ITEM NO. 06A

CONSTRUCTION PLANS

REPLACE TAXIWAY AIRFIELD LIGHTING KEWANEE AIRPORT AUTHORITY KEWANEE MUNICIPAL AIRPORT (EZI) KEWANEE, HENRY COUNTY, ILLINOIS

SBG PROJECT NO. 3-17-SBGP-TBD IDA PROJECT NO. EZI-4939 NOVEMBER 22, 2024 100% SUBMITTAL

SCOPE OF WORK:

THIS PROJECT WILL INCLUDE REMOVAL AND REPLACEMENT OF THE TAXIWAY LIGHTING SYSTEMS FOR TAXIWAY A AND TAXIWAY B, THE ASSOCIATED CABLING, CONDUITS AND DUCT WORK, JUNCTION STRUCTURES, VAULT WORK AND INCIDENTALS.

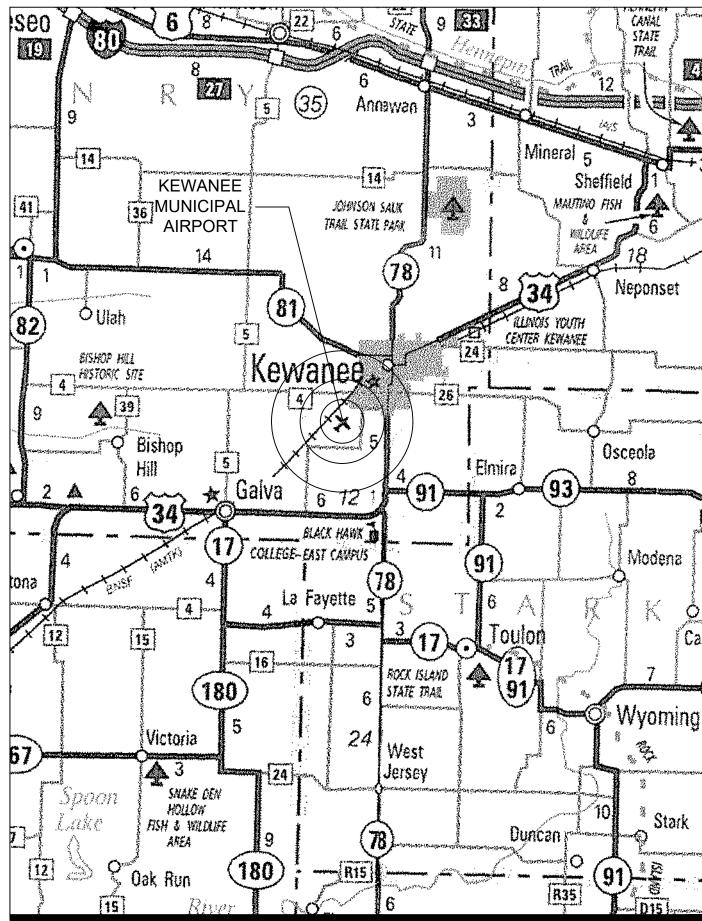
NOTICE TO CONTRACTORS AND BIDDERS

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

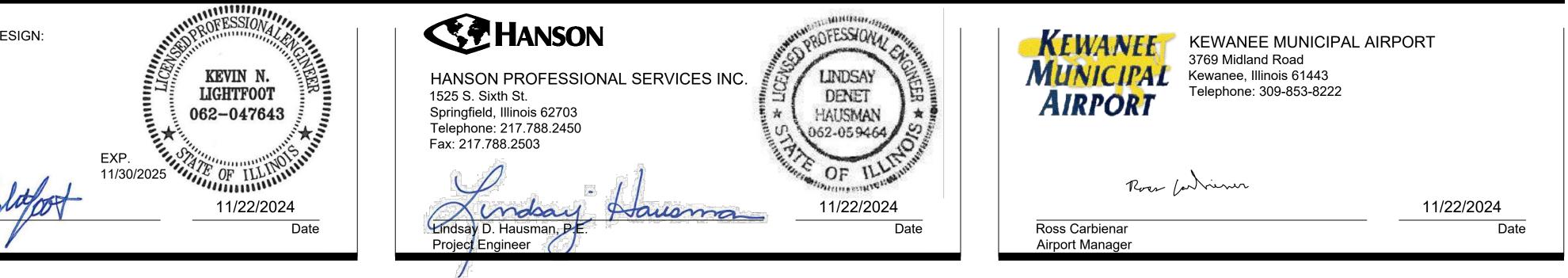
No.	Issue/Description	Sheets Changed	Date	By

COVERING ELECTRICAL DESIGN:

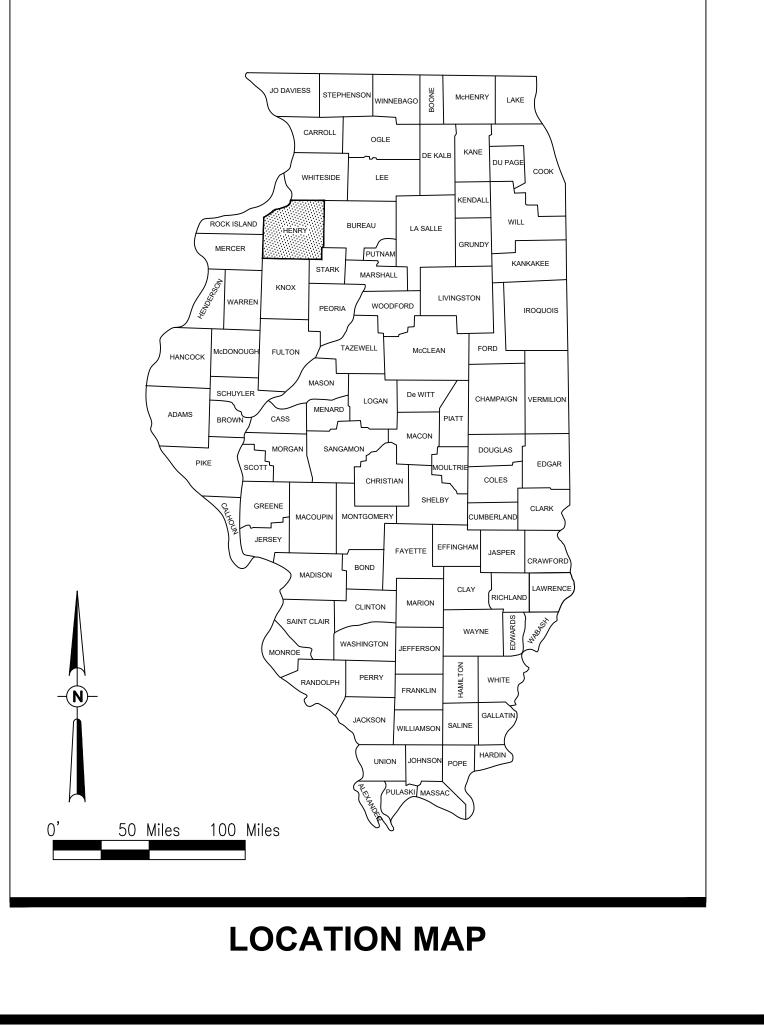
Electrical



VICINITY MAP



KE020 TOTAL SHEETS = 42



	SUMMARY OF QUANT	ITIES	
ITEM NO.	DESCRIPTION	UNIT	TOTAL QUANTITY
AR108108	1/C #8 5 KV UG CABLE	FOOT	8,000
AR108158	1/C #8 5 KV UG CABLE IN UD	FOOT	15,000
AR109200	INSTALL ELECTRICAL EQUIPMENT	L SUM	1
AR110012	2" DIRECTIONAL BORE	FOOT	1,020
AR110202	2" PVC DUCT, DIRECT BURY	FOOT	2,000
AR125411	MITL-STAKE MOUNTED-LED	EACH	63
AR125416	MITL-BASE MOUNTED-LED	EACH	61
AR125565	SPLICE CAN	EACH	4
AR150510	ENGINEER'S FIELD OFFICE	L SUM	1
AR150520	MOBILIZATION	L SUM	1
AR150530	TRAFFIC MAINTENANCE	L SUM	1
AR800476	REMOVE AIRFIELD LIGHTING	L SUM	1
AR800545	MITL, BASE MOUNTED SIZE D	EACH	14
AR800564	CABLE AND CCR TESTING AND CALIBRATION	L SUM	1

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4	SITE AND SAFETY PLAN NOTES
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9	EXISTING TAXIWAY A LTG DEMOLITION PLAN SHEET 2
10	EXISTING TAXIWAYS A AND B LTG DEMOLITION PLAN SHEET 3
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REPLACE TAXIWAY AIRFIELD LIGHTING

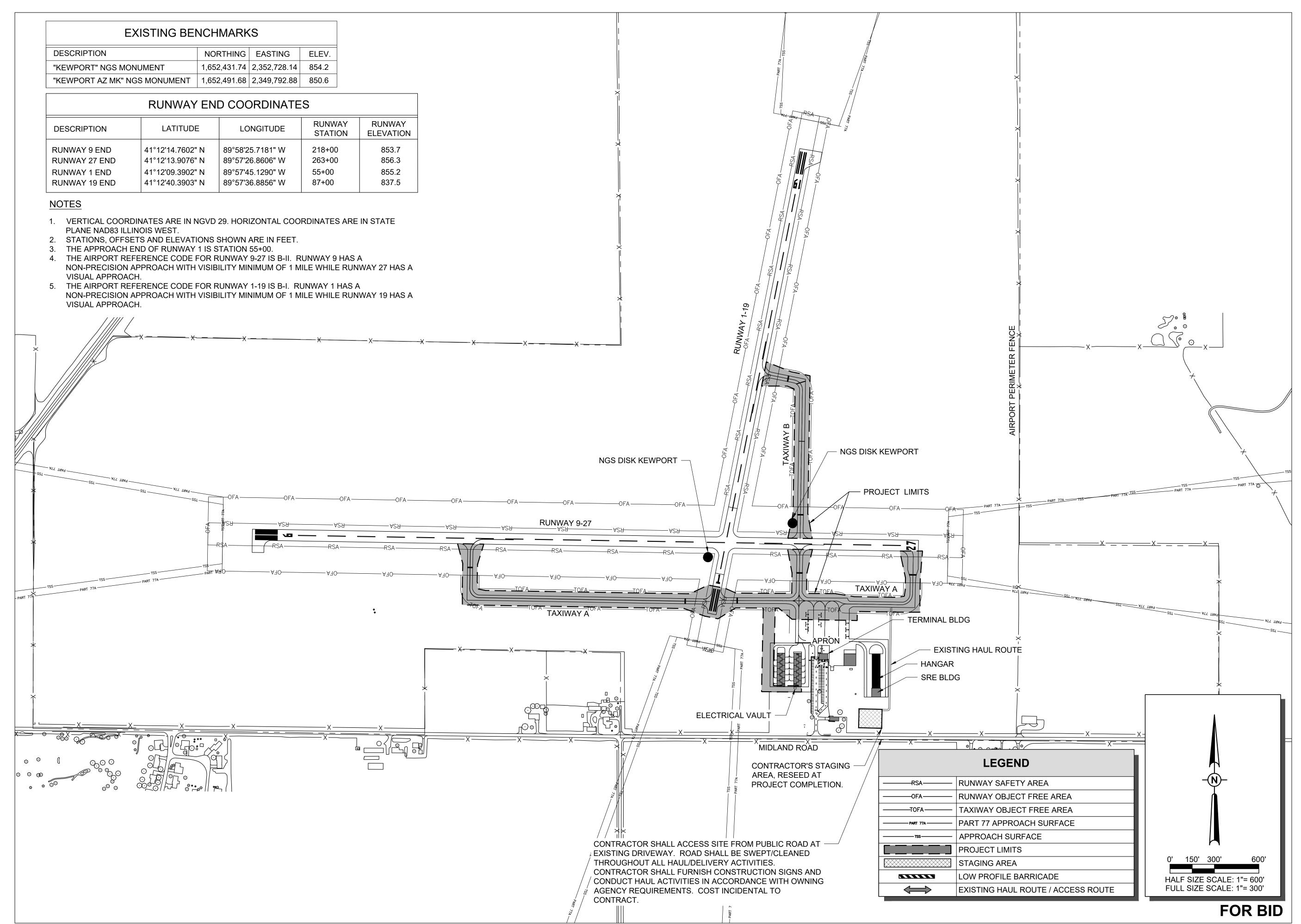
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Contract No.: KE020

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SUMMARY OF QUANTITIES AND INDEX TO SHEETS



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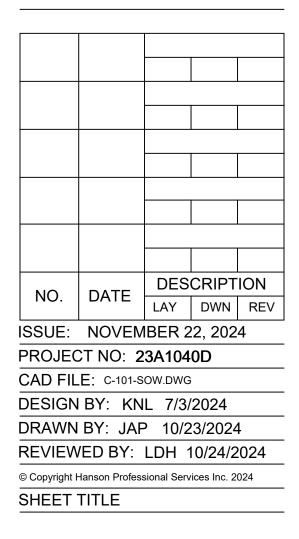
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IDA No: EZI-4939

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SITE AND SAFETY PLAN

CONSTRUCTION AND SAFETY NOTES

SAFETY IS REQUIRED

CONSTRUCTION OF THE PROJECT SHALL BE PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH THE GUIDELINES SPECIFIED IN FAA ADVISORY CIRCULAR 150/5370-2 (CURRENT ISSUE) AND THE AIRPORT RULES AND REGULATIONS. ANY CONTRACTOR ACTIVITIES REQUIRED FOR PROJECT SAFETY SHALL BE PROVIDED BY THE CONTRACTOR AND BE INCIDENTAL TO THE CONTRACT.

SEQUENCE OF CONSTRUCTION

TO MINIMIZE DISRUPTIONS OF AIRPORT OPERATIONS. CONSTRUCTION OPERATIONS MUST BE CONTROLLED THROUGHOUT THE PROJECT'S DURATION. AND WORK MUST BE COMPLETED EXPEDITIOUSLY. A CONSTRUCTION PHASING 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 PHASING PLAN AT THE PRE-CONSTRUCTION CONFERENCE. ANY AND ALL CHANGES TO THE CONSTRUCTION PHASING PLAN THAT MAY BE REQUESTED BY THE CONTRACTOR MUST BE APPROVED BY THE PROJECT ENGINEER AND THE AIRPORT OWNER. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE SUFFICIENT ADVANCE NOTICE OF ANY PROPOSED PHASING CHANGE TO PERMIT CONSIDERATION AND APPROVAL BY THE PROJECT ENGINEER AND THE AIRPORT OWNER. THE CONTRACTOR SHALL NOT BE ENTITLED TO ANY EXTRA COMPENSATION, NOR EXTENSION TO THE CONTRACT TIME, BECAUSE OF A PHASING CHANGE REQUEST NOR FOR ANY TIME NECESSARY IN RECEIVING THE REQUIRED APPROVALS. THE CONTRACTOR SHALL EXPEDITE WORK AT THOSE STAGES WHERE ACTIVE RUNWAYS, TAXIWAYS, HANGAR ACCESS, APRONS, ROADWAYS OR PARKING LOTS MUST BE CLOSED, TO MINIMIZE THE LENGTH OF TIME THAT AIRPORT OPERATIONS ARE RESTRICTED.

AT THE PRE-CONSTRUCTION CONFERENCE, THE CONTRACTOR SHALL PROVIDE A CONTRACTOR COORDINATION PLAN THAT COORDINATES HIS WORK WITH THE WORK OF HIS SUBCONTRACTORS AND THE WORK OF OTHER CONTRACTORS OF OTHER ON-GOING AIRPORT PROJECTS.

RUNWAY CLOSURE

RUNWAY 9-27 AND RUNWAY 1-19 WILL BE CLOSED FOR PORTIONS OF THE PROJECT. TO MINIMIZE DISRUPTION TO AIRCRAFT OPERATIONS ASSOCIATED WITH THE RUNWAY CLOSURES. CONSTRUCTION WORK MUST BE COMPLETED EXPEDITIOUSLY. RUNWAY CLOSINGS SHALL ONLY BE PERMITTED BY PRIOR AUTHORIZATION OF THE RESIDENT ENGINEER AND THE AIRPORT OWNER.

THE CONTRACTOR WILL PROVIDE, INSTALL, MAINTAIN AND REMOVE RUNWAY CLOSURE MARKERS AS DETAILED 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 OWNER. THE COST OF PLACING AND RELOCATING THESE ITEMS, AND THEIR OPERATION AND MAINTENANCE, IS TO BE PAID UNDER ITEM AR150530 TRAFFIC MAINTENANCE.

THE AIRPORT OWNER AND CONTRACTOR SHALL DE-ENERGIZE AND LOCKOUT AIRPORT/RUNWAY NAVAIDS. AND AIRFIELD LIGHTING POWER AND CONTROL CIRCUITS WHEN THE RESPECTIVE RUNWAY IS CLOSED.

TEMPORARY BARRICADES

THE CONTRACTOR SHALL FURNISH BARRICADES FOR ANY AIRFIELD OR ROADWAY PAVEMENT TO BE CLOSED BY HIS WORK. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO FURNISH, PLACE AND MAINTAIN BARRICADES AS SHOWN IN DETAIL B, THIS SHEET, AND AS DIRECTED BY THE RESIDENT ENGINEER AND AIRPORT DIRECTOR. THE COST OF THESE ITEMS, AND THEIR MAINTENANCE, IS TO BE PAID FOR UNDER AR150530 TRAFFIC MAINTENANCE. ANY WORK THAT REQUIRES PORTIONS OF AN ACTIVE RUNWAY, TAXIWAY OR APRON TO BE CLOSED MUST BE COMPLETED EXPEDITIOUSLY TO MINIMIZE DISRUPTION TO AIRCRAFT OPERATIONS.

VEHICULAR TRAFFIC CONTROL

THE CONTRACTOR SHALL ERECT AND MAINTAIN, AT NO COST TO THE CONTRACT, DIRECTIONAL AND INFORMATIONAL SIGNS FOR THE CONTRACTOR'S ACCESS ROUTES AT THE EXISTING CONSTRUCTION ENTRANCES AND FOR THE CONTRACTOR'S ROUTE WITHIN THE AIRPORT OPERATIONS AREA, AS NOTED ON THE PLANS OR AS DIRECTED BY THE RESIDENT ENGINEER. WHERE CONTRACTOR EQUIPMENT IS OPERATING WITHIN ACTIVE AIRCRAFT OPERATIONS AREAS, RADIO-EQUIPED FLAGGERS SHALL BE FURNISHED BY THE CONTRACTOR. CONTINUOUS PAVEMENT SWEEPING SHALL BE FURNISHED TO REMOVE DEBRIS FROM ACTIVE AIRCRAFT MOVEMENT PATHS. THE COST OF TRAFFIC CONTROL/FLAGGERS AND PAVEMENT SWEEPING SHALL BE PAID UNDER ITEM AR150530 TRAFFIC MAINTENANCE.

AIRFIELD OPERATIONAL SAFETY DURING CONSTRUCTION

THE CONTRACTOR SHALL NOT HAVE ACCESS TO ANY PART OF THE ACTIVE AIRFIELD (RUNWAYS, TAXIWAYS OR APRONS) FOR ANY EQUIPMENT OR PERSONNEL WITHOUT THE APPROVAL OF THE RESIDENT ENGINEER AND THE AIRPORT OWNER. ACTIVITIES WITHIN THE AIRPORT OPERATIONS AREA (AOA) ARE SUBJECT TO FEDERAL ACCESS CONTROL. BECAUSE OF THE HIGH REQUIREMENTS FOR AIRPORT SECURITY AND SAFETY, THE FOLLOWING REQUIREMENTS MUST BE ADHERED TO:

- ALL EMPLOYEES OF THE CONTRACTOR SHALL PARK THEIR PERSONAL VEHICLES IN THE DESIGNATED EQUIPMENT PARKING AND STORAGE AREA. EACH PERSON OR VEHICLE ENTERING THE CONTRACTOR AREA SHALL DO SO IN ACCORDANCE WITH THE POLICIES AND PROCEDURES OF THE AIRPORT OWNER. THE CONTRACTOR WILL TRANSPORT THE WORKERS FROM THE PARKING AREAS TO THE WORK AREA. ONLY CONTRACTOR VEHICLES WILL BE ALLOWED OUTSIDE OF THE PROPOSED EQUIPMENT STORAGE AND PARKING AREAS.
- SHOULD ANY CONTRACTOR PERSONNEL BE IDENTIFIED AS NONCOMPLIANT WITH ANY VEHICLE DRIVING SAFETY REQUIREMENTS IN THIS PROJECT SAFETY PLAN OR • IN THE AIRPORT VEHICLE OPERATIONS REGULATIONS. SUCH DRIVERS SHALL BE PENALIZED BY RESCISSION OF THEIR ON-AIRPORT DRIVING PRIVILEGES. AND THEIR ACCESS TO THE CONSTRUCTION LIMIT AREA WHEN OPERATING VEHICLES SHALL BE REVOKED.
- THE CONTRACTOR WILL BE REQUIRED TO BE IN CONTACT WITH AIRPORT OPERATIONS. THIS WILL KEEP THE CONTRACTOR IN CONTACT WITH AIRPORT PERSONNEL AND ENABLE THE AIRPORT PERSONNEL TO IMMEDIATELY CONTACT THE CONTRACTOR IN CASE OF AN AERONAUTICAL EMERGENCY THAT WOULD REQUIRE ACTION BY THE CONTRACTOR AND/OR HIS PERSONNEL.

THE CONTRACTOR SHALL REMAIN WITHIN THE PROJECT LIMITS LINE SHOWN IN THE PLANS. WHEN OUTSIDE THESE LIMITS, ALL CONTRACTOR ACTIVITIES SHALL REMAIN MORE THAN 250 FEET FROM THE CENTERLINE AND 300 FEET FROM THE END OF ACTIVE RUNWAY 9-27, AND 200 FEET FROM THE CENTERLINE AND 240 FEET FROM THE END OF ACTIVE RUNWAY 1-19. FOR WORK NEAR TAXIWAYS AND APRONS, THE CONTRACTOR'S PERSONNEL AND EQUIPMENT MUST REMAIN AT LEAST 44.5 FEET FROM CENTERLINE OF ACTIVE CATEGORY I TAXIWAYS, 65.5 FEET FROM ACTIVE CATEGORY II TAXIWAYS, AND TEN (10) FEET FROM ACTIVE APRONS. WHEN CONSTRUCTION OPERATIONS MUST BE CONDUCTED WITHIN THESE SEPARATIONS, THE PAVEMENT MUST BE CLOSED TO AIRCRAFT ACTIVITY BY THE CONTRACTOR BY PROVIDING TEMPORARY BARRICADES AS SHOWN IN THE PLANS, AND IN THE CASE OF RUNWAY PAVEMENTS, CLOSED RUNWAY MARKERS. WHEN HAUL VEHICLES ARE PERMITTED TO CROSS ACTIVE AIRFIELD PAVEMENTS, THE CONTRACTOR WILL PROVIDE POSITIVE CONTROL OF CONSTRUCTION VEHICLES USING RADIO-EQUIPPED FLAGGERS. CONTRACTOR SHALL ESTABLISH AND MAINTAIN RADIO CONTACT WITH KEWANEE AIRPORT UNICOM (122.8 MHz). ALL CONTRACTOR'S EQUIPMENT USED IN ACTIVE AIRPORT OPERATIONS AREAS SHALL BE EQUIPPED WITH AN FAA-STANDARD FLAG, AS REFERENCED IN FAA AC 150/5370-2, CURRENT ISSUE. AIRCRAFT SHALL HAVE THE RIGHT-OF-WAY.

THE CONTRACTOR SHALL KEEP ALL OF HIS EQUIPMENT AND PERSONNEL AT LEAST 15 FEET FROM THE EDGE OF ANY ACTIVE ROADWAY OR AUTO PARKING PAVEMENT. WHEN HIS ACTIVITIES REQUIRE WORKING WITHIN 15 FEET OF THE ROAD/PAVEMENT EDGE. THE CONTRACTOR SHALL PROVIDE FOR TRAFFIC CONTROL IN ACCORDANCE WITH IDOT SPECIFICATIONS (HIGHWAY STANDARDS).

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 SHALL BE ALLOWED WITHIN THE RUNWAY SAFETY AREA (RSA) OR THE TAXIWAY SAFETY AREA (TSA) WHEN THE RUNWAY OR TAXIWAY IS OPEN TO AIR TRAFFIC (INCLUDING OVERNIGHT). THE RSA IS DEFINED AS 75 FEET FROM THE CENTERLINE AND 300 FEET FROM THE END OF RUNWAY 9-27, AND 60 FEET FROM THE CENTERLINE AND 240 FEET FROM THE END OF RUNWAY 1-19. THE TSA IS MEASURED AT 24.5 FEET FROM THE CATEGORY I TAXIWAY CENTERLINE AND 39.5 FEET FROM THE CATEGORY II TAXIWAY CENTERLINE. NO VERTICAL DROP OF GREATER THAN 3-INCHES IN HEIGHT FROM PAVEMENT EDGE TO EARTH GRADE OR EARTH GRADE TO EARTH GRADE WITHIN THE RSA OR TSA WILL BE PERMITTED WHEN THE RUNWAY OR TAXIWAY IS OPEN TO AIR TRAFFIC. THE CONTRACTOR WILL HAVE STEEL PLATES ON-SITE TO ALLOW FOR THE RAPID COVERING OF TRENCHES OR EARTH DROPS IN THE EVENT OF UNEXPECTED WORK STOPPAGES FOR WEATHER OR AIRPORT EMERGENCIES.

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 PHASING PLAN. THE CONTRACTOR WILL BE RESPONSIBLE FOR MAINTAINING THE CONSTRUCTION ENTRANCES IN GOOD CONDITION. THE COST OF MAINTAINING THE CONSTRUCTION ENTRANCE AND CONTRACTOR AREAS IS TO BE INCIDENTAL TO THE CONTRACT. THE CONTRACTOR SHALL PROTECT ALL EXISTING PAVEMENT EDGES FROM DAMAGE FROM CONSTRUCTION EQUIPMENT AND HAUL VEHICLES.

AT NO TIME SHALL THE CONTRACTOR CONDUCT ANY ACTIVITIES OR OPERATE OR PARK EQUIPMENT SO AS TO OBSTRUCT ACTIVE PART 77 AIRPORT IMAGINARY

SURFACES OR THE RUNWAY PROTECTION ZONES (RPZ) AS DELINEATED IN THE PLANS. CONTRACTOR'S EQUIPMENT SHALL EXTEND NO HIGHER THAN 20 FEET.

BEFORE REOPENING TEMPORARILY CLOSED PAVEMENTS, 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 OWNER AND IS INCIDENTAL TO THE CONTRACT.

ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE APPROVED PROJECT SAFETY PLAN. ISSUED BY THE ILLINOIS DIVISION OF AERONAUTICS.

FAILURE TO USE THESE PRESCRIBED PROCEDURES OR ADHERE TO THE SAFETY REQUIREMENTS WILL RESULT IN THE SUSPENSION OF WORK.

NOTIFICATIONS BY CONTRACTOR

THE CONTRACTOR MUST NOTIFY THE RESIDENT ENGINEER AND THE AIRPORT OWNER 3 DAYS IN ADVANCE OF ANY REQUIRED PARTIAL OR COMPLETE CLOSING OF ANY RUNWAY, TAXIWAY OR APRON. THE DATE, TIME AND SCHEDULED DURATION OF THE CLOSING MUST BE APPROVED BY THE RESIDENT ENGINEER AND THE AIRPORT OWNER. THE CONTRACTOR SHALL NOTIFY THE RESIDENT ENGINEER AND AIRPORT OWNER 3 DAYS IN ADVANCE OF THE CONTRACTOR'S CLOSING OF OTHER ACTIVE ROADWAYS, AIRFIELD OR ROADWAY LIGHTING CIRCUITS, OR OTHER AIRPORT FACILITIES.

CONTRACTOR'S USE OF SITE

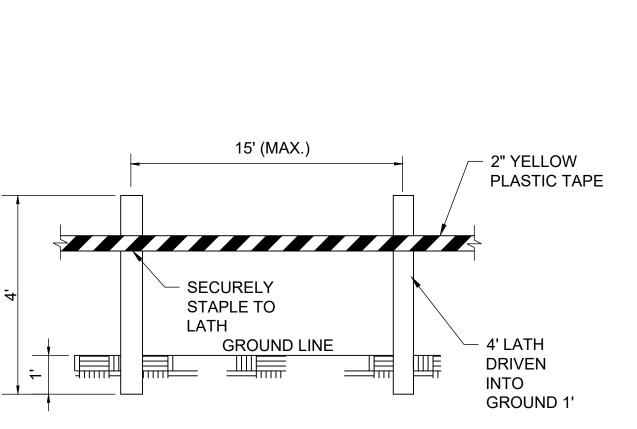
CONTRACTOR'S ACCESS TO THE PROJECT WHEN ON AIRPORT PROPERTY IS SHOWN IN THE PLANS. CONTRACTOR'S ACCESS TO THE AIRPORT ITSELF IS TO BE PROVIDED BY PUBLIC RIGHTS-OF-WAY. THE CONTRACTOR IS TO SECURE ALL NECESSARY PERMITS FOR THE USE OF ANY PUBLIC RIGHTS-OF-WAY AND IS TO MAINTAIN TRAFFIC ON THESE PUBLIC 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 OF THE FACILITY'S OWNER.

THE CONTRACTOR IS TO PROVIDE TEMPORARY CONSTRUCTION ROADS WITHIN THE PROJECT LIMIT LINES AS MAY BE REQUIRED BY HIS ACTIVITIES. HEAVY VEHICLES SHALL NOT CROSS EXISTING PAVEMENT SURFACES EXCEPT AS APPROVED BY THE AIRPORT OWNER AND THE RESIDENT ENGINEER. 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 OWNER AND THE RESIDENT ENGINEER. FOR HAUL ROUTES MADE BY THE CONTRACTOR THROUGH GRASSED AREAS. CONTRACTOR SHALL GRADE. LEVEL, TOPSOIL, SEED AND MULCH AT THE END OF THE PROJECT, COST INCIDENTAL TO THE CONTRACT.

THE CONTRACTOR IS TO PROVIDE AN EQUIPMENT STORAGE AND PARKING AREA AT THE LOCATION SHOWN IN THE PLANS. 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 OWNER AND THE RESIDENT ENGINEER. AT THE AIRPORT OWNER'S DISCRETION, THE TEMPORARY FACILITIES MAY REMAIN, BUT THEY MUST BE LEFT IN CONDITIONS SUITABLE TO THE AIRPORT OWNER. THE COST OF PROVIDING, MAINTAINING AND RESTORING THE TEMPORARY FACILITIES IS INCIDENTAL TO THE CONTRACT.

UTILITY OUTAGES AND SHUTDOWNS

THE CONTRACTOR SHALL PROVIDE 3 DAYS PRIOR NOTICE OF ANY OUTAGES OR SHUTDOWNS TO THE OWNER 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.



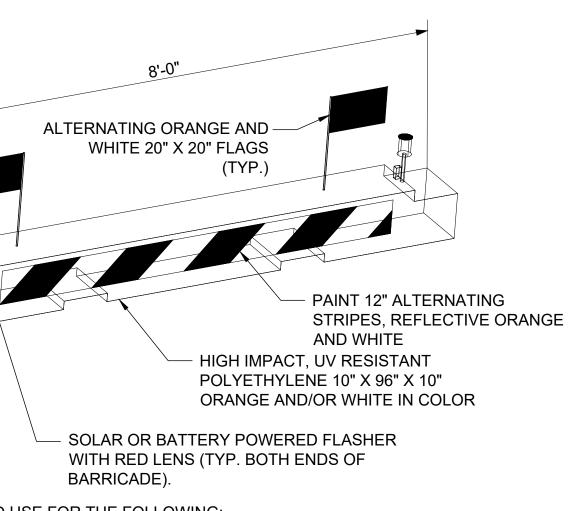
MATERIALS ARE TO BE APPROVED BY ENGINEER PRIOR TO INSTALLATION. COST OF MATERIALS, INSTALLATION, RELOCATION AND MAINTENANCE OF LATHING AND WARNING TAPE IS TO BE INCIDENTAL TO THE CONTRACT.



(TYP.) NOTES:

- 1. INTENDED USE FOR THE FOLLOWING:
- IN THE PHASING PLANS.
- 20" FLAGS.
- 150/5370-2 (LATEST EDITION).

TYPE 2 - LOW PROFILE AIRCRAFT BARRICADE DETAIL



- MARKING/LIGHTING OF TEMPORARY HAZARDS WITHIN THE AOA. - LONGTERM CLOSURE OF AIRCRAFT ROUTES.

2. INSTALL AT 12' CENTER TO CENTER SPACING ALONG FULL WIDTH OF PAVEMENT

3. USE TYPE 2 AIRCRAFT BARRICADES IN AREAS SUBJECT TO JET BLAST AS SHOWN

4. BARRICADE SHALL BE EQUIPPED WITH ALTERNATING ORANGE AND WHITE 20" X

5. BARRICADES SHALL BE WATER-FILLED AND MODULAR TO ASSEMBLE/DISASSEMBLE AND NEST FOR COMPACT STORAGE.

6. CONTRACTOR MAY SUBMIT ALTERNATIVE BARRICADE FOR APPROVAL BY ENGINEER. ALTERNATIVE MUST MEET MINIMUM REQUIREMENTS OF FAA AC

7. FURNISHING, INSTALLING, MAINTAINING AND REMOVING BARRICADES SHALL BE PAID UNDER ITEM AR150530. SEE SPECIAL PROVISIONS.

8. CONTRACTOR SHALL MAINTAIN THE BARRICADES. ANY DAMAGED BARRICADES SHALL BE REPLACED AND NEW BARRICADES PROVIDED. DETAIL B

FOR BID



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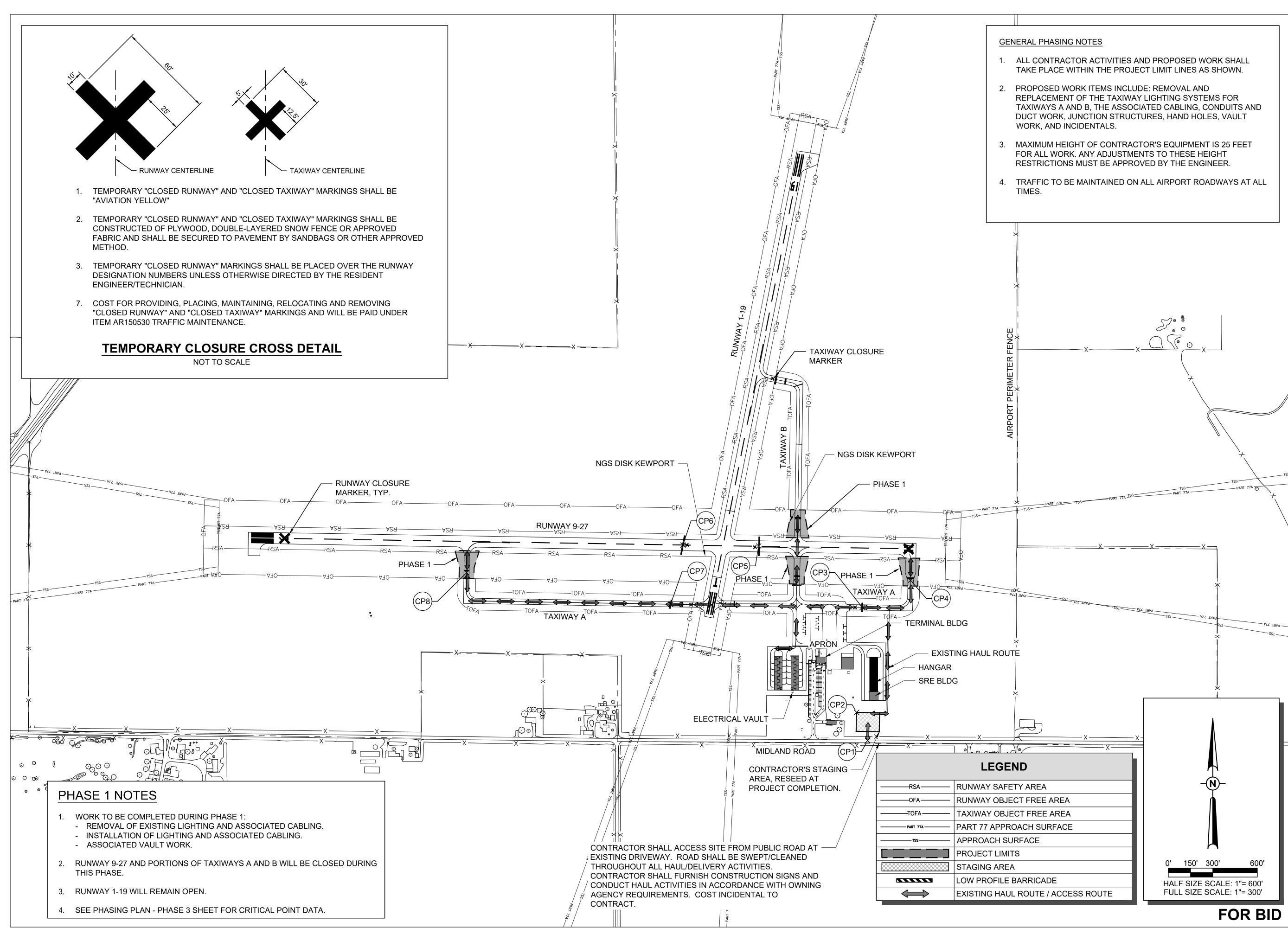
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SITE AND SAFETY PLAN NOTES





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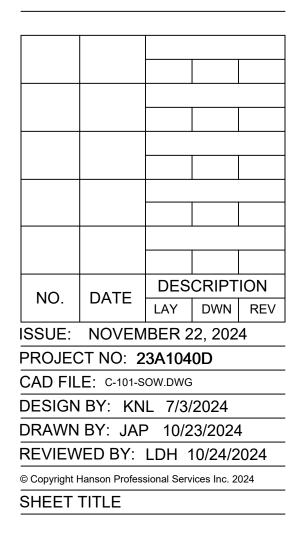
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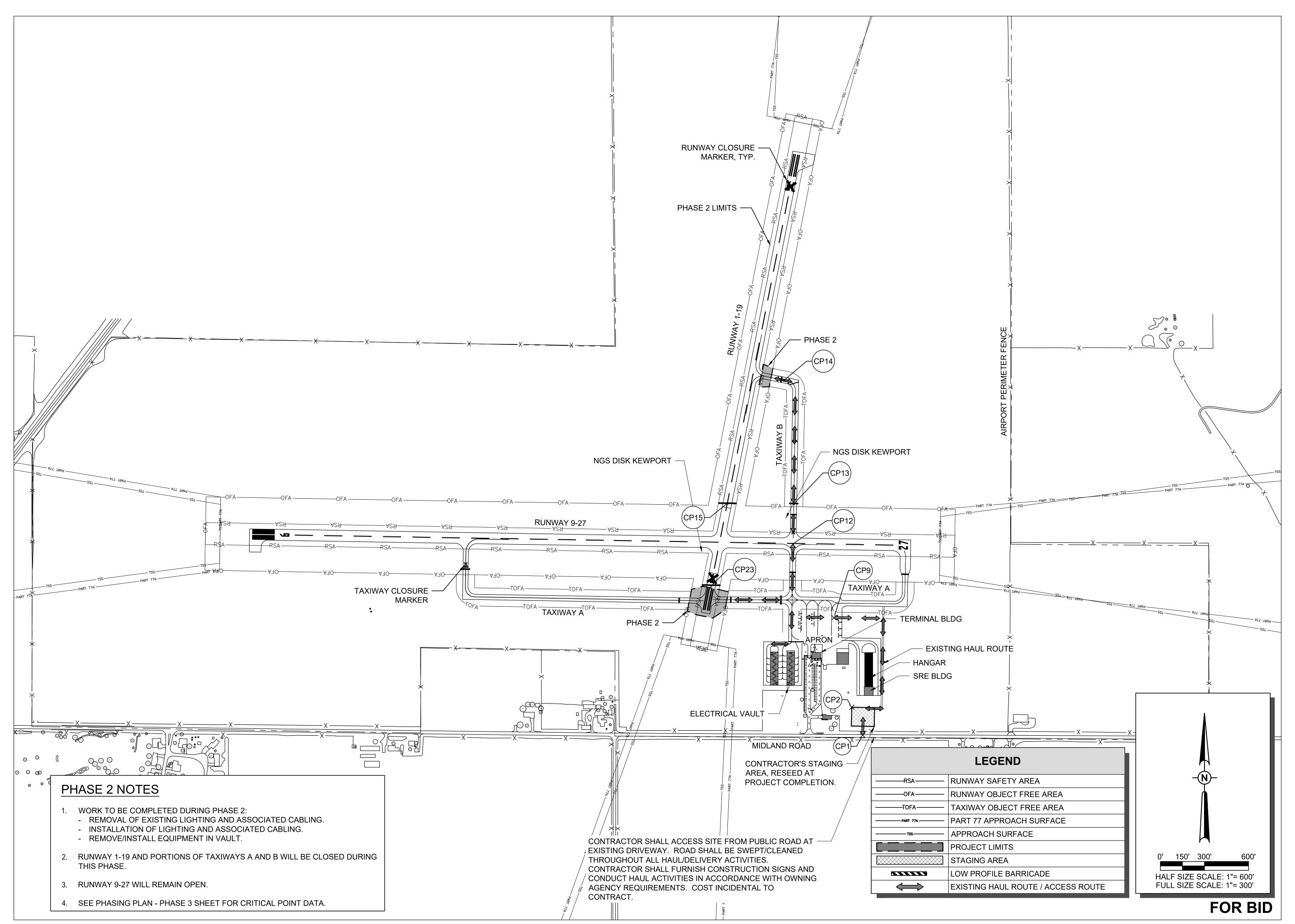
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PHASING PLAN -PHASE 1



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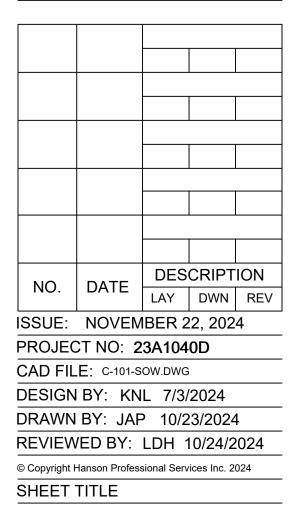
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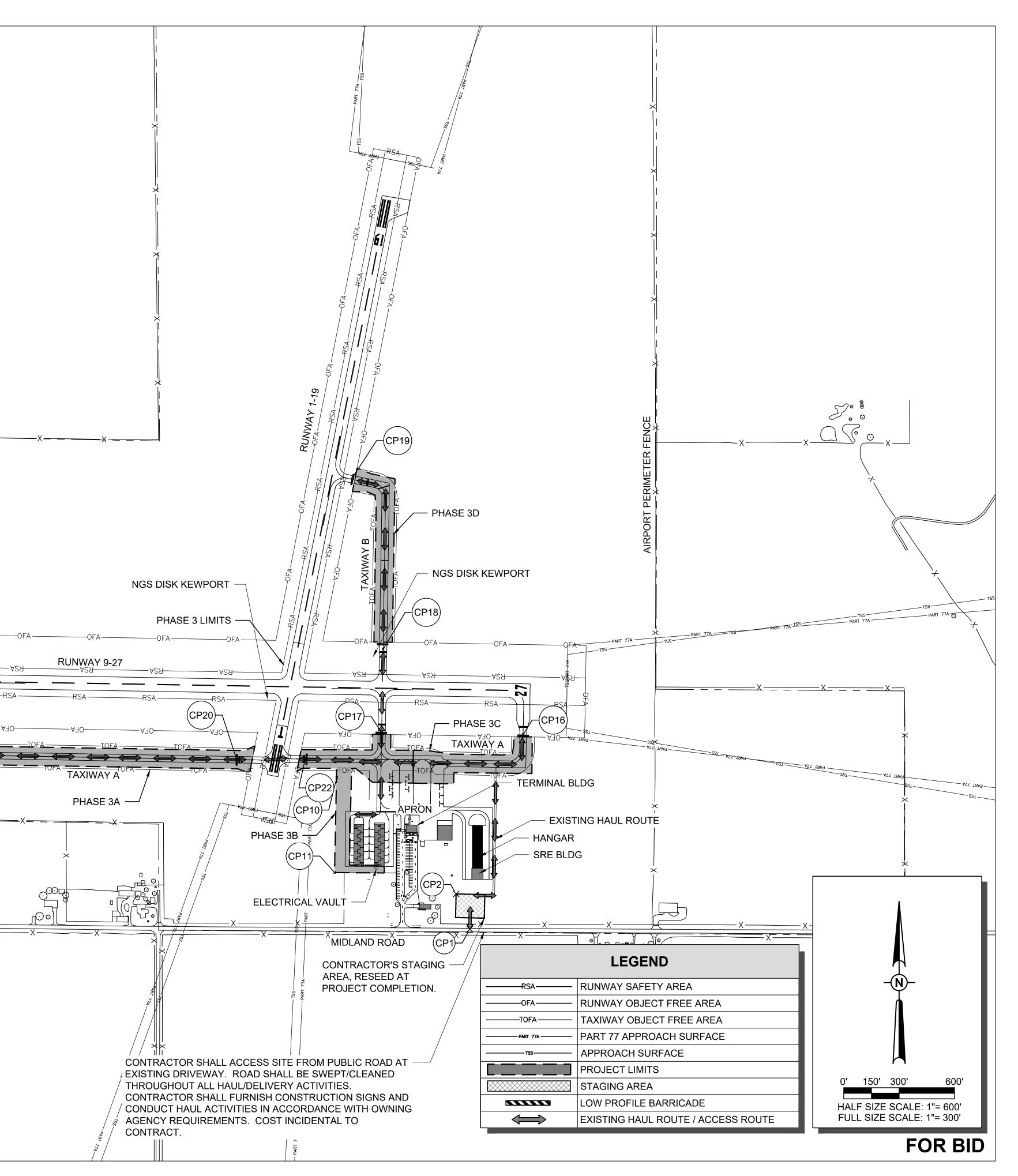
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PHASING PLAN -PHASE 2

		CRITICA	LPOINTS	-				
POINT #	DESCRIPTION	LATITUDE	LONGITUDE	GND. ELEV. (MSL)	MAX. EQUIP. HEIGHT (FT)	TOP ELEV. (MSL)		
1	EQUIPMENT	041° 12' 01.16"	-089° 57' 31.17"	848	25	873	1	
2	EQUIPMENT	041° 12' 03.04"	-089° 57' 32.14"	847	25	872		
3	BARRICADE	041° 12' 10.03"	-089° 57' 31.62"	852	25	877	1	
4	BARRICADE	041° 12' 11.82"	-089° 57' 27.35"	854	25	879	1	
5	BARRICADE	041° 12' 14.13"	-089° 57' 40.74"	858	25	883	1	
6	BARRICADE	041° 12' 14.21"	-089° 57' 47.40"	855	25	880	1	
7	BARRICADE	041° 12' 10.27"	-089° 57' 48.50"	853	25	877		
8	EQUIPMENT	041° 12' 12.40"	-089° 58' 06.48"	848	25	873	1	
9	EQUIPMENT	041° 12' 09.06"	-089° 57' 33.70"	850	25	875	1	
10	EQUIPMENT	041° 12' 09.29"	-089° 57' 40.58"	851	25	851		
11	EQUIPMENT	041° 12' 04.20"	-089° 57' 40.75"	846	25	871	1	
12	EQUIPMENT	041° 12' 14.03"	-089° 57' 37.34"	858	25	883		
13	BARRICADE	041° 12' 16.72"	-089° 57' 37.26"	857	25	882	1	
14	EQUIPMENT	041° 12' 25.04"	-089° 57' 38.08"	852	25	877	1	
15	BARRICADE	041° 12' 16.77"	-089° 57' 43.17"	856	25	881		
16	BARRICADE	041° 12' 11.57"	-089° 57' 27.35"	853	25	878		——————————————————————————————————————
17	BARRICADE	041° 12' 11.69"	-089° 57' 37.40"	854	25	879	1	
18	EQUIPMENT	041° 12' 16.15"	-089° 57' 37.27"	857	25	882	1	
19	BARRICADE	041° 12' 25.30"	-089° 57' 39.45"	856	25	881	1	
20	EQUIPMENT	041° 12' 10.25"	-089° 57' 47.66"	853	25	878	1	
21	EQUIPMENT	041° 12' 12.11"	-089° 58' 06.52"	855	25	880	1	
22	EQUIPMENT	041° 12' 10.29"	-089° 57' 42.81"	855	25	880	-	
23	BARRICADE	041° 12' 11.22"	-089° 57' 44.62"	858	25	883	1	
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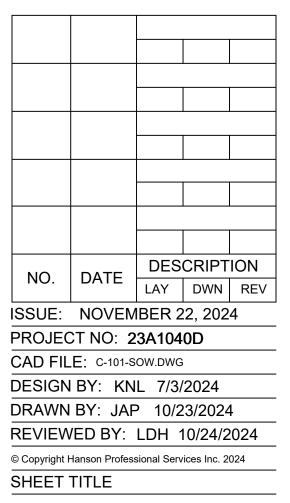
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REPLACE TAXIWAY AIRFIELD LIGHTING

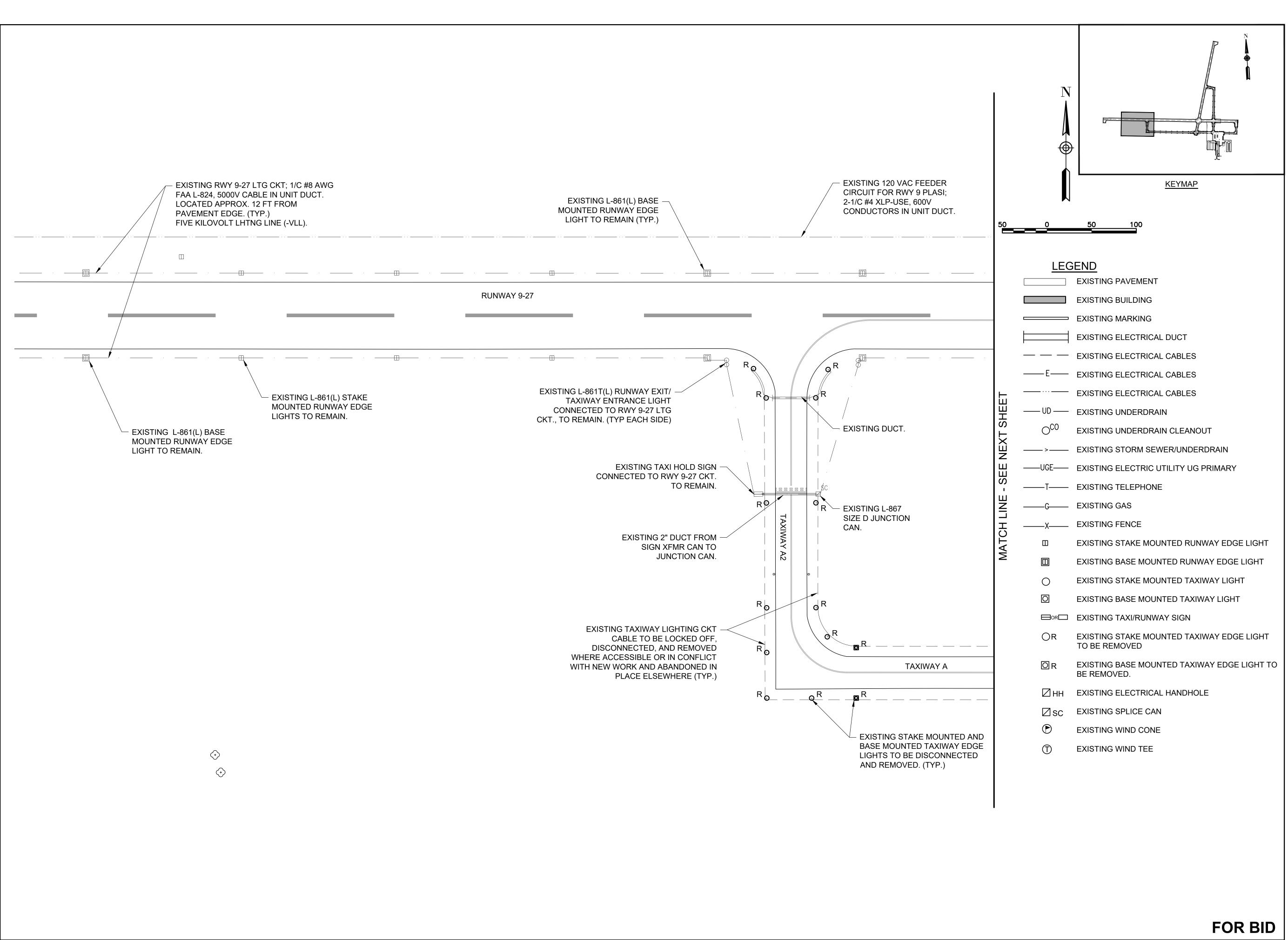
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Contract No.: KE020



PHASING PLAN -PHASE 3



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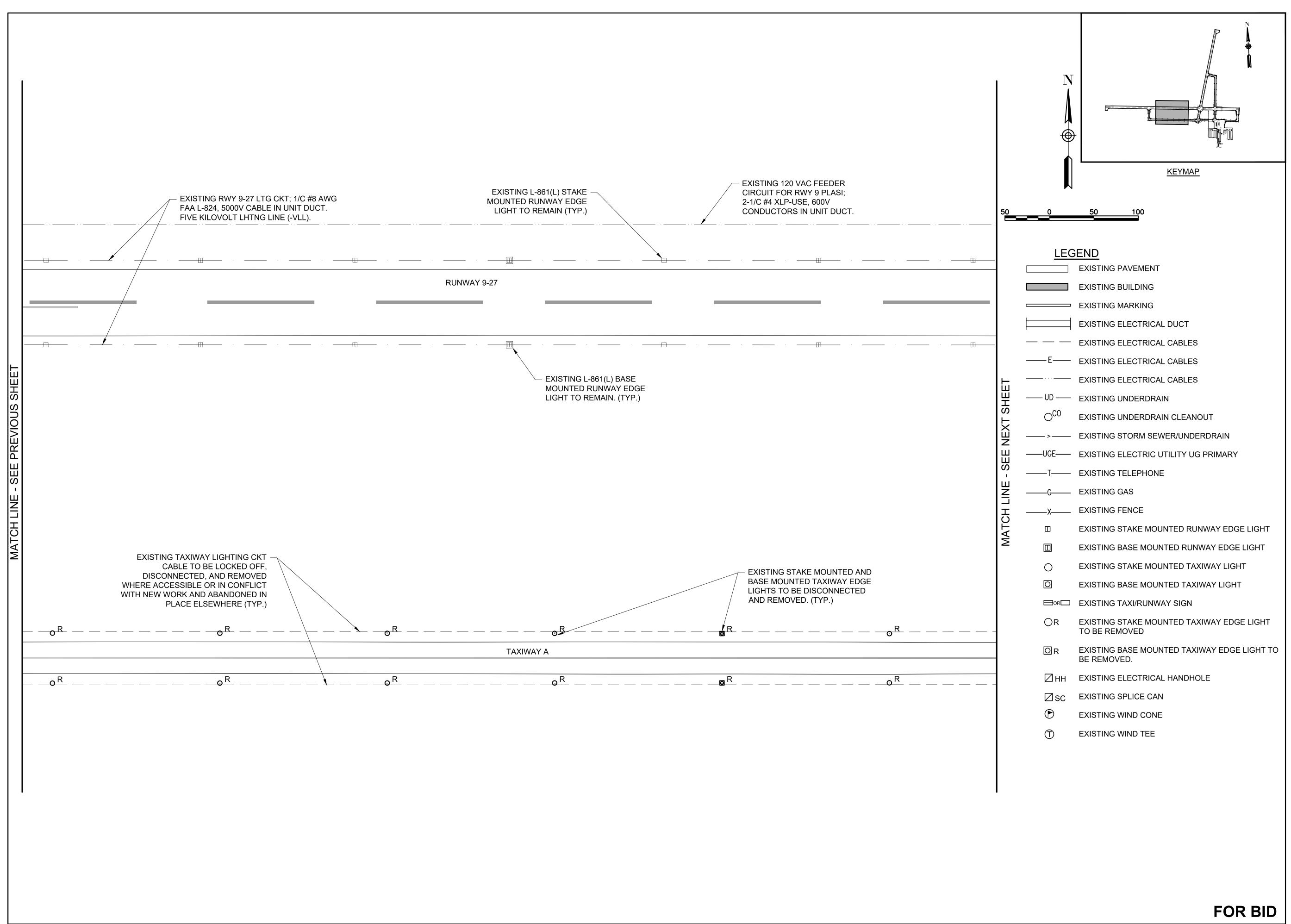
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EXISTING TAXIWAY A LTG DEMOLITION PLAN SHEET 1



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REPLACE TAXIWAY AIRFIELD LIGHTING

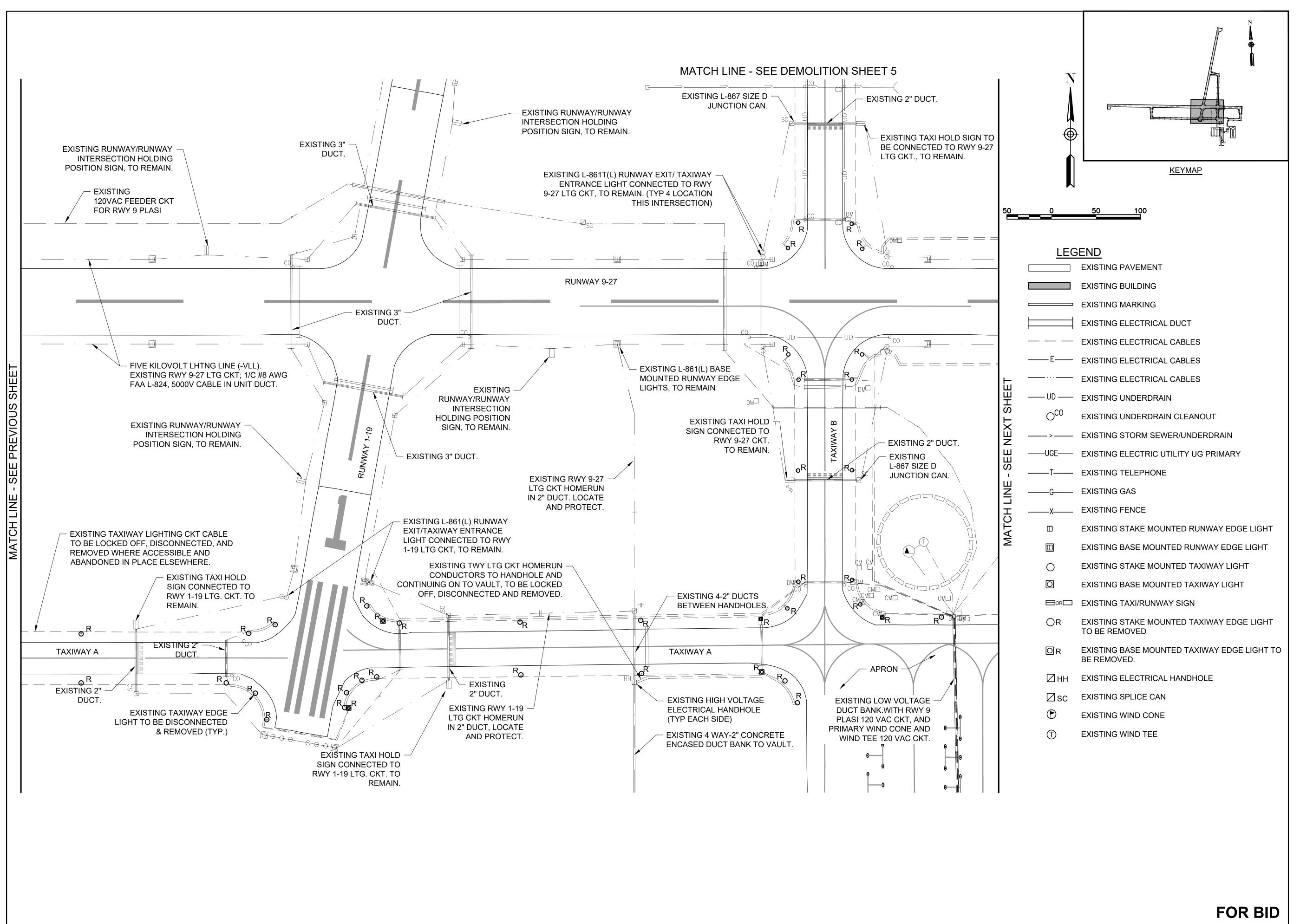
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EXISTING TAXIWAY A LTG DEMOLITION PLAN SHEET 2



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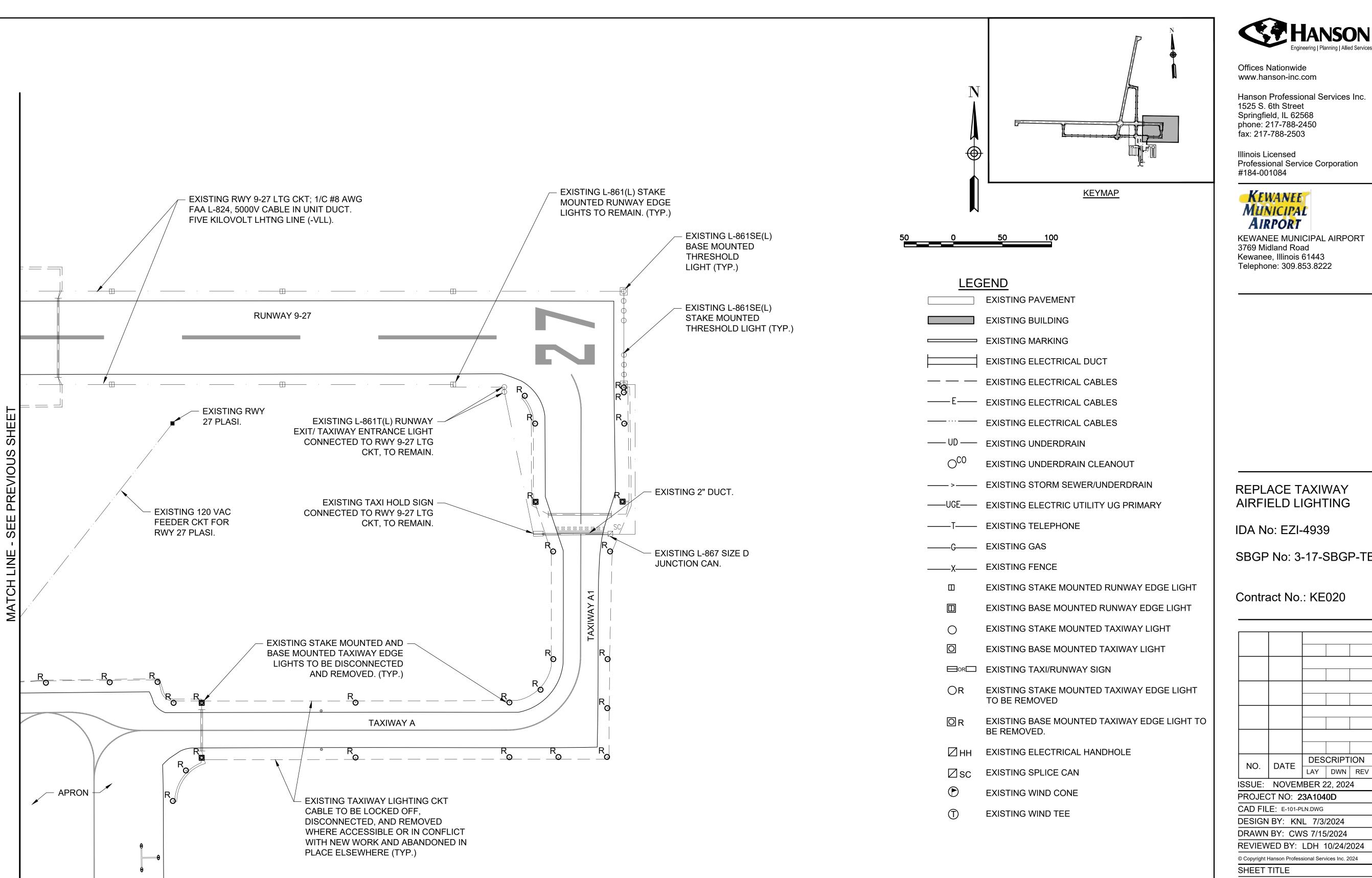
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EXISTING TAXIWAYS A AND B LTG DEMOLITION PLAN SHEET 3

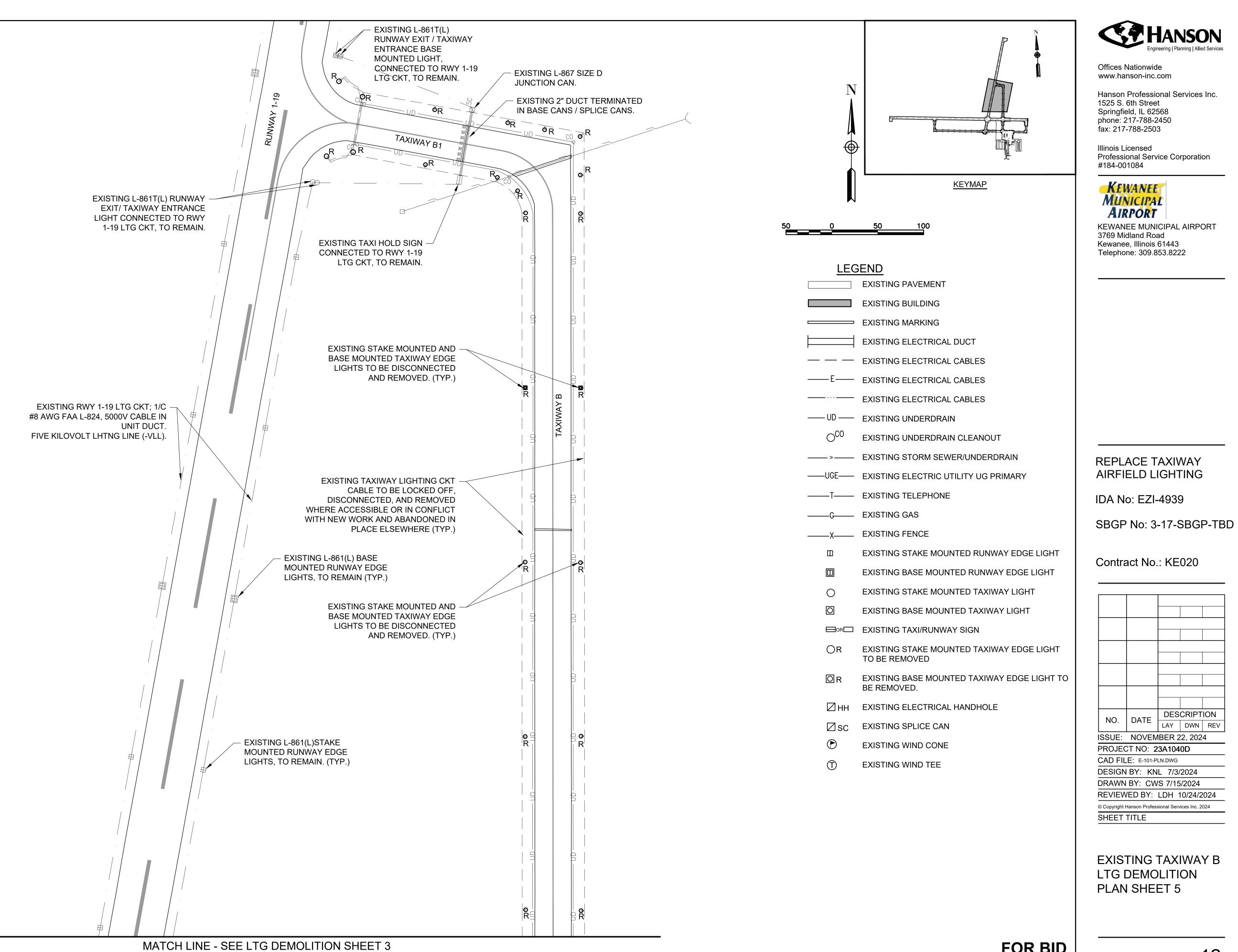
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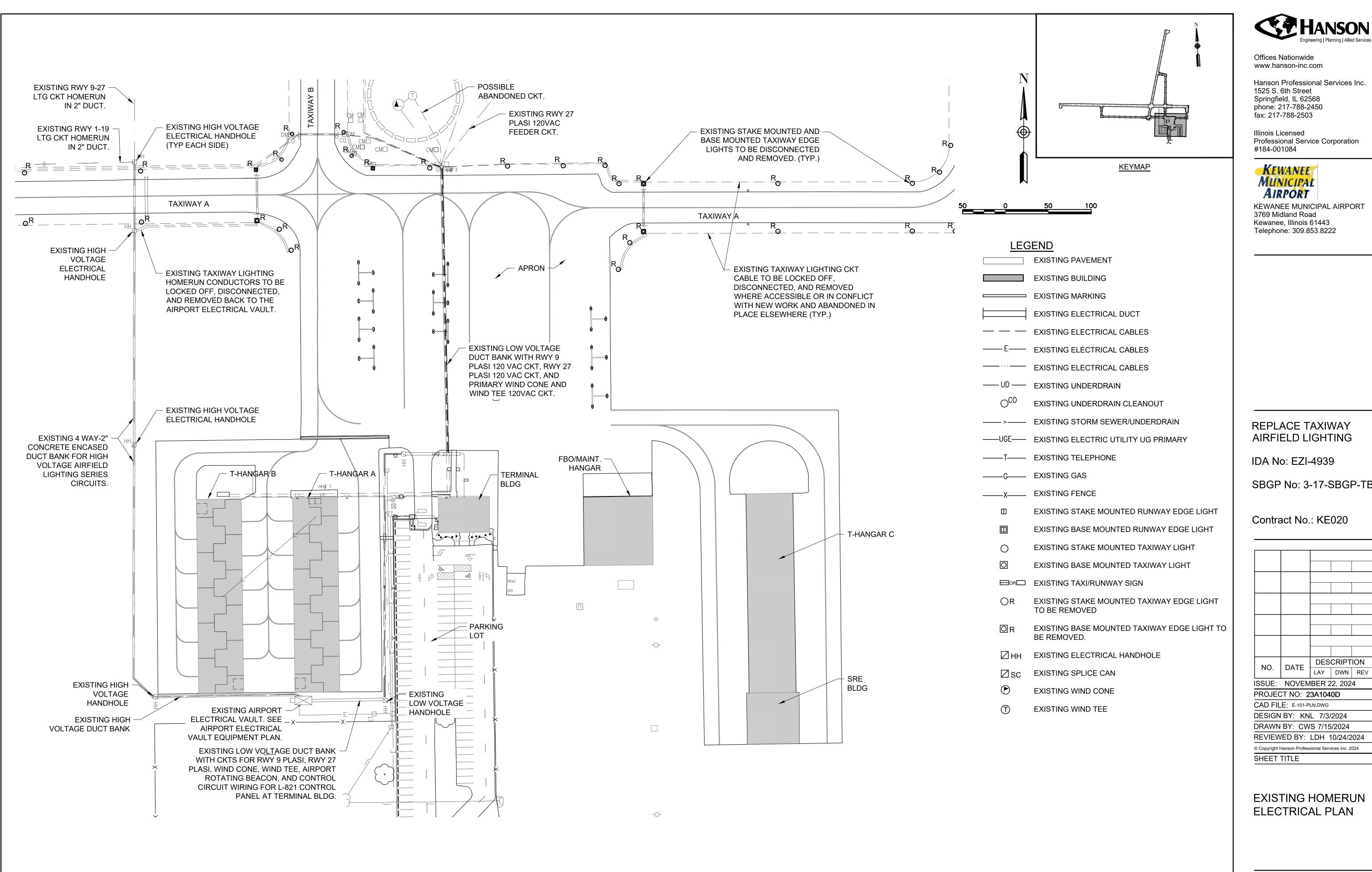
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EXISTING TAXIWAY A LTG DEMOLITION PLAN SHEET 4



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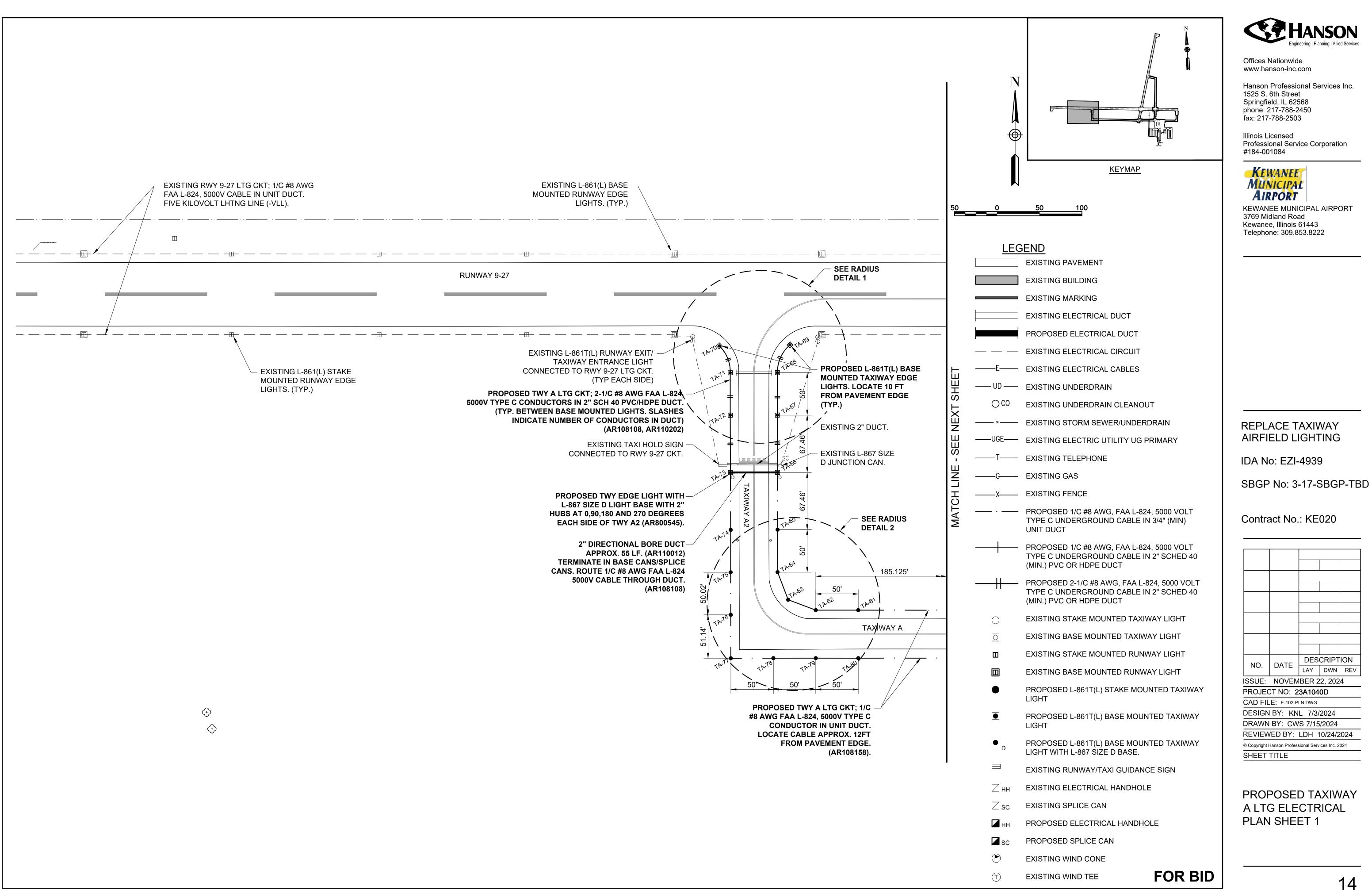
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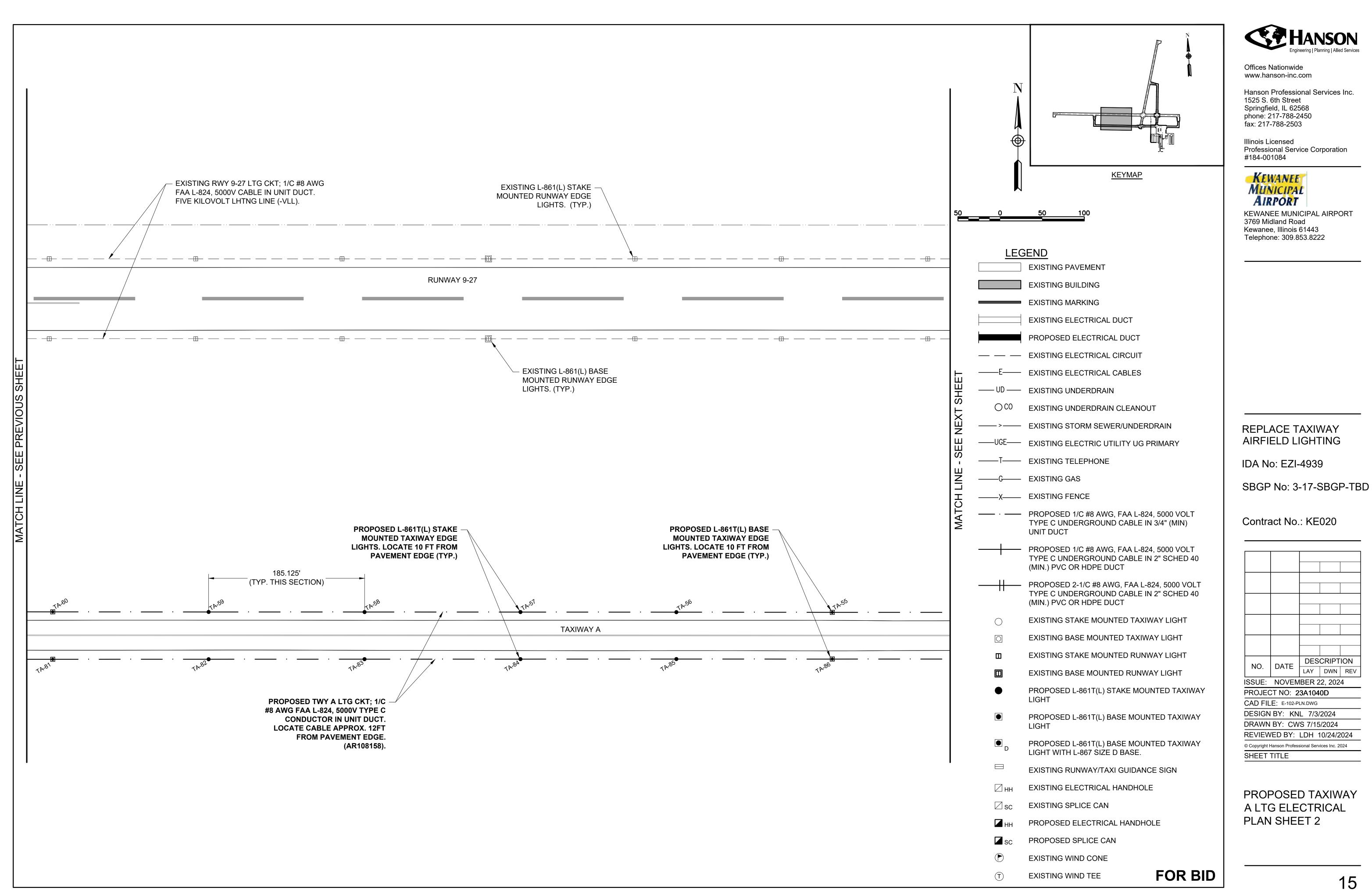
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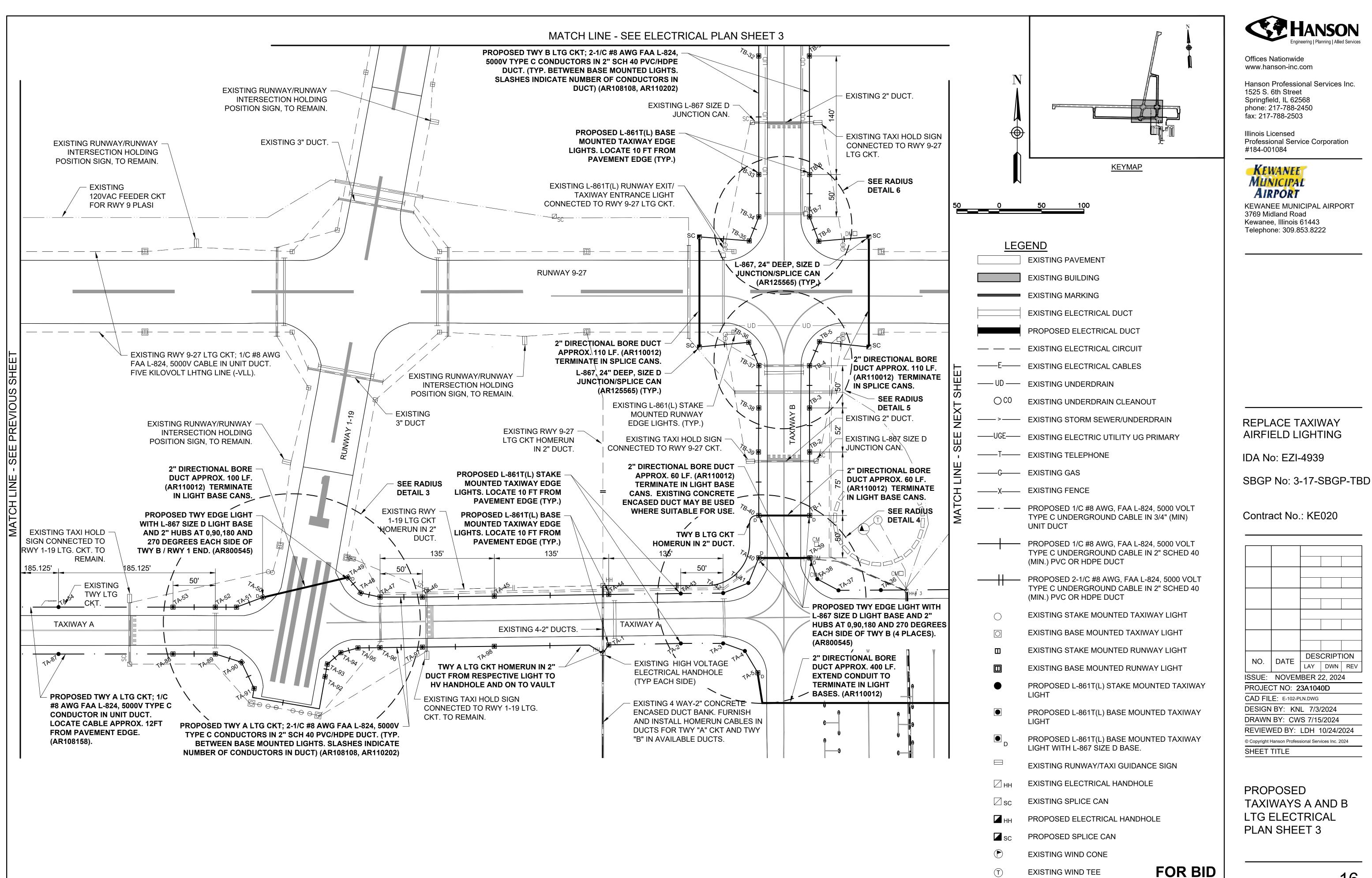
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PROPOSED TAXIWAY A LTG ELECTRICAL

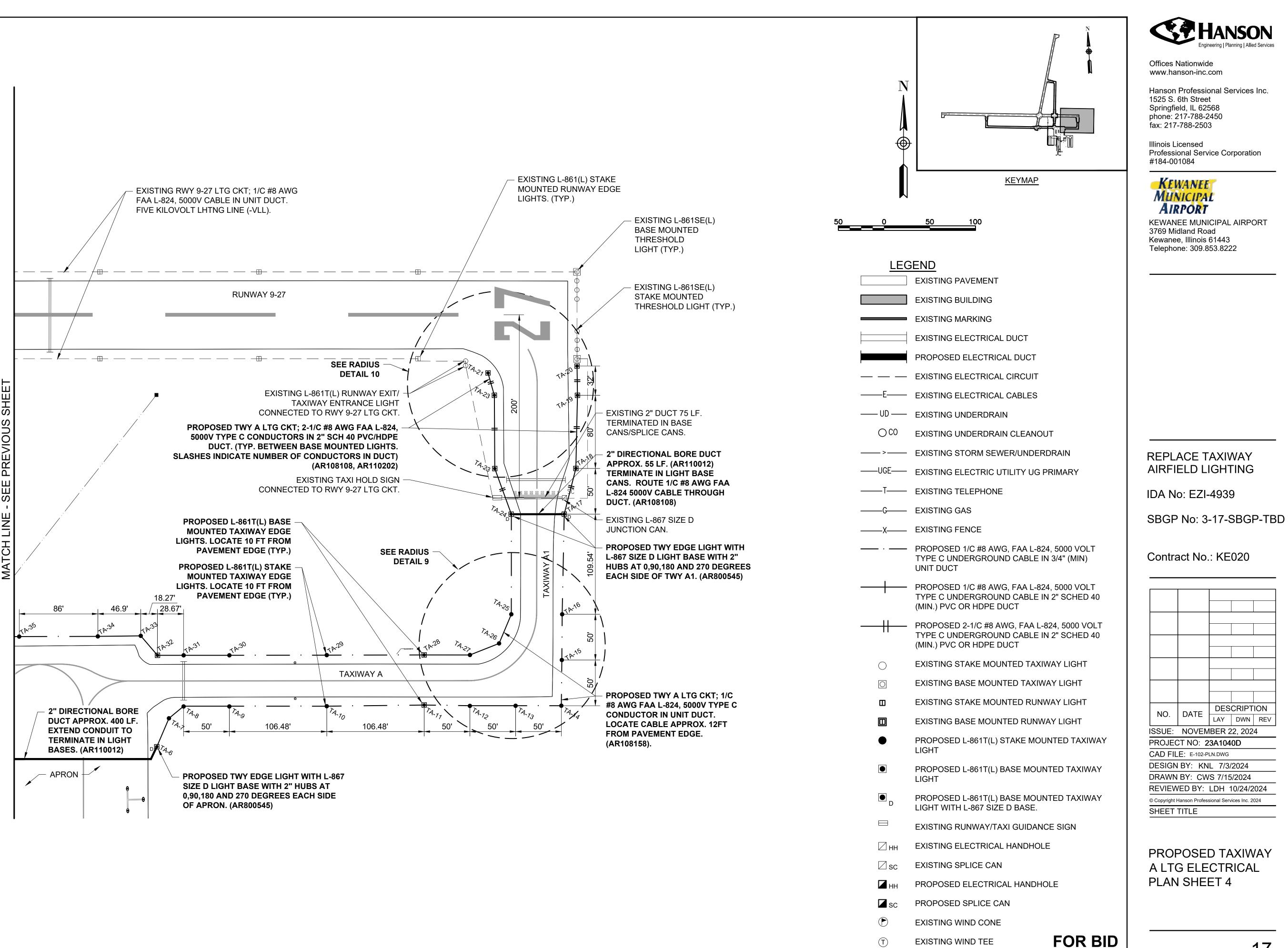




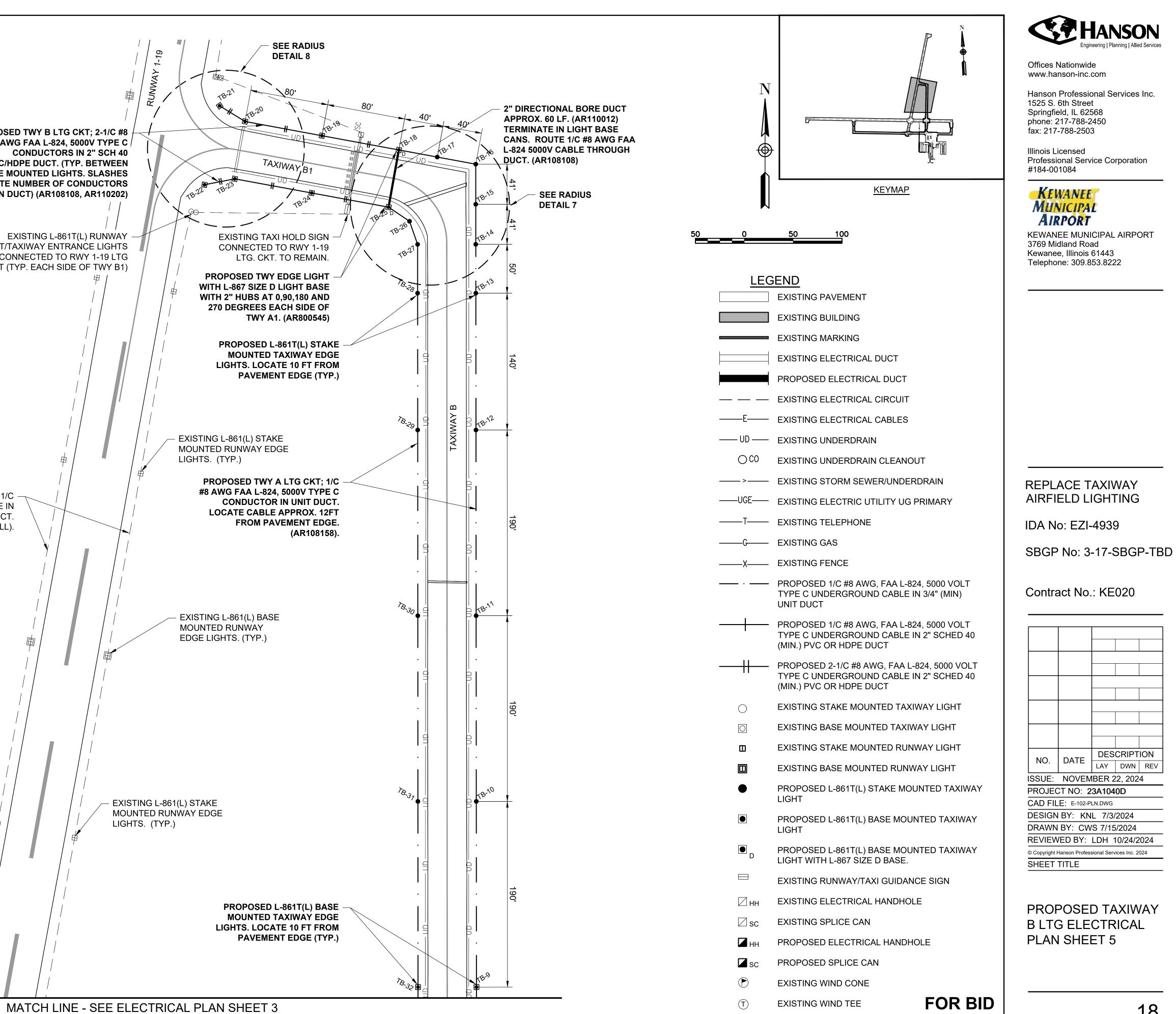


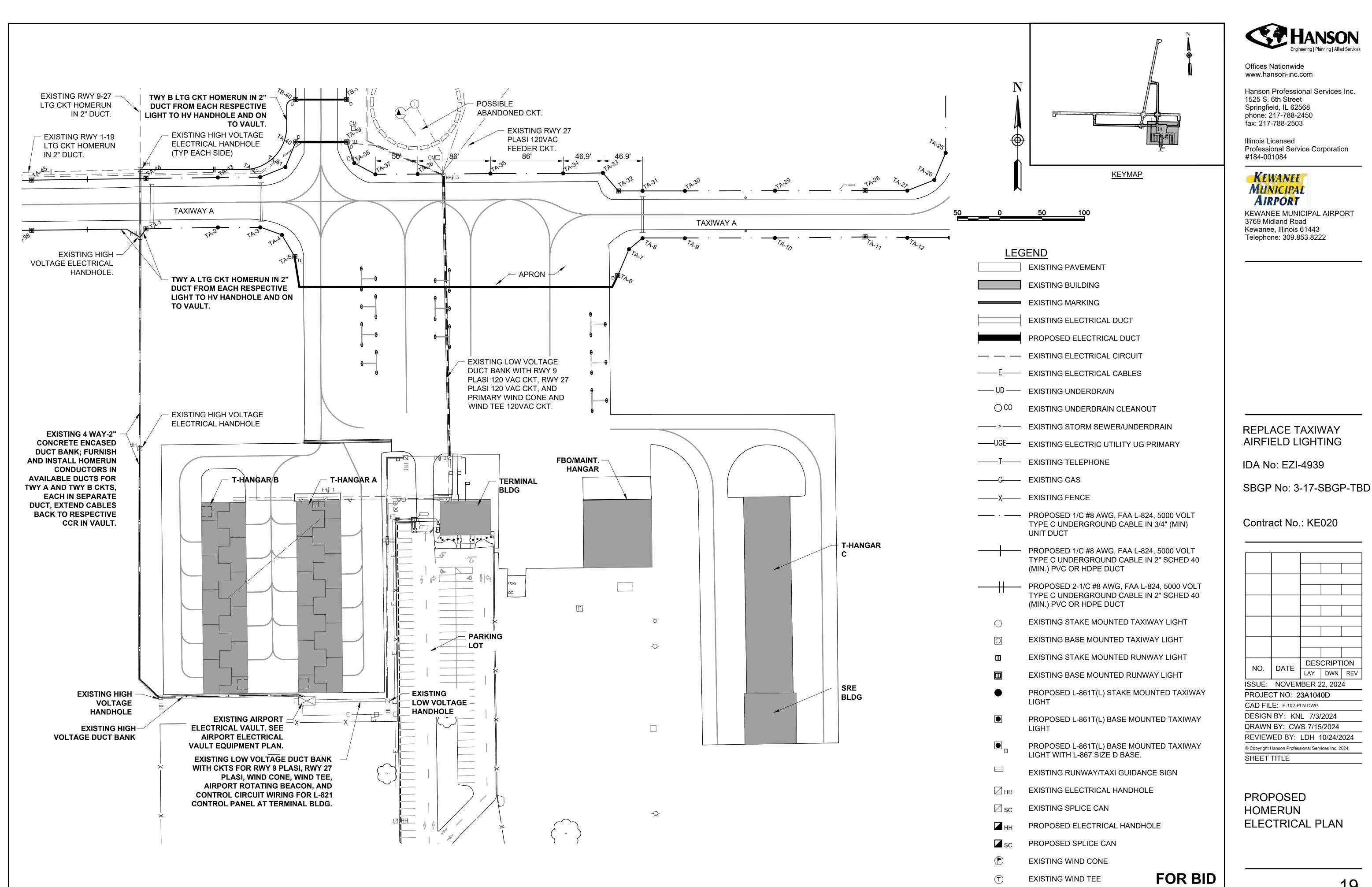
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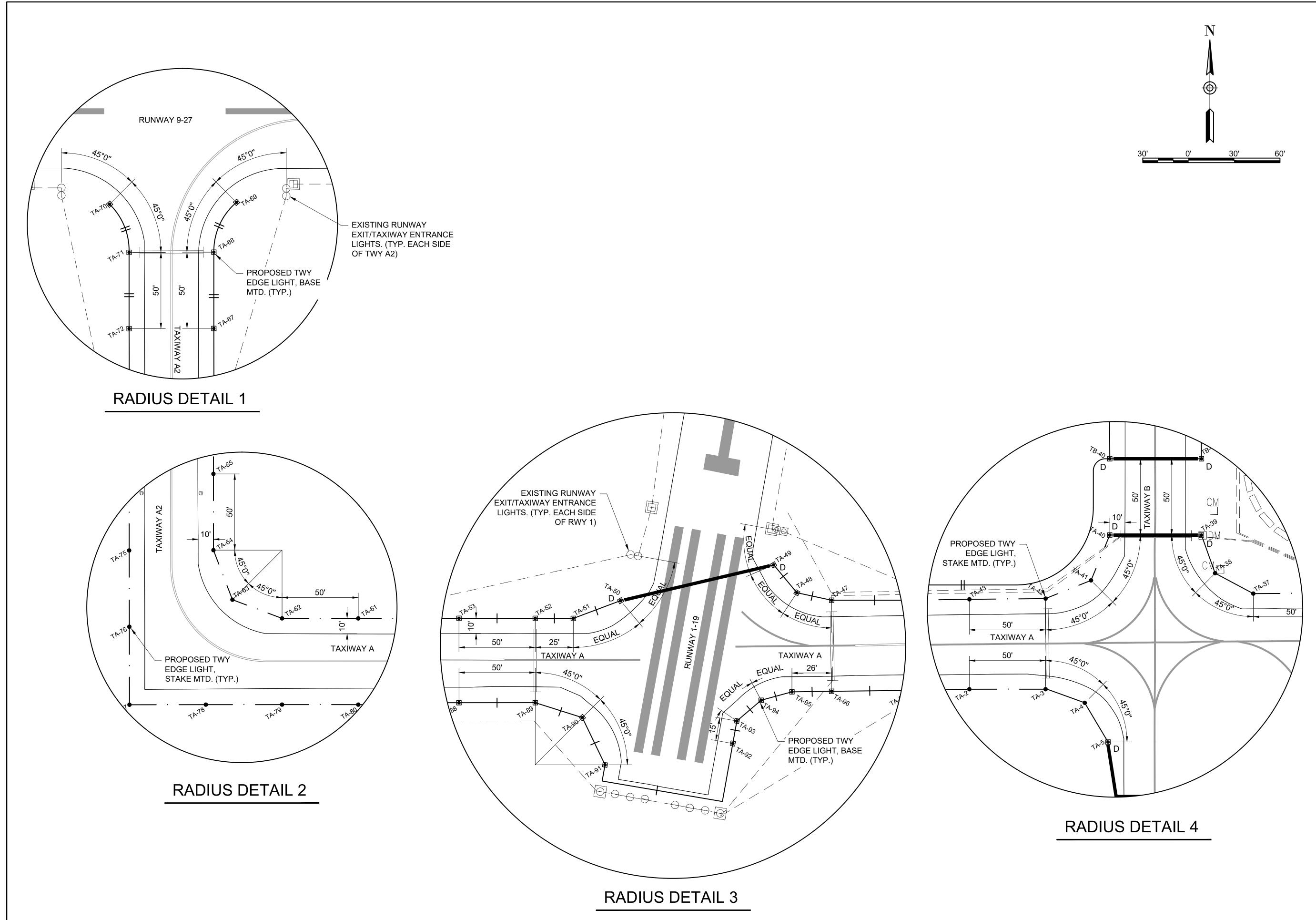


面 PROPOSED TWY B LTG CKT; 2-1/C #8 AWG FAA L-824, 5000V TYPE C / CONDUCTORS IN 2" SCH 40 **PVC/HDPE DUCT. (TYP. BETWEEN BASE MOUNTED LIGHTS. SLASHES** INDICATE NUMBER OF CONDUCTORS IN DUCT) (AR108108, AR110202) EXISTING L-861T(L) RUNWAY EXIT/TAXIWAY ENTRANCE LIGHTS CONNECTED TO RWY 1-19 LTG CKT (TYP. EACH SIDE OF TWY B1) EXISTING RWY 9-27 LTG CKT; 1/C #8 AWG FAA L-824, 5000V CABLE IN UNIT DUCT. FIVE KILOVOLT LHTNG LINE (-VLL). LIGHTS. (TYP.)





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REPLACE TAXIWAY AIRFIELD LIGHTING

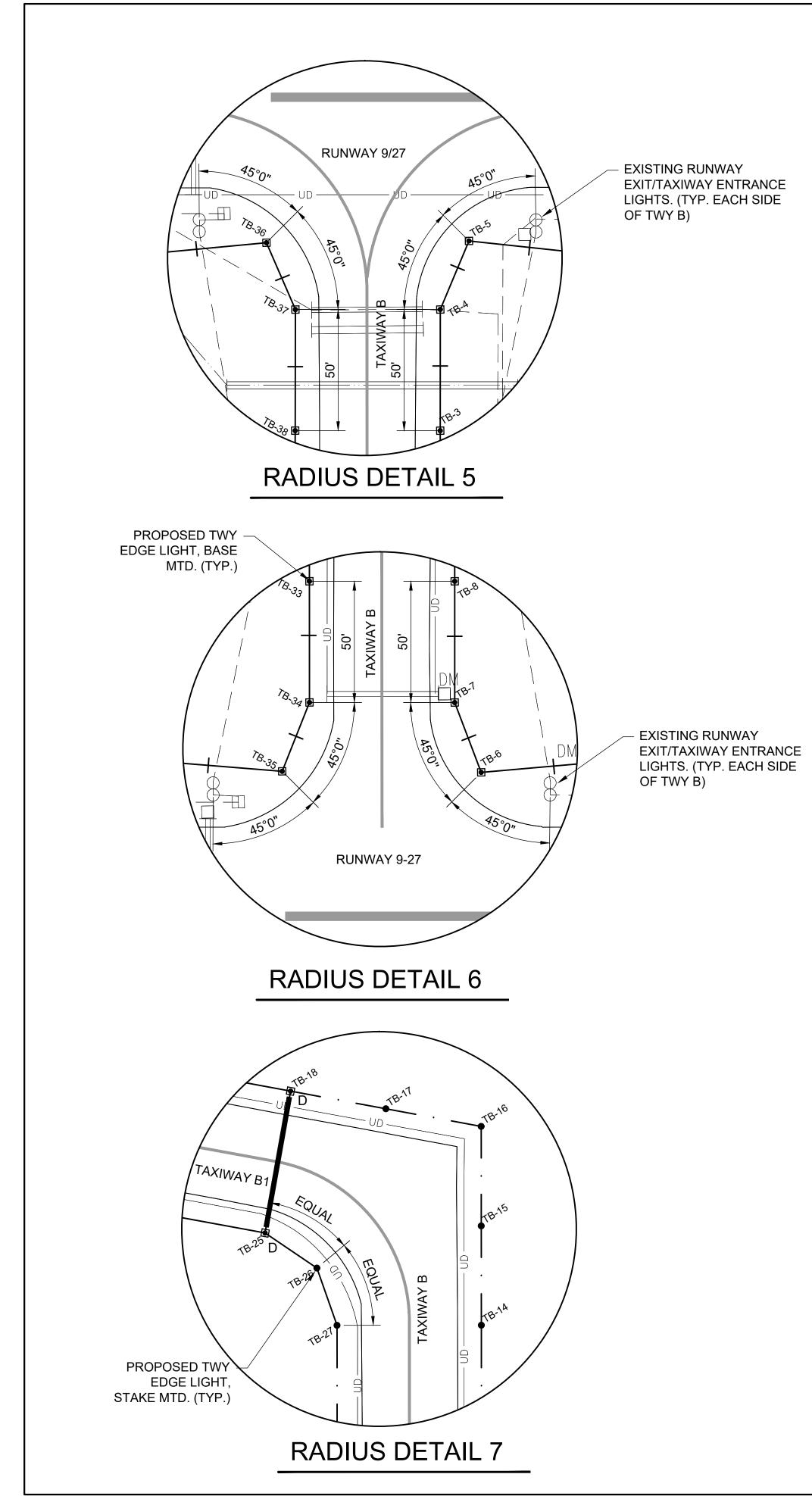
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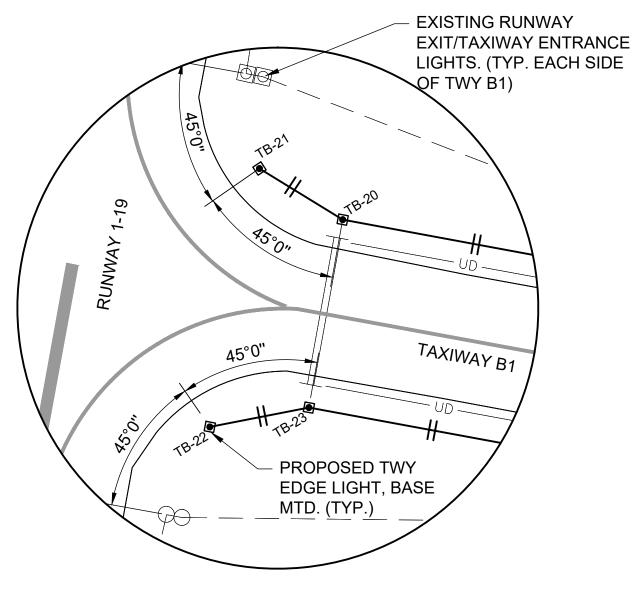
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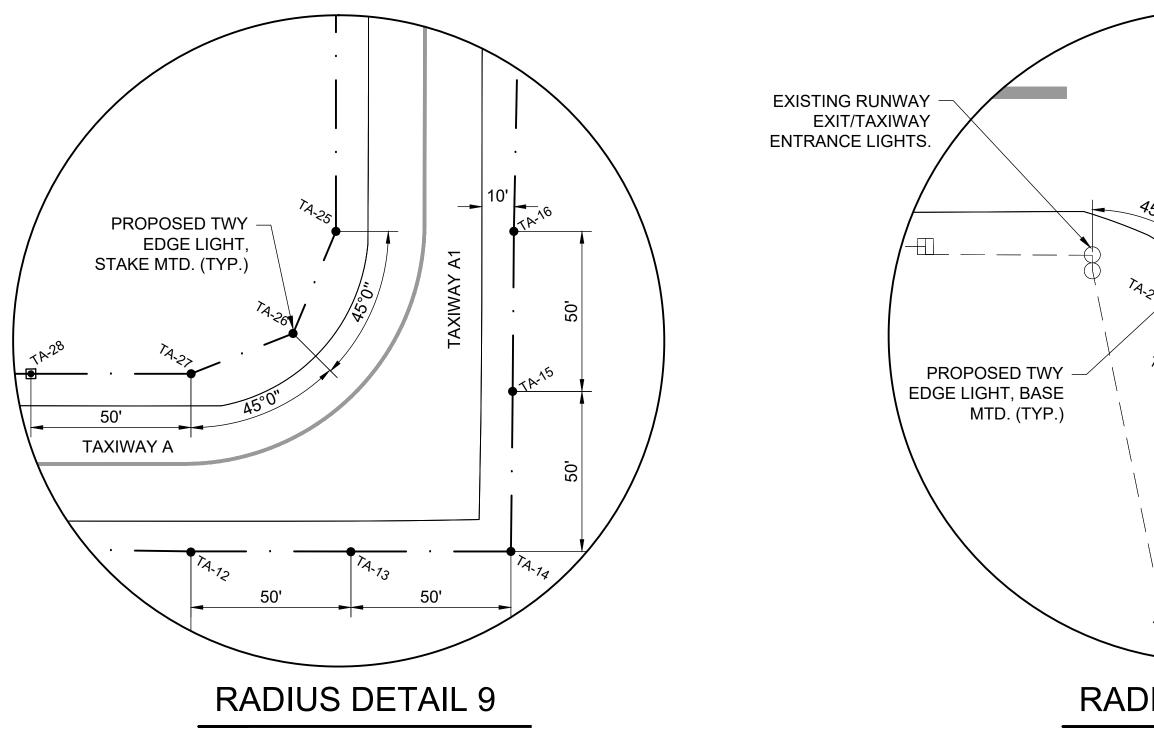
PROPOSED TAXIWAY RADIUS PLAN DETAILS SHEET 1

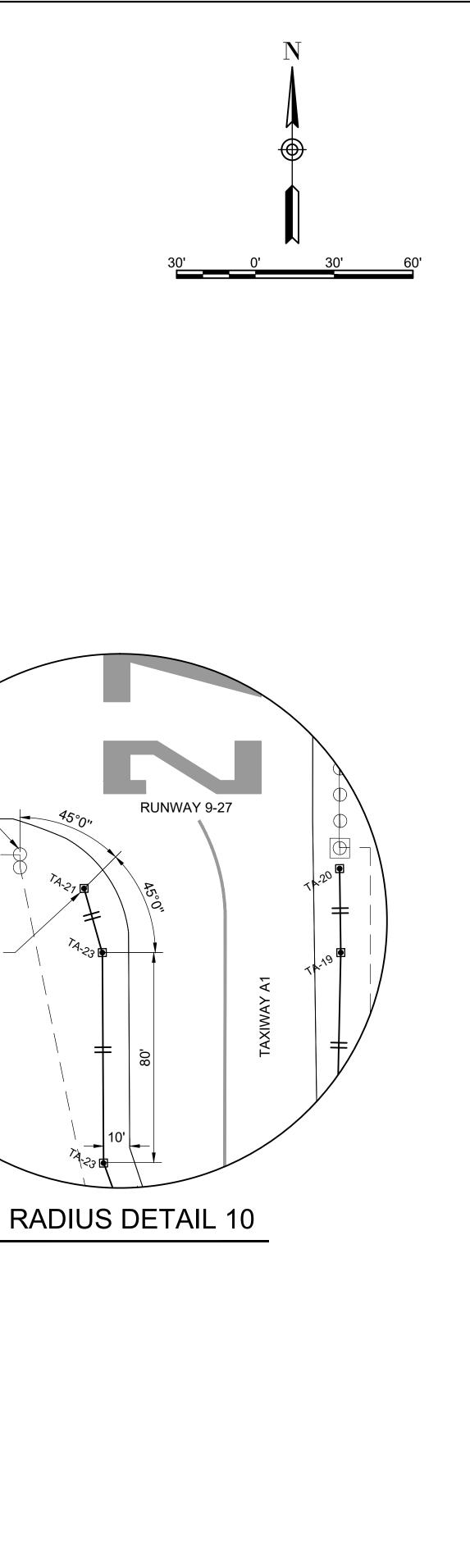


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RADIUS DETAIL 8







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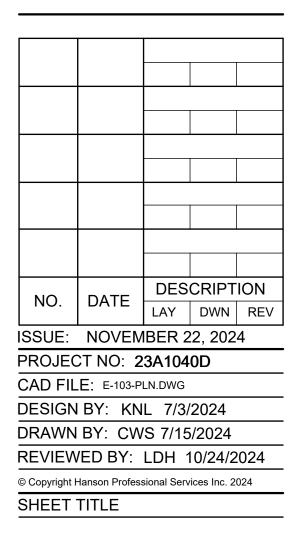
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PROPOSED TAXIWAY RADIUS PLAN DETAILS SHEET 2

AIRFIELD LIGHTING REMOVAL, RELOCATION, AND INSTALLATION NOTES

- 1. KEEP ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS COORDINATED WITH THE AIRPORT DIRECTOR/MANAGER. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT). WHERE THE FACILITY IS NOT EQUIPPED WITH LOCK/TAGOUT EQUIPMENT THE RESPECTIVE PERSONNEL WILL BE RESPONSIBLE FOR PROVIDING THE APPROPRIATE LOCKOUT/TAGOUT EQUIPMENT. FAILURE TO SHUT DOWN AND LOCKOUT THE CIRCUIT(S) PRESENTS A DANGEROUS HAZARD FOR PERSONNEL WORKING ON THIS SYSTEM.
- 2. EACH RESPECTIVE PERSON PERFORMING AIRFIELD LIGHTING WORK, VAULT WORK, AND/OR TESTS SHALL BE FAMILIAR WITH, AND QUALIFIED TO WORK ON, 5000 VOLT AIRFIELD LIGHTING SERIES CIRCUITS, CONSTANT CURRENT REGULATORS AND ASSOCIATED AIRPORT ELECTRICAL VAULT EQUIPMENT. ONLY QUALIFIED ELECTRICAL CONTRACTORS SHALL PERFORM ELECTRICAL WORK ON THIS PROJECT. NEC DEFINES A QUALIFIED PERSON AS FOLLOWS; "ONE WHO HAS SKILLS AND KNOWLEDGE RELATED TO THE CONSTRUCTION AND OPERATION OF THE ELECTRICAL EQUIPMENT AND INSTALLATIONS AND HAS RECEIVED SAFETY TRAINING TO RECOGNIZE AND AVOID THE HAZARDS INVOLVED".
- 3. VERIFY RESPECTIVE CIRCUITS, POWER SOURCES AND SITE CONDITIONS PRIOR TO REMOVING, DISCONNECTING, RELOCATING, INSTALLING, CONNECTING OR WORKING ON THE RESPECTIVE AIRFIELD LIGHTING, DISTANCE REMAINING SIGN, RUNWAY SIGN, TAXI SIGN, NAVAID, VAULT EQUIPMENT OR OTHER DEVICE.
- 4. INSTALL AIRFIELD LIGHTING, SIGNS, SPLICE CANS, ELECTRICAL DUCTS, HANDHOLES, MANHOLES, AND CABLE AT THE LOCATIONS SHOWN AND IN COMPLIANCE WITH THE SPECIFICATIONS, SPECIAL PROVISIONS, RESPECTIVE DETAILS, AND MANUFACTURER'S RECOMMENDATIONS.
- 5. NEW AIRFIELD LIGHTING SYSTEM INSTALLATIONS, ADJUSTMENTS, RELOCATIONS, REINSTALLATIONS, AND/OR UPGRADES SHALL USE BASE (L-867 OR L-868) MOUNTED AND STAKE MOUNTED FIXTURES AND 1/C #8, FAA L-824 5000V TYPE C CABLE IN UNIT DUCT.
- 6. LIGHTING CABLE FOR AIRFIELD LIGHTING SERIES CIRCUITS SHALL BE 1/C, #8 AWG, FAA L-824, 5000 VOLT, TYPE C UNDERGROUND CABLE IN 3/4" (MIN.) UNIT DUCT. CABLE SHALL BE FAA APPROVED.
- 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. GROUND ROD MUST BE INSTALLED AT EACH LIGHT FIXTURE, RUNWAY/TAXI SIGN AND SPLICE CAN. THE PURPOSE OF THE LIGHT BASE GROUND IS 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. PER NATIONAL ELECTRICAL CODE ARTICLE 250.53 "GROUNDING ELECTRODE SYSTEM INSTALLATION" RESISTANCE FROM THE GROUND ROD/ELECTRODE TO EARTH GROUND MUST BE 25 OHMS OR LESS VIA MEASUREMENT WITH A GROUND TESTER. GROUNDS RODS FOR LIGHT BASE GROUNDS SHALL BE 3/4-INCH BY 10-FEET MINIMUM LENGTH UL LISTED COPPER-CLAD STEEL SECTIONAL RODS. GROUND RODS SHALL BE PRODUCED FROM 100% DOMESTIC STEEL. EACH GROUND ROD SHALL BE TESTED AND THE RESULTS RECORDED FOR EACH AIRFIELD LIGHT FIXTURE AND RUNWAY/TAXI SIGN INSTALLATION. COPIES OF GROUND SYSTEM TEST RESULTS SHALL BE FURNISHED TO THE PROJECT ENGINEER OF RECORD; KEVIN LIGHTFOOT, AND/OR THE **RESIDENT ENGINEER/TECHNICIAN.**
- 9. HOMERUN CABLES FOR A RESPECTIVE CIRCUIT THAT ARE INSTALLED IN CONDUIT OR DUCT SHALL BE RUN TOGETHER IN THE SAME RACEWAY OR DUCT.
- 10. THE CONTRACTOR SHALL TEST THE RESPECTIVE AIRFIELD LIGHTING CIRCUITS IN AREAS OF WORK WHERE RESPECTIVE CIRCUITS MIGHT BE AFFECTED. THE RESPECTIVE RUNWAY AND TAXIWAY LIGHTING CCR'S (FOR THE AREAS OF WORK ON THIS PROJECT) SHALL BE TESTED FOR PROPER OPERATION BEFORE REMOVAL WORK, MODIFICATIONS, AND/OR ADDITIONS AND AFTER THE NEW CABLES AND LIGHTING SYSTEM MODIFICATIONS AND ADDITIONS HAVE BEEN COMPLETED. CONTRACTOR SHALL TEST AND RECORD THE INPUT CURRENT AND OUTPUT CURRENT FOR EACH CONSTANT CURRENT REGULATOR IN THE AUTOMATIC AND MANUAL MODES OF OPERATIONS. CONTRACTOR SHALL REPORT CONCERNS AND/OR DEFICIENCIES TO THE RESIDENT ENGINEER/TECHNICIAN. TEST RESULTS SHALL BE COORDINATED WITH AND PROVIDED TO THE PROJECT ENGINEER OF RECORD; KEVIN LIGHTFOOT, AND RESIDENT ENGINEER/ TECHNICIAN.
- 11. FAA AC 150/5370-10G "STANDARDS FOR SPECIFYING CONSTRUCTION OF AIRPORTS", ITEM L-108 "UNDERGROUND POWER CABLE FOR AIRPORTS", REQUIRES THAT EVERY AIRFIELD LIGHTING CABLE SPLICER SHALL BE QUALIFIED IN MAKING CABLE SPLICES AND TERMINATIONS ON CABLES RATED ABOVE 5,000 VOLTS AC. CABLE SPLICING/TERMINATING PERSONNEL SHALL HAVE A MINIMUM OF THREE (3) YEARS CONTINUOUS EXPERIENCE IN TERMINATING/SPLICING MEDIUM VOLTAGE CABLE.

- THE WORK.
- SHUT OFF.

- REQUIREMENTS.
- LUMP SUM.

- PERMITTED.

- ALLOWED.

12. OTHER CONSTRUCTION PROJECTS MIGHT BE IN PROGRESS AT THE AIRPORT AT THE SAME TIME AS THIS PROJECT. THE CONTRACTOR WILL BE REQUIRED TO COOPERATE WITH ALL OTHER CONTRACTORS AND THE AIRPORT MANAGER IN THE COORDINATION OF

13. OBTAIN APPROVAL FROM THE AIRPORT MANAGER PRIOR TO SHUTTING DOWN A RUNWAY OR TAXIWAY, WHEN A RESPECTIVE RUNWAY IS CLOSED THE RESPECTIVE RUNWAY LIGHTING AND NAVAIDS FOR THAT RUNWAY SHALL BE SHUT OFF. WHEN A RESPECTIVE TAXIWAY IS CLOSED THE RESPECTIVE TAXIWAY LIGHTING FOR THAT TAXIWAY SHALL BE

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. IN THE EVENT A CONFLICT IS DETERMINED WITH RESPECT TO MANUFACTURER INSTALLATION INSTRUCTIONS, NEC, AND/OR THE CONTRACT DOCUMENTS, CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION.

16. SEE SAFETY PLAN AND NOTES FOR SAFETY AND CONSTRUCTION COORDINATION

17. EXISTING AIRFIELD LIGHTS AND/OR SIGNS DESIGNATED FOR REMOVAL SHALL BE CAREFULLY REMOVED IN THERE ENTIRETY. THE CONTRACTOR SHALL DISCONNECT AND REMOVE THE EXISTING LIGHTS AND SIGNS. AS NOT TO DAMAGE THEM. INCLUDING MOUNTING STAKES, BASES, FOUNDATIONS AND TRANSFORMERS. THE EXISTING AIRFIELD LIGHTS, TRANSFORMERS, LIGHT BASES, COVERS AND MOUNTING STAKES SHALL BE TURNED OVER TO THE AIRPORT. SIGNS SHALL BE TURNED OVER TO THE AIRPORT FOR THEIR RIGHT OF FIRST REFUSAL. LIGHT BASES AND SIGN FOUNDATIONS SHALL BE REMOVED AND DISPOSED OF OFF SITE. ANY MATERIAL NOT SALVAGED BY THE AIRPORT SHALL BE DISPOSED OF OFF THE AIRPORT SITE, IN A LEGAL MANNER, AT THE CONTRACTOR'S OWN EXPENSE. EXISTING DUCTS AND CABLES ASSOCIATED WITH AIRFIELD LIGHTING REMOVALS, RELOCATIONS, REPLACEMENTS AND/OR CABLE OR DUCT REPLACEMENTS SHALL BE REMOVED AND DISPOSED OF OFF SITE AT NO ADDITIONAL COST TO THE CONTRACT WHERE ACCESSIBLE AND ABANDONED IN PLACE ELSEWHERE. PROVIDE TEMPORARY CABLES AND DUCTS TO ACCOMMODATE AIRFIELD LIGHTING CIRCUITS THAT ARE TO REMAIN ACTIVE DURING CONSTRUCTION. CONTRACTOR MAY REMOVE ABANDONED CABLES AT NO ADDITIONAL COST TO THE CONTRACT AND SHALL HAVE THE SALVAGE RIGHTS TO ABANDONED CABLES. REMOVAL OF EXISTING AIRFIELD LIGHTING WILL BE PAID FOR UNDER ITEM AR800476 REMOVE AIRFIELD LIGHTING PER

18. OWNER SHALL BE KEPT INFORMED OF WORK AND SCHEDULES.

19. ROUTE NEW CABLES AND DUCTS TO AVOID INTERFERENCES WITH OTHER UTILITIES, LINES, CABLES AND STRUCTURES.

20. ALL ELECTRICAL EQUIPMENT (INCLUDING AIRFIELD LIGHTING AND NAVADS) AND MATERIALS SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 - NATIONAL ELECTRIC 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. INTERNEK TESTING SERVICES VERIFICATION/ETL LISTING (OR OTHER THIRD PARTY LISTING) AND/OR MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE

21. CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF FAA AC NO. 150/5370-2G (OR MOST CURRENT ISSUE) "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION".

22. CONTRACTOR SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF NFPA 70E -STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE.

23. RUNWAY AND TAXIWAY LIGHTING CIRCUITS SHALL BE ACTIVE AT THE END OF EACH CONSTRUCTION DAY FOR AN OPEN RUNWAY OR AN OPEN TAXIWAY. THE CONTRACTOR SHALL PROVIDE TEMPORARY CABLE & CONNECTIONS WHERE NECESSARY TO MAINTAIN A RUNWAY OR TAXIWAY LIGHTING SYSTEM. TEMPORARY CABLE FOR AIRFIELD LIGHTING SERIES CIRCUITS SHALL BE 1/C #8 FAA L-824 5KV UG CABLE IN DUCT OR UNIT DUCT.

24. 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 150/5370-2G, OPERATION SAFETY ON AIRPORTS DURING CONSTRUCTION, SECTION 2.18.3 "LIGHTING AND VISUAL NAVAIDS". ALL LABOR, MATERIALS, AND TIME NECESSARY TO COMPLY WITH THIS REQUIREMENT SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT AND NO ADDITIONAL COMPENSATION WILL BE

25. CONTRACTOR SHALL INTERFACE EXISTING AIRFIELD LIGHTING AND/OR SIGNS TO THE NEW, REMOVED, REINSTALLED, ADJUSTED, REPLACED, AND/OR RELOCATED AIRFIELD LIGHTING AND ASSOCIATED CIRCUITS.

- 26. ALL AIRFIELD LIGHT FIXTURES SHALL BE TAGGED BY THE CONTRACTOR IN ACCORDANCE WITH THE RESPECTIVE LIGHT FIXTURE NUMBERS. CONFIRM LIGHT FIXTURE NUMBERING WITH THE AIRPORT MANAGER/MAINTENANCE SUPERVISOR.
- 27. HIGH VOLTAGE CIRCUITS (AIRFIELD LIGHTING 5000 VOLT SERIES CIRCUITS AND OTHER CIRCUITS RATED ABOVE 600 VOLTS) AND LOW VOLTAGE CIRCUITS (RATED 600 VOLTS AND BELOW) SHALL NOT BE INSTALLED IN THE SAME WIREWAY, CONDUIT, DUCT, RACEWAY, JUNCTION STRUCTURE, OR HANDHOLE.
- 28. THE CONTRACTOR IS REQUIRED TO RESTORE ALL DISTURBED PAVEMENT ASSOCIATED WITH REMOVAL WORK AND/OR NEW AIRFIELD LIGHTING INSTALLATIONS.
- 29. NO CONNECTION TO AN ACTIVE LIGHTING CIRCUIT WILL BE BROKEN UNTIL THE CIRCUIT HAS BEEN TURNED OFF IN ACCORDANCE WITH NOTE 1

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

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



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REPLACE TAXIWAY AIRFIELD LIGHTING

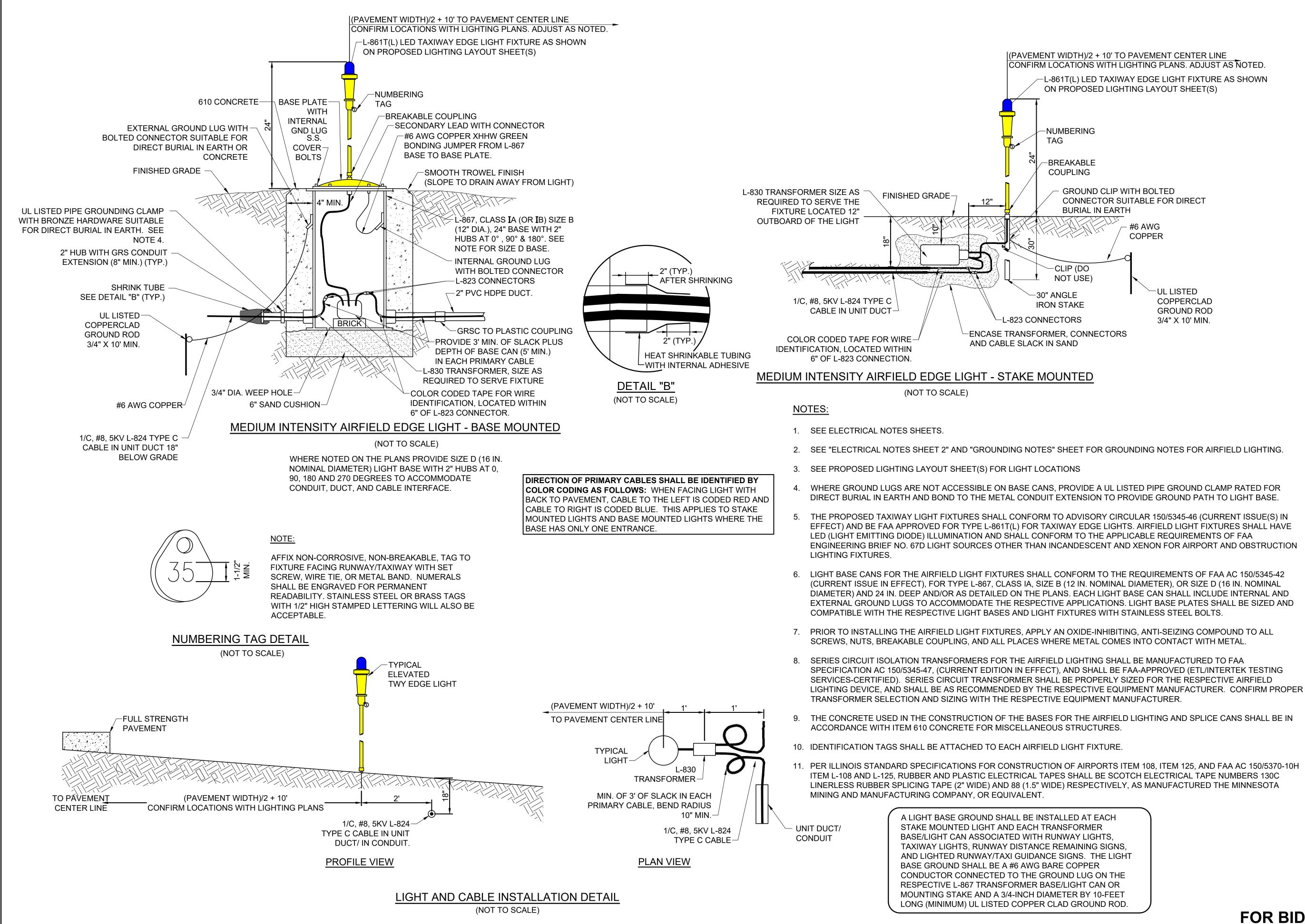
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SBGP No: 3-17-SBGP-TBD

Contract No.: KE020

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AIRFIELD LIGHTING NOTES



CONFIRM LOCATIONS WITH LIGHTING PLANS. ADJUST AS NOTED. -L-861T(L) LED TAXIWAY EDGE LIGHT FIXTURE AS SHOWN ON PROPOSED LIGHTING LAYOUT SHEET(S)

CONNECTOR SUITABLE FOR DIRECT



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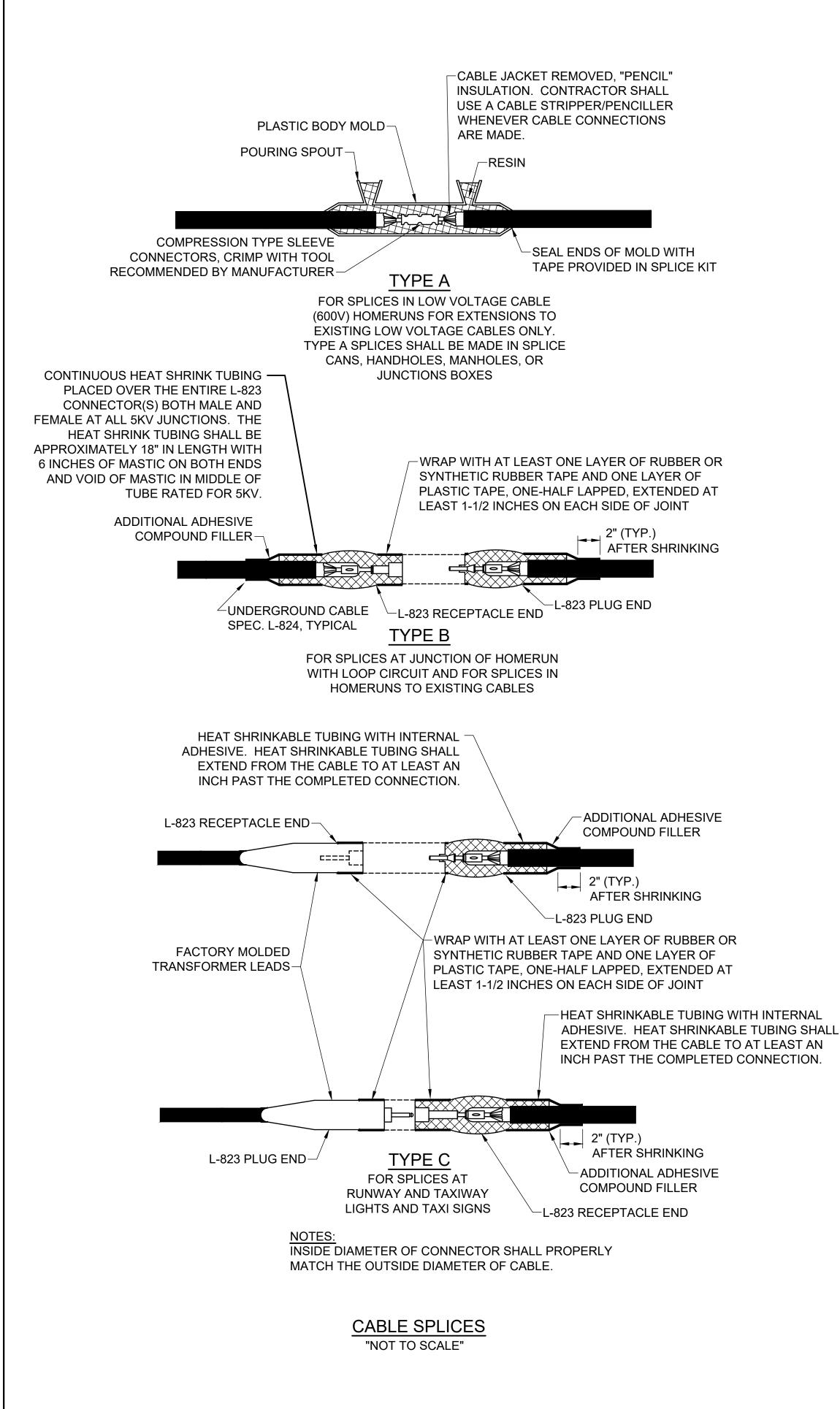
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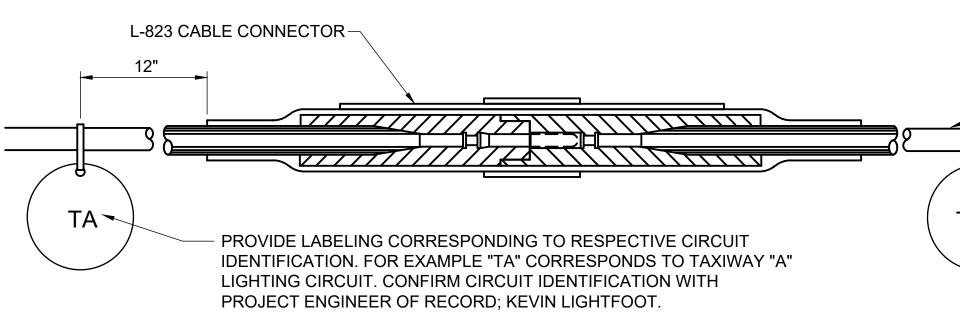
AIRFIELD LIGHTING DETAIL



PLASTIC BODY MOLD-POURING SPOUT--RESIN SEAL ENDS OF MOLD WITH TAPE PROVIDED IN SPLICE KIT LOW VOLTAGE UNDERGROUND TAP SPLICE FOR TAP SPLICES IN LOW VOLTAGE (600V) CABLE. SPLICES SHALL BE RATED AND LISTED SUITABLE FOR DIRECT BURIAL LOCATIONS. FOR SPLICES UP TO #2 AWG CONDUCTOR, SPLICES SHALL BE WYE **RESIN TYPE POWER CABLE TAP SPLICE KIT** SUITABLE FOR THE RESPECTIVE CABLES AND **RESPECTIVE APPLICATION.**

NOTES:

- AIRFIELD LIGHTING CABLES.
- KITS TO ACCOMMODATE REPAIRS.
- MATCH OUTSIDE DIAMETER OF CABLE.
- APPLICATION.
- JUNCTION BOXES, AND WIREWAYS.



- 1. CONTRACTOR SHALL PROVIDE CABLE CIRCUIT IDENTIFICATION MARKERS ATTACHED TO BOTH SIDES OF EACH CABLE CONNECTION.
- 2. CABLE IDENTIFICATION TAGS SHALL BE STAINLESS STEEL OR BRASS.
- 3. THE CABLE SHALL THOROUGHLY BE CLEANED PRIOR TO THE INSTALLATION OF THE L-823 CONNECTOR KIT.
- 4. ATTACH EACH CABLE TIE ENOUGH TO HOLD IN PLACE WITHOUT COMPRESSING EDGE OF CABLE TAG INTO CONDUCTOR. TRIM OFF EXCESS CABLE TIE.
- 5. CABLE TAGS SHALL BE PROVIDED AT ALL POINTS OF ACCESS INCLUDING L-867 BASES, L-868 BASES, HANDHOLES, MANHOLES, JUNCTION BOXES, AND WIREWAYS.
- 6. CABLE TAGS SHALL BE LABELED AS FOLLOWS FOR RESPECTIVE AIRFIELD LIGHTING CIRCUITS, RUNWAY 1-19 LIGHTING: R1 RUNWAY 9-27 LIGHTING: R2 TAXIWAYS A, A1 & A2 LIGHTING: TA CABLE TAG DETAIL TAXIWAYS B & B1 LIGHTING: TB "NOT TO SCALE"

1. SPLICE DETAILS ARE PROVIDED FOR NEW WORK AND TO ASSIST IN REPAIRS OF ACCIDENTAL OR UNEXPECTED INTERRUPTIONS AND/OR CUTS TO

2. KEEP ON HAND A MINIMUM OF 10 SETS OF SPLICE KITS FOR L-823 CONNECTORS AND A MINIMUM OF 10 SETS OF TYPE A LOW VOLTAGE SPLICE

3. EVERY AIRFIELD LIGHTING CABLE SPLICER SHALL BE QUALIFIED AND EXPERIENCED IN MAKING CABLE SPLICES AND TERMINATIONS ON CABLES RATED AT AND/OR ABOVE 5,000 VOLTS AC TO COMPLY WITH THE REQUIREMENTS OF FAA AC 150/5370-10G ITEM L-108.

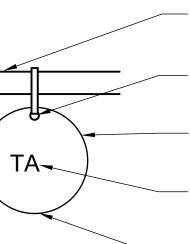
4. INSIDE DIAMETER OF RESPECTIVE CABLE CONNECTOR SHALL PROPERLY

5. WHEN PREPARING CABLE FOR SPLICES, THE CONTRACTOR SHALL USE A CABLE STRIPPER/PENCILLER WHENEVER CABLE CONNECTIONS ARE MADE.

6. WRAP ALL PRIMARY AND SECONDARY POWER CONNECTIONS WITH SUFFICIENT LAYERS OF HIGH VOLTAGE ELECTRICAL INSULATING TAPE (RUBBER SPLICING TAPE SUITABLE FOR PRIMARY ELECTRICAL INSULATION FOR SPLICING CABLE FROM 600 VOLTS TO 69,000 VOLTS) AND COVER WITH VINYL ELECTRICAL TAPE (ALL-WEATHER VINYL INSULATING TAPE SUITABLE FOR PROTECTIVE JACKETING FOR HIGH-VOLTAGE CABLE SPLICES AND REPAIRS) FOR FULL VALUE OF CABLE INSULATION VOLTAGE. PER ILLINOIS STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS ITEM 108, ITEM 125, AND FAA AC 150/5370-10H ITEM L-108 AND L-125, HIGH VOLTAGE ELECTRICAL INSULATING TAPE SHALL BE 3M SCOTCH 130C LINERLESS RUBBER SPLICING TAPE (2 INCHES WIDE) OR APPROVED EQUIVALENT, AND VINYL ELECTRICAL TAPE SHALL BE 3M SCOTCH 88 (1.5 INCHES WIDE) OR APPROVED EQUIVALENT. TAPES MUST BE RATED SUITABLE FOR THE

7. PROVIDE CABLE TAGS TO IDENTIFY THE RESPECTIVE CIRCUITS ALL POINTS OF ACCESS INCLUDING L-867 BASES, L-868 BASES, HANDHOLES, MANHOLES,

8. CONNECTION OF CONDUCTORS MUST BE MADE BY USING CRIMP CONNECTORS AND A CRIMPING TOOL APPROVED BY THE CONNECTOR/LUG MANUFACTURER. THE TOOL MUST PRODUCE A COMPLETE CRIMP BEFORE IT CAN BE REMOVED. FOR THE L-823 CONNECTORS, THE CRIMPING TOOL USED MUST BE LISTED BY THE L-823 KIT MANUFACTURER. MAKE THE NUMBER AND TYPE OF CRIMPS PER THE KIT MANUFACTURER'S INSTRUCTIONS.



#8 AWG FAA L824 CABLE (5KV)

3/16" HOLE WITH TY-RAP OR APPROVED EQUAL.

CABLE TAGS, 2" DIA., 18 GAUGE, STAINLESS STEEL

3/8" TEXT - MACHINE STAMPED (NOT ETCHED)

INSTALL CABLE TAGS WITH L-823 CONNECTOR



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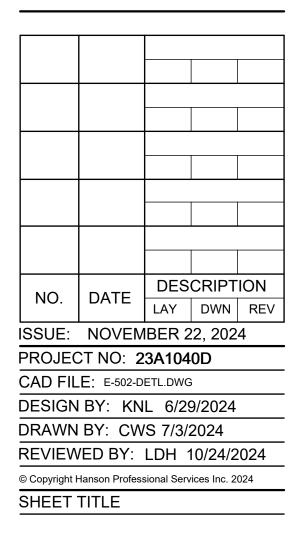
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REPLACE TAXIWAY AIRFIELD LIGHTING

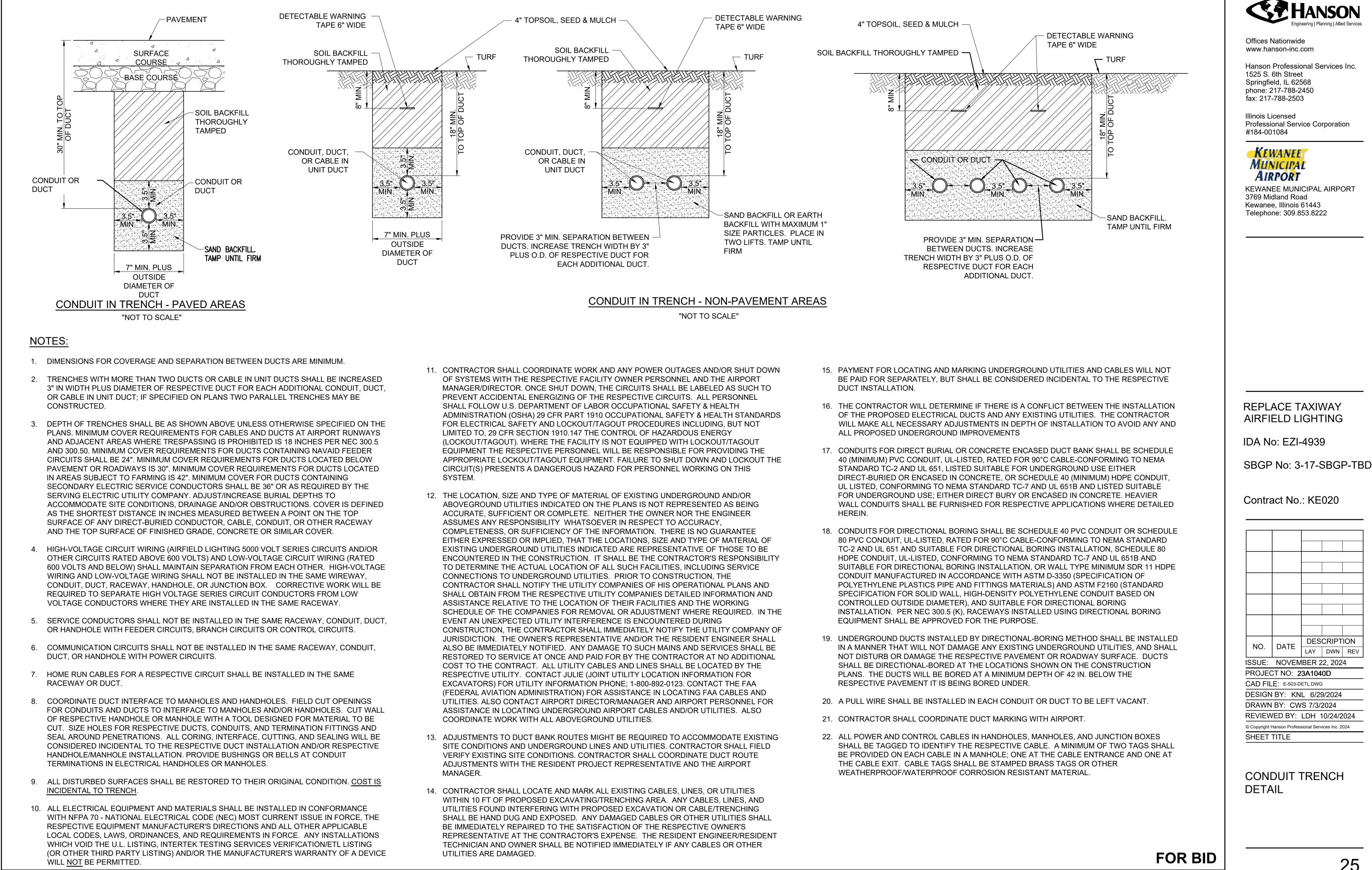
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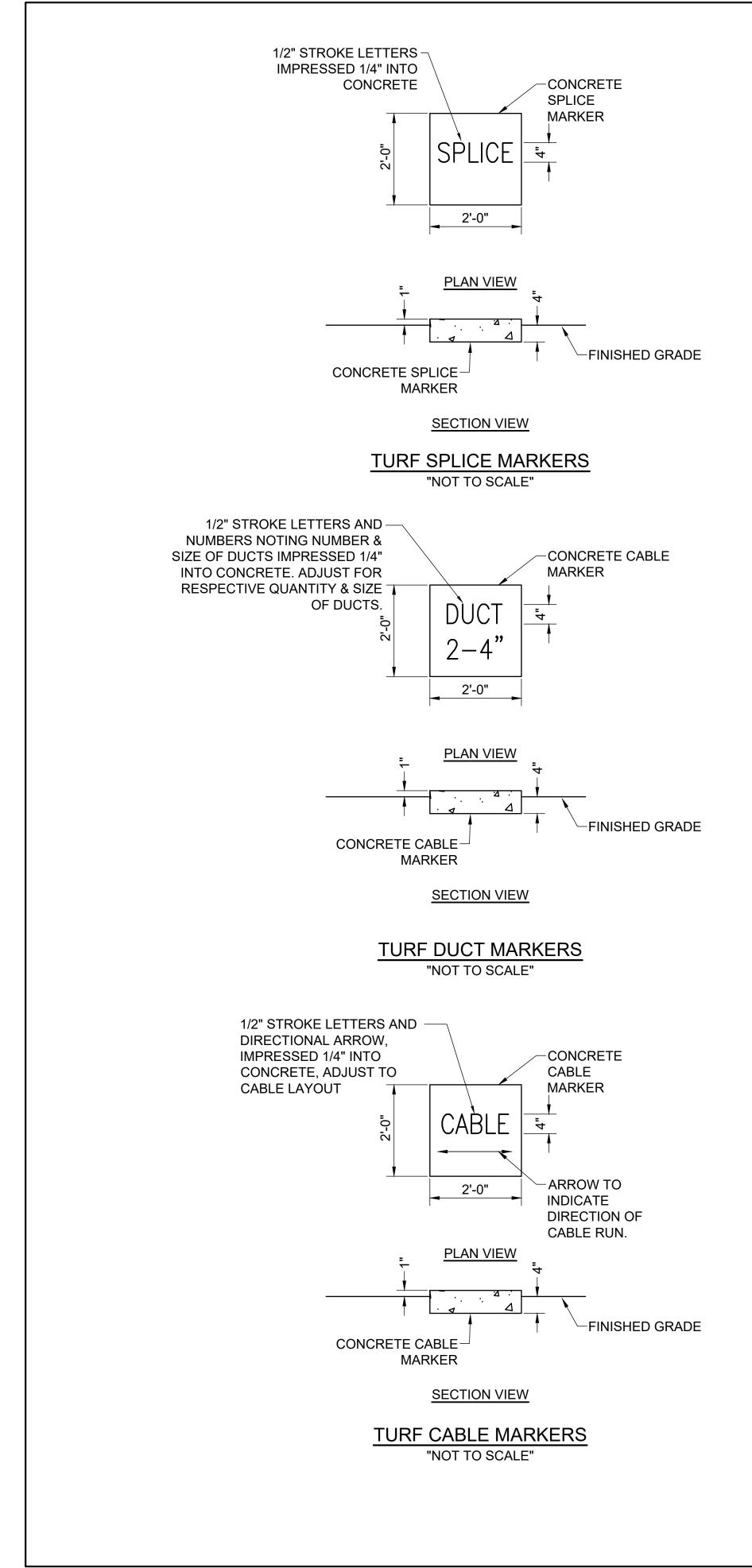
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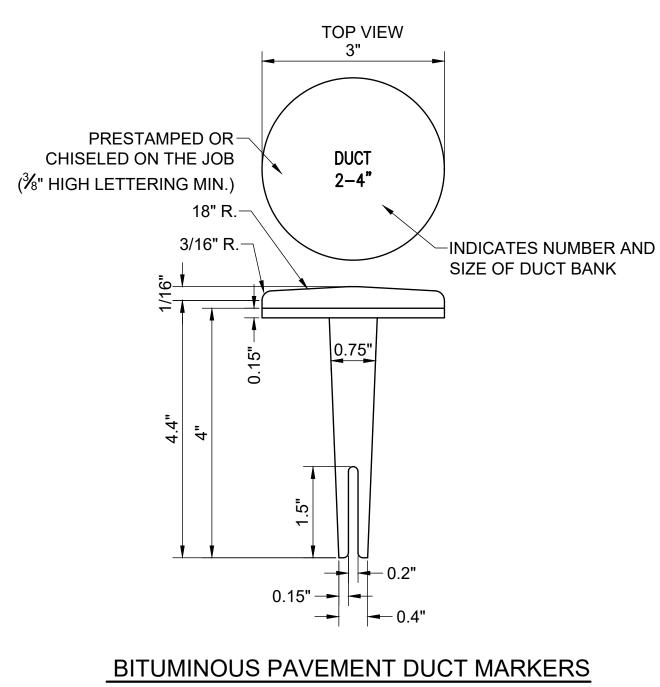


AIRFIELD LIGHTING CABLE SPLICE DETAILS





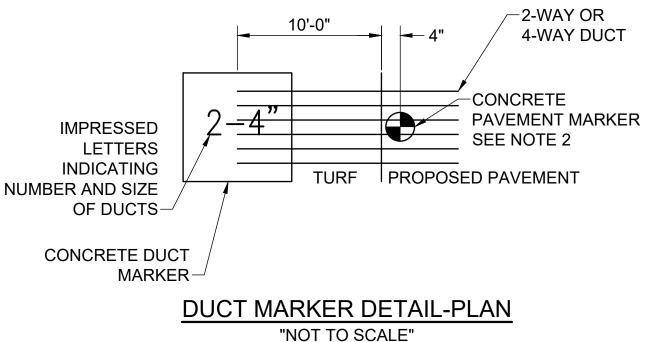
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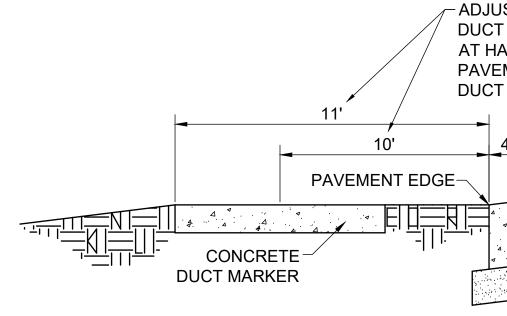


"NOT TO SCALE"

NOTE:

- 1. 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 BERNTSEN 2 INTERNATIONAL INC., P.O. BOX 8670, MADISON, WI. 53708-8670, PHONE: 1-877-959-8556, SURV-KAP, 3225 E. 47TH ST., TUCSON, AZ 85713, PHONE: (502)-622-6011, OR OTHER EQUIVALENT MANUFACTURERS.





 $^{\perp}$ #10 PULL WIRE COIL A MINIMUM OF 3' AT DUCT ENDS. INSTALL APPROVED PLUGS IN END OF DUCTS NOT USED.

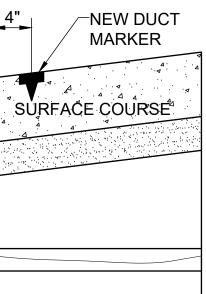
UNDERGROUND ELECTRICAL DUCT

(NOT TO SCALE)

CABLE & DUCT MARKER NOTES:

- THE COST OF ALL TURF AND PAVEMENT DUCT MARKERS SHALL BE INCIDENTAL TO THE DUCT. THE COST OF ALL CABLE MARKERS SHALL BE INCIDENTAL TO THE CABLE.
- BITUMINOUS PAVEMENT DUCT MARKER AND CONCRETE DUCT MARKER TO BE PROVIDED AT EACH END OF EACH DUCT AS SHOWN ON THE LOCATION PLAN. FOR CONCRETE PAVEMENT, THE LETTER "D" SHALL BE IMPRESSED IN THE PAVEMENT INSTEAD OF THE MARKER. THE LETTER SHALL BE INFORMED AS DESCRIBED IN NOTE 4.
- UNDERGROUND CABLE RUNS MUST BE IDENTIFIED BY CABLE MARKERS AT 200 3. FEET (61 M) MAXIMUM SPACING WITH AN ADDITIONAL MARKER AT EACH CHANGE OF DIRECTION OF THE CABLE RUN. CABLE MARKERS MUST BE INSTALLED ABOVE THE CABLE. CABLE MARKERS ARE NOT REQUIRED FOR CABLE RUNS BETWEEN RUNWAY/TAXIWAY EDGE LIGHTS.
- CONCRETE CABLE MARKERS AND DUCT MARKERS SHALL HAVE LETTERS 4" 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 THE 5. LEGEND IS REQUIRED:
 - A. REDUCE LETTER SIZE TO 3" HIGH, 2" WIDE. B. INCREASE THE MARKER SIZE TO 30" X 30".
 - C. PROVIDE ADDITIONAL MARKERS PLACED SIDE BY SIDE
- 6 TURF DUCT MARKERS ARE NOT REQUIRED AT PAVEMENT CROSSINGS WHERE DUCTS TERMINATE IN HANDHOLES, OR JUNCTION STRUCTURES.
- LOCATION OF ALL DIRECT EARTH BURIAL UNDERGROUND CABLE 7. SPLICE/CONNECTIONS, EXCEPT THOSE AT ISOLATION TRANSFORMERS, MUST BE IDENTIFIED BY SPLICE MARKERS. SPLICE MARKERS MUST BE PLACED ABOVE THE SPLICE/CONNECTIONS. DIRECT EARTH BURIAL UNDERGROUND CABLE SPLICES SHALL BE AVOIDED WHERE POSSIBLE. CABLE SPLICES SHALL BE LOCATED IN SPLICE CANS, LIGHT BASES, HANDHOLES, MANHOLES, OR OTHER JUNCTION STRUCTURES UNLESS OTHERWISE APPROVED BY THE PROJECT ENGINEER OF RECORD.
- 8 THE CABLE AND SPLICE MARKERS MUST IDENTIFY THE CIRCUITS TO WHICH THE CABLES BELONG. FOR EXAMPLE: TWY A, TWY B.
- LOCATIONS OF ENDS OF ALL UNDERGROUND DUCTS MUST BE IDENTIFIED BY 9 DUCT MARKERS.

- ADJUST FOR RESPECTIVE LOCATION OF DUCT TERMINATION. DUCT TERMINATING AT HANDHOLES OR MANHOLES NEAR PAVEMENT WILL NOT REQUIRE ADDITIONAL DUCT MARKERS IN TURF.





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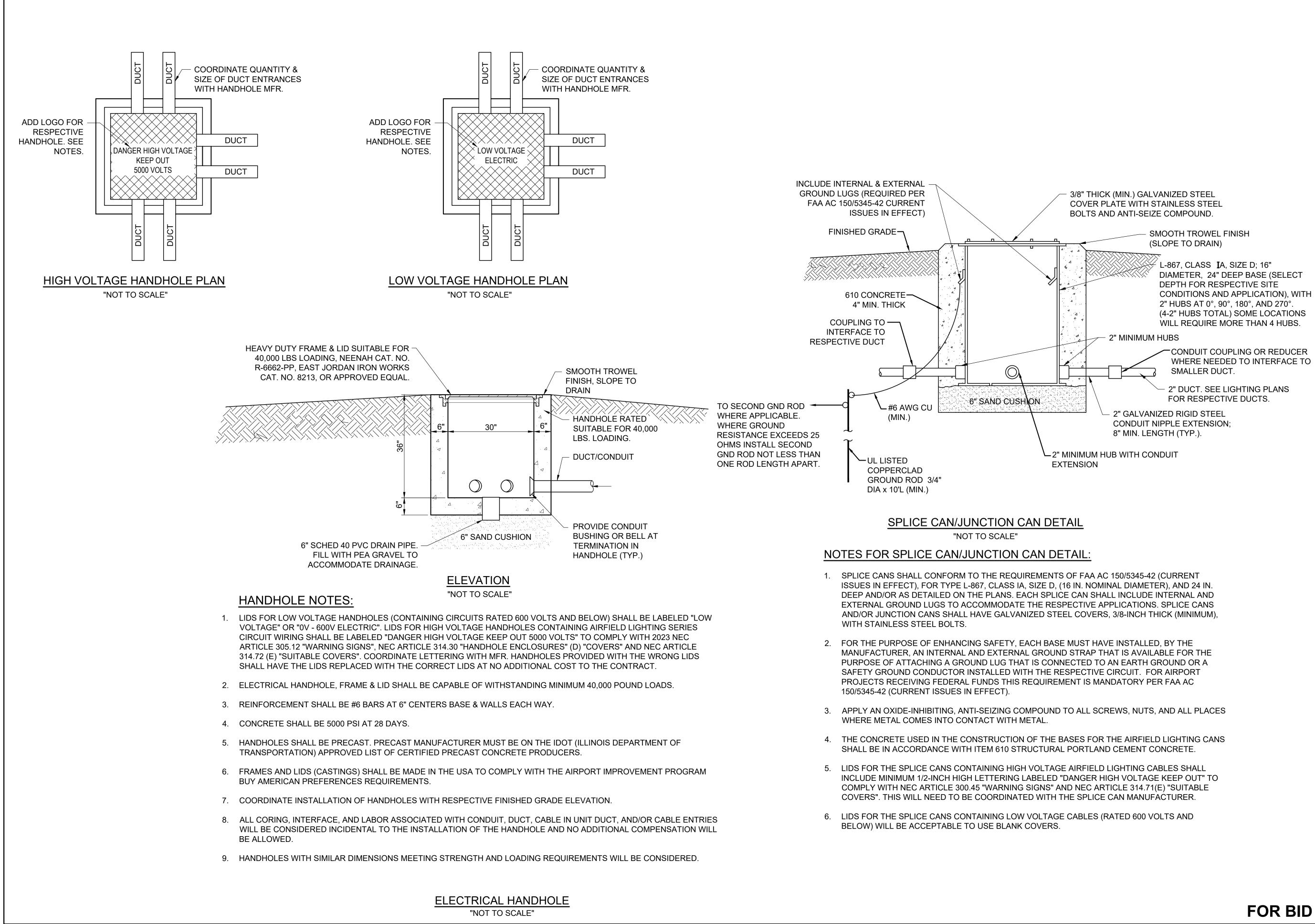
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CABLE AND DUCT MARKER DETAILS





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HANDHOLE AND SPLICE CAN DETAILS

GENERAL NOTES

- ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 - NATIONAL ELECTRICAL CODE (NEC) MOST CURRENT ISSUE IN FORCE, THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES, AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L. LISTING, INTERTEK TESTING SERVICES VERIFICATION/ETL LISTING (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE PERMITTED.
- 2. CONTRACTOR SHALL KEEP A COPY OF THE LATEST NEC IN FORCE ON SITE AT ALL TIMES DURING CONSTRUCTION FOR USE AS A REFERENCE
- CONTRACTOR SHALL COORDINATE WORK AND ANY POWER OUTAGES AND/OR 3. SHUT DOWN OF SYSTEMS WITH THE RESPECTIVE FACILITY OWNER PERSONNEL AND THE AIRPORT MANAGER/DIRECTOR. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 **OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND** LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- THE CONTRACTOR SHALL ASCERTAIN THAT ALL LIGHTING SYSTEM COMPONENTS FURNISHED BY HIM, INCLUDING FAA APPROVED EQUIPMENT, ARE COMPATIBLE IN ALL RESPECTS WITH EACH OTHER AND THE REMAINDER OF THE NEW/EXISTING SYSTEM. ANY NONCOMPATIBLE COMPONENTS FURNISHED BY THIS CONTRACTOR SHALL BE REPLACED BY HIM AT NO ADDITIONAL COST TO THE AIRPORT SPONSOR WITH A SIMILAR UNIT, APPROVED BY THE ENGINEER (DIFFERENT MODEL OR DIFFERENT MANUFACTURER) THAT IS COMPATIBLE WITH THE REMAINDER OF THE AIRPORT LIGHTING SYSTEM.
- IN CASE THE CONTRACTOR ELECTS TO FURNISH AND INSTALL AIRPORT LIGHTING 5. 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.
- 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.
- ANY AND ALL INSTRUCTIONS FROM THE RESIDENT ENGINEER/RESIDENT TECHNICIAN TO THE CONTRACTOR REGARDING CHANGES IN OR DEVIATIONS FROM THE PLANS AND SPECIFICATIONS SHALL BE IN WRITING WITH COPIES SENT TO THE AIRPORT SPONSOR AND THE ILLINOIS DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS. THE CONTRACTOR SHALL NOT ACCEPT ANY VERBAL INSTRUCTIONS FROM THE RESIDENT ENGINEER/RESIDENT TECHNICIAN REGARDING ANY CHANGES FROM THE PLANS AND SPECIFICATIONS.
- A MINIMUM OF THREE COPIES OF THE INSTRUCTION BOOK SHALL BE SUPPLIED WITH EACH DIFFERENT TYPE OF EQUIPMENT. THE BOOKS DESCRIBING A MORE SOPHISTICATED TYPE OF EQUIPMENT, SUCH AS REGULATORS, PAPI, REIL, ETC. AS A MINIMUM SHALL CONTAIN THE FOLLOWING:
 - A. A DETAILED DESCRIPTION OF THE OVERALL EQUIPMENT AND ITS INDIVIDUAL COMPONENTS.
 - THEORY OF OPERATION INCLUDING THE FUNCTION OF EACH COMPONENT B.
 - INSTALLATION INSTRUCTION. C.
 - START-UP INSTRUCTIONS. D.
 - PREVENTATIVE MAINTENANCE REQUIREMENTS. E.
 - CHART FOR TROUBLE-SHOOTING. F.
 - COMPLETE POWER AND CONTROL DETAILED WIRING DIAGRAM(S), SHOWING G 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.
 - PARTS LIST WHICH WILL INCLUDE ALL MAJOR AND MINOR COMPONENTS H. SUCH AS RESISTORS, DIODES, ETC. IT SHALL INCLUDE A COMPLETE NOMENCLATURE OF EACH COMPONENT AND, IF APPLICABLE, THE NAME OF ITS MANUFACTURER AND THE CATALOG NUMBER.
 - SAFETY INSTRUCTIONS.

POWER AND CONTROL NOTES

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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 OR NATURAL GRAY OUTER FINISH ALONG ITS ENTIRE LENGTH. NEUTRAL CONDUCTORS LARGER THAN NO. 6 AWG SHALL BE IDENTIFIED EITHER BY A CONTINUOUS WHITE OR NATURAL GRAY OUTER FINISH ALONG ITS ENTIRE LENGTH OR BY THE USE OF WHITE TAPE AT ITS TERMINATIONS AND INSIDE ACCESSIBLE WIREWAYS. INSULATED GROUND CONDUCTORS SHALL HAVE GREEN COLORED INSULATION FOR ALL CONDUCTOR SIZES (AWG OR KCMIL).

ALL BRANCH CIRCUIT CONDUCTORS CONNECTED TO A PARTICULAR PHASE SHALL BE IDENTIFIED WITH THE SAME COLOR. THE COLOR CODING SHALL BE EXTENDED TO THE POINT OF UTILIZATION.

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.

THE MINIMUM SIZE OF PULL/JUNCTION BOXES, REGARDLESS OF THE QUANTITY AND SIZE OF THE CONDUCTORS SHOWN, SHALL BE AS FOLLOWS:

- IN STRAIGHT PULLS THE LENGTH OF THE BOX SHALL NOT BE LESS THAN EIGHT TIMES THE TRADE DIAMETER OF THE LARGER CONDUIT. THE TOTAL AREA (INCLUDING THE CONDUIT CROSS-SECTIONAL AREA) OF A BOX END SHALL BE AT LEAST 3 TIMES GREATER THAN THE TOTAL TRADE CROSS-SECTIONAL AREA OF THE CONDUITS TERMINATING AT THE END.
- IN ANGLE PULLS OR 'U' PULLS THE DISTANCE BETWEEN EACH CONDUIT ENTRY INSIDE THE BOX AND THE OPPOSITE WALL OF THE BOX SHALL NOT BE LESS THAN SIX (6) TIMES THE TRADE DIAMETER OF THE LARGEST CONDUIT. THIS DISTANCE SHALL BE INCREASED FOR ADDITIONAL ENTRIES BY THE AMOUNT OF THE SUM OF THE DIAMETERS OF ALL OTHER CONDUIT ENTRIES ON THE SAME WALL AS THE BOX. THE DISTANCE BETWEEN CONDUIT ENTRIES ENCLOSING THE SAME CONDUCTOR SHALL NOT BE LESS THAN SIX TIMES THE TRADE DIAMETER OF THE LARGEST CONDUIT.

A RUN OF CONDUIT BETWEEN TERMINATIONS AT EQUIPMENT ENCLOSURES, SQUARE DUCTS AND PULL/JUNCTION BOXES, SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF FOUR QUARTER BENDS (360 DEGREES TOTAL), INCLUDING THOSE BENDS LOCATED IMMEDIATELY AT THE TERMINATIONS, CAST, CONDUIT TYPE OUTLETS SHALL NOT BE TREATED AS PULL/JUNCTION BOXES.

EQUIPMENT CABINETS SHALL NOT BE USED AS PULL/JUNCTION BOXES. ONLY WIRING TERMINATING AT THE EQUIPMENT SHALL BE BROUGHT INTO THESE ENCLOSURES.

SPLICES AND JUNCTION POINTS SHALL BE PERMITTED ONLY IN JUNCTION BOXES. DUCTS EQUIPPED WITH REMOVABLE COVERS, AND AT EASILY ACCESSIBLE LOCATIONS.

11. CIRCUIT BREAKERS IN POWER DISTRIBUTION PANEL(S) SHALL BE THERMAL-MAGNETIC MOLDED CASE. PERMANENT TRIP WITH 100 AMPERE. MINIMUM FRAME.

12. DUAL LUGS SHALL BE USED WHERE TWO (2) WIRES, SIZE NO. 6 OR LARGER, ARE TO BE CONNECTED TO THE SAME TERMINAL

13. ALL INTERIOR WALL MOUNTED EQUIPMENT ENCLOSURES SHALL BE MOUNTED ON HOT DIPPED GALVANIZED STEEL STRUT SUPPORT, OR STAINLESS STEEL STRUT SUPPORT, WITH CORROSION RESISTANT HARDWARE. 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 RECOMENTATIONS.

14. SUPPORT FOR EXTERIOR MOUNTED EQUIPMENT SHALL USE STAINLESS STEEL STRUT SUPPORT WITH STAINLESS STEEL HARDWARE.

- 15. CONDUITS FOR ELECTRIC SERVICE ENTRANCE AND FEEDERS SHALL BE AS DETAILED HEREIN ON THE PLANS. WHERE GALVANIZED RIGID STEEL CONDUIT IS SPECIFIED IT SHALL HAVE THREADED FITTINGS. SET SCREW TYPE FITTINGS WILL NOT BE ACCEPTABLE. CONDUITS FOR UNDERGROUND APPLICATIONS SHALL BE AS DETAILED HEREIN. CONDUITS FOR GROUNDING ELECTRODE CONDUCTORS OR INDIVIDUAL GROUNDING CONDUCTORS SHALL BE SCHEDULE 40 OR SCHEDULE 80 PVC.
- 16. PROVIDE LIQUID TIGHT FLEXIBLE METAL CONDUIT AT CONNECTIONS TO EQUIPMENT SUBJECT TO VIBRATION OR WHERE FLEXIBILITY IS REQUIRED. LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE U.L. LISTED TO MEET THE REQUIREMENTS OF NEC 350.6, SUITABLE FOR GROUNDING, SUNLIGHT RESISTANT, AND RESISTANT TO OIL, GASOLINE, AND GREASE. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO MOTORS, TRANSFORMERS, & CONSTANT CURRENT REGULATORS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. DO NOT INSTALL LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS NOT UL LISTED. CONFIRM LIQUID-TIGHT FLEXIBLE METAL CONDUIT BEARS THE UL LABEL PRIOR TO INSTALLING IT.
- 17. UNLESS OTHERWISE SHOWN, ALL EXPOSED CONDUITS SHALL BE RUN PARALLEL TO OR AT RIGHT ANGLES WITH THE LINES OF THE STRUCTURE.
- 18. ALL STEEL CONDUITS, FITTINGS, NUTS, BOLTS, ETC. SHALL BE GALVANIZED.
- 19. USE CONDUIT BUSHINGS AT EACH CONDUIT TERMINATION. WHERE NO. 4 AWG OR LARGER UNDERGROUND WIRE IS INSTALLED. USE INSULATED BUSHINGS.
- 20. USE DOUBLE LOCK NUTS AT EACH CONDUIT TERMINATION.
- 21. WRAP ALL PRIMARY AND SECONDARY POWER CONNECTIONS WITH SUFFICIENT LAYERS OF HIGH VOLTAGE ELECTRICAL INSULATING TAPE (RUBBER SPLICING TAPE SUITABLE FOR PRIMARY ELECTRICAL INSULATION FOR SPLICING CABLE FROM 600 VOLTS TO 69,000 VOLTS) AND COVER WITH VINYL ELECTRICAL TAPE (ALL-WEATHER VINYL INSULATING TAPE SUITABLE FOR PROTECTIVE JACKETING FOR HIGH-VOLTAGE CABLE SPLICES AND REPAIRS) FOR FULL VALUE OF CABLE INSULATION VOLTAGE. PER ILLINOIS STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS ITEM 108, ITEM 125 AND FAA AC 150/5370-10H ITEM L-108, HIGH VOLTAGE ELECTRICAL INSULATING TAPE SHALL BE 3M SCOTCH 130C (2 INCHES WIDE) OR APPROVED EQUIVALENT, AND VINYL ELECTRICAL TAPE SHALL BE 3M SCOTCH 88 (1.5 INCHES WIDE) OR APPROVED EQUIVALENT. TAPES MUST BE RATED SUITABLE FOR THE APPLICATION.
- 22. UNLESS OTHERWISE NOTED, ALL SINGLE CONDUCTOR CONTROL WIRING SHALL BE NO. 12 AWG. COPPER MINIMUM.
- 23. THE FOLLOWING SHALL APPLY TO RELAY/CONTACTOR PANELS/ENCLOSURES:
 - TO MAINTAIN THE NEMA 4. 4X RATING OF THE ENCLOSURE.
 - THE ENCLOSURE(S) SHALL HAVE AMPLE SPACE FOR THE CIRCUIT
 - TERMINATIONS WITHOUT CONNECTORS ARE NOT ACCEPTABLE.
 - VOLTAGE COMPONENTS.
 - TERMINAL BLOCK.
 - F
 - COVER. THE DIAGRAM SHALL REPRESENT EACH CONDUCTOR BY A SEPARATE LINE.
 - AND COLOR OF EACH TERMINAL CONDUCTOR AND TERMINAL
 - ALL WIRING SHALL BE NEATLY TRAINED AND LACED.
 - MINIMUM WIRE SIZE SHALL BE NO. 12 AWG.

24. THE ABOVE GENERAL NOTES & POWER AND CONTROL NOTES ARE BASED ON DEPT. OF TRANSPORTATION FAA GREAT LAKES REGION ELECTRICAL NOTES SUBMITTED BY AL GRIGAITIS, DATE: 2/11/1987 AND HAVE BEEN UPDATED BY KEVIN LIGHTFOOT TO ACCOMMODATE CODE CHANGES, FAA ADVISORY CIRCULAR CHANGES, AND OTHER RESPECTIVE APPLICATIONS.

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

COMPONENTS, TERMINAL BLOCKS AND INCOMING AND INTERNAL WIRING.

ALL CONTROL CONDUCTOR TERMINATIONS SHALL BE OF THE OPEN-EYE CONNECTOR/SCREW TYPE. SOLDERED CLOSED-EYE TERMINATIONS, OR

WHEN THE ENCLOSURE COVER IS OPENED, ALL CIRCUIT COMPONENTS, WIRING AND TERMINALS SHALL BE EXPOSED AND ACCESSIBLE WITHOUT REMOVAL OF ANY PANELS, COVERS, ETC., EXCEPT THOSE COVERING HIGH

ACCESS TO, OR REMOVAL OF A CIRCUIT COMPONENT OR TERMINAL BLOCK WILL NOT REQUIRE THE REMOVAL OF ANY OTHER CIRCUIT COMPONENT OR

EACH CIRCUIT COMPONENT SHALL BE CLEARLY IDENTIFIED INDICATING ITS CORRESPONDING NUMBER SHOWN ON THE DRAWINGS AND ITS FUNCTION.

A COMPLETE WIRING DIAGRAM SHALL BE MOUNTED ON THE INSIDE OF THE

THE DIAGRAM SHALL IDENTIFY EACH CIRCUIT COMPONENT AN NUMBERING



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REPLACE TAXIWAY AIRFIELD LIGHTING

IDA No: EZI-4939

SBGP No: 3-17-SBGP-TBD

Contract No.: KE020

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ELECTRICAL NOTES SHEET 1

AIRFIELD LIGHTING NOTES

	UNLESS OTHERWISE NOTED, ALL UNDERGROUND AIRFIELD LIGHTING SERIES CIRCUIT CONDUCTORS WHETHER DEB OR IN DUCT/CONDUIT SHALL BE FAA APPROVED 5000 VOLT L-824 TYPE. ALL UNDERGROUND FIELD POWER LOW VOLTAGE (600 VOLT & BELOW) CIRCUIT CONDUCTORS WHETHER DEB OR IN DUCT/CONDUIT SHALL BE UL LISTED 600	20.	ENT INT SHF
	VOLT, TYPE XLP-USE-2 COPPER CONDUCTORS. CONDUCTOR SIZES SHALL BE AS SPECIFIED, HEREIN.	21.	gal Dri Bef
2.	NO COMPONENTS OF PRIMARY CIRCUIT SUCH AS CABLE, CONNECTORS AND TRANSFORMERS SHALL BE BROUGHT ABOVE GROUND AT EDGE LIGHTS, SIGNS, REIL, PAPI, ETC.	22.	EDO
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.	23. 24.	CAE LET MAI COI ACO
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	25	MAX The Cae
5.	SHOWN ON AIRFIELD LIGHTING CABLE SPLICE DETAILS. THE CABLE ENTRANCE INTO THE FIELD-ATTACHED L-823 CONNECTORS SHALL BE ENCLOSED BY A HEAT-SHRINKABLE TUBING WITH CONTINUOUS INTERNAL ADHESIVE, AS	25.	THE COI OTH
	SHOWN ON AIRFIELD LIGHTING CABLE SPLICE DETAILS.	26.	APF BRE
6.	L-823 TYPE II, TWO-CONDUCTOR SECONDARY CONNECTORS SHALL BE CLASS 'A' (FACTORY MOLDED).	27.	LOC MAI
7.	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.	28.	WH SHA
8.	ELECTRICAL INSULATING GREASE SHALL BE APPLIED WITHIN THE L-823, SECONDARY, TWO CONDUCTOR CONNECTORS TO PREVENT WATER ENTRANCE. THESE CONNECTORS SHALL NOT BE TAPED.	29.	COI MAI 610
9.	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.	30.	ALL EME OF MAI
10.	A SLACK OF THREE (3') FEET, MINIMUM, PLUS DEPTH OF BASE CAN (IF APPLICABLE), SHALL BE PROVIDED IN THE PRIMARY CABLE AT EACH TRANSFORMER/CONNECTOR TERMINATION. AT STAKE-MOUNTED LIGHTS, THE SLACK SHALL BE LOOSELY COILED IMMEDIATELY BELOW THE ISOLATION TRANSFORMER. THERE SHALL BE NO ADDITIONAL PAYMENT FOR CABLE SLACK AND THEREFORE THE QUANTITY OF PROPOSED CABLE SLACK HAS NOT BEEN INCLUDED IN THE RESPECTIVE CABLE PAY ITEMS.	31.	ABO ACO ASS COI EITI
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.		EXI ENC RES INC COI
12.	L-867 BASES SHALL BE SIZE B, 24" DEEP, CLASS I, UNLESS OTHERWISE NOTED.		OPE DE1
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.		FAC AD IS E NO ⁻ ANI
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.		TO BY ANI UTI
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.		1-80 ASS COI BY FOF
16.	TOPS OF THE STAKES SUPPORTING LIGHT FIXTURES SHALL BE FLUSH WITH THE SURROUNDING GRADE.	32.	CO WH
17.	PLASTIC LIGHTING FIXTURE COMPONENTS, SUCH AS LAMP HEADS, STEMS, BREAKABLE COUPLINGS, BASE COVERS, BRACKETS, STAKES, SHALL NOT BE ACCEPTABLE.	33.	STF
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.		ARE NO ⁻ LIG ANI
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.		

TRANCES INTO L-867 BASES SHALL HAVE CONDUIT COUPLINGS OR REDUCERS TO ERFACE UNIT DUCT/CONDUIT TO L-867 BASE HUBS. OR SHALL BE SEALED WITH HEAT RINK.

LVANIZED/PAINTED EQUIPMENT/COMPONENT SURFACES SHALL NOT BE DAMAGED BY ILLING, FILING, ETC. DRAIN HOLES IN METAL TRANSFORMER HOUSINGS SHALL BE MADE FORE GALVANIZING.

GE LIGHT NUMBERING TAGS SHALL BE FACING THE PAVEMENT.

BLE/SPLICE/DUCT MARKERS SHALL BE PRECAST CONCRETE OF THE SIZE SHOWN. ITERS/NUMBERS/ARROWS FOR THE LEGEND TO BE IMPRESSED INTO THE TOPS OF THE RKERS SHALL BE PRE-ASSEMBLED AND SECURED IN THE MOLD BEFORE THE NCRETE IS POURED. LEGEND INSCRIBED BY HAND IN WET CONCRETE SHALL NOT BE CEPTABLE.

UNDERGROUND CABLE RUNS SHALL BE IDENTIFIED BY CABLE MARKERS AT 200 FEET XIMUM SPACING, WITH AN ADDITIONAL MARKER AT EACH CHANGE OF DIRECTION OF E CABLE RUN. CABLE MARKERS SHALL BE INSTALLED IMMEDIATELY ABOVE THE BLES.

ERE SHALL BE NO SPLICES BETWEEN THE ISOLATION TRANSFORMERS. L-823 INNECTORS ARE ALLOWED AT TRANSFORMER CONNECTIONS ONLY, UNLESS HERWISE SHOWN.

PLY AN OXIDE INHIBITING, ANTI-SEIZING COMPOUND TO ALL SCREWS, NUTS AND EAKAGE COUPLING THREADS.

CATIONS OF ENDS OF ALL UNDERGROUND DUCTS SHALL BE IDENTIFIED BY DUCT RKERS.

IERE A PARALLEL, CONSTANT VOLTAGE PAPI SYSTEM IS PROVIDED, THE "T" SPLICES ALL BE OF THE CAST TYPE.

NCRETE USED FOR SLABS, FOOTINGS, BACKFILL AROUND TRANSFORMER HOUSINGS, RKINGS, ETC. SHALL BE 3500 PSI (MINIMUM) AT 14 DAYS, IN ACCORDANCE WITH ITEM) STRUCTURAL PORTLAND CEMENT CONCRETE.

. POWER AND CONTROL CABLES IN MAN/HAND HOLES SHALL BE TAGGED. USE BOSSED COPPER STRIPS TO BE ATTACHED AT BOTH ENDS TO THE CABLE BY THE USE PLASTIC STRAPS. MINIMUM OF TWO TAGS SHALL BE PROVIDED ON EACH CABLE IN A N/HAND HOLE-ONE AT THE CABLE ENTRANCE AND ONE AT THE CABLE EXIT.

E LOCATION, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND AND/OR OVEGROUND UTILITIES INDICATED ON THE PLANS IS NOT REPRESENTED AS BEING CURATE, SUFFICIENT OR COMPLETE. NEITHER THE OWNER NOR THE ENGINEER SUMES ANY RESPONSIBILITY WHATSOEVER IN RESPECT TO ACCURACY MPLETENESS, OR SUFFICIENCY OF THE INFORMATION. THERE IS NO GUARANTEE HER EXPRESSED OR IMPLIED, THAT THE LOCATIONS, SIZE AND TYPE OF MATERIAL OF ISTING UNDERGROUND UTILITIES INDICATED ARE REPRESENTATIVE OF THOSE TO BE COUNTERED IN THE CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S SPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, CLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO INSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES OF HIS ERATIONAL PLANS AND SHALL OBTAIN FROM THE RESPECTIVE UTILITY COMPANIES TAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF THEIR CILITIES AND THE WORKING SCHEDULE OF THE COMPANIES FOR REMOVAL OR JUSTMENT WHERE REQUIRED. IN THE EVENT AN UNEXPECTED UTILITY INTERFERENCE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY TIFY THE UTILITY COMPANY OF JURISDICTION. THE OWNER'S REPRESENTATIVE D/OR THE RESIDENT ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY DAMAGE SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT. ALL UTILITY CABLES D LINES SHALL BE LOCATED BY THE RESPECTIVE UTILITY. CONTACT JULIE (JOINT ILITY LOCATION INFORMATION FOR EXCAVATORS) FOR UTILITY INFORMATION. PHONE: 00-892-0123. CONTACT THE FAA (FEDERAL AVIATION ADMINISTRATION) FOR SISTANCE IN LOCATING FAA CABLES AND UTILITIES. LOCATION OF FAA POWER, NTROL AND COMMUNICATION CABLES SHALL BE COORDINATED WITH AND/OR LOCATED THE FAA. ALSO CONTACT AIRPORT DIRECTOR/MANAGER AND AIRPORT PERSONNEL R ASSISTANCE IN LOCATING UNDERGROUND AIRPORT CABLES AND/OR UTILITIES. ALSO ORDINATE WORK WITH ALL ABOVE GROUND UTILITIES.

IEN PREPARING CABLE FOR SPLICES, THE CONTRACTOR SHALL USE A CABLE RIPPER/PENCILLER WHENEVER CABLE CONNECTIONS ARE MADE.

E ABOVE AIRFIELD LIGHTING NOTES

E BASED ON DEPT. OF TRANSPORTATION FAA GREAT LAKES REGION ELECTRICAL TES SUBMITTED BY AL GRIGAITIS, DATE: 2/11/1987 AND HAVE BEEN UPDATED BY KEVIN GHTFOOT TO ACCOMMODATE CODE CHANGES, FAA ADVISORY CIRCULAR CHANGES, D OTHER RESPECTIVE APPLICATIONS.

GROUNDING NOTES FOR AIRFIELD LIGHTING

- TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. A LIGHT BASE GROUND SHALL ALSO BE INSTALLED AT EACH STAKE MOUNTED LIGHT AND IN ACCORDANCE WITH THE RESPECTIVE TAXI GUIDANCE SIGN GROUND ROD. CONNECTIONS TO GROUND LUGS ON THE L-867 RODS SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY PENTAIR ERICO PRODUCTS, INC., THERMOWELD BY EQUAL. EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED RODS SHALL BE BURIED 12 INCHES MINIMUM BELOW GRADE. UNLESS SPECIFIED OTHERWISE HEREIN, FOR RESPECTIVE APPLICATIONS.
- 2. RATED 600 VOLTS WITH GREEN XHHW, THWN-2, OR OTHER SUITABLE BASE FOR ROUTINE MAINTENANCE. SEE THE LIGHT FIXTURE BONDING WIRE TO THE FIXTURE.
- 3 DOMESTIC STEEL.
- ARTICLE 250-12.
- FOR EACH AIRFIELD LIGHT FIXTURE, TAXI GUIDANCE SIGN, DISTANCE AIRFIELD LIGHT FIXTURE, THE CONTRACTOR SHALL TEST THE MADE FOR EACH AIRFIELD LIGHT FIXTURE AND EACH TAXI GUIDANCE SIGN **RECORD: KEVIN LIGHTFOOT.**
- 7 OR DAMAGED EQUIPMENT OR MATERIALS. PROPER GROUNDING WILL DEATH. PLEASE FOCUS ON SAFETY OF PERSONNEL AT ALL TIMES

GROUNDING FOR RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS SHALL BE AS DETAILED ON THE PLANS AND AS SPECIFIED HEREIN. A GROUND ROD MUST BE INSTALLED AT EACH LIGHT FIXTURE, TAXI GUIDANCE SIGN AND L-867/L-868 BASE. 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, FIXTURE. A LIGHT BASE GROUND SHALL BE INSTALLED AND CONNECTED TO THE METAL FRAME OF EACH TAXI GUIDANCE SIGN AS DETAILED ON THE PLANS MANUFACTURER RECOMMENDATIONS. THE LIGHT BASE GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR BONDED TO THE GROUND LUG ON THE **RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND** A 3/4-INCH DIAMETER BY 10-FOOT LONG (MINIMUM) UL LISTED COPPER CLAD TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE SHALL BE WITH A UL LISTED GROUNDING CONNECTOR. CONNECTIONS TO LIGHT BASES MAY ALSO BE MADE WITH A UL 467 LISTED PIPE CLAMP CONNECTED TO THE GRSC NIPPLE EXTENDING FROM A THREADED LIGHT BASE HUB. CONNECTIONS TO GROUND CONTINENTAL INDUSTRIES, INC., ULTRAWELD BY HARGER, OR APPROVED CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS. TOP OF GROUND

PER THE REQUIREMENTS OF FAA AC 150/5340-30J DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, CHAPTER 12, PART 12.6 "LIGHT FIXTURE BONDING" IT NOTES THE FOLLOWING: BOND THE LIGHT FIXTURE TO THE LIGHT BASE INTERNAL GROUND LUG VIA A NO. 6 AWG STRANDED COPPER WIRE INSULATION, BARE STRANDED CONDUCTOR OR A BRAIDED GROUND STRAP OF EQUIVALENT CURRENT RATING. THE BONDING CONDUCTOR LENGTH MUST BE SUFFICIENT TO ALLOW THE REMOVAL OF THE LIGHT FIXTURE FROM THE LIGHT MANUFACTURER'S INSTRUCTIONS FOR PROPER METHODS OF ATTACHING A

STEEL USED TO MANUFACTURE GROUND RODS SHALL BE 100 PERCENT

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 2020 NATIONAL ELECTRICAL CODE

THE RESISTANCE TO GROUND OF THE RESPECTIVE MOUNTING STAKE OR LIGHT BASE (WITH GROUND ROD CONNECTED) MUST BE 25 OHMS OR LESS.

REMAINING SIGN, JUNCTION STRUCTURE/L-867 BASE/L-868 BASE, OR OTHER ELECTRODE GROUND SYSTEM WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUNDING SYSTEMS. TEST RESULTS SHALL BE RECORDED INSTALLATION. IF GROUND RESISTANCE EXCEEDS 25 OHMS, LONGER GROUND RODS OR ADDITIONAL GROUND RODS MIGHT BE REQUIRED. IF GROUND **RESISTANCE EXCEEDS 25 OHMS CONTACT THE PROJECT ENGINEER FOR** FURTHER DIRECTION. ALSO REFER TO EOR-062-047643 FOR ADDITIONAL INFORMATION ON GROUNDING REQUIREMENTS WHERE APPLICABLE. COPIES OF THE GROUND SYSTEM TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN AND THE PROJECT ENGINEER OF

SAFETY OF PERSONNEL IS THE PRIORITY. PROTECTION OF EQUIPMENT IS SECONDARY. PLEASE BE AWARE THAT GROUNDING DOES NOT GUARANTEE YOU WILL NOT RECEIVE A SHOCK, BE INJURED, OR KILLED FROM DEFECTIVE HOWEVER SIGNIFICANTLY REDUCE THE POSSIBILITY OF SHOCK, INJURY, OR



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REPLACE TAXIWAY AIRFIELD LIGHTING

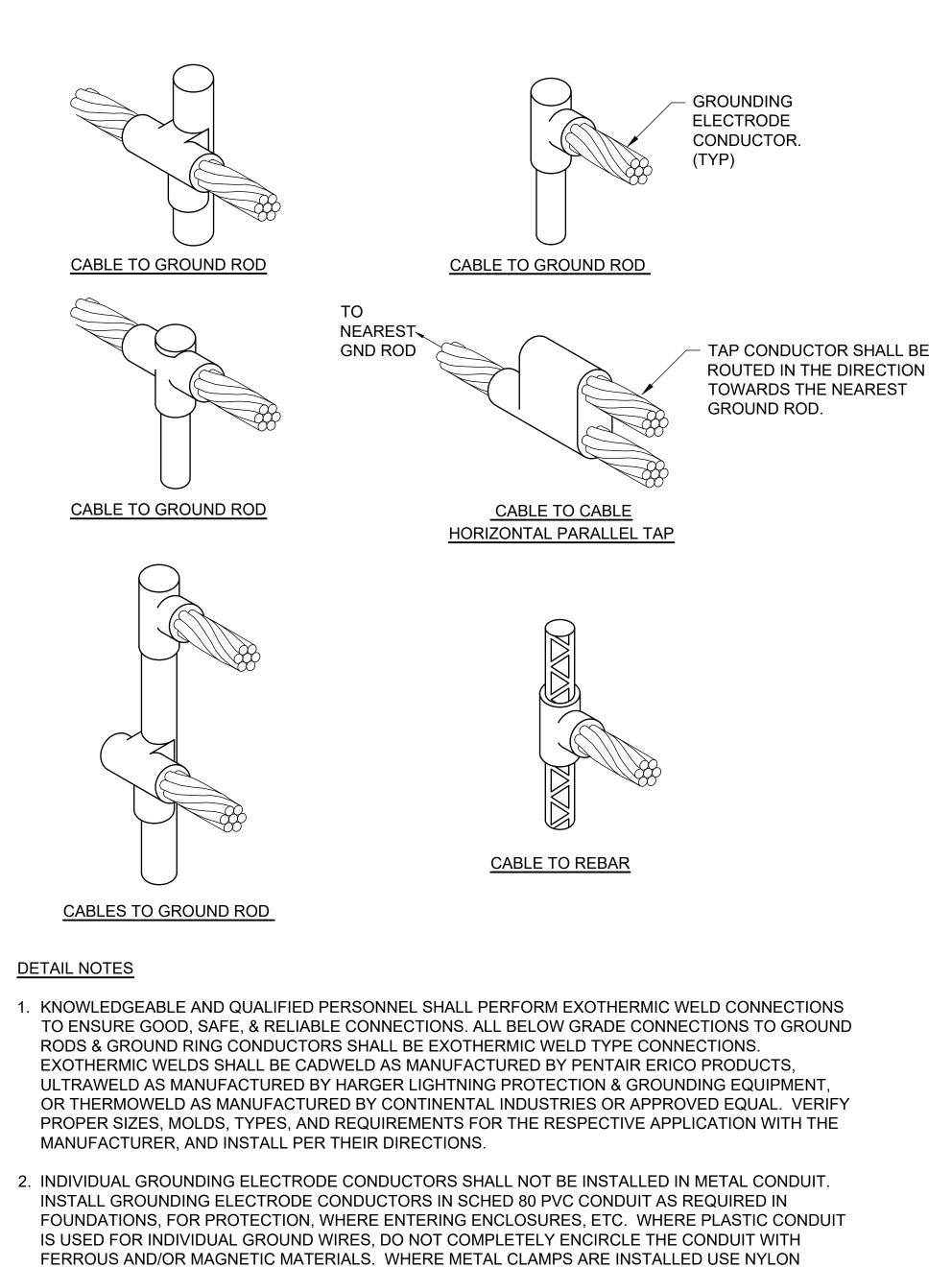
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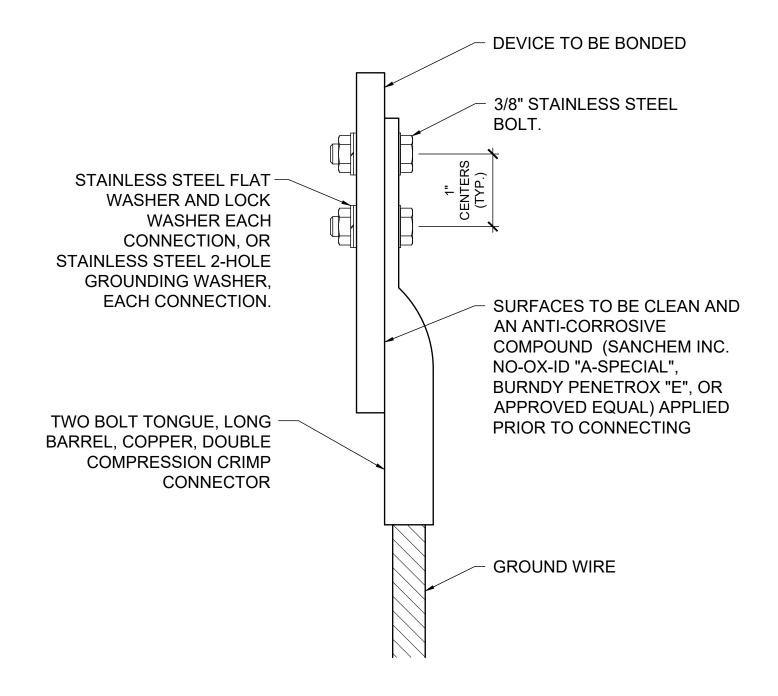
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ELECTRICAL NOTES SHEET 2



- BOLTS, NUTS, WASHERS, & 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.
- 3. ALL APPLICATIONS TO GALVANIZED STEEL OR PAINTED STEEL, SHALL REMOVE GALVANIZING AND/OR PAINT & CLEAN THE SURFACE TO EXPOSE BARE STEEL BEFORE MAKING EXOTHERMIC WELD CONNECTION.

EXOTHERMIC WELD DETAILS



BARREL COMPRESSION I	LUG TABLE (OR APPROV	ED EQUAL)
BURNDY CAT. NO.	THOMAS & BETTS CAT. NO.	PENN-UNION CAT. NO.
YA8C-2TC38	256-30695-1157	BBLU-8D-2TC38
YA8C-2TC38 OR YGA6C-2TC38E2G1	(CONTACT MFR)	(CONTACT MFR)
YA6C-2TC38	256-30695-1158	BBLU-6D-2TC38
YA4C-2TC38	256-30695-1159	BBLU-4D-2TC38
YA2C-2TC38	256-30695-1160	BBLU-2D-2TC38
YA3C-2TC38	256-30695-1160	BBLU-3D-2TC38
YA25-2TC38	256-30695-1162	BBLU-1/0D-2TC38
YA26-2TC38	256-30695-1116	BBLU-2/0D-2TC38
YA27-2TC38	54816BE	BBLU-3/0D-2TC38
YA28-2TC38	256-30695-1117	BBLU-4/0D-2TC38
	BURNDY CAT. NO. YA8C-2TC38 YA8C-2TC38 OR YGA6C-2TC38 OR YA6C-2TC38 YA4C-2TC38 YA2C-2TC38 YA3C-2TC38 YA2C-2TC38 YA2C-2TC38 YA2C-2TC38 YA2C-2TC38 YA2C-2TC38 YA2C-2TC38 YA2C-2TC38 YA2C-2TC38 YA2C-2TC38 YA2C-2TC38	BETTS CAT. NO. YA8C-2TC38 256-30695-1157 YA8C-2TC38 OR YGA6C-2TC38E2G1 (CONTACT MFR) YA6C-2TC38 256-30695-1158 YA4C-2TC38 256-30695-1159 YA2C-2TC38 256-30695-1160 YA3C-2TC38 256-30695-1160 YA25-2TC38 256-30695-1162 YA26-2TC38 256-30695-1162 YA26-2TC38 256-30695-1162 YA26-2TC38 256-30695-1162 YA26-2TC38 256-30695-1162

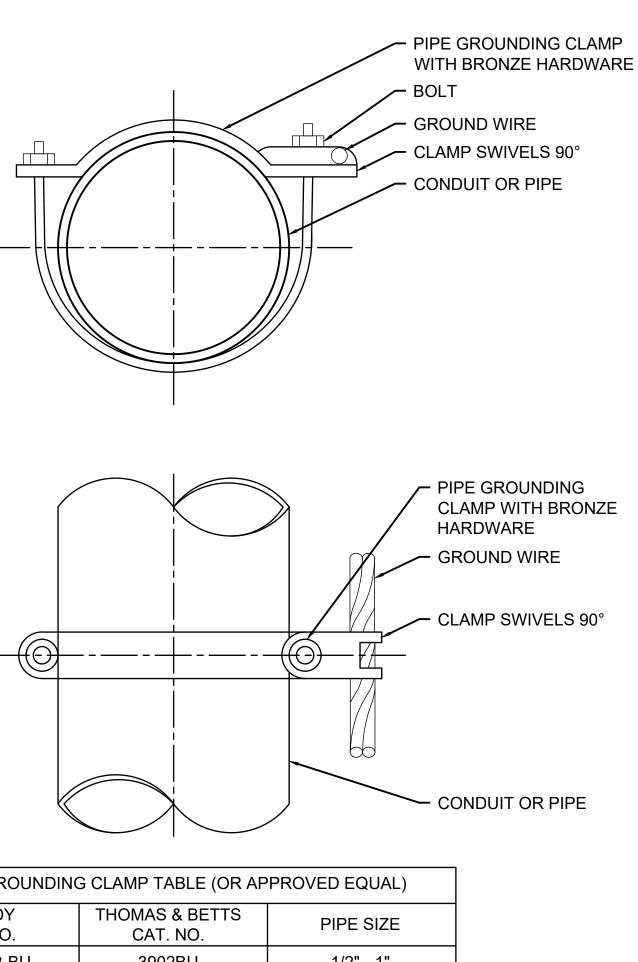
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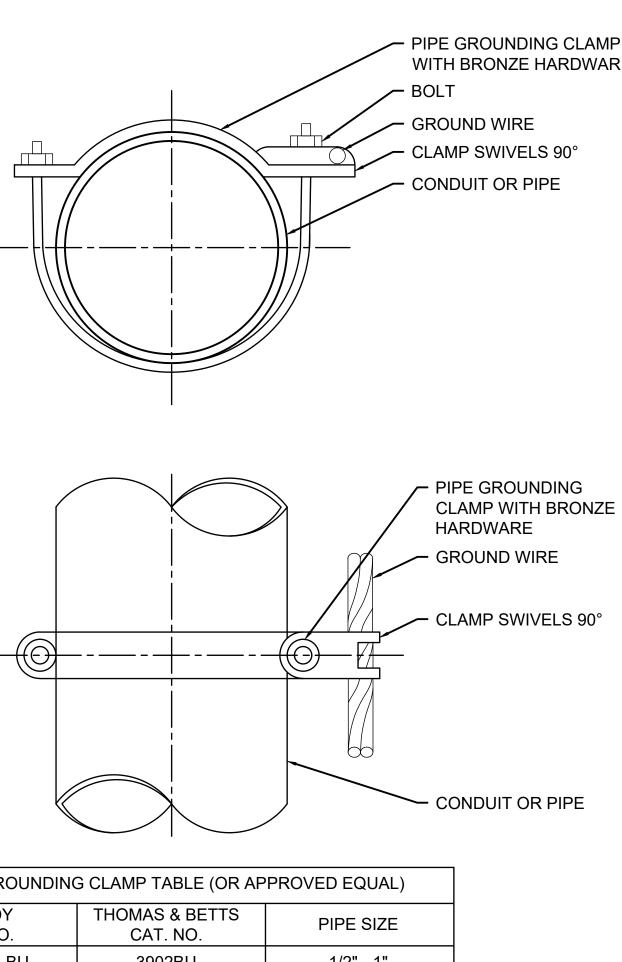
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- 1. IT IS IMPORTANT TO HAVE GOOD SECURE GROUND CONNECTIONS THAT WILL WITHSTAND WEATHER CONDITIONS AND MAINTAIN CONTINUITY TO GROUND. OFTEN WEATHER CONDITIONS CAN AFFECT GROUNDING CONNECTIONS THAT **RESULT IN LOOSE CONNECTIONS AND UNSAFE CONDITIONS.**
- 2. SAFETY OF PERSONNEL IS THE PRIORITY. PROTECTION OF EQUIPMENT IS SECONDARY. PLEASE BE AWARE THAT GROUNDING DOES NOT GUARANTEE YOU WILL NOT RECEIVE A SHOCK, BE INJURED, OR KILLED FROM DEFECTIVE OR DAMAGED EQUIPMENT OR MATERIALS. PROPER GROUNDING WILL HOWEVER SIGNIFICANTLY REDUCE THE POSSIBILITY OF SHOCK, INJURY, OR DEATH. PLEASE FOCUS ON SAFETY OF PERSONNEL AT ALL TIMES
- 3. THE GROUND WIRE CONNECTIONS TO EQUIPMENT LOCATED ABOVE GRADE, SHALL BE WITH 2 HOLE TONGUE LONG BARREL COMPRESSION LUGS BOLTED TO THE DEVICE WITH 3/8-INCH STAINLESS STEEL BOLTS, NUTS, AND WASHERS OR WITH THE RESPECTIVE EQUIPT MANUFACTURER'S LUG OR TERMINAL WHERE APPLICABLE. THIS ALSO APPLIES TO CONNECTIONS TO GROUND BUS BARS.
- 4. HARGER LIGHTING PROTECTION AND GROUNDING EQUIPMENT ALSO MANUFACTURERS TWO HOLE LONG BARREL COMPRESSION LUGS.
- 5. EACH CONNECTION SHALL BE COATED WITH A CORROSION PREVENTATIVE COMPOUND (SANCHEM INC. NO-OX-ID "A-SPECIAL", BURNDY PENETROX E, OR APPROVED EQUAL) BEFORE JOINING. ALL COPPER BUS BARS SHALL BE CLEANED PRIOR TO MAKING CONNECTIONS TO REMOVE SURFACE OXIDATION. CLEAN SURFACES, OF RESPECTIVE DEVICES TO BE BONDED, TO BARE METAL, PER NEC 250-12.

GROUNDING LUG CONNECTION DETAIL





PIPE GROUNDING	PIPE GROUNDING CLAMP TABLE (OR APPROVED EQUAL)					
BURNDY CAT. NO.						
GAR3902-BU	3902BU	1/2" - 1"				
GAR3903-BU	3903BU	1 1/4" - 2"				
GAR3904-BU	3904BU	2 1/2" - 3 1/2"				
GAR3905-BU	3905BU	4" - 5"				
GAR3906-BU	3906BU	6"				

NOTES

- 1.
- CLAMPS WITH TINNED COATED BRONZE HARDWARE
- 3. RESPECTIVE PIPE AND GROUND WIRE ARE ALSO ACCEPTABLE.
- THE RESPECTIVE PIPE AND GROUND WIRE ARE ALSO ACCEPTABLE.

EACH PIPE GROUNDING CLAMP SHALL HAVE BRONZE HARDWARE, BE CORROSION RESISTANT, SUITABLE FOR DIRECT BURIAL IN EARTH OR CONCRETE, & UL 467 LISTED.

2. FOR APPLICATIONS SUBJECT TO ADDITIONAL CORROSION. PROVIDE PIPE GROUNDING

HARGER CPC AND APC SERIES PIPE GROUNDING CLAMPS PROPERLY SIZED FOR THE

4. PENN-UNION TYPE "GPL" SERIES PIPE GROUNDING CLAMPS PROPERLY SIZED FOR

PIPE/CONDUIT GROUNDING CLAMP DETAIL



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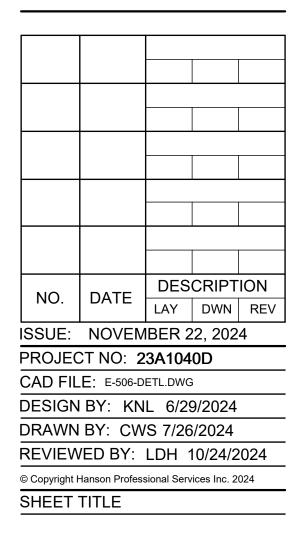
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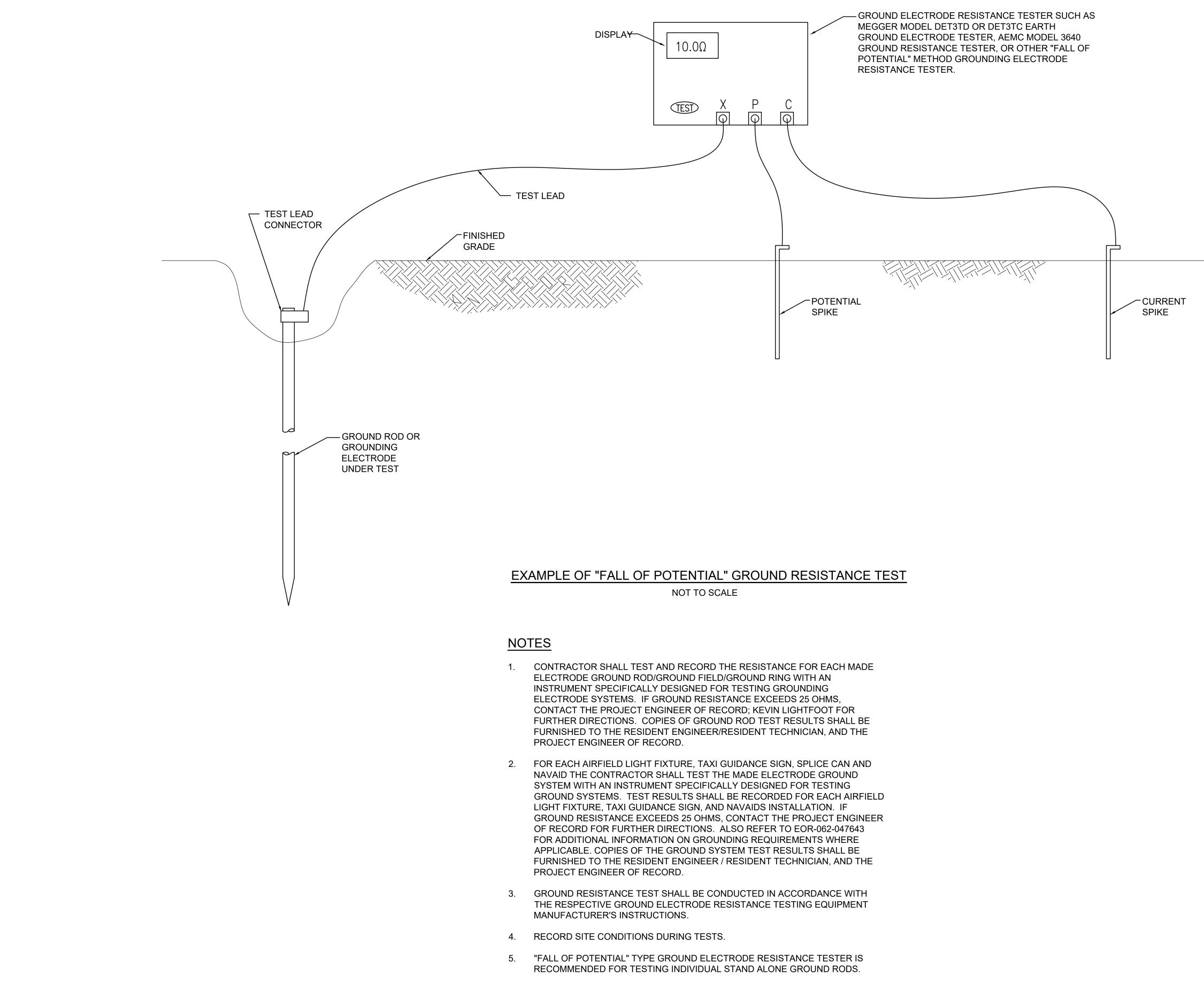
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GROUNDING DETAILS







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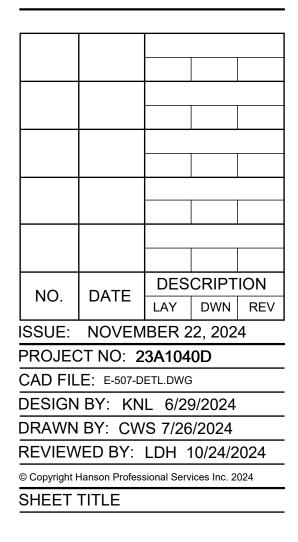
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Contract No.: KE020



GROUND RESISTANCE **TESTING DETAILS**

GROUNDING NOTES

RES MAK ELE THE REC THE WIT	E CONTRACTOR SHALL FURNISH AND INSTALL ALL GROUNDING SHOWN ON THE SPECTIVE CONTRACT DOCUMENTS AND/OR AS MAY BE NECESSARY OR REQUIRED TO (E A COMPLETE GROUNDING SYSTEM, AS REQUIRED BY THE LATEST NFPA 70 - NATIONAL CTRICAL CODE (NEC) IN FORCE, OTHER APPLICABLE CODES, AND IN ACCORDANCE WITH E RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS, INSTRUCTIONS, AND QUIREMENTS FOR THE PRIORITY OF PROTECTION OF PERSONNEL AND ADDITIONALLY FOR E PROTECTION OF EQUIPMENT. ALL PERSONNEL ARE RECOMMENDED TO ALSO COMPLY 'H NFPA 70E STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE. THE RELIABILITY OF E GROUNDING SYSTEM IS DEPENDENT ON CAREFUL, PROPER INSTALLATION, AND CHOICE	11.	AI M C M S V R
OF I ELE SER EQU CIR	MATERIALS. IMPROPER PREPARATION OF SURFACES TO BE JOINED TO MAKE AN CTRICAL PATH, LOOSE JOINTS, OR CORROSION CAN INTRODUCE IMPEDANCE THAT WILL RIOUSLY IMPAIR THE ABILITY OF THE GROUND PATH TO PROTECT PERSONNEL AND JIPMENT AND TO ABSORB TRANSIENTS THAT CAN CAUSE NOISE IN COMMUNICATIONS CUITS. THE FOLLOWING FUNCTIONS ARE PARTICULARLY IMPORTANT TO ENSURE A JABLE GROUND SYSTEM:	12.	IT EI H, B(BI
1.	FURNISH AND INSTALL GROUND RODS AS DETAILED HEREIN. GROUND RODS FOR AIRFIELD LIGHTING LIGHT BASE GROUNDS FOR (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 COUNTERPOISE/LIGHTNING PROTECTION SYSTEM ON THE AIRFIELD 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	13.	PI G T C E S S
	DETAILED ON THE RESPECTIVE PLANS, AND IN NO CASE SPACED LESS THAN ONE ROD LENGTH APART. ALL CONNECTIONS TO GROUND RODS AND THE GROUND RING SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY PENTAIR ERICO PRODUCTS, THERMOWELD BY CONTINENTAL INDUSTRIES, ULTRAWELD BY HARGER, OR APPROVED EQUAL. EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS	14. 15.	E S A
0	AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS OR AT BURIED GROUNDING ELECTRODE CONDUCTORS.	13.	A S E
2.	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 OF RECORD FOR FURTHER DIRECTIONS. ALSO REFER TO	16	E C E
0	EOR-47643 FOR ADDITIONAL INFORMATION ON GROUNDING REQUIREMENTS, WHERE APPLICABLE. COPIES OF GROUND ROD TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT PROJECT REPRESENTATIVE, AND THE PROJECT ENGINEER OF RECORD.	16. 17.	
3.	ALL PRODUCTS ASSOCIATED WITH THE GROUNDING SYSTEM SHALL BE UL-LISTED AND LABELED.	18.	ll C
4.	ALL BOLTED OR MECHANICAL CONNECTIONS SHALL BE COATED WITH A CORROSION PREVENTIVE COMPOUND BEFORE JOINING, SANCHEM INC. "NO-OX-ID "A-SPECIAL" COMPOUND, BURNDY PENETROX E, OR APPROVED EQUAL.		
5.	METALLIC SURFACES TO BE JOINED SHALL BE PREPARED BY THE REMOVAL OF ALL NON-CONDUCTIVE MATERIAL, PER 2020 NATIONAL ELECTRICAL CODE ARTICLE 250-12. ALL COPPER BUS BARS MUST BE CLEANED PRIOR TO MAKING CONNECTIONS TO REMOVE SURFACE OXIDATION.		F N F (
6.	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	19. 20.	N E C 2 F J
	LOCKNUTS OR BUSHINGS SHALL NOT BE THE SOLE MEANS FOR BONDING WHERE A CONDUIT ENTERS AN ENCLOSURE THROUGH A CONCENTRIC OR ECCENTRIC KNOCKOUT	20.	\ E F
7.	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.		
8.	ALL METAL EQUIPMENT ENCLOSURES, CONDUITS, CABINETS, BOXES, RECEPTACLES, MOTORS, ETC. SHALL BE BONDED TO THE RESPECTIVE GROUNDING SYSTEM.		
9.	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.		v F N F F F
10.	EACH NEW FEEDER CIRCUIT AND/OR BRANCH CIRCUIT SHALL INCLUDE AN EQUIPMENT GROUND WIRE. METAL RACEWAY OR CONDUIT SHALL NOT MEET THIS REQUIREMENT. THE EQUIPMENT GROUND WIRE FROM EQUIPMENT SHALL NOT BE SMALLER THAN ALLOWED BY 2020 NEC TABLE 250-122 "MINIMUM SIZE CONDUCTORS OR GROUNDING RACEWAY AND EQUIPMENT." WHEN CONDUCTORS ARE ADJUSTED IN SIZE TO COMPENSATE FOR VOLTAGE DROP, EQUIPMENT-GROUNDING CONDUCTORS SHALL BE ADJUSTED PROPORTIONATELY ACCORDING TO CIRCULAR MIL AREA. ALL EQUIPMENT GROUND WIRES SHALL BE COPPER, EITHER BARE OR INSULATED GREEN IN COLOR. WHERE THE EQUIPMENT GROUNDING CONDUCTORS ARE INSULATED, THEY SHALL BE IDENTIFIED BY THE COLOR GREEN, AND SHALL BE THE SAME INSULATION TYPE AS THE PHASE CONDUCTORS.		F L F A

024 23A

EXTERIOR METAL CONDUIT, WHERE NOT ELECTRICALLY CONTINUOUS BECAUSE OF NHOLES, HANDHOLES, NON-METALLIC JUNCTION BOXES, ETC., SHALL BE BONDED TO OTHER METAL CONDUIT IN THE RESPECTIVE DUCT RUN, AND AT EACH END, WITH A PPER-BONDING JUMPER SIZED IN CONFORMANCE WITH 2020 NEC 250-102. WHERE TAL CONDUITS TERMINATE IN AN ENCLOSURE (SUCH AS A MOTOR CONTROL CENTER, TCHBOARD, ETC) WHERE THERE IS NOT ELECTRICAL CONTINUITY WITH THE NDUIT AND THE RESPECTIVE ENCLOSURE, PROVIDE A BONDING JUMPER FROM THE SPECTIVE ENCLOSURE GROUND BUS TO THE CONDUIT SIZED PER 2020 NEC 250-102.

THE INTENT OF THIS SPECIFICATION THAT ALL MOTOR FRAMES. PUMP BASES CTRICAL EQUIPMENT ENCLOSURES, PANEL HOUSINGS, CONDUITS, BOXES, ETC. E A CONTINUOUS COPPER WIRE GROUND CONNECTION AND SHALL BE POSITIVELY IDED TO THE RESPECTIVE GROUNDING SYSTEM. CONDUIT CONNECTORS WILL NOT CONSIDERED AS ADEQUATE GROUNDING

VIDE A POSITIVE GROUND BOND FOR ALL OUTLET BOXES, ELECTRICAL EQUIPMENT CLOSURES, GROUNDING RECEPTACLES, TOGGLE SWITCHES, ETC. INSTALL A DUNDING CONDUCTOR IN ALL WIRE AND CABLE RACEWAYS. GROUND CONDUCTOR HAVE 600-VOLT INSULATION AND BE IDENTIFIED BY A CONTINUOUS GREEN COLOR ATING. THEY SHALL BE USED SOLELY FOR GROUNDING PURPOSES AND BE IRELY SEPARATE FROM WHITE GROUNDED NEUTRAL CONDUCTOR, EXCEPT AT PPLY SIDE OF SERVICE DISCONNECTING MEANS. WHERE GROUNDING AND NEUTRAL STEMS ARE TO BE CONNECTED TO SERVICE GROUND.

CH AND ALL GROUNDED CASED AND METAL PARTS ASSOCIATED WITH ELECTRICAL JIPMENT SHALL BE TESTED FOR CONTINUITY OF CONNECTION WITH GROUND BUS STEM BY CONTRACTOR IN PRESENCE OF OWNER'S REPRESENTATIVE.

CONNECTIONS BETWEEN THE DIFFERENT TYPES OF GROUNDING CONDUCTORS OVE GRADE SHALL BE MADE USING BOLTED GROUND CONNECTORS. GROUND LUGS ALL BE PROVIDED IN ALL ENCLOSURES AND WIRING TERMINATION JUNCTION BOXES. JIPMENT GROUNDS AND GROUNDING CONDUCTOR SHALL BE CONNECTED TO THESE DUND LUGS. FOR GROUND CONNECTIONS TO ENCLOSURES, CASES AND FRAMES OF CTRICAL EQUIPMENT NOT SUPPLIED WITH GROUND LUGS THE CONTRACTOR SHALL LL REQUIRED HOLES FOR MOUNTING A BOLTED GROUND CONNECTOR. ALL BOLTED OUND CONNECTORS SHALL BE BURNDY, OR EQUAL.

ID ALL NONCURRENT-CARRYING PARTS OF METAL EQUIPMENT TO GROUND SYSTEM.

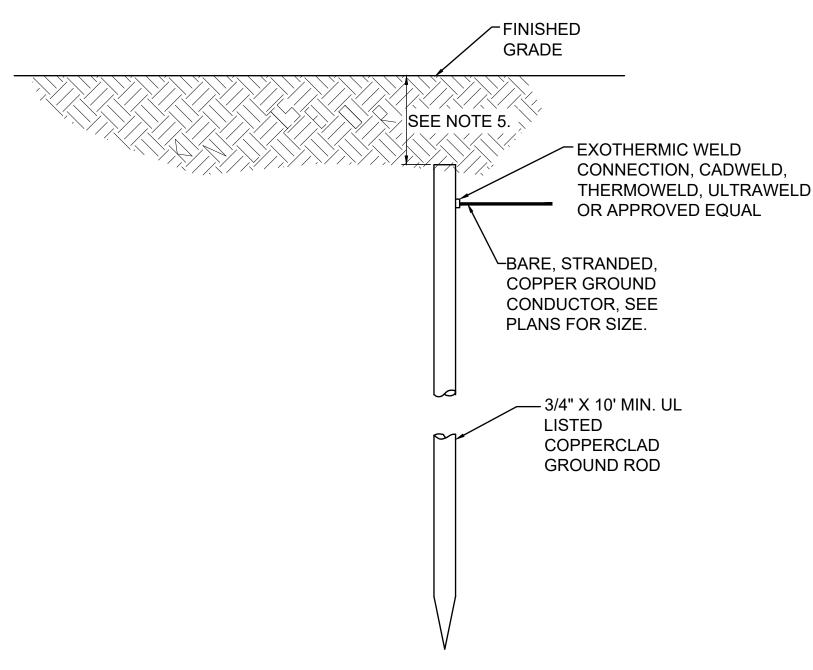
LDING STRUCTURAL STEEL SYSTEM SHALL BE BONDED TO ELECTRICAL GROUND STEM.

TALL GROUNDING ELECTRODE CONDUCTORS, LIGHTNING PROTECTION DOWN NDUCTORS AND SEPARATE GROUND CONDUCTORS IN SCHEDULE 80 PVC CONDUIT EXPOSED WHERE ACCEPTABLE TO LOCAL CODES. WHERE GROUNDING ELECTRODE NDUCTORS, LIGHTNING PROTECTION DOWN CONDUCTORS OR INDIVIDUAL GROUND NDUCTORS ARE RUN IN PVC CONDUIT, DO NOT COMPLETELY ENCIRCLE CONDUIT H FERROUS AND/OR MAGNETIC MATERIALS. USE NON-METALLIC REINFORCED ERGLASS STRUT SUPPORT. WHERE METAL CONDUIT CLAMPS ARE INSTALLED, USE ON BOLTS, NUTS, WASHERS AND SPACERS TO INTERRUPT A COMPLETE METALLIC H FROM ENCIRCLING THE CONDUIT. THIS IS REQUIRED TO AVOID GIRDLING OF DUND CONDUCTORS.

OCAL CODES DICTATE THAT INDIVIDUAL GROUNDING CONDUCTORS MUST BE RUN IN TAL CONDUIT OR RACEWAY, THEN THE CONDUIT OR RACEWAY MUST BE BONDED AT CH END OF THE RUN WITH A BONDING JUMPER SIZED EQUAL TO THE INDIVIDUAL DUNDING CONDUCTOR OR AS REQUIRED BY 2020 NEC 250-102 AND/OR 2020 NEC .64(E). NOTE THIS DOES NOT APPLY TO AC EQUIPMENT GROUNDING CONDUCTORS I WITH AC CIRCUITS. CONFIRM REQUIREMENTS WITH AUTHORITY HAVING SDICTION.

DUNDING WORK AFFECTING OPERATIONS AT A FACILITY SHALL BE COORDINATED THE OWNER'S DESIGNATED REPRESENTATIVE(S) AND TO MINIMIZE DOWNTIME TO STING SYSTEMS. THE RESPECTIVE PERSONNEL SHALL COORDINATE WORK AND ANY VER OUTAGES WITH THE OWNER'S DESIGNATED REPRESENTATIVE(S). ANY JTDOWN OF EXISTING SYSTEMS SHALL BE SCHEDULED WITH AND APPROVED BY THE NER'S REPRESENTATIVE PRIOR TO SHUT DOWN. ALL POWER SYSTEMS (AC OR DC) ALL HAVE PROVISIONS TO LOCKOUT AND TAGOUT ANY CIRCUIT TO HELP ENSURE E CIRCUIT IS SAFE TO WORK ON FOR PROTECTION OF PERSONNEL. ONCE SHUT WN. THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL RGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. PARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 R PART 1910 OCCUPATIONAL SAFETY AND HEALTH STANDARDS FOR ELECTRICAL ETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR TION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT). WHERE ACILITY DOES NOT HAVE LOCKOUT/TAGOUT KITS THE RESPECTIVE PERSONNEL ALL PROVIDE ADEQUATE QUANTITIES OF LOCKOUT/TAGOUT KITS SUITABLE FOR USE 'H THE RESPECTIVE EQUIPMENT. WHERE EXISTING ELECTRICAL EQUIPMENT DOES FHAVE FEATURES FOR LOCKOUT/TAGOUT THE RESPECTIVE PERSONNEL WILL BE SPONSIBLE FOR PROVIDING THE APPROPRIATE LOCKOUT/TAGOUT EQUIPMENT AND ASURES TO COMPLY WITH OSHA LOCKOUT/TAGOUT REQUIREMENTS. ALL PADLOCKS USE WITH LOCKOUT/TAGOUT PROCEDURES SHALL HAVE A DIFFERENT KEY VIDE LOCKOUT HASPS TO ACCOMMODATE MULTIPLE PADLOCKS WHERE MULTIPLE PLE ARE WORKING ON THE SAME SYSTEM. INCLUDE LOCKOUT TAGS FOR EACH CE OF EQUIPMENT REQUIRING SERVICING AND SHUTDOWN. COMPLIANCE WITH KOUT/TAGOUT PROCEDURES AND ALL OTHER SAFETY PROCEDURES AND QUIREMENTS ARE THE RESPONSIBILITY OF THE RESPECTIVE PERSONNEL WORKING THE FACILITY.

- 22. GROUNDING WORK AND MODIFICATIONS SHALL NOT BE PERFORMED DURING A THUNDERSTORM OR WHEN A THUNDERSTORM IS PREDICTED IN THE AREA.
- 23. PER NFPA 70E STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE IT DEFINES ELECTRICALLY SAFE WORK CONDITION AS "A STATE IN WHICH AN ELECTRICAL PERSONNEL PROTECTION." PRIOR TO CONDUCTING TESTS OR WORKING ON
- FURTHER DIRECTIONS.
- WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCES AIP PROJECTS MUST BE PRODUCED IN THE UNITED STATES



10 FT. GROUND ROD NOT TO SCALE

NOTES

- PLAN.
- 2. OHMS.
- GROUNDING UNLESS OTHERWISE SPECIFIED.
- SPACED LESS THAN ONE ROD LENGTH APART.
- OTHERWISE HEREIN.
- 6 3/4-INCH DIAMETER BY 10-FT LONG UL LISTED COPPER CLAD.
- ENGINEER OF RECORD; KEVIN LIGHTFOOT FOR DIRECTIONS.

GROUND RODS NOT TO SCALE

21. NEVER REMOVE, ALTER, OR ATTEMPT TO REPAIR CONDUCTORS OR CONDUIT SYSTEMS PROVIDING GROUNDING OR ELECTRICAL BONDING FOR ANY ELECTRICAL EQUIPMENT UNTIL ALL POWER IS REMOVED FROM EQUIPMENT. WARN ALL PERSONNEL OF THE UNGROUNDED CONDITION OF THE EQUIPMENT. DISPLAY APPROPRIATE WARNING SIGNS, SUCH AS DANGER TAGS, TO WARN PERSONNEL OF THE POSSIBLE HAZARDS.

CONDUCTOR OR CIRCUIT PART HAS BEEN DISCONNECTED FROM ENERGIZED PARTS LOCKED/TAGGED IN ACCORDANCE WITH ESTABLISHED STANDARDS, TESTED TO VERIFY THE ABSENCE OF VOLTAGE, AND, IF NECESSARY, TEMPORARILY GROUNDED FOR EQUIPMENT, VERIFY EQUIPMENT ENCLOSURES AND FRAMES HAVE A GOOD AND SECURE GROUND CONNECTION. FAILURE TO PROPERLY GROUND THIS EQUIPMENT PRESENTS A DANGEROUS HAZARD FOR PERSONNEL WORKING ON THIS SYSTEM.

24. WHERE A CONFLICT IS DETERMINED WITH RESPECT TO GROUNDING REQUIREMENTS PER MANUFACTURER INSTALLATION INSTRUCTIONS, NEC, AND/OR THE CONTRACT DOCUMENTS, CONTACT THE PROJECT ENGINEER OF RECORD: KEVIN LIGHTFOOT FOR

25. GROUND RODS SHALL BE PRODUCED FROM 100 PERCENT DOMESTIC STEEL TO COMPLY REQUIREMENT. THE BUY AMERICAN PREFERENCE REQUIREMENTS ESTABLISHED WITHIN 49 USC 50101 REQUIRE THAT ALL STEEL AND MANUFACTURED GOODS USED ON

1. TYPE AND MINIMUM NUMBER OF GROUND RODS SHALL BE AS SPECIFIED ON THE

THE RESISTANCE TO GROUND OF THE GROUNDING SYSTEM SHALL NOT EXCEED 25

COST OF GROUND RODS IS INCIDENTAL TO THE ASSOCIATED ITEMS REQUIRING

GROUND RODS SHALL BE SPACED AS DETAILED ON THE PLANS AND SHALL NOT BE

TOP OF GROUND RODS SHALL BE 12" MINIMUM BELOW GRADE UNLESS DETAILED

GROUND RODS FOR SPLICE CANS AND AIRFIELD LIGHTING SHALL BE A MINIMUM

7. FOR OTHER GROUNDING APPLICATIONS NOT DETAILED HEREIN, CONTACT



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KEWANEE MUNICIPAL AIRPORT 3769 Midland Road Kewanee, Illinois 61443 Telephone: 309.853.8222

REPLACE TAXIWAY AIRFIELD LIGHTING

IDA No: EZI-4939

SBGP No: 3-17-SBGP-TBD

Contract No.: KE020

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GROUNDING NOTES

ELECT	RICAL LEGEND - ONE-LINE DIAGRAM	E	LECTRICAL LEGEND - SCHEMATIC		ELECTRICAL ABBREVIATIONS	ELEC	TRICAL ABBREVIATIONS (CONTINUED)	NOTES:
-0	CABLE TERMINATOR/LUG		NORMALLY OPEN (N.O.) CONTACT	A.F.F.	ABOVE FINISHED FLOOR	PB	PULL BOX	1. ALL ELECTRICAL CONFORMANCE V
₩~	TRANSFORMER	-#	NORMALLY CLOSED (N.C.) CONTACT	A, AMP	AMPERES	PC	PHOTO CELL	(NEC) MOST CUP
	DISCONNECT SWITCH	S *	STARTER COIL, * = STARTER NUMBER	ATS	AUTOMATIC TRANSFER SWITCH	PDB	POWER DISTRIBUTION BLOCK	EQUIPMENT MAN APPLICABLE LO
	FUSIBLE DISCONNECT SWITCH	OL 	OVERLOAD RELAY CONTACT	AWG	AMERICAN WIRE GAUGE	PNL	PANEL	REQUIREMENTS I THE U.L. LIS
~	CIRCUIT BREAKER		CONTROL RELAY, * = CONTROL RELAY NUMBER	BKR	BREAKER	RCPT	RECEPTACLE	VERIFICATION/ET
	THERMAL MAGNETIC CIRCUIT BREAKER	(R*)	RELAY, * = RELAY NUMBER	С	CONDUIT	R	RELAY	AND/OR THE MAN <u>NOT</u> BE PERMITTE
	FUSE		TOGGLE SWITCH / 2 POSITION SWITCH	СВ	CIRCUIT BREAKER	S	STARTER	2. KEEP A COPY OF
1				СКТ	CIRCUIT	SPD	SURGE PROTECTION DEVICE	TIMES DURING/CO
• •	TRANSIENT VOLTAGE SURGE SUPPRESSOR OR SURGE PROTECTOR DEVICE		2-POSITION SELECTOR SWITCH		CONTROL RELAY	SPST	SINGLE POLE SINGLE THROW	3. NEW WORK, PO
' L	GROUND - GROUND ROD, GROUNDING				COPPER	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR	EXISTING SYSTE AIRPORT MANAGI
	ELECTRODE, OR AT EARTH POTENTIAL	OFF HAND ↑ AUTO		CU				BE LABELED AS S OF THE RESPE
^	INDICATING LIGHT	xoo	3-POSITION SELECTOR SWITCH	DPDT		TYP	TYPICAL	FOLLOW U.S. [
∕	MOTOR		(H-O-A SHOWN)	DPST	DOUBLE POLE SINGLE THROW	UG	UNDERGROUND	SAFETY & HEALTH OCCUPATIONAL
	LOAD, MOTOR, # = HORSEPOWER			EM	EMERGENCY	UGE	UNDERGROUND ELECTRIC	ELECTRICAL SAF INCLUDING, BUT
51				EMT	ELECTRICAL METALLIC TUBING	UL	UNDERWRITER'S LABORATORIES	THE CONTROL OF
기	ELECTRIC UTILITY METER BASE	<u>ل</u> م	N.O. THERMAL SWITCH	ENCL	ENCLOSURE	V	VOLTS	4. LTFMC DENOTES
_ †			N.C. THERMAL SWITCH	EOR	ENGINEER OF RECORD	W/	WITH	LISTED, SUNLIGH
	JUNCTION BOX WITH SPLICE	م لو م		EP	EXPLOSION PROOF	W/O	WITHOUT	LIQUID TIGHT FL FITTINGS SHALL E
				ES	EMERGENCY STOP	WP	WEATHER PROOF	OF NEC 350.6. LI IS USED FOR F
	EQUIPMENT, XXX = DEVICE		2 POLE DISCONNECT SWITCH	FTI	INTERTEK - ELECTRICAL TESTING LABS	XFER	TRANSFER	CCR'S & TRANS
				ETM	ELAPSE TIME METER	XFMR	TRANSFORMER	BONDING JUMPE CONDUCTOR PEF
	GROUND BUS OR TERMINAL		3 POLE DISCONNECT SWITCH		GROUND FAULT CIRCUIT INTERRUPTER	-	DASH, HYPHEN, OR MINUS SIGN	USED WITH CCR (MINIMUM). DO N
<u> </u>	NEUTRAL BUS	<u> </u>	PHOTOCELL	GFCI				CONFIRM
	PANELBOARD WITH MAIN LUGS		TERMINAL BLOCK, * = TERMINAL NUMBER	GFI	GROUND FAULT INTERRUPTER	XXX	LETTERS AND / OR NUMBERS (TO BE DETERMINED)	INSTALLATION.
			DEVICE TERMINAL, * = DEVICE TERMINAL NUMBER	GND	GROUND	AIRPO	RT EQUIPMENT/FACILITY ABBREVIATIONS	5. INSULATED CONE NEUTRAL COND
			· · · · · · · · · · · · · · · · · · ·	GRSC	GALVANIZED RIGID STEEL CONDUIT	ASOS	AUTOMATED SURFACE OBSERVING SYSTEM	SMALLER. PRO
			INTERNAL PANEL WIRING	HOA	HAND OFF AUTOMATIC	ACCC	AIR TRAFFIC CONTROL TOWER	MARKING TAPE F NO. 4 AWG AND L
	PANELBOARD WITH MAIN BREAKER		FIELD WIRING	HP	HORSEPOWER			SHALL HAVE G
			FUSE	J	JUNCTION BOX	AWOS	AUTOMATED WEATHER OBSERVING SYSTEM	CONDUCTOR AW 250.119. NEUT
		GND	GROUND BUS OR TERMINAL	KVA	KILOVOLT AMPERE(S)	CCR	CONSTANT CURRENT REGULATOR	COLORED INSUL
		S/N	NEUTRAL BUS	KNL	KEVIN NEIL LIGHTFOOT	DME	DISTANCE MEASURING EQUIPMENT	FOR POWER WIF
'	FUSE PANEL WITH MAIN FUSE PULLOUT	Ļ	GROUND, GROUND ROD, GROUND BUS	KW	KILOWATTS	FAR	FEDERAL AVIATION REGULATION	FOLLOWS:
					LIGHTING CONTACTOR	GS	GLIDE SLOPE FACILITY	<u>120/240 VAC, 1 PH</u> PHASE A
-	DUPLEX RECEPTACLE 120V SINGLE PHASE GROUNDING TYPE					HIRL	HIGH INTENSITY RUNWAY LIGHT	PHASE C
n			INDUSTRIAL CONTROL RELAY OR LIGHTING CONTACTOR	LED	LIGHT EMITTING DIODE	ILS	INSTRUMENT LANDING SYSTEM	NEUTRAL GROUND
	CONTROL STATION	<u> </u>		LTFMC	LIQUID TIGHT FLEXIBLE METAL CONDUIT (UL LISTED)	IM	INNER MARKER	
EM				LTG	LIGHTING	I IR	LOW IMPACT-RESISTANT	6. SEE RESPECTI INFORMATION.
, 0	TRANSFER SWITCH		TYPE S1 CUTOUT HANDLE REMOVED	LHTNG	LIGHTING	LOC	LOCALIZER FACILITY	
		+□+	(MFRD BY CROUSE-HINDS, MANAIRCO, AND OTHERS)	LP	LIGHTING PANEL		MEDIUM INTENSITY APPROACH LIGHTING SYSTEM	7. ENCLOSURES RA
~ 11	ENGINE GENERATOR SET	││ <u></u> ╡╄ <u></u> ╡┘ ╒		MAX	MAXIMUM	MALS		HUBS AT CONDU THE RESPECTIVE
ン		·		МСВ	MAIN CIRCUIT BREAKER	MALSR	MEDIUM INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATING LIGHTS	RATING.
			TYPE S1 CUTOUT HANDLE INSERTED	МСМ	THOUSAND CIRCULAR MIL	MIRL	MEDIUM INTENSITY RUNWAY LIGHT	8. ONLY QUALIFIE
		キ『キ	(MFRD BY CROUSE-HINDS,		MAIN DISTRIBUTION PANEL	MITL	MEDIUM INTENSITY TAXIWAY LIGHT	PERFORM ELEC DEFINES A QUALI
			MANAIRCO, AND OTHERS)	MFR	MANUFACTURER	NDB	NON-DIRECTIONAL BEACON	KNOWLEDGE RI OPERATION OF
						PAPI	PRECISION APPROACH PATH INDICATOR	INSTALLATIONS A
			•	MH		PLASI	PULSE LIGHT APPROACH SLOPE INDICATOR	RECOGNIZE AND
			TYPE SCO CUTOUT	MIN	MINIMUM			9. RESPECTIVE PO EQUIPMENT, AIR
			──┘ 🖕 (MFRD BY ADB)	MLO	MAIN LUGS ONLY	RAIL	RUNWAY ALIGNMENT INDICATING LIGHTS	DEVICE SHALL
			, <u> </u>	NEC	NATIONAL ELECTRICAL CODE (NFPA 70)	REIL	RUNWAY END IDENTIFIER LIGHT	RELOCATING, INSTALLING THE
		╽╓╁╁┐		NC	NORMALLY CLOSED	RVR	RUNWAY VISUAL RANGE	AND TAGOUT FOR
			TYPE ALSC AIRFIELD LIGHTING SAFETY CUTOUT	NO	NORMALLY OPEN	VADI	VISUAL APPROACH DESCENT INDICATOR	10. HIGH VOLTAGE
		👯 🎇	(MFRD BY ADB)	NTS	NOT TO SCALE	VASI	VISUAL APPROACH SLOPE INDICATOR	SERIES CIRCUITS VOLTS) AND LOW
				OHE	OVERHEAD ELECTRIC	VOR	VERY HIGH FREQUENCY	BELOW) SHALL N
			L-830 SERIES ISOLATION TRANSFORMER		OVERLOAD		OMNIDIRECTIONAL RANGE FACILITY	CONDUIT, DUCT HANDHOLE.
				OL		WC	WIND CONE	

Ŋ

MENT SHALL BE INSTALLED IN PA 70 - NATIONAL ELECTRICAL CODE SSUE IN FORCE, THE RESPECTIVE RER'S DIRECTIONS AND ALL OTHER DES, LAWS, ORDINANCES, AND ANY INSTALLATIONS WHICH VOID INTERTEK TESTING SERVICES G (OR OTHER THIRD PARTY LISTING) RER'S WARRANTY OF A DEVICE WILL

EST NEC IN FORCE ON SITE AT ALL TION FOR USE AS A REFERENCE.

JTAGES, AND/OR SHUT DOWN OF ALL BE COORDINATED WITH THE E SHUT DOWN, THE CIRCUITS SHALL PREVENT ACCIDENTAL ENERGIZING IRCUITS. ALL PERSONNEL SHALL IENT OF LABOR OCCUPATIONAL STRATION (OSHA) 29 CFR PART 1910 & HEALTH STANDARDS FOR LOCKOUT/TAGOUT PROCEDURES ITED TO, 29 CFR SECTION 1910.147 OUS ENERGY (LOCKOUT/TAGOUT).

FIGHT FLEXIBLE METAL CONDUIT UL ANT, & SUITABLE FOR GROUNDING. METAL CONDUIT AND ASSOCIATED STED TO MEET THE REQUIREMENTS HT FLEXIBLE METAL CONDUIT THAT TY (INCLUDING CONNECTIONS TO S) SHALL REQUIRE AN EXTERNAL NTERNAL EQUIPMENT GROUNDING 0.60. EXTERNAL BONDING JUMPERS ATIONS SHALL BE #6 AWG COPPER ALL LTFMC THAT IS NOT UL LISTED. RS THE UL LABEL PRIOR TO

SHALL COLOR CODE PHASE AND NSULATION FOR NO. 6 AWG OR LORED INSULATION OR COLORED E AND NEUTRAL CONDUCTORS FOR INSULATED GROUND CONDUCTORS COLORED INSULATION FOR ALL OR KCMIL TO COMPLY WITH NEC NDUCTORS SHALL HAVE WHITE OR NO. 6 AWG AND SMALLER TO OF NEC 200.6. STANDARD COLORS BRANCH CIRCUITS SHALL BE AS

PLANS FOR SITE LEGEND

A 4, 4X SHALL HAVE WATERTIGHT ANCES UL LISTED NEMA 4, 4X FOR SURE, TO MAINTAIN THE NEMA 4, 4X

CTRICAL CONTRACTORS SHALL WORK ON THIS PROJECT. NEC SON AS "ONE WHO HAS SKILLS AND TO THE CONSTRUCTION AND ELECTRICAL EQUIPMENT AND RECEIVED SAFETY TRAINING TO HE HAZARDS INVOLVED."

SOURCES FOR EACH PANEL, IGHT, SIGN, NAVAID, OR OTHER RIFIED PRIOR TO WORKING ON, NG, DISCONNECTING, AND/OR TIVE DEVICES. SHUT OFF, LOCKOUT, CTION OF PERSONNEL.

(AIRFIELD LIGHTING 5000 VOLT THER CIRCUITS RATED ABOVE 600 E CIRCUITS (RATED 600 VOLTS AND NSTALLED IN THE SAME WIREWAY, WAY, JUNCTION STRUCTURE OR



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REPLACE TAXIWAY AIRFIELD LIGHTING

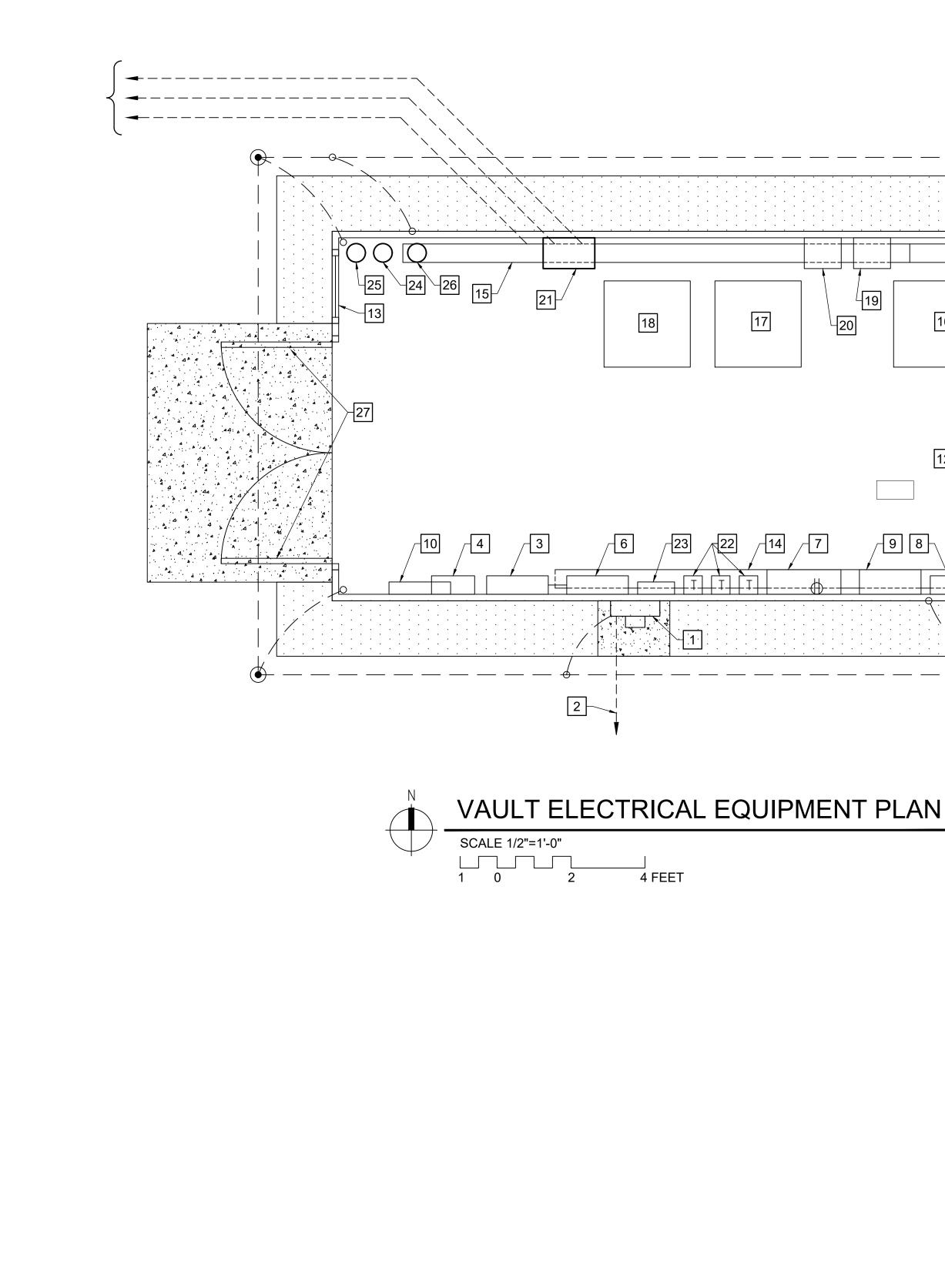
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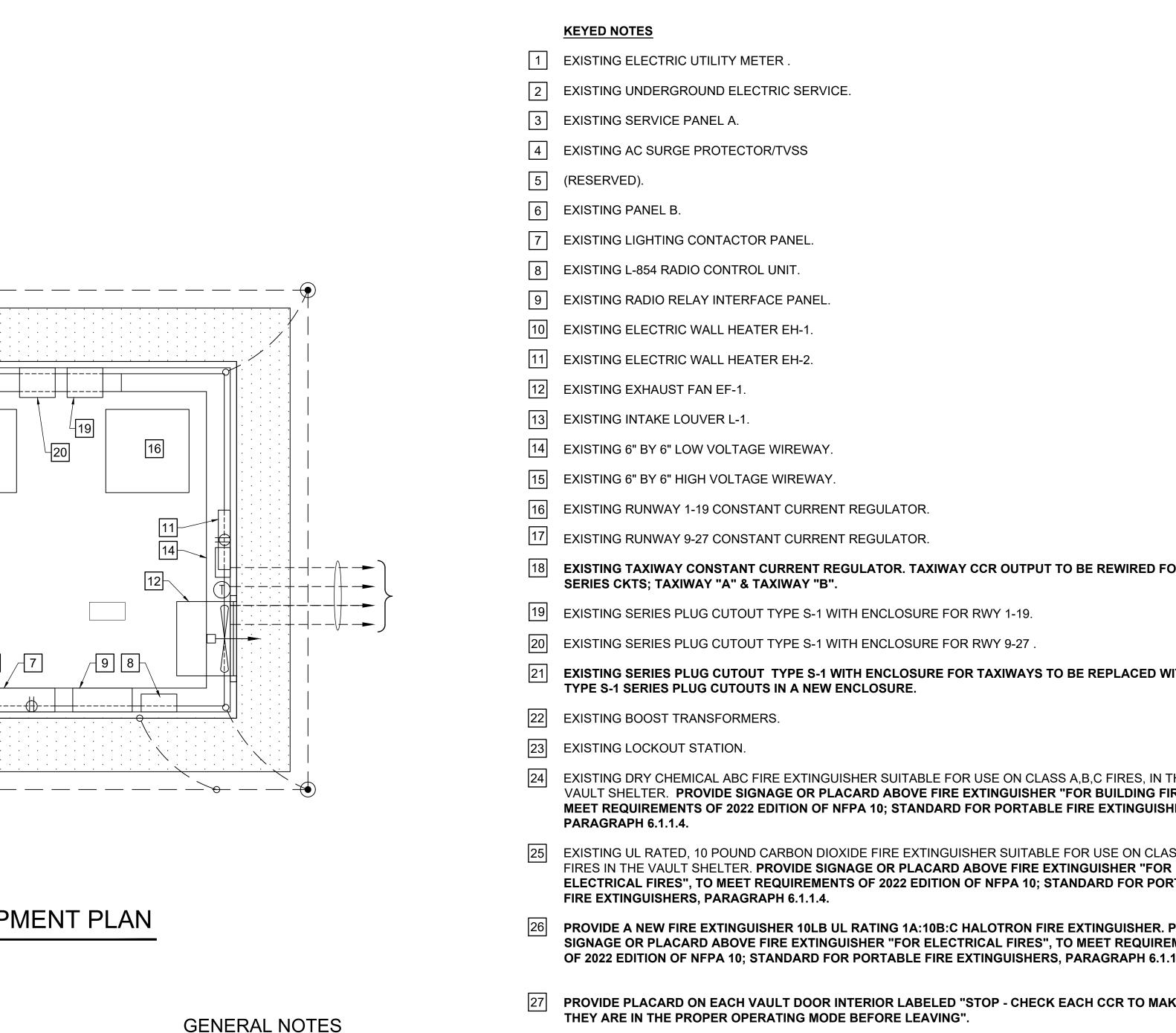
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	DRAWN BY: CWS 7/26/2024				
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ELECTRICAL LEGEND AND ABBREVATIONS



024 23A



- 1. CONTRACTOR SHALL COORDINATE WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS WITH THE AIRPORT DIRECTOR/MANAGER AND THE RESIDENT PROJECT REPRESENTATIVE. AND SHUTDOWN OF EXISTING SYSTEMS SHALL BE SCHEDULED WITH AND APPROVED BY THE AIRPORT MANAGER PRIOR TO SHUTDOWN. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY AND HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT). FAILURE TO SHUT DOWN AND LOCKOUT THE RESPECTIVE CIRCUIT(S) PRESENTS A DANGEROUS HAZARD FOR PERSONNEL WORKING ON THE SYSTEM.
- 2. THE RESPECTIVE PERSONNEL PERFORMING AIRFIELD LIGHTING WORK, VAULT WORK, AND/OR TESTS SHALL BE FAMILIAR WITH AND QUALIFIED TO WORK ON 5000 VOLT AIRFIELD LIGHTING SERIES CIRCUITS, CONSTANT CURRENT REGULATORS, AND ASSOCIATED AIRPORT ELECTRICAL VAULT EQUIPMENT. ONLY QUALIFIED ELECTRICAL CONTRACTORS SHALL PERFORM ELECTRICAL WORK ON THIS PROJECT. NEC DEFINES A QUALIFIED PERSON AS FOLLOWS; "ONE WHO HAS SKILLS AND KNOWLEDGE RELATED TO THE CONSTRUCTION AND OPERATION OF THE ELECTRICAL EQUIPMENT AND INSTALLATIONS AND HAS RECEIVED SAFETY TRAINING TO RECOGNIZE AND AVOID THE HAZARDS INVOLVED".
- 3. CONTRACTOR SHALL EXAMINE THE SITE TO CONFIRM AND FIELD VERIFY EXISTING SITE CONDITIONS.
- 4. CONTRACTOR SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF NFPA 70E STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE.
- 5. EACH ACTIVE CCR SERVING THE RESPECTIVE WORK AREAS OF THE PROJECT, SHALL BE TESTED FOR PROPER OPERATION BEFORE REMOVAL WORK, MODIFICATIONS, ADDITIONS AND/OR ANY OTHER WORK THAT MIGHT POSSIBLY AFFECT AIRFIELD LIGHTING CIRCUITS AND AGAIN AFTER THE AIRFIELD LIGHTING REPLACEMENTS AND VAULT ADDITIONS HAVE BEEN COMPLETED. CONTRACTOR SHALL TEST AND RECORD THE INPUT CURRENT AND OUTPUT CURRENT FOR EACH CONSTANT CURRENT REGULATOR IN THE AUTOMATIC AND MANUAL MODES OF OPERATION. CONTRACTOR SHALL REPORT CONCERNS AND/OR DEFICIENCIES TO THE PROJECT ENGINEER OF RECORD.

EXISTING TAXIWAY CONSTANT CURRENT REGULATOR. TAXIWAY CCR OUTPUT TO BE REWIRED FOR TWO

EXISTING SERIES PLUG CUTOUT TYPE S-1 WITH ENCLOSURE FOR TAXIWAYS TO BE REPLACED WITH TWO

EXISTING DRY CHEMICAL ABC FIRE EXTINGUISHER SUITABLE FOR USE ON CLASS A,B,C FIRES, IN THE VAULT SHELTER. PROVIDE SIGNAGE OR PLACARD ABOVE FIRE EXTINGUISHER "FOR BUILDING FIRES", TO MEET REQUIREMENTS OF 2022 EDITION OF NFPA 10; STANDARD FOR PORTABLE FIRE EXTINGUISHERS,

EXISTING UL RATED, 10 POUND CARBON DIOXIDE FIRE EXTINGUISHER SUITABLE FOR USE ON CLASS C ELECTRICAL FIRES", TO MEET REQUIREMENTS OF 2022 EDITION OF NFPA 10; STANDARD FOR PORTABLE

PROVIDE A NEW FIRE EXTINGUISHER 10LB UL RATING 1A:10B:C HALOTRON FIRE EXTINGUISHER. PROVIDE SIGNAGE OR PLACARD ABOVE FIRE EXTINGUISHER "FOR ELECTRICAL FIRES", TO MEET REQUIREMENTS OF 2022 EDITION OF NFPA 10; STANDARD FOR PORTABLE FIRE EXTINGUISHERS, PARAGRAPH 6.1.1.4.

PROVIDE PLACARD ON EACH VAULT DOOR INTERIOR LABELED "STOP - CHECK EACH CCR TO MAKE SURE





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REPLACE TAXIWAY AIRFIELD LIGHTING

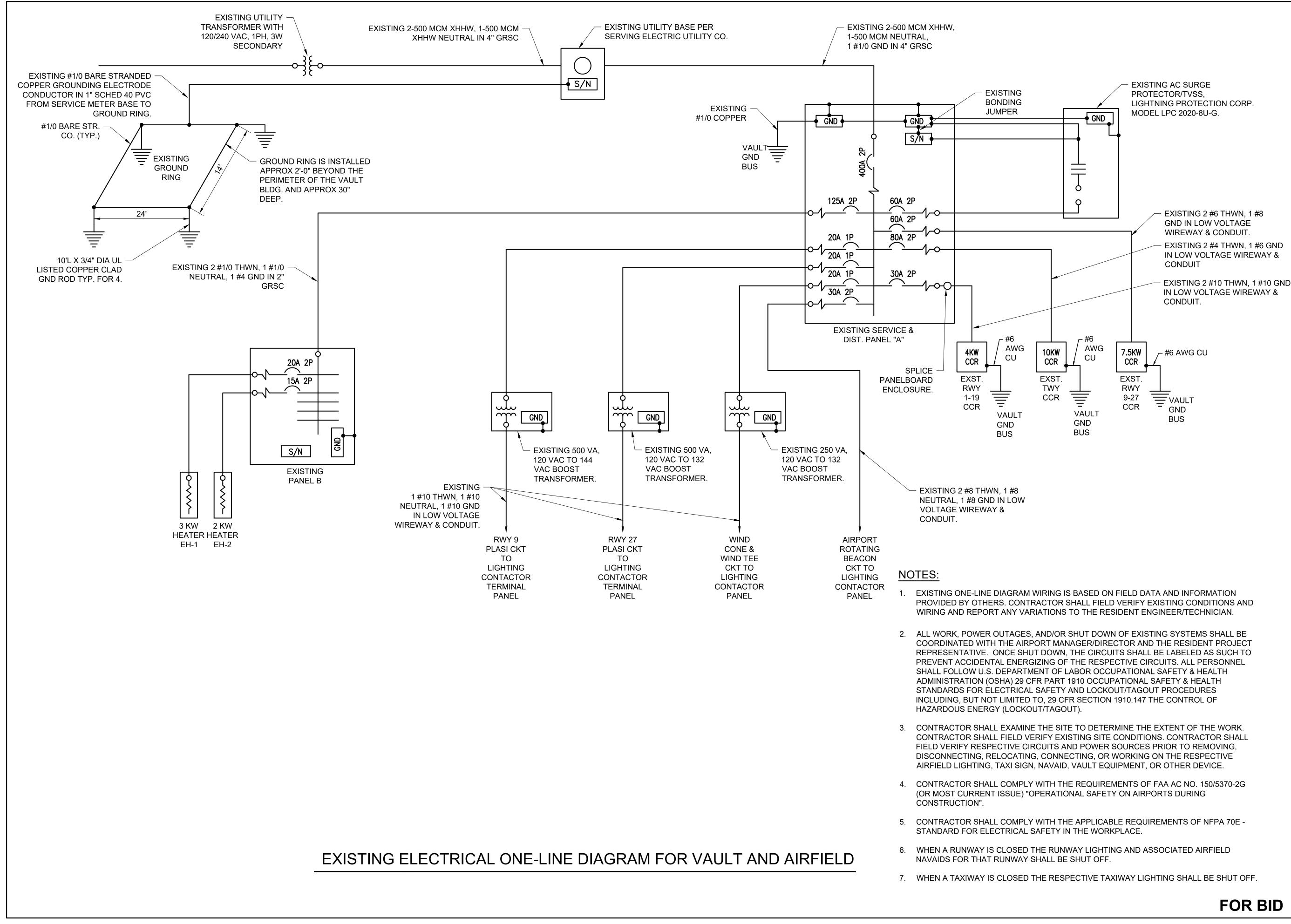
IDA No: EZI-4939

SBGP No: 3-17-SBGP-TBD

Contract No.: KE020

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CAD FIL	CAD FILE: E-101.DWG				
DESIGN	DESIGN BY: KNL 7/3/2024				
DRAWN BY: CWS 8/22/2024					
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AIRPORT ELECTRICAL VAULT EQUIPMENT PLAN



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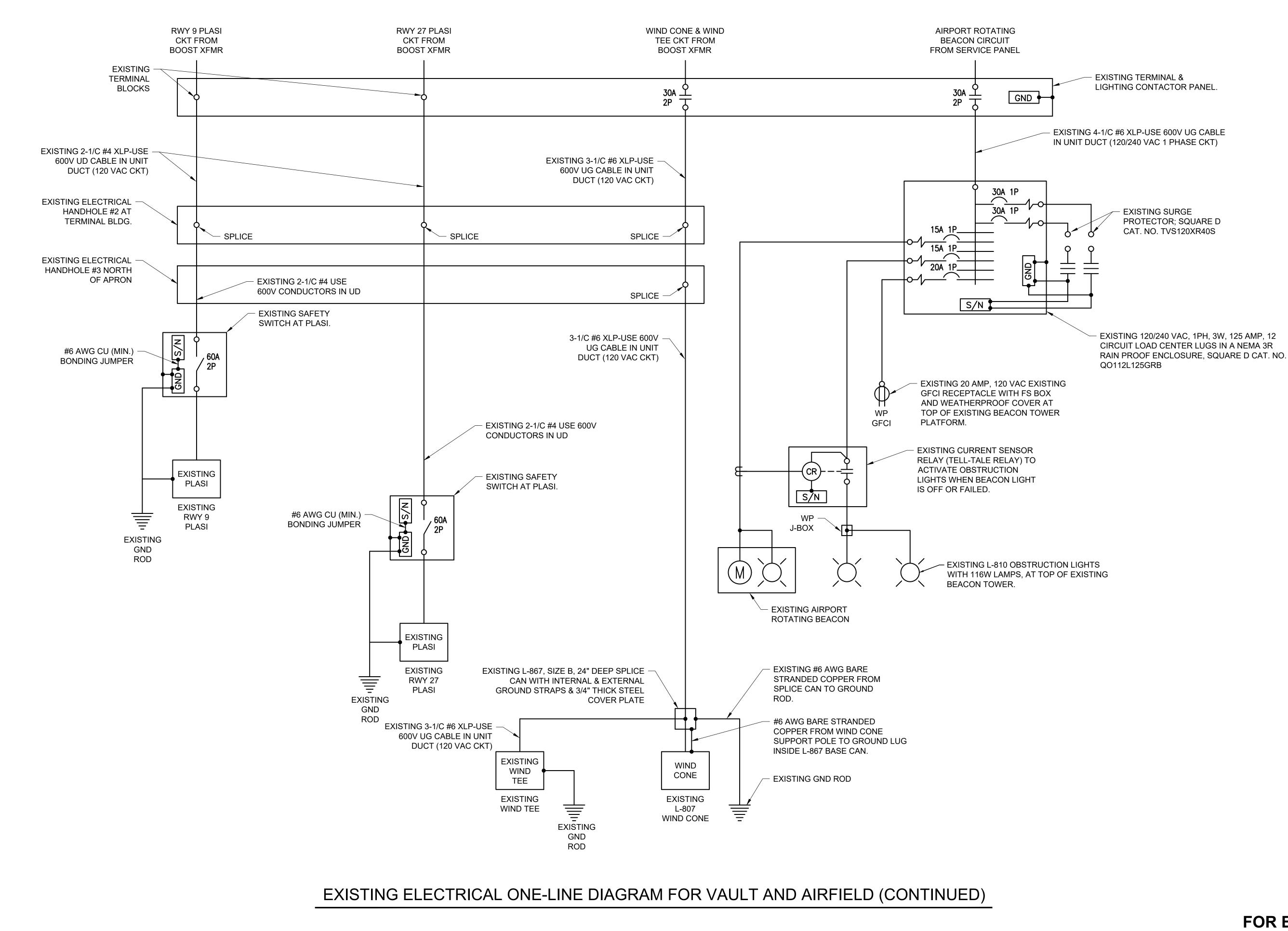
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EXISTING ONE-LINE DIAGRAM FOR VAULT AND AIRFIELD



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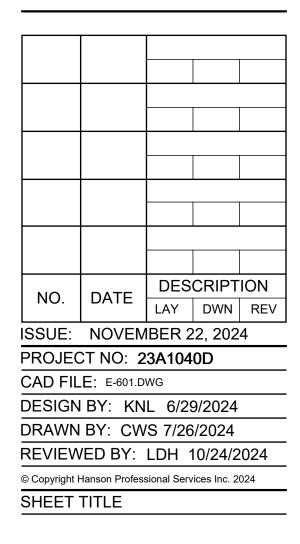
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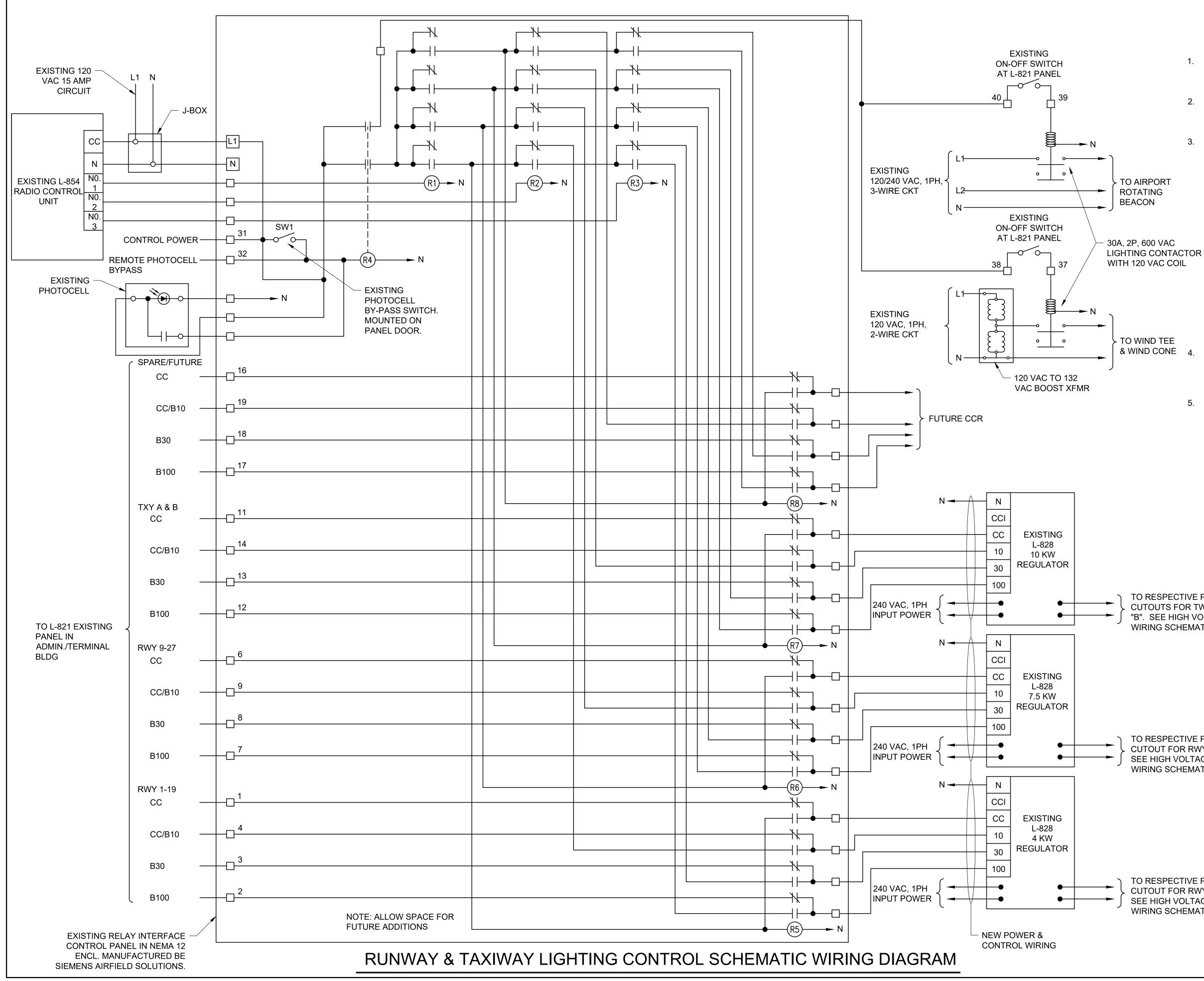
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EXISTING ONE-LINE DIAGRAM FOR VAULT AND AIRFIELD (CONTINUED)



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<u>NOTES</u>

- AIRFIELD LIGHTING CONTROL 1 SCHEMATIC IS PROVIDED FOR REFERENCE.
- 2 RELAY INTERFACE CONTROL PANEL IS EXISTING AND WAS MANUFACTURED BY SIEMENS AIRFIELD SOLUTIONS.
- THE RUNWAY/TAXIWAY CIRCUITS ARE **BE CONTROLLED BY PHOTOCELL & THE** L-854 RADIO CONTROL UNIT IN THE FOLLOWING MANNER: PHOTOCELL OR PHOTOCELL BYPASS SHALL ACTIVATE RADIO CONTROL OR MANUAL CONTROL REMOTE MANUAL CONTROL FOR INDIVIDUAL CCR'S SHALL BE ACTIVATED BY THE L-821 PANEL AT THE TERMINAL BUILDING. MANUAL CONTROL SHALL ALLOW PRE-SET LIGHTING LEVELS AT 10%, 30%, OR 100% BRIGHTNESS.
- RADIO CONTROL SHALL OVER-RIDE MANUAL CONTROL SETTINGS. RADIO CONTROL SETTINGS SHALL BE AS FOLLOWS: 3 CLICKS - 10% BRIGHTNESS 5 CLICKS - 30% BRIGHTNESS 7 CLICKS - 100% BRIGHTNESS
- TO WIND TEE & WIND CONE 4
 - EQUIPMENT GROUND WIRES ARE **REQUIRED FOR CCR INPUT POWER,** CCR CONTROL WIRING, AND CCR OUTPUT WIRING TO CUTOUTS.
 - 5 "N" DENOTES NEUTRAL FOR **RESPECTIVE BRANCH CIRCUIT** OR CONTROL CIRCUIT.

TO RESPECTIVE PLUG CUTOUTS FOR TWY "A" & "B". SEE HIGH VOLTAGE WIRING SCHEMATIC.

TO RESPECTIVE PLUG CUTOUT FOR RWY 9-27. SEE HIGH VOLTAGE WIRING SCHEMATIC.

TO RESPECTIVE PLUG CUTOUT FOR RWY 1-19. SEE HIGH VOLTAGE WIRING SCHEMATIC.



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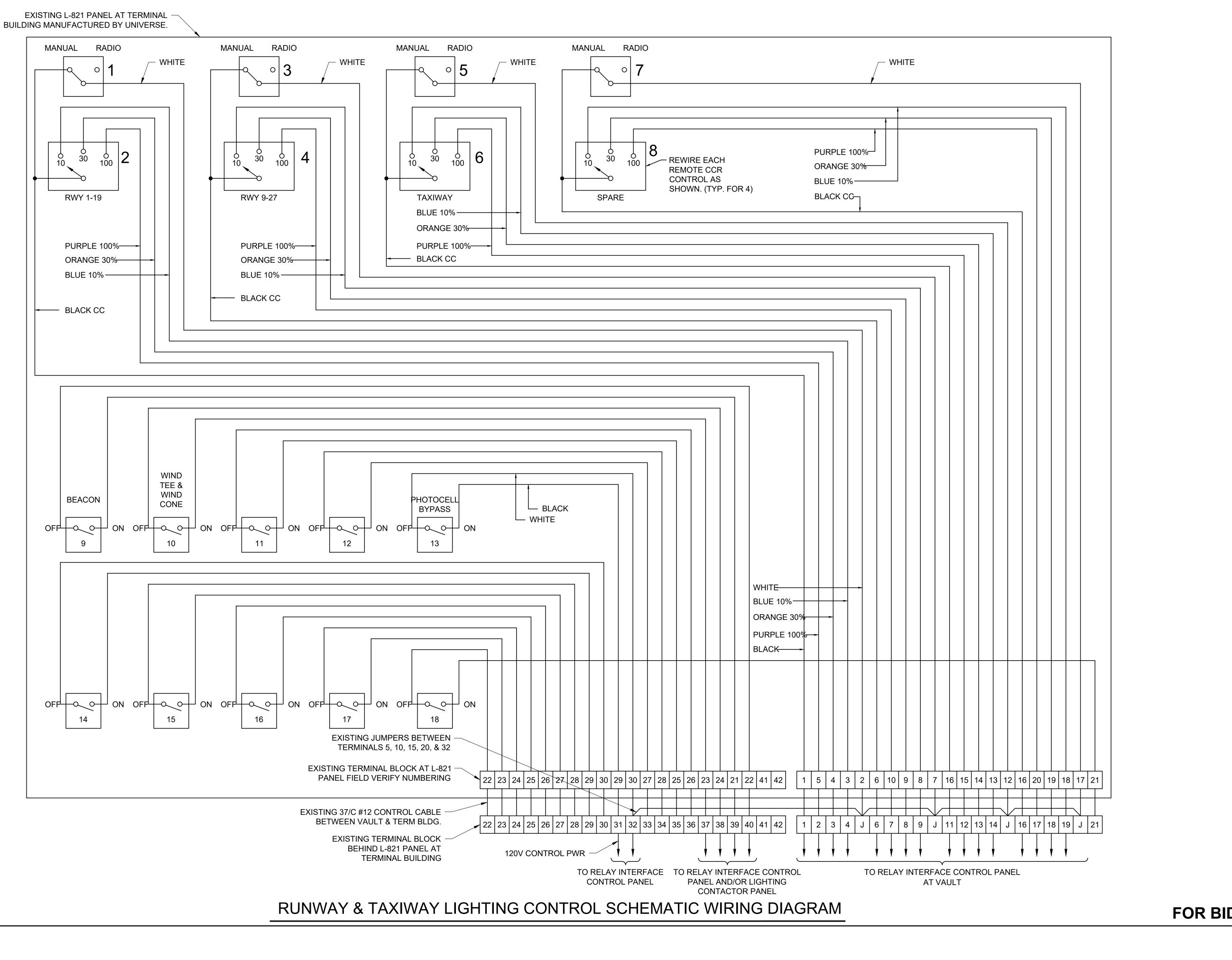
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AIRFIELD LIGHTING CONTROL SCHEMATIC



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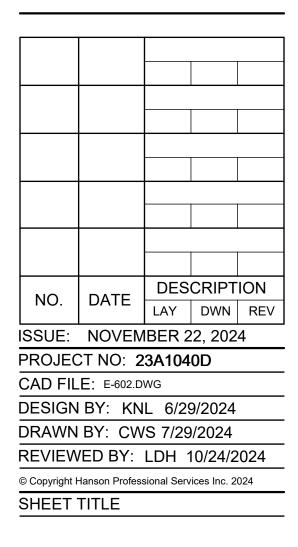
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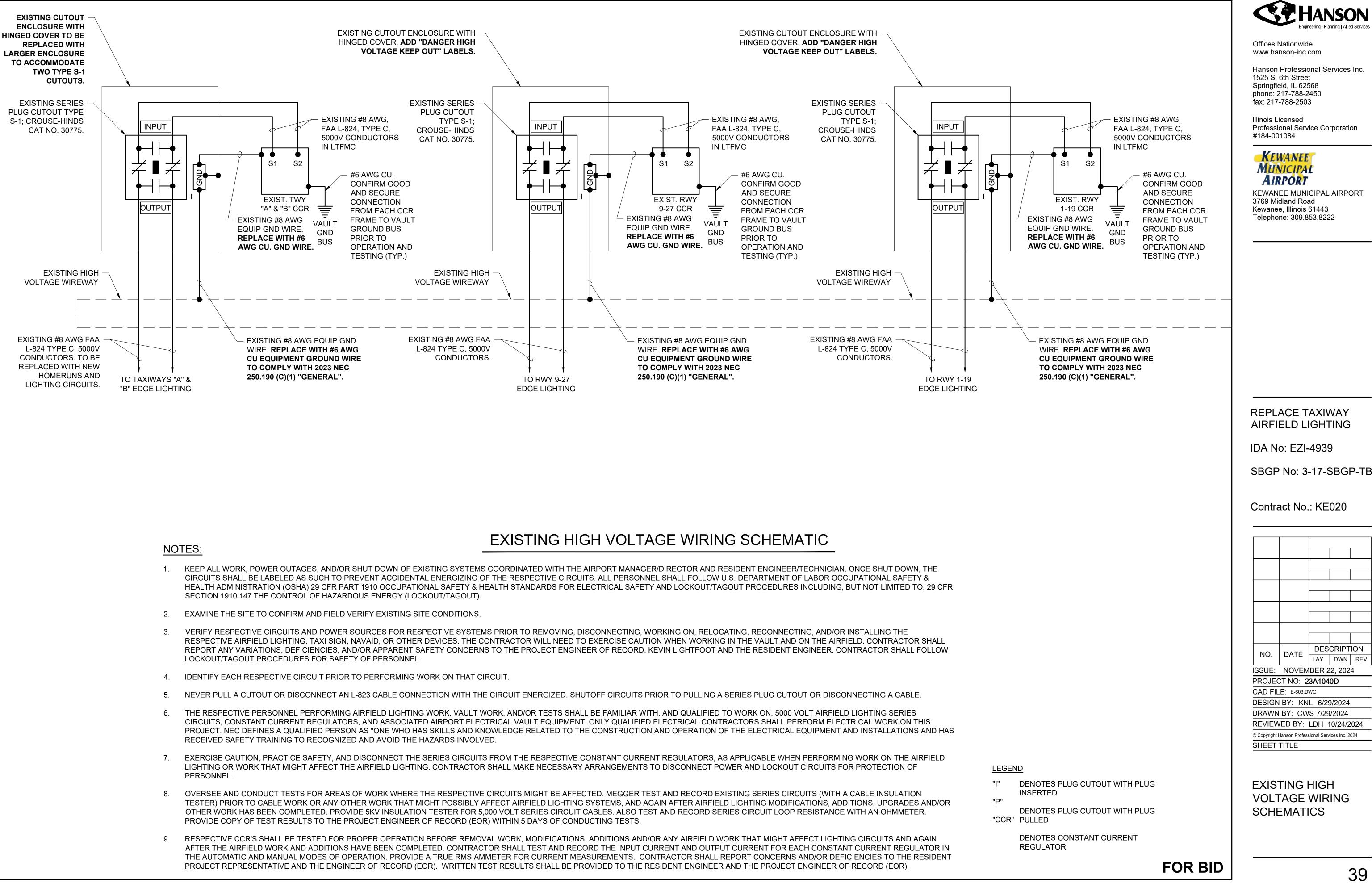
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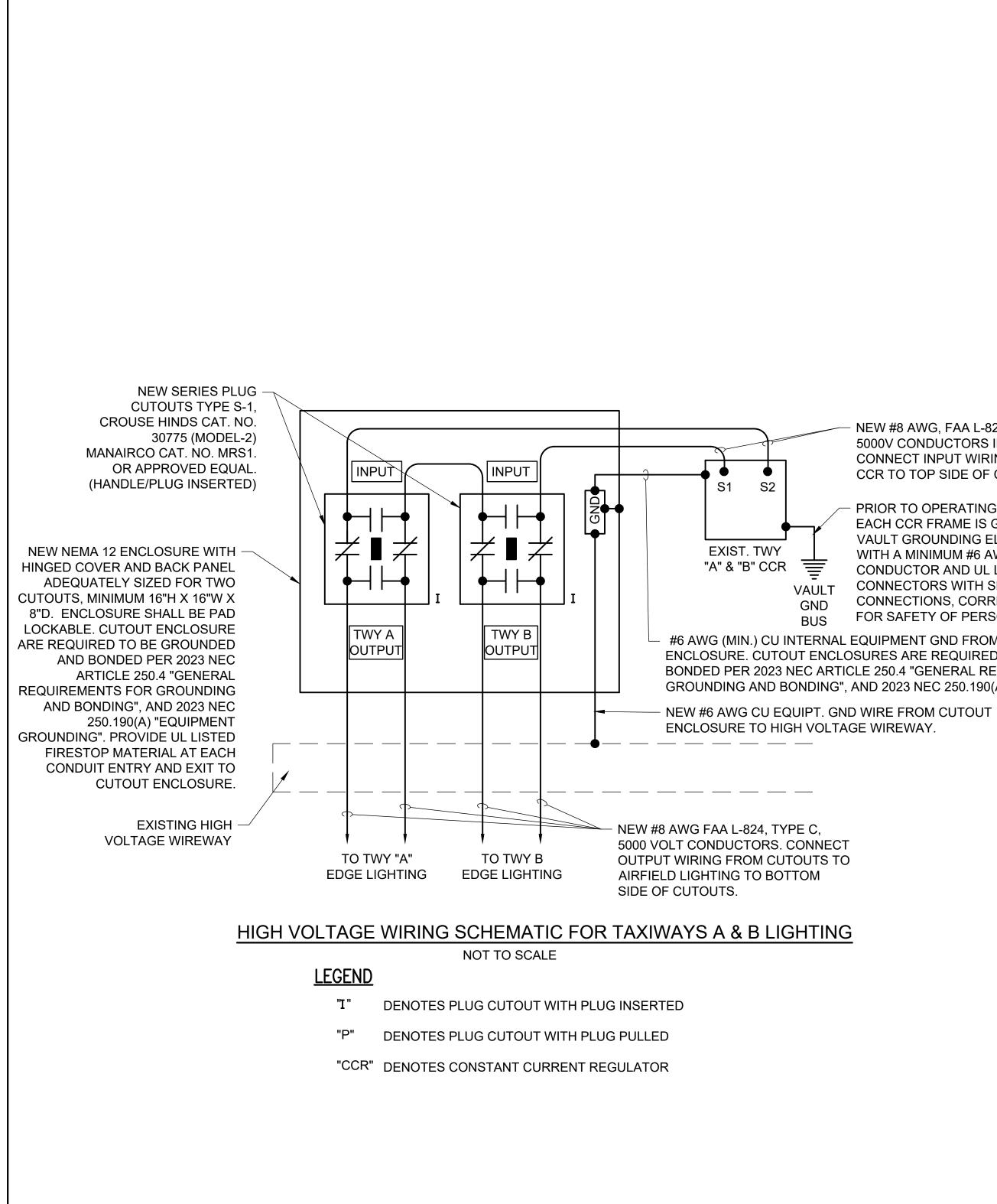


AIRFIELD LIGHTING CONTROL SCHEMATIC (CONTINUED)





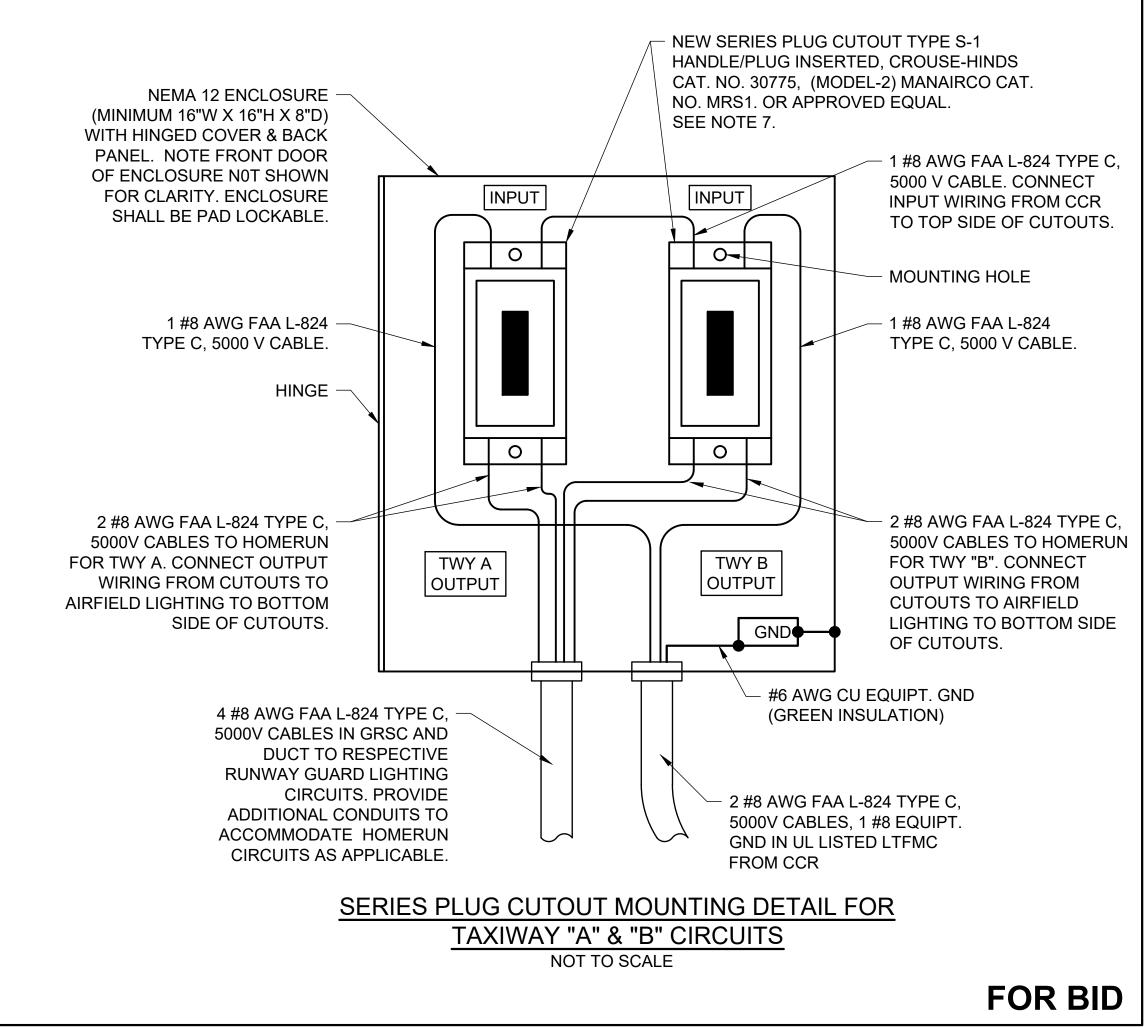
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NOTES

- PROVIDE PHENOLIC ENGRAVED LEGEND PLATES FOR EACH CONSTANT CURRENT REGULATOR NOTING THE REGULATOR DESIGNATION AND THE RUNWAY AND/OR TAXIWAY SERVED
- 2. EACH PLUG CUTOUT CABINET SHALL BE FURNISHED WITH A PHENOLIC ENGRAVED LEGEND PLATE THAT IDENTIFIES THE RESPECTIVE CIRCUIT OR REGULATOR. INCLUDE AN ADDITIONAL LEGEND PLATE LABELED "CAUTION OPERATE CUTOUTS WITH CCR SHUT OFF". FURNISH & INSTALL A WARNING LABEL FOR CUTOUT ENCLOSURE TO WARN PERSONS OF POTENTIAL ARC FLASH HAZARDS. PER THE REQUIREMENTS OF NEC 110.16 "ARC-FLASH HAZARD WARNING".
- PROVIDE PHENOLIC ENGRAVED LEGEND PLATES FOR EACH CUTOUT TO IDENTIFY THE RESPECTIVE CUTOUT INPUT 3. CONNECTION AND THE RESPECTIVE CUTOUT OUTPUT CONNECTION.
- BOND EACH REGULATOR FRAME TO VAULT GROUND BUS WITH A DEDICATED #6 AWG COPPER BONDING JUMPER. 4.
- 5. PROVIDE ADEQUATE WORKING SPACE IN FRONT OF EACH CUTOUT ENCLOSURE TO MEET NEC CLEARANCE REQUIREMENTS.
- LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE U.L. LISTED TO MEET THE 6. REQUIREMENTS OF NEC 350.6, SUITABLE FOR GROUNDING AND SUNLIGHT RESISTANT. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO CCR'S & TRANSFORMERS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. EXTERNAL BONDING JUMPERS USED WITH CCR INSTALLATIONS SHALL BE #6 AWG COPPER (MINIMUM). DO NOT INSTALL LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS NOT UL LISTED. CONFIRM LIQUID TIGHT FLEXIBLE METAL CONDUIT BEARS THE UL LABEL PRIOR TO INSTALLING IT.
- 7. SERIES PLUG CUTOUTS SHALL BE TYPE S-1, RATED 5000 VOLTS, 20-AMP. SERIES PLUG CUTOUTS SHALL BE RATED SUITABLE FOR NORMAL OPERATION WITH HANDLE REMOVED OR HANDLE INSERTED. CUTOUTS SHALL DISCONNECT THE INPUT FROM THE OUTPUT, SHORT THE INPUT TERMINALS, AND SHORT THE OUTPUT TERMINALS WHEN THE HANDLE/PLUG IS REMOVED. SERIES PLUG CUTOUTS FOR TAXIWY A AND TAXIWAY B LIGHTING CIRCUITS SHALL BE WIRED TO POWER TWO SEPARATE SERIES LIGHTING CIRCUITS FROM ONE CCR. SERIES CIRCUIT PLUG CUTOUTS SHALL BE SUITABLE FOR NORMAL OPERATION WITH HANDLE PLUG REMOVED TO ACCOMMODATE OPERATING ONE TWY LTG CKT WHILE THE OTHER TWY LTG CKT IS OFF. SERIES PLUG CUTOUTS SHALL BE CROUSE-HINDS CAT. NO. 30775, MANAIRCO CAT. NO. MRS1, HUGHEY & PHILLIPS CAT. NO. MRS1 OR APPROVED EQUAL. THE RESPECTIVE MANUFACTURER SHALL CERTIFY IN WRITING THAT THEIR CUTOUT IS SUITABLE AND RATED FOR THE RESPECTIVE APPLICATION.
- MAINTAIN SEPARATION OF HIGH VOLTAGE WIRING (AIRFIELD LIGHTING 5000 VOLT SERIES CIRCUITS AND/OR OTHER CIRCUITS RATED ABOVE 600 VOLTS) FROM LOW VOLTAGE WIRING (RATED 600 VOLTS AND BELOW) 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.
- 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.



NEW #8 AWG, FAA L-824, TYPE C, 5000V CONDUCTORS IN LTFMC. CONNECT INPUT WIRING FROM CCR TO TOP SIDE OF CUTOUTS.

PRIOR TO OPERATING EACH CCR, CONFIRM EACH CCR FRAME IS GROUNDED TO THE VAULT GROUNDING ELECTRODE SYSTEM WITH A MINIMUM #6 AWG COPPER CONDUCTOR AND UL LISTED GROUNDING CONNECTORS WITH SECURE AND TIGHT CONNECTIONS, CORRECT WHERE MISSING FOR SAFETY OF PERSONNEL.

#6 AWG (MIN.) CU INTERNAL EQUIPMENT GND FROM CCR TO CUTOUT ENCLOSURE. CUTOUT ENCLOSURES ARE REQUIRED TO BE GROUNDED AND BONDED PER 2023 NEC ARTICLE 250.4 "GENERAL REQUIREMENTS FOR GROUNDING AND BONDING", AND 2023 NEC 250.190(A) "EQUIPMENT GROUNDING".



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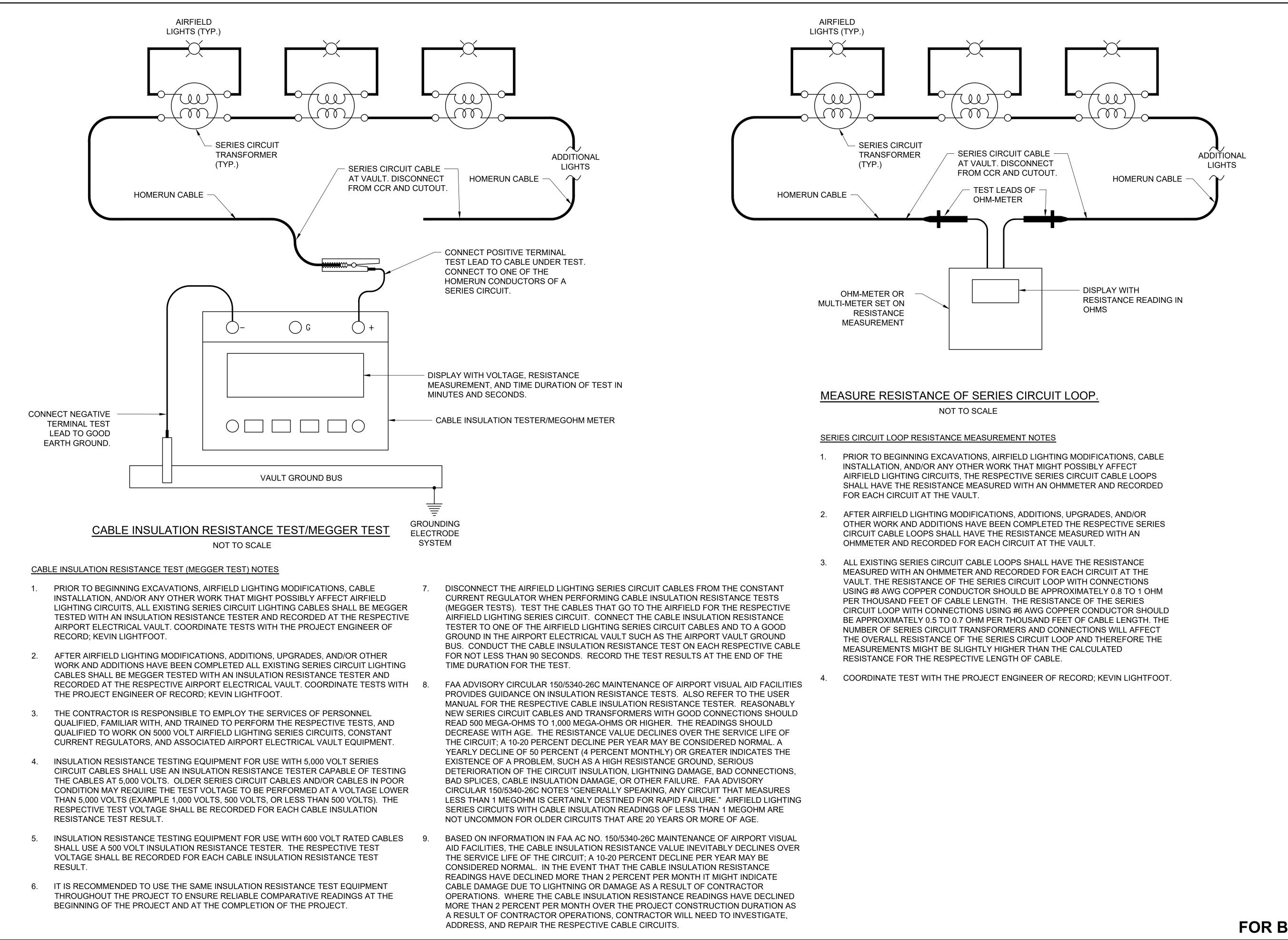
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PROPOSED HIGH VOLTAGE WIRING SCHEMATIC - TWY A & B





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SERIES CIRCUIT CABLE TESTING DETAILS

LEGEND PLATE SCHEDULE				
DEVICE	LABEL			
TAXIWAYS A & B LIGHTS CCR	TWY A & TWY B CCR			
CUTOUT ENCLOSURE FOR TAXIWAYS A & B LIGHTS CCR	TWY A & TWY B CUTOUTS			
TAXIWAYS A & B CUTOUT ENCLOSURE	CAUTION OPERATE CUTOUTS WITH CCR SHUT OFF			
CUTOUTS INPUT TOP SIDE CONNECTIONS (PROVIDE 2 LEGEND PLATES)	INPUT			
TWY A LIGHTS CUTOUT OUTPUT BOTTOM SIDE CONNECTION	TWY A OUTPUT			
TWY B LIGHTS CUTOUT OUTPUT BOTTOM SIDE CONNECTION	TWY B OUTPUT			
TOP OF CCR FOR TAXIWAYS A & B	KEEP CLEAR DO NO STORE MATERIALS ON TOP OF CCR			
TOP OF CCR FOR RWY 9-27	KEEP CLEAR DO NO STORE MATERIALS ON TOP OF CCR			
TOP OF CCR FO RWY 1-19	KEEP CLEAR DO NO STORE MATERIALS ON TOP OF CCR			



"DANGER - HIGH VOLTAGE UNAUTHORIZED PERSONNEL KEEP OUT" SIGN

NOT TO SCALE

PROVIDE WEATHERPROOF WARNING SIGN FOR EACH DOOR TO AIRPORT ELECTRICAL VAULT LABELED "DANGER - HIGH VOLTAGE UNAUTHORIZED PERSONNEL KEEP OUT" PER THE REQUIREMENTS OF NEC 110.34 (C). SIGN SHALL BE APPROXIMATELY 10"H X 14"W OR 14" H X 20" W. NEW SIGNS SHALL REPLACE EXISTING SIGNS ON VAULT DOORS

NOTES:

- HAZARD WARNING".
- MANUFACTURER.

STOP

CHECK EACH CCR TO MAKE SURE IT IS IN THE **PROPER MODE OF OPERATION BEFORE LEAVING** THE VAULT

CCR CHECK SIGN

NOT TO SCALE PROVIDE ONE SIGN FOR EACH INTERIOR DOOR AT THE VAULT.

"DANGER HIGH VOLTAGE KEEP OUT" LABELS, MARKINGS, AND/OR SIGNS ARE REQUIRED FOR EQUIPMENT RATED OVER 1000 VOLTS AC IN ACCORDANCE WITH THE FOLLOWING:

- 2020/2023 NEC 110.34(C) "LOCKED ROOMS OR ENCLOSURES". 2020 NEC 300.45 "DANGER SIGNS".
- 2023 NEC 305.12 "DANGER SIGNS".
- 2020/2023 NEC 314.72(E) "SUITABLE COVERS".
- 2020 NEC 490.35 (A) "HIGH-VOLTAGE EQUIPMENT".
- 2023 NEC 495.35 (A) "HIGH-VOLTAGE EQUIPMENT".
- AC 150/5340-26C "MAINTENANCE OF AIRPORT VISUAL AID FACILITIES".



"DANGER - HIGH VOLTAGE KEEP OUT" SIGN

NOT TO SCALE

FURNISH AND INSTALL "DANGER - HIGH VOLTAGE KEEP OUT" LABELS/SIGNS FOR HIGH VOLTAGE SECTION OF CONSTANT CURRENT REGULATORS, SERIES CIRCUIT DISCONNECT/CUTOUT ENCLOSURES, HIGH VOLTAGE WIREWAYS, AND HIGH VOLTAGE PULL BOXES. LABELS SHALL BE MINIMUM 3.5"H X 5" W.

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 "ARC-FLASH

3. FURNISH AND INSTALL A 10LB UL RATING 1A:10B:C HALOTRON FIRE EXTINGUISHER SUITABLE FOR USE ON CLASS A, B, C FIRES, IN THE VAULT SHELTER. INCLUDE WALL MOUNTING BRACKET. CONFIRM MODEL NUMBERS WITH THE RESPECTIVE FIRE EXTINGUISHER

4. PROVIDE PLACARD/SIGN FOR HALOTRON FIRE EXTINGUISHER "FOR ELECTRICAL FIRES" WITH ARROW POINTING TO EXTINGUISHER.

5. PROVIDE PLACARD/SIGN FOR CARBON DIOXIDE FIRE EXTINGUISHER "FOR ELECTRICAL FIRES" WITH ARROW POINTING TO EXTINGUISHER.

6. PROVIDE PLACARD/SIGN FOR ABC DRY CHEMICAL FIRE EXTINGUISHER "FOR BUILDING FIRES" WITH ARROW POINTING TO FIRE EXTINGUISHER.



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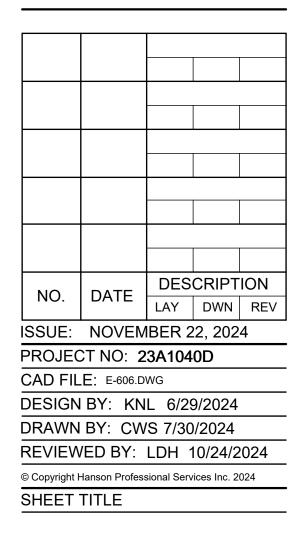
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LEGEND PLATE SCHEDULES