL SHALL BE A SEPARATE PANEL. DO NOT COMBINE WITH LIGHTING CONTACTOR PANEL.
- 2. PANEL SHALL BE IN A NEMA 12 ENCLOSURE WITH HINGED COVER. DRILL HOLE IN BOTTOM OF ENCLOSURE TO ALLOW CONDENSATION TO ESCAPE.
- EXTERNAL CONTROL CABLE SHALL BE NO. 12 AWG COPPER, 600 VOLT CABLE. ALL PANEL INTERIOR CONTROL CABLE SHALL BE MINIMUM 16 AWG, COPPER, 600 VOLT CABLE.
- 4. IN THE AUTOMATIC MODE OF OPERATION THE RUNWAY 11-29 AND TAXIWAY CONSTANT CURRENT REGULATORS (PRIMARY UNIT & SPARE UNIT) SHALL BE CONTROLLED BY THE PHOTOCELL & THE L-854 RADIO CONTROL UNIT IN THE FOLLOWING MANNER:

PHOTOCELL - 10% BRIGHTNESS & ACTIVATE RADIO CONTROL

5 CLICKS - 30% BRIGHTNESS

7 CLICKS - 100% BRIGHTNESS

 THE RUNWAY 11-29 PAPI CIRCUITS WILL BE CONTROLLED IN THE AUTOMATIC MODE BY THE L-854 RADIO CONTROL UNIT IN THE FOLLOWING MANNER. CONFIRM CONTROL WITH AIRPORT MANAGER.

3 CLICKS -

5 CLICKS - REMAIN ON

7 CLICKS - REMAIN ON

THE RUNWAY 11-29 REIL CIRCUITS WILL BE CONTROLLED IN THE AUTOMATIC MODE BY THE PHOTOCELL & THE L-854 RADIO CONTROL UNIT IN THE FOLLOWING MANNER.

PHOTOCELL ACTIVATION ENABLES RADIO CONTROL

3 CLICKS - OFF 5 CLICKS - OFF

7 CLICKS - ON

- THE RADIO OVERRIDE SWITCH WILL ACTIVATE L-854 RADIO CONTROL 24 HOURS PER DAY IN THE "RADIO ON" POSITION. THE PHOTOCELL WILL ACTIVATE RADIO CONTROL IN THE "PHOTOCELL ACTIVATE RADIO" POSITION.
- IN THE AUTOMATIC MODE THE WIND CONES AND AIRPORT ROTATING BEACON WILL BE ACTIVATED BY THE PHOTOCELL OR PHOTOCELL BYPASS SWITCH.
- EQUIPMENT GROUND WIRES SHALL BE INCLUDED WITH EACH BRANCH CIRCUIT & EACH CONTROL CIRCUIT.
- 10. INCLUDE PHOTOCELL BYPASS SWITCH.
- 11. SURGE PROTECTOR SHALL BE UL LISTED PER UL 1449, SUITABLE FOR 120 VAC, 1 PH, 2 WIRE PLUS GROUND SYSTEM WITH SURGE CURRENT RATING OF 40 KA (MIN.), 8x20 MICROSECOND WAVE, AND STATUS INDICATION LIGHTS IN A WEATHERPOOF HOUSING, JOSLYN MODEL 1260-21, OR APPROVED EQUAL. MAINTAIN LEADS AS SHORT & AS STRAIGHT AS POSSIBLE. INCLUDE MOUNTING BRACKET.
- 12. INCLUDE EQUIPMENT GROUND BAR, ILSCO D167-12 OR EQUAL.
- 13. CONTROL RELAYS SHALL HAVE 10 AMP CONTACT RATINGS AT 240 VAC WITH 120 VAC COILS. PROVIDE 3 SPARE RELAYS FOR EACH TYPE USED IN THE RELAY
- COLOR CODING FOR THE CONTROL WIRING TO EACH CONSTANT CURRENT REGULATOR SHALL BE CONSISTENT FOR ALL REGULATORS. COLOR CODING SHALL BE AS FOLLOWS:

10%

ORANGE -YELLOW

% – TELLO)% – BLUE

EQUIPT. GND -GREEN

NEUTRAL -WHITE

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

- 15. "N" DESIGNATES NEUTRAL CONNECTION OR NEUTRAL CONDUCTOR.
- 16. THE RUNWAY LIGHTING AND NAVAIDS (INCLUDING PAPIS, REILS, WIND CONES AND AIRPORT ROTATING BEACON) SHALL REMAIN OPERATIONAL THROUGHOUT THE PROJECT EXCEPT WHEN NECESSARY TO INTERFACE TO THE NEW CONTROL SYSTEMS. CONTRACTOR SHALL PROVIDE WORK AND TEMPORARY CONNECTIONS AS APPLICABLE TO MAINTAIN OPERATION OF RUNWAY LIGHTING AND NAVAIDS.



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REHABILITATE AIRFIELD LIGHTS

IDA No: 06C-4161 SBG No:3-17-0124-B30

Contract No: SH026

NO.	DATE	DESCRIPTION			
INO.	DAIL	LAY	DWN	REV	
ISSUE:	Novemb	er 15,	2013		
PROJECT NO: 12A0156					
CAD FILE: 26-E-605.DWG					
LAYOUT	ГВҮ: KN	L 9/1:	3/13		
DRAWN BY: LDH: 9/13/13					

AIRFIELD LIGHTING CONTROL WIRING SCHEMATIC

REVIEWED BY: KNL 9/17/13

120VAC CONTROL POWER FROM RESPECTIVE RELAY INTERFACE PANEL

RWY 11

PAPI

RWY 11 REIL

RWY 9

LIGHTING CONTACTOR

(TYP.)

AUTO 1

OFF HAND | AUTO

HAND AUTO

LEGEND PLATE (TYP.)

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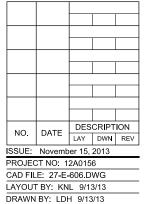


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IDA No: 06C-4161 SBG No:3-17-0124-B30

Contract No: SH026



LIGHTING **CONTACTOR PANEL SCHEMATIC**

REVIEWED BY: KNL 9/17/13

SHEET TITLE

V.	TI	г	c	

EXISTING

RUNWAY 11

PAPI CKT

EXISTING

RUNWAY 29

PAPI CKT

EXISTING RUNWAY 11

REIL CKT

EXISTING

RUNWAY 29 REIL CKT

EXISTING

AIRPORT

ROTATING

BEACON CKT

EXISTING EAST

WIND CONE CKT

EXISTING

CENTER WIND

CONE CKT

EXISTING WEST

WIND CONE CKT

- 15 AMP & 20 AMP INPUT POWER/BRANCH CIRCUITS SHALL BE #10 AWG COPPER THWN FROM THE RESPECTIVE POWER SOURCE TO THE LIGHTING CONTACTOR/RELAY PANEL. 25 AMP AND 30 AMP INPUT POWER/BRANCH CIRCUITS SHALL BE #8 AWG COPPER THWN (MIN.) FROM THE RESPECTIVE POWER SOURCE TO THE LIGHTING CONTACTOR/RELAY PANEL.
- INPUT CONTROL CIRCUITS SHALL BE #12 AWG COPPER THWN.
- FOR 120 VAC BRANCH CIRCUITS THE NEUTRAL CONDUCTOR SHALL NOT BE SWITCHED THROUGH THE RELAY CONTACTS. USE TERMINAL BLOCKS TO TRANSITION FROM VAULT BRANCH CIRCUIT WIRING TO FIELD WIRING.
- PROVIDE \sharp 10 AWG COPPER BONDING JUMPER FROM PANEL ENCLOSURE FRAME TO ENCLOSURE DOOR.
- PROVIDE 3-POSITION MAINTAINED CONTACT "HAND-OFF-AUTO" SELECTOR SWITCH FOR EACH LIGHTING CONTACTOR & MOUNT ON LIGHTING CONTACTOR PANEL ENCLOSURE DOOR. SELECTOR SWITCH SHALL BE SQUARE D CLASS 9001, TYPE KS43FBH13, OR APPROVED EQUAL. INCLUDE LEGEND PLATE TO IDENTIFY THE DEVICE CONTROLLED (EX: "WIND CONE" OR "AIRPORT ROTATING BEACON").

INPUT CONTACT -FROM L-854 RADIO

RELAY NO. 1

OUTPUT

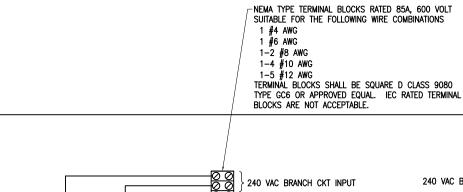
RECEIVER CONTROL

#12 AWG THWN

CONTROL WIRING)

TYP. FOR

NEMA TYPE TERMINAL BLOCK (TYP.)



RWY 11

PAPI

TO HOA SWITCH-

RWY 29

PAPI

RWY 11

REIL

TO HOA SWITCH-

RWY 29

REIL

TO HOA SWITCH

ON DOOR #10 THWN, MTW, OR THW-COPPER (TYP. FOR POWER CIRCUITS TO CONTACTORS)

LIGHTING CONTACTORS)

#12 THWN, MTW, OR THW COPPER

(TYP. FOR CONTROL CIRCUITS TO

ON DOOR

TO HOA SWITCH

ON DOOR

240 VAC BRANCH CKT OUTPUT

CONTROL POWER NEUTRAL

120 VAC CONTROL POWER

240 VAC BRANCH CKT INPUT

240 VAC BRANCH CKT OUTPUT

CONTROL POWER NEUTRAL

120 VAC CONTROL POWER

240 VAC BRANCH CKT INPUT

240 VAC BRANCH CKT OUTPUT

CONTROL POWER NEUTRAL

120 VAC CONTROL POWER

240 VAC BRANCH CKT INPUT

240 VAC BRANCH CKT OUTPUT

CONTROL POWER NEUTRAL

120 VAC CONTROL POWER

CONTROL CKT INPUT

SPARE TERMINALS

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CONTROL CKT INPUT

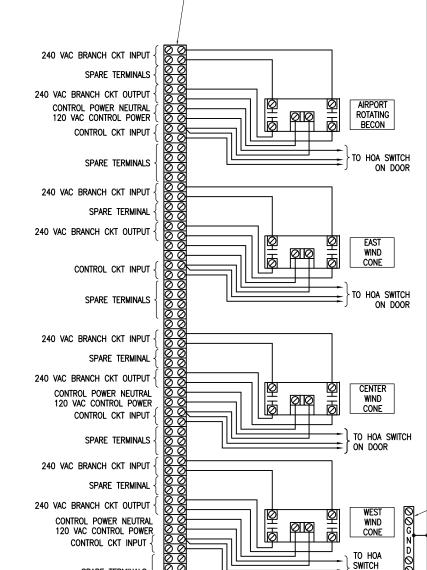
SPARE TERMINALS

SPARE TERMINALS

NEMA TYPE TERMINAL BLOCKS RATED 85A, 600 VOLT SUITABLE FOR THE FOLLOWING WIRE COMBINATIONS 1 #4 AWG 1 #6 AWG 1-2 #8 AWG

1-4 #10 AWG 1-5 #12 AWG

TERMINAL BLOCKS SHALL BE SQUARE D CLASS 9080 TYPE GC6 OR APPROVED EQUAL. IEC RATED TERMINAL BLOCKS ARE NOT ACCEPTABLE.



NOTES

- 1. 15 AMP & 20 AMP INPUT POWER/BRANCH CIRCUITS SHALL BE #10 AWG COPPER THWN FROM THE RESPECTIVE POWER SOURCE TO THE LIGHTING CONTACTOR/RELAY PANEL. 30 AMP INPUT POWER/BRANCH CIRCUITS SHALL BE #8 AWG COPPER THWN (MIN.) FROM THE RESPECTIVE POWER SOURCE TO THE LIGHTING CONTACTOR/RELAY PANEL.
- 2. INPUT CONTROL CIRCUITS SHALL BE #12 AWG COPPER THWN.
- 3. FOR 120 VAC BRANCH CIRCUITS THE NEUTRAL CONDUCTOR SHALL NOT BE SWITCHED THROUGH THE RELAY CONTACTS. USE TERMINAL BLOCKS TO TRANSITION FROM VAULT BRANCH CIRCUIT WIRING TO FIELD WIRING.
- 4. PROVIDE #10 AWG COPPER BONDING JUMPER FROM PANEL ENCLOSURE FRAME
- 5. PROVIDE 3-POSITION MAINTAINED CONTACT "HAND-OFF-AUTO" SELECTOR SWITCH FOR EACH LIGHTING CONTACTOR & MOUNT ON LIGHTING CONTACTOR PANEL ENCLOSURE DOOR. SELECTOR SWITCH SHALL BE SQUARE D CLASS 9001, TYPE KS43FBH13. OR APPROVED EQUAL. INCLUDE LEGEND PLATE TO IDENTIFY THE DEVICE CONTROLLED (EX: "RWY 11 REILS" OR "RWY 11 PAPI").
- 6. SEE "LIGHTING CONTACTOR SCHEMATIC" SHEET FOR ADDITIONAL INFORMATION ON WIRING. ALSO SEE "AIRFIELD LIGHTING CONTROL WIRING SCHEMATIC" SHEET FOR INFORMATION ON WIRING.
- 7. INCLUDE LEGEND PLATE LABELED "NOTICE: CONTACTORS HAVE REMOTE LOCATED CONTROLS AND MAY ACTIVATE AT ANY TIME".
- 8. 120/240 VAC PHASE "A" CONDUCTORS SHALL HAVE BLACK COLORED INSULATION. 120/240 VAC PHASE "B" CONDUCTORS SHALL HAVE RED COLORED INSULATION. NEUTRAL CONDUCTORS SHALL HAVE WHITE COLORED INSULATION. INSULATED EQUIPMENT GROUND WIRES SHALL HAVE GREEN COLORED INSULATION.
- 9. CONTROL PANEL FOR AIRFIELD LIGHTING AND NAVAIDS SHALL BE MANUFACTURED BY A UL 508 INDUSTRIAL CONTROL PANEL BUILDER OR AN FAA APPROVED L-821 PANEL BUILDER, AND SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCE REQUIREMENTS. WHERE THE PANEL IS MANUFACTURED BY AN L-821 PANEL BUILDER IT SHALL BE LABELED AS AN 1-821 PANEL
- 10. ALL FEEDER AND/OR BRANCH CIRCUIT CONDUCTORS OF THE SAME CIRCUIT (INCLUDING NEUTRAL CONDUCTORS AND EQUIPMENT GROUNDING CONDUCTORS) SHALL BE CONTAINED WITHIN THE SAME RACEWAY, AUXILIARY GUTTER, OR WIREWAY TO COMPLY WITH NEC 300.3(B). FOR VOLTAGE POWERED CIRCUITS TO AIRFIELD DEVICES, ROUTE ALL PHASE, NEUTRAL, AND EQUIPMENT GROUNDING CONDUCTORS FROM THE VAULT PANELBOARD TO THE LIGHTING/CONTACTOR PANEL AND THEN TO THE RESPECTIVE AIRFIELD DEVICE.

COPPER EQUIPMENT GROUND BAR ADEQUATELY SIZED FOR ALL GROUND WIRES TO AND FROM LIGHTING CONTACTOR PANEL; ILSCO D167-12, OR APPROVED EQUAL. INSTALL ONE GROUND WIRE PER TERMINAL.

ON DOOR

NEMA 12 ENCLOSURE WITH HINGED DOOR SIZED AS REQUIRED TO HOUSE LIGHTING CONTACTORS, CONTROL RELAY, TERMINAL BLOCKS, WIRING & INTERFACE TO EXISTING CONDUITS, APPROXIMATE 30"Hx24"Wx8"D. CONFIRM DIMENSIONS AND PROVIDE AN ENCLOSURE TO HOUSE EQUIPMENT AND TO

NOTE: CONFIRM SIZE OF EXISTING RELAY PANEL ENCLOSURE TO BE REPLACED AND AVAILABLE MOUNTING SPACE FOR REPLACEMENT PANEL.

SPARE TERMINALS

LIGHTING CONTACTOR PANEL DETAIL

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REHABILITATE AIRFIELD LIGHTS

IDA No: 06C-4161 SBG No:3-17-0124-B30

Contract No: SH026

NO.	DATE	DES	CRIPT	ION		
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ISSUE: November 15, 2013						
PROJECT NO: 12A0156						
CAD FIL	E: 28-E-	607.D	WG			

LAYOUT BY: KNL 9/13/13 DRAWN BY: LDH 9/13/13

REVIEWED BY: KNL 9/17/13

SHEET TITLE

LIGHTING CONTACTOR PANEL DETAIL

L-861 30 WATT INCANDESCENT FIXTURE

WITH CLEAR LENS FOR GROUND FAULT

TO RUNWAY LIGHTING

CIRCUIT

EXISTING #8 AWG FAA L-824

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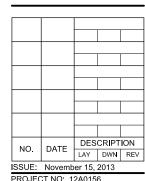


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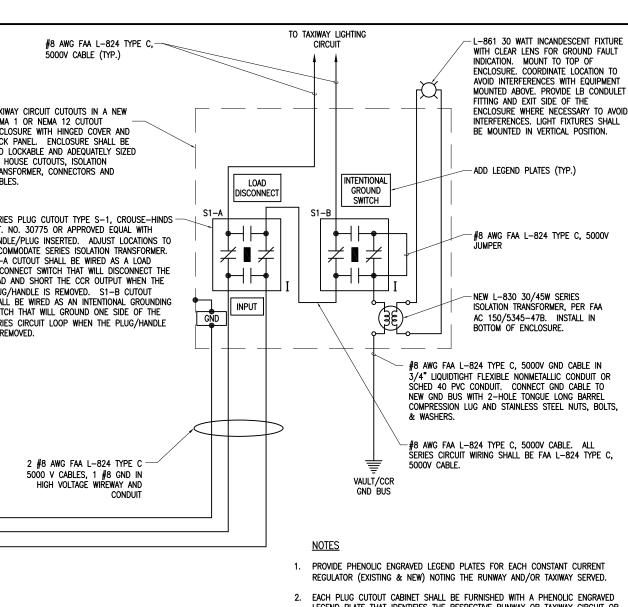
PROJECT NO: 12A0156 CAD FILE: 29-E-602-LIN.DWG LAYOUT BY: KNL 9/6/13 DRAWN BY: LDH 9/12/13

REVIEWED BY: KNL 10/16/13

SHEET TITLE

HIGH VOLTAGE WIRING SCHEMATIC

29



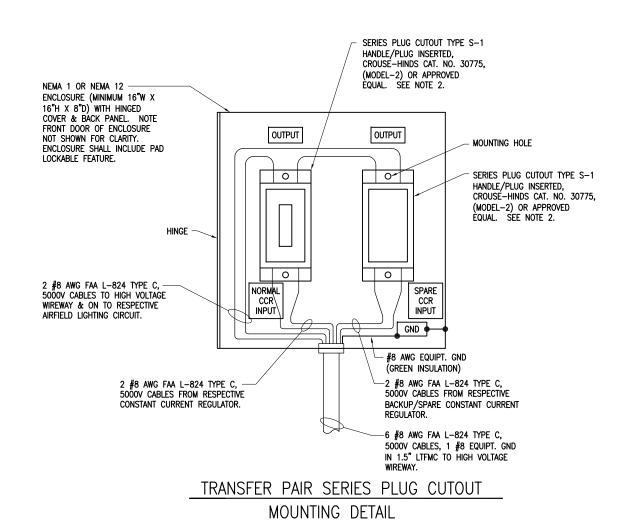
- LEGEND PLATE THAT IDENTIFIES THE RESPECTIVE RUNWAY OR TAXIWAY CIRCUIT OR FUNCTION OF THE RESPECTIVE CUTOUT. INCLUDE AN ADDITIONAL LEGEND PLATE LABELED "CAUTION OPERATE CUTOUTS WITH CCR SHUT OFF"
- PROVIDE PHENOLIC ENGRAVED LEGEND PLATES FOR THE CUTOUTS TO IDENTIFY THE RESPECTIVE REGULATOR OUTPUT CONNECTION AND THE RESPECTIVE CIRCUIT LOAD
- 4. BOND REGULATOR FRAME TO VAULT GROUND BUS WITH A DEDICATED #6 AWG BONDING JUMPER.
- 5. PROVIDE ADEQUATE WORKING SPACE IN FRONT OF EACH CUTOUT ENCLOSURE TO MEET NEC CLEARANCE REQUIREMENTS.
- 6. LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE U.L. LISTED TO MEET THE REQUIREMENTS OF NEC 350.6, SUITABLE FOR GROUNDING AND SUNLIGHT RESISTANT. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO CCR'S & TRANSFORMERS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. EXTERNAL BONDING JUMPERS USED WITH CCR INSTALLATIONS SHALL BE #6 AWG COPPER (MINIMUM). DO NOT INSTALL LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS NOT UL LISTÉD. CONFIRM LIQUID TIGHT FLEXIBLE METAL
- CONDUIT BEARS THE UL LABEL PRIOR TO INSTALLING IT. 7. SERIES PLUG CUTOUTS SHALL BE TYPE S-1, RATED 5000 VOLTS, 20-AMP, AND SHALL COMPLY WITH FAA AC 150/5340-4C. SERIES PLUG CUTOUTS SHALL BE RATED SUITABLE FOR NORMAL OPERATION WITH HANDLE REMOVED OR HANDLE INSERTED. CUTOUTS SHALL DISCONNECT THE INPUT FROM THE FROM THE OUTPUT, SHORT THE INPUT TERMINALS, AND SHORT THE OUTPUT TERMINALS WHEN THE HANDLE/PLUG IS REMOVED. CUTOUTS SHALL BE SUITABLE FOR MANUAL TRANSFER OPERATION (ONE SERIES CIRCUIT LOOP WITH THE CAPABILITY OF BEING POWERED FROM EITHER OF TWO CONSTANT CURRENT REGULATOR POWER SOURCES). CUTOUTS SHALL BE SUITABLE FOR USE AS AN INTENTIONAL GROUND SWITCH TEST. SERIES PLUG CUTOUTS SHALL BE CROUSE-HINDS CAT. NO. 30775. OR APPROVED FOUAL.

THE RESPECTIVE MANUFACTURER SHALL CERTIFY IN WRITING THAT THEIR CUTOUT IS

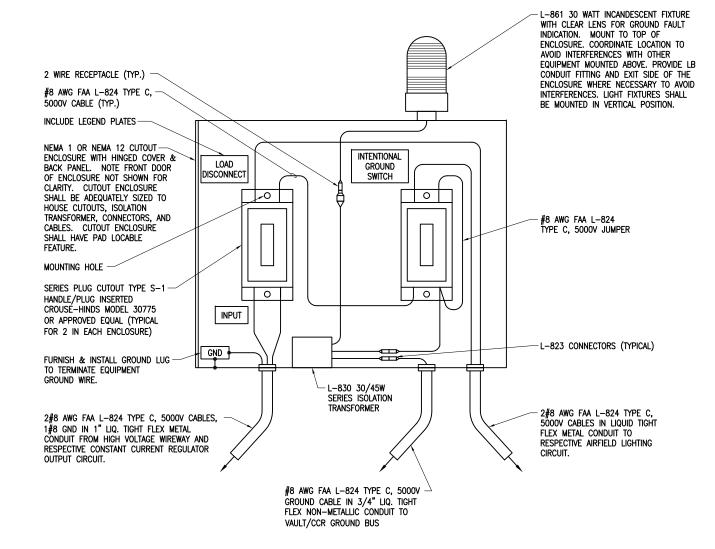
8. HIGH VOLTAGE & LOW VOLTAGE CIRCUITS SHALL NOT BE INSTALLED IN THE SAME

SUITABLE AND RATED FOR THE RESPECTIVE APPLICATION.

"CCR" DENOTES CONSTANT CURRENT REGULATOR



NOT TO SCALE



SERIES PLUG CUTOUT INSTALLATION DETAIL FOR AIRFIELD LIGHTING CIRCUITS

(TYPICAL FOR 2)

NOTES

- 1. PROPOSED SERIES PLUG CUTOUT INSTALLATION DETAIL SHOWN ON THIS SHEET IS FOR THE FOLLOWING CIRCUITS: RUNWAY 11-29
- SEE "HIGH VOLTAGE WIRING SCHEMATIC" SHEET FOR ADDITIONAL INFORMATION AND REQUIREMENTS REGARDING INSTALLATION OF CUTOUTS AND WIRING.



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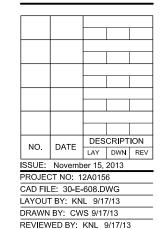


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REHABILITATE AIRFIELD LIGHTS

IDA No: 06C-4161 SBG No:3-17-0124-B30

Contract No: SH026



SERIES PLUG CUTOUT INSTALLATION DETAILS

LEGEND PLATE SCHEDULE					
DEVICE	LABEL				
RUNWAY 11-29 AND TAXWIAY CCR	RUNWAY 11-29 & TAXIWAY				
BACKUP/SPARE CCR FOR RUNWAY 11-29 AND TAXIWAY	BACKUP CCR FOR RUNWAY 11-29 AND TAXIWAY				
CUTOUT ENCLOSURE FOR TRANSFER PAIR OF CUTOUTS	Transfer Pair Cutouts				
NORMAL CUTOUT INPUT SIDE CONNECTION FOR RUNWAY 11-29 AND TAXIWAY	NORMAL CCR INPUT				
SPARE CUTOUT INPUT SIDE CONNECTION FOR RUNWAY 11-29 AND TAXIWAY	SPARE CCR INPUT				
EACH CUTOUT (TRANSFER PAIR) OUTPUT SIDE CONNECTION (2 LEGEND PLATES)	оитрит				
CUTOUT ENCLOSURE FOR RUNWAY 11-29	RUNWAY 11-29 CUTOUTS				
RUNWAY 11-29 LOAD DISCONNECT CUTOUT INPUT SIDE	INPUT				
RUNWAY 11-29 LOAD DISCONNECT CUTOUT OUTPUT SIDE	LOAD DISCONNECT				
RUNWAY 11-29 INTENTIONAL GROUND SWITCH CUTOUT	Intentional Ground Switch				
CUTOUT ENCLOSURE FOR TAXIWAY	TAXIWAY CUTOUTS				
TAXIWAY LOAD DISCONNECT CUTOUT INPUT SIDE	INPUT				
TAXIWAY LOAD DISCONNECT CUTOUT OUTPUT SIDE	LOAD DISCONNECT				
TAXIWAY INTENTIONAL GROUND SWITCH CUTOUT	Intentional Ground Switch				
EACH CUTOUT ENCLOSURE (3 LEGEND PLATES)	CAUTION OPERATE CUTOUTS WITH CCR'S SHUT OFF				
RADIO RELAY INTERFACE PANEL	RADIO RELAY INTERFACE PANEL				
MANUAL TRANSFER SWITCH FOR RUNWAY 11-29 AND TAXIWAY NORMAL CCR AND SPARE/BACKUP CCR	TRANSFER SWITCH FOR RUNWAY 11-29 AND TAXIWAY CONSTANT CURRENT REGULATORS				
MANUAL TRANSFER SWITCH FOR RUNWAY 11-29 AND TAXIWAY NORMAL CCR AND SPARE/BACKUP CCR - NORMAL SWITCH POSITION	NORMAL CCR				
MANUAL TRANSFER SWITCH FOR RUNWAY 11-29 AND TAXIWAY NORMAL CCR AND SPARE/BACKUP CCR - BACKUP SWITCH POSITION	SPARE/BACKUP CCR				

LEGEND PLATE SCHEDULE (CONTINUED)			
DEVICE	LABEL		
LOW VOLTAGE WIREWAY (PROVIDE 6 LEGEND PLATES 1/2" HIGH BLACK LETTERS WHITE BACKGROUND)	LOW VOLTAGE		
HIGH VOLTAGE WIREWAY (PROVIDE 6 LEGEND PLATES 1/2" HIGH BLACK LETTERS WHITE BACKGROUND)	HIGH VOLTAGE		
VAULT GROUND BUS (PROVIDE 4 LEGEND PLATES 1/2" HIGH WHITE LETTERS GREEN BACKGROUND; INSTALL ABOVE OR BELOW GROUND BUS)	VAULT GROUND BUS		
GROUNDING ELECTRODE CONDUCTORS TERMINATED ON VAULT GROUND BUS. (PROVIDE 3 LEGEND PLATES & SECURE TO CONDUCTORS WITH NYLON STRING OR CABLE TIES)	DO NOT DISCONNECT		

DIRECTIONS TO TRANSFER RUNWAY 11-29 AND TAXIWAY LIGHTING FROM NORMAL CCR TO SPARE/BACKUP CCR.

- SHUT OFF INPUT POWER (CIRCUIT BREAKER) TO BOTH RWY 11-29 AND TAXIWAY CCR'S & TURN CCR SELECTOR SWITCHES TO OFF.
- OPERATE MANUAL TRANSFER SWITCH FOR RWY 11-29 AND TAXIWAY AND MOVE HANDLE FROM "NORMAL" POSITION TO "SPARE/BACKUP" POSITION.
- 3. PULL CUTOUT HANDLE FROM NORMAL CCR UNIT & INSERT INTO SPARE CCR CUTOUT.
- GO TO RADIO RELAY INTERFACE PANEL & TURN "RWY 11-29 AND TAXIWAY CCR TRANSFER" SELECTOR SWITCH FROM "NORMAL" TO "SPARE" POSITION.
- . TURN ON INPUT POWER (CIRCUIT BREAKER) TO SPARE RWY 11-29 AND TAXIWAY CCR.
- 6. TURN SELECTOR SWITCH ON SPARE CCR TO "REMOTE" POSITION.

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

RUNWAY 11-29 AND TAXIWAY CCR TRANSFER PROCEDURE PLACARD DETAIL



<u>"DANGER – HIGH VOLTAGE KEEP OUT" SIGN</u>

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

NOTES:

- 1. 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. FURNISH & INSTALL A WEATHERPROOF WARNING LABEL FOR EACH SAFETY SWITCH, PANELBOARD, LOAD CENTER, CUTOUT, & CONTROL PANEL TO WARN PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS, PER THE REQUIREMENTS OF NEC 110.16 "FLASH PROTECTION". LABELS SHALL BE HAZARD COMMUNICATION SYSTEMS, LLC (190 OLD MILFORD RD., BOX 1174, MILFORD, PA 18337, PHONE: 1–877–748–0244) PART NO. H6010–9VWHBJ OR APPROVED EQUAL.

DIRECTIONS TO TEST FOR AIRFIELD GROUND FAULTS IN LIGHTING CIRCUITS.

- 1. TURN OFF RESPECTIVE CCR.
- . TO TEST RUNWAY 11—29 LIGHTING, PULL THE LOAD DISCONNECT CUTOUT FOR THE TAXIWAY CIRCUIT. RUNWAY LOAD DISCONNECT TO REMAIN CONNECTED. GO TO STEP 4.
- TO TEST TAXIWAY LIGHTING, PULL THE LOAD DISCONNECT FOR THE RUNWAY 11-29 CIRCUIT. TAXIWAY LOAD DISCONNECT TO REMAIN CONNECTED. GO TO STEP 4.
- PULL INTENTIONAL GROUND SWITCH CUTOUT FOR THE RESPECTIVE CIRCUIT TO BE TESTED..
- TURN ON RESPECTIVE CCR TO 100%.
- IF GROUND FAULT LIGHT IS DIM CHECK AIRFIELD CIRCUIT FOR LOCATION OF BRIGHT TO DIM LIGHTS TO ASSIST IN LOCATING AREA OF GROUND FAULT.

PROVIDE PLACARD OR LEGEND PLATE FOR GROUND FAULT TESTING PROCEDURE. LETTERING TO BE MIN. 1/4" HIGH BLACK ON WHITE BACKGROUND. LOCATE PLACARD IN REGULATOR ROOM, COORDINATED WITH AIRPORT MAINTENANCE STAFF AND RESURENT ENVINEER

GROUND FAULT TESTING PLACARD DETAIL



"DANGER – HIGH VOLTAGE" SIGN

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

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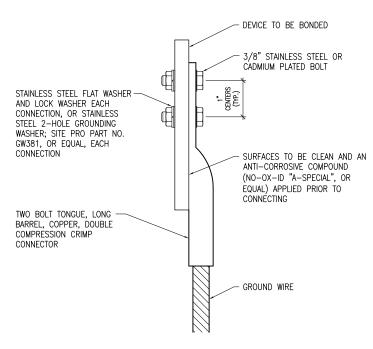
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LAYOUT BY: KNL 9/13/13					
	DRAWN BY: LDH 9/13/13				

LEGEND PLATE SCHEDULES

SHEET TITLE

REVIEWED BY: KNL 9/17/13

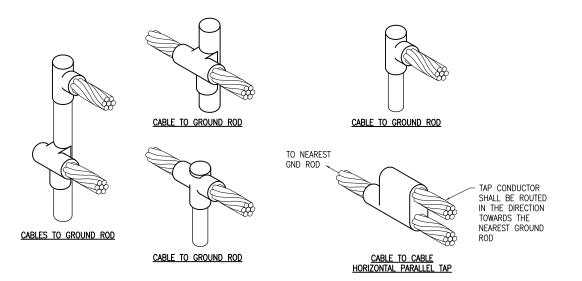


2 HOLE LONG BARREL COMPRESSION LUG TABLE				
WIRE SIZE	BURNDY CAT. NO.	THOMAS & BETTS CAT. NO.	PENN-UNION CAT. NO.	
#8 AWG STRANDED	YA8C-2TC38	256-30695-1157	BBLU-8D-2TC38	
#6 AWG SOLID	YA8C-2TC38 OR YGA6C-2TC38E2G1			
#6 AWG STRANDED	YA6C-2TC38	256-30695-1158	BBLU-6D-2TC38	
#4 AWG STRANDED	YA4C-2TC38	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	

NOTES

- 1. 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.
- 3. GROUNDING ELECTRODE CONDUCTORS, BONDING JUMPERS, & INDIVIDUAL GROUND WIRES SHALL NOT BE INSTALLED IN METAL CONDUIT. WHERE PLASTIC CONDUIT IS USED FOR INDIVIDUAL GROUND WIRES, DO NOT COMPLETELY ENCIRCLE THE CONDUIT WITH FERROUS AND/OR MAGNETIC MATERIALS. WHERE METAL CLAMPS ARE INSTALLED USE NYLON BOLTS, NUTS, WASHERS, & SPACERS TO INTERRUPT A COMPLETE METALLIC APTH FROM ENCIRCLING THE CONDUIT.
- 4. ALL CONNECTIONS SHALL BE COATED WITH A CORROSION PREVENTATIVE COMPOUND (SANCHEM INC. NO-OX-ID "A-SPECIAL", BURNDY PENETROX E, OR 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 NFC 250-12.

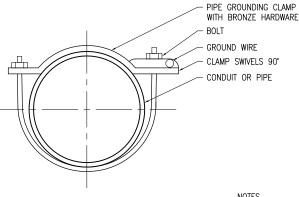
GROUNDING LUG CONNECTION DETAIL



DETAIL NOTES

- 1. 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.
- 3. INDIVIDUAL GROUNDING ELECTRODE CONDUCTORS SHALL NOT BE INSTALLED IN METAL CONDUIT. INSTALL GROUNDING ELECTRODE CONDUCTORS IN SCHED 40 PVC CONDUIT AS REQUIRED IN FOUNDATIONS, FOR PROTECTION, WHERE ENTERING ENCLOSURES, ETC. WHERE PLASTIC CONDUIT IS USED FOR INDIVIDUAL GROUND WIRES, DO NOT COMPLETELY ENCRUE 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



		_
PIPE GROUNDIN	G 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"	

GROUND WIRE

CLAMP SWIVELS 90'

CONDUIT OR PIPE

PIPE GROUNDING CLAMP

WITH BRONZE HARDWARE

<u>NOTES</u>

. 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



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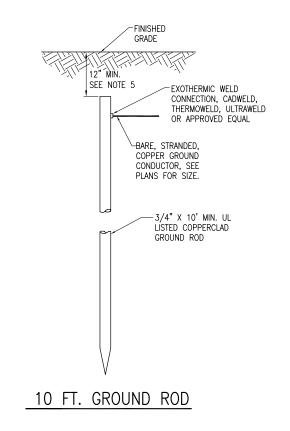
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ISSUE: November 15, 2013					
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CAD FILE: 32-E-504-GND.DWG					
LAYOUT BY: KNL 9/12/2013					
DRAWN BY: LDH 9/12/2013					

GROUNDING DETAILS

REVIEWED BY: KNL 9/17/2013

- FURNISH AND INSTALL GROUND RODS AS DETAILED HEREIN. GROUND RODS FOR AIRFIELD LIGHTING (RUNWAY LIGHTING, TAXIWAY LIGHTING, TAXI GUIDANCE SIGNS, & DISTANCE REMAINING SIGNS) SHALL BE MINIMUM 3/4-IN. DIAMETER BY 10-FT LONG, UL-LISTED COPPER CLAD WITH 10-MIL MINIMUM COPPER COATING. GROUND RODS FOR OTHER APPLICATIONS SHALL BE MINIMUM 3/4-IN. DIAMETER BY 10-FT LONG, UL-LISTED, COPPER CLAD WITH 10-MIL MINIMUM COPPER COATING. GROUND RODS SHALL BE SPACED OR AS DETAILED ON THE RESPECTIVE PLANS, AND IN NO CASE SPACED LESS THAN ONE ROD LENGTH APART. ALL CONNECTIONS TO GROUND RODS AND THE GROUND RING SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY ERICO PRODUCTS, INC., SOLON, OHIO, (PHONE 1-800-248-9353), THERMOWELD BY CONTINENTAL INDUSTRIES, INC., TULSA, OKLAHOMA (PHONE 918-663-1440) OR 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
- 3. CONTRACTOR SHALL TEST EACH MADE ELECTRODE GROUND ROD/GROUND FIELD/GROUND RING WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUND FIELD SYSTEMS. IF GROUND RESISTANCE EXCEEDS 25 OHMS, CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION. COPIES OF GROUND ROD TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER/RESIDENT PROJECT REPRESENTATIVE.
- 4. 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 2011 NATIONAL ELECTRICAL CODE ARTICLE 250-12. ALL COPPER BUS BARS MUST BE CLEANED PRIOR TO MAKING CONNECTIONS TO REMOVE SURFACE OXIDATION.
- 7. METALLIC RACEWAY FITTINGS SHALL BE MADE UP TIGHT TO PROVIDE A PERMANENT LOW IMPEDANCE PATH FOR ALL CIRCUITS. METAL CONDUIT TERMINATIONS IN ENCLOSURES SHALL BE BONDED TO THE ENCLOSURE WITH UL-LISTED FITTINGS SUITABLE FOR GROUNDING. PROVIDE GROUNDING BUSHINGS WITH BONDING JUMPERS FOR ALL METAL CONDUITS ENTERING SERVICE EQUIPMENT (METER BASE, CT CABINET, MAIN SERVICE BREAKER ENCLOSURE, ETC.). PROVIDE GROUNDING BUSHINGS WITH BONDING JUMPERS FOR ALL METAL CONDUITS ENTERING AN ENCLOSURE THROUGH CONCENTRIC OR ECCENTRIC KNOCKOUTS THAT ARE PUNCHED OR OTHERWISE FORMED SO AS TO IMPAIR THE ELECTRICAL CONNECTION TO GROUND. STANDARD LOCKNUTS OR BUSHINGS SHALL NOT BE THE SOLE MEANS FOR BONDING WHERE A CONDUIT ENTERS AN ENCLOSURE THROUGH A CONCENTRIC OR ECCENTRIC KNOCKOUT
- 8. ALL CONNECTIONS, LOCATED ABOVE GRADE, BETWEEN THE DIFFERENT TYPES OF GROUNDING CONDUCTORS SHALL BE MADE USING UL-LISTED DOUBLE COMPRESSION CRIMP TYPE CONNECTORS OR UL-LISTED BOLTED GROUND CONNECTORS. FOR GROUND CONNECTIONS TO ENCLOSURES, CASES AND FRAMES OF ELECTRICAL EQUIPMENT NOT SUPPLIED WITH GROUND LUGS THE CONTRACTOR SHALL DRILL REQUIRED HOLES FOR MOUNTING A BOLTED GROUND CONNECTOR. ALL BOLTED GROUND CONNECTORS SHALL BE BURNDY, THOMAS AND BETTS, OR EQUAL. TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUES IN UL STANDARD 486A TO ASSURE PERMANENT AND EFFECTIVE GROUNDING.
- ALL METAL EQUIPMENT ENCLOSURES, CONDUITS, CABINETS, BOXES, RECEPTACLES, MOTORS, ETC. SHALL BE BONDED TO THE RESPECTIVE GROUNDING SYSTEM.
- 10. PROVIDE ALL BOXES FOR PROPOSED OUTLETS, SWITCHES, CIRCUIT BREAKERS, ETC. WITH GROUNDING SCREWS. PROVIDE ALL PANELBOARD, SWITCHGEAR, ETC., ENCLOSURES WITH GROUNDING BARS WITH INDIVIDUAL SCREWS, LUGS, CLAMPS, ETC., FOR EACH OF THE GROUNDING CONDUCTORS THAT ENTER THEIR RESPECTIVE ENCLOSURES.
- 11. EACH NEW FEEDER CIRCUIT AND/OR BRANCH CIRCUIT SHALL INCLUDE AN EQUIPMENT GROUND WIRE. METAL RACEWAY OR CONDUIT SHALL NOT MEET THIS REQUIPMENT. THE EQUIPMENT GROUND WIRE FROM EQUIPMENT SHALL NOT BE SMALLER THAN ALLOWED BY 2011 NEC TABLE 250-122 "MINIMUM SIZE CONDUCTORS OR GROUNDING RACEWAY AND EQUIPMENT." WHEN CONDUCTORS ARE ADJUSTED IN SIZE TO COMPENSATE FOR VOLTAGE DROP, EQUIPMENT-GROUNDING CONDUCTORS SHALL BE ADJUSTED PROPORTIONATELY ACCORDING TO CIRCULAR MIL AREA. ALL EQUIPMENT GROUND WIRES SHALL BE COPPER, EITHER BARE OR INSULATED, THEY SHALL BE IDENTIFIED BY THE COLOR GREEN, AND SHALL BE THE SAME INSULATION TYPE AS THE PHASE CONDUCTORS.

- 12. ALL EXTERIOR METAL CONDUIT, WHERE NOT ELECTRICALLY CONTINUOUS BECAUSE OF MANHOLES, HANDHOLES, NON-METALLIC JUNCTION BOXES, ETC., SHALL BE BONDED TO ALL OTHER METAL CONDUIT IN THE RESPECTIVE DUCT RUN, AND AT EACH END, WITH A COPPER-BONDING JUMPER SIZED IN CONFORMANCE WITH 2011 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 2011 NEC 250-102.
- 13. IT IS THE INTENT OF THIS SPECIFICATION THAT ALL MOTOR FRAMES, PUMP BASES ELECTRICAL EQUIPMENT ENCLOSURES, PANEL HOUSINGS, CONDUITS, BOXES, ETC. HAVE A CONTINUOUS COPPER WIRE GROUND CONNECTION AND SHALL BE POSITIVELY BONDED TO THE RESPECTIVE GROUNDING SYSTEM. CONDUIT CONNECTORS <u>WILL NOT</u> BE CONSIDERED AS ADEQUATE GROUNDING.
- 14. PROVIDE A POSITIVE GROUND BOND FOR ALL OUTLET BOXES, ELECTRICAL EQUIPMENT ENCLOSURES, GROUNDING RECEPTACLES, TOGGLE SWITCHES, ETC. INSTALL A GROUNDING CONDUCTOR IN ALL WIRE AND CABLE RACEWAYS. GROUND CONDUCTOR TO HAVE 600—VOLT INSULATION AND BE IDENTIFIED BY A CONTINUOUS GREEN COLOR COATING. THEY SHALL BE USED SOLELY FOR GROUNDING PURPOSES AND BE ENTIRELY SEPARATE FROM WHITE GROUNDED NEUTRAL CONDUCTOR, EXCEPT AT SUPPLY SIDE OF SERVICE DISCONNECTING MEANS, WHERE GROUNDING AND NEUTRAL SYSTEMS ARE TO BE CONNECTED TO SERVICE GROUND.
- 15. EACH AND ALL GROUNDED CASED AND METAL PARTS ASSOCIATED WITH ELECTRICAL EQUIPMENT SHALL BE TESTED FOR CONTINUITY OF CONNECTION WITH GROUND BUS SYSTEM BY CONTRACTOR IN PRESENCE OF OWNER'S REPRESENTATIVE.
- 16. ALL CONNECTIONS BETWEEN THE DIFFERENT TYPES OF GROUNDING CONDUCTORS ABOVE GRADE SHALL BE MADE USING BOLTED GROUND CONNECTORS. GROUND LUGS SHALL BE PROVIDED IN ALL ENCLOSURES AND WIRING TERMINATION JUNCTION BOXES. EQUIPMENT GROUNDS AND GROUNDING CONDUCTOR SHALL BE CONNECTED TO THESE GROUND LUGS. FOR GROUND CONNECTIONS TO ENCLOSURES, CASES AND FRAMES OF ELECTRICAL EQUIPMENT NOT SUPPLIED WITH GROUND LUGS THE CONTRACTOR SHALL DRILL REQUIRED HOLES FOR MOUNTING A BOLTED GROUND CONNECTOR. ALL BOLTED GROUND CONNECTORS SHALL BE BURNDY, OR APPROVED EQUAL.
- 17. BOND ALL NONCURRENT-CARRYING PARTS OF METAL EQUIPMENT TO GROUND SYSTEM.
- 18. BUILDING STRUCTURAL STEEL SYSTEM SHALL BE BONDED TO ELECTRICAL GROUND SYSTEM.
- 19. 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, $\underline{\text{DO}}$ $\underline{\text{NOT}}$ COMPLETELY ENCIRCLE CONDUIT WITH FERROUS AND/OR MAGNETIC MATERIALS. USE NON-METALLIC REINFORCED FIBERGLASS STRUT SUPPORT. WHERE METAL CONDUIT CLAMPS ARE INSTALLED, USE NYLON BOLTS, NUTS, WASHERS AND SPACERS TO INTERRUPT A COMPLETE METALLIC PATH FROM ENCIRCLING THE CONDUIT. THIS IS REQUIRED TO AVOID GIRDLING OF GROUND CONDUCTORS. GIRDLING OF A GROUND CONDUCTOR IS THE RESULT OF PLACING THE CONDUCTOR IN A RING OF MAGNETIC MATERIAL. THIS RING COULD BE A METALLIC CONDUIT, U-BOLT OR STRUT SUPPORT PIPE CLAMP, OR OTHER SUPPORT HARDWARE. THE RESULT OF GIRDLING GROUND CONDUCTORS SIGNIFICANTLY INCREASES THE INDUCTIVE IMPEDANCE OF THE GROUND CONDUCTOR. INDUCTIVE AND CAPACITIVE IMPEDANCE IS A TYPE OF RESISTANCE THAT OPPOSES THE FLOW OF ALTERNATING CURRENT. ANY INCREASE IN THE IMPEDANCE OF A GROUND CONDUCTOR REDUCES ITS ABILITY TO EFFECTIVELY MITIGATE RADIO FREQUENCY NOISE IN THE GROUND SYSTEM. THE CONDITION WHERE A GROUND CONDUCTOR IS GIRDLED DURING A LIGHTNING STRIKE RESULTS IN PHENOMENA KNOWN AS SURGE IMPEDANCE LOADING. SURGE IMPEDANCE LOADING IS A RESULT OF VOLTAGE AND CURRENT REACHING 500,000 VOLTS AND 10,000 AMPS FOR A SHORT DURATION. GIRDLING FURTHER INCREASES THE IMPEDANCE AT LIGHTNING FREQUENCIES OF 100 KILOHERTZ TO 100 MEGAHERTZ. AT THESE POWER AND FREQUENCY LEVELS ANY INCREASE IN THE IMPEDANCE OF THE GROUND CONDUCTOR MUST BE CONTROLLED. DURING LIGHTNING DISCHARGE CONDITIONS A LOW INDUCTIVE IMPEDANCE PATH IS MORE IMPORTANT THAN A LOW DC RESISTANCE PATH
- 20. IF LOCAL CODES DICTATE THAT INDIVIDUAL GROUNDING CONDUCTORS MUST BE RUN IN METAL CONDUIT OR RACEWAY, THEN THE CONDUIT OR RACEWAY MUST BE BONDED AT EACH END OF THE RUN WITH A BONDING JUMPER SIZED EQUAL TO THE INDIVIDUAL GROUNDING CONDUCTOR OR AS REQUIRED BY 2011 NEC 250-102. NOTE THIS DOES NOT APPLY TO AC EQUIPMENT GROUNDING CONDUCTORS RUN WITH AC CIRCUITS.
- 21. WHERE A CONFLICT IS DETERMINED WITH RESPECT TO GROUNDING REQUIREMENTS PER MANUFACTURER INSTALLATION INSTRUCTIONS, NEC, AND/OR THE CONTRACT DOCUMENTS, CONTACT THE RESIDENT ENGINEER OR PROJECT ENGINEER FOR FURTHER DIRECTIONS.
- 22. GROUND RODS SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN REQUIREMENTS. STEEL USED TO MANUFACTURER GROUND RODS SHALL BE 100 PERCENT DOMESTIC



<u>NOTES</u>

- 1. TYPE AND MINIMUM NUMBER OF GROUND RODS SHALL BE AS SPECIFIED ON THE PLAN.
- THE RESISTANCE TO GROUND OF THE GROUNDING SYSTEM SHALL NOT EXCEED 25 OHMS.
- 3. COST OF GROUND RODS IS INCIDENTAL TO THE ASSOCIATED ITEMS REQUIRING GROUNDING UNLESS OTHERWISE SPECIFIED.
- GROUND RODS SHALL BE SPACED AS DETAILED ON THE PLANS AND SHALL NOT BE SPACED LESS THAN ONE ROD LENGTH APART.
- 5. TOP OF GROUND RODS SHALL BE 12" MINIMUM BELOW GRADE UNLESS DETAILED OTHERWISE HERFIN
- GROUND RODS FOR RUNWAY LIGHTING, TAXIWAY LIGHTING, AND TAXI GUIDANCE SIGNS SHALL BE A MINIMUM 3/4-INCH DIAMETER BY 10-FT LONG UL LISTED COPPER CLAD.

GROUND RODS
(NOT TO SCALE)



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> REHABILITATE AIRFIELD LIGHTS

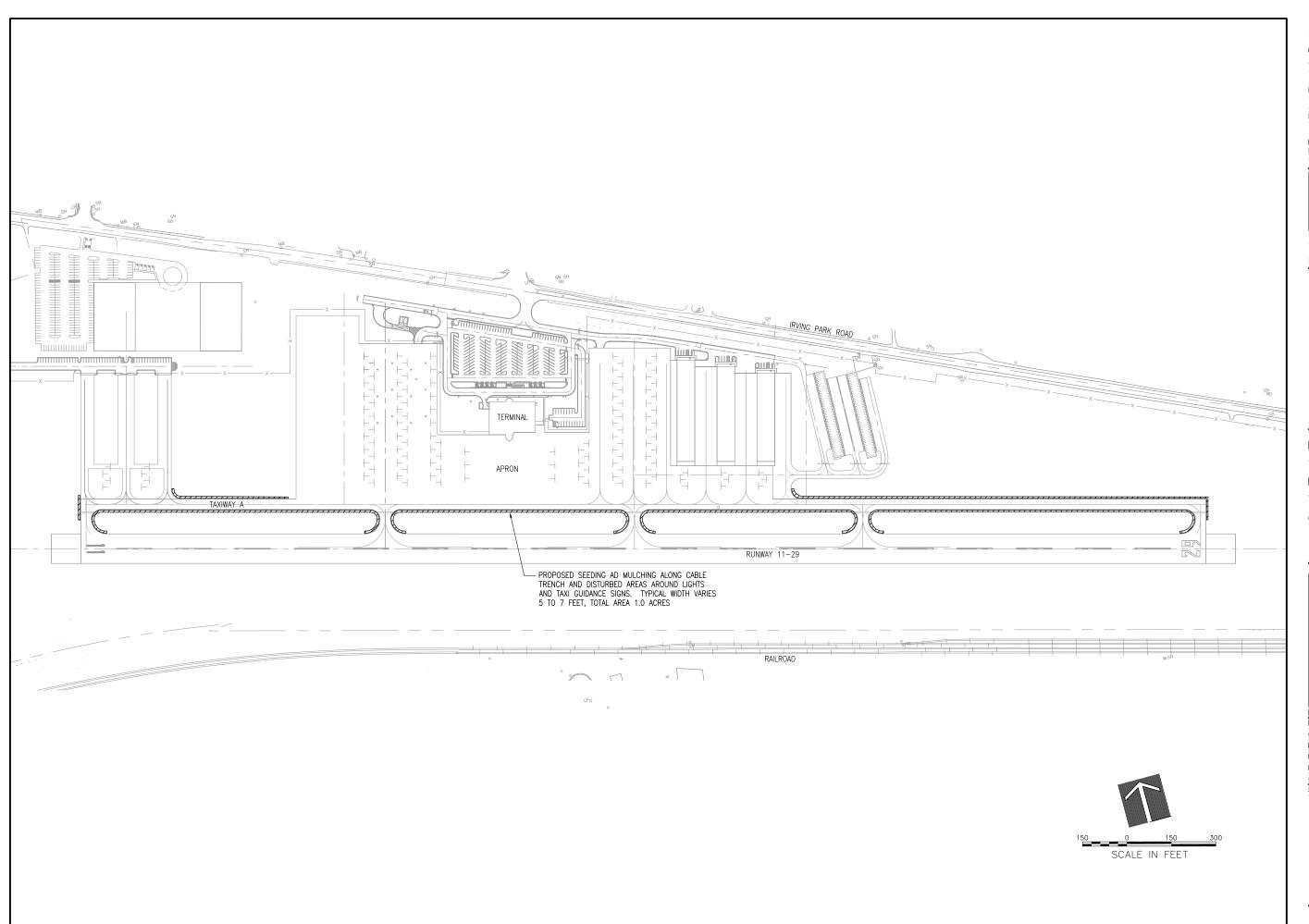
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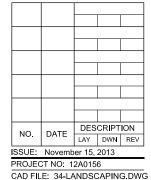


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SHEET TITLE

LANDSCAPING PLAN