

CONSTRUCTION PLANS - ISSUED SEPTEMBER 21, 2018

**APRON EXPANSION AND  
RELOCATE/UPGRADE FUEL FACILITY**

BOARD OF EDGAR COUNTY  
EDGAR COUNTY AIRPORT (PRG)  
PARIS, EDGAR COUNTY, ILLINOIS

IDA PROJECT NO. PRG-4144

SBG PROJECT NO.  
3-17-SBGP-99/105/111/120/133

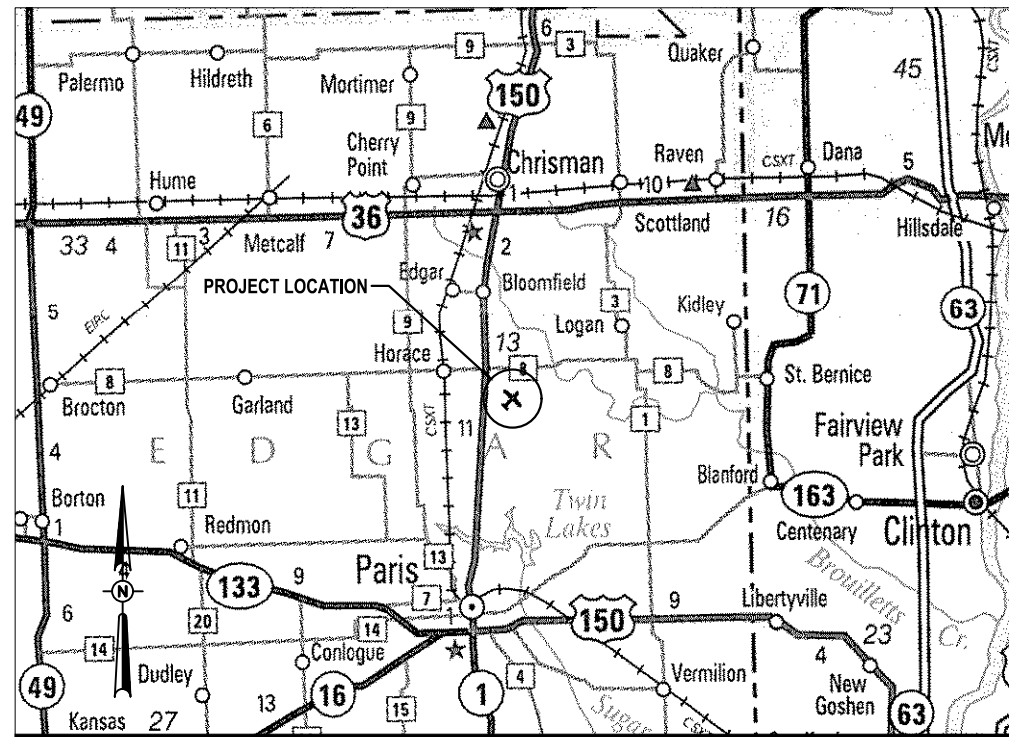
SCOPE OF WORK:

THIS PROJECT CONSISTS OF THE EXPANSION OF THE AIRCRAFT APRON, CONSTRUCTION OF A NEW FUELING FACILITY, INCLUDING THE RELOCATION OF ONE EXISTING FUEL TANK. THE PROJECT INCLUDES PAVEMENT REMOVAL AND PLACEMENT, EARTHWORK GRADING AND DRAINAGE, INSTALLATION OF AIRFIELD LIGHTING ITEMS, PAVEMENT MARKING AND EROSION CONTROL ITEMS.

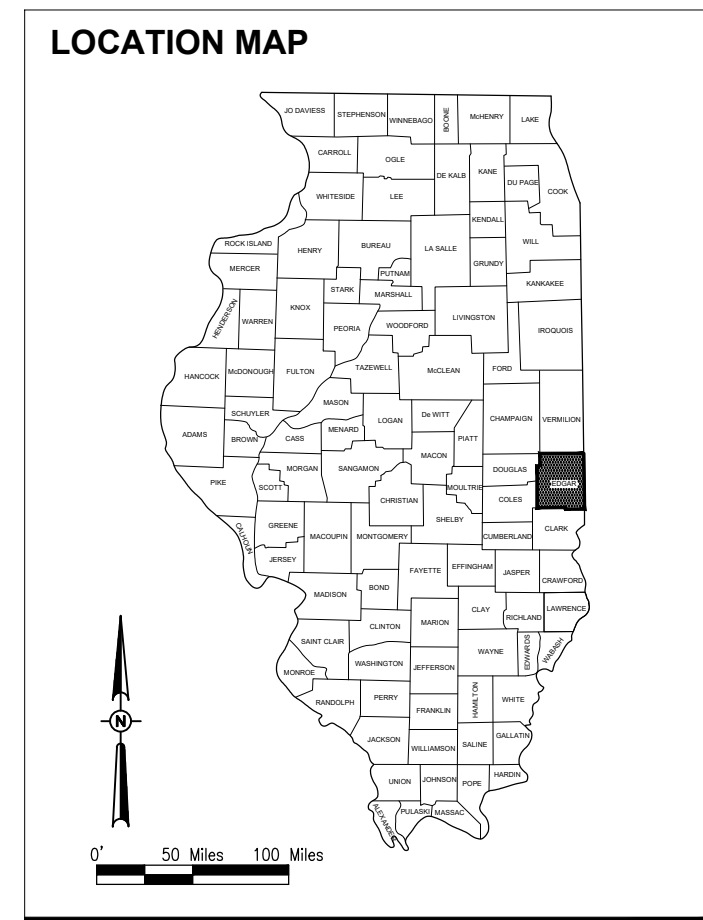
NOTICE TO CONTRACTORS AND BIDDERS

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.

VICINITY MAP



LOCATION MAP



No.	Issue/Description	Sheets Changed	Date	By

COVERING ELECTRICAL DESIGN

EXPIRES: 11-30-2019

*Kevin Lightfoot*

Kevin N. Lightfoot, P.E.  
Electrical Engineer

9-14-2018

HANSON PROFESSIONAL SERVICES INC.  
1525 S 6th St.  
Springfield, Illinois 62703  
Telephone: 217-788-2450  
Fax: 217-788-2503

EXP 11/30/19

*Barry S. Stolz* 9/20/18

Barry S. Stolz, P.E.  
Project Manager/Civil Engineer

Edgar County Airport  
Board of Edgar County  
15551 Airport Rd.  
Paris, IL 61944-8474  
Telephone: 217.465.4151

*[Signature]* 9-16-18

Date



**APRON EXPANSION  
AND RELOCATE/  
UPGRADE FUEL  
FACILITY**

IDA No: PRG-4144

Contract No. ED018

NO.	DATE	DESCRIPTION		
		LAY	DWN	REV

ISSUE: SEPTEMBER 21, 2018

PROJECT NO: 13A0062D

CAD FILE: G-002-FLP.DWG

LAYOUT BY: JRH 01/22/2016

DRAWN BY: JRH 01/22/2016

REVIEWED BY: BSS 08/17/2018

SHEET TITLE

**SUMMARY OF  
QUANTITIES AND  
INDEX TO SHEETS**

SUMMARY OF QUANTITIES				
ITEM NO.	DESCRIPTION	TOTAL QUANTITY	UNIT	AS-BUILT QUANTITY
AR108084	1/C #4 XLP-USE	1,340	L.F.	
AR108086	1/C #6 XLP-USE	760	L.F.	
AR108108	1/C #8 5 KV UG CABLE	1,300	L.F.	
AR108158	1/C #8 5 KV UG CABLE IN UD	110	L.F.	
AR110504	4-WAY CONCRETE ENCASED DUCT	620	L.F.	
AR110710	ELECTRICAL MANHOLE	4	EA.	
AR125415	MITL-BASE MOUNTED	2	EA.	
AR150510	ENGINEER'S FIELD OFFICE	1	L.S.	
AR150520	MOBILIZATION	1	L.S.	
AR150540	HAUL ROUTE	1	L.S.	
AR152410	UNCLASSIFIED EXCAVATION	545	C.Y.	
AR155540	BY-PRODUCT LIME	157	TON	
AR155616	SOIL PROCESSING-16"	4,325	S.Y.	
AR156510	SILT FENCE	183	L.F.	
AR156511	DITCH CHECK	5	EA.	
AR156530	TEMPORARY SEEDING	1.1	ACRE	
AR156531	EROSION CONTROL BLANKET	1,235	S.Y.	
AR209510	CRUSHED AGGREGATE BASE COURSE	1,016	TON	
AR501506	6" PCC PAVEMENT	4,325	S.Y.	
AR501530	PCC TEST BATCH	1	EA.	
AR620520	PAVEMENT MARKING-WATERBORNE	841	S.F.	
AR620525	PAVEMENT MARKING-BLACK BORDER	1,030	S.F.	
AR701900	REMOVE PIPE	93	L.F.	
AR705506	6" PERFORATED UNDERDRAIN	442	L.F.	
AR705546	6" NON PERFORATED UNDERDRAIN	327	L.F.	
AR705620	UNDERDRAIN END SECTION	1	EA.	
AR705640	UNDERDRAIN CLEANOUT	3	EA.	
AR751411	INLET-TYPE A	1	EA.	
AR751900	REMOVE INLET	1	EA.	
AR752900	REMOVE END SECTION	1	EA.	
AR800469	REMOVE BITUMINOUS & PCC PAVEMENT	707	S.Y.	
AR800494	CONSTRUCT FUELING FACILITY	1	L.S.	
AR800561	SITE WORK FOR FUELING FACILITY	1	L.S.	
AR800562	RELOCATE EXISTING FUEL TANK	1	L.S.	
AR800586	REMOVE EXISTING FUELING FACILITY	1	L.S.	
AR901510	SEEDING	1.1	ACRE	
AR908510	MULCHING	0.8	ACRE	

\*\* DENOTES A SPECIALTY ITEM

**GENERAL NOTES:**

**QUANTITIES**

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

**CERTIFIED PAYROLLS**

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

**MATERIAL CERTIFICATIONS**

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

EARTHWORK QUANTITY SUMMARY				
WORK AREA	CUT (CY)	FILL (CY)	FILL + 20% (CY)	NET (CY)
APRON EXPANSION	545**	349	419	126 (EXCESS)

\*\* USED TO CALCULATE AR152410 PAY ITEM QUANTITY

**NOTES:**

- EARTHWORK QUANTITIES (CUT/FILL VOLUMES) FOR THE "SURVEYED AREA VS. PROP. DESIGN" SHOWN ABOVE WERE CALCULATED UTILIZING AUTODESK CIVIL3D 2017 SOFTWARE THROUGH AUTOCAD. THE CALCULATION METHOD WAS BY A COMPARISON OF SURFACE MODELS CREATED WITH EXISTING SURVEY DATA AND PROPOSED DESIGN GRADES. THE VOLUMES WERE CALCULATED IN TWO PARTS: THE CUT/FILL VOLUME REQUIRED TO CORE OUT AND FILL FOR THE PROPOSED PAVEMENT SECTION AS COMPARED TO THE EXISTING SUBGRADE DATUM, AND THE CUT/FILL VOLUMES REQUIRED FOR PROPOSED GRADING WORK OUTSIDE OF THE PROPOSED PAVEMENT LIMITS AS COMPARED TO THE EXISTING GROUND SURFACE. THE NUMBERS IN THE SUMMARY TABLES ABOVE REPRESENT A TOTAL OF THESE TWO PARTS ADDED TOGETHER FOR CLARITY.
- IF THE CONTRACTOR DOES NOT AGREE TO THE QUANTITIES DERIVED IN THIS METHOD, THE CONTRACTOR MAY ELECT TO SURVEY THE EXISTING GRADES PRIOR TO BEGINNING EARTHWORK OPERATIONS AS PART OF THE PROJECT FOR THE ENGINEER TO REVIEW FOR A POTENTIAL ADJUSTMENT TO THE PAY ITEM QUANTITY. ANY COSTS ASSOCIATED WITH THE CONTRACTOR-PROVIDED SURVEY SHALL BE INCLUDED IN THE ORIGINAL BID AMOUNT, AND NO ADDITIONAL PAYMENT SHALL BE MADE.

INDEX TO SHEETS	
Sheet Number	Sheet Title
1	COVER SHEET
2	SUMMARY OF QUANTITIES AND INDEX TO SHEETS
3	SCOPE OF WORK
4	CONSTRUCTION SAFETY AND PHASING PLAN
5	CONSTRUCTION SAFETY AND PHASING DETAILS AND NOTES
6	PROPOSED CONSTRUCTION PLAN
7	PROPOSED DRAINAGE DETAILS
8	PROPOSED PLAN AND PROFILE
9	JOINTING PLAN
10	JOINTING DETAILS
11	PROPOSED MARKING PLAN
12	STORM WATER POLLUTION PREVENTION PLAN
13	ELECTRICAL LEGEND AND ABBREVIATIONS
14	REGULATORY REQUIREMENTS AND NOTES
15	EXISTING ELECTRICAL PLAN
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17	EXISTING ELEC ONELINE FOR VAULT & AIRFIELD
18	EXISTING ELEC ONELINE FOR VAULT & AIRFIELD - CONTINUATION
19	PROPOSED ELECTRICAL PLAN
20	NOTES FOR PROPOSED ELECTRICAL PLAN
21	TAXIWAY LIGHT DETAILS
22	AIRFIELD LIGHTING CABLE SPLICE DETAILS
23	SPLICE CAN DETAIL
24	CONDUIT TRENCH DETAILS
25	CABLE AND DUCT MARKER DETAILS
26	DUCT BANK DETAILS AND NOTES
27	4'X4' ELECTRICAL MANHOLE
28	ELECTRICAL NOTES SHEET 1
29	ELECTRICAL NOTES SHEET 2
30	PROPOSED FUEL FACILITY PAD DETAIL
31	PROPOSED ELEC ONELINE FOR FUEL FACILITY
32	FUEL FACILITY PANELBOARD SCHEDULE AND DETAILS
33	FUEL FACILITY PANEL ELEVATION DETAILS
34	FUEL FACILITY LIGHTING DETAILS
35	PROPOSED ELECTRICAL ONE LINE FOR AIRFIELD
36	HIGH VOLTAGE WIRING SCHEMATIC
37	GROUNDING DETAILS
38	GROUND RESISTANCE TESTING DETAILS
39	GROUNDING NOTES

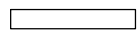


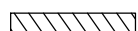
**UTILITY NOTE**

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

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

COUNTY \_\_\_\_\_ EDGAR  
 CITY \_\_\_\_\_ PARIS  
 TOWNSHIP \_\_\_\_\_ EDGAR  
 SECTION NO. \_\_\_\_\_ 5 & 6  
 ADDRESS \_\_\_\_\_ EDGAR COUNTY AIRPORT  
 15551 AIRPORT ROAD  
 PARIS, ILLINOIS 61944

**LEGEND**

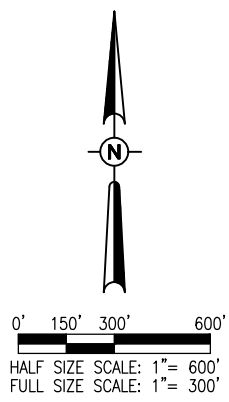
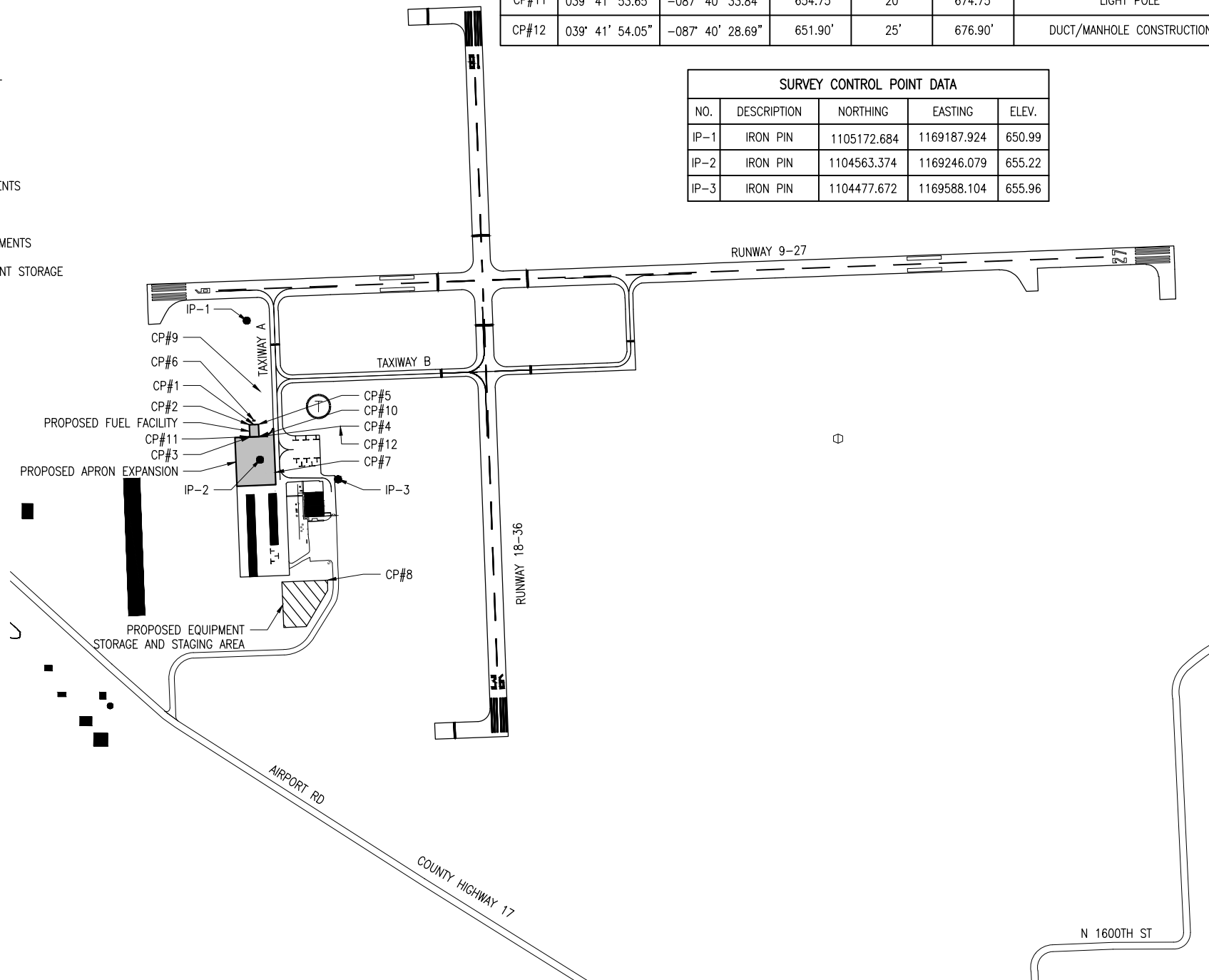
-  EXISTING IMPROVEMENTS
-  EXISTING BUILDINGS
-  PROPOSED IMPROVEMENTS
-  PROPOSED EQUIPMENT STORAGE AND STAGING AREA

CRITICAL POINT DATA						
POINT #	LATITUDE	LONGITUDE	GROUND ELEVATION	PROPOSED EQUIPMENT HEIGHT	PROPOSED EQUIPMENT ELEVATION	REMARKS
CP#1	039° 41' 54.18"	-087° 40' 33.54"	654.18'	75'	729.18'	TEMPORARY CRANE
CP#2	039° 41' 54.17"	-087° 40' 33.79"	654.53'	15'	669.53'	NEW FUEL FACILITY
CP#3	039° 41' 53.64"	-087° 40' 33.77"	654.75'	15'	669.75'	NEW FUEL FACILITY
CP#4	039° 41' 53.65"	-087° 40' 33.26"	653.76'	15'	668.76'	NEW FUEL FACILITY
CP#5	039° 41' 54.18"	-087° 40' 33.28"	653.74'	15'	668.74'	NEW FUEL FACILITY
CP#6	039° 41' 54.36"	-087° 40' 33.53"	654.04'	5.5'	659.54'	ELECTRICAL PANEL
CP#7	039° 41' 52.10"	-087° 40' 32.36"	656.60'	75'	731.60'	TEMPORARY CRANE
CP#8	039° 41' 47.41"	-087° 40' 29.48"	655.11'	25'	680.11'	EQUIPMENT STAGING AREA
CP#9	039° 41' 55.61"	-087° 40' 33.17"	651.77'	25'	676.77'	DITCH FLOWLINE
CP#10	039° 41' 53.67"	-087° 40' 33.21"	653.76'	20'	673.76'	LIGHT POLE
CP#11	039° 41' 53.65"	-087° 40' 33.84"	654.75'	20'	674.75'	LIGHT POLE
CP#12	039° 41' 54.05"	-087° 40' 28.69"	651.90'	25'	676.90'	DUCT/MANHOLE CONSTRUCTION

SURVEY CONTROL POINT DATA				
NO.	DESCRIPTION	NORTHING	EASTING	ELEV.
IP-1	IRON PIN	1105172.684	1169187.924	650.99
IP-2	IRON PIN	1104563.374	1169246.079	655.22
IP-3	IRON PIN	1104477.672	1169588.104	655.96

**GENERAL NOTES**

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



Offices Nationwide  
 www.hanson-inc.com

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

Illinois Licensed  
 Professional Service Corporation  
 #184-001084

Edgar County Airport

Board of Edgar County  
 15551 Airport Rd.  
 Paris, IL 61944-8474  
 Telephone: 217.465.4151



**APRON EXPANSION AND RELOCATE/UPGRADE FUEL FACILITY**

IDA No: PRG-4144

Contract No. ED018

NO.	DATE	DESCRIPTION		
		LAY	DWN	REV

ISSUE: SEPTEMBER 21, 2018  
 PROJECT NO: 13A0062D  
 CAD FILE: G-003-SOW.DWG  
 LAYOUT BY: JRH 12/21/2015  
 DRAWN BY: JRH 12/21/2015  
 REVIEWED BY: BSS 08/17/2018

SHEET TITLE

SCOPE OF WORK

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**APRON EXPANSION AND RELOCATE/UPGRADE FUEL FACILITY**

IDA No: PRG-4144

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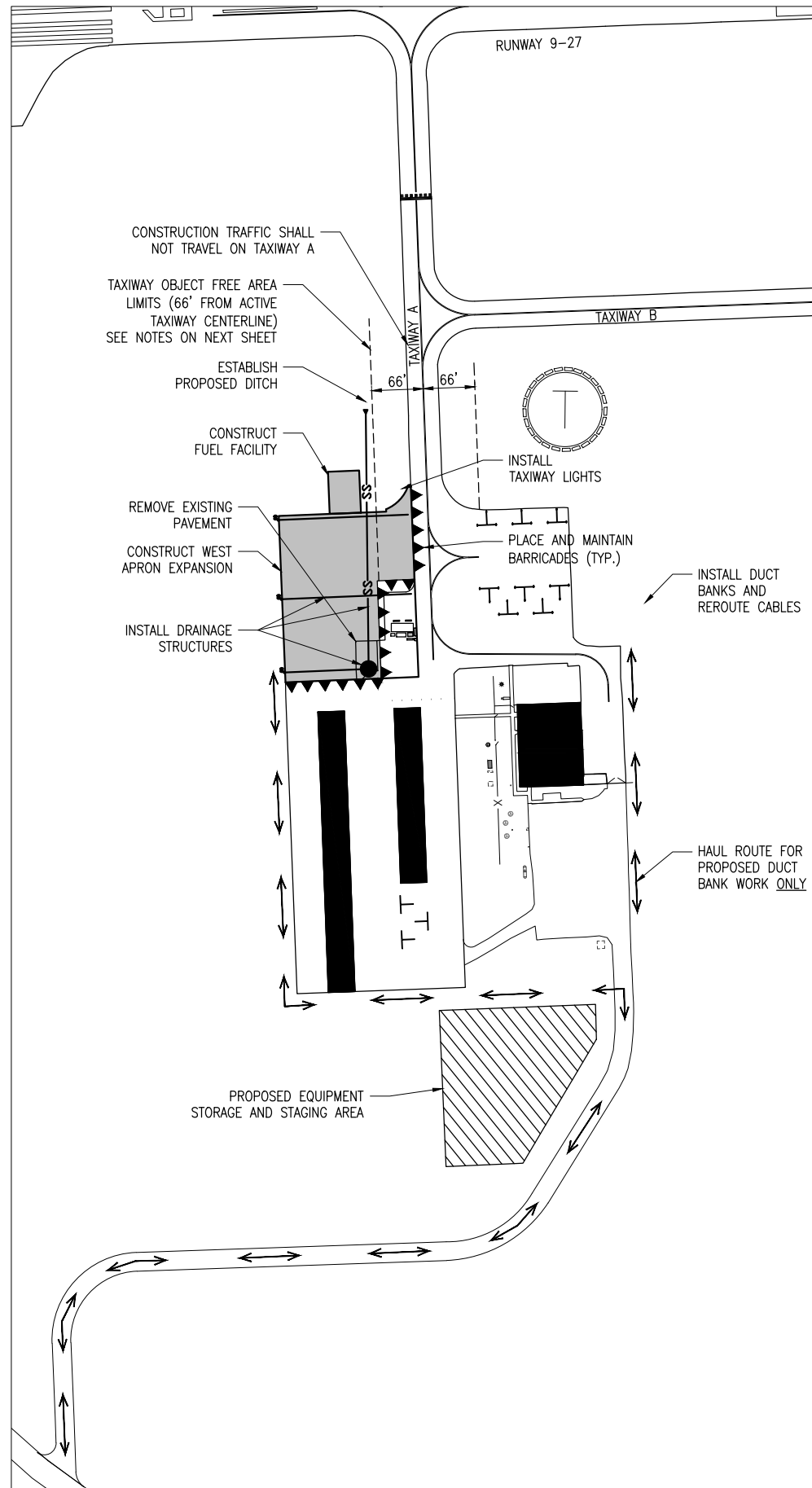
LAYOUT BY: BSS 12/22/2015

DRAWN BY: JRH 12/22/2015

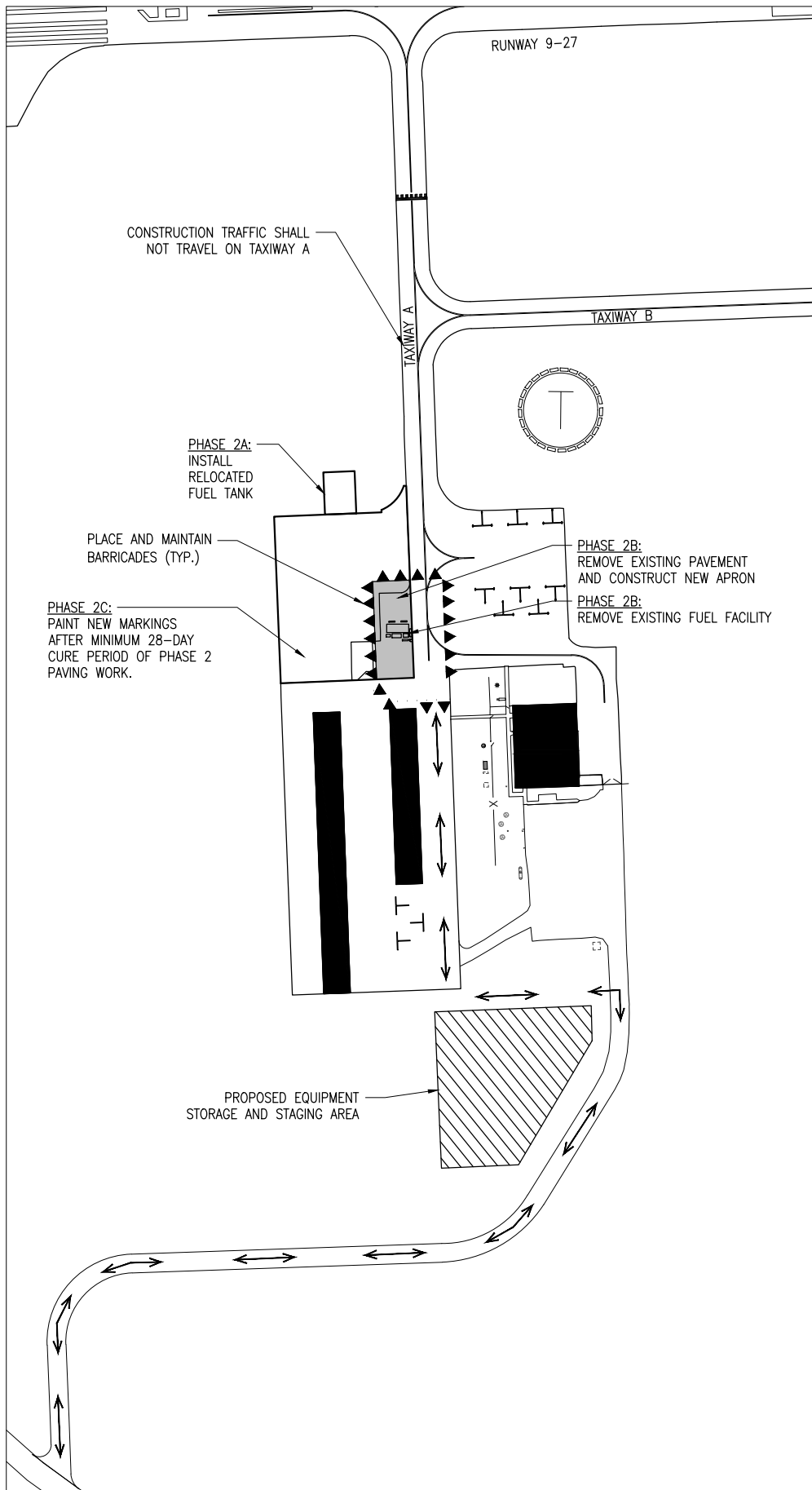
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SHEET TITLE

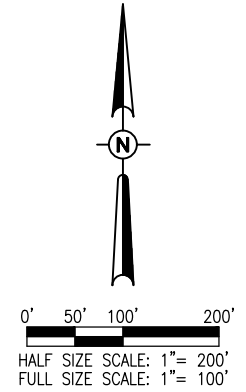
**CONSTRUCTION SAFETY AND PHASING PLAN**



**PHASE 1 CONSTRUCTION**



**PHASE 2 CONSTRUCTION**



**LEGEND**

	EXISTING IMPROVEMENTS
	EXISTING BUILDINGS
	PROPOSED IMPROVEMENTS
	PROPOSED BARRICADES
	PROPOSED CONSTRUCTION TRAFFIC
	PROPOSED EQUIPMENT STORAGE AND STAGING AREA

**WORK AREA NOTES**

- BARRICADES SHALL BE IN PLACE PRIOR TO BEGINNING CONSTRUCTION. PHASE 1 BARRICADES SHALL REMAIN IN PLACE UNTIL THE CURED 501 PAVEMENT IS ALLOWED TO BE OPENED TO TRAFFIC PER SPECIFICATION SECTION 501-3.21, OPENING TO TRAFFIC. PHASE 2 WORK SHALL NOT BEGIN UNTIL THE PHASE 1 PAVEMENT IS OPEN TO AIRCRAFT TRAFFIC.
- IF ALL WORK ITEMS WITHIN PHASE 1 ARE COMPLETED AND ONLY CURE TIME REMAINS AS THE CONTROLLING ITEM TO BEGIN PHASE 2, THE CONTRACT TIME MAY BE TEMPORARILY SUSPENDED UNTIL SUCH TIME THAT PHASE 1 IS OPENED TO AIRCRAFT TRAFFIC AND PHASE 2 BEGINS.
- NO PAVEMENT MARKINGS SHALL BE PAINTED UNTIL THE PHASE 2 PCC PAVEMENT HAS CURED FOR A MINIMUM OF 28 DAYS. IF ALL WORK ITEMS WITHIN PHASE 2 ARE COMPLETED AND ONLY CURE TIME REMAINS AS THE CONTROLLING ITEM TO PAINT, THE CONTRACT TIME MAY BE TEMPORARILY SUSPENDED UNTIL SUCH TIME THAT PAINTING BEGINS.
- AT ALL TIMES, THE CONTRACTOR'S OPERATIONS SHALL BE SUCH AS TO MINIMIZE DISRUPTION TO AIRCRAFT OPERATIONS.
- ALL AIRCRAFT AND AIRPORT OPERATIONS HAVE THE RIGHT-OF-WAY. CONTRACTOR TO YIELD TO AIRPORT VEHICLES AND REMAIN CLEAR AT ALL TIMES.
- ALL ACTIVE AIRFIELD PAVEMENTS SHALL BE KEPT CLEAN AND FREE OF DEBRIS AT ALL TIMES DURING CONSTRUCTION.
- AT THE COMPLETION OF ALL WORK AREA CONSTRUCTION, THE HAUL ROUTE AND CONSTRUCTION EQUIPMENT PARKING AREA SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITIONS PER THE SPECIFICATIONS.
- CONTRACTOR SHALL PROVIDE TEMPORARY AIRFIELD LIGHTING CIRCUIT JUMPER CABLES, CONDUIT ENCASED ABOVE GROUND, DURING CONSTRUCTION TO MAINTAIN EXISTING LIGHTING CIRCUITS, UNLESS OTHERWISE APPROVED BY THE AIRPORT MANAGER.
- THE COSTS FOR PROVISION, PLACEMENT, MAINTENANCE AND REMOVAL OF BARRICADES AND TEMPORARY JUMPER CABLES/CONDUITS ON THE AIRFIELD AND ALL ASSOCIATED INCIDENTALS SHALL BE PAID FOR UNDER ITEM AR150520 MOBILIZATION.
- THE COSTS FOR CONSTRUCTION/MAINTENANCE OF HAUL ROUTE AND EQUIPMENT STAGING AREA AND ALL ASSOCIATED INCIDENTALS SHALL BE PAID FOR UNDER ITEM AR150540 HAUL ROUTE.

PRG CTAF/UNICOM FREQUENCY = 123.00 MHz

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## TAXIWAY OBJECT FREE AREA NOTES

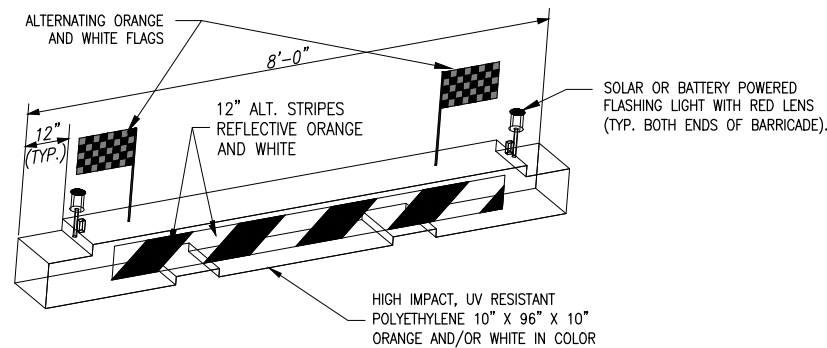
1. ACCORDING TO THE FAA ADVISORY CIRCULAR 150/5370-2G (CURRENT EDITION), "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION", CONSTRUCTION ACTIVITY, INCLUDING OPEN EXCAVATIONS, MAY BE ACCOMPLISHED WITHIN AN ACTIVE TAXIWAY OBJECT FREE AREA, SUBJECT TO RESTRICTIONS. THIS IS APPLICABLE FOR THIS PROJECT, AND THEREFORE THE FOLLOWING ITEMS APPLY TO THIS CONTRACT, AND THE CONTRACTOR SHALL CONSIDER THESE RESTRICTIONS THROUGHOUT THE DURATION OF BIDDING AND CONSTRUCTION.
  - 1.1. AIRCRAFT TAXIING SPEED SHALL BE LIMITED TO 10 MPH. (THIS IS THE OWNER'S RESPONSIBILITY FOR THIS PROJECT.)
  - 1.2. NOTAMS SHALL BE ISSUED ADVISING TAXIING PILOTS OF HAZARD AND RECOMMENDING REDUCED TAXIING SPEEDS ON THE TAXIWAY. (THIS IS THE OWNER'S RESPONSIBILITY FOR THIS PROJECT.)
  - 1.3. LOW-PROFILE BARRICADES SHALL BE IN PLACE AS SHOWN ON THE CONSTRUCTION SAFETY AND PHASING PLAN, PRIOR TO CONSTRUCTION OF EACH PHASE, IN ACCORDANCE WITH THE DETAIL AND NOTES ON THIS SHEET. (THIS IS THE CONTRACTOR'S RESPONSIBILITY FOR THIS PROJECT.)
  - 1.4. A FIVE (5) FOOT CLEARANCE SHALL BE MAINTAINED BETWEEN EQUIPMENT AND MATERIALS AND ANY PART OF AN AIRCRAFT (INCLUDES WING TIP OVERHANG). IF NECESSARY TO FACILITATE THIS CLEARANCE IT MAY BE NECESSARY TO TEMPORARILY MOVE PERSONNEL AND EQUIPMENT FOR THE PASSAGE OF THAT AIRCRAFT. (THIS IS THE CONTRACTOR'S RESPONSIBILITY FOR THIS PROJECT.)
  - 1.5. FLAGGERS FURNISHED BY THE CONTRACTOR SHALL BE USED TO DIRECT AND CONTROL CONSTRUCTION EQUIPMENT AND PERSONNEL TO A PRE-ESTABLISHED SETBACK DISTANCE FOR SAFE PASSAGE OF AIRCRAFT, AND SHALL BE USED TO DIRECT TAXIING AIRCRAFT. (THIS IS THE CONTRACTOR'S RESPONSIBILITY FOR THIS PROJECT.)
  - 1.6. THE CONTRACTOR SHALL PROVIDE THE FLAGGER PERSONNEL WITH AN AIRCRAFT BAND RADIO WHICH SHALL BE USED TO MONITOR AIRCRAFT TRAFFIC VIA THE UNICOM FREQUENCY (123.00 MHZ). (THIS IS THE CONTRACTOR'S RESPONSIBILITY FOR THIS PROJECT.)
2. WHEN WORK IS NOT BEING PERFORMED WITHIN AN ACTIVE TAXIWAY OBJECT FREE AREA AND DURING ALL NIGHT-TIME HOURS, ALL EQUIPMENT, MATERIALS AND PERSONNEL SHALL REMAIN CLEAR OF THE TAXIWAY OBJECT FREE AREA.
3. WORK WITHIN THE TAXIWAY OBJECT FREE AREA AS SHOWN SHOULD BE EXPEDITED TO THE BEST EXTENT POSSIBLE IN ORDER TO AVOID PROLONGED DISRUPTION TO NORMAL AIRCRAFT OPERATIONS.
4. ALL AIRCRAFT AND AIRPORT OPERATIONS HAVE THE RIGHT-OF-WAY. CONTRACTOR TO YIELD TO VEHICLES AND REMAIN CLEAR AT ALL TIMES.

## SAFETY NOTES

1. FOLLOWING ARE THE CONSTRUCTION SAFETY PROCEDURES THAT THE CONTRACTOR SHALL FOLLOW THROUGHOUT THIS PROJECT. ADDITIONAL REQUIREMENTS ARE SHOWN ON THE CONSTRUCTION SAFETY AND PHASING PLAN SHEET AND THIS SHEET.
2. ALL PROVISIONS OF THE LATEST EDITION OF FAA ADVISORY CIRCULAR AC 150/5370-2 (CURRENT EDITION), "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION", APPLY TO THIS CONTRACT, EXCEPT AS MODIFIED BY THIS SAFETY PLAN, OR AS MODIFIED BY THE OWNER THROUGH THE RESIDENT ENGINEER/TECHNICIAN AT THE PRECONSTRUCTION CONFERENCE, OR DURING THE COURSE OF THE CONTRACT.
3. THE CONTRACTORS SHALL MINIMIZE DISRUPTION OF STANDARD OPERATING PROCEDURES FOR AERONAUTICAL ACTIVITY BY REMAINING WITHIN THE PRESCRIBED STAGING, CONSTRUCTION, AND PHASING AREAS PRESENTED ON THE CONSTRUCTION SAFETY AND PHASING PLAN SHEETS.
4. NO UNAUTHORIZED PERSONNEL SHALL ENTER ANY AREA OF THE AIRPORT THAT COULD POTENTIALLY BE HAZARDOUS. THE AIRPORT MANAGER RESERVES THE RIGHT TO SUSPEND OPERATIONS IN ORDER TO MAINTAIN SAFETY AT THE AIRPORT.
5. CONTRACTOR EQUIPMENT, VEHICLES, AND PROJECT MATERIALS SHALL BE STORED IN THE EQUIPMENT PARKING/STAGING AREA SHOWN ON THE PLAN VIEW, EXCEPT AS OTHERWISE PROVIDED FOR AT THE PRECONSTRUCTION CONFERENCE.
6. ALL CONSTRUCTION EQUIPMENT OPERATING IN THE PRESCRIBED CONSTRUCTION AREA IS REQUIRED TO DISPLAY A CHECKERBOARD FLAG PROPERLY LOCATED OR A ROTATING BEACON (STROBE) AS SPECIFIED IN AC 150/5210-5, "PAINTING, MARKING, AND LIGHTING OF VEHICLES USED ON AN AIRPORT" LATEST EDITION.
7. NO CONSTRUCTION MATERIAL STOCKPILES SHALL BE LOCATED WITHIN 250' OF ANY ACTIVE RUNWAY, WITHIN 66' OF ANY OTHER ACTIVE AIRPORT OPERATIONS AREA, OR PENETRATE A PART 77 IMAGINARY SURFACE (PROVIDED BY THE RESIDENT ENGINEER/TECHNICIAN) EXTENDING OUT AND UPWARDS FROM ALL SIDES OF AN ACTIVE RUNWAY.
8. CLOSED AIRFIELD PHASING AREAS, OPEN TRENCHES, AND STOCKPILED MATERIALS AT THE CONSTRUCTION SITE SHALL BE PROMINENTLY MARKED WITH LIGHTED BARRICADES WITH STEADY BURNING OR FLASHING RED LIGHTS AS SPECIFIED IN 150/5370-2, "OPERATIONAL SAFETY ON AIRPORT DURING CONSTRUCTION, LATEST EDITION. LIGHTED BARRICADES MUST BE NO TALLER THAN 18" (EXCLUSIVE OF SUPPLEMENTARY LIGHTS AND FLAGS) ON THE TAXIWAYS AND COMPLY WITH ADVISORY CIRCULAR 150/5370-2, LATEST EDITION. CONTRACTOR SHALL NIGHT CHECK BARRICADES DAILY FOR PROPER OPERATION.
9. NO OPEN TRENCHES WITHIN 250' OF AN ACTIVE RUNWAY CENTERLINE OR WITHIN 66' OF ANY AIRPORT OPERATIONS AREA WILL BE PERMITTED UNLESS PROPERLY MARKED. OTHER TRENCHES SHALL BE MAINTAINED SAFE, I.E., BARRICADED OR COVERED WITH STEEL PLATES IN ALL OTHER AREAS.
10. OPEN TRENCHES, EXCAVATIONS, AND STOCKPILED MATERIALS AT THE CONSTRUCTION SITE SHALL BE PROMINENTLY MARKED WITH ORANGE FLAGS AND LIGHTED WITH FLASHING RED LIGHTS DURING HOURS OF RESTRICTED VISIBILITY AND/OR DARKNESS.
11. NO CONSTRUCTION EQUIPMENT GREATER THAN 25' TALL WILL BE PERMITTED ON THE AIRPORT. HOWEVER OTHER EQUIPMENT TALLER THAN 25' MAY BE PERMITTED WITH THE APPROVAL OF THE AIRPORT MANAGER AND AIRSPACE APPROVAL BY THE FAA.
12. NO OPEN FLAME WELDING OR TORCH CUTTING OPERATION IS PERMITTED UNLESS ADEQUATE FIRE AND SAFETY PRECAUTIONS ARE PROVIDED AND HAVE BEEN APPROVED BY THE AIRPORT MANAGER NO FLARE POTS ARE ALLOWED ON THE PROJECT.
13. SOIL, DEBRIS, AND LOOSE MATERIAL DROPPED OR TRUCKED ONTO AIRPORT ROADS, TAXIWAYS, AND SOD SURFACES, OR WHICH CAN BE BLOWN ONTO SUCH SURFACES, SHALL BE IMMEDIATELY SWEEP, PICKED UP AND REMOVED, OR PLACED INTO CLOSED CONTAINERS. ANY DAMAGE TO AIRPORT PROPERTY SHALL BE REPAIRED IMMEDIATELY AT NO COST TO THE OWNER.
14. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND MAINTAINING AIRPORT LIGHTING AND NAVIGATIONAL ELECTRICAL SYSTEMS DURING CONSTRUCTION. A CONTACT PERSON AND TELEPHONE NUMBER FOR 24 HOUR EMERGENCY IMMEDIATE REPAIR SHALL BE SUBMITTED TO THE AIRPORT MANAGER AND RESIDENT ENGINEER/TECHNICIAN. HAUL ROUTES CROSSING PAVEMENT, DRAINAGE, MISCELLANEOUS STRUCTURES AND/OR AIRFIELD CABLES SHALL BE PROTECTED FROM DAMAGE.
15. ALL AIRCRAFT AND AIRPORT OPERATIONS HAVE THE RIGHT-OF-WAY. CONTRACTOR TO YIELD TO VEHICLES AND REMAIN CLEAR AT ALL TIMES.
16. CONTRACTOR SHALL PLACE, SECURE, AND MAINTAIN LIGHTED BARRICADES AND CLOSURE CROSSES WHEN A RUNWAY/TAXIWAY/APRON IS CLOSED OR AS REQUIRED BY THE PLANS AND DESIGNATED BY THE RESIDENT ENGINEER/TECHNICIAN.
17. CONTRACTOR SHALL MARK HAZARDOUS AREA WITH STEADY-BURNING OR FLASHING RED LIGHTS DURING PERIODS OF LOW VISIBILITY AS REQUIRED.
18. THE CONTRACTOR SHALL PERIODICALLY PERFORM ONSITE INSPECTIONS THROUGHOUT THE DURATION OF THE PROJECT WITH THE IMMEDIATE REMEDY OF ANY DIFFERENCES, WHETHER CAUSED BY NEGLIGENCE, OVERSIGHT, OR PROJECT SCOPE CHANGE.
19. CONTRACTOR SHALL MOVE MAINTENANCE OF TRAFFIC COMPONENTS AT THE WRITTEN DIRECTION OF THE RESIDENT ENGINEER/TECHNICIAN AT NO ADDITIONAL COST.
20. CONTRACTOR SHALL NOT REMOVE THE BARRICADES WITHOUT THE APPROVAL BY THE RESIDENT ENGINEER/TECHNICIAN.
21. CONTRACTOR SHALL MAINTAIN FLASHERS, SIGNS AND/OR BARRICADES AS REQUIRED BY THE PLANS, CITY OR COUNTY REGULATIONS OR CONTRACTOR ACTIVITIES. CONTRACTOR SHALL OBTAIN ANY AND ALL REQUIRED LOCAL PERMITS UNLESS SPECIFIED OTHERWISE.
22. THE CONTRACTOR SHALL UTILIZE WATER AND/OR CHEMICALS APPROVED BY THE RESIDENT ENGINEER/TECHNICIAN AS NECESSARY TO CONTROL DUST.
23. NO CONSTRUCTION VEHICLES SHALL BE DRIVEN ACROSS ANY ACTIVE RUNWAY, INCLUDING TURF RUNWAYS. CONSTRUCTION EQUIPMENT OR CONSTRUCTION ACTIVITY WILL NOT BE PERMITTED WITHIN 250' OF ANY ACTIVE RUNWAY CENTERLINE OR WITHIN 66' OF ANY OTHER ACTIVE AIRPORT TAXIWAY OR TAXILANE CENTERLINE. HOWEVER, CONSTRUCTION MAY BE PERMITTED IN THESE AREAS IF THE CONTRACTOR HAS GAINED APPROVAL FROM THE AIRPORT MANAGER AT LEAST 7 DAYS IN ADVANCE OF THE SCHEDULED CONSTRUCTION PERIOD AND THE OPERATIONAL AREA IS CLOSED TO TRAFFIC AND PROPER NOTAMS ARE ISSUED BY THE AIRPORT MANAGER TO THE APPROPRIATE FLIGHT SERVICE STATION.
24. UNLESS SPECIFIED OTHERWISE, COST FOR THE ABOVE IS TO BE CONSIDERED INCIDENTAL TO THE PROJECT. SEPARATE PAYMENT SHALL NOT BE MADE.

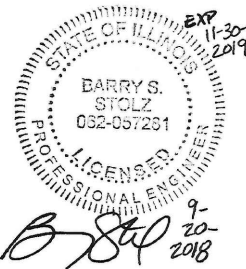
## BARRICADE NOTES

1. ALL CONSTRUCTION SIGNS AND TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES INCLUDING THE ILLINOIS SUPPLEMENT (LATEST EDITION) AND THE FAA ADVISORY CIRCULARS (LATEST EDITION) UNLESS NOTED OTHERWISE. THE FAA OR MORE STRINGENT SPECIFICATIONS SHALL GOVERN.
2. BARRICADES SHALL BE "LOW-PROFILE" WITH A MAXIMUM HEIGHT OF 18" ABOVE GROUND, EXCLUSIVE OF ASSOCIATED WARNING LIGHTS AND FLAGS.
3. BARRICADES SHALL BE SPACED END TO END THE WIDTH OF THE PAVEMENT, WITH GAPS BETWEEN BARRICADES NOT TO EXCEED 4' WIDE. BARRICADES ARE TO BE SET BACK 66' FROM THE ACTIVE TAXIWAY CENTERLINE OR AS SHOWN ON THE PLANS.
4. CONSTRUCTION RED WARNING LIGHT: THESE ARE PORTABLE, LENS DIRECTED, ENCLOSED LIGHTS. THE COLOR OF THE LIGHT EMITTED SHALL BE RED. THEY MAY BE USED IN EITHER A STEADY BURN (TYPE C) OR LOW INTENSITY FLASHING MODE (TYPE A) UNLESS NOTED OTHERWISE.
5. THE LIGHTING SHALL BE MAINTAINED IN OPERATION DURING THE HOURS OF DARKNESS BETWEEN 1/2 HOUR BEFORE SUNSET AND 1/2 HOUR AFTER SUNRISE AND WHEN CONDITIONS EXIST WHICH TEND TO OBSCURE VISION.
6. BARRICADES SHALL BE SECURED TO THE GROUND BY APPROVED METHODS TO PREVENT MOVEMENT BY PROP WASH, JET BLAST OR OTHER WIND CURRENTS.
7. THE ONLY COLOR COMBINATION ON BARRICADES IS ORANGE AND WHITE. THE ORANGE STRIPES SHALL BE ENCAPSULATED LENS REFLECTIVE SHEETING. THE WHITE STRIPES SHALL BE EITHER ENCAPSULATED OR ENCLOSED LENS REFLECTIVE SHEETING AND MUST BE IN ACCEPTABLE CONDITION.
8. COST FOR PROVIDING, PLACING, MAINTAINING, AND REMOVING BARRICADES SHALL BE INCLUDED IN THE COST OF THE OTHER CONTRACT ITEMS.



**LOW-PROFILE BARRICADE DETAIL**  
NOT TO SCALE

DETAIL ABOVE REPRESENTS ONE OPTION FOR LOW-PROFILE BARRICADES. OTHER OPTIONS MAY BE UTILIZED AS LONG AS THEY MEET THE REQUIREMENTS OF THE PROJECT, INCLUDING BARRICADE NOTE 1.



## APRON EXPANSION AND RELOCATE/UPGRADE FUEL FACILITY

IDA No: PRG-4144

Contract No. ED018

NO.	DATE	DESCRIPTION		
		LAY	DWN	REV

ISSUE: SEPTEMBER 21, 2018

PROJECT NO: 13A0062D

CAD FILE: G-004-SFY.DWG

LAYOUT BY: JRH 01/05/2016

DRAWN BY: JRH 01/05/2016

REVIEWED BY: BSS 08/17/2018

SHEET TITLE

## CONSTRUCTION SAFETY AND PHASING DETAILS AND NOTES





**APRON EXPANSION AND RELOCATE/UPGRADE FUEL FACILITY**

IDA No: PRG-4144

Contract No. ED018


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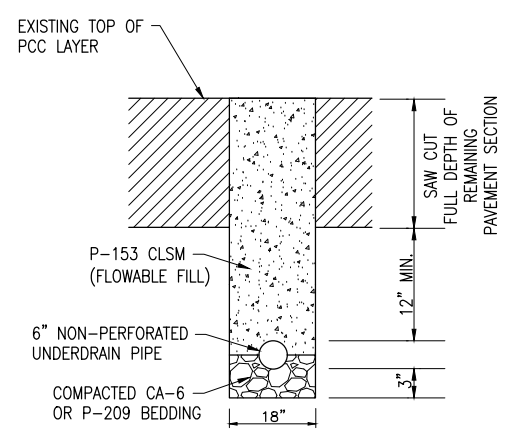
LAYOUT BY: JRH 01/06/2016

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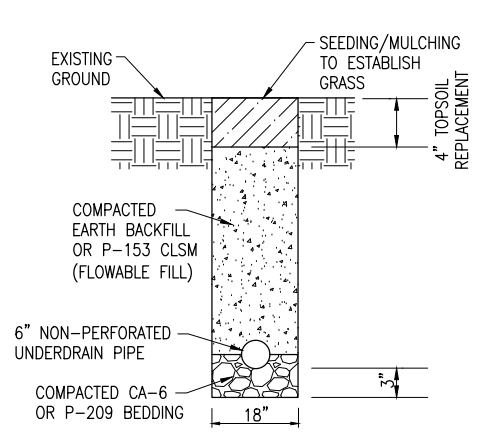
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**PROPOSED DRAINAGE DETAILS**



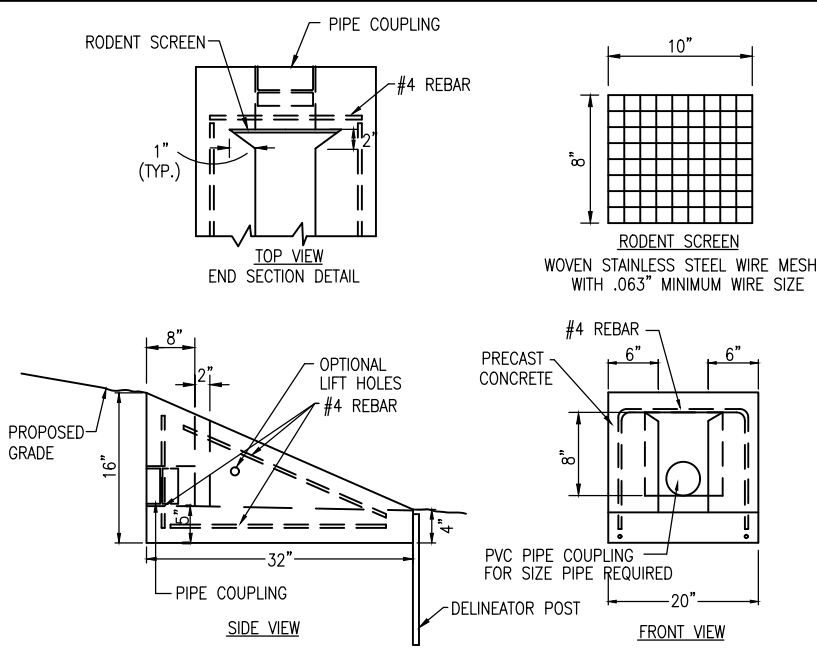
**NON-PERFORATED UNDERDRAIN TRENCH UNDER PAVEMENT**  
NOT TO SCALE

NOTE:  
COST OF ALL WORK ASSOCIATED WITH THIS DETAIL SHALL BE INCLUDED IN COST OF D-705 NON-PERFORATED UNDERDRAIN PIPE.

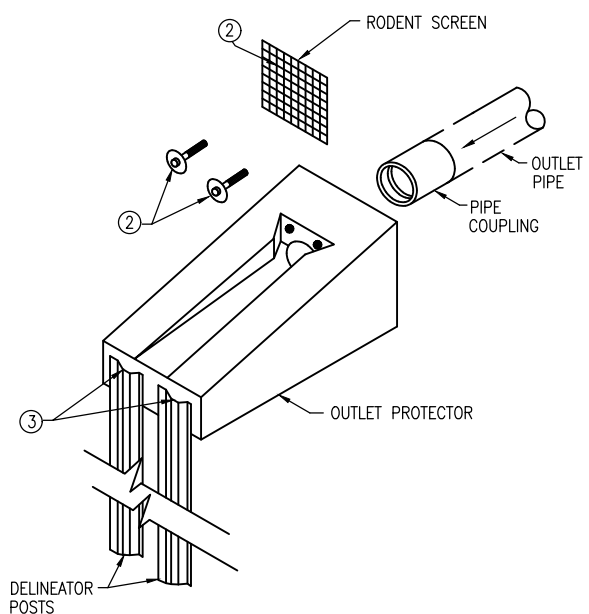


**NON-PERFORATED UNDERDRAIN TRENCH UNDER TURF**  
NOT TO SCALE

NOTE:  
COST OF ALL WORK ASSOCIATED WITH THIS DETAIL SHALL BE INCLUDED IN COST OF D-705 NON-PERFORATED UNDERDRAIN PIPE.



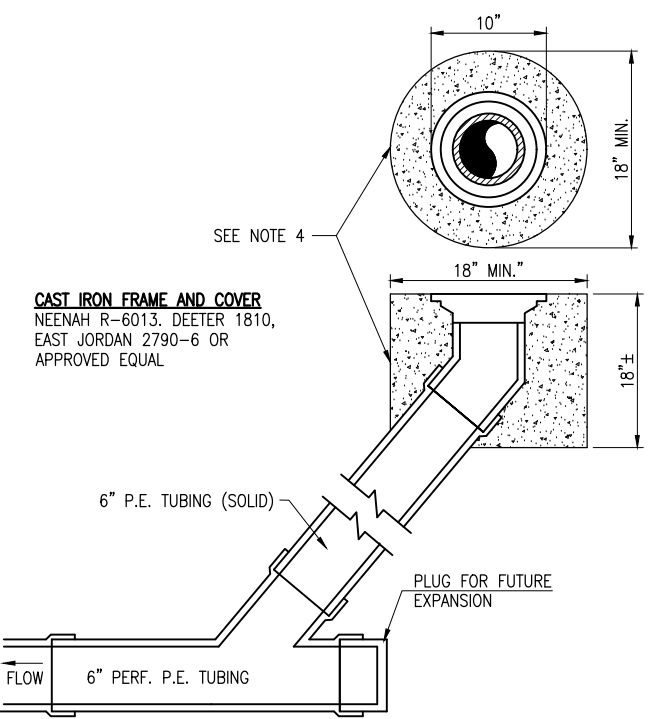
**UNDERDRAIN END SECTION**  
NOT TO SCALE



**UNDERDRAIN END SECTION ISOMETRIC DETAIL**  
NOT TO SCALE

**UNDERDRAIN END SECTION NOTES:**

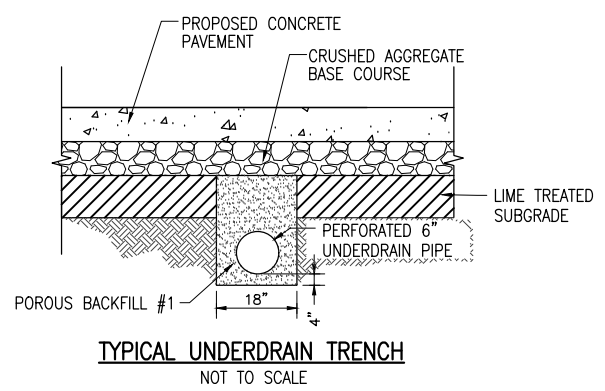
1. THE CONTRACTOR SHALL INSTALL THE PROPOSED UNDERDRAIN END SECTION AT THE LOCATION AND GRADE SHOWN ON THE PLANS. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
2. THE RODENT SCREEN SHALL BE 1/3" SQUARE (3 OPENINGS PER INCH). IT SHALL BE FASTENED TO THE OUTLET PROTECTOR WITH TWO 1/4" BY 1" HEX HEAD LAG SCREWS WITH FLAT WASHERS AND ANCHORS. THE APPROXIMATE LOCATION OF THE ANCHOR HOLES SHALL BE AS SHOWN ON THE DETAILS.
3. THE DELINEATOR POSTS USED TO ANCHOR THE OUTLET PROTECTOR SHALL BE EMBEDDED A MINIMUM OF 2'. THE EXPOSED END OF THESE DELINEATOR POSTS SHALL NOT PROTRUDE ABOVE THE TOP EDGE OF THE DOWNSTREAM END OF THE OUTLET PROTECTOR.
4. THE PROPOSED UNDERDRAIN END SECTION WILL BE PAID FOR UNDER ITEM AR705620 UNDERDRAIN END SECTION.



**UNDERDRAIN CLEANOUT TYPE B**  
NOT TO SCALE

**CLEANOUT NOTES**

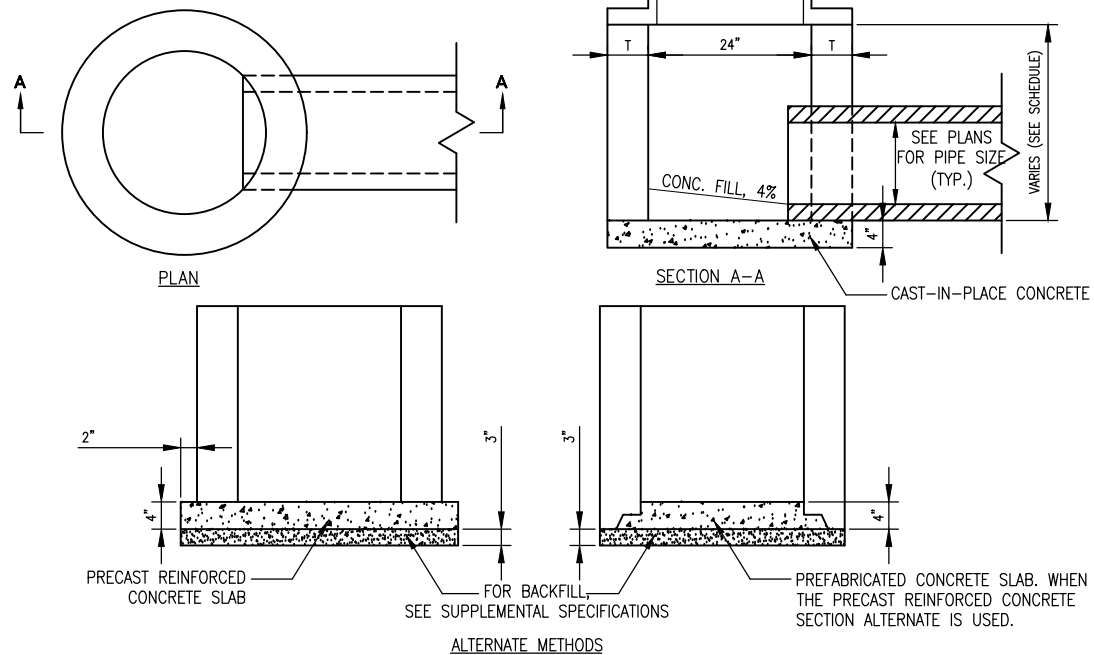
1. DIAMETER OF PIPE AS SPECIFIED.
2. TOP OF CLEANOUTS SHALL BE FLUSH WITH PAVEMENT OR 2" ABOVE FINISH GROUND LINE AT TURF LOCATIONS, OR AS SHOWN ON PLANS.
3. 1/2" CHAMFER TO BE USED ON ALL EXPOSED EDGES OF CLEANOUTS.
4. THE CONCRETE SHALL BE STRUCTURAL PORTLAND CEMENT CONCRETE (NON-REINFORCED) IN ACCORDANCE WITH ITEM 610. 501 CONCRETE MAY BE USED AS AN ALTERNATIVE.



**TYPICAL UNDERDRAIN TRENCH**  
NOT TO SCALE

**UNDERDRAIN NOTES**

1. THE CONTRACTOR SHALL INSTALL THE PROPOSED 6" P.E. TUBING UNDERDRAINS TO THE DEPTH AND GRADES SHOWN ON THE PLANS. THE UNDERDRAINS SHALL BE INSTALLED AFTER THE LIME SUBGRADE PROCESSING HAS BEEN COMPLETED.
2. THE 6" P.E. TUBING SHALL BE CAPPED AT THE ENDS WHICH DO NOT CONNECT INTO EXISTING STRUCTURES.
3. CONNECTING UNDERDRAINS TO EXISTING STRUCTURES SHALL BE INCLUDED IN THE COST OF THE UNDERDRAINS THEMSELVES, AND MAY INCLUDE CORING INTO THE EXISTING STRUCTURE WALL AND GROUTING THE UNDERDRAIN IN PLACE.
4. THE TRENCH SHALL BE BACKFILLED AND COMPACTED WITH POROUS BACKFILL NO. 1 MATERIAL. THE TRENCH LOCATED IN THE PROPOSED PAVEMENT AREAS WILL BE BACKFILLED AS SHOWN IN THE DETAIL ON THIS SHEET. THE TRENCH LOCATED IN TURF AREAS SHALL BE BACKFILLED UP TO WITHIN 1 FT. OF THE EXISTING GROUND ELEVATION. THE REMAINING 1 FT. OF TRENCH WILL BE BACKFILLED AND COMPACTED WITH EARTH MATERIAL.
5. THE PROPOSED UNDERDRAINS AND POROUS BACKFILL MATERIAL WILL BE PAID FOR UNDER ITEM AR705506 6" PERFORATED UNDERDRAIN.



**NOTES**

1. SEE DRAINAGE AND UNDERDRAIN SCHEDULE FOR LOCATION, SIZE AND NUMBER OF PIPE CONNECTIONS.
2. INLETS TO BE PRECAST REINFORCED CONCRETE SECTIONS (T = 3").

**INLET TYPE A**  
(DOT STANDARD 602301)



**APRON EXPANSION AND RELOCATE/UPGRADE FUEL FACILITY**

IDA No: PRG-4144

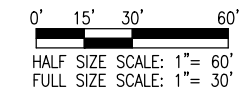
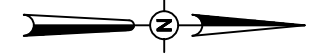
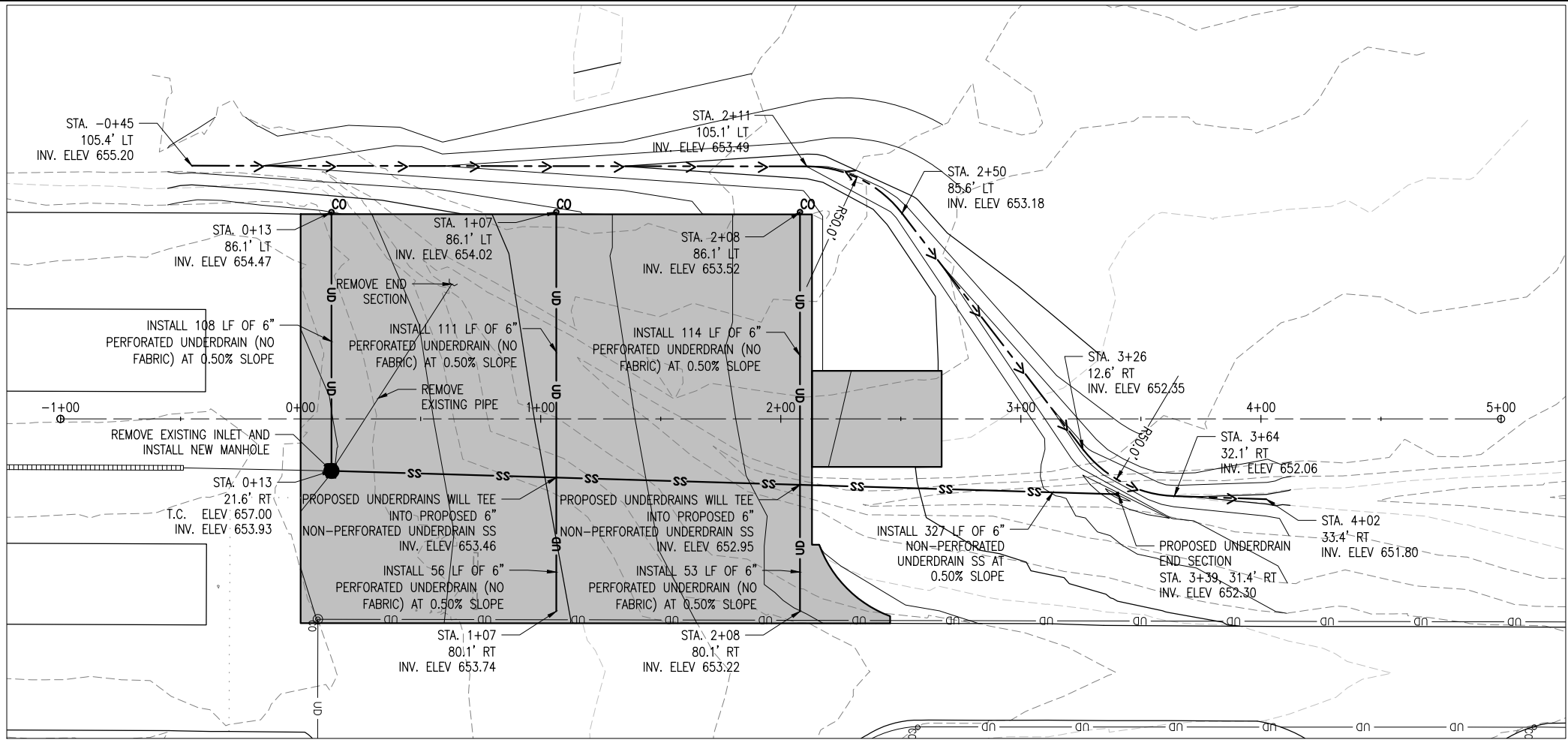
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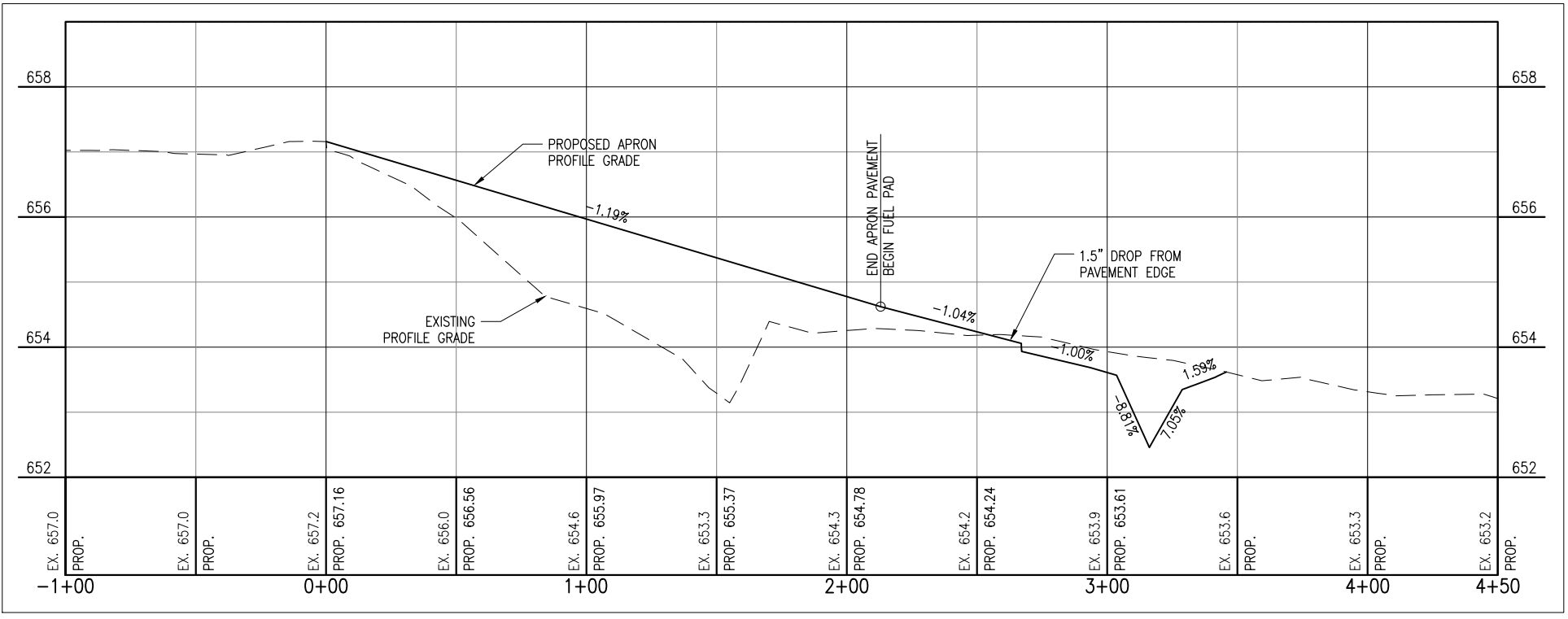
SHEET TITLE

**PROPOSED PLAN AND PROFILE**



**LEGEND**

- EXISTING IMPROVEMENTS
- PROPOSED TAXIWAY PAVEMENT
- PROPOSED DITCH FLOWLINE
- EXISTING STORM PIPE
- PROPOSED STORM PIPE
- PROPOSED UNDERDRAIN
- PROPOSED UNDERDRAIN CLEANOUT
- PROPOSED MANHOLE







**APRON EXPANSION  
AND RELOCATE/  
UPGRADE FUEL  
FACILITY**

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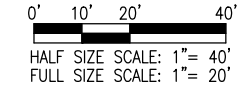
SHEET TITLE

**JOINTING PLAN**

**LEGEND**

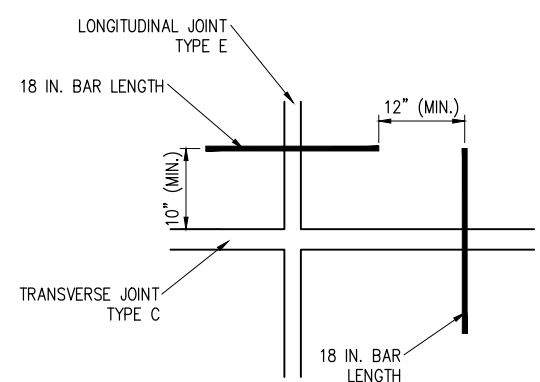
- PROPOSED PAVEMENT
- CONSTRUCTION/CONTRACTION JOINT (TYPE B,C,E)
- CONTRACTION JOINT (TYPE D)
- ISOLATION JOINT (TYPE A)
- PROPOSED PAVEMENT SPOT ELEVATION
- REINFORCED PANEL (QUANTITY INCLUDED IN PCC PAY ITEM)

**NOTE:**  
CONTRACTOR MAY PROPOSE ALTERNATIVE PAVING/JOINTING PLAN FOR ENGINEER'S REVIEW AND APPROVAL FOLLOWING AWARD.



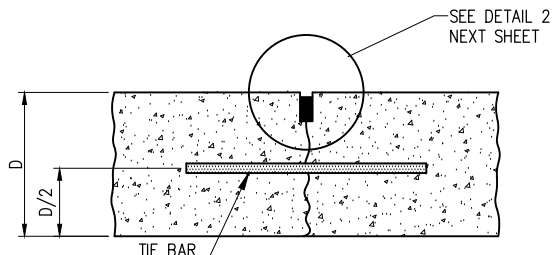
**JOINTING NOTES**

- ALL JOINT EDGES SHALL BE SAWCUT TO PRODUCE THE 1/4" CHAMFER.
- ALL LONGITUDINAL AND TRANSVERSE CONTRACTION JOINTS SHALL BE SAWED.
- ALL DOWEL BARS SHALL BE SECURELY HELD IN PLACE BY MEANS OF A DOWEL BAR ASSEMBLY WHICH WILL ENSURE THAT THEY WILL REMAIN PARALLEL TO THE SURFACE OF THE PAVEMENT AND TO THE CENTERLINES OF THE PAVEMENT LANES. THE DOWEL BAR ASSEMBLIES SHALL BE APPROVED BY THE RESIDENT ENGINEER PRIOR TO INSTALLATION.
- DOWEL BARS FOR 6 IN. THICK PAVEMENT SHALL BE 3/4 IN. DIAMETER, 18 IN. LONG AT 12 IN. SPACING.
- TIE BARS SHALL BE NO. 4 DEFORMED BARS, 20 IN. LONG AT 36" ON CENTERS.
- ALL TIE BARS SHALL BE HELD IN PLACE BY SUPPORT PINS OR OTHER METHODS TO PREVENT SHIFTING DURING AND AFTER CONCRETE PLACEMENT. SUPPORT PINS SHALL BE OF SUFFICIENT LENGTH TO PENETRATE AT LEAST 6" INTO THE SUBGRADE.
- ALL TIE BARS SHALL BE PLACED AT A POINT NOT LESS THAN 6" OR MORE THAN 15" FROM A TRANSVERSE OR EXPANSION JOINT.
- DOWELS IN TRANSVERSE CONTRACTION AND LONGITUDINAL CONSTRUCTION JOINTS SHALL BE COATED WITH A RUSTPROOFING COMPOUND AND HALF THE LENGTH GREASED WITH A HEAVY GREASE.
- ALLOWABLE TOLERANCES FOR GROOVE DEPTH WILL BE ±1/8" FOR CONSTRUCTION JOINTS AND ±1/4" FOR CONTRACTION JOINTS.
- THE CONTRACTOR IS REQUIRED TO DRILL AND EPOXY THE PROPOSED DOWELS IN ACCORDANCE WITH THE DETAILS AND SPECIFICATIONS. THE EPOXY MATERIAL MUST BE APPROVED BY THE DIVISION OF AERONAUTICS PRIOR TO USE.
- THE COST OF ALL DOWEL BARS, TIE-BARS, SAWING AND SEALING SHALL BE INCLUDED IN THE COST OF THE PCC PAVEMENT.
- WHEN CONSTRUCTING "FILL-IN" PAVEMENT LANES THE CONTRACTOR SHALL USE BELTING OR OTHER PROTECTIVE MATERIAL FOR THE PAVING MACHINE TO TRAVEL ON AND WILL PROTECT THE TRANSVERSE JOINTS.
- JOINT SEALANT SHALL BE AS SPECIFIED IN THE STANDARD SPECIFICATIONS ITEM 605.
- CURING COMPOUND SHALL BE AS SPECIFIED IN THE STANDARD SPECIFICATIONS ITEM 501-2.9, AND SHALL BE APPROVED PRIOR TO THE PAVING OPERATION BY THE RESIDENT ENGINEER/TECHNICIAN.
- ALL NON-ALIGNED EDGES WILL BE SAWED FULL DEPTH.

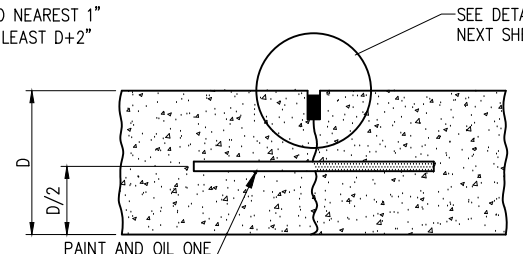


POSITION OF DOWELS AT EDGE OF JOINT TYPE C OR E

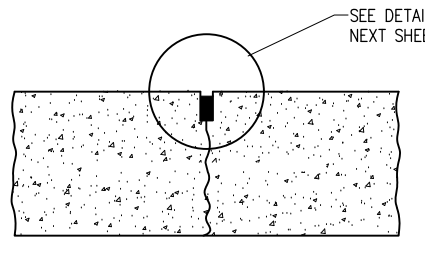
**DOWEL PLAN VIEW**



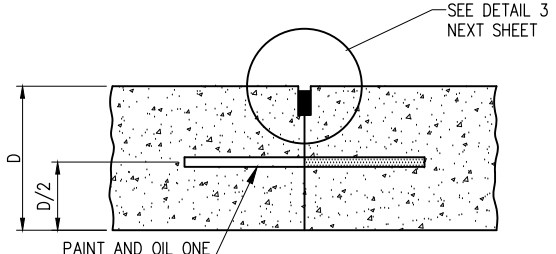
**TYPE B HINGED  
CONTRACTION JOINT**



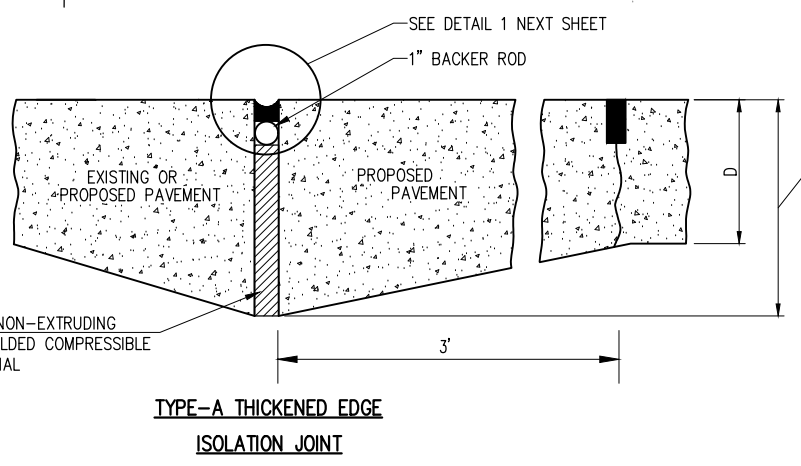
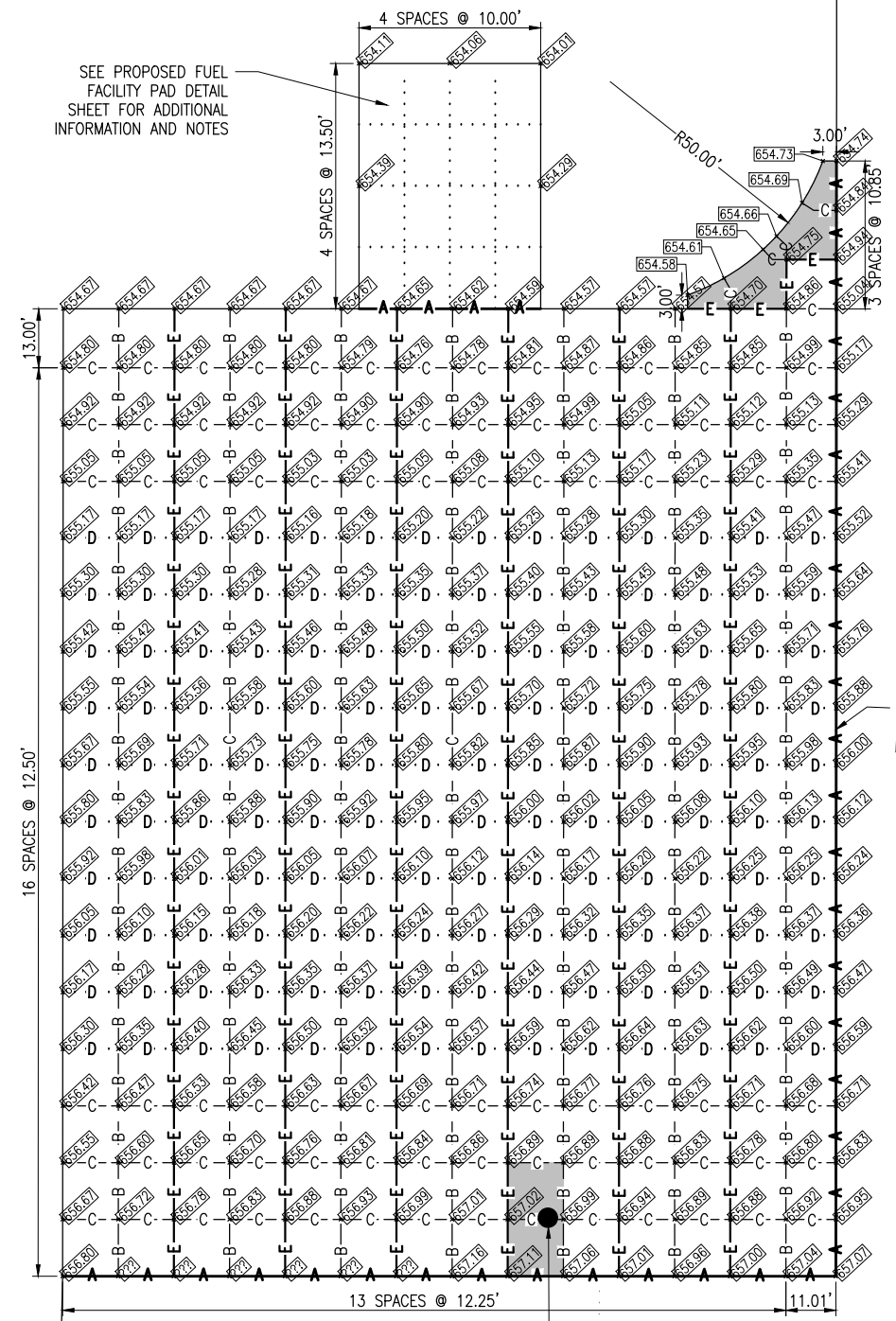
**TYPE C DOWELED  
CONTRACTION JOINT**



**TYPE D DUMMY  
CONTRACTION JOINT**

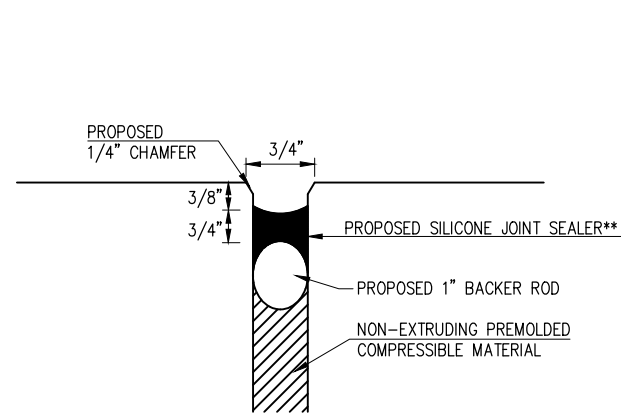


**TYPE E DOWELED  
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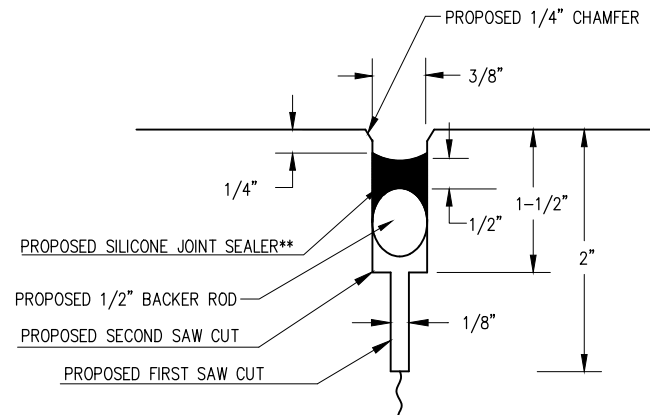


**TYPE-A THICKENED EDGE  
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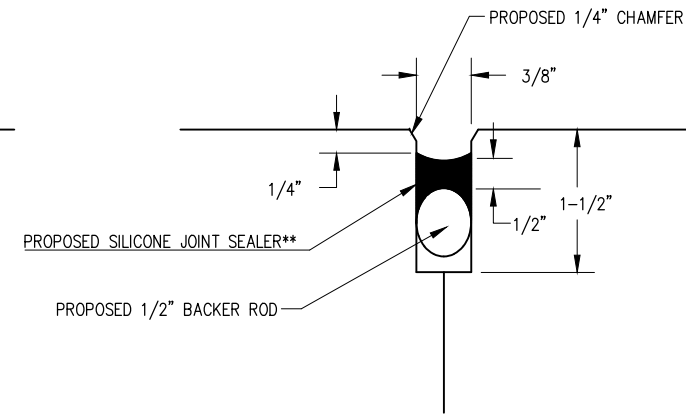
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**DETAIL 1**  
NOT TO SCALE



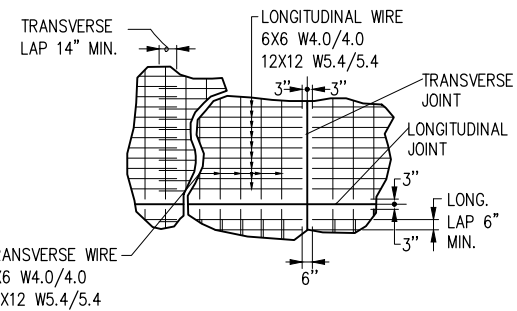
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**DETAIL 3**  
NOT TO SCALE

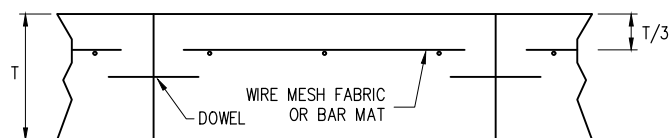
**JOINT SEALING DETAILS**  
NOT TO SCALE

\*\* PROPOSED JOINT SEALANT SHALL BE DOW CORNING 888 NON-SAG SILICONE JOINT SEALER, PECORA 301, OR APPROVED EQUAL.



**REINFORCEMENT SHEET WIRE FABRIC DETAIL**  
NOT TO SCALE

NOTE:  
DIFFERENT WIRE MESH SIZES/CONFIGURATIONS OR SIZES ARE PERMITTED  
IF THE MINIMUM CROSS SECTIONAL AREA EQUALS 0.5 OR GREATER.



**PAVEMENT REINFORCING DETAIL**  
NOT TO SCALE

**REINFORCING NOTES:**

1. END LAPS SHALL BE A MINIMUM OF 12", BUT NOT LESS THAN 30 TIMES THE DIAMETER OF THE LONGITUDINAL WIRE OR BAR.
2. SIDE LAPS SHALL BE A MINIMUM OF 6", BUT NOT LESS THAN 20 TIMES THE DIAMETER OF TRANSVERSE WIRE OR BAR.
3. END AND SIDE CLEARANCES SHALL BE A MAXIMUM OF 6" AND A MINIMUM OF 2".
4. LONGITUDINAL MEMBERS SHALL BE SPACED NOT LESS THAN 4" NOR MORE THAN 12" APART.
5. TRANSVERSE MEMBERS SHALL BE SPACED NOT LESS THAN 4" NOR MORE THAN 24" APART.
6. REINFORCING SHALL CONSIST OF WELDED STEEL WIRE FABRIC CONFORMING TO THE REQUIREMENTS OF ASTM A 185.
7. PAVEMENT REINFORCING SHALL BE INCLUDED IN THE COST OF THE PCC PAVEMENT.



APRON EXPANSION  
AND RELOCATE/  
UPGRADE FUEL  
FACILITY

IDA No: PRG-4144

Contract No. ED018

NO.	DATE	DESCRIPTION		
		LAY	DWN	REV

ISSUE: SEPTEMBER 21, 2018

PROJECT NO: 13A0062D

CAD FILE: C-161-JNT.DWG

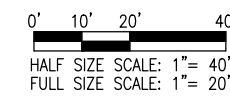
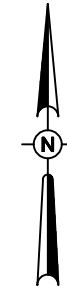
LAYOUT BY: JRH 01/04/2016

DRAWN BY: JRH 01/04/2016

REVIEWED BY: BSS 08/17/2018

SHEET TITLE

JOINTING DETAILS



**LEGEND**

- EXISTING IMPROVEMENTS
- PROPOSED IMPROVEMENTS



**APRON EXPANSION AND RELOCATE/UPGRADE FUEL FACILITY**

IDA No: PRG-4144

Contract No. ED018


NO.	DATE	DESCRIPTION		
		LAY	DWN	REV

ISSUE: SEPTEMBER 21, 2018

PROJECT NO: 13A0062D

CAD FILE: C-151-MRK.DWG

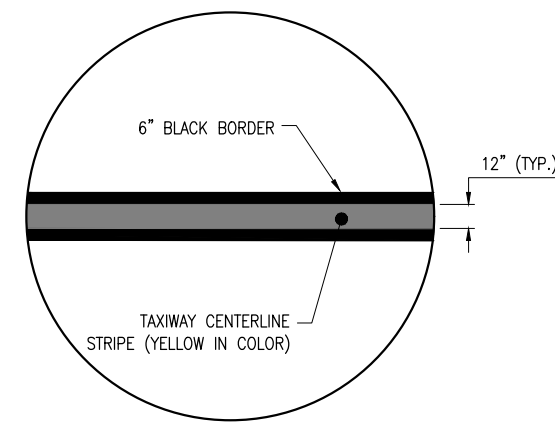
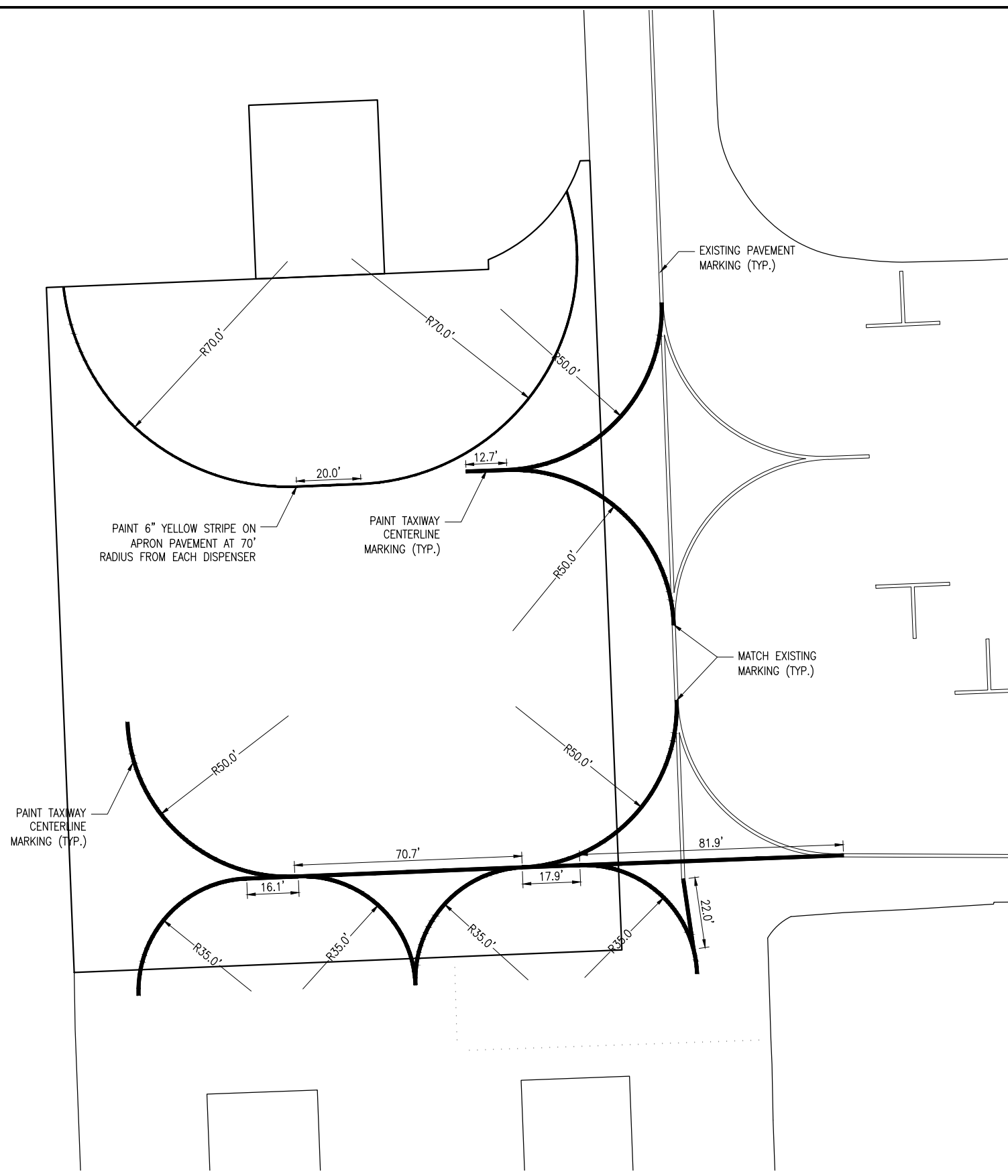
LAYOUT BY: JRH 01/21/16

DRAWN BY: JRH 01/21/16

REVIEWED BY: BSS 08/17/2018

SHEET TITLE

**PROPOSED MARKING PLAN**



**TAXIWAY CENTERLINE DETAIL**  
NOT TO SCALE

**PAVEMENT MARKING NOTES**

1. TYPE B GLASS BEADS SHALL BE REQUIRED FOR ALL YELLOW PERMANENT PAINT MARKINGS. GLASS BEADS ARE NOT REQUIRED FOR TEMPORARY MARKINGS OR BLACK PAINT. REFER TO SPECIFICATION ITEM 620 FOR ADDITIONAL INFORMATION.
2. PAINT SHALL MEET REQUIREMENTS OF TECHNICAL SPECIFICATION 620, WATERBORNE PAINT.
3. IMMEDIATELY PRIOR TO THE APPLICATION OF PAINT, ALL SURFACES SHALL BE DRY AND FREE FROM DIRT, GREASE, OIL, LAITANCE, OR OTHER FOREIGN MATERIAL WHICH WOULD REDUCE THE BOND BETWEEN THE PAINT AND THE PAVEMENT. THIS SHALL INCLUDE PAINTED AREAS ON THE EXISTING PAVEMENTS. REFER TO SPECIFICATION ITEM 620-3.3 FOR ADDITIONAL INFORMATION.
4. EXISTING PAVEMENT MARKINGS OUTSIDE THE LIMITS OF THE MARKINGS SHOWN ON THE MARKING PLAN WHICH ARE REMOVED OR WORN DUE TO CONSTRUCTION ACTIVITY SHALL BE REPAINTED. NO ADDITIONAL COMPENSATION SHALL BE MADE FOR THIS WORK.
5. IF THE CONTRACTOR ELECTS TO "BLOCK PAINT" THE BLACK PAINT AND THEN PAINT YELLOW PAINT OVER THE BLACK PAINT; ONLY THE VISIBLE BLACK PAINT WILL BE ELIGIBLE FOR PAYMENT.

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**APRON EXPANSION  
AND RELOCATE/  
UPGRADE FUEL  
FACILITY**

IDA No: PRG-4144

Contract No. ED018

NO.	DATE	DESCRIPTION
		LAY DWN REV

ISSUE: SEPTEMBER 21, 2018

PROJECT NO: 13A0062D  
CAD FILE: E-001-LGND.DWG  
LAYOUT BY: KNL 01/09/2016  
DRAWN BY: CWS 01/11/2016  
REVIEWED BY: BSS 08/17/2018

SHEET TITLE

**ELECTRICAL LEGEND  
AND ABBREVIATIONS**

ELECTRICAL LEGEND - ONE-LINE DIAGRAM	
	CABLE TERMINATOR/LUG
	TRANSFORMER
	DISCONNECT SWITCH
	FUSIBLE DISCONNECT SWITCH
	CIRCUIT BREAKER
	THERMAL MAGNETIC CIRCUIT BREAKER
	CIRCUIT BREAKER WITH SWITCHED NEUTRAL FEATURE
	FUSE
	TRANSIENT VOLTAGE SURGE SUPPRESSOR OR SURGE PROTECTOR DEVICE
	GROUND - GROUND ROD, GROUNDING ELECTRODE, OR AT EARTH POTENTIAL
	INDICATING LIGHT
	MOTOR
	LOAD, MOTOR, # = HORSEPOWER
	ELECTRIC UTILITY METER BASE
	JUNCTION BOX WITH SPLICE
	EQUIPMENT, XXX = DEVICE DESCRIPTION
	GROUND BUS OR TERMINAL
	NEUTRAL BUS
	PANELBOARD WITH MAIN LUGS
	PANELBOARD WITH MAIN BREAKER
	FUSE PANEL WITH MAIN FUSE PULLOUT
	DUPLEX RECEPTACLE 120V SINGLE PHASE GROUNDING TYPE
	CONTROL STATION
	TRANSFER SWITCH
	ENGINE GENERATOR SET
	CONTACTOR
	COMBINATION CIRCUIT BREAKER/STARTER WITH OVERLOAD PROTECTION. # = NEMA SIZE NO.
	HP RATED MANUAL SWITCH
	THERMAL OVERLOAD PROTECTION

ELECTRICAL LEGEND - SCHEMATIC	
	NORMALLY OPEN (N.O.) CONTACT
	NORMALLY CLOSED (N.C.) CONTACT
	STARTER COIL, * = STARTER NUMBER
	OVERLOAD RELAY CONTACT
	CONTROL RELAY, * = CONTROL RELAY NUMBER
	RELAY, * = RELAY NUMBER
	TOGGLE SWITCH / 2 POSITION SWITCH
	2-POSITION SELECTOR SWITCH
	3-POSITION SELECTOR SWITCH (H-O-A SHOWN)
	2 POLE DISCONNECT SWITCH
	3 POLE DISCONNECT SWITCH
	PHOTOCELL
	TERMINAL BLOCK, * = TERMINAL NUMBER
	DEVICE TERMINAL, * = DEVICE TERMINAL NUMBER
	INTERNAL PANEL WIRING
	FIELD WIRING
	FUSE
	GROUND BUS OR TERMINAL
	NEUTRAL BUS
	GROUND, GROUND ROD, GROUND BUS
	INDUSTRIAL CONTROL RELAY OR LIGHTING CONTACTOR
	S1 CUTOUT HANDLE REMOVED
	S1 CUTOUT HANDLE INSERTED
	N.O. THERMAL SWITCH
	N.C. THERMAL SWITCH
	L-830 SERIES ISOLATION TRANSFORMER

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

ELECTRICAL ABBREVIATIONS (CONTINUED)	
PB	PULL BOX
PC	PHOTO CELL
PDB	POWER DISTRIBUTION BLOCK
PNL	PANEL
RCPT	RECEPTACLE
R	RELAY
S	STARTER
SPD	SURGE PROTECTION DEVICE
SPST	SINGLE POLE SINGLE THROW
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
UG	UNDERGROUND
UGE	UNDERGROUND ELECTRIC
UL	UNDERWRITER'S LABORATORIES
V	VOLTS
W/	WITH
W/O	WITHOUT
WP	WEATHER PROOF
XFER	TRANSFER
XFMR	TRANSFORMER

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

NOTES

- 1. ALL EQUIPMENT AND INSTALLATIONS AT THE FUEL TANK AND DISPENSER SITES SHALL CONFORM TO THE APPLICABLE SECTIONS OF THE FOLLOWING:

NFPA 1 – UNIFORM FIRE CODE.

NFPA 10 – STANDARD FOR PORTABLE FIRE EXTINGUISHERS.

NFPA 30 – FLAMMABLE AND COMBUSTIBLE LIQUIDS CODE (MOST CURRENT ISSUE IN FORCE).

NFPA 30A – CODE FOR MOTOR FUEL DISPENSING FACILITIES AND REPAIR GARAGES (MOST CURRENT ISSUE IN FORCE).

NFPA 70 – NATIONAL ELECTRICAL CODE (NEC) (MOST CURRENT ISSUE IN FORCE).

NFPA 77 – RECOMMENDED PRACTICE ON STATIC ELECTRICITY (MOST CURRENT ISSUE IN FORCE).

NFPA 327, 'STANDARD PROCEDURES FOR CLEANING OR SAFEGUARDING SMALL TANKS AND CONTAINERS'.

NFPA 407 – STANDARD FOR AIRCRAFT FUEL SERVICING (MOST CURRENT ISSUE IN FORCE), INCLUDING APPENDICES FOR DESIGN AND CONSTRUCTION, INSTALLATION, INSPECTION AND TESTING OF FUEL DISTRIBUTION SYSTEM, TANKS, PIPING, AND OTHER COMPONENTS RELATED TO INSTALLATION OF FUEL STORAGE AND DISPENSING SYSTEM.

UL 842, 'STANDARD FOR VALVES FOR FLAMMABLE FLUIDS'.

ANSI/UL 87, 'POWER OPERATED DISPENSING DEVICES FOR PETROLEUM PRODUCTS'.

ANSI/UL 913, 'STANDARD FOR INTRINSICALLY SAFE APPARATUS AND ASSOCIATED APPARATUS FOR USE IN CLASS I, II AND III DIVISION 1 HAZARDOUS (CLASSIFIED) LOCATIONS'.

API BULLETIN 1529 LATEST EDITION, 'AVIATION FUELING HOSE'.

PETROLEUM EQUIPMENT INSTITUTE (PEI) STANDARDS RP-200 AND RP-100-90.

APPLICABLE LOCAL, STATE, AND FEDERAL CODES AND REGULATIONS.

FAA ADVISORY CIRCULAR 150/5230-4B AIRCRAFT FUEL STORAGE, HANDLING, AND DISPENSING ON AIRPORTS.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA).

2006 INTERNATIONAL FIRE CODE, SECTION 312-VEHICLE IMPACT PROTECTION.

ILLINOIS ADMINISTRATIVE CODE, TITLE 8: AGRICULTURE AND ANIMALS, CHAPTER I: DEPARTMENT OF AGRICULTURE, SUBCHAPTER P: WEIGHTS AND MEASURE, PART 600 WEIGHTS AND MEASURES ACT, SUBPART F: LIQUID PETROLEUM MEASURING DEVICES, SECTION 600.660 RETAIL LIQUID PETROLEUM PUMPS ACCURATELY MARKED: LITERS OR GALLONS. THE ILLINOIS BUREAU OF WEIGHTS AND MEASURES CONFIRMED THAT RETAIL FUEL DISPENSING SYSTEMS USED AT AIRPORTS ARE REQUIRED TO COMPLY WITH THIS CODE.

APPLICABLE REGULATIONS, AS SPECIFIED IN ILLINOIS ADMINISTRATIVE CODE, TITLE 41: FIRE PROTECTION, CHAPTER 1, OFFICE OF THE STATE FIRE MARSHALL, STATE OF ILLINOIS, PARTS 160 AND 180.

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

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

- 3. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS NECESSARY FOR A COMPLETE AND OPERATIONAL INSTALLATION OF THE ELECTRICAL EQUIPMENT. THE COMPLETE INSTALLATION AND WIRING SHALL BE DONE IN A NEAT, WORKMANLIKE MANNER. ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 – NATIONAL ELECTRICAL CODE (MOST CURRENT ISSUE IN FORCE), THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS ORDINANCES, AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L. LISTING, ETL LISTING, FM APPROVAL, (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE PERMITTED.
- 4. CONTRACTOR SHALL COORDINATE WORK, ANY POWER OUTAGES, AND ANY DOWNTIME OF EXISTING FACILITIES WITH THE RESPECTIVE FACILITY OWNER PERSONNEL AND THE AIRPORT MANAGER. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY 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)
- 5. ELECTRICAL EQUIPMENT INSTALLED AT THE FUEL TANK & DISPENSER SITES IN CLASSIFIED HAZARDOUS LOCATIONS (CLASS I, DIV. 1 OR 2, GROUP D) SHALL BE SUITABLE FOR THE RESPECTIVE ENVIRONMENT AND SHALL CONFORM TO THE APPLICABLE SECTIONS OF NEC (MOST CURRENT ISSUE) INCLUDING, BUT NOT LIMITED TO ARTICLES 500, 501, 504, 514 AND 515 AS WELL AS ALL MANUFACTURER REQUIREMENTS AND ALL LOCAL CODES, LAWS, ORDINANCES, AND REQUIREMENTS IN FORCE.
- 6. CONTRACTOR SHALL CONFIRM INTERFACE AND WIRING CONNECTIONS TO FUEL DISPENSERS & FUEL MANAGEMENT SYSTEM CONTROLLERS WITH RESPECTIVE EQUIPMENT MANUFACTURER'S REPRESENTATIVE.
- 7. PER NFPA 30A AND NEC ARTICLE 514, MOTOR FUEL DISPENSING DEVICES HAVE CLASSIFIED HAZARDOUS LOCATIONS AS FOLLOWS: ANY PIT OR BOX BELOW GRADE LEVEL, ANY PART OF WHICH IS WITHIN THE DIVISION 1 OR DIVISION 2 LOCATION IS CLASSIFIED AS CLASS I, DIVISION 1, GROUP D LOCATION. WITHIN 18 INCHES HORIZONTALLY IN ALL DIRECTIONS EXTENDING TO GRADE FROM THE DISPENSER ENCLOSURE OR THAT PORTION OF THE DISPENSER ENCLOSURE CONTAINING LIQUID-HANDLING COMPONENTS IS CLASSIFIED AS CLASS I, DIVISION 2, GROUP D LOCATION. UP TO 18 INCHES ABOVE GRADE LEVEL WITHIN 20 FEET HORIZONTALLY OF ANY EDGE OF THE DISPENSER ENCLOSURE IS CLASSIFIED AS CLASS I, DIVISION 2, GROUP D LOCATION. REFER TO NFPA 30A AND NEC ARTICLE 514 FOR ADDITIONAL INFORMATION DEFINING THE CLASSIFIED HAZARDOUS LOCATIONS FOR MOTOR FUEL DISPENSING FACILITIES.
- 8. PER NFPA 30, NFPA 30A AND NEC ARTICLES 514 AND 515, ABOVEGROUND FUEL STORAGE TANKS HAVE CLASSIFIED HAZARDOUS LOCATIONS AS FOLLOWS: AREA INSIDE TANK IS CLASSIFIED AS CLASS I, DIVISION 1, GROUP D LOCATION. WITHIN 10 FEET FROM SHELL, ENDS, OR ROOF OF TANK IS CLASSIFIED AS CLASS I, DIVISION 2, GROUP D LOCATION. WITHIN 5 FEET OF OPEN END OF VENT, EXTENDING IN ALL DIRECTIONS IS CLASSIFIED AS CLASS I, DIVISION 1, GROUP D LOCATION. SPACE BETWEEN 5 FEET AND 10 FEET OF OPEN END OF VENT, EXTENDING IN ALL DIRECTIONS IS CLASSIFIED AS CLASS I, DIVISION 2, GROUP D LOCATION. REFER TO NFPA 30, NFPA 30A AND NEC ARTICLES 514 AND 515 FOR ADDITIONAL INFORMATION DEFINING THE CLASSIFIED HAZARDOUS LOCATIONS FOR FUEL STORAGE TANKS.
- 9. THE EXTENT OF CLASSIFIED HAZARDOUS AREAS FOR TANK VEHICLES SHALL BE AS DEFINED IN NFPA 30, NEC ARTICLE 515, AND THE AUTHORITY OF JURISDICTION. WHEN CLASSIFYING THE EXTENT OF THE HAZARDOUS AREA, CONSIDERATION SHALL BE GIVEN TO THE FACT THAT TANK CARS OR TANK VEHICLES MAY BE SPOTTED AT VARYING POINTS. THEREFORE, THE EXTREMITIES OF THE LOADING OR UNLOADING POSITIONS SHALL BE USED.
- 10. PER NEC 513, AIRCRAFT HANGARS ARE CLASSIFIED AS A CLASS I, DIVISION 2, GROUP D HAZARDOUS LOCATION FOR A LEVEL OF 18 IN. ABOVE THE FLOOR FOR THE ENTIRE AREA OF THE HANGAR. PER NEC 513.3(C) "VICINITY OF AIRCRAFT", THE AREA WITHIN 5 FT HORIZONTALLY FROM AIRCRAFT POWER PLANTS OR AIRCRAFT FUEL TANKS SHALL BE CLASSIFIED AS A CLASS I, DIVISION 2 LOCATION THAT SHALL EXTEND UPWARD FROM THE FLOOR TO A LEVEL 5 FT ABOVE THE UPPER SURFACE OF WINGS AND OF ENGINE ENCLOSURES. ALL ELECTRICAL INSTALLATIONS IN THE HANGAR SHALL CONFORM TO THE APPLICABLE SECTIONS OF NEC 500, 501, AND 513 IN ADDITION TO THE OTHER APPLICABLE SECTIONS OF NEC. WHERE ELECTRICAL EQUIPMENT IS INSTALLED IN A CLASSIFIED HAZARDOUS LOCATION, IT SHALL BE SUITABLE FOR USE IN THE RESPECTIVE CLASSIFIED HAZARDOUS LOCATION. WHERE POSSIBLE, AVOID INSTALLATION OF ELECTRICAL EQUIPMENT, RACEWAYS, AND WIRING IN THE CLASSIFIED HAZARDOUS AREAS OF HANGARS.
- 11. NFPA 30A REQUIRES THAT FUEL DISPENSING SYSTEMS SHALL BE PROVIDED WITH ONE OR MORE CLEARLY IDENTIFIED EMERGENCY SHUTOFF DEVICES OR ELECTRICAL DISCONNECTS. SUCH DEVICES OR DISCONNECTS SHALL BE INSTALLED IN APPROVED LOCATIONS BUT NOT LESS THAN 20 FT. OR MORE THAN 100 FT. FROM THE FUEL DISPENSING DEVICES THAT THEY SERVE. EMERGENCY SHUTOFF DEVICES OR ELECTRICAL DISCONNECTS SHALL DISCONNECT POWER TO ALL DISPENSING DEVICES; TO ALL ASSOCIATED POWER, CONTROL, AND SIGNAL CIRCUITS; AND TO ALL OTHER ELECTRICAL EQUIPMENT IN THE HAZARDOUS (CLASSIFIED) LOCATIONS SURROUNDING THE FUEL DISPENSING DEVICES. WHEN MORE THAN ONE EMERGENCY SHUTOFF DEVICE OR ELECTRICAL DISCONNECT IS PROVIDED, ALL DEVICES SHALL BE INTERCONNECTED. RESETTING FROM AN EMERGENCY SHUTOFF CONDITION SHALL REQUIRE MANUAL INTERVENTION AND THE MANNER OF RESETTING SHALL BE APPROVED BY THE AUTHORITY HAVING JURISDICTION. AT UNATTENDED SELF-SERVICE MOTOR FUEL DISPENSING FACILITIES ADDITIONAL EMERGENCY CONTROLS SHALL BE INSTALLED ON EACH GROUP OF DISPENSERS OR THE OUTDOOR EQUIPMENT USED TO CONTROL THE DISPENSERS, (PER

NEC 514.11 (C)). AT UNATTENDED MOTOR FUEL DISPENSING FACILITIES, THE DEVICES OR DISCONNECTS SHALL BE READILY ACCESSIBLE TO PATRONS AND AT LEAST ONE DEVICE OR DISCONNECT SHALL BE READILY ACCESSIBLE TO EACH GROUP OF DISPENSING DEVICES ON AN INDIVIDUAL ISLAND. EMERGENCY FUEL SHUT OFF STATIONS SHALL ALSO COMPLY WITH NFPA 407 AND SHALL BE PLACARDED "EMERGENCY FUEL SHUTOFF" IN LETTERS AT LEAST 2 IN. HIGH. CONTRACTOR SHALL CONFIRM REQUIREMENTS WITH THE AUTHORITY OF JURISDICTION. FUEL SHUTOFF ALARM NOTIFICATION REQUIREMENTS SHALL BE PER THE AUTHORITY OF JURISDICTION.

- 12. TELEPHONE AND COMMUNICATIONS CABLE TO THE FUEL DISPENSING SYSTEM SHALL BE INSTALLED IN GALVANIZED RIGID STEEL CONDUIT. TELEPHONE AND COMMUNICATION CABLES SHALL MAINTAIN SEPARATION FROM POWER WIRING. TELEPHONE AND COMMUNICATION CABLES SHALL NOT BE INSTALLED IN THE SAME RACEWAY, CONDUIT, DUCT, JUNCTION BOX OR HANDHOLE WITH POWER CIRCUITS. PROVIDE EXPLOSION PROOF CONDUIT SEAL OFFS WHERE ENTERING/LEAVING THE HAZARDOUS LOCATION BOUNDARY & WHERE RE-EMERGING FROM GRADE AFTER LEAVING THE HAZARDOUS LOCATION.
- 13. POWER AND CONTROL CABLE AT THE FUEL FACILITY SHALL BE INSTALLED IN GALVANIZED RIGID STEEL CONDUIT. PROVIDE EXPLOSION PROOF CONDUIT SEAL OFF FITTINGS IN CONFORMANCE WITH THE APPLICABLE ARTICLES OF NEC CHAPTER 5 – SPECIAL OCCUPANCIES, THE RESPECTIVE EQUIPMENT MANUFACTURER'S INSTRUCTIONS, AND AS DETAILED HEREIN.
- 14. GROUNDING OF DISPENSER TO THE AIRCRAFT AND AIRCRAFT TO THE GROUND MUST BE PROVIDED DURING ALL FUELING OPERATIONS. GROUNDING CABLES MUST BE CONTAINED ON RETRACTABLE REELS AND CONNECTED TO THE GROUND RING/GROUNDING ELECTRODE SYSTEM.
- 15. ALL FUELING LOCATIONS SHALL HAVE "NO SMOKING, STOP ENGINES" AND "PRIOR TO FUELING TURN OFF ALL ELECTRICAL OR HEATING DEVICES" AND "ALL PASSENGERS MUST DEPLANE" SIGNS WITH LETTERS AT LEAST FOUR INCHES (4") HIGH.
- 16. BOLLARDS SHALL BE FURNISHED & INSTALLED AROUND THE FUEL FACILITY TO PROTECT IT FROM VEHICLE IMPACT IN ACCORDANCE WITH 2006 INTERNATIONAL FIRE CODE, SECTION 312-VEHICLE IMPACT PROTECTION AND THE DETAILS HEREIN ON THE PLANS.
- 17. EACH PUMP MOTOR CONTROLLER SHALL BE PROVIDED WITH A DISCONNECTING MEANS LOCATED IN SITE FROM THE CONTROLLER LOCATION TO COMPLY WITH NEC 430.102. EACH PUMP MOTOR SHALL BE PROVIDED WITH A DISCONNECTING MEANS LOCATED IN SITE FROM THE MOTOR LOCATION TO COMPLY WITH NEC 430.102. THE CONTROLLER DISCONNECTING MEANS SHALL BE PERMITTED TO SERVE AS THE DISCONNECTING MEANS FOR THE MOTOR IF IT IS IN SIGHT FROM THE MOTOR LOCATION AND THE DRIVEN MACHINERY LOCATION.
- 18. CONDUIT SEALS SUITABLE FOR CLASS I, DIVISION 1, GROUP D LOCATION SHALL BE INSTALLED IN CONFORMANCE WITH NEC 501, 514, AND 515 AND SHALL BE REQUIRED FOR, BUT NOT LIMITED TO:
  - A.) ALL CONDUITS EMERGING FROM GRADE AT THE FUEL TANK & DISPENSER SITES IN CLASS I, DIVISION 1 OR 2, GROUP D LOCATIONS, AND SHALL BE THE FIRST FITTING AFTER THE CONDUIT EMERGES FROM GRADE.
  - B.) IN EACH CONDUIT RUN ENTERING AN ENCLOSURE (LOCATED IN A HAZARDOUS AREA) FOR SWITCHES, CIRCUIT BREAKERS, FUSES, RELAYS, RESISTORS OR OTHER APPARATUS WHICH MAY PRODUCE ARCS, SPARKS, OR HIGH TEMPERATURES, (WITHIN 18" FROM SUCH ENCL.). FACTORY SEALED DEVICES DO NOT REQUIRE CONDUIT SEALS IF CONDUIT ENTERING SUCH DEVICE IS 1 1/2" OR SMALLER.
  - C.) ALL CONDUITS EMERGING FROM GRADE IN A NON-HAZARDOUS LOCATION THAT ARE TO OR FROM A CLASSIFIED HAZARDOUS LOCATION AND SHALL BE THE FIRST AFTER THE CONDUIT EMERGES FROM GRADE.
  - D.) EACH CONDUIT RUN PASSING FROM A CLASS I, DIVISION 1 OR 2 LOCATION INTO AN UNCLASSIFIED LOCATION. THE SEALING FITTING SHALL BE PERMITTED ON EITHER SIDE OF THE BOUNDARY OF SUCH LOCATION WITHIN 10 FEET OF THE BOUNDARY
  - E.) IN ACCORDANCE WITH THE FUEL SYSTEM CONTROLLER MANUFACTURER'S INSTRUCTIONS.
- 19. ALL MOTOR FRAMES SHALL HAVE AUXILIARY EXTERNAL GROUND BONDING CONDUCTORS (#4 COPPER MINIMUM) INSTALLED BETWEEN THE FRAME AND CONDUIT SYSTEM.
- 20. COLOR CODE PHASE AND NEUTRAL CONDUCTOR INSULATION FOR NO. 6 AWG OR SMALLER. PROVIDE COLORED INSULATION OR COLORED MARKING TAPE FOR PHASE AND NEUTRAL CONDUCTORS FOR NO. 4 AWG AND LARGER. INSULATED GROUND CONDUCTORS SHALL HAVE GREEN COLORED INSULATION FOR ALL CONDUCTOR AWG AND/OR KCMIL TO COMPLY WITH NEC 250.119. NEUTRAL CONDUCTORS SHALL HAVE WHITE COLOR INSULATION FOR NO. 6 AWG OR SMALLER TO MEET THE REQUIREMENTS OF NEC 200.6. STANDARD COLORS FOR POWER WIRING AND BRANCH CIRCUITS SHALL BE AS FOLLOWS:
  - 120/240 VAC, 1 PHASE, 3 WIRE
  - PHASE A –BLACK
  - PHASE B –RED
  - NEUTRAL –WHITE
  - GROUND –GREEN
- 21. ALL ENCLOSURES RATED NEMA 4, 4X SHALL HAVE WATERTIGHT HUBS AT CONDUIT ENTRANCES U.L. LISTED NEMA 4, 4X FOR THE RESPECTIVE ENCLOSURE, TO MAINTAIN THE NEMA 4, 4X RATING.



**APRON EXPANSION AND RELOCATE/ UPGRADE FUEL FACILITY**

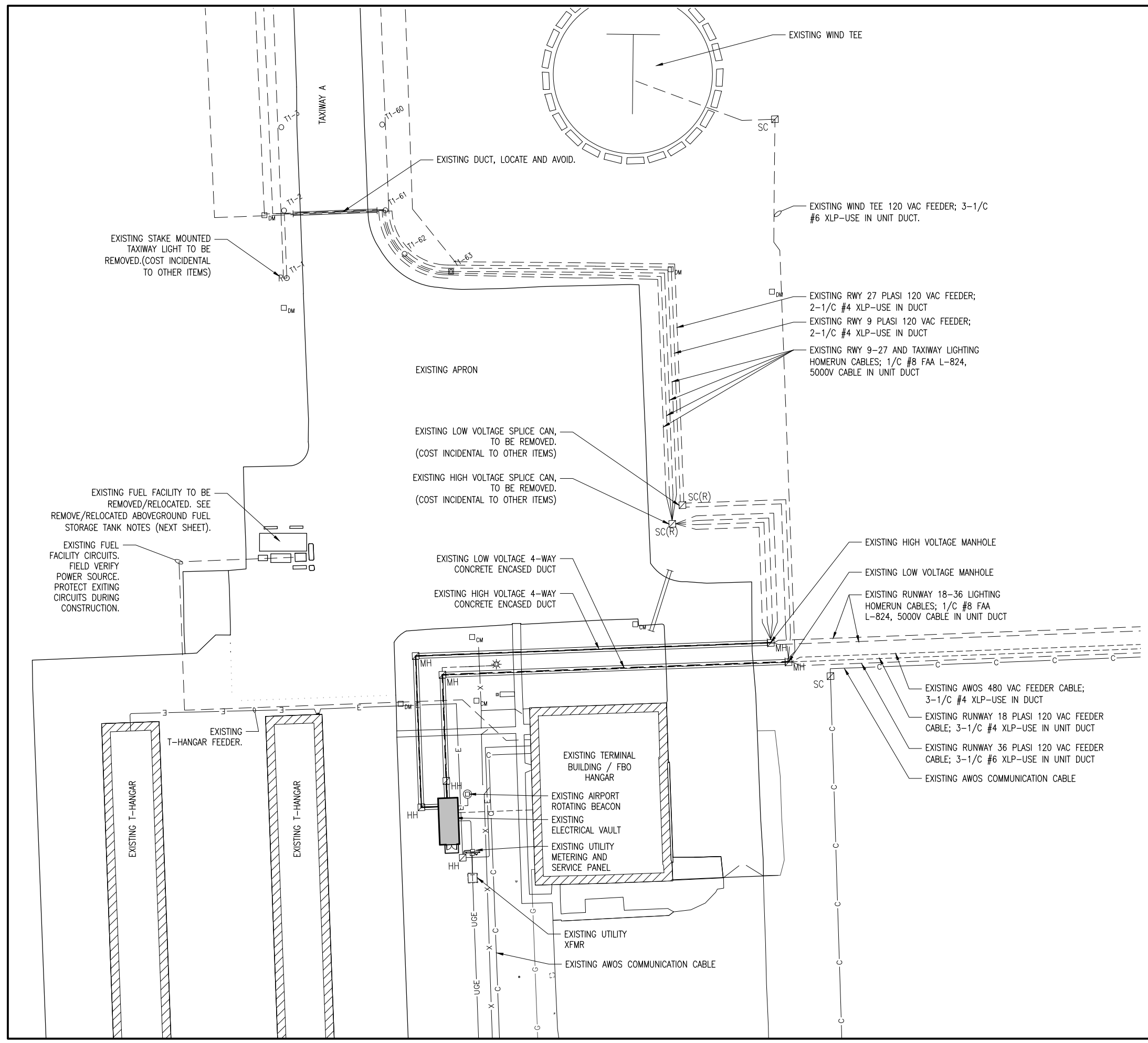
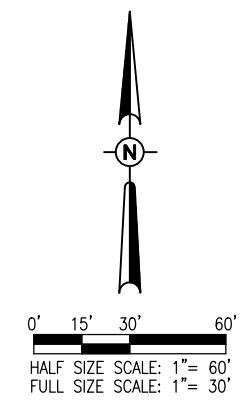
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Contract No. ED018

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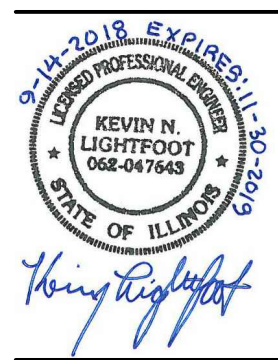
**REGULATORY REQUIREMENTS AND NOTES**

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**LEGEND**

- EXISTING PAVEMENT
- EXISTING ELECTRICAL DUCT
- EXISTING ELECTRICAL CABLES
- EXISTING ELECTRICAL CABLE
- EXISTING COMMUNICATION CABLE
- EXISTING GAS LINE
- EXISTING UG ELECTRIC UTILITY PRIMARY
- EXISTING FENCE
- EXISTING STAKE MOUNTED TAXIWAY LIGHT
- EXISTING BASE MOUNTED TAXIWAY LIGHT
- EXISTING STAKE MOUNTED TAXIWAY LIGHT TO BE REMOVED
- EXISTING ELECTRICAL STRUCTURE (MANHOLE, HANDHOLE, SPLICE CAN)
- EXISTING ELECTRICAL STRUCTURE (MANHOLE, HANDHOLE, SPLICE CAN)
- EXISTING SPLICE CAN TO BE REMOVED.
- EXISTING SPLICE CAN TO BE REMOVED.
- EXISTING ELECTRICAL MARKER (DUCT MARKER, CABLE MARKER)
- EXISTING ELECTRICAL MARKER (DUCT MARKER, CABLE MARKER)



**APRON EXPANSION AND RELOCATE/UPGRADE FUEL FACILITY**

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SHEET TITLE

**EXISTING ELECTRICAL PLAN**



**APRON EXPANSION  
AND RELOCATE/  
UPGRADE FUEL  
FACILITY**

IDA No: PRG-4144

Contract No. ED018


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SHEET TITLE

**NOTES FOR EXISTING  
ELECTRICAL PLAN**

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

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

**AIRFIELD LIGHTING REMOVAL NOTES**

1. ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT DIRECTOR/MANAGER. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
2. CONTRACTOR SHALL EXAMINE THE SITE TO DETERMINE THE EXTENT OF THE WORK. CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL FIELD VERIFY RESPECTIVE CIRCUITS AND POWER SOURCES PRIOR TO REMOVING, DISCONNECTING, OR WORKING ON THE RESPECTIVE AIRFIELD LIGHTING, TAXI SIGN, NAVAID, OR OTHER DEVICE.
3. CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF FAA AC NO. 150/5370-2G (OR MOST CURRENT ISSUE) "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION".
4. CONTRACTOR SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF NFPA 70E - STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE.
5. THE EXISTING AIRFIELD (TAXIWAY) LIGHTS AND THEIR ISOLATED TRANSFORMERS DESIGNATED FOR REMOVAL SHALL BE REMOVED AND TURNED OVER TO THE AIRPORT. THE CONCRETE LIGHT BASES SHALL BE REMOVED AND DISPOSED OF OFF THE AIRPORT SITE IN A LEGAL MANNER. REMOVAL OF THE EXISTING AIRFIELD LIGHTS WILL BE INCIDENTAL TO THE CONTRACT.
6. THE EXISTING SPLICE CANS DESIGNATED FOR REMOVAL SHALL BE REMOVED AND DISPOSED OF, OFF THE AIRPORT SITE IN A LEGAL MANNER. REMOVAL OF THE EXISTING SPLICE CANS WILL BE INCIDENTAL TO THE CONTRACT.
7. THE EXISTING AIRFIELD LIGHTING CABLES ASSOCIATED WITH AIRFIELD LIGHTING REMOVALS SHALL BE ABANDONED IN PLACE UNLESS IT CONFLICTS WITH THE INSTALLATION OF A PROPOSED LIGHT OR CABLE, PAVEMENT, OR OTHER WORK, THEN IT SHALL BE REMOVED AND DISPOSED OF OFF SITE AT NO ADDITIONAL COST TO THE CONTRACT. CONTRACTOR MAY REMOVE ABANDONED CABLES AT NO ADDITIONAL COST TO THE CONTRACT AND SHALL HAVE THE SALVAGE RIGHTS TO ABANDONED CABLES.
8. ALL ABOVEGROUND JUMPERS SHALL BE IN A DUCT WITH ALL CONNECTIONS SEALED. THE CONTRACTOR SHALL SECURE, IDENTIFY AND PLACE ALL TEMPORARY EXPOSED WIRING IN CONDUIT, DUCT, OR UNIT DUCT TO PREVENT ELECTROCUTION AND FIRE IGNITION SOURCES AS PER THE REQUIREMENTS OF FAA 150/5370-2G, 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 ALLOWED.
9. THE CONTRACTOR IS REQUIRED TO FILL IN ALL HOLES AND DEPRESSIONS RESULTING FROM THE LIGHT AND/OR BASE REMOVAL WITH EARTH MATERIAL. THE AREAS SHALL BE COMPACTED TO PREVENT FUTURE SETTLEMENT AND FERTILIZED, SEEDED, AND MULCHED IN ACCORDANCE WITH ITEMS 901 AND 908 RESPECTIVELY.
10. CONTRACTOR SHALL CONFIRM RESPECTIVE LIGHTS, SPLICE CANS, AND OTHER ITEMS TO BE REMOVED WITH RESIDENT ENGINEER/RESIDENT TECHNICIAN PRIOR TO REMOVAL.
11. NO CONNECTION TO AN ACTIVE LIGHTING CIRCUIT SHALL BE BROKEN UNTIL THE CIRCUIT HAS BEEN TURNED OFF IN ACCORDANCE WITH THE ABOVE NOTE 1.

**REMOVE / RELOCATE ABOVEGROUND FUEL STORAGE TANK NOTES**

1. THE EXISTING 10,000 GALLON ABOVEGROUND FUEL STORAGE TANK FOR THE JET FUEL SHALL BE RELOCATED TO THE NEW FUEL FACILITY SITE. THE EXISTING JET FUEL DISPENSER SHALL BE DISCONNECTED, REMOVED, AND DISPOSED OF IN ACCORDANCE WITH THE SPECIAL PROVISION SPECS. A NEW JET FUEL DISPENSER WITH A 75 FT HOSE SHALL BE FURNISHED, INSTALLED, AND INTERFACED TO THE RELOCATED JET FUEL TANK. THE EXISTING JET FUEL TANK NAMEPLATE DATA IS AS FOLLOWS:  
MODERN WELDING COMPANY  
FIREGUARD, UL-2085 SECONDARY CONTAINMENT ABOVEGROUND STORAGE TANK FOR FLAMMABLE LIQUIDS  
MFG DATE: MONTH 5, YEAR 2006  
MODEL NUMBER: MWCFG-96" DIAMETER - 10,000 GALLONS CAPACITY  
TANK WEIGHT: 25,000 POUNDS.
2. THE EXISTING 1,000 GALLON AND 2,000 GALLON ABOVEGROUND FUEL STORAGE TANKS FOR AVGAS AND THE DISPENSER SHALL BE DISCONNECTED, REMOVED, AND DISPOSED OF IN ACCORDANCE WITH THE SPECIAL PROVISION SPECS.
3. THE EXISTING DIESEL FUEL ABOVEGROUND FUEL STORAGE TANK WILL BE RELOCATED BY THE AIRPORT.
4. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL PERTINENT PERMITS REQUIRED FOR THE RELOCATION, REMOVAL, HAULING AND DISPOSAL OF THESE STORAGE TANKS.
5. THE STATE FIRE MARSHAL'S OFFICE SHALL BE CONTACTED PRIOR TO REMOVAL OF THE TANKS AND THE TANKS SHALL NOT BE REMOVED FROM THE SITE WITHOUT PRIOR APPROVAL FROM THE STATE FIRE MARSHAL'S OFFICE.
6. THE REMOVAL AND DISPOSAL OF THE ABOVEGROUND TANKS, FUEL DISPENSERS, ASSOCIATED EQUIPMENT, MATERIALS, PIPING AND ELECTRICAL WILL BE CONSIDERED INCIDENTAL TO THE "REMOVE EXISTING FUELING FACILITY" ITEM AND NO ADDITIONAL COMPENSATION WILL BE PROVIDED.
7. THE RELOCATION OF THE EXISTING JET FUEL ABOVEGROUND FUEL STORAGE TANK WILL BE CONSIDERED INCIDENTAL TO THE "RELOCATE EXISTING FUEL TANK" ITEM.
8. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS.
9. POWER FOR THE RESPECTIVE FUEL SYSTEM EQUIPMENT AND/OR OTHER EQUIPMENT ASSOCIATED WITH THE FUEL STORAGE AND DISPENSING SYSTEMS SHALL BE DISCONNECTED AT THE RESPECTIVE POWER SOURCE PRIOR TO REMOVING THE RESPECTIVE EQUIPMENT.
10. CONTRACTOR SHALL COORDINATE WORK AND ANY POWER OUTAGES WITH THE AIRPORT MANAGER AND/OR THE AIRPORT REPRESENTATIVE. ANY SHUTDOWN OF EXISTING SYSTEMS SHALL BE SCHEDULED WITH AND APPROVED BY THE AIRPORT MANAGER AND/OR THE AIRPORT REPRESENTATIVE 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).
11. CONTRACTOR SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF NFPA 70E - STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE.
12. THE EXISTING FIRE EXTINGUISHERS LOCATED AT THE FUEL FACILITY SHALL BE TURNED OVER TO THE AIRPORT.





**APRON EXPANSION AND RELOCATE/UPGRADE FUEL FACILITY**

IDA No: PRG-4144

Contract No. ED018

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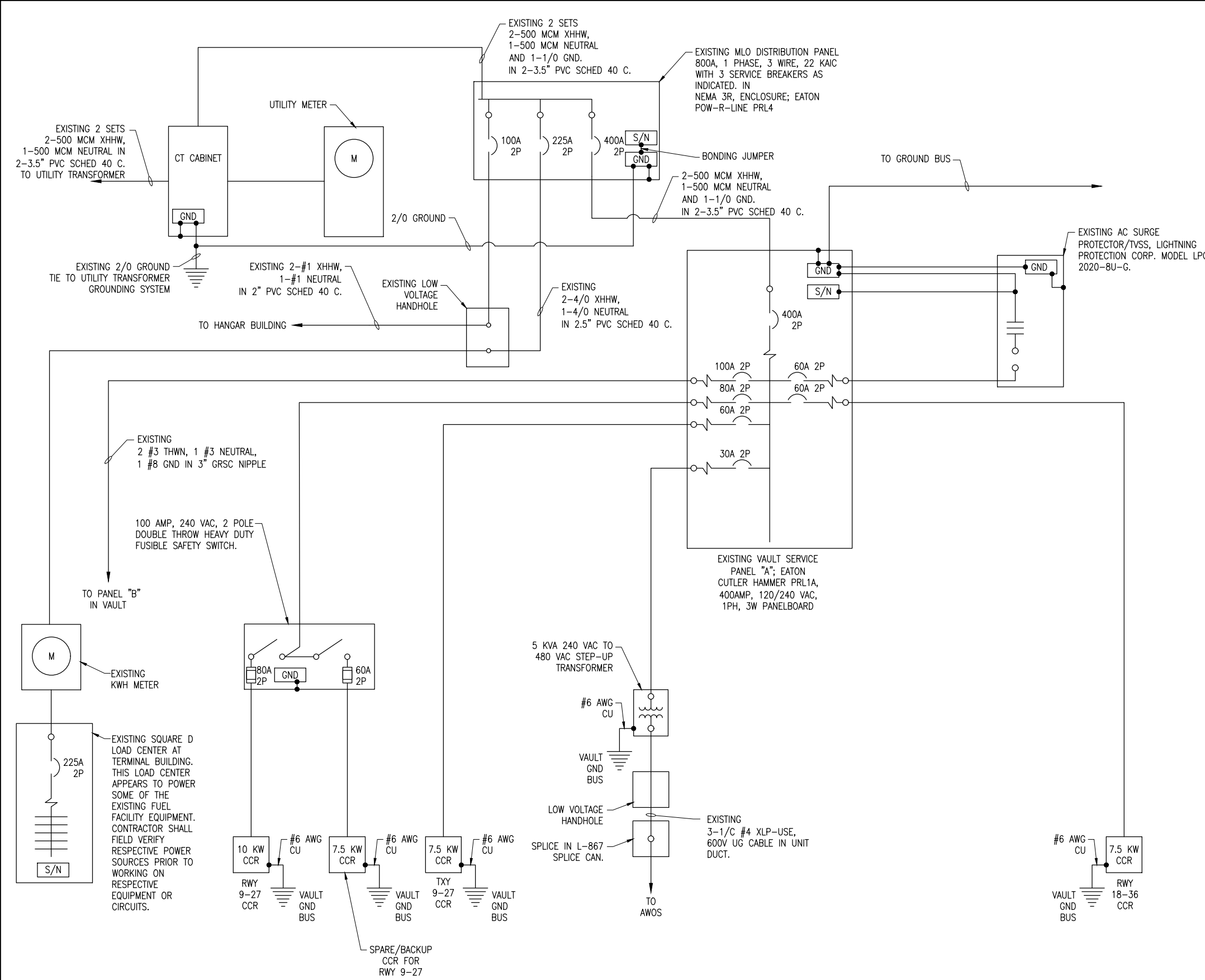
REVIEWED BY: BSS 08/17/2018

SHEET TITLE

**EXISTING ELEC ONELINE FOR VAULT & AIRFIELD**

**NOTES:**

- CONTRACTOR SHALL EXAMINE THE SITE TO DETERMINE EXISTING CONDITIONS.
- ALL POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING AIRFIELD LIGHTING OR OTHER SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER AND/OR AIRPORT REPRESENTATIVE. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF FAA AC NO. 150/5370-2G (OR MOST CURRENT ISSUE) "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION".
- CONTRACTOR SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF NFPA 70E - STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE.
- 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.
- MEGGER TEST AND RECORD EXISTING SERIES CIRCUITS PRIOR TO CABLE WORK AND AGAIN AFTER APRON WORK, AIRFIELD WORK, ADDITIONS, AND/OR UPGRADES HAVE BEEN COMPLETED. ALSO TEST AND RECORD SERIES CIRCUIT LOOP RESISTANCE.
- EACH CCR SHALL BE TESTED FOR PROPER OPERATION BEFORE AIRFIELD AND/OR APRON WORK BEGINS AND AGAIN AFTER AIRFIELD WORK, APRON WORK AND FUEL SYSTEM WORK IS COMPLETED.
- SEE "REGULATORY REQUIREMENTS AND NOTES" SHEET FOR GENERAL NOTES AND REQUIREMENTS.
- ALL EXISTING AIRFIELD LIGHTING SYSTEMS, NAVAIDS, APRON LIGHTING, AND/OR OTHER AIRPORT FACILITIES (THAT ARE NOT SCHEDULED FOR REMOVAL OR REPLACEMENT) SHALL BE OPERABLE DURING NIGHTFALL WHEN THE RESPECTIVE RUNWAY IS OPEN FOR OPERATION UNLESS OTHERWISE APPROVED BY THE AIRPORT MANAGER AND/OR OTHERWISE DETAILED HEREIN. CONTRACTOR SHALL PROVIDE ALL TEMPORARY WORK AS NECESSARY TO MAINTAIN OPERATION OF THE AIRFIELD LIGHTING SYSTEMS AT NIGHTFALL. CONTRACTOR SHALL COORDINATE TRANSFER OF EXISTING AIRFIELD CIRCUITS TO MINIMIZE DOWNTIME.
- THE EXISTING FEEDER CIRCUITS FOR RWY 9 PLASI, RWY 27 PLASI, AND THE WIND TEE WILL REQUIRE LOCATING, INTERCEPTING, RELOCATION, AND SPLICING/INTERFACE OF NEW FEEDER SEGMENTS TO EXISTING CIRCUITS TO ACCOMMODATE APRON WORK.
- THE EXISTING HOMERUN CIRCUITS FOR RWY 9-27 AND TAXIWAY WILL REQUIRE LOCATING, INTERCEPTING, RELOCATION, AND SPLICING/INTERFACE OF NEW HOMERUN SEGMENTS TO EXISTING HOMERUN CIRCUITS TO ACCOMMODATE APRON WORK.
- EXISTING FUEL DISPENSING EQUIPMENT SHALL BE DISCONNECTED. THE EXISTING 10,000 GALLON JET FUEL TANK SHALL BE RELOCATED AND PROVIDED WITH NEW DISPENSER. THE REMAINING FUEL TANKS AND DISPENSERS SHALL BE DISCONNECTED, REMOVED AND DISPOSED OF OFF THE AIRPORT SITE IN A LEGAL MANNER. THE AIRPORT HAS SALVAGE RIGHTS TO EQUIPMENT.



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



**APRON EXPANSION  
AND RELOCATE/  
UPGRADE FUEL  
FACILITY**

IDA No: PRG-4144

Contract No. ED018


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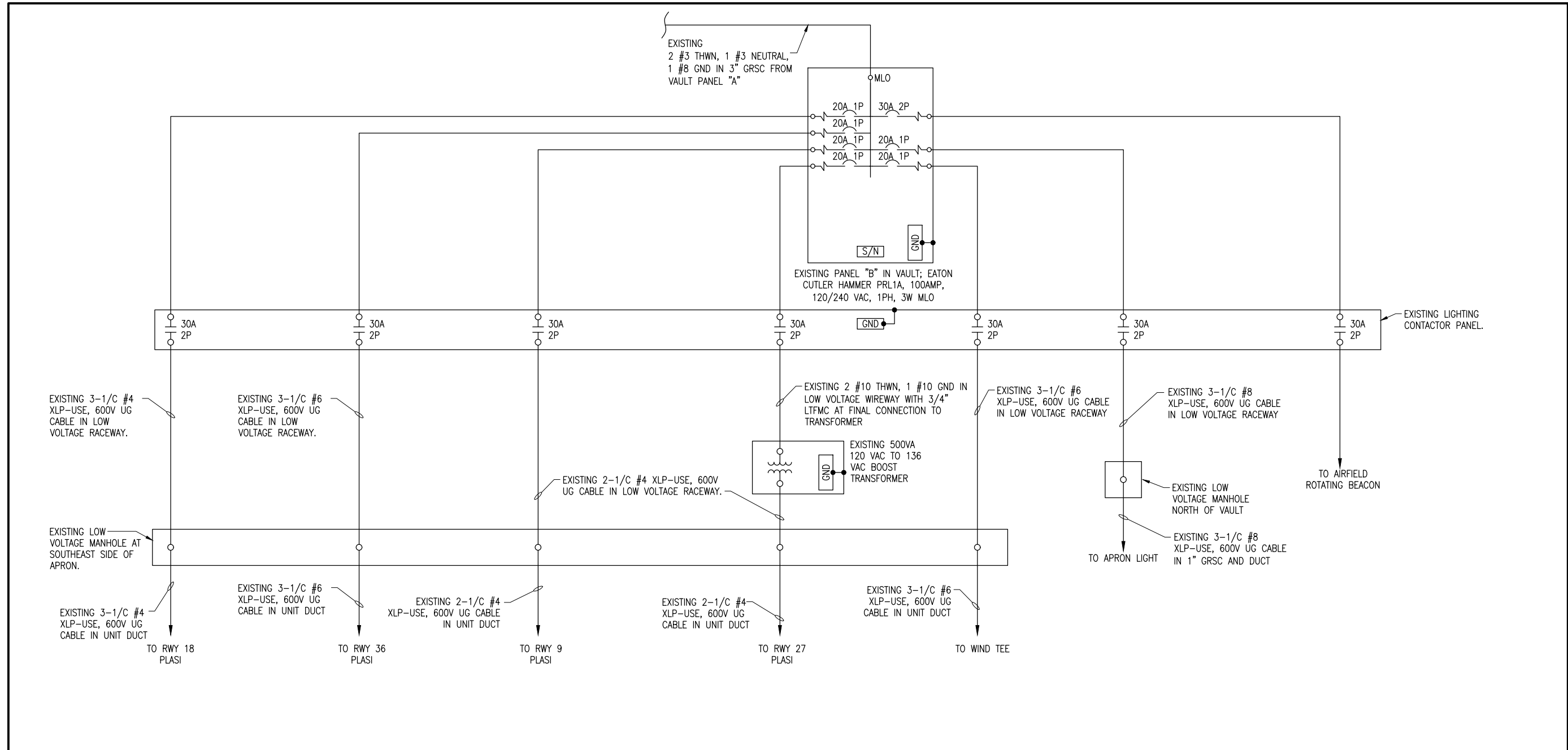
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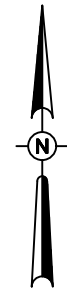
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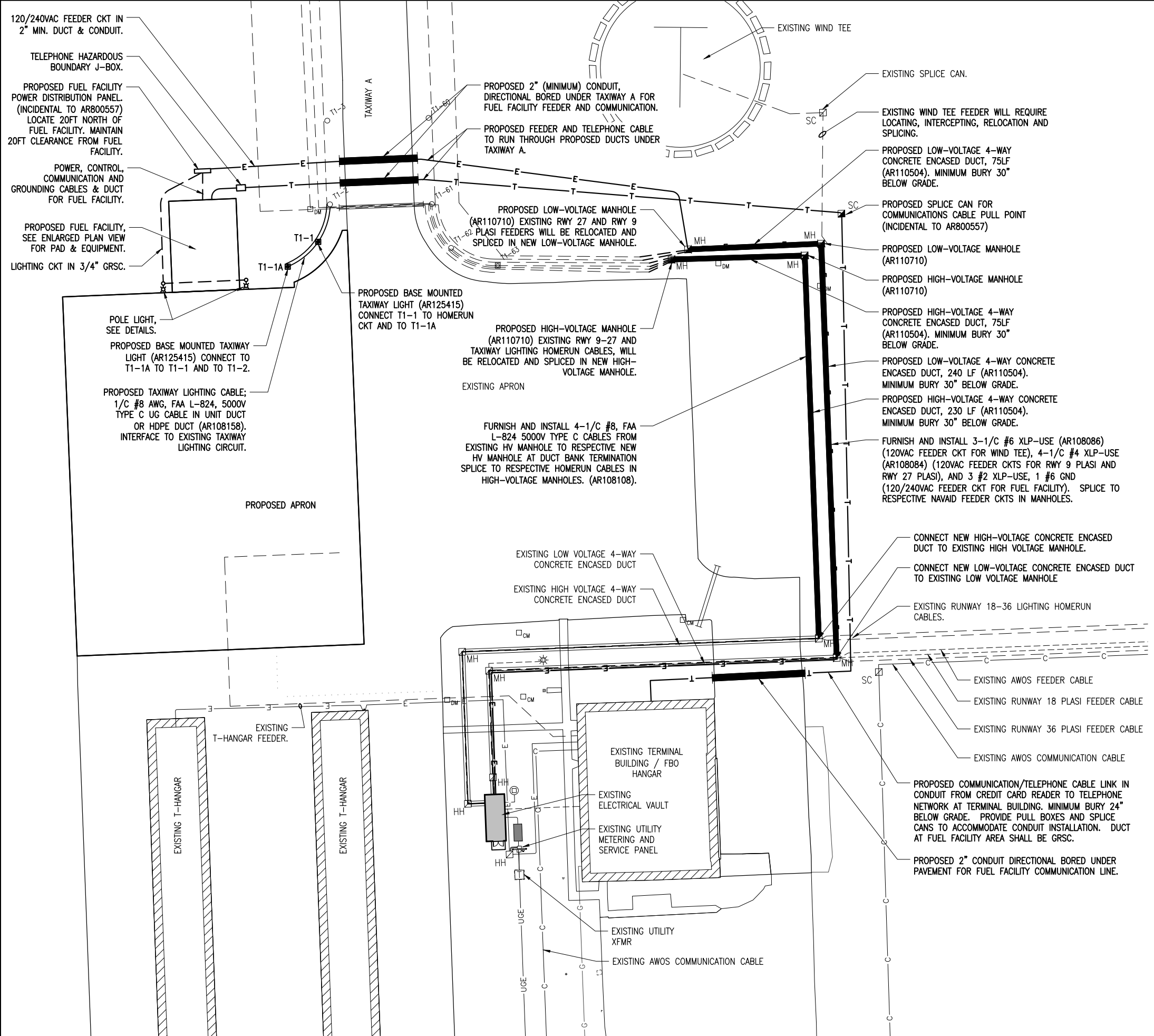
**EXISTING ELEC  
ONELINE FOR VAULT  
& AIRFIELD -  
CONTINUATION**



**EXISTING ELECTRICAL ONE-LINE DIAGRAM  
FOR VAULT AND AIRFIELD CONTINUATION**



0' 15' 30' 60'  
HALF SIZE SCALE: 1" = 60'  
FULL SIZE SCALE: 1" = 30'



**LEGEND**

- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- EXISTING ELECTRICAL DUCT
- PROPOSED ELECTRICAL DUCT
- EXISTING ELECTRICAL CABLES
- EXISTING UG ELECTRIC UTILITY PRIMARY
- PROPOSED 1/C #8 AWG, FAA L-824, 5000 VOLT TYPE C UG CABLE IN UNIT DUCT
- PROPOSED ELECTRICAL FEEDER
- PROPOSED TELEPHONE / COMMUNICATION LINE
- EXISTING AWOS COMMUNICATION CABLE
- EXISTING STAKE MOUNTED TAXIWAY LIGHT
- EXISTING BASE MOUNTED TAXIWAY LIGHT
- PROPOSED BASE MOUNTED TAXIWAY LIGHT
- EXISTING ELECTRICAL STRUCTURE (HANDHOLE, SPLICE CAN)
- PROPOSED ELECTRICAL STRUCTURE (MANHOLE, HANDHOLE, SPLICE CAN)
- EXISTING ELECTRICAL MARKER (DUCT MARKER, CABLE MARKER)

**NOTE:**  
PROPOSED CABLES, CONDUITS, DUCTS, SPLICE CANS, POLE LIGHTS, AND ASSOCIATED WORK RELATED TO THE ELECTRICAL AND COMMUNICATIONS SYSTEMS FOR THE PROPOSED FUELING FACILITY SHALL BE INCLUDED IN THE COSTS FOR ITEM AR800557, SITE WORK FOR FUELING FACILITY.



**APRON EXPANSION AND RELOCATE/UPGRADE FUEL FACILITY**

IDA No: PRG-4144

Contract No. ED018


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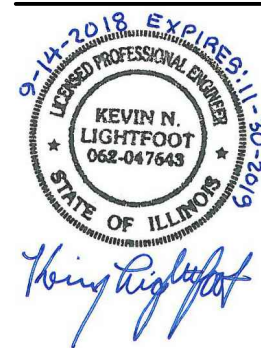
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SHEET TITLE

**PROPOSED ELECTRICAL PLAN**



APRON EXPANSION  
AND RELOCATE/  
UPGRADE FUEL  
FACILITY

IDA No: PRG-4144

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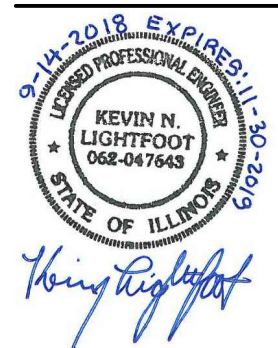
NOTES FOR  
PROPOSED  
ELECTRICAL PLAN

AIRFIELD LIGHTING NOTES

- ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT DIRECTOR/MANAGER. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL FIELD VERIFY RESPECTIVE CIRCUITS AND POWER SOURCES PRIOR TO REMOVING OR DISCONNECTING THE RESPECTIVE AIRFIELD LIGHTING, NAVAID, OR OTHER DEVICE.
- PROPOSED AIRFIELD LIGHTS, TAXIWAY LIGHTS, OTHER AIRFIELD LIGHTING, SPLICE CANS, HANDHOLES, MANHOLES, ELECTRICAL DUCTS, AND CABLE SHALL BE INSTALLED AT THE LOCATIONS SHOWN AND IN COMPLIANCE WITH THE SPECIFICATIONS, SPECIAL PROVISIONS, RESPECTIVE DETAILS, AND MANUFACTURER'S RECOMMENDATIONS.
- PROPOSED CABLE FOR RUNWAY AND TAXIWAY LIGHTING SHALL BE INSTALLED APPROXIMATELY 12' TO 15' FROM THE PAVEMENT EDGE. CABLES SHALL BE PLACED A MINIMUM OF 18" BELOW FINISHED GRADE.
- THE PROPOSED RUNWAY AND TAXIWAY LIGHTING CABLE SHALL BE 1/C, #8 AWG, FAA L-824, 5000 VOLT, TYPE C UNDERGROUND CABLE INSTALLED IN DUCT OR IN UNIT DUCT.
- IN AREAS WHERE THERE IS A CONGESTION OF CABLES OR WHERE THE PROPOSED CABLE CROSSES AN EXISTING CABLE, THE CONTRACTOR IS REQUIRED TO HAND DIG THE TRENCH NECESSARY FOR THE PROPOSED CABLE. AT OTHER LOCATIONS, THE PROPOSED CABLE MAY BE TRENCHED OR PLOWED INTO PLACE. HAND DIGGING, TRENCHING AND/OR PLOWING WILL BE CONSIDERED INCIDENTAL TO THE PROPOSED CABLES AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- THE PROPOSED TAXIWAY LIGHT FIXTURES SHALL CONFORM TO ADVISORY CIRCULAR 150/5345-46 (CURRENT ISSUE IN EFFECT) AND BE FAA APPROVED FOR TYPE L-861T WITH QUARTZ LAMPS. ALL PROPOSED TAXIWAY LIGHTS WILL BE FITTED WITH 360° BLUE LENSES.
- ALL PROPOSED AIRFIELD LIGHTS SHALL BE TAGGED BY THE CONTRACTOR IN ACCORDANCE WITH THE LIGHT NUMBERS SHOWN ON THESE CONSTRUCTION DRAWINGS.
- THE CONTRACTOR SHALL SECURE, IDENTIFY AND PLACE ALL TEMPORARY EXPOSED WIRING IN CONDUIT, DUCT OR UNIT DUCT TO PREVENT ELECTROCUTION AND FIRE IGNITION SOURCES AS PER THE REQUIREMENTS OF FAA AC 150/5370-2G, OPERATIONAL 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 ALLOWED.
- HOMERUN CABLES FOR A RESPECTIVE CIRCUIT THAT ARE INSTALLED IN CONDUIT OR DUCT SHALL BE RUN TOGETHER IN THE SAME RACEWAY OR DUCT.
- EXISTING AIRFIELD LIGHTING CABLES (SCHEDULED FOR REPLACEMENT) IN AREAS OF NEW WORK SHALL BE DISCONNECTED & REMOVED WHERE IN CONFLICT WITH NEW CONSTRUCTION. IN OTHER AREAS CABLES MAY BE ABANDONED IN PLACE.
- THE CONTRACTOR IS REQUIRED TO FILL IN ALL HOLES AND DEPRESSIONS RESULTING FROM THE NEW WORK, WITH EARTH MATERIAL. THE AREAS SHALL BE COMPACTED TO PREVENT FUTURE SETTLEMENT AND FERTILIZED, SEEDED, AND MULCHED IN ACCORDANCE WITH ITEMS 901 AND 908 RESPECTIVELY.
- A GROUND ROD MUST BE INSTALLED AT EACH LIGHT FIXTURE. 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. GROUND 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 INSTALLATION. COPIES OF GROUND SYSTEM TEST RESULTS SHALL BE FURNISHED TO THE PROJECT ENGINEER AND/OR THE RESIDENT ENGINEER/TECHNICIAN.
- PER FAA AC 150/5270-10G "STANDARDS FOR SPECIFYING CONSTRUCTION OF AIRPORTS", ITEM L-108 "UNDERGROUND POWER CABLE FOR AIRPORT", 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 TEMINATING/SPLICING MEDIUM VOLTAGE CABLE.
- CONTRACTOR SHALL INTERFACE EXISTING AIRFIELD LIGHTING TO THE NEW, REMOVED, REINSTALLED, ADJUSTED, REPLACED, AND/OR RELOCATED AIRFIELD LIGHTING AND ASSOCIATED CIRCUITS.
- 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.
- IN THE EVENT THAT OTHER CONSTRUCTION PROJECTS ARE IN PROGRESS AT THE AIRPORT AT THE SAME TIME AS THIS PROJECT, THE CONTRACTOR WILL BE REQUIRED TO COOPERATE WITH ALL OTHER CONTRACTORS AND THE AIRPORT MANAGER IN THE COORDINATION OF THE WORK.
- NO CONNECTION TO AN ACTIVE LIGHTING CIRCUIT WILL BE BROKEN UNTIL THE CIRCUIT HAS BEEN TURNED OFF IN ACCORDANCE WITH NOTE 1.

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

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



APRON EXPANSION  
AND RELOCATE/  
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FACILITY

IDA No: PRG-4144

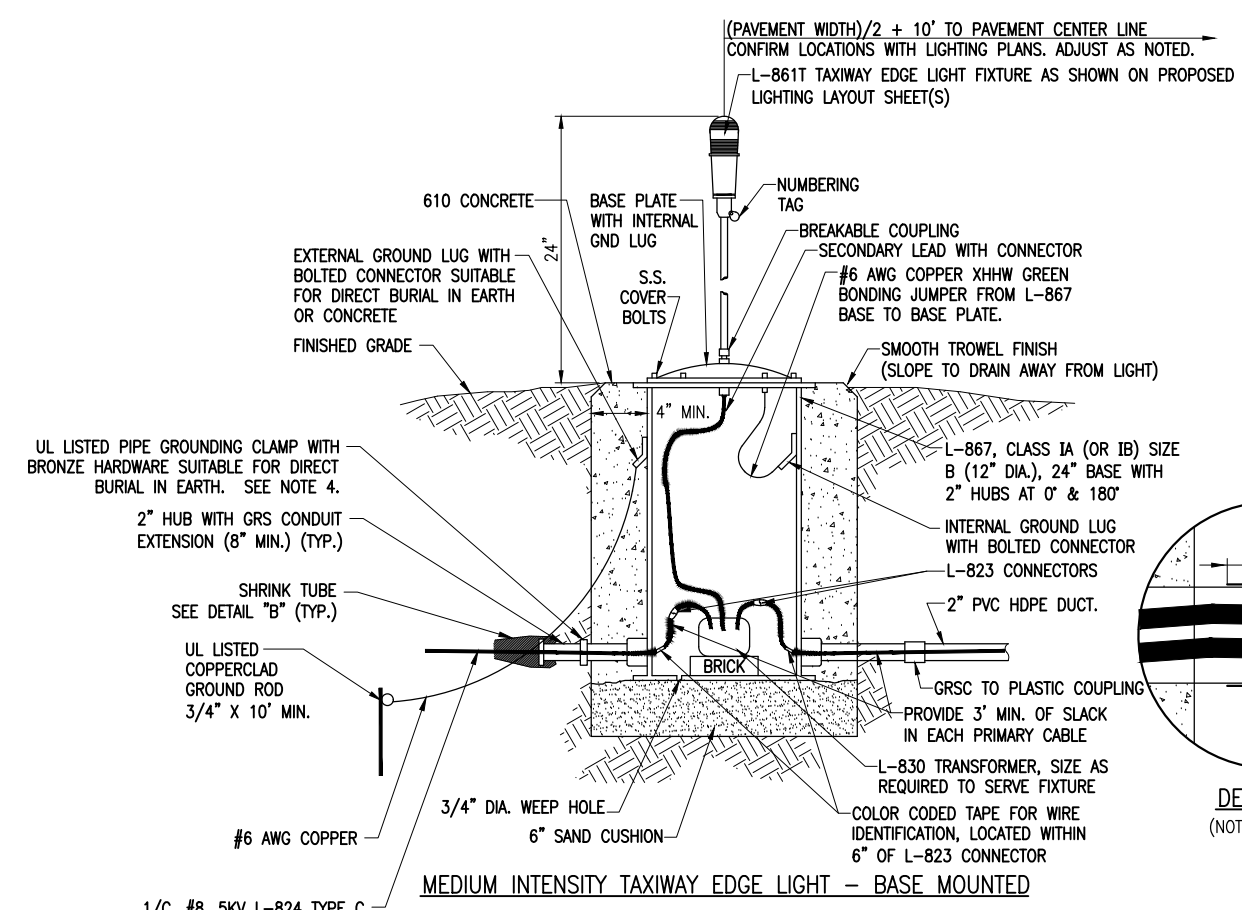
Contract No. ED018


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		LAY DWN REV

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PROJECT NO: 13A0062D  
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REVIEWED BY: BSS 08/17/2018

SHEET TITLE

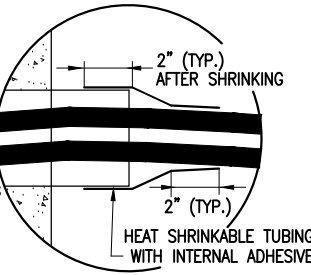
TAXIWAY LIGHT  
DETAILS



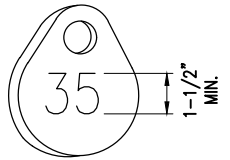
MEDIUM INTENSITY TAXIWAY EDGE LIGHT - BASE MOUNTED

(NOT TO SCALE)

L-867 BASE WITH 1-3" HUB IS ALSO ACCEPTABLE, FOR INTERFACE TO CABLE IN 3/4" UNIT DUCT. L-867 BASES WITH 3" HUBS MAY WORK BETTER FOR TAXIWAY LIGHTS INSTALLED ON TAXIWAY B-WEST DUE TO SITE CONDITIONS AND CABLE ROUTING. FOR INTERFACE TO 2" DUCT 2" HUBS LOCATED AT 0°, 180° ARE REQUIRED. ADDITIONAL HUBS WILL BE REQUIRED TO ACCOMMODATE MORE THAN TWO DUCT INTERFACES

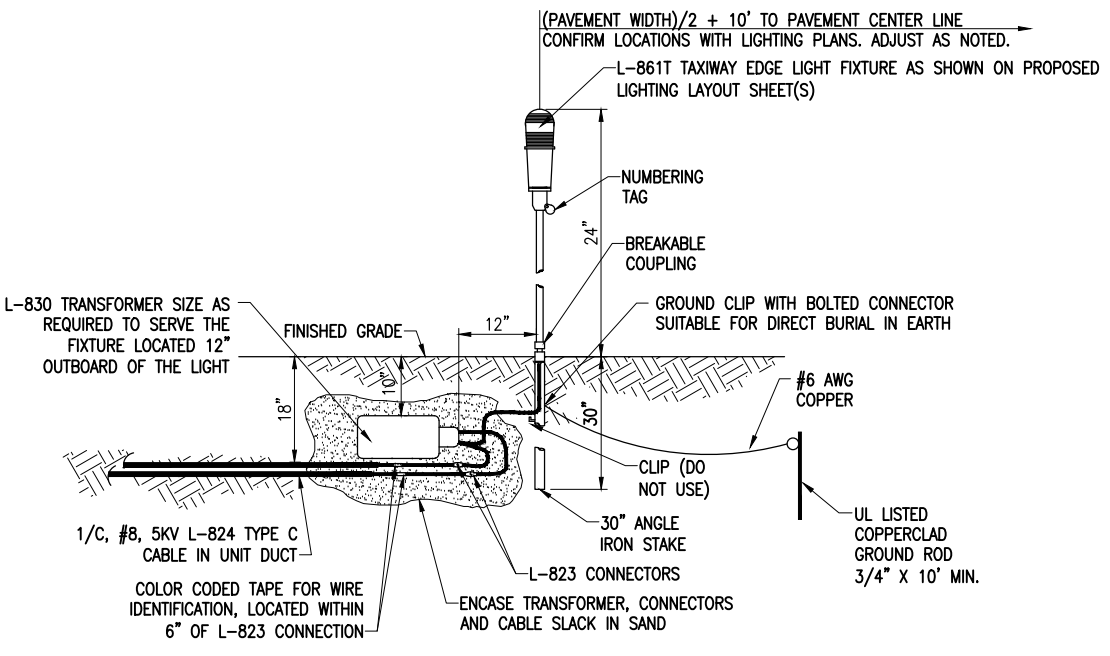


DETAIL "B"  
(NOT TO SCALE)



NUMBERING TAG DETAIL  
(NOT TO SCALE)

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

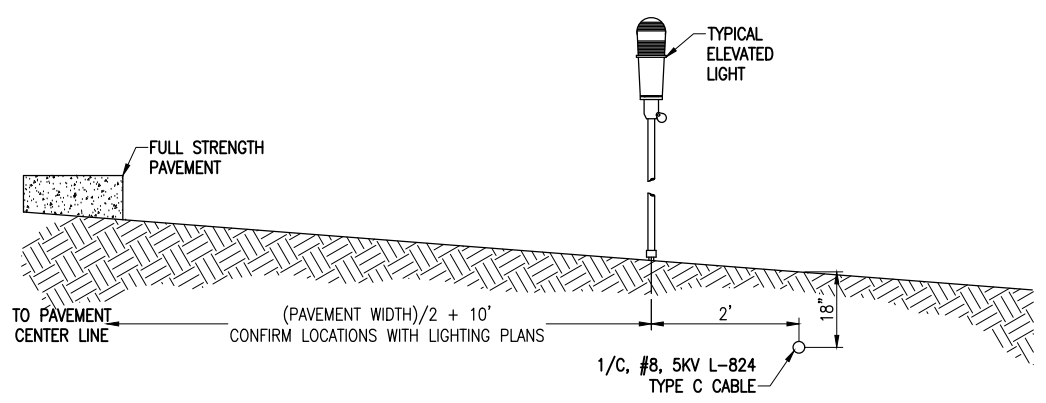


MEDIUM INTENSITY TAXIWAY EDGE LIGHT - STAKE MOUNTED

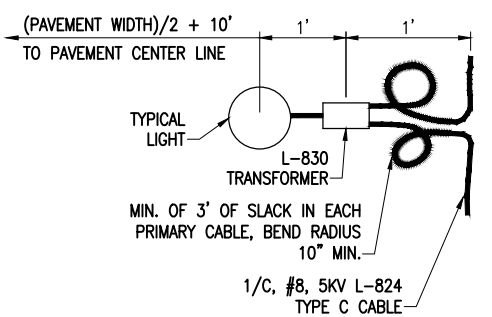
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- NOTES:
- SEE ELECTRICAL NOTES SHEETS.
  - SEE "ELECTRICAL NOTES SHEET 2" AND "GROUNDING NOTES" SHEET FOR GROUNDING NOTES FOR AIRFIELD LIGHTING.
  - SEE PROPOSED ELECTRICAL PLAN SHEET(S) FOR LIGHT LOCATIONS.
  - WHERE GROUND LUGS ARE NOT ACCESSIBLE ON EXISTING BASE CANS SCHEDULED TO BE RELOCATED, PROVIDE A UL LISTED PIPE GROUND CLAMP RATED FOR DIRECT BURIAL IN EARTH AND BOND TO THE METAL CONDUIT EXTENSION TO PROVIDE GROUND PATH TO LIGHT BASE.

A LIGHT BASE GROUND SHALL BE INSTALLED AT EACH STAKE MOUNTED LIGHT AND EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. THE LIGHT BASE GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR CONNECTED TO THE GROUND LUG ON THE RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND A 3/4-INCH DIAMETER BY 10-FEET LONG (MINIMUM) UL LISTED COPPER CLAD GROUND ROD.



PROFILE VIEW



PLAN VIEW

LIGHT AND CABLE INSTALLATION DETAIL

(NOT TO SCALE)

NOTES:  
SEE PROPOSED LIGHTING LAYOUT SHEET FOR LIGHT LOCATIONS.



**APRON EXPANSION  
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IDA No: PRG-4144

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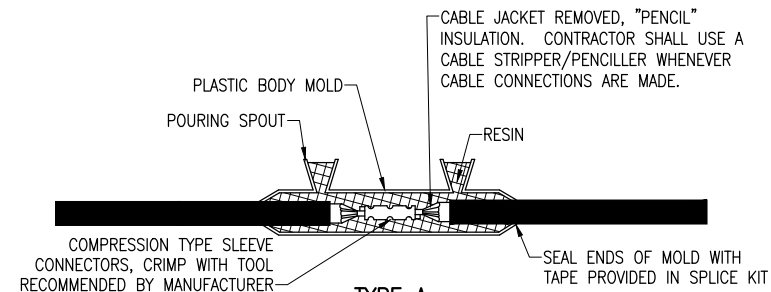
REVIEWED BY: BSS 08/17/2018

SHEET TITLE

**AIRFIELD LIGHTING  
CABLE SPLICE  
DETAILS**

**NOTES:**

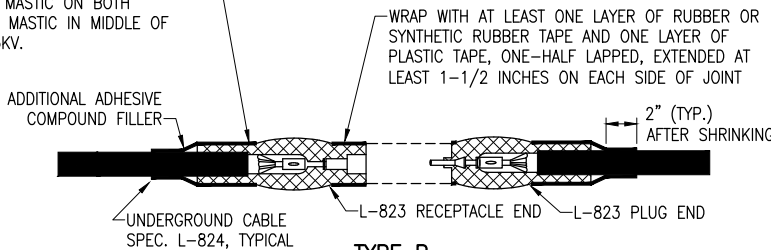
1. SPLICE DETAILS ARE PROVIDED FOR NEW WORK AND TO ASSIST IN REPAIRS OF ACCIDENTAL OR UNEXPECTED INTERRUPTIONS AND/OR CUTS TO AIRFIELD LIGHTING CABLES.
2. CONTRACTOR SHALL KEEP ON HAND A MINIMUM OF 10 SETS OF SPLICE KITS FOR L-823 CONNECTORS AND A MINIMUM OF 10 SETS OF TYPE A LOW VOLTAGE SPLICE KITS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



**TYPE A**

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

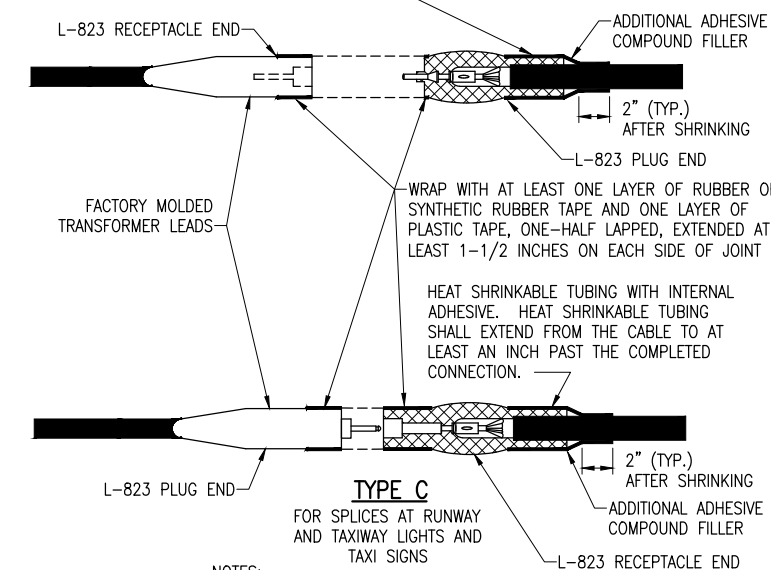
CONTINUOUS HEAT SHRINK TUBING PLACED OVER THE ENTIRE L-823 CONNECTOR(S) BOTH MALE AND FEMALE AT ALL 5KV JUNCTIONS. THE HEAT SHRINK TUBING SHALL BE APPROXIMATELY 18" IN LENGTH WITH 6 INCHES OF MASTIC ON BOTH ENDS AND VOID OF MASTIC IN MIDDLE OF TUBE RATED FOR 5KV.



**TYPE B**

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

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

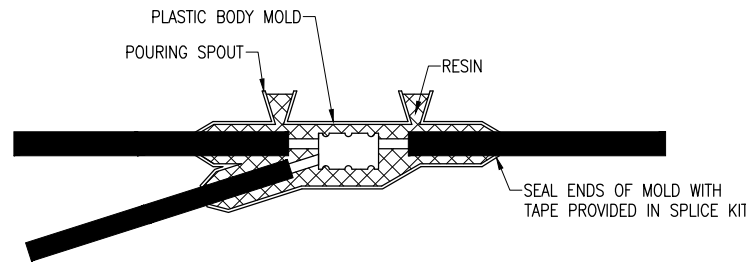


**TYPE C**

FOR SPLICES AT RUNWAY AND TAXIWAY LIGHTS AND TAXI SIGNS

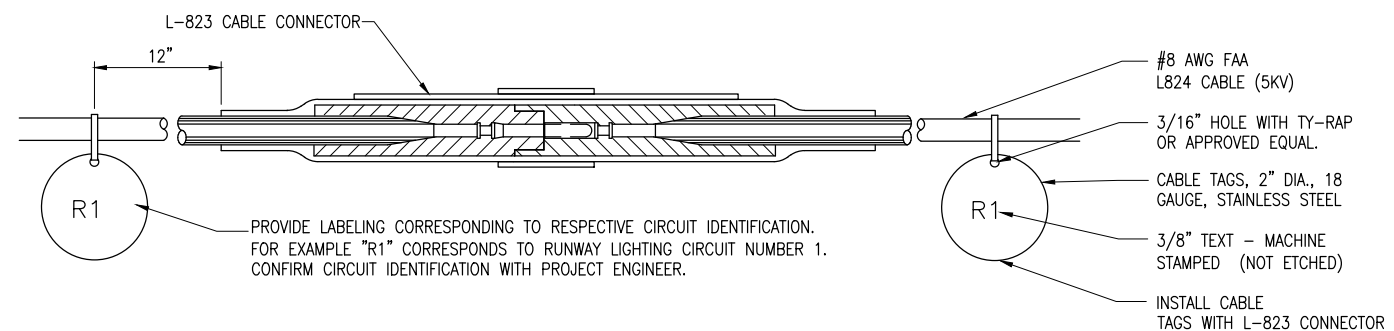
NOTES:  
INSIDE DIAMETER OF CONNECTOR SHALL PROPERLY MATCH THE OUTSIDE DIAMETER OF CABLE.

**CABLE SPLICES  
(NOT TO SCALE)**



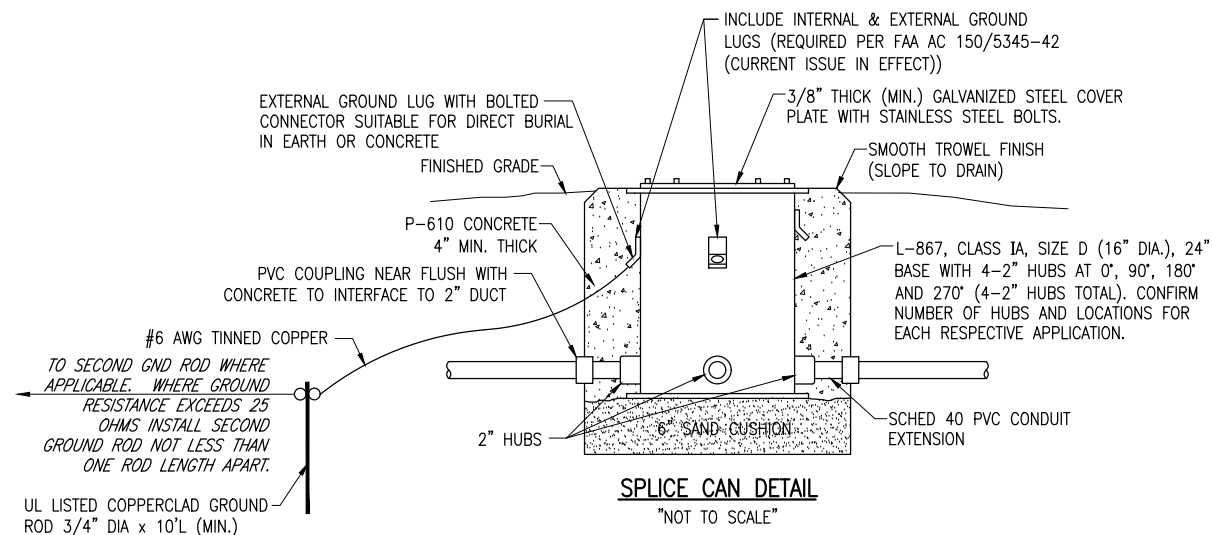
**LOW VOLTAGE UNDERGROUND TAP SPLICE**

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.



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. R1 CORRESPONDS TO EDGAR CO. AIRPORT RUNWAY 9-27 LIGHTING CIRCUIT. R2 CORRESPONDS TO EDGAR CO. AIRPORT RUNWAY 18-36 LIGHTING CIRCUIT. T1 CORRESPONDS TO EDGAR CO. AIRPORT TAXIWAY LIGHTING CIRCUIT 1.

**CABLE TAG DETAIL  
"NOT TO SCALE"**



**NOTES FOR SPLICE CAN DETAIL:**

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



**APRON EXPANSION  
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SHEET TITLE

**SPLICE CAN DETAIL**



APRON EXPANSION  
AND RELOCATE/  
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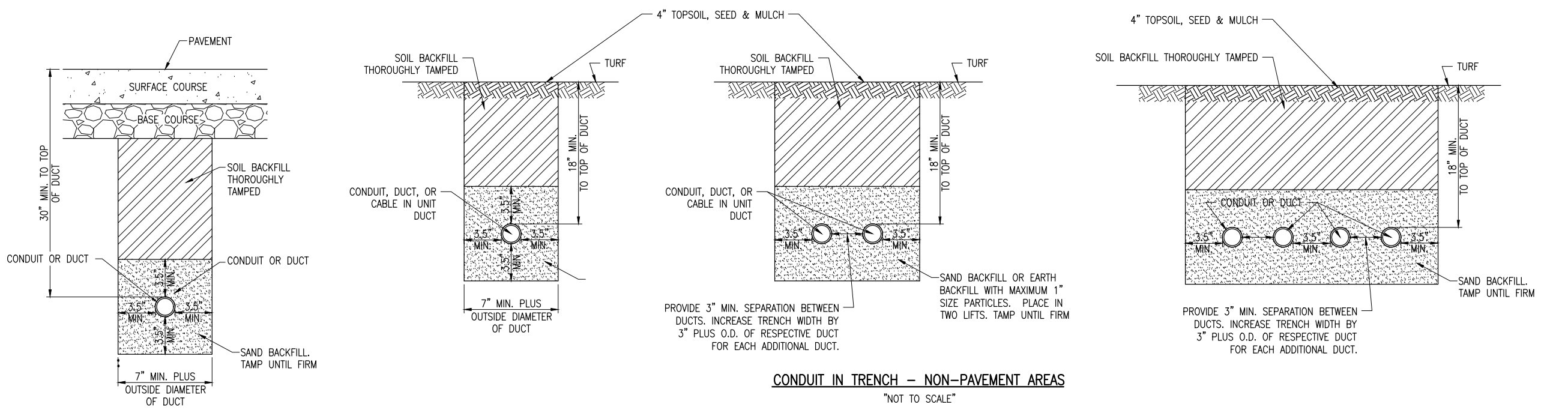
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SHEET TITLE

CONDUIT TRENCH  
DETAILS



- NOTES:**
- DIMENSIONS FOR COVERAGE AND SEPARATION BETWEEN DUCTS ARE MINIMUM.
  - TRENCHES WITH MORE THAN TWO DUCTS OR CABLE IN UNIT DUCTS SHALL BE INCREASED 3" IN WIDTH PLUS DIAMETER OF RESPECTIVE DUCT FOR EACH ADDITIONAL CONDUIT, DUCT, OR CABLE IN UNIT DUCT; IF SPECIFIED ON PLANS TWO PARALLEL TRENCHES MAY BE CONSTRUCTED.
  - DEPTH OF TRENCHES SHALL BE AS SHOWN ABOVE UNLESS OTHERWISE SPECIFIED ON THE PLANS. MINIMUM COVER REQUIREMENTS FOR CABLES AND DUCTS AT AIRPORT RUNWAYS AND ADJACENT AREAS WHERE TRESPASSING IS PROHIBITED IS 18 INCHES PER NEC 300.5 AND 300.50. MINIMUM COVER REQUIREMENTS FOR DUCTS LOCATED BELOW PAVEMENT OR ROADWAYS IS 30". MINIMUM COVER REQUIREMENTS FOR DUCTS LOCATED IN AREAS SUBJECT TO FARMING IS 42". ADJUST/INCREASE BURIAL DEPTHS TO ACCOMMODATE SITE CONDITIONS, DRAINAGE AND/OR OBSTRUCTIONS. COVER IS DEFINED AS THE SHORTEST DISTANCE IN INCHES MEASURED BETWEEN A POINT ON THE TOP SURFACE OF ANY DIRECT-BURIED CONDUCTOR, CABLE, CONDUIT, OR OTHER RACEWAY AND THE TOP SURFACE OF FINISHED GRADE, CONCRETE OR SIMILAR COVER.
  - HIGH VOLTAGE CIRCUITS (AIRFIELD LIGHTING 5000 VOLT SERIES CIRCUITS AND/OR OTHER CIRCUITS RATED ABOVE 600 VOLTS) AND LOW VOLTAGE CIRCUITS (RATED 600 VOLTS AND BELOW) SHALL NOT BE INSTALLED IN THE SAME RACEWAY, CONDUIT, DUCT, HANDHOLE, OR MANHOLE.
  - CONDUIT, DUCT, CABLE, AND/OR CABLE IN UNIT DUCT INTERFACE TO HANDHOLES, MANHOLES, SPLICE CANS, OR OTHER JUNCTION STRUCTURES WILL BE CONSIDERED INCIDENTAL TO THE RESPECTIVE CABLE PAY ITEM OR RESPECTIVE DUCT PAY ITEM.
  - ALL DISTURBED SURFACES SHALL BE RESTORED TO THEIR ORIGINAL CONDITION. COST IS INCIDENTAL TO TRENCH.





**APRON EXPANSION  
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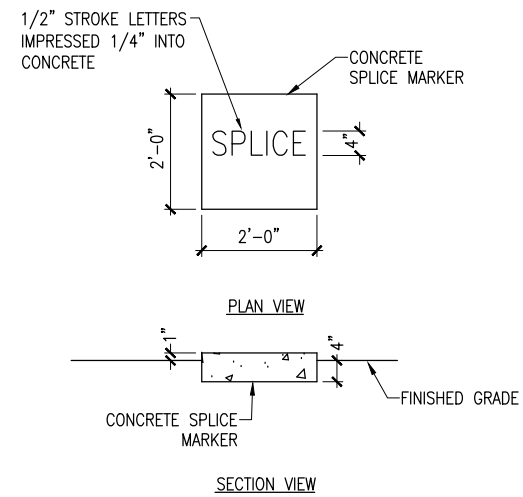
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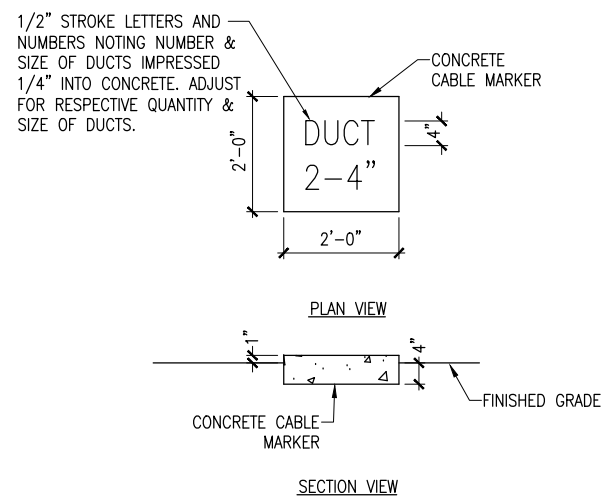
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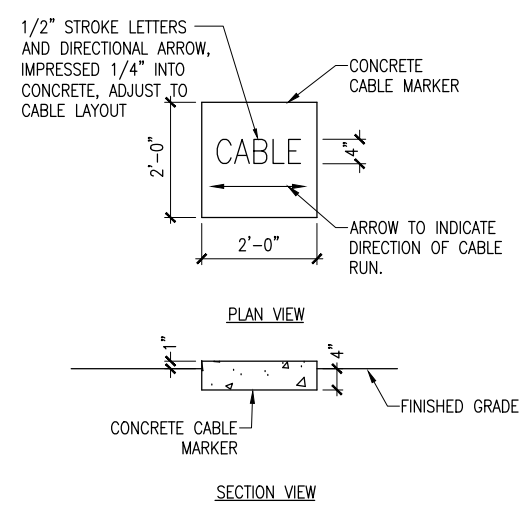
**CABLE AND DUCT  
MARKER DETAILS**



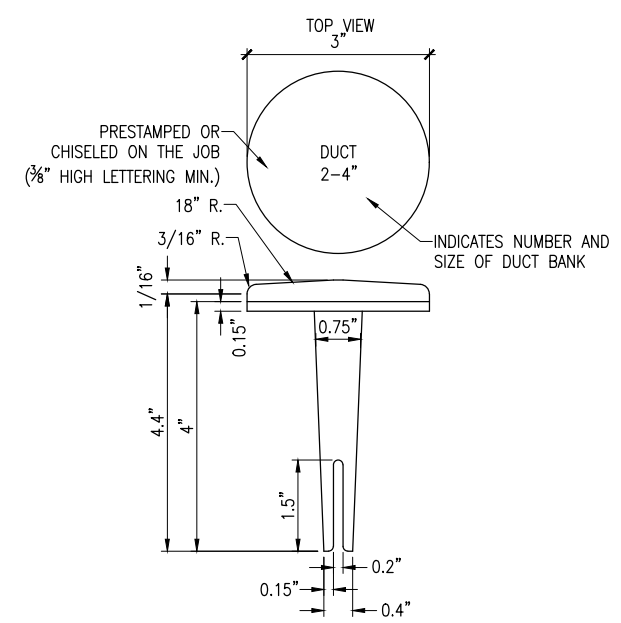
**TURF CABLE MARKERS**  
"NOT TO SCALE"



**TURF CABLE MARKERS**  
"NOT TO SCALE"

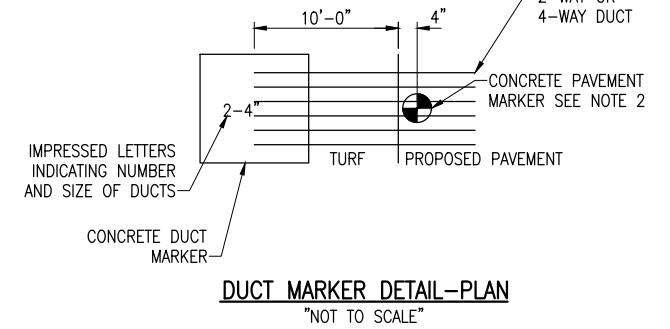


**TURF CABLE MARKERS**  
"NOT TO SCALE"

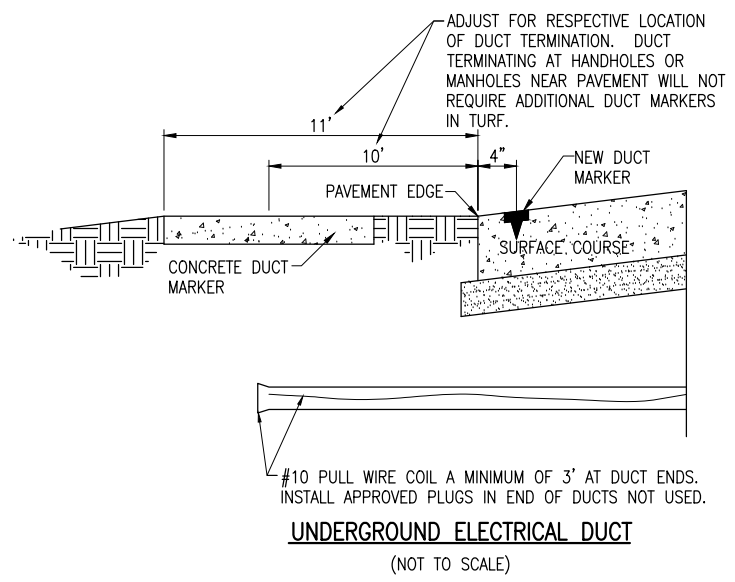


**BITUMINOUS PAVEMENT DUCT MARKERS**  
"NOT TO SCALE"

- NOTE:**
- TOP OF MARKER SHALL BE FLUSH WITH FINISHED PAVEMENT SURFACE. MARKER MAY BE INSTALLED IN A DRILLED HOLE AND SECURED WITH EPOXY GLUE
  - BRASS DUCT MARKERS ARE AVAILABLE FROM G&S FOUNDRY & MANUFACTURING CO. INC., 210 KASKASKIA DRIVE, RED BUD, IL 62278, PHONE: (618)-282-4114, SURV-KAP, 3225 E. 47TH ST., TUCSON, AZ 85713, PHONE: (502)-622-6011, OR OTHER EQUIVALENT MANUFACTURERS.



**DUCT MARKER DETAIL-PLAN**  
"NOT TO SCALE"



**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 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" 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 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
- 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 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.
- THE CABLE AND SPLICE MARKERS MUST IDENTIFY THE CIRCUITS TO WHICH THE CABLES BELONG. FOR EXAMPLE: RWY 9-27, PLASI-9, PLASI-27.
- LOCATIONS OF ENDS OF ALL UNDERGROUND DUCTS MUST BE IDENTIFIED BY DUCT MARKERS.



*Kevin N. Lightfoot*

**APRON EXPANSION  
AND RELOCATE/  
UPGRADE FUEL  
FACILITY**

IDA No: PRG-4144

Contract No. ED018


NO.	DATE	DESCRIPTION		
		LAY	DWN	REV

ISSUE: SEPTEMBER 21, 2018

PROJECT NO: 13A0062D

CAD FILE: E-503-ELEC.DWG

LAYOUT BY: KNL 01/10/2016

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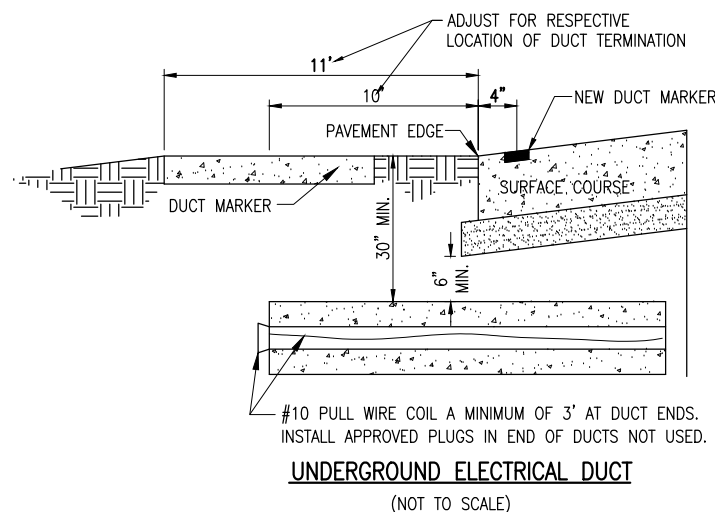
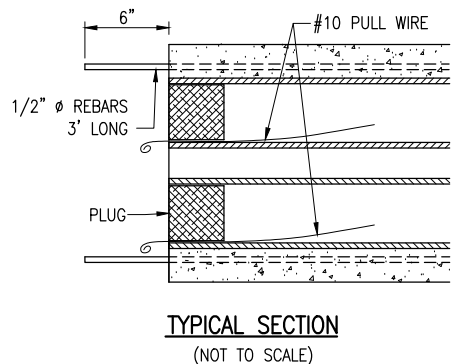
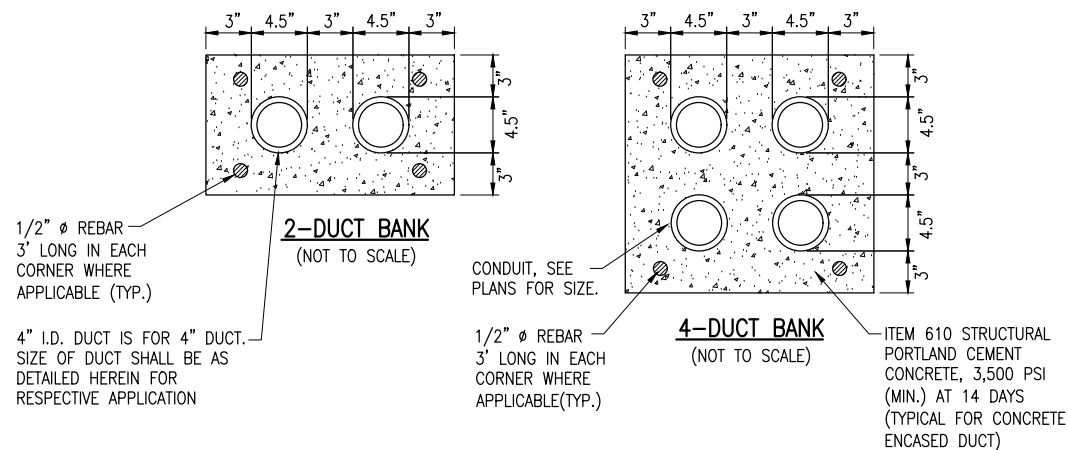
REVIEWED BY: BSS 08/17/2018

SHEET TITLE

**DUCT BANK DETAILS  
AND NOTES**

**DUCT INSTALLATION NOTES**

- ALL ELECTRICAL EQUIPMENT AND MATERIALS SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 – NATIONAL ELECTRICAL CODE (NEC) MOST CURRENT ISSUE IN FORCE, THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES, AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L. LISTING, INTERTEK TESTING SERVICES VERIFICATION/ETL LISTING (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE PERMITTED.
- CONTRACTOR SHALL KEEP A COPY OF THE LATEST NEC IN FORCE ON SITE AT ALL TIMES DURING CONSTRUCTION FOR USE AS A REFERENCE.
- CONTRACTOR SHALL COORDINATE WORK AND ANY POWER OUTAGES AND/OR SHUT DOWN OF SYSTEMS WITH THE RESPECTIVE FACILITY OWNER PERSONNEL AND THE AIRPORT MANAGER/DIRECTOR. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- THE LOCATION, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND AND/OR ABOVEGROUND UTILITIES INDICATED ON THE PLANS IS NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY WHATEVER IN RESPECT TO ACCURACY, COMPLETENESS, OR SUFFICIENCY OF THE INFORMATION. THERE IS NO GUARANTEE EITHER EXPRESSED OR IMPLIED, THAT THE LOCATIONS, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ARE REPRESENTATIVE OF THOSE TO BE ENCOUNTERED IN THE CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES OF HIS OPERATIONAL PLANS AND SHALL OBTAIN FROM THE RESPECTIVE UTILITY COMPANIES DETAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF THEIR FACILITIES AND THE WORKING SCHEDULE OF THE COMPANIES FOR REMOVAL OR ADJUSTMENT WHERE REQUIRED. IN THE EVENT AN UNEXPECTED UTILITY INTERFERENCE IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY COMPANY OF JURISDICTION. THE OWNER'S REPRESENTATIVE AND/OR THE RESIDENT ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY DAMAGE TO SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT. ALL UTILITY CABLES AND LINES SHALL BE LOCATED BY THE RESPECTIVE UTILITY. CONTACT JULIE (JOINT UTILITY LOCATION INFORMATION FOR EXCAVATORS) FOR UTILITY INFORMATION, PHONE: 1-800-892-0123. CONTACT THE FAA (FEDERAL AVIATION ADMINISTRATION) FOR ASSISTANCE IN LOCATING FAA CABLES AND UTILITIES. ALSO CONTACT AIRPORT DIRECTOR/MANAGER AND AIRPORT PERSONNEL FOR ASSISTANCE IN LOCATING UNDERGROUND AIRPORT CABLES AND/OR UTILITIES. ALSO COORDINATE WORK WITH ALL ABOVEGROUND UTILITIES.
- ADJUSTMENTS TO DUCT BANK ROUTES MIGHT BE REQUIRED TO ACCOMMODATE EXISTING SITE CONDITIONS AND UNDERGROUND LINES AND UTILITIES. CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL COORDINATE DUCT ROUTE ADJUSTMENTS WITH THE RESIDENT ENGINEER/ RESIDENT TECHNICIAN AND THE AIRPORT MANAGER.
- CONTRACTOR SHALL LOCATE AND MARK ALL EXISTING CABLES, LINES, OR UTILITIES WITHIN 10 FT OF PROPOSED EXCAVATING/TRENCHING AREA. ANY CABLES, LINES, AND UTILITIES FOUND INTERFERING WITH PROPOSED EXCAVATION OR CABLE/TRENCHING SHALL BE HAND DUG AND EXPOSED. ANY DAMAGED CABLES OR OTHER UTILITIES SHALL BE IMMEDIATELY REPAIRED TO THE SATISFACTION OF THE RESPECTIVE OWNER'S REPRESENTATIVE AT THE CONTRACTOR'S EXPENSE. THE RESIDENT ENGINEER/RESIDENT TECHNICIAN AND OWNER SHALL BE NOTIFIED IMMEDIATELY IF ANY CABLES OR OTHER UTILITIES ARE DAMAGED.
- PAYMENT FOR LOCATING AND MARKING UNDERGROUND UTILITIES AND CABLES WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE CONSIDERED INCIDENTAL TO THE RESPECTIVE DUCT INSTALLATION.
- THE CONTRACTOR WILL DETERMINE IF THERE IS A CONFLICT BETWEEN THE INSTALLATION OF THE PROPOSED ELECTRICAL DUCTS AND ANY EXISTING UTILITIES. HE WILL MAKE ALL NECESSARY ADJUSTMENTS IN DEPTH OF INSTALLATION TO AVOID ANY AND ALL PROPOSED UNDERGROUND IMPROVEMENTS
- CONDUITS FOR DIRECT BURIAL OR CONCRETE ENCASED DUCT BANK SHALL BE SCHEDULE 40 PVC CONDUIT, UL-LISTED, RATED FOR 90°C CABLE—CONFORMING TO NEMA STANDARD TC-2 AND UL 651, LISTED SUITABLE FOR UNDERGROUND USE EITHER DIRECT-BURIED OR ENCASED IN CONCRETE, OR SCHEDULE 40 (MINIMUM) HDPE CONDUIT, UL LISTED, CONFORMING TO NEMA STANDARD TC-7 AND UL 651B AND LISTED SUITABLE FOR UNDERGROUND USE; EITHER DIRECT BURY OR ENCASED IN CONCRETE.
- CONDUITS FOR DIRECTIONAL BORING SHALL BE SCHEDULE 40 PVC CONDUIT OR SCHEDULE 80 PVC CONDUIT, UL-LISTED, RATED FOR 90°C CABLE—CONFORMING TO NEMA STANDARD TC-2 AND UL 651 AND SUITABLE FOR DIRECTIONAL BORING INSTALLATION, SCHEDULE 80 HDPE CONDUIT, UL-LISTED, CONFORMING TO NEMA STANDARD TC-7 AND UL 651B AND SUITABLE FOR DIRECTIONAL BORING INSTALLATION, OR WALL TYPE SDR 13.5 OR SDR 11 HDPE CONDUIT MANUFACTURED IN ACCORDANCE WITH ASTM D-3350 (SPECIFICATION OF POLYETHYLENE PLASTICS PIPE AND FITTINGS MATERIALS) AND ASTM F2160 (STANDARD SPECIFICATION FOR SOLID WALL, HIGH-DENSITY POLYETHYLENE CONDUIT BASED ON CONTROLLED OUTSIDE DIAMETER), AND SUITABLE FOR DIRECTIONAL BORING INSTALLATION. PER NEC 300.5 (K), RACEWAYS INSTALLED USING DIRECTIONAL BORING EQUIPMENT SHALL BE APPROVED FOR THE PURPOSE.



**DUCT BANK NOTES:**

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



**APRON EXPANSION AND RELOCATE/UPGRADE FUEL FACILITY**

IDA No: PRG-4144

Contract No. ED018

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REVIEWED BY: BSS 08/17/2018

SHEET TITLE

**4'X4'X4' ELECTRICAL MANHOLE**

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

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

**DESIGN CRITERIA:**

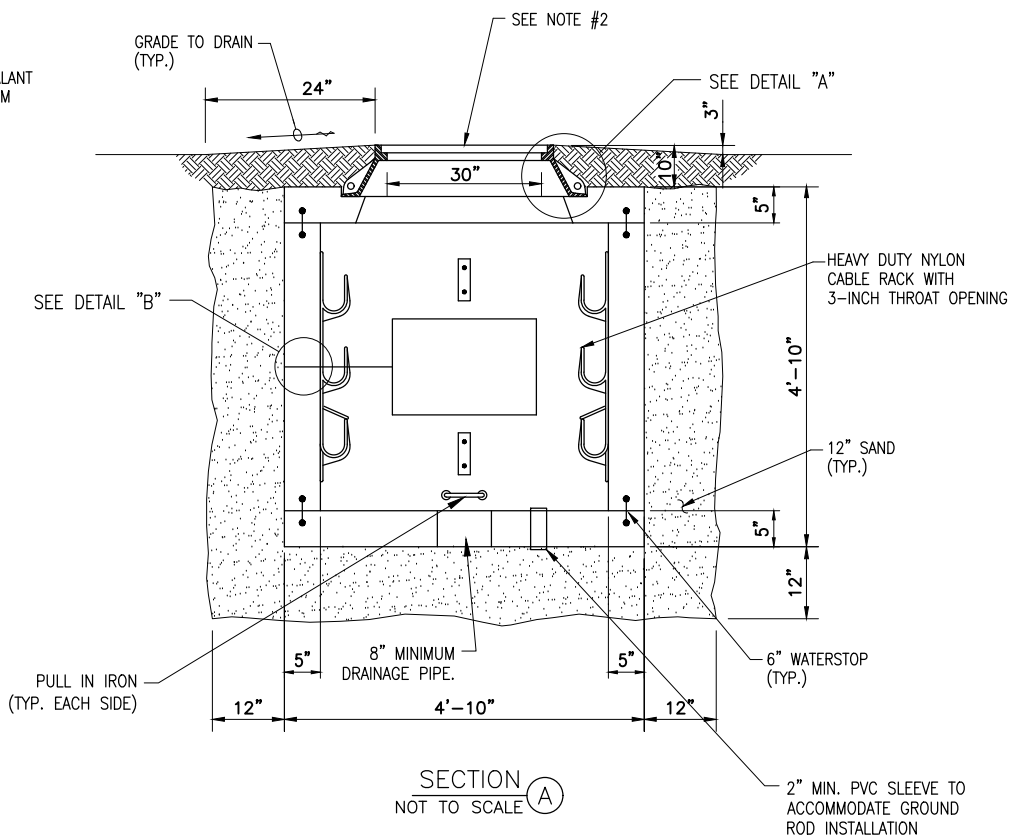
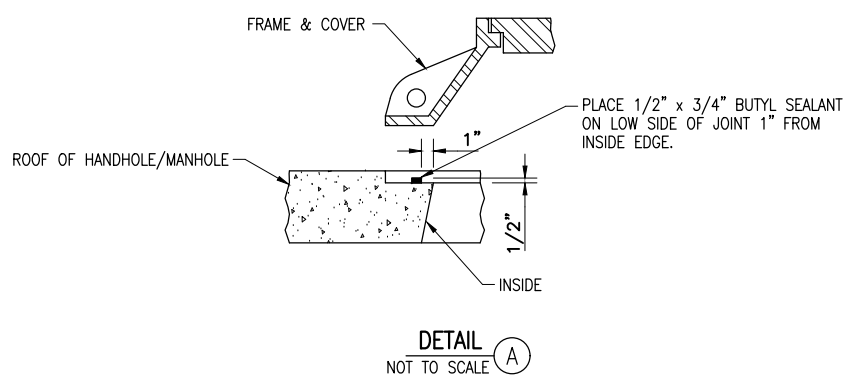
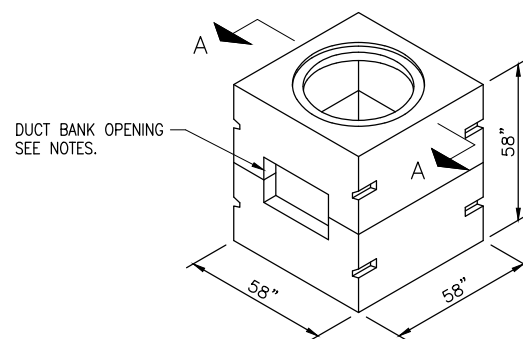
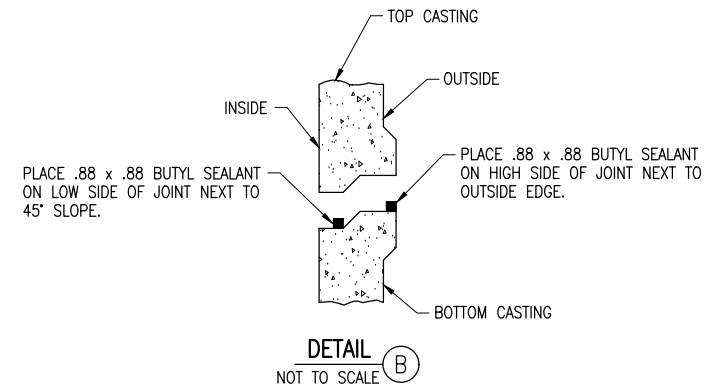
- 1) DESIGN SPECIFICATION: ACI 318, AASHTO LOAD FACTOR DESIGN METHOD, AND ASTM C858
- 2) DESIGN LOADING: AASHTO HS20 (32,000 LB/AXLE)
- 3) LIVE LOAD SURCHARGE: .5% OF THE WHEEL LOADING APPLIED TO 8'-0" OF DEPTH.
- 4) CONCRETE COMPRESSIVE STRENGTH:  $F'_c = 4500$  PSI
- 5) REINFORCING STEEL: ASTM A706,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

**DESIGN ASSUMPTIONS:**

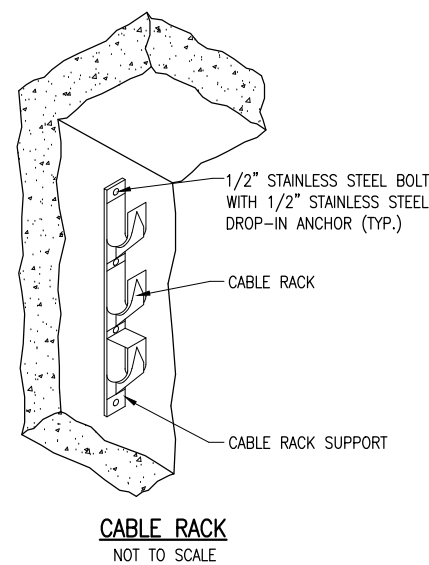
- 1) GROUND WATER LEVEL: 3'-6" BELOW GRADE.
- 2) EARTH COVER: 2'-0" MINIMUM TO 5'-0" MAXIMUM
- 3) LIVE LOAD IMPACT: 2'-0"  $I = 20\%$   
2'-1" TO 2'-11"  $I = 10\%$   
3'-0" TO 5'-0"  $I = 0\%$
- 4) COEFFICIENT OF ACTIVE EARTH PRESSURE:  $K_a = 0.3$
- 5) SPECIFIC WEIGHT OF STD. AGGREGATE CONCRETE: 150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

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

2. MANHOLE FRAME & LID SHALL BE CAPABLE OF WITHSTANDING MINIMUM 50,000 POUND LOADS. MANHOLE FRAME & LID SHALL BE NEENAH CATALOG NO. R-1640-C MANHOLE FRAME AND SOLID LID, EAST JORDAN IRON WORKS CATALOG NO. 1825 FRAME AND COVER, OR APPROVED EQUAL LID FOR LOW VOLTAGE MANHOLES SHALL BE LABELED "LOW VOLTAGE" OR "OV-600V". LIDS FOR HIGH VOLTAGE MANHOLES CONTAINING AIRFIELD LIGHTING SERIES CIRCUIT WIRING SHALL BE LABELED "DANGER HIGH VOLTAGE KEEP OUT 5000 VOLTS" TO COMPLY WITH 2017 NEC ARTICLE 300.45 "WARNING SIGNS" AND 2017 NEC ARTICLE 314.30(D) "COVERS". COORDINATE LETTERING WITH MFR.
3. COORDINATE DUCT BANK INTERFACE & OPENINGS WITH THE MANHOLE MFR. CONTRACTOR SHALL SLOPE DUCT BANK TO PRECAST MANHOLE OPENINGS. ALL OPENINGS SHALL BE SEALED WATERTIGHT AFTER DUCT BANK INSTALLATION.
4. 4'x4'x4' MANHOLE SHALL BE MANUFACTURED BY A CONCRETE ELECTRICAL MANHOLE PRODUCER ON THE ILLINOIS DEPARTMENT OF TRANSPORTATION APPROVED LIST OF CERTIFIED PRECAST CONCRETE PRODUCERS..
5. 4'x4'x4' MANHOLE SHALL BE PAID FOR UNDER ITEM AR110710 ELECTRICAL MANHOLE PER EACH.
6. CABLE RACKS SHALL BE HEAVY DUTY CORROSION RESISTANT NYLON MATERIAL WITH CORROSION RESISTANT STAINLESS STEEL MOUNTING HARDWARE; UNDERGROUND DEVICES, INC. CAT. NO. 3SR1N, 3SR2N OR 3SR3N OR APPROVED EQUAL. PROVIDE AT LEAST TWO TRIPLE HOOK CABLE RACKS ON EACH MANHOLE WALL, SPACED TO SUPPORT RESPECTIVE CABLES.
7. COORDINATE INSTALLATION OF MANHOLES WITH RESPECTIVE FINISHED GRADE ELEVATIONS.
8. INCLUDE FLOOR SUMP OR DRAINAGE PIPE.
9. ALL CORING, INTERFACE, AND LABOR ASSOCIATED WITH CONDUIT, DUCT, CABLE IN UNIT DUCT, AND/OR CABLE ENTRIES WILL BE CONSIDERED INCIDENTAL TO THE INSTALLATION OF THE MANHOLE AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
10. INCLUDE 2" MIN. SCHED. 40 PVC CONDUIT SLEEVE IN BOTTOM OF MANHOLE TO ACCOMMODATE GROUND ROD INSTALLATION.



**PRECAST 4' x 4' x 4' MANHOLE DETAILS**  
NOT TO SCALE





**APRON EXPANSION  
AND RELOCATE/  
UPGRADE FUEL  
FACILITY**

IDA No: PRG-4144

Contract No. ED018

NO.	DATE	DESCRIPTION		
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DRAWN BY: JRH 06/26/2018

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SHEET TITLE

**ELECTRICAL NOTES  
SHEET 1**

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.
- CONTRACTOR SHALL KEEP A COPY OF THE LATEST NEC IN FORCE ON SITE AT ALL TIMES DURING CONSTRUCTION FOR USE AS A REFERENCE.
- CONTRACTOR SHALL COORDINATE WORK AND ANY POWER OUTAGES AND/OR SHUT DOWN OF SYSTEMS WITH THE RESPECTIVE FACILITY OWNER PERSONNEL AND THE AIRPORT MANAGER/DIRECTOR. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- THE CONTRACTOR SHALL ASCERTAIN THAT ALL LIGHTING SYSTEM COMPONENTS FURNISHED BY HIM, INCLUDING FAA APPROVED EQUIPMENT, ARE COMPATIBLE IN ALL RESPECTS WITH EACH OTHER AND THE REMAINDER OF THE NEW/EXISTING SYSTEM. ANY NONCOMPATIBLE COMPONENTS FURNISHED BY THIS CONTRACTOR SHALL BE REPLACED BY HIM AT NO ADDITIONAL COST TO THE AIRPORT SPONSOR WITH A SIMILAR UNIT, APPROVED BY THE ENGINEER (DIFFERENT MODEL OR DIFFERENT MANUFACTURER) THAT IS COMPATIBLE WITH THE REMAINDER OF THE AIRPORT LIGHTING SYSTEM.
- IN CASE THE CONTRACTOR ELECTS TO FURNISH AND INSTALL AIRPORT LIGHTING EQUIPMENT REQUIRING ADDITIONAL WIRING, TRANSFORMERS, ADAPTORS, MOUNTINGS, ETC., TO THOSE SHOWN ON THE DRAWINGS AND/OR LISTED IN THE SPECIFICATION, ANY COST FOR THESE ITEMS SHALL BE INCIDENTAL TO THE 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 DETAILED DESCRIPTION OF THE OVERALL EQUIPMENT AND ITS INDIVIDUAL COMPONENTS.
  - THEORY OF OPERATION INCLUDING THE FUNCTION OF EACH COMPONENT.
  - INSTALLATION INSTRUCTION.
  - START-UP INSTRUCTIONS.
  - PREVENTATIVE MAINTENANCE REQUIREMENTS.
  - CHART FOR TROUBLE-SHOOTING.
  - COMPLETE POWER AND CONTROL DETAILED WIRING DIAGRAM(S), SHOWING EACH CONDUCTOR/CONNECTION/COMPONENT – "BLACK" BOXES ARE NOT ACCEPTABLE. THE DIAGRAM OF THE NARRATIVE SHALL SHOW VOLTAGE/CURRENTS/WAVE SHAPES AT STRATEGIC LOCATIONS TO BE USED WHEN CHECKING AND/OR TROUBLE-SHOOTING THE EQUIPMENT. WHEN THE EQUIPMENT HAS SEVERAL MODES OF OPERATION, SUCH AS SEVERAL BRIGHTNESS STEPS, THESE PARAMETERS SHALL BE INDICATED FOR ALL DIFFERENT MODES.
  - PARTS LIST WHICH WILL INCLUDE ALL MAJOR AND MINOR COMPONENTS SUCH AS RESISTORS, DIODES, ETC. IT SHALL INCLUDE A COMPLETE NOMENCLATURE OF EACH COMPONENT AND, IF APPLICABLE, THE NAME OF ITS MANUFACTURER AND THE CATALOG NUMBER.
  - SAFETY INSTRUCTIONS.

POWER AND CONTROL NOTES

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

**AIRFIELD LIGHTING NOTES**

- UNLESS OTHERWISE NOTED, ALL UNDERGROUND AIRFIELD LIGHTING SERIES CIRCUIT CONDUCTORS WHETHER DEB OR IN DUCT/CONDUIT SHALL BE FAA APPROVED 5000 VOLT L-824 TYPE. ALL UNDERGROUND FIELD POWER LOW VOLTAGE (600 VOLT & BELOW) CIRCUIT CONDUCTORS WHETHER DEB OR IN DUCT/CONDUIT SHALL BE UL LISTED 600 VOLT, TYPE XLP-USE-2 COPPER CONDUCTORS. CONDUCTOR SIZES SHALL BE AS SPECIFIED, HEREIN.
- NO COMPONENTS OF PRIMARY CIRCUIT SUCH AS CABLE, CONNECTORS AND TRANSFORMERS SHALL BE BROUGHT ABOVE GROUND AT EDGE LIGHTS, SIGNS, REIL, PAPI, ETC.
- THERE SHALL BE NO EXPOSED POWER/CONTROL CABLES BETWEEN THE POINT WHERE THEY LEAVE THE UNDERGROUND (DEB OR L-867 BASES) AND WHERE THEY ENTER THE EQUIPMENT (SUCH AS TAXIWAY SIGNS, PAPI, REIL, ETC.) ENCLOSURES. THESE CABLES SHALL BE ENCLOSED IN RIGID CONDUIT OR IN FLEXIBLE, WATERTIGHT CONDUIT WITH BREAKABLE COUPLING(S) AT THE GRADE OR THE HOUSING COVER, AS SHOWN IN APPLICABLE DETAILS.
- THE JOINTS OF THE L-823 PRIMARY CONNECTORS SHALL BE WRAPPED WITH AT LEAST ONE LAYER OF RUBBER OR SYNTHETIC RUBBER TAPE AND ONE LAYER OF PLASTIC TAPE, ONE-HALF LAPPED, EXTENDING AT LEAST 1-1/2 INCHES ON EACH SIDE OF THE JOINT, AS SHOWN ON AIRFIELD LIGHTING CABLE SPLICE DETAILS.
- THE CABLE ENTRANCE INTO THE FIELD-ATTACHED L-823 CONNECTORS SHALL BE ENCLOSED BY A HEAT-SHRINKABLE TUBING WITH CONTINUOUS INTERNAL ADHESIVE, AS SHOWN ON AIRFIELD LIGHTING CABLE SPLICE DETAILS.
- L-823 TYPE II, TWO-CONDUCTOR SECONDARY CONNECTORS SHALL BE CLASS 'A' (FACTORY MOLDED).
- THERE SHALL BE NO SPLICES IN THE SECONDARY CABLE(S) WITHIN THE STEMS OF A RUNWAY/TAXIWAY EDGE/THRESHOLD LIGHTING FIXTURE AND THE WIREWAYS LEADING TO TAXIWAY SIGNS AND PAPI/REIL EQUIPMENT.
- ELECTRICAL INSULATING GREASE SHALL BE APPLIED WITHIN THE L-823, SECONDARY, TWO CONDUCTOR CONNECTORS TO PREVENT WATER ENTRANCE. THESE CONNECTORS SHALL NOT BE TAPED.
- DEB ISOLATION TRANSFORMERS SHALL BE BURIED AT A DEPTH OF TEN (10") INCHES ON A LINE CROSSING THE LIGHT AND PERPENDICULAR TO THE RUNWAY/TAXIWAY CENTERLINE AT A LOCATION TWELVE (12") INCHES FROM THE LIGHT OPPOSITE FROM THE RUNWAY/TAXIWAY.
- A SLACK OF THREE (3') FEET, MINIMUM, PLUS DEPTH OF BASE CAN (IF APPLICABLE), SHALL BE PROVIDED IN THE PRIMARY CABLE AT EACH TRANSFORMER/CONNECTOR TERMINATION. AT STAKE-MOUNTED LIGHTS, THE SLACK SHALL BE LOOSELY COILED IMMEDIATELY BELOW THE ISOLATION TRANSFORMER. THERE SHALL BE NO ADDITIONAL PAYMENT FOR CABLE SLACK AND THEREFORE THE QUANTITY OF PROPOSED CABLE SLACK HAS NOT BEEN INCLUDED IN THE RESPECTIVE CABLE PAY ITEMS.
- DIRECTION OF PRIMARY CABLES SHALL BE IDENTIFIED BY COLOR CODING AS FOLLOWS: WHEN FACING LIGHT WITH BACK TO PAVEMENT, CABLE TO THE LEFT IS CODED RED AND CABLE TO RIGHT IS CODED BLUE. THIS APPLIES TO STAKE MOUNTED LIGHTS AND BASE MOUNTED LIGHTS WHERE THE BASE HAS ONLY ONE ENTRANCE.
- L-867 BASES SHALL BE SIZE B, 24" DEEP, CLASS I, UNLESS OTHERWISE NOTED.
- BASE MOUNTED BREAKABLE COUPLINGS SHALL NOT HAVE WEEP HOLES TO THE OUTSIDE. PLUGGED UP HOLES SHALL NOT BE ACCEPTABLE. IT SHALL BE A 1/4" DIAMETER, MINIMUM, OR EQUIVALENT OPENING FOR DRAINAGE FROM THE SPACE AROUND THE SECONDARY CONNECTOR INTO THE L-867 BASE.
- THE ELEVATION OF THE BREAKABLE COUPLING GROOVE SHALL NOT EXCEED 1-1/2" ABOVE THE EDGE OF THE COVER IN CASE OF BASE MOUNTED COUPLINGS, OR THE TOP OF THE STAKE IN CASE OF STAKE MOUNTED COUPLINGS.
- WHERE THE BREAKABLE COUPLING IS NOT AN INTEGRAL PART OF THE LIGHT FIXTURE STEM OR MOUNTING LEG, A BEAD OF SILICON SEAL SHALL BE APPLIED COMPLETELY AROUND LIGHT STEM OR WIREWAY AT BREAKABLE COUPLING TO PROVIDE A WATERTIGHT SEAL.
- TOPS OF THE STAKES SUPPORTING LIGHT FIXTURES SHALL BE FLUSH WITH THE SURROUNDING GRADE.
- PLASTIC LIGHTING FIXTURE COMPONENTS, SUCH AS LAMP HEADS, STEMS, BREAKABLE COUPLINGS, BASE COVERS, BRACKETS, STAKES, SHALL NOT BE ACCEPTABLE.
- THE TOLERANCE FOR THE HEIGHT OF RUNWAY/TAXIWAY EDGE LIGHTS SHALL BE: ONE (1) INCH. IN CASE OF STAKE MOUNTED LIGHTS, THE SPECIFIED LIGHTING FIXTURE HEIGHT SHALL BE MEASURED BETWEEN THE TOP OF THE STAKE AND THE TOP OF THE LENS. IN CASE OF BASE MOUNTED LIGHTS, THE SPECIFIED LIGHTING FIXTURE HEIGHT SHALL BE MEASURED BETWEEN THE TOP OF THE BASE FLANGE AND THE TOP OF THE LENS, THUS INCLUDING THE BASE COVER, THE FRANGIBLE COUPLING, THE STEM, THE LAMP HOUSING AND THE LENS.
- THE TOLERANCE FOR THE LATERAL SPACING (LIGHT LANE TO RUNWAY/TAXIWAY CENTERLINE) OF RUNWAY/TAXIWAY EDGE LIGHTS SHALL BE ONE (1) INCH. THIS ALSO APPLIES AT INTERSECTIONS TO LATERAL SPACING BETWEEN LIGHTS OF A RUNWAY/TAXIWAY AND THE INTERSECTING RUNWAY/TAXIWAY.

**GROUNDING NOTES FOR AIRFIELD LIGHTING**

- ENTRANCES INTO L-867 BASES SHALL HAVE CONDUIT COUPLINGS OR REDUCERS TO INTERFACE UNIT DUCT/CONDUIT TO L-867 BASE HUBS, OR SHALL BE SEALED WITH HEAT SHRINK.
- GALVANIZED/PAINTED EQUIPMENT/COMPONENT SURFACES SHALL NOT BE DAMAGED BY DRILLING, FILING, ETC. DRAIN HOLES IN METAL TRANSFORMER HOUSINGS SHALL BE MADE BEFORE GALVANIZING.
- EDGE LIGHT NUMBERING TAGS SHALL BE FACING THE PAVEMENT.
- CABLE/SPLICE/DUCT MARKERS SHALL BE PRECAST CONCRETE OF THE SIZE SHOWN. LETTERS/NUMBERS/ARROWS FOR THE LEGEND TO BE IMPRESSED INTO THE TOPS OF THE MARKERS SHALL BE PRE-ASSEMBLED AND SECURED IN THE MOLD BEFORE THE CONCRETE IS POURED. LEGEND INSCRIBED BY HAND IN WET CONCRETE SHALL NOT BE ACCEPTABLE.
- ALL UNDERGROUND CABLE RUNS SHALL BE IDENTIFIED BY CABLE MARKERS AT 200 FEET MAXIMUM SPACING, WITH AN ADDITIONAL MARKER AT EACH CHANGE OF DIRECTION OF THE CABLE RUN. CABLE MARKERS SHALL BE INSTALLED IMMEDIATELY ABOVE THE CABLES.
- THERE SHALL BE NO SPLICES BETWEEN THE ISOLATION TRANSFORMERS. L-823 CONNECTORS ARE ALLOWED AT TRANSFORMER CONNECTIONS ONLY, UNLESS OTHERWISE SHOWN.
- APPLY AN OXIDE INHIBITING, ANTI-SEIZING COMPOUND TO ALL SCREWS, NUTS AND BREAKAGE COUPLING THREADS.
- LOCATIONS OF ENDS OF ALL UNDERGROUND DUCTS SHALL BE IDENTIFIED BY DUCT MARKERS.
- WHERE A PARALLEL, CONSTANT VOLTAGE PAPI SYSTEM IS PROVIDED, THE "T" SPLICES SHALL BE OF THE CAST TYPE.
- CONCRETE USED FOR SLABS, FOOTINGS, BACKFILL AROUND TRANSFORMER HOUSINGS, MARKINGS, ETC. SHALL BE 3500 PSI (MINIMUM) AT 14 DAYS, IN ACCORDANCE WITH ITEM 610 STRUCTURAL PORTLAND CEMENT CONCRETE.
- ALL POWER AND CONTROL CABLES IN MAN/HAND HOLES SHALL BE TAGGED. USE EMBOSSED COPPER STRIPS TO BE ATTACHED AT BOTH ENDS TO THE CABLE BY THE USE OF PLASTIC STRAPS. MINIMUM OF TWO TAGS SHALL BE PROVIDED ON EACH CABLE IN A MAN/HAND HOLE-ONE AT THE CABLE ENTRANCE AND ONE AT THE CABLE EXIT.
- THE LOCATION, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND AND/OR ABOVEGROUND UTILITIES INDICATED ON THE PLANS IS NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY WHATSOEVER IN RESPECT TO ACCURACY, COMPLETENESS, OR SUFFICIENCY OF THE INFORMATION. THERE IS NO GUARANTEE EITHER EXPRESSED OR IMPLIED, THAT THE LOCATIONS, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ARE REPRESENTATIVE OF THOSE TO BE ENCOUNTERED IN THE CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES OF HIS OPERATIONAL PLANS AND SHALL OBTAIN FROM THE RESPECTIVE UTILITY COMPANIES DETAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF THEIR FACILITIES AND THE WORKING SCHEDULE OF THE COMPANIES FOR REMOVAL OR ADJUSTMENT WHERE REQUIRED. IN THE EVENT AN UNEXPECTED UTILITY INTERFERENCE IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY COMPANY OF JURISDICTION. THE OWNER'S REPRESENTATIVE AND/OR THE RESIDENT ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY DAMAGE TO SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT. ALL UTILITY CABLES AND LINES SHALL BE LOCATED BY THE RESPECTIVE UTILITY. CONTACT JULIE (JOINT UTILITY LOCATION INFORMATION FOR EXCAVATORS) FOR UTILITY INFORMATION, PHONE: 1-800-892-0123. CONTACT THE FAA (FEDERAL AVIATION ADMINISTRATION) FOR ASSISTANCE IN LOCATING FAA CABLES AND UTILITIES. LOCATION OF FAA POWER, CONTROL AND COMMUNICATION CABLES SHALL BE COORDINATED WITH AND/OR LOCATED BY THE FAA. ALSO CONTACT AIRPORT DIRECTOR/MANAGER AND AIRPORT PERSONNEL FOR ASSISTANCE IN LOCATING UNDERGROUND AIRPORT CABLES AND/OR UTILITIES. ALSO COORDINATE WORK WITH ALL ABOVE GROUND UTILITIES.
- WHEN PREPARING CABLE FOR SPLICES, THE CONTRACTOR SHALL USE A CABLE STRIPPER/PENCILLER WHENEVER CABLE CONNECTIONS ARE MADE.

- GROUNDING 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, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. A LIGHT BASE GROUND SHALL ALSO BE INSTALLED AT EACH STAKE MOUNTED LIGHT FIXTURE. A LIGHT BASE GROUND SHALL BE INSTALLED AND CONNECTED TO THE METAL FRAME OF EACH TAXI GUIDANCE SIGN AS DETAILED ON THE PLANS AND IN ACCORDANCE WITH THE RESPECTIVE TAXI GUIDANCE SIGN MANUFACTURER RECOMMENDATIONS. THE LIGHT BASE GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR BONDED TO THE GROUND LUG ON THE RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND A 3/4-INCH DIAMETER BY 10-FOOT LONG (MINIMUM) UL LISTED COPPER CLAD GROUND ROD. CONNECTIONS TO GROUND LUGS ON THE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE SHALL BE WITH A UL LISTED GROUNDING CONNECTOR. 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 RODS SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY PENTAIR ERICO PRODUCTS, INC., THERMOWELD BY CONTINENTAL INDUSTRIES, INC., ULTRAWELD BY HARGER, OR APPROVED EQUAL. EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS. TOP OF GROUND RODS SHALL BE BURIED 12 INCHES MINIMUM BELOW GRADE, UNLESS SPECIFIED OTHERWISE HEREIN, FOR RESPECTIVE APPLICATIONS.
- 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 RATED 600 VOLTS WITH GREEN XHHW, THWN-2, OR OTHER SUITABLE 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 BASE FOR ROUTINE MAINTENANCE. SEE THE LIGHT FIXTURE MANUFACTURER'S INSTRUCTIONS FOR PROPER METHODS OF ATTACHING A BONDING WIRE TO THE FIXTURE.
- STEEL USED TO MANUFACTURE GROUND RODS SHALL BE 100 PERCENT DOMESTIC STEEL.
- 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 2017 NATIONAL ELECTRICAL CODE ARTICLE 250-12.
- THE RESISTANCE TO GROUND OF THE RESPECTIVE MOUNTING STAKE OR LIGHT BASE (WITH GROUND ROD CONNECTED) MUST BE 25 OHMS OR LESS.
- FOR EACH AIRFIELD LIGHT FIXTURE, TAXI GUIDANCE SIGN, JUNCTION STRUCTURE/L-867 BASE/L-868 BASE, OR OTHER AIRFIELD LIGHT FIXTURE, THE CONTRACTOR SHALL TEST THE MADE ELECTRODE GROUND SYSTEM WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUNDING SYSTEMS. TEST RESULTS SHALL BE RECORDED FOR EACH AIRFIELD LIGHT FIXTURE AND EACH TAXI GUIDANCE SIGN 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. COPIES OF THE GROUND SYSTEM TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN AND THE PROJECT ENGINEER.



Offices Nationwide  
www.hanson-inc.com  
  
Hanson Professional Services Inc.  
1525 S. 6th Street  
Springfield, IL 62703  
phone: 217-788-2450  
fax: 217-788-2503

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Edgar County Airport  
  
Board of Edgar County  
15551 Airport Rd.  
Paris, IL 61944-8474  
Telephone: 217.465.4151



**APRON EXPANSION  
AND RELOCATE/  
UPGRADE FUEL  
FACILITY**

IDA No: PRG-4144  
  
Contract No. ED018

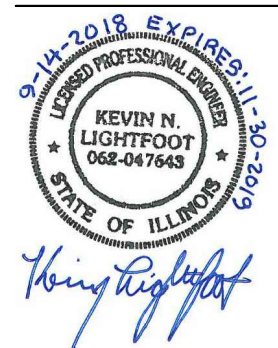
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ISSUE: SEPTEMBER 21, 2018  
PROJECT NO: 13A0062D  
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SHEET TITLE

**ELECTRICAL NOTES  
SHEET 2**

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**APRON EXPANSION AND RELOCATE/UPGRADE FUEL FACILITY**

IDA No: PRG-4144

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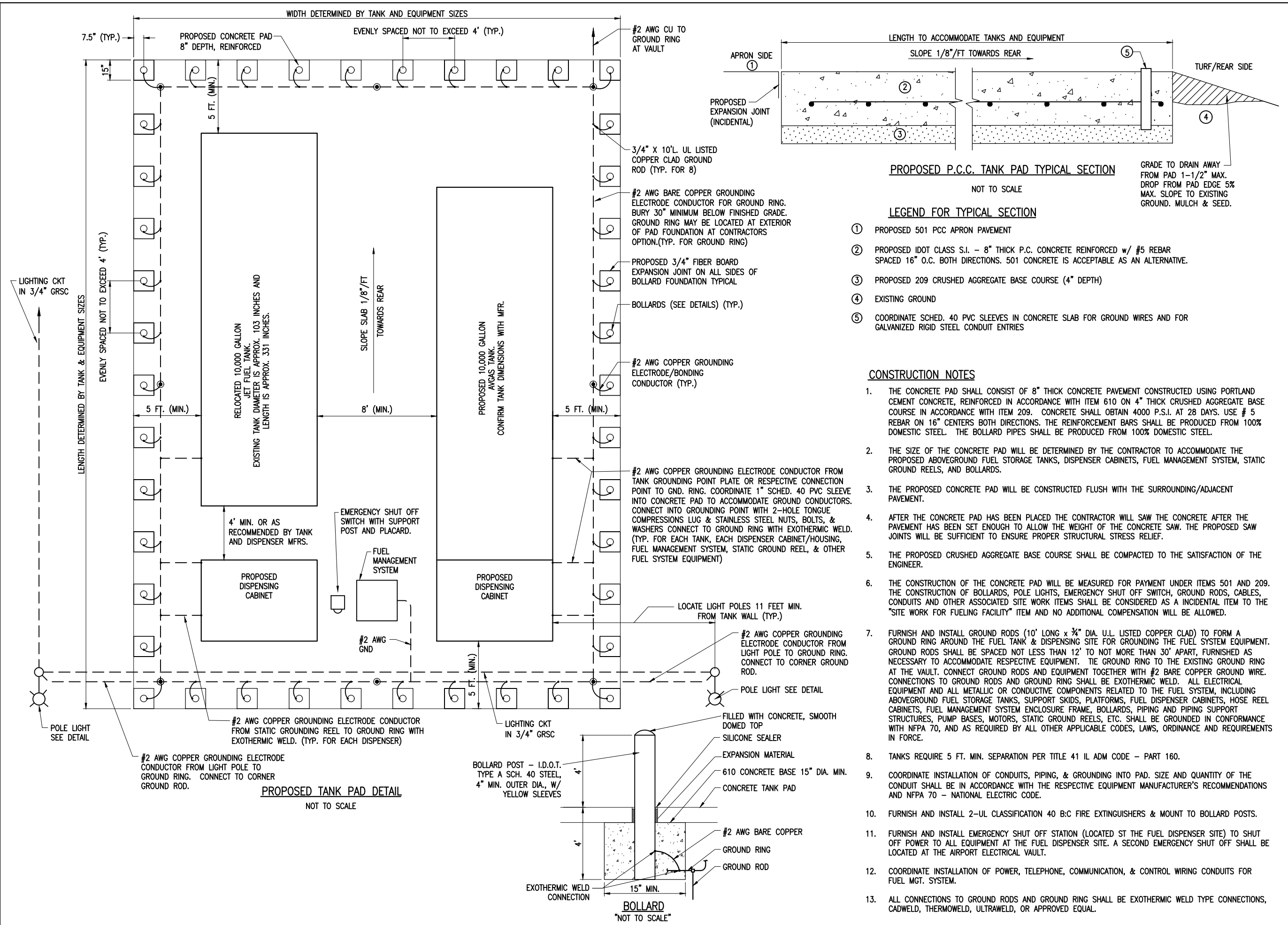

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SHEET TITLE

**PROPOSED FUEL FACILITY PAD DETAIL**



**PROPOSED P.C.C. TANK PAD TYPICAL SECTION**  
NOT TO SCALE

- LEGEND FOR TYPICAL SECTION**
- ① PROPOSED 501 PCC APRON PAVEMENT
  - ② PROPOSED IDOT CLASS S.I. - 8" THICK P.C. CONCRETE REINFORCED w/ #5 REBAR SPACED 16" O.C. BOTH DIRECTIONS. 501 CONCRETE IS ACCEPTABLE AS AN ALTERNATIVE.
  - ③ PROPOSED 209 CRUSHED AGGREGATE BASE COURSE (4" DEPTH)
  - ④ EXISTING GROUND
  - ⑤ COORDINATE SCHED. 40 PVC SLEEVES IN CONCRETE SLAB FOR GROUND WIRES AND FOR GALVANIZED RIGID STEEL CONDUIT ENTRIES

- CONSTRUCTION NOTES**
1. THE CONCRETE PAD SHALL CONSIST OF 8" THICK CONCRETE PAVEMENT CONSTRUCTED USING PORTLAND CEMENT CONCRETE, REINFORCED IN ACCORDANCE WITH ITEM 610 ON 4" THICK CRUSHED AGGREGATE BASE COURSE IN ACCORDANCE WITH ITEM 209. CONCRETE SHALL OBTAIN 4000 P.S.I. AT 28 DAYS. USE # 5 REBAR ON 16" CENTERS BOTH DIRECTIONS. THE REINFORCEMENT BARS SHALL BE PRODUCED FROM 100% DOMESTIC STEEL. THE BOLLARD PIPES SHALL BE PRODUCED FROM 100% DOMESTIC STEEL.
  2. THE SIZE OF THE CONCRETE PAD WILL BE DETERMINED BY THE CONTRACTOR TO ACCOMMODATE THE PROPOSED ABOVEGROUND FUEL STORAGE TANKS, DISPENSER CABINETS, FUEL MANAGEMENT SYSTEM, STATIC GROUND REELS, AND BOLLARDS.
  3. THE PROPOSED CONCRETE PAD WILL BE CONSTRUCTED FLUSH WITH THE SURROUNDING/ADJACENT PAVEMENT.
  4. AFTER THE CONCRETE PAD HAS BEEN PLACED THE CONTRACTOR WILL SAW THE CONCRETE AFTER THE PAVEMENT HAS BEEN SET ENOUGH TO ALLOW THE WEIGHT OF THE CONCRETE SAW. THE PROPOSED SAW JOINTS WILL BE SUFFICIENT TO ENSURE PROPER STRUCTURAL STRESS RELIEF.
  5. THE PROPOSED CRUSHED AGGREGATE BASE COURSE SHALL BE COMPACTED TO THE SATISFACTION OF THE ENGINEER.
  6. THE CONSTRUCTION OF THE CONCRETE PAD WILL BE MEASURED FOR PAYMENT UNDER ITEMS 501 AND 209. THE CONSTRUCTION OF BOLLARDS, POLE LIGHTS, EMERGENCY SHUT OFF SWITCH, GROUND RODS, CABLES, CONDUITS AND OTHER ASSOCIATED SITE WORK ITEMS SHALL BE CONSIDERED AS A INCIDENTAL ITEM TO THE "SITE WORK FOR FUELING FACILITY" ITEM AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
  7. FURNISH AND INSTALL GROUND RODS (10' LONG x 3/4" DIA. U.L. LISTED COPPER CLAD) TO FORM A GROUND RING AROUND THE FUEL TANK & DISPENSING SITE FOR GROUNDING THE FUEL SYSTEM EQUIPMENT. GROUND RODS SHALL BE SPACED NOT LESS THAN 12' TO NOT MORE THAN 30' APART, FURNISHED AS NECESSARY TO ACCOMMODATE RESPECTIVE EQUIPMENT. TIE GROUND RING TO THE EXISTING GROUND RING AT THE VAULT. CONNECT GROUND RODS AND EQUIPMENT TOGETHER WITH #2 BARE COPPER GROUND WIRE. CONNECTIONS TO GROUND RODS AND GROUND RING SHALL BE EXOTHERMIC WELD. ALL ELECTRICAL EQUIPMENT AND ALL METALLIC OR CONDUCTIVE COMPONENTS RELATED TO THE FUEL SYSTEM, INCLUDING ABOVEGROUND FUEL STORAGE TANKS, SUPPORT SKIDS, PLATFORMS, FUEL DISPENSER CABINETS, HOSE REEL CABINETS, FUEL MANAGEMENT SYSTEM ENCLOSURE FRAME, BOLLARDS, PIPING AND PIPING SUPPORT STRUCTURES, PUMP BASES, MOTORS, STATIC GROUND REELS, ETC. SHALL BE GROUNDED IN CONFORMANCE WITH NFPA 70, AND AS REQUIRED BY ALL OTHER APPLICABLE CODES, LAWS, ORDINANCE AND REQUIREMENTS IN FORCE.
  8. TANKS REQUIRE 5 FT. MIN. SEPARATION PER TITLE 41 IL ADM CODE - PART 160.
  9. COORDINATE INSTALLATION OF CONDUITS, PIPING, & GROUNDING INTO PAD. SIZE AND QUANTITY OF THE CONDUIT SHALL BE IN ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS AND NFPA 70 - NATIONAL ELECTRIC CODE.
  10. FURNISH AND INSTALL 2-UL CLASSIFICATION 40 B:C FIRE EXTINGUISHERS & MOUNT TO BOLLARD POSTS.
  11. FURNISH AND INSTALL EMERGENCY SHUT OFF STATION (LOCATED ST THE FUEL DISPENSER SITE) TO SHUT OFF POWER TO ALL EQUIPMENT AT THE FUEL DISPENSER SITE. A SECOND EMERGENCY SHUT OFF SHALL BE LOCATED AT THE AIRPORT ELECTRICAL VAULT.
  12. COORDINATE INSTALLATION OF POWER, TELEPHONE, COMMUNICATION, & CONTROL WIRING CONDUITS FOR FUEL MGT. SYSTEM.
  13. ALL CONNECTIONS TO GROUND RODS AND GROUND RING SHALL BE EXOTHERMIC WELD TYPE CONNECTIONS, CADWELD, THERMOWELD, ULTRAWELD, OR APPROVED EQUAL.

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**APRON EXPANSION AND RELOCATE/UPGRADE FUEL FACILITY**

IDA No: PRG-4144

Contract No. ED018

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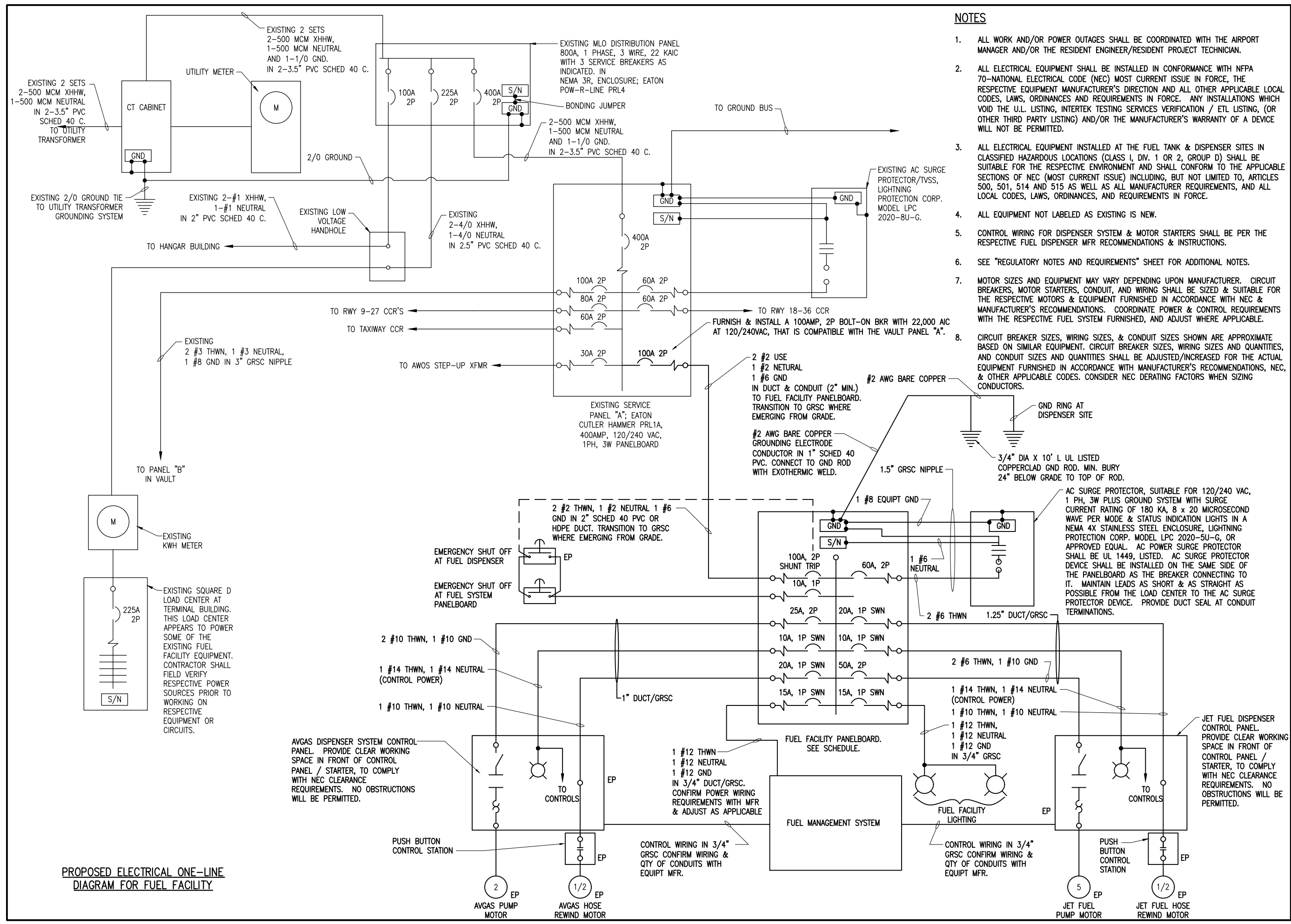
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SHEET TITLE

**PROPOSED ELEC ONELINE FOR FUEL FACILITY**

**NOTES**

- ALL WORK AND/OR POWER OUTAGES SHALL BE COORDINATED WITH THE AIRPORT MANAGER AND/OR THE RESIDENT ENGINEER/RESIDENT PROJECT TECHNICIAN.
- 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 DIRECTION AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L. LISTING, INTERTEK TESTING SERVICES VERIFICATION / ETL LISTING, (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE PERMITTED.
- ALL ELECTRICAL EQUIPMENT INSTALLED AT THE FUEL TANK & DISPENSER SITES IN CLASSIFIED HAZARDOUS LOCATIONS (CLASS I, DIV. 1 OR 2, GROUP D) SHALL BE SUITABLE FOR THE RESPECTIVE ENVIRONMENT AND SHALL CONFORM TO THE APPLICABLE SECTIONS OF NEC (MOST CURRENT ISSUE) INCLUDING, BUT NOT LIMITED TO, ARTICLES 500, 501, 514 AND 515 AS WELL AS ALL MANUFACTURER REQUIREMENTS, AND ALL LOCAL CODES, LAWS, ORDINANCES, AND REQUIREMENTS IN FORCE.
- ALL EQUIPMENT NOT LABELED AS EXISTING IS NEW.
- CONTROL WIRING FOR DISPENSER SYSTEM & MOTOR STARTERS SHALL BE PER THE RESPECTIVE FUEL DISPENSER MFR RECOMMENDATIONS & INSTRUCTIONS.
- SEE "REGULATORY NOTES AND REQUIREMENTS" SHEET FOR ADDITIONAL NOTES.
- MOTOR SIZES AND EQUIPMENT MAY VARY DEPENDING UPON MANUFACTURER. CIRCUIT BREAKERS, MOTOR STARTERS, CONDUIT, AND WIRING SHALL BE SIZED & SUITABLE FOR THE RESPECTIVE MOTORS & EQUIPMENT FURNISHED IN ACCORDANCE WITH NEC & MANUFACTURER'S RECOMMENDATIONS. COORDINATE POWER & CONTROL REQUIREMENTS WITH THE RESPECTIVE FUEL SYSTEM FURNISHED, AND ADJUST WHERE APPLICABLE.
- CIRCUIT BREAKER SIZES, WIRING SIZES, & CONDUIT SIZES SHOWN ARE APPROXIMATE BASED ON SIMILAR EQUIPMENT. CIRCUIT BREAKER SIZES, WIRING SIZES AND QUANTITIES, AND CONDUIT SIZES AND QUANTITIES SHALL BE ADJUSTED/INCREASED FOR THE ACTUAL EQUIPMENT FURNISHED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, NEC, & OTHER APPLICABLE CODES. CONSIDER NEC DERATING FACTORS WHEN SIZING CONDUCTORS.



**PROPOSED ELECTRICAL ONE-LINE DIAGRAM FOR FUEL FACILITY**

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APRON EXPANSION  
AND RELOCATE/  
UPGRADE FUEL  
FACILITY

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SHEET TITLE

FUEL FACILITY  
PANELBOARD  
SCHEDULE AND  
DETAILS

### FUEL FACILITY PANELBOARD

CKT #	DUTY	SIZE	SIZE	DUTY	CKT #
1	MAIN	100A, 2P	60A, 2P	AC SURGE PROTECTOR	2
3	BREAKER				4
5	SPACE FOR SHUNT TRIP	ST	20A, 1P	JET FUEL HOSE REWIND MOTOR	6
7	SHUNT TRIP POWER	10A, 1P	SWN		8
9	AVGAS PUMP	25A, 2P	10A, 1P	JET FUEL PUMP CONTROL POWER	10
11			SWN		12
13	AVGAS PUMP CONTROL POWER	10A, 1P	50A, 2P	JET FUEL PUMP	14
15		SWN			16
17	AVGAS HOSE REWIND MOTOR	20A, 1P			18
19		SWN			20
21	FUEL MANAGEMENT SYSTEM	15A, 1P			22
23		SWN		BLANK	24
25	BLANK			BLANK	26
27	BLANK			BLANK	28
29	BLANK			BLANK	30

100 AMP (MINIMUM), 120/240VAC, 1 PHASE, 3 WIRE 30 CIRCUIT MAIN LUG PANELBOARD WITH BACKFED MAIN BREAKER. ENCLOSURE SHALL BE NEMA 3R & NEMA 12 PAINTED STEEL WITH HINGED COVER. PANELBOARD SHALL BE SQUARE D TYPE NQ, EQUIVALENT BY EATON CUTLER-HAMMER, OR APPROVED EQUAL.

**NOTES**

- PANELBOARD BUSSES SHALL BE COPPER. NEUTRAL SHALL BE COPPER. EQUIPT. GROUND BAR SHALL BE COPPER.
- ALL BREAKERS SHALL BE BOLT-ON TYPE WITH 10,000 AIC AT 120/240 VAC.
- SWN INDICATES BRANCH BREAKER WITH SWITCHED NEUTRAL FEATURE.
- ST INDICATES BRANCH BREAKER WITH SHUNT TRIP FEATURE.
- PROVIDE LEGEND PLATE FOR PANELBOARD LABELED "FUEL FACILITY PANEL, 120/240 VAC, 1PH, 3W, FED FROM VAULT SERVICE PANEL.
- CIRCUIT BREAKERS AND WIRING SHALL BE SIZED FOR THE ACTUAL EQUIPMENT FURNISHED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S RECOMMENDATION AND NEC (NFPA 70 - NATIONAL ELECTRICAL CODE). CONTRACTOR SHALL ADJUST CIRCUIT BREAKER SIZES & WIRING WHERE APPLICABLE TO CONFORM WITH MFR RECOMMENDATIONS AND NEC.
- PANELBOARD SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCE REQUIREMENTS. PROVIDE CERTIFICATION OF MANUFACTURE IN THE UNITED STATES WITH SHOP DRAWING SUBMITTAL.

LEGEND PLATE SCHEDULE	
DEVICE	LABEL
FUEL FACILITY PANELBOARD	FUEL FACILITY PANEL 120/240VAC, 1 PH, 3W FED FROM VAULT SERVICE PANEL.

NOTE: LEGEND PLATES SHALL BE WEATHERPROOF ENGRAVED PLASTIC OR PHENOLIC MATERIAL, 1/4" HIGH BLACK LETTERS ON A WHITE BACKGROUND UNLESS NOTED OTHERWISE. SECURE WITH WEATHERPROOF ADHESIVE AND MACHINE SCREWS, FURNISH ADDITIONAL LEGEND PLATES WHERE REQUIRED BY CODE, FOR ADDITIONAL EQUIPMENT, AS DETAILED HEREIN ON THE PLANS, AND AS NOTED IN THE SPECIAL PROVISION SPECIFICATIONS.

FURNISH & INSTALL A WEATHERPROOF WARNING LABEL FOR EACH SAFETY SWITCH, PANEL BOARD, LOAD CENTER, CUTOUT, & CONTROL PANEL TO WARN PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS, PER THE REQUIREMENTS OF NEC 110.16 "ARC FLASH HAZARD WARNING".

EMERGENCY  
FUEL SHUTOFF  
PUSH TO STOP  
RESET AT  
POWER SOURCE  
BREAKER

PROVIDE PLACARD WITH 2" MIN HIGH RED LETTERING ON WHITE BACKGROUND AND SUPPORT BACKING, TO COMPLY WITH NFPA 407. PROVIDE PLACARD FOR EACH EMERGENCY SHUTOFF STATION. PROVIDE BACKING FOR SUPPORT OF PLACARD.

EMERGENCY SHUTOFF PLACARD DETAIL  
NOT TO SCALE





**APRON EXPANSION AND RELOCATE/UPGRADE FUEL FACILITY**

IDA No: PRG-4144

Contract No. ED018


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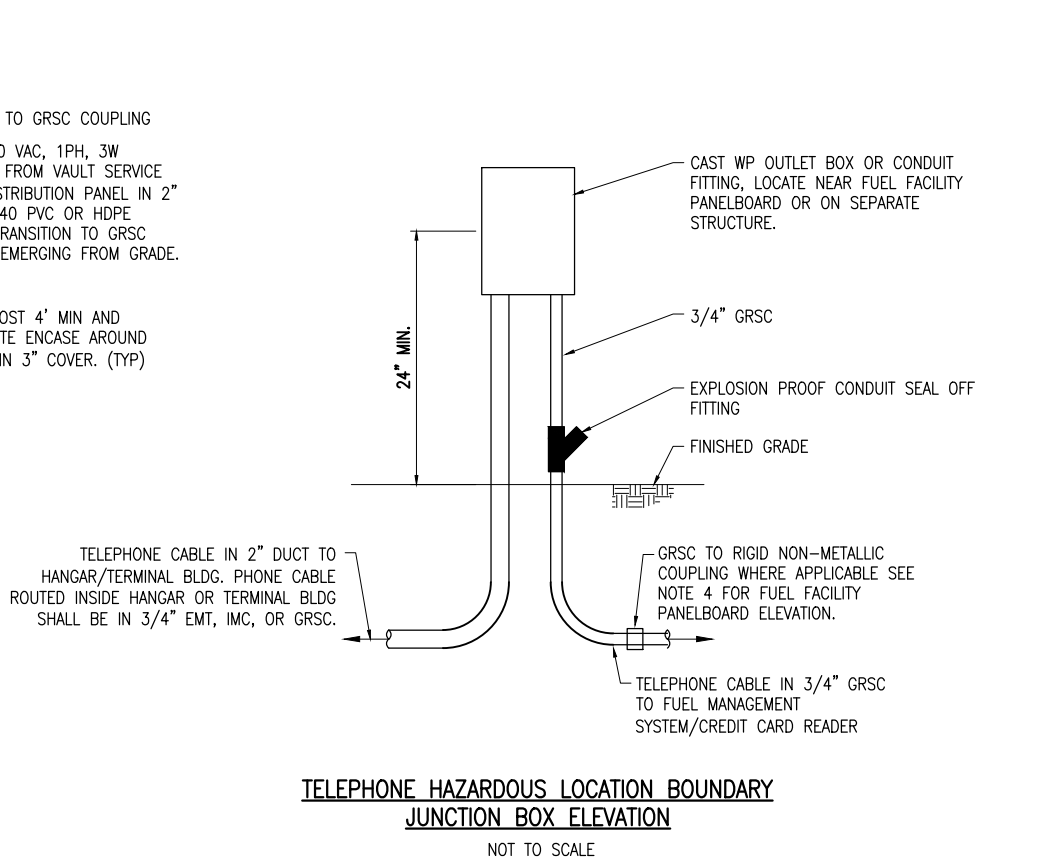
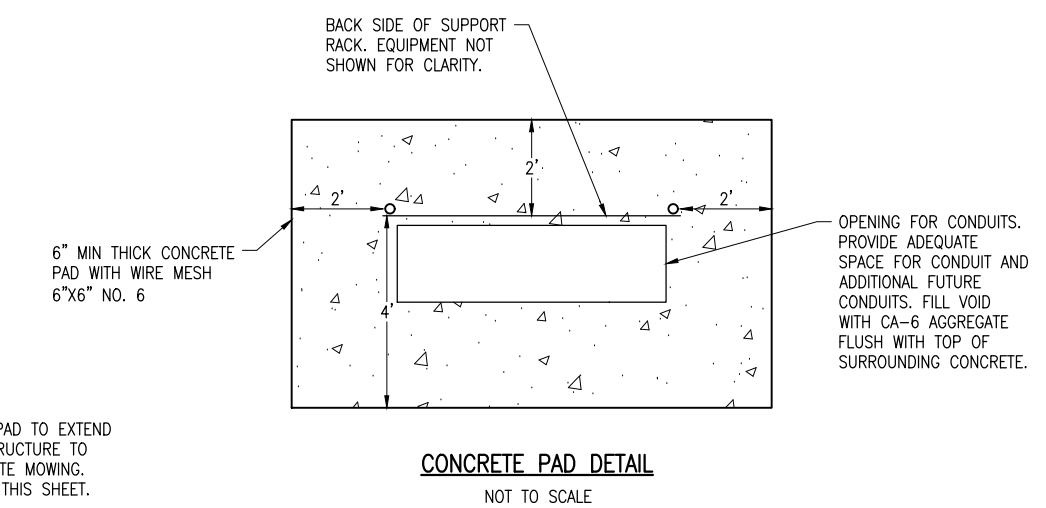
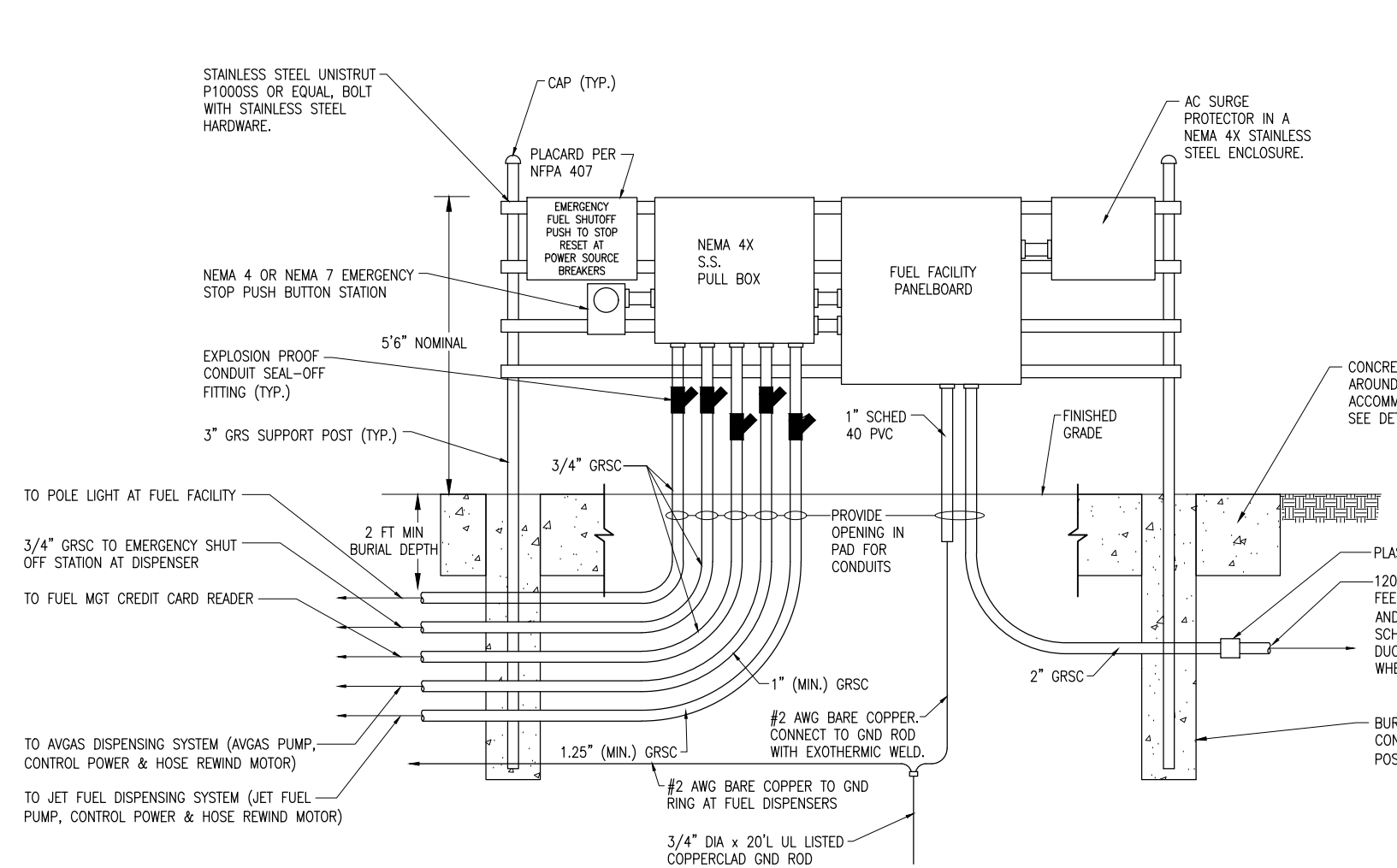
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SHEET TITLE

**FUEL FACILITY PANEL ELEVATION DETAILS**



**NOTES**

1. PROVIDE EMERGENCY FUEL SHUT OFF STATION IN NEMA 7 FACTORY SEALED ENCLOSURE WITH 2" GRSC SUPPORT POST OR STAINLESS STEEL SUPPORT HARDWARE & PLACARD PER NFPA 407 AT FUEL DISPENSER SITE.
2. PROVIDE EMERGENCY FUEL SHUT OFF STATION IN NEMA 4 OR NEMA 7 ENCLOSURE AT FUEL SYSTEM PANELBOARD.
3. EACH EMERGENCY FUEL SHUTOFF STATION SHALL INCLUDE A PLACARD AS DETAILED.
4. CONDUITS TO FUEL FACILITY SHALL BE GALVANIZED RIGID STEEL WITH THREADED FITTINGS.
5. INCREASE CONDUIT SIZES WHERE APPLICABLE FOR RESPECTIVE EQUIPMENT FURNISHED & TO COMPLY WITH NEC.
6. PROVIDE CABLE TAGS TO IDENTIFY EACH CIRCUIT IN THE PULL BOX.
7. PROVIDE DUCT SEAL FOR CONDUIT BETWEEN FUEL FACILITY PANELBOARD AND AC SURGE PROTECTOR DEVICE.
8. PROVIDE NEMA 4, 4X HUBS FOR ALL CONDUIT ENTRIES INTO NEMA 4, 4X EQUIPMENT ENCLOSURES TO MAINTAIN THE NEMA 4, 4X RATING OF THE RESPECTIVE ENCLOSURE. HUBS FOR USE WITH NEMA 4X STAINLESS STEEL ENCLOSURES SHALL BE NEMA 4X STAINLESS STEEL HUBS.

**CONDUIT SEAL OFF NOTES:**

1. CONDUIT SEAL OFF FITTINGS SHALL BE UL LISTED OR FM APPROVED SUITABLE FOR CLASS I, DIV. 1, GROUP D LOCATION. PER UL STANDARD 886 & NEC 501.15(C)(6), THE CROSS-SECTIONAL AREA OF THE CONDUCTORS PERMITTED IN A SEAL SHALL NOT EXCEED 25 PERCENT OF THE CROSS-SECTIONAL AREA OF A RIGID METAL CONDUIT OF THE SAME TRADE SIZE UNLESS IT IS SPECIFICALLY IDENTIFIED FOR A HIGHER PERCENTAGE OF FILL.
2. CONDUIT SEAL OFF FITTINGS ARE REQUIRED FOR ALL CONDUITS EMERGING FROM GRADE AT THE FUEL TANK & DISPENSER SITES IN CLASS I, DIVISION 1 OR 2, GROUP D LOCATIONS, AND SHALL BE THE FIRST FITTING AFTER THE CONDUIT EMERGES FROM GRADE.
3. CONDUIT SEAL OFF FITTINGS ARE REQUIRED FOR EACH CONDUIT RUN ENTERING AN ENCLOSURE (LOCATED IN A HAZARDOUS AREA) FOR SWITCHES, CIRCUIT BREAKERS, FUSES, RELAYS, RESISTORS OR OTHER APPARATUS WHICH MAY PRODUCE ARCS, SPARKS, OR HIGH TEMPERATURES, (WITHIN 18" FROM SUCH ENCL). FACTORY SEALED DEVICES DO NOT REQUIRE CONDUIT SEALS IF CONDUIT ENTERING SUCH DEVICE IS 1 1/2" OR SMALLER.
4. CONDUIT SEAL OFF FITTINGS ARE REQUIRED FOR ALL CONDUITS EMERGING FROM GRADE IN A NON-HAZARDOUS LOCATION THAT ARE TO OR FROM A CLASSIFIED HAZARDOUS LOCATION (FUEL TANK & DISPENSER SITE) AND SHALL BE THE FIRST AFTER THE CONDUIT EMERGES FROM GRADE.



**APRON EXPANSION  
AND RELOCATE/  
UPGRADE FUEL  
FACILITY**

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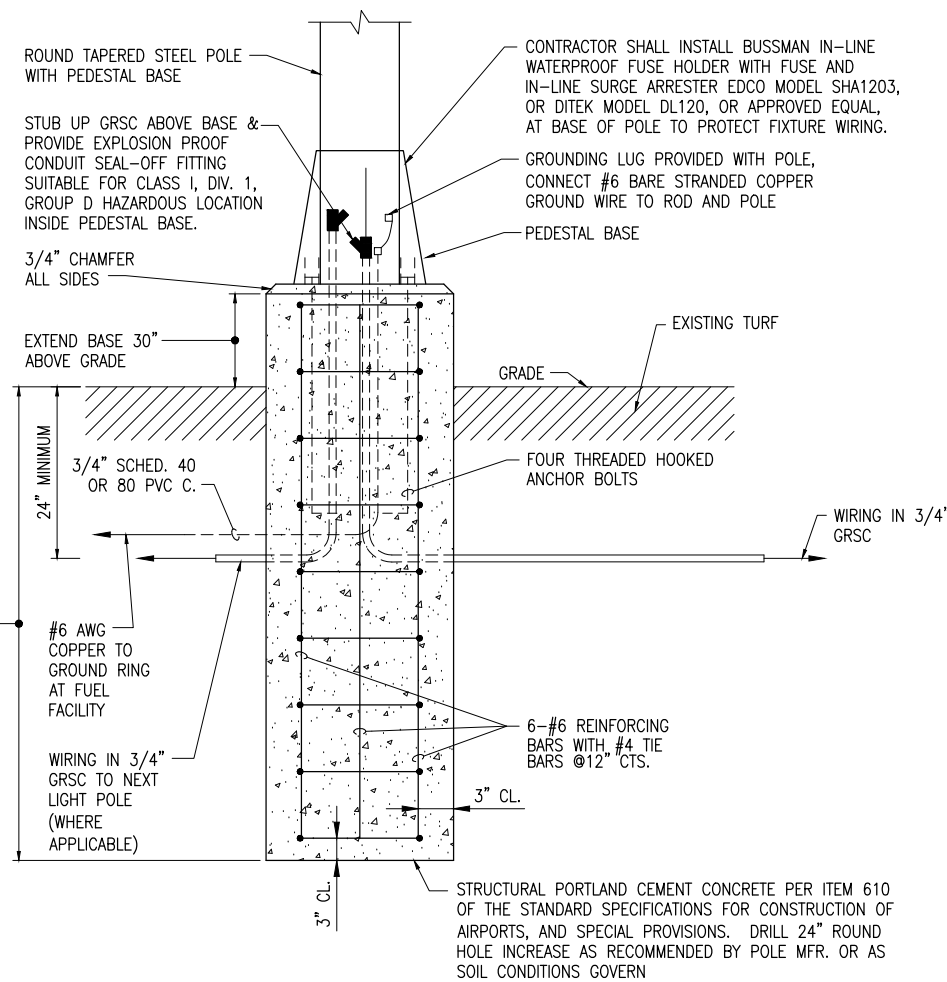

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SHEET TITLE

**FUEL FACILITY  
LIGHTING DETAILS**

FUEL FACILITY LIGHTING FIXTURE SCHEDULE						
FIXT. TYPE	DESCRIPTION	MANUFACTURER & CATALOG NO.	LAMPS/WATTS	VOLTS	MOUNTING	REMARKS
F1	LED AREA LUMINAIRE, SINGLE PIECE DIE CAST HOUSING, INTEGRAL HEAT SINK, MODULAR DESIGN, COMPLETELY SEALED AGAINST MOISTURE & BUGS (IP-65) RATED, ZINC INFUSED THERMOSET DARK BRONZE POWDER COAT FINISH, 4000K COLOR TEMPERATURE, 60 LEDs WITH 700ma DRIVE CURRENT, BUILT IN SURGE ARRESTER, LONG LIFE RATED L96 AT 100,000 HOURS, 5 YEAR WARRANTY. PROVIDE NEMA TWISTLOCK RECEPTACLE & PHOTOCELL FOR DUSK TO DAWN OPERATION ON EACH POLE LIGHT.	LITHONIA: DSX1-LED-60C-700-40K-T3M-120-SF-DDBXD-USPOM "USPOM" SUFFIX INDICATES UNITED STATES POINT OF MANUFACTURE. DECO LIGHTING: CATALOG NUMBER D804-LED-150-40-U-T3-PM-BZ-T, OR APPROVED EQUAL.	1-131W LED OR 1-150W LED	120	20' ROUND TAPERED POLE MOUNTED WITH 9" POLE ARM.	POLE SHALL BE ROUND TAPERED STEEL POLE WITH PEDESTAL BASE, 20 FT. MOUNTING HEIGHT, MINIMUM 11 GAUGE WALL THICKNESS, WITH A MINIMUM EPA RATING OF 12 OR 3 TIMES THE FIXTURE AREA WHICHEVER IS GREATER, AT 100 MPH WIND SPEED WITH 1.3 GUST FACTOR, AND DARK BRONZE FINISH. PEDESTAL BASE SHALL HAVE MIN. 7 GAUGE SIDE WALLS, & DOOR OPENINGS FOR ACCESS. POLE SHALL BE VALMONT DS202-R566A190-D1-DB OR APPROVED EQUAL. CONFIRM FIXTURE MOUNTING & HARDWARE TO BE COMPATIBLE WITH THE POLE.



**LIGHT POLE FOUNDATION DETAIL**  
NOT TO SCALE

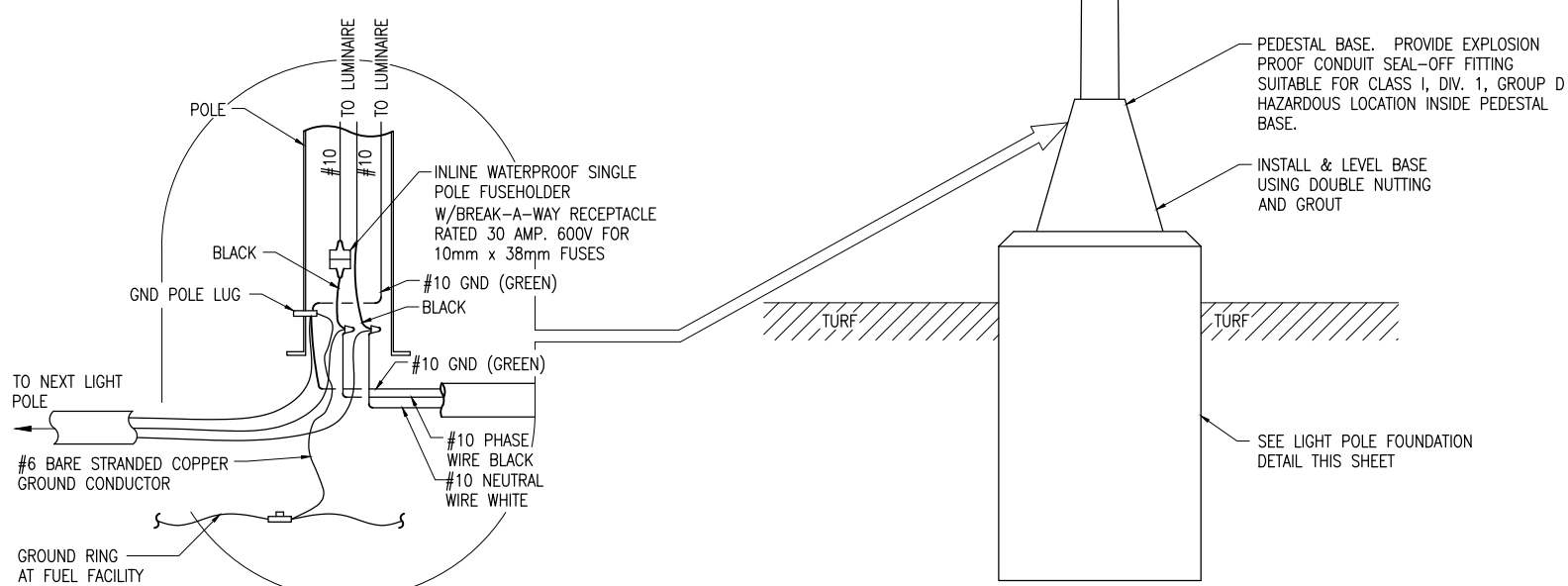
**ANCHOR BOLTS NOTES:**

1. ANCHOR SYSTEMS SHALL BE SUPPLIED BY THE POLE MANUFACTURER.
2. REQ'D. ANCHOR BOLT PROJECTION SHALL BE VERIFIED BY CONTRACTOR PRIOR TO PLACING.

\* WIRE IN POLE SHALL BE 3-1/C #10 THWN STRANDED

**NOTES**

1. LIGHT FIXTURES SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCES REQUIREMENTS. PROVIDE CERTIFICATION OF MANUFACTURE IN THE UNITED STATES WITH SHOP DRAWINGS SUBMITTAL.
2. LIGHT POLES SHALL BE MANUFACTURED IN THE UNITED STATES WITH 100% DOMESTIC STEEL TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCE REQUIREMENTS AND THE STEEL PRODUCTS PROCUREMENT ACT. CONTRACTOR SHALL PROVIDE CERTIFICATION THAT LIGHT POLES ARE PRODUCED WITH 100% DOMESTIC STEEL.
3. ANCHOR BOLTS & REBAR SHALL BE MANUFACTURED FROM 100% DOMESTIC STEEL TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCE REQUIREMENTS AND THE STEEL PRODUCTS PROCUREMENT ACT



**POLE WIRING DETAIL**  
NOT TO SCALE

**LIGHT POLE AND FIXTURE DETAIL TYPE F1**  
NOT TO SCALE



**APRON EXPANSION AND RELOCATE/UPGRADE FUEL FACILITY**

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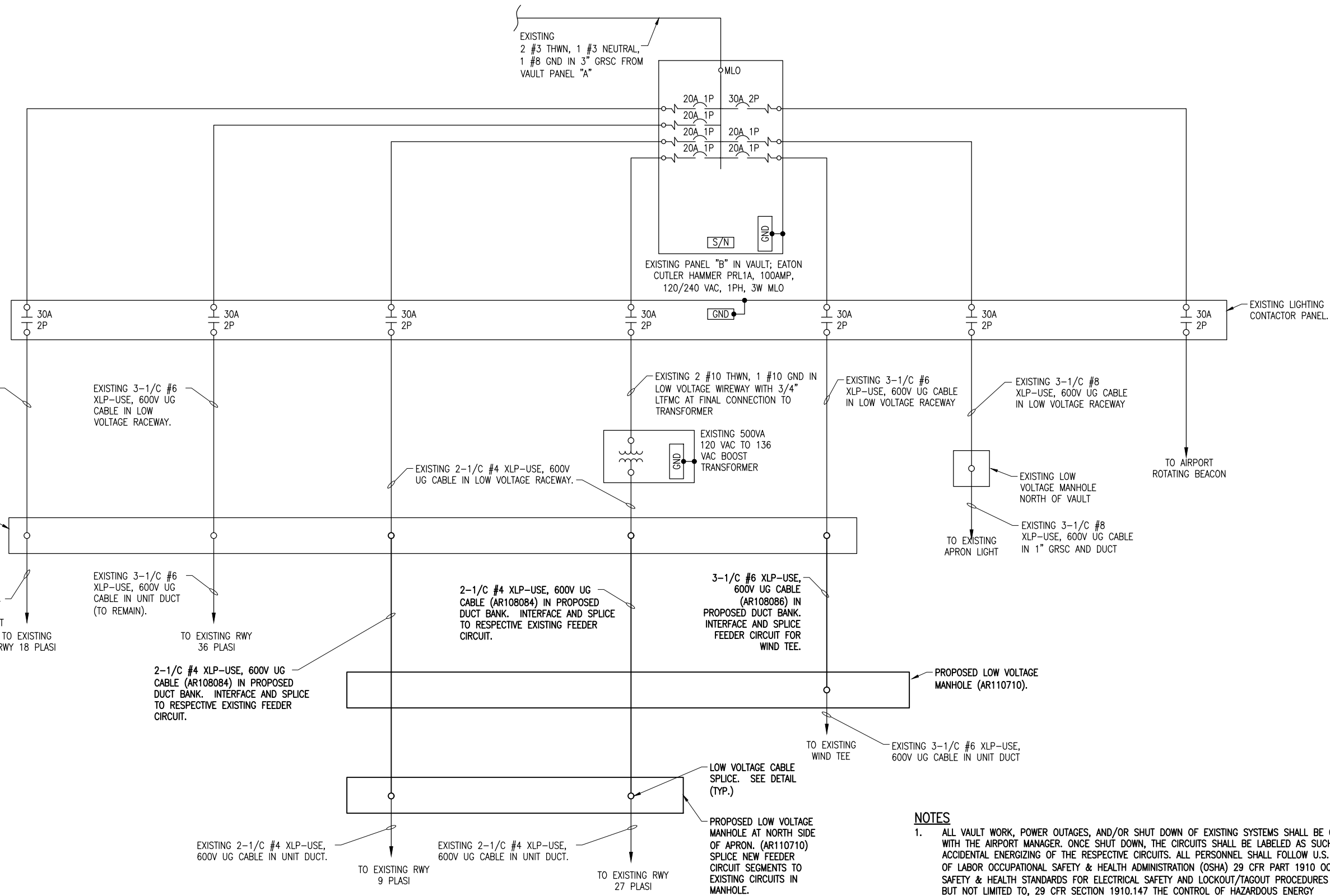
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**PROPOSED ELECTRICAL ONE LINE FOR AIRFIELD**



**PROPOSED ELECTRICAL ONE-LINE DIAGRAM FOR AIRFIELD**

- NOTES**
1. ALL VAULT WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
  2. ALL ELECTRICAL EQUIPMENT AND MATERIALS SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 - NATIONAL ELECTRICAL CODE (NEC) MOST CURRENT ISSUE IN FORCE, THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L. LISTING, INTERTEK TESTING SERVICES VERIFICATION/ETL LISTING, (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE PERMITTED.
  3. ALL CONDUCTORS/WIRING SHALL BE COPPER.
  4. HIGH VOLTAGE CIRCUITS (AIRFIELD LIGHTING 5000 VOLT SERIES CIRCUITS AND/OR OTHER CIRCUITS RATED ABOVE 600 VOLTS) & LOW VOLTAGE CIRCUITS (RATED 600 VOLTS AND BELOW) SHALL NOT BE INSTALLED IN THE SAME RACEWAY, WIREWAY, HANDHOLE, OR MANHOLE.
  5. ALL EQUIPMENT AND/OR MATERIALS NOT LABELED AS EXISTING IS NEW.



**APRON EXPANSION AND RELOCATE/UPGRADE FUEL FACILITY**

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Contract No. ED018

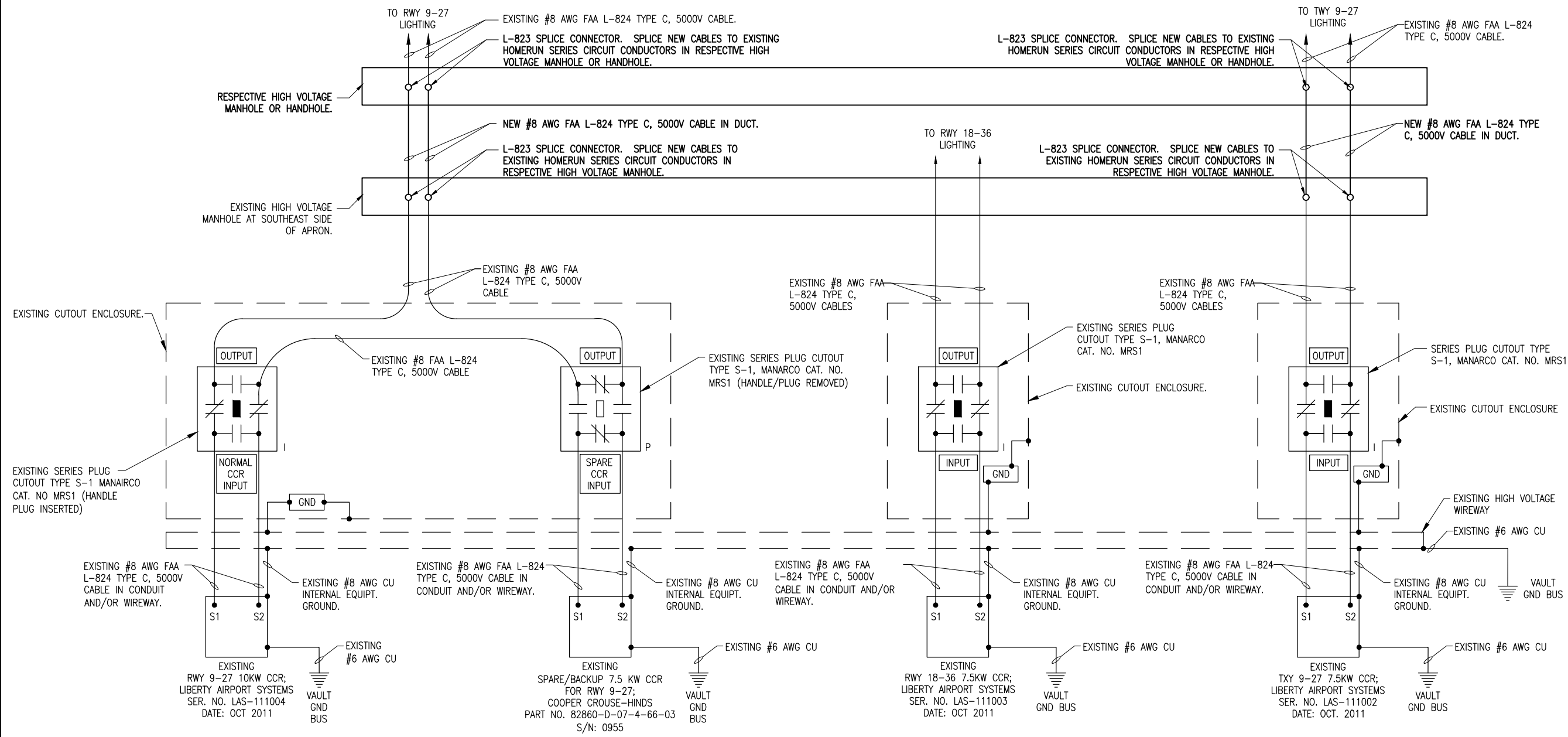
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SHEET TITLE

**HIGH VOLTAGE WIRING SCHEMATIC**

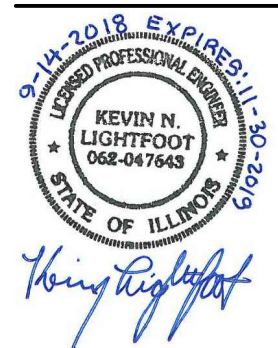
- LEGEND**
- "I" DENOTES PLUG CUTOUT WITH PLUG INSERTED
  - "P" DENOTES PLUG CUTOUT WITH PLUG PULLED
  - "CCR" DENOTES CONSTANT CURRENT REGULATOR



**HIGH VOLTAGE WIRING SCHEMATIC**

- NOTES:**
- ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER/DIRECTOR AND RESIDENT ENGINEER/RESIDENT PROJECT REPRESENTATIVE. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
  - CONTRACTOR SHALL EXAMINE THE SITE TO CONFIRM AND FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL REPORT ANY VARIATIONS, DEFICIENCIES, AND/OR APPARENT SAFETY CONCERNS TO THE RESIDENT ENGINEER/TECHNICIAN.
  - 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 EQUIPMENT.
  - CONTRACTOR SHALL EXERCISE CAUTION, PRACTICE SAFETY, AND DISCONNECT THE SERIES CIRCUITS FROM THE RESPECTIVE CONSTANT CURRENT REGULATORS, AS APPLICABLE WHEN PERFORMING WORK ON THE AIRFIELD LIGHTING OR WORK THAT MIGHT AFFECT THE AIRFIELD LIGHTING. CONTRACTOR SHALL MAKE NECESSARY ARRANGEMENTS TO DISCONNECT POWER AND LOCKOUT CIRCUITS FOR PROTECTION OF PERSONNEL.

- MEGGER TEST (WITH AN ISULATION RESISTANCE TESTER) AND RECORD EXISTING SERIES CIRCUITS PRIOR TO CABLE WORK AND AGAIN AFTER AIRFIELD LIGHTING MODIFICATIONS, ADDITIONS, AND/OR UPGRADES HAVE BEEN COMPLETED. ALSO TEST AND RECORD SERIES CIRCUIT LOOP RESISTANCE (WITH AN OHMMETER).
- RUNWAY 9-27 CCR, BACKUP CCR FOR RUNWAY 9-27, RUNWAY 18-36 CCR, TAXIWAY CCR, AND THE ASSOCIATED CUTOUPS ARE EXISTING.
- ALL CCR'S SHALL BE TESTED FOR PROPER OPERATION BEFORE REMOVAL WORK, MODIFICATIONS, AND/OR ADDITIONS AND AFTER THE NEW CABLES AND LIGHTING SYSTEM MODIFICATIONS AND ADDITIONS HAVE BEEN COMPLETED. CONTRACTOR SHALL TEST AND RECORD THE INPUT CURRENT AND OUTPUT CURRENT FOR EACH CONSTANT CURRENT REGULATOR IN THE AUTOMATIC AND MANUAL MODES OF OPERATIONS. CONTRACTOR SHALL REPORT CONCERNS AND/OR DEFICIENCIES TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN. TEST RESULTS SHALL BE PROVIDED TO THE PROJECT ENGINEER AND RESIDENT ENGINEER/RESIDENT TECHNICIAN, WITHIN 5 BUSINESS DAYS OF CONDUCTING TESTS.
- HIGH VOLTAGE CIRCUITS (AIRFIELD LIGHTING 5000 VOLT SERIES CIRCUITS AND/OR OTHER CIRCUITS RATED ABOVE 600 VOLTS) & LOW VOLTAGE CIRCUITS (RATED 600 VOLTS AND BELOW) SHALL NOT BE INSTALLED IN THE SAME RACEWAY, WIREWAY, HANDHOLE, OR MANHOLE.
- SPLICES FOR RUNWAY AND TAXIWAY SERIES CIRCUITS SHALL BE FAA APPROVED TYPE L-823 CONNECTORS AND SHALL BE INSTALLED IN HIGH VOLTAGE HANDHOLES, HIGH VOLTAGE MANHOLES, SPLICE CANS OR HIGH VOLTAGE ENCLOSURES.



**APRON EXPANSION AND RELOCATE/UPGRADE FUEL FACILITY**

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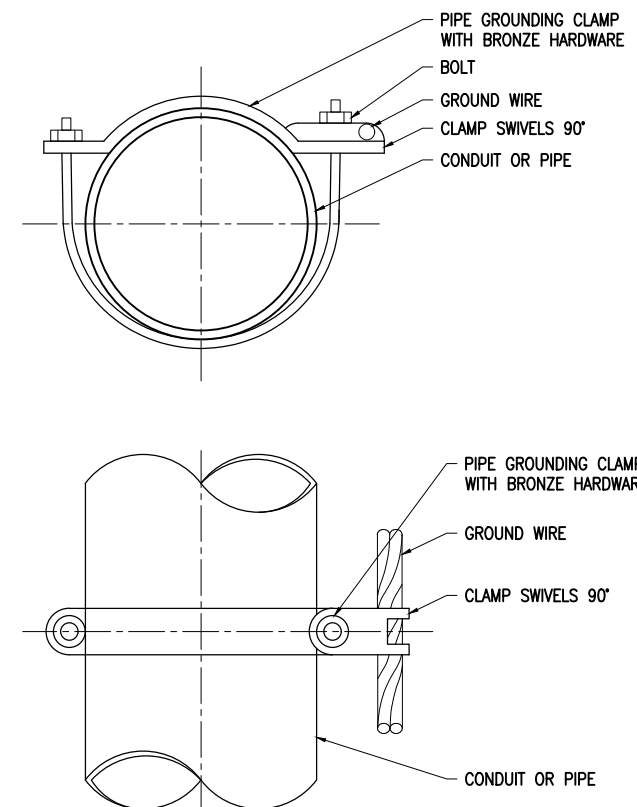
LAYOUT BY: KNL 01/09/2016

DRAWN BY: CWS 01/11/2016

REVIEWED BY: BSS 08/17/2018

SHEET TITLE

**GROUNDING DETAILS**

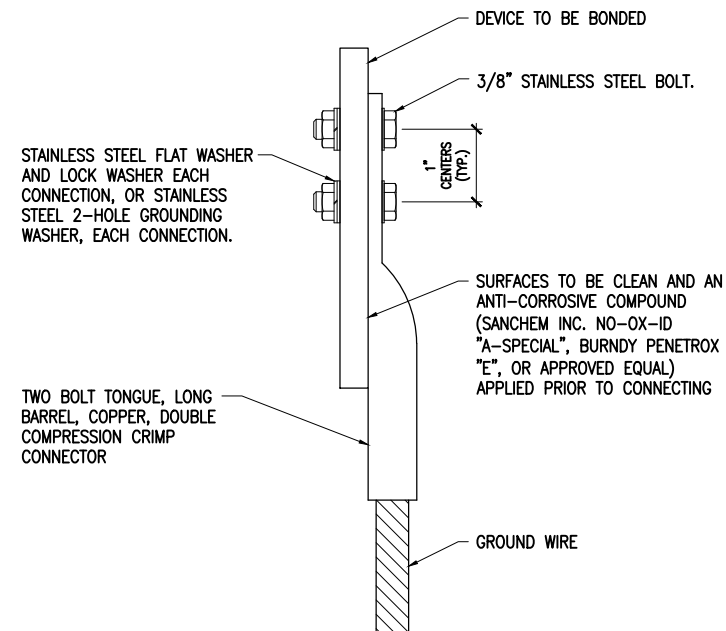


BURNDY CAT. NO.	THOMAS & BETTS CAT. NO.	PIPE SIZE
GAR3902-BU	3902BU	1/2" - 1"
GAR3903-BU	3903BU	1 1/4" - 2"
GAR3904-BU	3904BU	2 1/2" - 3 1/2"
GAR3905-BU	3905BU	4" - 5"
GAR3906-BU	3906BU	6"

**NOTES**

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

**PIPE/CONDUIT GROUNDING CLAMP DETAIL**

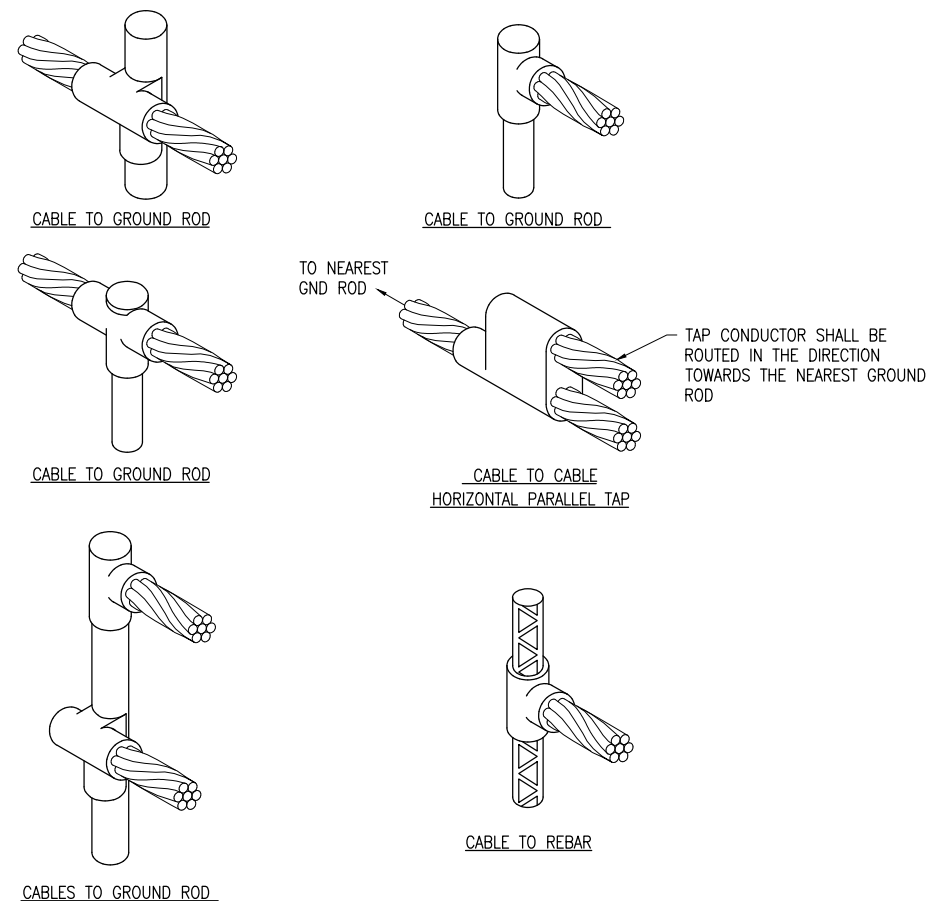


WIRE SIZE	BURNDY CAT. NO.	THOMAS & BETTS CAT. NO.	PENN-UNION CAT. NO.
#8 AWG STRANDED	YA8C-2TC38	256-30695-1157	BBLU-8D-2TC38
#6 AWG SOLID	YA8C-2TC38 OR YGA6C-2TC38E2G1		
#6 AWG STRANDED	YA6C-2TC38	256-30695-1158	BBLU-6D-2TC38
#4 AWG STRANDED	YA4C-2TC38	256-30695-1159	BBLU-4D-2TC38
#2 AWG STRANDED	YA2C-2TC38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

**NOTES**

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

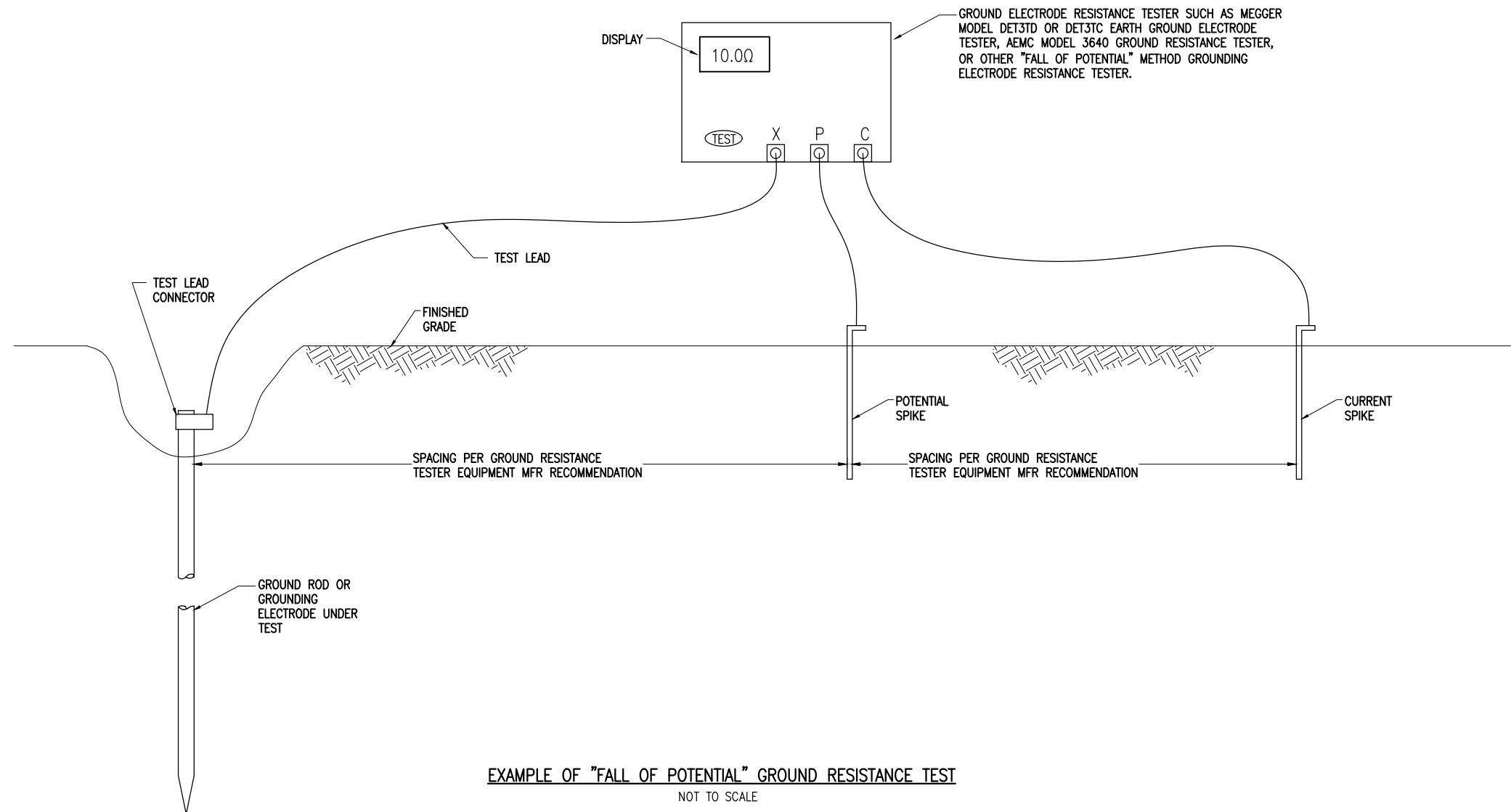
**GROUNDING LUG CONNECTION DETAIL**



**EXOTHERMIC WELD DETAILS**

**DETAIL NOTES**

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



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

**NOTES**

1. CONTRACTOR SHALL TEST AND RECORD THE RESISTANCE FOR EACH MADE ELECTRODE GROUND ROD/GROUND FIELD/GROUND RING WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUNDING ELECTRODE SYSTEMS. IF GROUND RESISTANCE EXCEEDS 25 OHMS, CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION. COPIES OF GROUND ROD TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN.
2. GROUND RESISTANCE TEST SHALL BE CONDUCTED IN ACCORDANCE WITH THE RESPECTIVE GROUND ELECTRODE RESISTANCE TESTING EQUIPMENT MANUFACTURER'S INSTRUCTIONS.
3. RECORD SITE CONDITIONS DURING TESTS.
4. "FALL OF POTENTIAL" TYPE GROUND ELECTRODE RESISTANCE TESTER IS RECOMMENDED FOR TESTING INDIVIDUAL STAND ALONE GROUND RODS.



APRON EXPANSION  
AND RELOCATE/  
UPGRADE FUEL  
FACILITY

IDA No: PRG-4144

Contract No. ED018


NO.	DATE	DESCRIPTION		
		LAY	DWN	REV

ISSUE: SEPTEMBER 21, 2018  
PROJECT NO: 13A0062D  
CAD FILE: E-507-DETL.DWG  
LAYOUT BY: KNL 01/09/2016  
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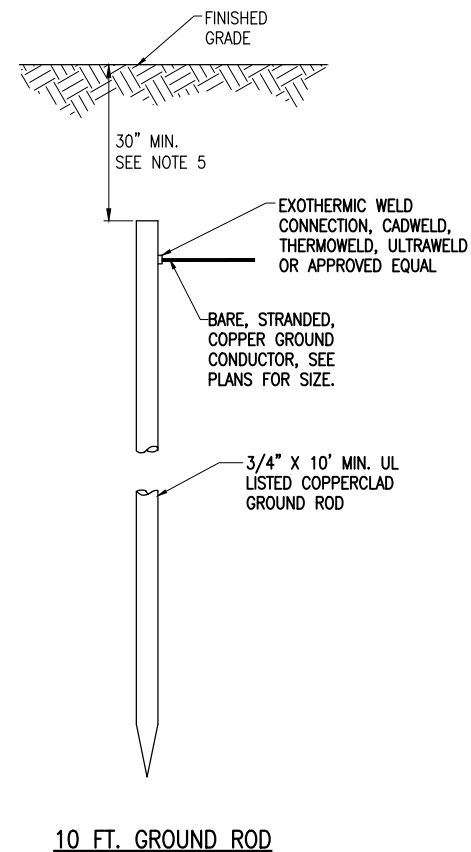
**GROUND  
RESISTANCE  
TESTING DETAILS**

### GROUNDING NOTES

THE CONTRACTOR SHALL FURNISH AND INSTALL ALL GROUNDING AS MAY BE NECESSARY OR REQUIRED TO MAKE A COMPLETE GROUNDING SYSTEM AS REQUIRED BY THE LATEST NATIONAL ELECTRICAL CODE (NFPA 70) IN FORCE AND FAA-STD-019e (LIGHTNING AND SURGE PROTECTION, GROUNDING, BONDING, AND SHIELDING REQUIREMENTS FOR FACILITIES AND ELECTRONIC EQUIPMENT). THE RELIABILITY OF THE GROUNDING SYSTEM IS DEPENDENT ON CAREFUL, PROPER INSTALLATION AND CHOICE OF MATERIALS. IMPROPER PREPARATION OF SURFACES TO BE JOINED TO MAKE AN ELECTRICAL PATH, LOOSE JOINTS OR CORROSION CAN INTRODUCE IMPEDANCE THAT WILL SERIOUSLY IMPAIR THE ABILITY OF THE GROUND PATH TO PROTECT PERSONNEL AND EQUIPMENT AND TO ABSORB TRANSIENTS THAT CAN CAUSE NOISE IN COMMUNICATIONS CIRCUITS. THE FOLLOWING FUNCTIONS ARE PARTICULARLY IMPORTANT TO ENSURE A RELIABLE GROUND SYSTEM:

1. FURNISH AND INSTALL GROUND RODS AS DETAILED HEREIN. GROUND RODS SHALL BE MINIMUM 3/4-IN. DIAMETER BY 10-FT LONG, UL-LISTED, COPPER CLAD WITH 10-MIL MINIMUM COPPER COATING (UNLESS DETAILED OTHERWISE HEREIN). GROUND RODS SHALL BE SPACED OR AS DETAILED ON THE RESPECTIVE PLANS, AND IN NO CASE SPACED LESS THAN ONE ROD LENGTH APART. ALL CONNECTIONS TO GROUND RODS AND THE GROUND RING SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY PENTAIR ERICO PRODUCTS, INC., THERMOWELD BY CONTINENTAL INDUSTRIES, INC., ULTRAWELD BY HARGER, OR APPROVED EQUAL. EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS OR AT BURIED GROUNDING ELECTRODE CONDUCTORS.
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 FOR FURTHER DIRECTION. COPIES OF GROUND ROD TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER/RESIDENT TECHNICIAN AND THE PROJECT ENGINEER.
3. ALL PRODUCTS ASSOCIATED WITH THE GROUNDING SYSTEM SHALL BE UL-LISTED AND LABELED.
4. ALL BOLTED OR MECHANICAL CONNECTIONS SHALL BE COATED WITH A CORROSION PREVENTATIVE COMPOUND BEFORE JOINING, SANCHEM INC. "NO-OX-ID "A-SPECIAL" COMPOUND, BURNDY PENETROX E, OR APPROVED EQUAL.
5. METALLIC SURFACES TO BE JOINED SHALL BE PREPARED BY THE REMOVAL OF ALL NON-CONDUCTIVE MATERIAL, PER 2017 NATIONAL ELECTRICAL CODE ARTICLE 250-12. ALL COPPER BUS BARS MUST BE CLEANED PRIOR TO MAKING CONNECTIONS TO REMOVE SURFACE OXIDATION.
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 LOCKNUTS OR BUSHINGS SHALL NOT BE THE SOLE MEANS FOR BONDING WHERE A CONDUIT ENTERS AN ENCLOSURE THROUGH A CONCENTRIC OR ECCENTRIC KNOCKOUT
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, DOSSERT CORPORATION, ILSCO CORPORATION, PENN-UNION CORPORATION, THOMAS & BETTS, OR APPROVED 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.
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 2017 NEC TABLE 250-122 "MINIMUM SIZE CONDUCTORS OR GROUNDING RACEWAY AND EQUIPMENT." WHEN CONDUCTORS ARE ADJUSTED IN SIZE TO COMPENSATE FOR VOLTAGE DROP, EQUIPMENT-GROUNDING CONDUCTORS SHALL BE ADJUSTED PROPORTIONATELY ACCORDING TO CIRCULAR MIL AREA. ALL EQUIPMENT GROUND WIRES SHALL BE COPPER, EITHER BARE OR INSULATED GREEN IN COLOR. WHERE THE EQUIPMENT GROUNDING CONDUCTORS ARE INSULATED, THEY SHALL BE IDENTIFIED BY THE COLOR GREEN, AND SHALL BE THE SAME INSULATION TYPE AS THE PHASE CONDUCTORS.

11. ALL EXTERIOR METAL CONDUIT, WHERE NOT ELECTRICALLY CONTINUOUS BECAUSE OF MANHOLES, HANDHOLES, NON-METALLIC JUNCTION BOXES, ETC., SHALL BE BONDED TO ALL OTHER METAL CONDUIT IN THE RESPECTIVE DUCT RUN, AND AT EACH END, WITH A COPPER-BONDING JUMPER SIZED IN CONFORMANCE WITH 2017 NEC 250-102. WHERE METAL CONDUITS TERMINATE IN AN ENCLOSURE (SUCH AS A MOTOR CONTROL CENTER, SWITCHBOARD, ETC) WHERE THERE IS NOT ELECTRICAL CONTINUITY WITH THE CONDUIT AND THE RESPECTIVE ENCLOSURE, PROVIDE A BONDING JUMPER FROM THE RESPECTIVE ENCLOSURE GROUND BUS TO THE CONDUIT SIZED PER 2017 NEC 250-102.
12. IT IS THE INTENT OF THIS SPECIFICATION THAT ALL MOTOR FRAMES, PUMP BASES ELECTRICAL EQUIPMENT ENCLOSURES, PANEL HOUSINGS, CONDUITS, BOXES, ETC. HAVE A CONTINUOUS COPPER WIRE GROUND CONNECTION AND SHALL BE POSITIVELY BONDED TO THE RESPECTIVE GROUNDING SYSTEM. CONDUIT CONNECTORS WILL NOT BE CONSIDERED AS ADEQUATE GROUNDING.
13. PROVIDE A POSITIVE GROUND BOND FOR ALL OUTLET BOXES, ELECTRICAL EQUIPMENT ENCLOSURES, GROUNDING RECEPTACLES, TOGGLE SWITCHES, ETC. INSTALL A GROUNDING CONDUCTOR IN ALL WIRE AND CABLE RACEWAYS. GROUND CONDUCTOR TO HAVE 600-VOLT INSULATION AND BE IDENTIFIED BY A CONTINUOUS GREEN COLOR COATING. THEY SHALL BE USED SOLELY FOR GROUNDING PURPOSES AND BE ENTIRELY SEPARATE FROM WHITE GROUNDED NEUTRAL CONDUCTOR, EXCEPT AT SUPPLY SIDE OF SERVICE DISCONNECTING MEANS, WHERE GROUNDING AND NEUTRAL SYSTEMS ARE TO BE CONNECTED TO SERVICE GROUND.
14. EACH AND ALL GROUNDED CASED AND METAL PARTS ASSOCIATED WITH ELECTRICAL EQUIPMENT SHALL BE TESTED FOR CONTINUITY OF CONNECTION WITH GROUND BUS SYSTEM BY CONTRACTOR IN PRESENCE OF OWNER'S REPRESENTATIVE.
15. ALL CONNECTIONS BETWEEN THE DIFFERENT TYPES OF GROUNDING CONDUCTORS ABOVE GRADE SHALL BE MADE USING BOLTED GROUND CONNECTORS. GROUND LUGS SHALL BE PROVIDED IN ALL ENCLOSURES AND WIRING TERMINATION JUNCTION BOXES. EQUIPMENT GROUNDS AND GROUNDING CONDUCTOR SHALL BE CONNECTED TO THESE GROUND LUGS. FOR GROUND CONNECTIONS TO ENCLOSURES, CASES AND FRAMES OF ELECTRICAL EQUIPMENT NOT SUPPLIED WITH GROUND LUGS THE CONTRACTOR SHALL DRILL REQUIRED HOLES FOR MOUNTING A BOLTED GROUND CONNECTOR. ALL BOLTED GROUND CONNECTORS SHALL BE BURNDY, DOSSERT CORPORATION, ILSCO CORPORATION, PENN-UNION CORPORATION, THOMAS & BETTS, OR APPROVED EQUAL.
16. BOND ALL NONCURRENT-CARRYING PARTS OF METAL EQUIPMENT TO GROUND SYSTEM.
17. BUILDING STRUCTURAL STEEL SYSTEM SHALL BE BONDED TO ELECTRICAL GROUND SYSTEM.
18. INSTALL GROUNDING ELECTRODE CONDUCTORS, LIGHTNING PROTECTION DOWN CONDUCTORS AND SEPARATE GROUND CONDUCTORS IN SCHEDULE 40 OR SCHEDULE 80 PVC CONDUIT OR EXPOSED WHERE ACCEPTABLE TO LOCAL CODES. WHERE GROUNDING ELECTRODE CONDUCTORS, LIGHTNING PROTECTION DOWN CONDUCTORS OR INDIVIDUAL GROUND CONDUCTORS ARE RUN IN PVC CONDUIT, DO NOT COMPLETELY ENIRCLE CONDUIT WITH FERROUS AND/OR MAGNETIC MATERIALS. USE NON-METALLIC REINFORCED FIBERGLASS STRUT SUPPORT. WHERE METAL CONDUIT CLAMPS ARE INSTALLED, USE NYLON BOLTS, NUTS, WASHERS AND SPACERS TO INTERRUPT A COMPLETE METALLIC PATH FROM 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.
19. IF LOCAL CODES DICTATE THAT INDIVIDUAL GROUNDING CONDUCTORS MUST BE RUN IN METAL CONDUIT OR RACEWAY, THEN THE CONDUIT OR RACEWAY MUST BE BONDED AT EACH END OF THE RUN WITH A BONDING JUMPER SIZED EQUAL TO THE INDIVIDUAL GROUNDING CONDUCTOR OR AS REQUIRED BY 2017 NEC 250-102. NOTE THIS DOES NOT APPLY TO AC EQUIPMENT GROUNDING CONDUCTORS RUN WITH AC CIRCUITS.
20. 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.
21. WHERE A CONFLICT IS DETERMINED WITH RESPECT TO GROUNDING REQUIREMENTS PER MANUFACTURER INSTALLATION INSTRUCTIONS, NEC, AND/OR THE CONTRACT DOCUMENTS, CONTACT THE RESIDENT ENGINEER OR PROJECT ENGINEER FOR FURTHER DIRECTIONS.
22. GROUND RODS SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA FROM 100 PERCENT DOMESTIC STEEL TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN REQUIREMENTS AND THE STEEL PRODUCTS PROCUREMENT ACT.



GROUND RODS  
NOT TO SCALE

### NOTES

1. TYPE AND MINIMUM NUMBER OF GROUND RODS SHALL BE AS SPECIFIED ON THE PLAN.
2. THE RESISTANCE TO GROUND OF THE GROUNDING SYSTEM SHALL NOT EXCEED 25 OHMS.
3. COST OF GROUND RODS IS INCIDENTAL TO THE ASSOCIATED ITEMS REQUIRING GROUNDING UNLESS OTHERWISE SPECIFIED.
4. GROUND RODS SHALL BE SPACED AS DETAILED ON THE PLANS AND SHALL NOT BE SPACED LESS THAN ONE ROD LENGTH APART.
5. TOP OF GROUND RODS SHALL BE 30" MINIMUM BELOW GRADE UNLESS DETAILED OTHERWISE HEREIN. GROUND RING CONDUCTORS SHALL BE 40" MINIMUM BELOW GRADE TO BE BELOW FROST LINE (FOR EDGAR COUNTY, ILLINOIS).



### APRON EXPANSION AND RELOCATE/ UPGRADE FUEL FACILITY

IDA No: PRG-4144

Contract No. ED018

NO.	DATE	DESCRIPTION		
		LAY	DWN	REV

ISSUE: SEPTEMBER 21, 2018

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SHEET TITLE

### GROUNDING NOTES