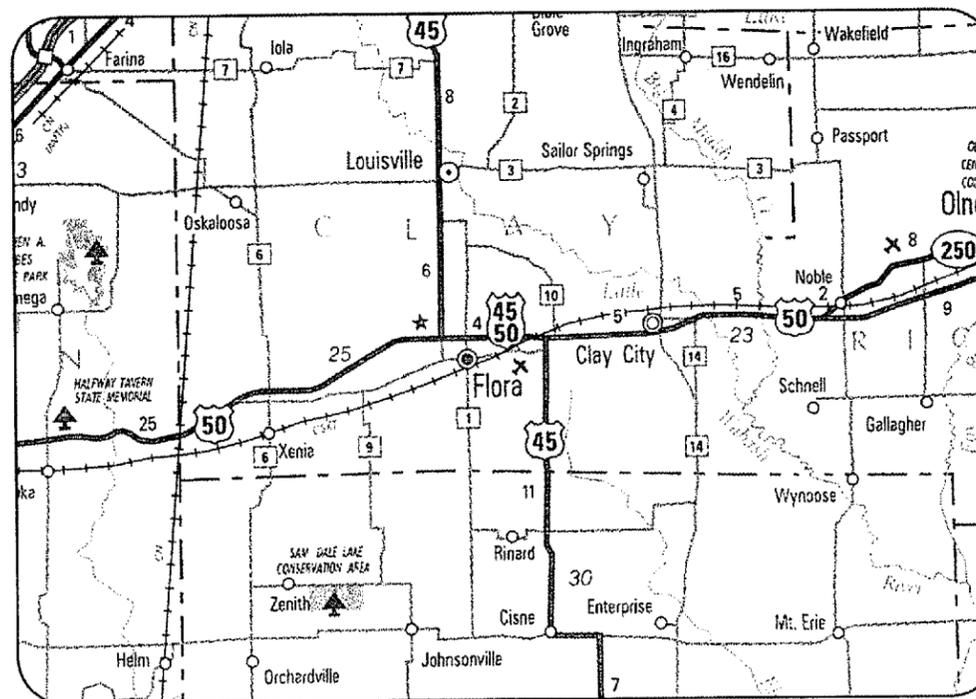


CONSTRUCTION PLANS FOR FLORA AIRPORT FLORA, CLAY COUNTY, ILLINOIS INSTALL REILS AND PLASI ON RUNWAY END 21

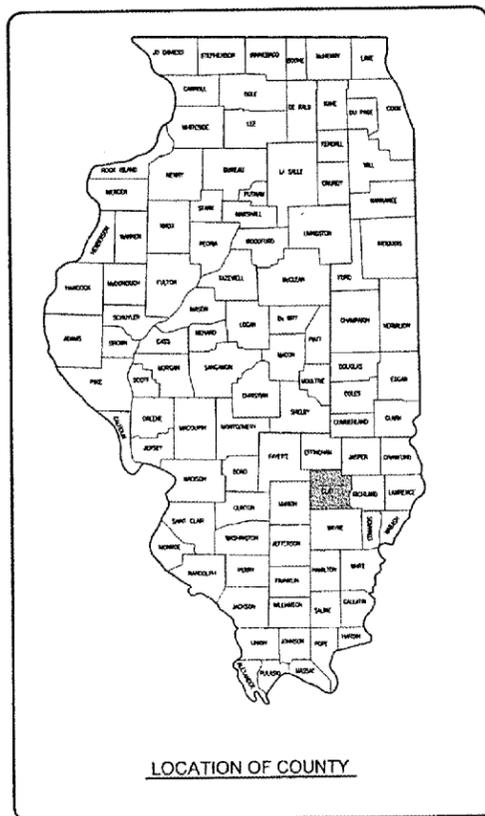
SCOPE OF WORK

THIS PROJECT CONSISTS OF THE REMOVAL OF THE VASI ON RUNWAY END 21, INSTALLATION OF A PLASI ON RUNWAY END 21, REMOVAL AND REPLACEMENT OF THE REILS ON RUNWAY END 21 AND ASSOCIATED VAULT WORK



LOCATION

ILL. PROJ.: FOA-3786
A.I.P. PROJ.: 3-17-0044-B15
LATITUDE: 38° 39' 57"
LONGITUDE: 88° 27' 09"
ELEVATION: 472.0' M.S.L.
DATE: FEBRUARY 1, 2008



LOCATION OF COUNTY



HANSON
Hanson Professional Services Inc.
ELECTRICAL ENGINEER
Submitted by *Kevin N. Lightfoot* ENG'R
Date Submitted 4/11/2008
Lic. Exp. Date 11/30/2009

AIRPORT AUTHORITY OF FLORA
Approved: *[Signature]* CHAIRMAN
Date 2/26/08
Approved: _____ SECRETARY
Date _____

DATE	REVISION

FLORA AIRPORT
FLORA, ILLINOIS

ILL. PROJ. No. 08A021D_0800	
Drawn: R-001CVR.DWG	
Scale: N/A	
Date: 02/01/08	
LAYOUT MDR 01/30/08	
DRAWN MDR 01/30/08	
REVIEWED CAH 02/01/08	

HANSON
Hanson Professional Services Inc.
1325 S. Main Street
Springfield, Illinois 62703-2886
Offices Nationwide

INSTALL REILS & PLASI
ON RUNWAY END 21

SCOPE OF WORK

THIS PROJECT CONSISTS OF THE REMOVAL OF THE VASI ON RUNWAY END 21, INSTALLATION OF A PLASI ON RUNWAY END 21, REMOVAL AND REPLACEMENT OF THE REILS ON RUNWAY END 21

AIRPORT SECURITY NOTE

AIRPORT SECURITY WILL BE MAINTAINED AT ALL TIMES. THE CONTRACTOR WILL CLOSE AND LOCK THE EXISTING GATE IN THE HAUL ROUTE AT THE END OF EACH WORKING DAY.

UTILITY NOTE

THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES AND AGENCIES WHICH HAVE LINES OR CONDUITS IN THE PROPOSED WORK AREA. ALL LINES AND CONDUITS SHALL BE LOCATED AND IDENTIFIED FOR DEPTH BEFORE ANY EXCAVATION BEGINS. THE CONTRACTOR WILL CALL J.U.L.I.E. (1-800-892-0123) TO ACCOMPLISH THE ABOVE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY ALL UNDERGROUND NON-JULIE UTILITIES LOCATED WITHIN THE PROPOSED CONSTRUCTION LIMITS. THESE UNDERGROUND IMPROVEMENTS WILL BE LOCATED AT THE CONTRACTOR'S OWN EXPENSE PRIOR TO THE START OF CONSTRUCTION ACTIVITIES.

HEIGHT OF CONSTRUCTION EQUIPMENT

THE MAXIMUM ANTICIPATED HEIGHT OF THE CONSTRUCTION EQUIPMENT WILL BE 25 FEET. THE TALLEST EQUIPMENT IS EXPECTED TO BE A CONCRETE TRUCK.

HAUL ROUTE AND VEHICLE PARKING

THE CONTRACTOR WILL USE THE DESIGNATED STAGING AREA AS SHOWN ON THIS SHEET. THE PROPOSED STAGING AREA WILL BE 75' X 150'. THE CONTRACTOR WILL BE REQUIRED TO MAINTAIN THIS AREA THROUGHOUT THE COURSE OF THE PROJECT. ANY AREAS DAMAGED OUTSIDE OF THIS AREA WILL BE REPAIRED BY THE CONTRACTOR AND AT THE CONTRACTOR'S OWN EXPENSE. AT THE CONCLUSION OF THE PROJECT THE CONTRACTOR WILL GRADE, FERTILIZE, SEED AND MULCH THE STAGING AREA AS NEEDED TO RESTORE IT TO ITS' ORIGINAL STATE. RESTORATION OF THE STAGING AREA WILL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

THE CONTRACTOR WILL BE ALLOWED TO USE THE EXISTING AIRPORT ENTRANCE ROAD AS HIS PROPOSED HAUL ROUTE. THE CONTRACTOR AND THE RESIDENT ENGINEER WILL WALK THE ENTRANCE ROAD PRIOR TO STARTING CONSTRUCTION AND WILL NOTE ANY PAVEMENT AREAS THAT ARE QUESTIONABLE. THE CONTRACTOR WILL BE REQUIRED TO MAINTAIN THE ENTRANCE ROAD THROUGHOUT THE DURATION OF THIS PROJECT. AT THE CONCLUSION OF THE PROJECT, THE CONTRACTOR WILL RESTORE THE ENTRANCE ROAD TO ITS' ORIGINAL STATE AT HIS OWN EXPENSE.

CONTRACTOR RESPONSIBILITIES

THE CONTRACTOR'S EMPLOYEES WILL PARK THEIR VEHICLES IN THE MAIN PARKING LOT. ONLY CONTRACTOR VEHICLES WILL BE ALLOWED OUTSIDE THIS AREA.

THE CONTRACTOR AND HIS EMPLOYEES WILL BE RESTRICTED TO THE WORK AREA AND ALL OTHER AREAS OF THE AIRPORT ARE "OFF LIMITS" TO THEM.

THE CONTRACTOR SHALL KEEP ONE RUNWAY OPEN AT ALL TIMES AND MAINTAIN CONTINUOUS TAXIWAY ACCESS TO ALL HANGARS AND ADMINISTRATIVE AREAS.

ALL WORK PERFORMED SHALL BE DONE IN A ORDERLY AND EFFECTIVE MANNER TO MINIMIZE RUNWAY CLOSURE.

NO TRENCHES OR HOLES WILL REMAIN OPEN OVERNIGHT.

NO RUNWAY SHALL BE CLOSED OVERNIGHT.

BARRICADES AND TRAFFIC CONES

IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO PLACE AND MAINTAIN BARRICADES AND TRAFFIC CONES AS DIRECTED BY THE AIRPORT MANAGER. THE BARRICADES WILL BE EQUIPPED WITH RED FLASHING OR RED STEADY-BURN LIGHTS AND 20" SQUARE ORANGE FLAGS. THE BARRICADES, THEIR MAINTENANCE, PLACEMENT AND REMOVAL WILL BE CONSIDERED AS AN INCIDENTAL ITEM TO THE CONTRACT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

LEGEND

- EXISTING IMPROVEMENTS
- PROPOSED IMPROVEMENTS
- EXISTING BUILDINGS
- PROPOSED HAUL ROUTE AND EQUIPMENT PARKING AREA
- PROPOSED BENCHMARK
- PROPOSED BARRICADES OR TRAFFIC CONES

THE LOCATION, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ON THE PLANS IS NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. 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 ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT.

CALL J.U.L.I.E. FOR UTILITY INFORMATION AT 1-800-892-0123.

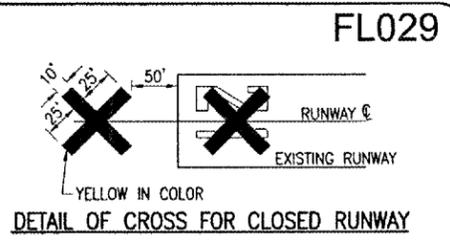
BENCHMARK DATA		
NO.	DESCRIPTION	ELEV.
1	CHISELED SQUARE, N.W. CORNER OF INLET SOUTH OF EMPLOYEE PARKING LOT	467.91
2	CHISELED SQUARE, N.E. CORNER OF ELECTRIC HANDHOLE	469.99

CERTIFIED PAYROLLS

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

MATERIAL CERTIFICATION

COMPLETED WORK CANNOT BE PLACED ON A CONSTRUCTION REPORT UNTIL ALL MATERIAL CERTIFICATIONS FOR THAT PAY ITEM HAVE BEEN RECEIVED, REVIEWED AND ACCEPTED BY THE RESIDENT ENGINEER.



"NOT TO SCALE"

NOTE:

COST OF CONSTRUCTING, PLACING, MAINTAINING AND REMOVING CROSSES WILL BE CONSIDERED INCIDENTAL TO THE CONTRACT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED. THE CROSSES WILL BE YELLOW IN COLOR AND SHALL BE MADE OF A SUITABLE MATERIAL AS APPROVED BY THE AIRPORT MANAGER. THE CROSSES WILL BE PLACED OVER THE NUMERALS AND SECURED IN A MANNER APPROVED BY THE MANAGER. THE PROPOSED CROSSES WILL BE PLACED EACH DAY THE RUNWAY IS CLOSED AND REMOVED WHEN THE RUNWAY IS RE-OPENED. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE PLACEMENT AND REMOVAL OF THE CROSSES. NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

J.U.L.I.E. INFORMATION

COUNTY CLAY
 CITY FLORA
 TOWNSHIP STANFORD
 SECTION NO. 29
 ADDRESS FLORA AIRPORT RR #1 FLORA, ILLINOIS 62839

CRITICAL POINT DATA

LATITUDE: 38° 40' 04.114"
 LONGITUDE: 88° 27' 08.732"
 ELEVATION: 464.4' M.S.L.

PROPOSED SAFETY PLAN

GENERAL - THE FLORA AIRPORT IS COMPRISED OF TWO RUNWAYS: A SOD RUNWAY 15/33 AND A PAVED RUNWAY 3/21. THE PROPOSED CONSTRUCTION WILL NECESSITATE CLOSING RUNWAY 3-21. ANY TIME THE CONTRACTOR IS WORKING WITHIN 200' OF THE RUNWAY CENTERLINE THE RUNWAY WILL BE CLOSED. THE RUNWAY WILL BE CLOSED ONLY DURING THE CONSTRUCTION DAY. AT THE END OF EACH CONSTRUCTION DAY THE CONTRACTOR WILL SMOOTH GRADE ALL AREAS WITHIN THE SAFETY AREA TO THE SATISFACTION OF THE RESIDENT ENGINEER AND RE-OPEN THE RUNWAY. ALL WORK INCLUDED IN OPENING AND CLOSING THE RUNWAY WILL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

IDENTIFICATION - WHEN THE CONTRACTORS VEHICLES AND EQUIPMENT ARE ON THE AIRPORT THEY SHALL BE PROPERLY MARKED WITH THREE (3') FOOT SQUARE CHECKERED FLAGS (INTERNATIONAL ORANGE AND WHITE). THE CONTRACTOR WILL ALSO PROVIDE WORKERS WITH SOME TYPE OF TAG OR GARMENT TO IDENTIFY THE PERSON AS BEING PART OF THE CONSTRUCTION CREW.

RADIO CONTROL - THE CONTRACTOR WILL BE REQUIRED TO BE IN TWO-WAY RADIO CONTACT (122.70 MHz.) WITH THE AIRPORT UNICOM. THIS WILL KEEP THE CONTRACTOR IN CONSTANT CONTACT WITH THE FLORA AIRPORT AND ENABLE THE AIRPORT TO IMMEDIATELY CONTACT THE CONTRACTOR IN CASE OF AN AERONAUTIC EMERGENCY THAT WOULD REQUIRE ACTION BY THE CONTRACTOR AND/OR HIS PERSONNEL.

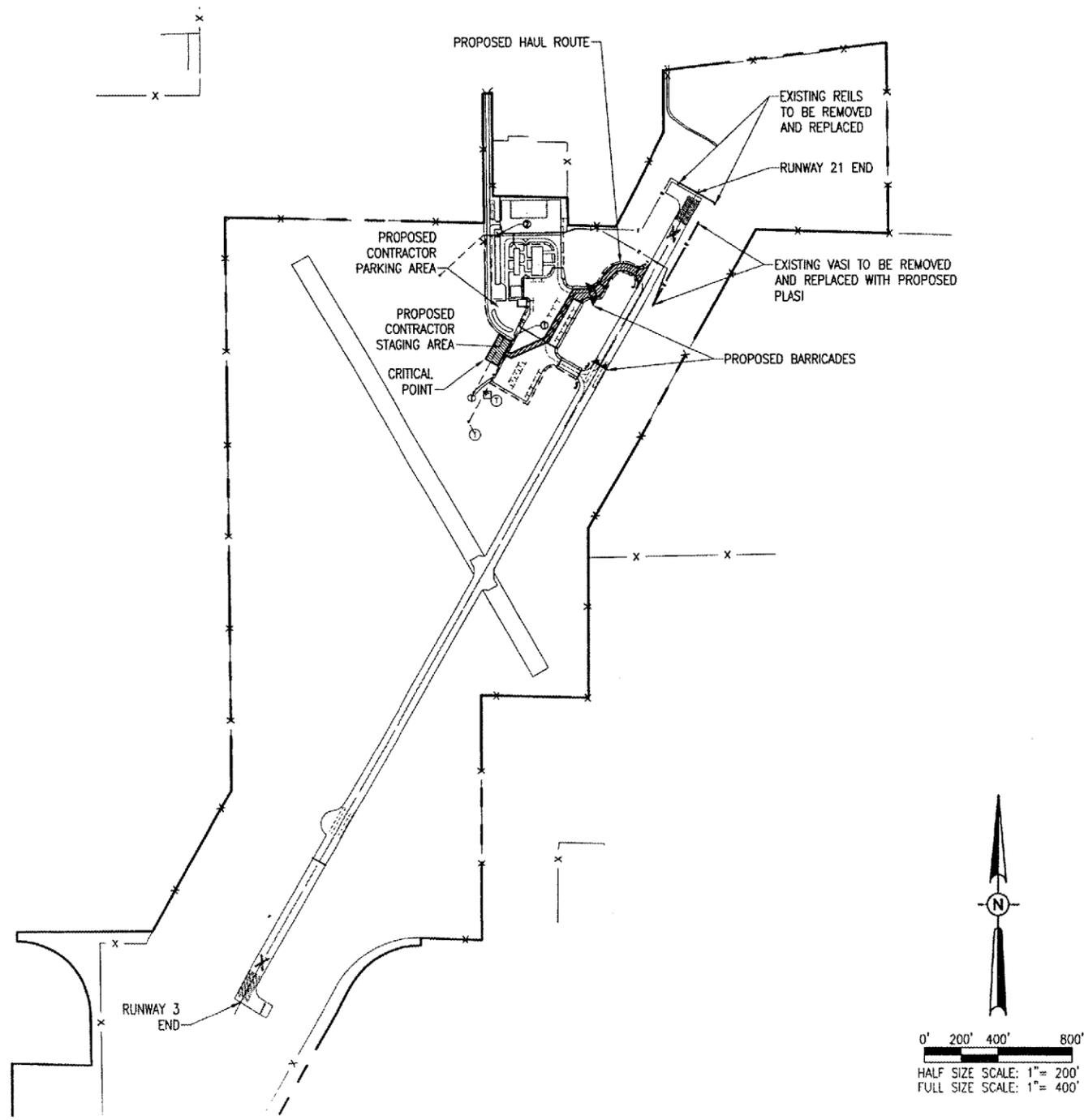
150-ENGINEER'S FIELD OFFICE NOTES

THE CONTRACTOR WILL FURNISH A CELL PHONE TO THE RESIDENT ENGINEER FOR HIS EXCLUSIVE USE FOR THE DURATION OF THIS PROJECT. THE RESIDENT ENGINEER WILL USE THIS PHONE FOR PROJECT BUSINESS ONLY. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL CHARGES ASSOCIATED WITH THIS CELL PHONE.

THE PROPOSED ENGINEER'S FIELD OFFICE WILL BE PAID FOR UNDER ITEMS: AR150510 ENGINEER'S FIELD OFFICE 1 L.S.

EROSION CONTROL

THIS PROJECT WILL DISTURB LESS THAN 1 ACRE OF LAND, THEREFORE NO N.P.D.E.S. PERMIT WILL BE REQUIRED.



FL029

DATE	REVISION	BY
	4/14/08	REVISED AS PER ISA REVIEW
<p>FLORA AIRPORT FLORA, ILLINOIS</p>		
<p>IL PROJ.: FCA-3768 A.I.P. PROJ.: 3-17-0944-B15</p>		
<p>FILE PROJECT NO. 08A0021D_0800 DRAWING NO. R-00335FY.DWG SCALE 1" = 400' DATE 02/01/08</p>	<p>LAYOUT MDR 01/30/08 DRAWN MDR 01/30/08 REVIEWED CAH 02/01/08</p>	<p>HANSON Hanson Professional Services Inc. 1529 South Silver Street Springfield, IL 62768 Offices Nationwide</p>
<p>INSTALL REILS & PLASI ON RUNWAY END 21</p>	<p>PROPOSED SAFETY SHEET</p>	<p>3 of 15 sheets</p>

4:25 14. 2008 10:08 AM HAGL000382
 \\AIRPORTS\FLORA\08A0021\AIRPORT\SHETS\R-00335FY.DWG - Layout1

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

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

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

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

AIRPORT EQUIPMENT/FACILITY ABBREVIATIONS	
ASOS	AUTOMATED SURFACE OBSERVING SYSTEM
ATCT	AIR TRAFFIC CONTROL TOWER
AWOS	AUTOMATED WEATHER OBSERVING SYSTEM
CCR	CONSTANT CURRENT REGULATOR
DME	DISTANCE MEASURING EQUIPMENT
FAR	FEDERAL AVIATION REGULATION
GS	GRADE 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
MALSRL	MEDIUM INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATING LIGHTS
MIRL	MEDIUM INTENSITY RUNWAY LIGHT
MIRL	MEDIUM INTENSITY TAXIWAY LIGHT
NDB	NON-DIRECTIONAL BEACON
PAPI	PRECISION APPROACH PATH INDICATOR
PLASI	PULSE LIGHT APPROACH SLOPE INDICATOR
RAIL	RUNWAY ALIGNMENT INDICATING LIGHTS
REIL	RUNWAY END IDENTIFIER LIGHT
RVR	RUNWAY VISUAL RANGE
VADI	VISUAL APPROACH DESCENT INDICATOR
VASI	VISUAL APPROACH SLOPE INDICATOR
VOR	VERY HIGH FREQUENCY OMNIDIRECTIONAL RANGE FACILITY
WC	WIND CONE

NOTES:

- ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 - NATIONAL ELECTRICAL CODE (NEC) MOST CURRENT ISSUE IN FORCE, THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES, AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L. LISTING, ETL LISTING (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE PERMITTED.
- CONTRACTOR SHALL COORDINATE WORK AND ANY POWER OUTAGES WITH THE RESPECTIVE FACILITY OWNER PERSONNEL AND THE AIRPORT MANAGER.
- COLOR CODE PHASE AND NEUTRAL CONDUCTOR INSULATION FOR NO. 6 AWG OR SMALLER. PROVIDE COLORED INSULATION OR COLORED MARKING TAPE FOR PHASE AND NEUTRAL CONDUCTORS FOR NO. 4 AWG AND LARGER. INSULATED GROUND CONDUCTORS SHALL HAVE GREEN COLORED INSULATION FOR ALL CONDUCTOR AWG AND/OR KCMIL TO COMPLY WITH NEC 250.119. NEUTRAL CONDUCTORS SHALL HAVE WHITE COLORED INSULATION FOR NO. 6 AWG AND SMALLER TO MEET THE REQUIREMENTS OF NEC 200.6. STANDARD COLORS FOR POWER WIRING AND BRANCH CIRCUITS SHALL BE AS FOLLOWS:

120/240 VAC, 1 PHASE, 3 WIRE	
PHASE A	BLACK
PHASE B	RED
NEUTRAL	WHITE
GROUND	GREEN
- SEE RESPECTIVE SITE PLANS FOR SITE LEGEND INFORMATION.

DATE	REVISION	BY

FLORA AIRPORT
FLORA, ILLINOIS

IL PROJ.: FOA-3786 A.I.P. PROJ.: 3-17-0044-B15

IEL Project No.	08A0021D-0800
Revision	E-001.DWG
Date	02/01/08
Scale	NONE
LAYOUT	KNL 01/22/08
DRAWN	MV 01/22/08
REVIEWED	CAH 02/01/08

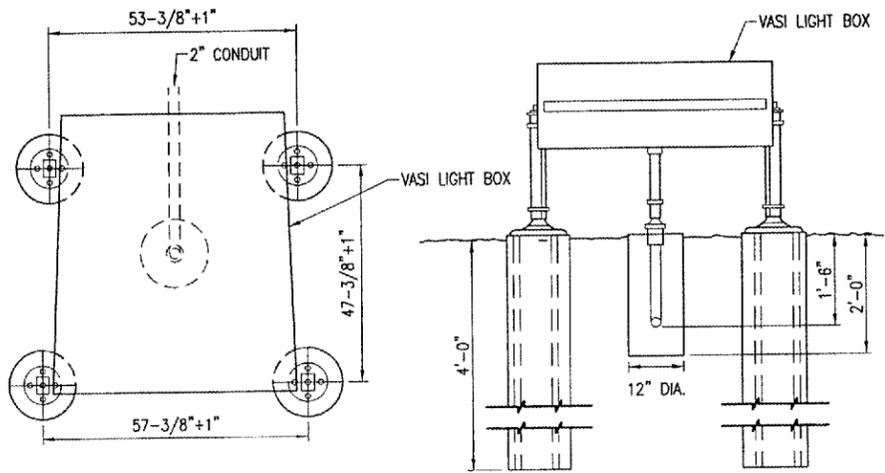
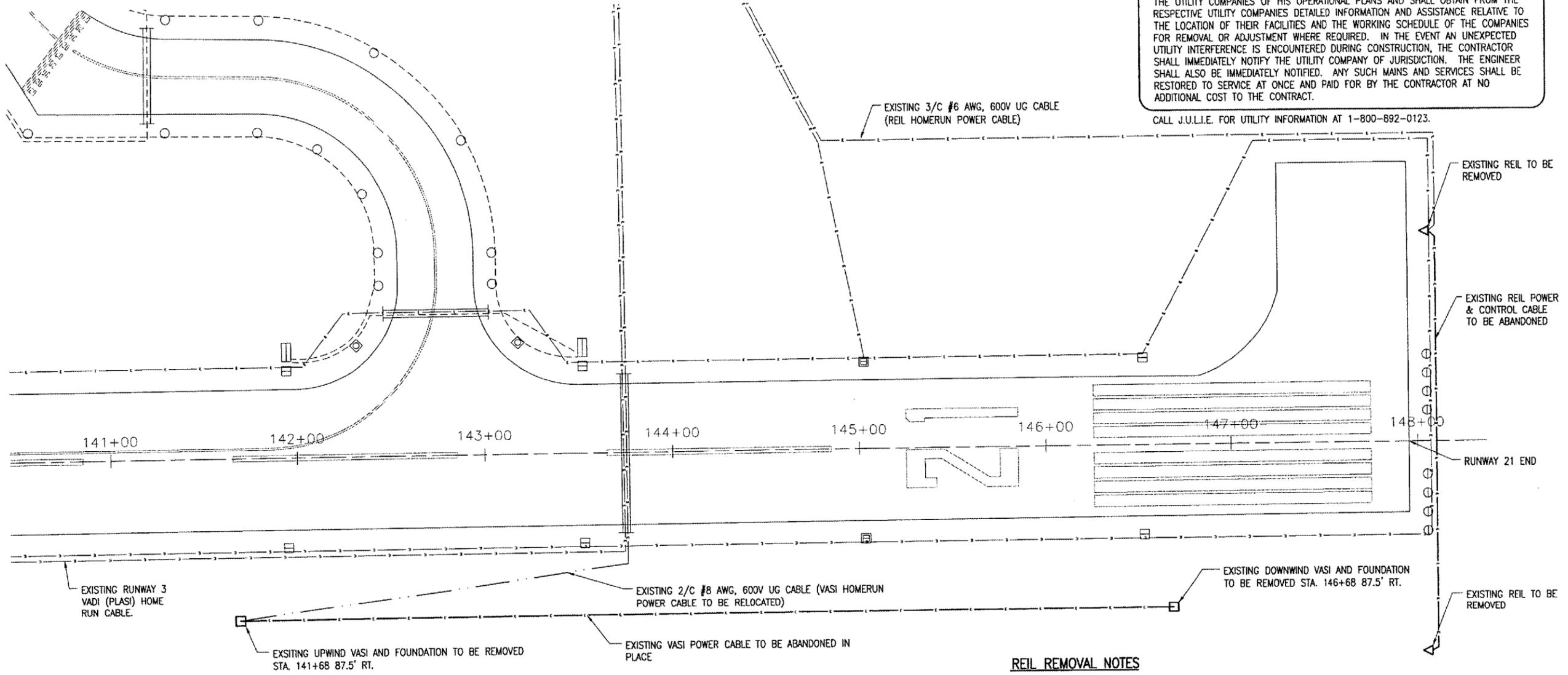


INSTALL REILS & PLASI
ON RUNWAY END 21

ELECTRICAL LEGEND
AND ABBREVIATIONS

THE LOCATION, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ON THE PLANS IS NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. 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 ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT.

CALL J.U.L.I.E. FOR UTILITY INFORMATION AT 1-800-892-0123.



V.A.S.I. DETAIL

VASI REMOVAL NOTES

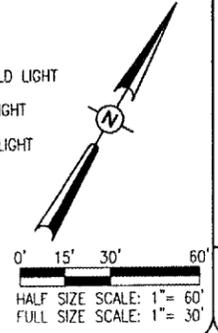
1. THE EXISTING VASI AND POWER & CONTROL UNITS SHOWN AT THE LOCATIONS ON THIS SHEET ARE TO BE UNBOLTED, REMOVED AND TURNED OVER TO THE AIRPORT MANAGER.
2. THE EXISTING VASI CONCRETE BASES ARE TO BE REMOVED TO THEIR FULL DEPTH AND DISPOSED OF OFF THE AIRPORT SITE. FOR APPROXIMATE DIMENSIONS OF THE EXISTING VASI BASES, SEE THE DETAIL ON THIS SHEET.
3. THE HOLES LEFT FROM THE VASI BASES AND POWER & CONTROL UNITS WILL BE FILLED IN WITH EARTH AND COMPACTED TO PREVENT FUTURE SETTLEMENT. THE DISTURBED AREAS WILL BE FERTILIZED AND SEEDED IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
4. THE EXISTING VASI CABLES WILL BE ABANDONED IN PLACE UNLESS IT CONFLICTS WITH THE INSTALLATION OF A PROPOSED LIGHT OR CABLE, THEN IT WILL BE REMOVED AT NO ADDITIONAL COST TO THE CONTRACT.
5. AN EXISTING VASI UNIT CONSISTS OF THE DOWNWIND VASI, UPWIND VASI AND VASI POWER & CONTROL UNIT.
6. REMOVAL OF THE EXISTING VASI UNITS WILL BE PAID FOR UNDER ITEM: AR125909 "REMOVE VASI" PER EACH.
7. QUANTITY OF VASI UNITS TO BE REMOVED ----- 1 EACH.

REIL REMOVAL NOTES

1. THE EXISTING REILS ON RUNWAY END 21 SHALL BE REMOVED AND TURNED OVER TO THE AIRPORT. REIL REMOVAL SHALL BE COORDINATED WITH THE AIRPORT MANAGER. THE HOLES LEFT FROM THE REIL REMOVAL SHALL BE FILLED WITH EARTH AND COMPACTED TO PREVENT FUTURE SETTLEMENT. THE DISTURBED AREAS SHALL BE RESTORED, FERTILIZED, AND SEEDED IN ACCORDANCE WITH THE SUPPLEMENTAL SPECIFICATIONS & RECURRING SPECIAL PROVISIONS.
2. AT THE END OF THE CONSTRUCTION DAY THE CONTRACTOR WILL HAVE ALL HOLES BACKFILLED AND SMOOTH GRADED AND THEN OPEN THE RUNWAY.
3. THE RUNWAY & TAXIWAY LIGHTING CIRCUIT SHALL BE OPERABLE AT THE END OF THE DAY, BUT THE REIL CIRCUIT DOES NOT.
4. THE AIRPORT MANAGER WILL NOTAM THE REILS OUT OF OPERATION UNTIL THE NEW REILS ARE INSTALLED AND OPERABLE.
5. REMOVAL OF THE EXISTING REILS WILL BE PAID FOR UNDER ITEM AR125907 REMOVE REILS PER PAIR.

LEGEND

- | | | | |
|--|---|--|--|
| | EXISTING PAVEMENT | | EXISTING STAKE MOUNTED THRESHOLD LIGHT |
| | EXISTING ELECTRICAL CABLE | | EXISTING BASE MOUNTED TAXIWAY LIGHT |
| | EXISTING ELECTRICAL/AIRFIELD LIGHTING CABLE | | EXISTING STAKE MOUNTED TAXIWAY LIGHT |
| | EXISTING VASI CABLE TO BE RELOCATED | | EXISTING TAXI GUIDANCE SIGN |
| | EXISTING VASI OR REIL CABLE TO BE ABANDONED | | EXISTING REIL TO BE REMOVED |
| | EXISTING ELECTRICAL DUCT | | EXISTING VASI TO BE REMOVED |
| | EXISTING BASE MOUNTED RUNWAY LIGHT | | |
| | EXISTING STAKE MOUNTED RUNWAY LIGHT | | |



DATE	REVISION	BY

FLORA AIRPORT
FLORA, ILLINOIS

IL PROJ.: FOA-3786 A.I.P. PROJ.: 3-17-0044-B15

Project No. 08A0021D_0800	
Revision R-141ELE.DWG	
Scale 1" = 30'	
Date 02/01/08	
LAYOUT	01/30/08
DRAWN	01/30/08
REVIEWED	02/01/08
	CAH



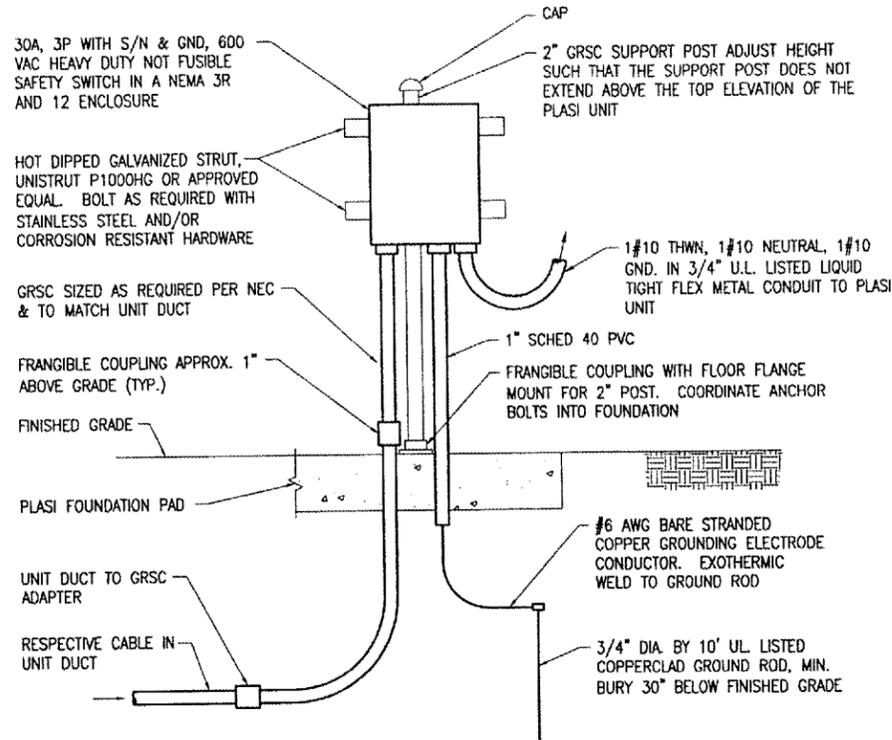
INSTALL REILS & PLASI ON RUNWAY END 21

EXISTING ELECTRICAL PLAN

APR 11, 2008 4:46 PM HAGL000382 \\AIRPORTS\F\ORA\08A0021\AIRPORT\SHEETS\R-141ELE.DWG - Layout1

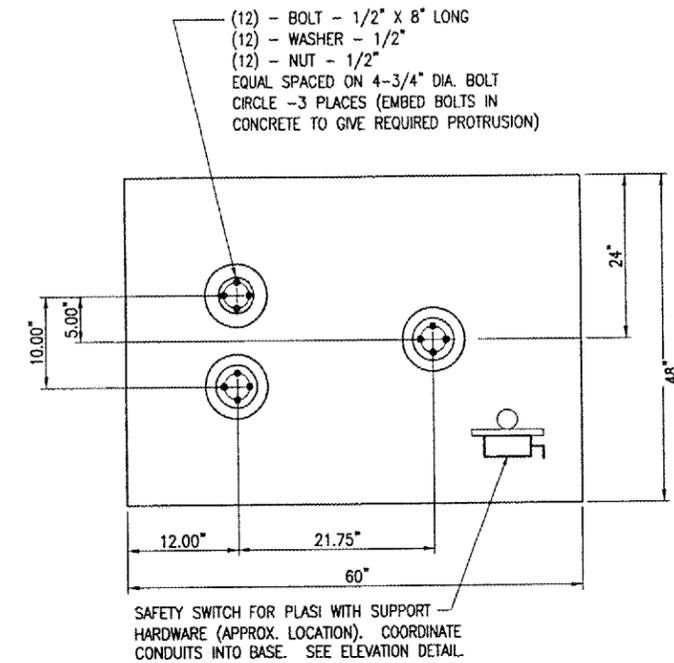
PLASI NOTES

1. THE PROPOSED P.L.A.S.I. UNIT WILL BE LOCATED TO 87.5' RT. STA. 143+43 ALONG RUNWAY 3-21.
2. THE PROPOSED P.L.A.S.I. CONCRETE BASE WILL BE CONSTRUCTED AS SHOWN IN THE DETAIL ON THIS SHEET. CONFIRM DIMENSIONS OF PLASI MOUNTING HARDWARE WITH PLASI MANUFACTURER.
3. THE CONCRETE FOR THE PROPOSED P.L.A.S.I. BASE IN ACCORDANCE WITH ITEM 610.
4. THE EXISTING POWER CABLES ARE #8 2/C 600V UG CABLE.
5. THE POWER CABLES SHALL BE REROUTED AND PLACED A MINIMUM OF 18" BELOW THE FINISHED GRADE AND LOCATED AS SHOWN ON SHEET NO. 6.
6. THE CONTRACTOR WILL BE REQUIRED TO EXPOSE A SUFFICIENT LENGTH OF THE EXISTING POWER CABLE TO RE-DIRECT IT TO THE PROPOSED PLASI LOCATION AND CONNECT THE EXISTING POWER CABLE INSIDE THE PROPOSED PLASI SAFETY SWITCH. ANY DAMAGE TO THE EXISTING POWER CABLE WILL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE RESIDENT ENGINEER AND AT THE CONTRACTOR'S OWN EXPENSE. THE RELOCATION OF THE EXISTING POWER CABLE WILL BE CONSIDERED AS AN INCIDENTAL ITEM TO THE INSTALLATION OF THE PLASI AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
7. THE CONTRACTOR WILL BE REQUIRED TO INSTALL A BUCK-BOOST TRANSFORMER FOR THE P.L.A.S.I. UNIT. THE CONTRACTOR WILL INSTALL THE PROPER SIZE BUCK-BOOST TRANSFORMER AT THE VAULT TO PROVIDE THE MANUFACTURER'S RECOMMENDED VOLTAGE AT THE PLASI. SEE ELECTRICAL ONE LINE DIAGRAM FOR DETAILS.
8. INSTALLATION OF THE P.L.A.S.I. UNIT, P.L.A.S.I. BASE, AND ALL INCIDENTALS WILL BE PAID FOR UNDER ITEM: AR125630 PLASI _____ 1 EACH.

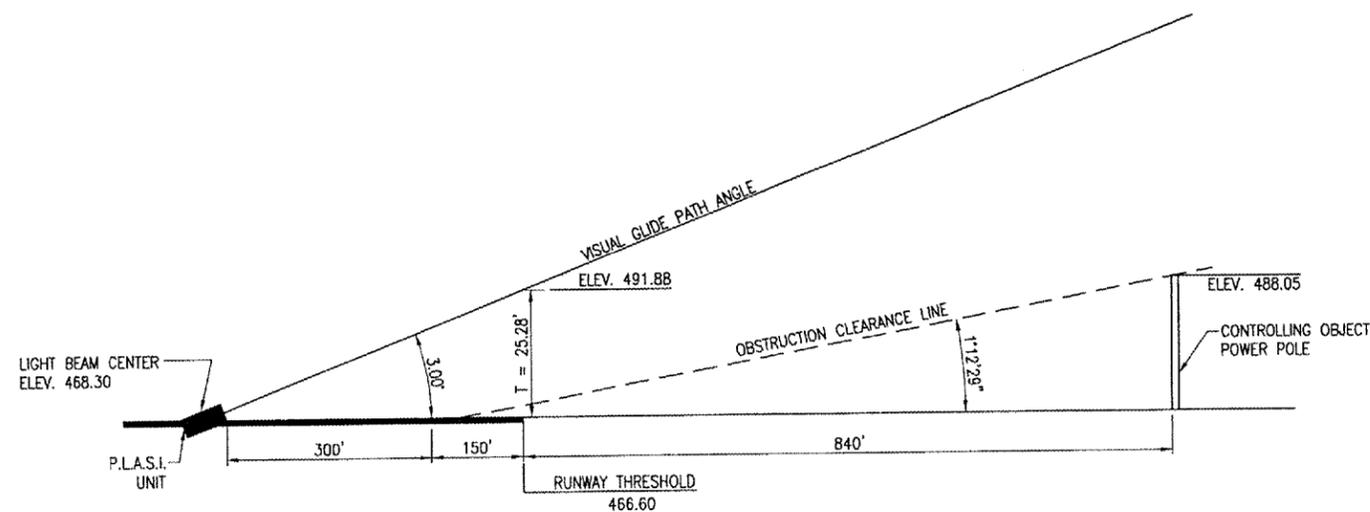


NOTE: SEE ELECTRICAL ONE LINE DIAGRAM FOR PLASI FOR ADDITIONAL INFORMATION ON EQUIPMENT AND WIRING.

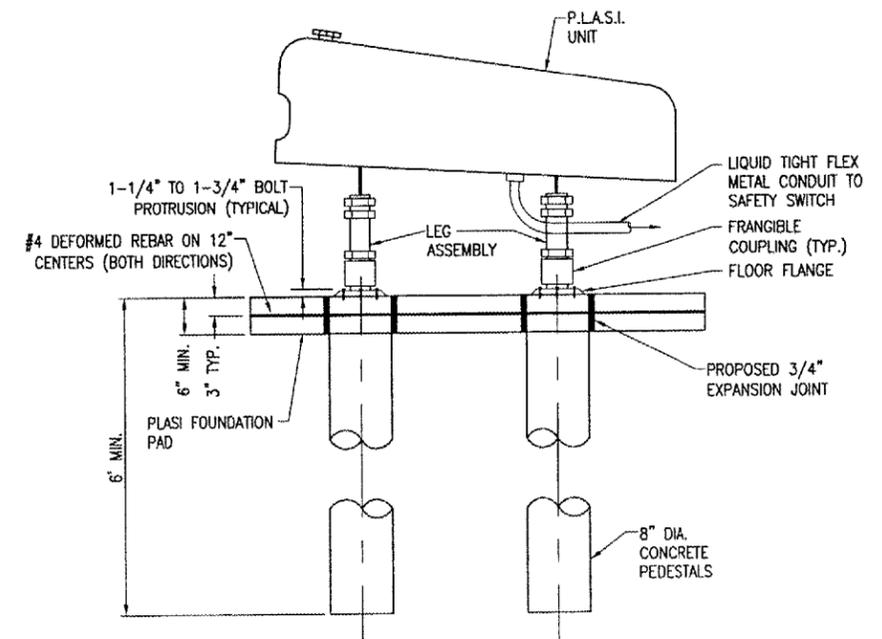
PLASI SAFETY SWITCH ELEVATION
"NOT TO SCALE"



FOUNDATION PAD PLAN
"NOT TO SCALE"



P.L.A.S.I. AIMING DIAGRAM 21 END
"NOT TO SCALE"



PLASI ELEVATION
"NOT TO SCALE"

REVISION	DATE

FLORA AIRPORT
FLORA, ILLINOIS

IL. PROJ.: FOA-3786 A.I.P. PROJ.: 3-17-0044-B15

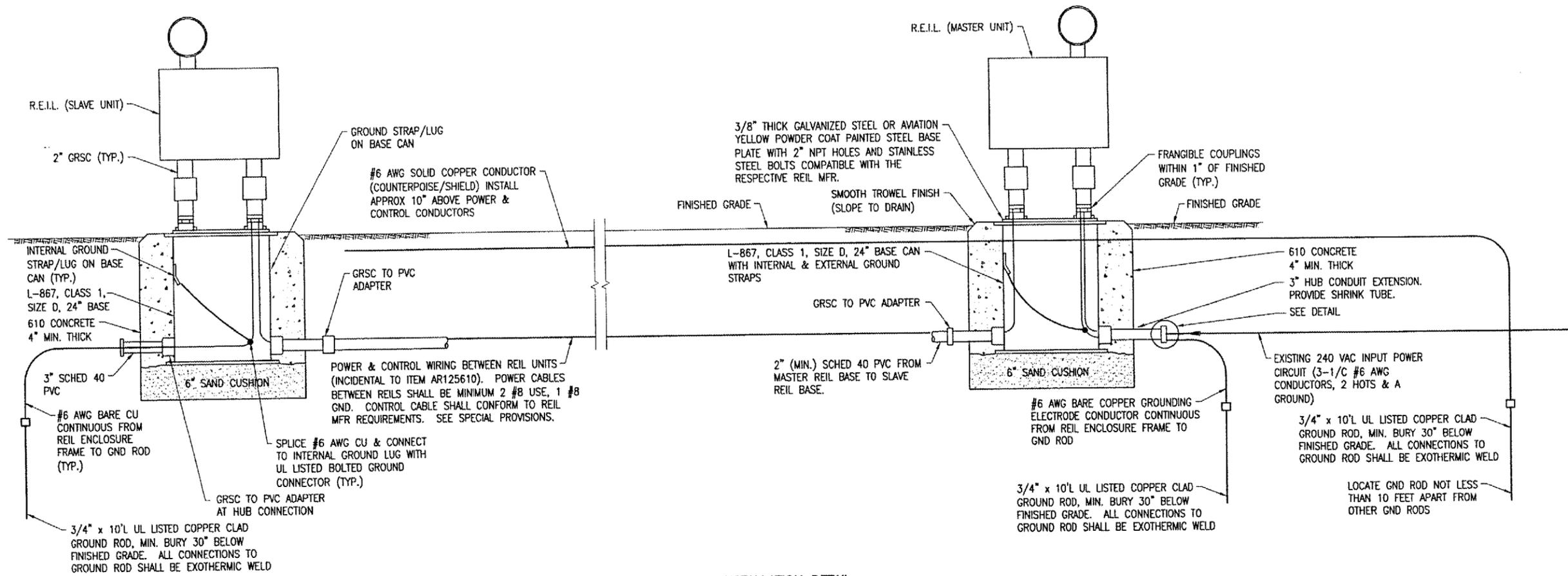
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FILENAME R-541ELE.DWG	DATE 02/01/08
SHEET N/A	DATE 02/01/08
LAYOUT MDR	01/29/08
DRAWN MDR	01/29/08
REVIEWED CAH/KNL	02/01/08



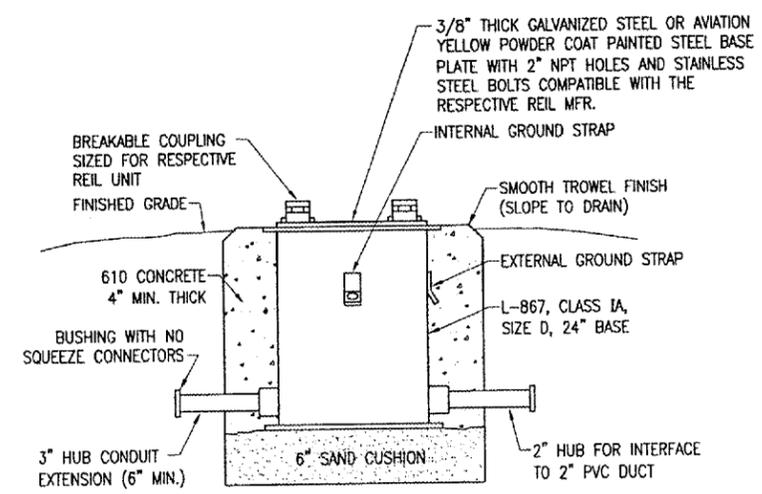
INSTALL REILS & PLASI ON RUNWAY END 21

PROPOSED RUNWAY END 21 PLASI DETAILS

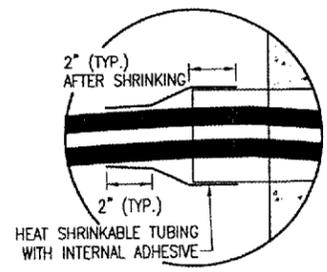
APR 11, 2008 4:46 PM HAGL000382 \\A\AIRPORTS\FLORA\08A0021\AIRPORT_SHEETS\R-541ELE.DWG - Layout1



REIL INSTALLATION DETAIL
NOT TO SCALE



REIL BASE DETAIL
(NOT TO SCALE)



SHRINK TUBE DETAIL
(NOT TO SCALE)

NOTE:
FOR THE PURPOSE OF ENHANCING SAFETY, EACH BASE MUST HAVE INSTALLED, BY THE MANUFACTURER, AN INTERNAL AND EXTERNAL GROUND STRAP THAT IS AVAILABLE FOR THE PURPOSE OF ATTACHING A GROUND LUG THAT IS CONNECTED TO AN EARTH GROUND OR A SAFETY GROUND CONDUCTOR INSTALLED WITH THE RESPECTIVE CIRCUIT. FOR AIRPORT PROJECTS RECEIVING FEDERAL FUNDS THIS REQUIREMENT IS MANDATORY PER FAA AC 150/5345-42F.

REIL INSTALLATION NOTES

1. **REIL POWER CABLE NOTE:** THE CONTRACTOR WILL DISCONNECT THE EXISTING POWER CABLES FROM THE EXISTING REIL UNIT. HE WILL PROTECT THE POWER CABLE DURING THE REMOVAL OF THE EXISTING REILS AND THE INSTALLATION OF THE PROPOSED REIL UNITS. THE CONTRACTOR WILL CONNECT THE EXISTING POWER CABLES TO THE PROPOSED REIL UNIT. THIS WORK WILL BE CONSIDERED AS AN INCIDENTAL ITEM TO INSTALLING THE PROPOSED REILS AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
2. VERIFY INSTALLATION & WIRING REQUIREMENTS WITH THE RESPECTIVE REIL MANUFACTURER.
3. REILS SHALL BE AIMED AT ANGLE 10 DEGREES VERTICALLY AND TOED OUT 15 DEGREES FROM THE LINE PARALLEL TO THE RUNWAY CENTERLINE.
4. REILS WILL BE PAID FOR UNDER ITEM AR125610 "REILS" PER PAIR.
5. ANY AND ALL TRENCHES AND DISTURBED AREAS WILL BE BACKFILLED AND RESTORED TO A SMOOTH GRADE AND SEEDED TO THE SATISFACTION OF THE ENGINEER. ALL TRENCH SETTLEMENT SHALL BE CORRECTED FOR A PERIOD OF ONE YEAR. RESTORATION, GRADING, SEEDING, AND MULCHING OF AREAS DISTURBED DURING THE REIL INSTALLATION AND ASSOCIATED CABLE WILL BE INCIDENTAL TO ITEM AR125610 REILS.

REVISION	DATE

FLORA AIRPORT
FLORA, ILLINOIS

A.I.P. PROJ.: 3-17-0044-815
I.L. PROJ.: FOA-3786

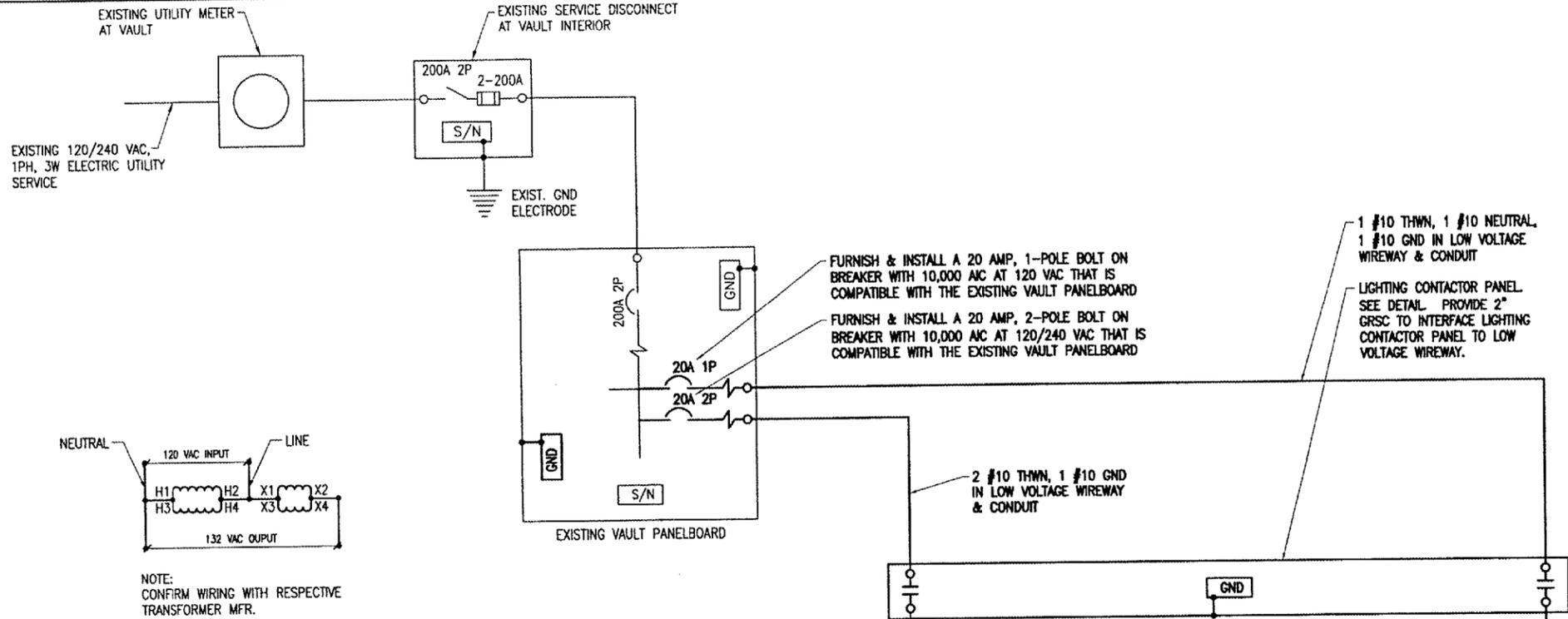
Project No.	08A0021D_0800
Element	E-503.DWG
Scale	NONE
Date	02/01/08
LAYOUT	KNL 01/29/08
DRAWN	MV 01/29/08
REVIEWED	CAH 02/01/08

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1625 South State Street
Springfield, Illinois 62703-2888
Offices Nationwide

INSTALL REILS & PLASTIC ON RUNWAY END 21

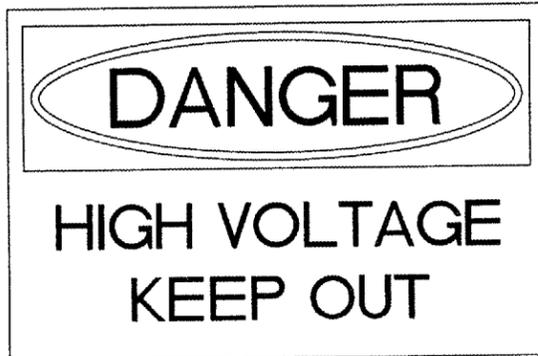
REIL INSTALLATION DETAIL



120 VAC TO 132 VAC BOOST TRANSFORMER
 CONNECTION DIAGRAM FOR SQUARE D
 CAT. NO. 500SV43B TRANSFORMER

DEVICE	LABEL
LIGHTING CONTACTOR CONTROL PANEL	RUNWAY 3-21 NAVAID CONTROL PANEL
BOOST TRANSFORMER FOR RUNWAY 21 PLASI	RWY 21 PLASI
SAFETY SWITCH FOR RUNWAY 21 PLASI	RWY 21 PLASI 120 VAC, 1PH, 2W FED FROM VAULT

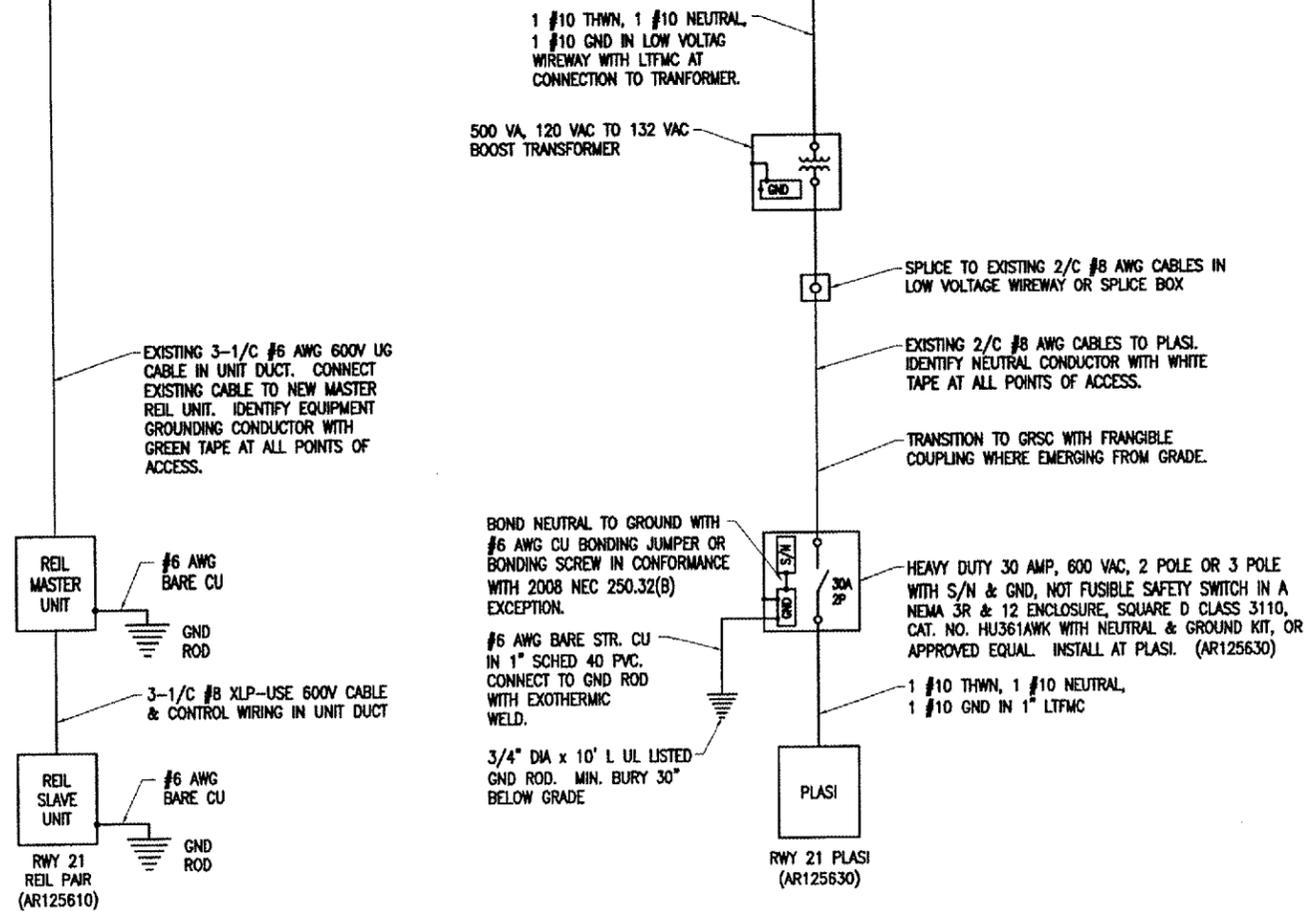
NOTE: LEGEND PLATES SHALL BE WEATHERPROOF ENGRAVED PLASTIC OR PHENOLIC MATERIAL, 1/4" HIGH BLACK LETTERS ON A WHITE BACKGROUND UNLESS NOTED OTHERWISE. SECURE WITH WEATHERPROOF ADHESIVE AND MACHINE SCREWS. FURNISH ADDITIONAL LEGEND PLATES WHERE REQUIRED BY CODE, FOR ADDITIONAL EQUIPMENT, AS DETAILED HEREIN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



PROVIDE WARNING SIGN ON VAULT EXTERIOR DOOR LABELED "DANGER - HIGH VOLTAGE - KEEP OUT" PER THE REQUIREMENTS OF NEC 110.34 (C).

NOTES

- ALL VAULT WORK AND/OR POWER OUTAGES SHALL BE COORDINATED WITH THE AIRPORT MANAGER.
- ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 - NATIONAL ELECTRICAL CODE (NEC) MOST CURRENT ISSUE IN FORCE, THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L. LISTING, ETL LISTING, (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE SHALL NOT BE PERMITTED.
- ALL EQUIPMENT SHOWN NOT LABELED AS EXISTING IS NEW.
- HIGH VOLTAGE & LOW VOLTAGE CIRCUITS SHALL NOT BE INSTALLED IN THE SAME WIREWAY, CONDUIT, DUCT, OR HANDHOLE.
- LTFMC DENOTES LIQUID TIGHT FLEXIBLE METAL CONDUIT UL LISTED, SUNLIGHT RESISTANT, & SUITABLE FOR GROUNDING. LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE U.L. LISTED TO MEET THE REQUIREMENTS OF NEC 350.6. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO CCR'S & TRANSFORMERS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. EXTERNAL BONDING JUMPERS USED WITH CCR INSTALLATIONS SHALL BE #6 AWG COPPER (MINIMUM). DO NOT INSTALL LTFMC THAT IS NOT UL LISTED.
- VAULT WORK SHALL BE PAID FOR UNDER ITEM AR109200.
- ALL EXISTING CIRCUIT BREAKERS REMOVED FROM THE PANELBOARD SHALL REMAIN AIRPORT PROPERTY.
- MEASURE VOLTAGE AT PLASI UNIT WITH PLASI OPERATING. PER THE PLASI MFR THE MAX OPERATING VOLTAGE SHOULD NOT EXCEED 130 VAC. IF VOLTAGE EXCEEDS 130 VAC THE BOOST TRANSFORMER WILL NOT BE REQUIRED. CONTACT RESIDENT ENGINEER FOR FURTHER DIRECTION.



ELECTRICAL ONE LINE DIAGRAM FOR PLASI & REIL UNITS

BY	REVISION	DATE

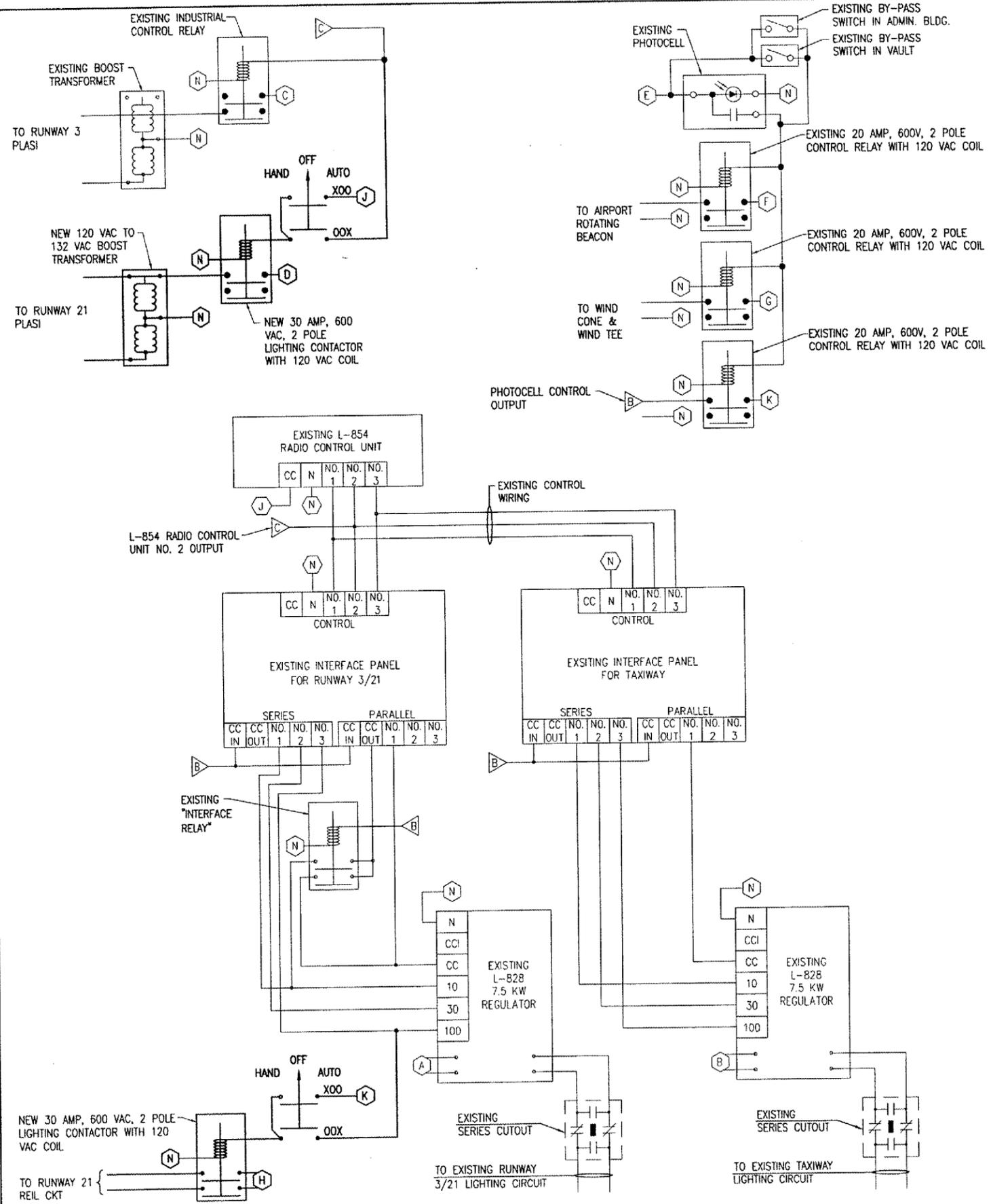
FLORA AIRPORT
 FLORA, ILLINOIS

IL PROJ.: F04-3786 A.I.P. PROJ.: 3-17-0044-B15

File No.	08A0021D_0800
Scale	E-601.DWG
Date	N/A
LAYOUT	01/28/08
DRAWN	MV 01/29/08
REVIEWED	CAH 02/01/08

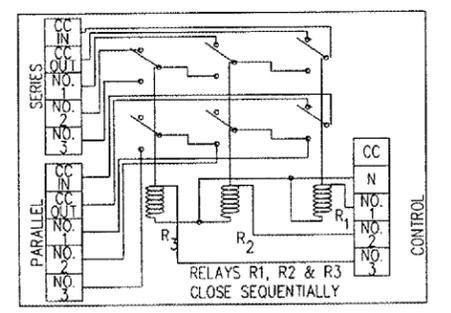


INSTALL REILS & PLASI
 ON RUNWAY END 21
 ELECTRICAL ONE LINE
 DIAGRAM FOR PLASI
 & REIL UNITS



- NOTES**
- ALL ELECTRICAL EQUIPMENT WILL BE WIRED IN ACCORDANCE WITH THE SCHEMATIC WIRING DIAGRAM AND ALL APPLICABLE CODES. EXISTING WIRING DIAGRAM IS BASED ON RECORD DRAWINGS FROM 1993 AND INFORMATION FROM THE AIRPORT MANAGER AND MAY NOT INDICATE ALL CHANGES AND UPDATES SINCE THE ORIGINAL INSTALLATION. CONTRACTOR SHALL FIELD VERIFY EXISTING CONTROL WIRING AND REPORT ANY VARIATIONS TO THE RESIDENT ENGINEER.
 - ALL CONTROL CABLE WILL BE NO. 12 AWG, 600 VOLT CABLE.
 - ALL ELECTRICAL EQUIPMENT WILL BE PROPERLY LABELED AND ALL ELECTRICAL CABLES WILL BE TAGGED.
 - ALL ELECTRICAL CABLES INSIDE THE VAULT WILL BE IN CONDUIT OR DUCT.
 - THE RUNWAY 21 PLASI CIRCUIT WILL BE CONTROLLED IN THE AUTOMATIC MODE BY THE L-854 RADIO CONTROL UNIT IN THE FOLLOWING MANNER. CONFIRM CONTROL WITH AIRPORT MANAGER:
3 CLICKS - OFF
5 CLICKS - ON
7 CLICKS - REMAIN ON
 - THE RUNWAY 21 REIL CIRCUIT WILL BE CONTROLLED IN THE AUTOMATIC MODE BY THE PHOTOCELL & THE L-854 RADIO CONTROL UNIT IN THE FOLLOWING MANNER:
PHOTOCELL ACTIVATION ENABLES RADIO CONTROL
3 CLICKS - OFF
5 CLICKS - OFF
7 CLICKS - ON
 - RADIO CONTROL UNIT, PHOTOCELL, INDUSTRIAL CONTROL RELAYS, CCR FOR RWY 3/21, CCR FOR TAXIWAY, AND THE 2 RESPECTIVE INTERFACE PANELS & 2 CUTOUPS ARE EXISTING.
 - LIGHTING CONTACTORS, HAND-OFF-AUTO SELECTOR SWITCHES, AND BOOST TRANSFORMER FOR RUNWAY 21 PLASI UNIT SHALL BE NEW. INTERFACE NEW CONTROL WIRING TO EXISTING CONTROL SYSTEM. FIELD VERIFY EXISTING CONTROL CIRCUITS.
 - EQUIPMENT GROUND WIRES SHALL BE INCLUDED WITH EACH BRANCH/FEEDER CIRCUIT & EACH CONTROL CIRCUIT.
 - SEE LIGHTING CONTACTOR PANEL DETAILS FOR REQUIREMENTS ON PANEL LAYOUT & WIRING.

- SHEET LEGEND**
- (A) VAULT PANEL CKT FOR RWY 3/21 CCR
 - (B) VAULT PANEL CKT FOR TXY CCR
 - (C) VAULT PANEL CKT FOR RWY 3 PLASI
 - (D) VAULT PANEL CKT FOR RWY 21 PLASI
 - (E) VAULT PANEL CKT FOR PHOTOCELL
 - (F) VAULT PANEL CKT FOR BEACON
 - (G) VAULT PANEL CKT FOR WIND TEE & WIND CONE
 - (H) VAULT PANEL CKT FOR RWY 21 REILS
 - (I) RESERVED
 - (J) VAULT PANEL CKT FOR RADIO CONTROL
 - (K) VAULT PANEL CKT FOR INTERFACE PANELS
 - (L) RESERVED
 - (M) RESERVED
 - (N) N DESIGNATES NEUTRAL FROM THE RESPECTIVE PANEL THAT POWERS THE DEVICE. FOR CONTROL CIRCUIT INPUTS TO CCR'S N SHALL BE FROM THE RESPECTIVE INTERFACE PANEL CIRCUIT NEUTRAL CONNECTION.



TYP. INTERFACE PANEL DETAIL

AIRFIELD LIGHTING SCHEMATIC WIRING DIAGRAM

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BY		REVISION		DATE					
FLORA AIRPORT FLORA, ILLINOIS									
I.L. PROJ.: FOA-3766 A.I.P. PROJ.: 3-17-0044-B15									
I.E. Project No.	08A0021D_0800		Date	02/01/08		LAYOUT	KNL 02/01/08		
Ename	E-603.DWG		Scale	NONE		DRAWN	MW 02/01/08		
Title			Reviewed	CAH 02/01/08					
HANSON									
Hanson Professional Services Inc. 1025 South State Street Springfield, IL 62761-2888 Offices Nationwide									
INSTALL REILS & PLASI ON RUNWAY 21					AIRFIELD LIGHTING WIRING SCHEMATIC				
10									
10 of 15 sheets									

BY	
REVISION	
DATE	

FLORA AIRPORT
FLORA, ILLINOIS

A.I.P. PROJ.: 3-17-0044-B15
IL PROJ.: FOA-3786

HEL Project No. 08A0021D-0800	DATE	02/01/08
Drawn E-602.DWG	SCALE	NONE
Checked	DATE	01/22/08
Reviewed	DATE	01/22/08
Drawn	DATE	01/22/08
Reviewed	DATE	02/01/08



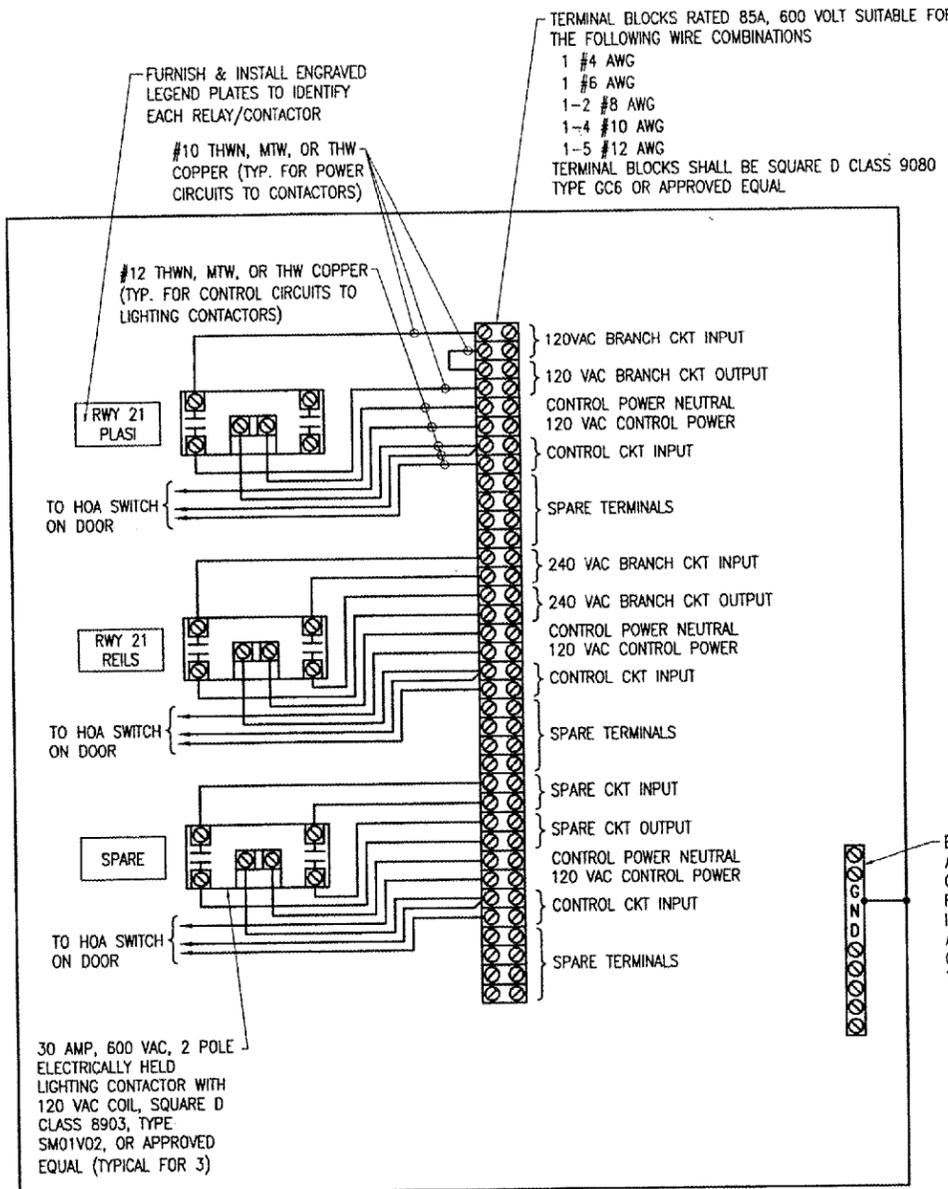
Hanson Professional Services Inc.
1525 South Sixth Street
Springfield, Illinois 62766
Chicago, Illinois 60606

INSTALL REILS & PLASI
ON RUNWAY END 21

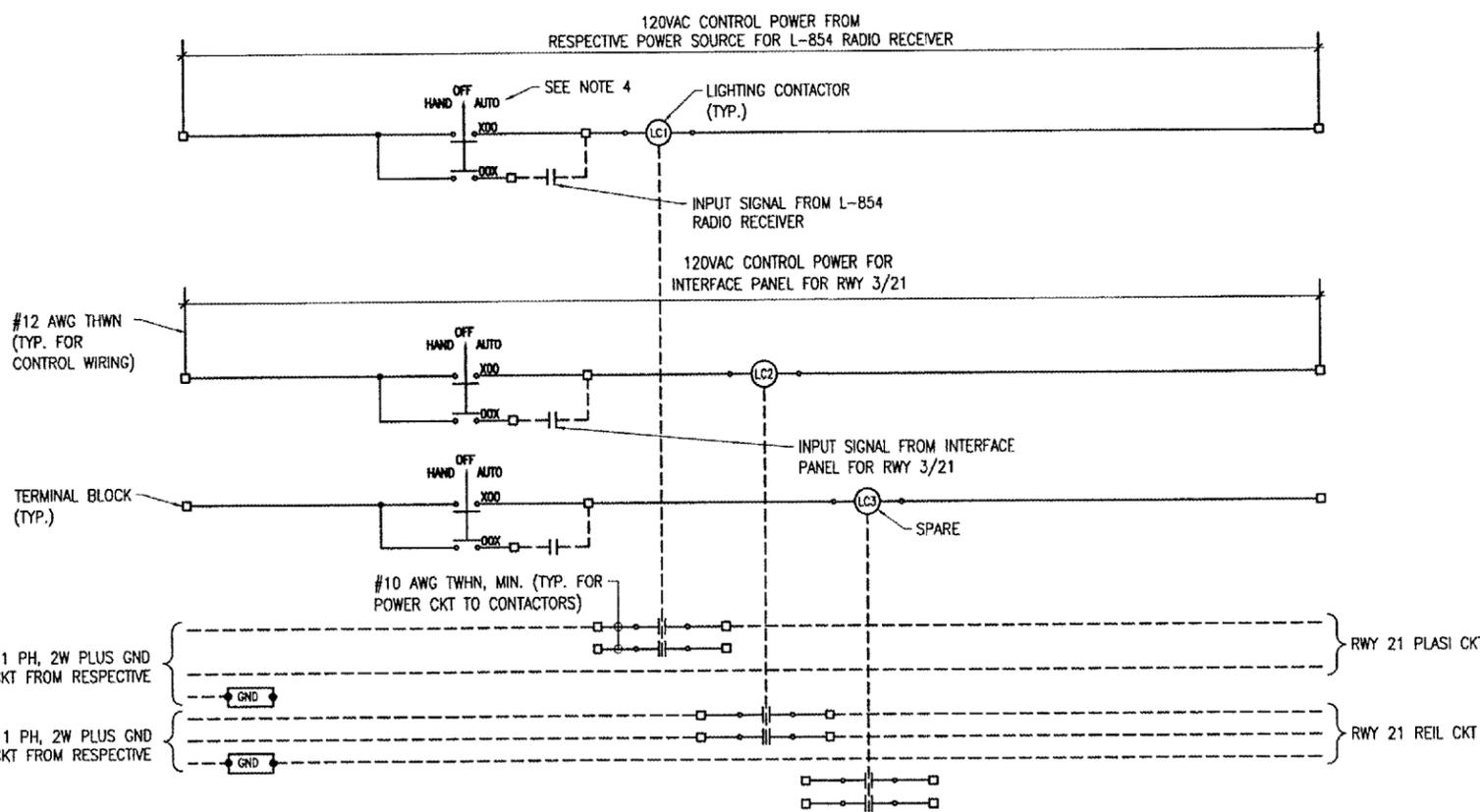
LIGHTING CONTACTOR
PANEL DETAIL

NOTES

- 15 AMP & 20 AMP INPUT POWER/BRANCH CIRCUITS SHALL BE #10 AWG COPPER THWN FROM THE RESPECTIVE POWER SOURCE TO THE LIGHTING CONTACTOR/RELAY PANEL. 30 AMP INPUT POWER/BRANCH CIRCUITS SHALL BE #8 AWG COPPER THWN (MIN.) FROM THE RESPECTIVE POWER SOURCE TO THE LIGHTING CONTACTOR/RELAY PANEL.
- INPUT CONTROL CIRCUITS SHALL BE #12 AWG COPPER THWN.
- PROVIDE #10 AWG COPPER BONDING JUMPER FROM PANEL ENCLOSURE FRAME TO ENCLOSURE DOOR.
- PROVIDE 3-POSITION MAINTAINED CONTACT "HAND-OFF-AUTO" SELECTOR SWITCH FOR EACH LIGHTING CONTACTOR & MOUNT ON LIGHTING CONTACTOR PANEL ENCLOSURE DOOR. SELECTOR SWITCH SHALL BE SQUARE D CLASS 9001, TYPE KS43FBH13, OR APPROVED EQUAL. INCLUDE LEGEND PLATE TO IDENTIFY THE DEVICE CONTROLLED (EX: "RWY 21 PLASI" OR "RWY 21 REIL").
- INSTALL CONTROL PANEL IN VAULT. FIELD VERIFY LOCATION WITH ADEQUATE CLEAR WORKING SPACE PER NEC 110.26. INTERFACE CONTROL PANEL TO LOW VOLTAGE WIREWAY WITH 2" GRSC AND JUNCTION BOXES.



EQUIPMENT GROUND BAR ADEQUATELY SIZED FOR ALL GROUND WIRES TO AND FROM RELAY CONTACTOR PANEL ILSCO CAT. NO. D167-12 OR APPROVED EQUAL. INSTALL ONE GROUND WIRE PER TERMINAL.



SCHEMATIC

CONTROL PANEL FOR RWY 21 PLASI & REIL

APR 11, 2008 4:45 PM HAGL000382
D:\AIRPORTS\FLORA\08A0021\AIRPORT\SHEETS\E-602.DWG - Layout1

DATE	REVISION	BY

FLORA AIRPORT
FLORA, ILLINOIS

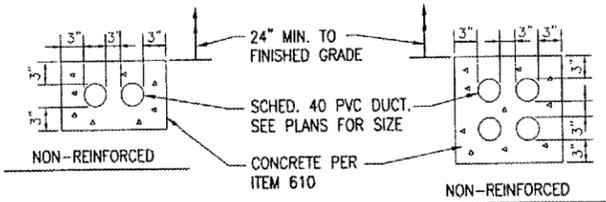
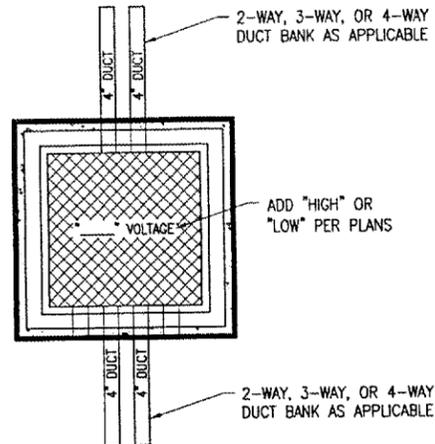
IL PROJ.: FOA-3786 A.I.P. PROJ.: 3-17-0044-B15

REV. PROJECT No.	0860021D_0800
Drawn	R-543ELE.DWG
Scale	N/A
Date	02/01/08
LAYOUT	MDR 01/17/08
DRAWN	MDR 01/17/08
REVIEWED	CAH/KNL 02/01/08

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2525 S. Main Street
Springfield, Illinois 62703-2886
Offices Nationwide

INSTALL REILS & PLASI
ON RUNWAY END 21

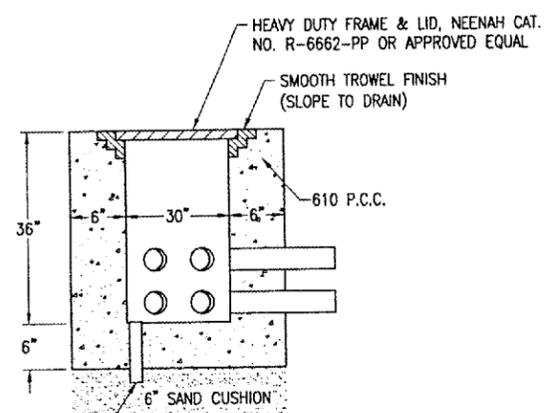
ELECTRICAL DETAILS
SHEET 1



- NOTES:**
- ALL DIMENSIONS ARE MINIMUM.
 - INCLUDE DUCT SPACERS AS MANUFACTURED BY UNDERGROUND DEVICES INC., TO MAINTAIN PROPER SEPARATION OF CONDUITS.

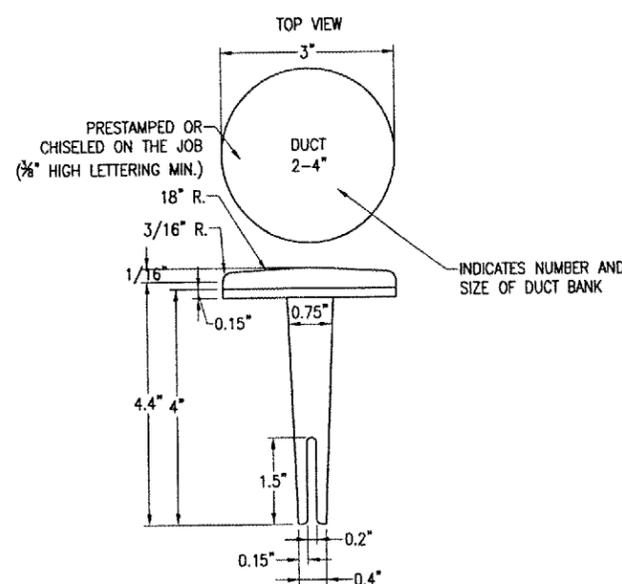
CONCRETE ENCASED DUCT DETAIL
(2-WAY & 4-WAY SHOWN)

THE LOCATION OF UNDERGROUND UTILITIES AS INDICATED ON THE PLANS HAS BEEN OBTAINED FROM EXISTING RECORDS. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY WHATSOEVER, IN RESPECT TO THE ACCURACY OR SUFFICIENCY OF THE INFORMATION AND THERE IS NO GUARANTEE, EITHER EXPRESSED OR IMPLIED, THAT THE CONDITIONS ARE REPRESENTATIVE OF THOSE TO BE ENCOUNTERED IN THE CONSTRUCTION.



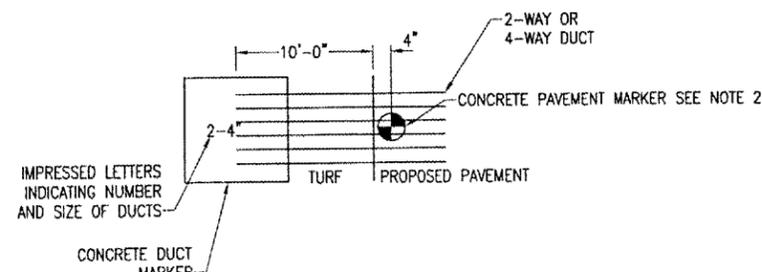
2" SCHED 40 PVC DRAIN PIPE. NOTE 6" OF CA-7 GRAVEL MAY BE PROVIDED, INSTEAD OF 6" CONCRETE FLOOR WITH DRAIN PIPE, AT CONTRACTORS OPTION.

- NOTE:**
- LIDS FOR LOW VOLTAGE HANDHOLES SHALL BE LABELED "LOW VOLTAGE". LIDS FOR HIGH VOLTAGE HANDHOLES SHALL BE LABELED "HIGH VOLTAGE". COORDINATE LETTERING WITH MFR.
 - HANDHOLE MAY BE CAST IN PLACE OR PRECAST.
 - SEE SPECIAL PROVISIONS.

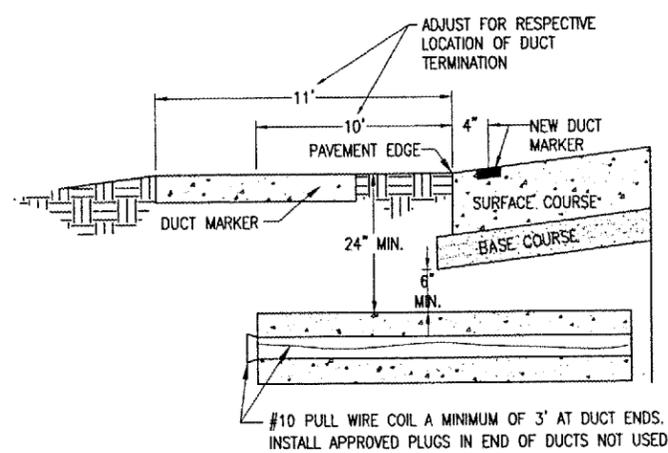


BITUMINOUS PAVEMENT DUCT MARKERS
"NOT TO SCALE"

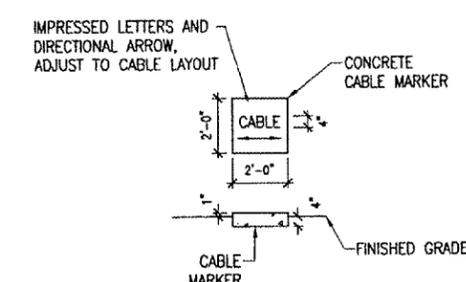
NOTE:
TOP OF MARKER SHALL BE FLUSH WITH FINISHED PAVEMENT SURFACE. MARKER MAY BE INSTALLED IN A DRILLED HOLE AND SECURED WITH EPOXY GLUE.



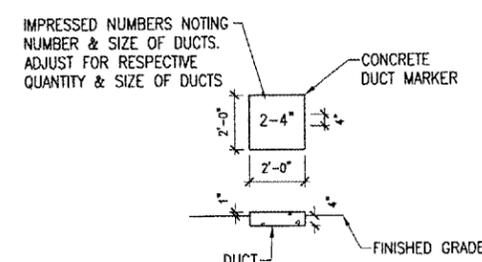
DUCT MARKER DETAIL
"NOT TO SCALE"



UNDERGROUND ELECTRICAL DUCT
"NOT TO SCALE"



TURF CABLE MARKERS
"NOT TO SCALE"



TURF DUCT MARKERS
"NOT TO SCALE"

- 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 IMPRESSED AS DESCRIBED IN NOTE 4.
 - CABLE MARKERS SHALL BE PLACED AT CHANGES OF DIRECTION AND APPROXIMATELY EVERY 400' ALONG CABLE RUNS.
 - 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.

GENERAL NOTES

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

POWER AND CONTROL NOTES

1. PROVIDE LEGEND PLATES FOR ALL ELECTRICAL EQUIPMENT TO IDENTIFY FUNCTION, CIRCUIT VOLTAGE AND PHASE. WHERE THE EQUIPMENT CONTAINS FUSES, ALSO IDENTIFY THE FUSE OR FUSE LINK AMPERE RATING. WHERE THE EQUIPMENT DOES NOT HAVE SUFFICIENT AREA TO INSTALL LEGEND PLATES, THE LEGEND PLATES SHALL BE INSTALLED ON THE WALL NEXT TO THE UNIT. LEGEND PLATES SHALL BE WEATHERPROOF ENGRAVED PLASTIC OR PHENOLIC MATERIAL, 1/4" HIGH BLACK LETTERS ON A WHITE BACKGROUND UNLESS NOTED OTHERWISE. SECURE WITH WEATHERPROOF ADHESIVE AND MACHINE SCREWS. FURNISH ADDITIONAL LEGEND PLATES WHERE REQUIRED BY CODE, FOR ADDITIONAL EQUIPMENT, AS DETAILED HEREIN ON THE PLANS, AND AS NOTED IN THE SPECIAL PROVISION SPECIFICATIONS.
2. COLOR CODE ALL PHASE WIRING BY THE USE OF COLORED WIRE INSULATION AND/OR COLORED TAPE. WHERE TAPE IS USED, THE WIRE INSULATION SHALL BE BLACK. BLACK AND RED SHALL BE USED FOR SINGLE-PHASE, THREE WIRE SYSTEMS AND BLACK, RED AND BLUE SHALL BE USED FOR THREE-PHASE SYSTEMS. NEUTRAL CONDUCTORS, SIZE NO. 6 AWG OR SMALLER, SHALL BE IDENTIFIED BY A CONTINUOUS WHITE OR NATURAL GRAY OUTER FINISH ALONG ITS ENTIRE LENGTH. NEUTRAL CONDUCTORS LARGER THAN NO. 6 AWG SHALL BE IDENTIFIED EITHER BY A CONTINUOUS WHITE OR NATURAL GRAY OUTER FINISH ALONG ITS ENTIRE LENGTH OR BY THE USE OF WHITE TAPE AT ITS TERMINATIONS AND INSIDE ACCESSIBLE WIREWAYS. INSULATED GROUND CONDUCTORS SHALL HAVE GREEN COLORED INSULATION FOR ALL CONDUCTOR SIZES (AWG OR KCMIL).
3. ALL BRANCH CIRCUIT CONDUCTORS CONNECTED TO A PARTICULAR PHASE SHALL BE IDENTIFIED WITH THE SAME COLOR. THE COLOR CODING SHALL BE EXTENDED TO THE POINT OF UTILIZATION.
4. IN CONTROL WIRING THE SAME COLOR SHALL BE USED THROUGHOUT THE SYSTEM FOR THE SAME FUNCTION, SUCH AS 10%, 30%, 100% BRIGHTNESS CONTROL, ETC.
5. LOW VOLTAGE (600 V.) AND HIGH VOLTAGE (5000 V.) CONDUCTORS SHALL BE INSTALLED IN SEPARATE WIREWAYS.
6. NEATLY LACE WIRING IN DISTRIBUTION PANELS, WIREWAYS, SWITCHES AND JUNCTION/PULL BOXES.
7. THE MINIMUM SIZE OF PULL/JUNCTION BOXES, REGARDLESS OF THE QUANTITY AND SIZE OF THE CONDUCTORS SHOWN, SHALL BE AS FOLLOWS:
 - A. IN STRAIGHT PULLS THE LENGTH OF THE BOX SHALL NOT BE LESS THAN EIGHT TIMES THE TRADE DIAMETER OF THE LARGER CONDUIT. THE TOTAL AREA (INCLUDING THE CONDUIT CROSS-SECTIONAL AREA) OF A BOX END SHALL BE AT LEAST 3 TIMES GREATER THAN THE TOTAL TRADE CROSS-SECTIONAL AREA OF THE CONDUITS TERMINATING AT THE END.
 - B. IN ANGLE PULLS OR 'U' PULLS THE DISTANCE BETWEEN EACH CONDUIT ENTRY INSIDE THE BOX AND THE OPPOSITE WALL OF THE BOX SHALL NOT BE LESS THAN SIX (6) TIMES THE TRADE DIAMETER OF THE LARGEST CONDUIT. THIS DISTANCE SHALL BE INCREASED FOR ADDITIONAL ENTRIES BY THE AMOUNT OF THE SUM OF THE DIAMETERS OF ALL OTHER CONDUIT ENTRIES ON THE SAME WALL AS THE BOX. THE DISTANCE BETWEEN CONDUIT ENTRIES ENCLOSING THE SAME CONDUCTOR SHALL NOT BE LESS THAN SIX TIMES THE TRADE DIAMETER OF THE LARGEST CONDUIT.
8. A RUN OF CONDUIT BETWEEN TERMINATIONS AT EQUIPMENT ENCLOSURES, SQUARE DUCTS AND PULL/JUNCTION BOXES, SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF FOUR QUARTER BENDS (360 DEGREES TOTAL), INCLUDING THOSE BENDS LOCATED IMMEDIATELY AT THE TERMINATIONS, CAST, CONDUIT TYPE OUTLETS SHALL NOT BE TREATED AS PULL/JUNCTION BOXES.
9. EQUIPMENT CABINETS SHALL NOT BE USED AS PULL/JUNCTION BOXES. ONLY WIRING TERMINATING AT THE EQUIPMENT SHALL BE BROUGHT INTO THESE ENCLOSURES.
10. SPLICES AND JUNCTION POINTS SHALL BE PERMITTED ONLY IN JUNCTION BOXES, DUCTS EQUIPPED WITH REMOVABLE COVERS, AND AT EASILY ACCESSIBLE LOCATIONS.
11. CIRCUIT BREAKERS IN POWER DISTRIBUTION PANEL(S) SHALL BE THERMAL-MAGNETIC MOLDED CASE, PERMANENT TRIP WITH 100 AMPERE, MINIMUM FRAME.
12. DUAL LUGS SHALL BE USED WHERE TWO (2) WIRES, SIZE NO. 6 OR LARGER, ARE TO BE CONNECTED TO THE SAME TERMINAL.
13. ALL INTERIOR WALL MOUNTED EQUIPMENT ENCLOSURES SHALL BE MOUNTED ON HOT DIPPED GALVANIZED STEEL STRUT SUPPORT, OR STAINLESS STEEL STRUT SUPPORT, WITH CORROSION RESISTANT HARDWARE.
14. SUPPORT FOR EXTERIOR MOUNTED EQUIPMENT SHALL USE HOT DIPPED GALVANIZED STEEL STRUT SUPPORT OR STAINLESS STEEL STRUT SUPPORT WITH STAINLESS STEEL HARDWARE. PROVIDE ZINC RICH PAINT APPLIED TO FIELD CUTS OF GALVANIZED STEEL SUPPORT TO MINIMIZE THE POTENTIAL FOR CORROSION PER THE RESPECTIVE STRUT SUPPORT MANUFACTURER'S RECOMMENDATIONS.
15. CONDUITS FOR ELECTRIC SERVICE ENTRANCE AND FEEDERS SHALL BE AS DETAILED HEREIN ON THE PLANS. WHERE GALVANIZED RIGID STEEL CONDUIT IS SPECIFIED IT SHALL HAVE THREADED FITTINGS. SET SCREW TYPE FITTINGS WILL NOT BE ACCEPTABLE. CONDUITS FOR UNDERGROUND APPLICATIONS SHALL BE AS DETAILED HEREIN. CONDUITS FOR GROUNDING ELECTRODE CONDUCTORS OR INDIVIDUAL GROUNDING CONDUCTORS SHALL BE SCHEDULE 40 OR SCHEDULE 80 PVC.
16. PROVIDE LIQUID TIGHT FLEXIBLE METAL CONDUIT AT CONNECTIONS TO EQUIPMENT SUBJECT TO VIBRATION OR WHERE FLEXIBILITY IS REQUIRED. LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE U.L. LISTED TO MEET THE REQUIREMENTS OF NEC 350.6, SUITABLE FOR GROUNDING, SUNLIGHT RESISTANT, AND RESISTANT TO OIL, GASOLINE, AND GREASE. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO MOTORS, TRANSFORMERS, & CONSTANT CURRENT REGULATORS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. DO NOT INSTALL LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS NOT UL LISTED.
17. UNLESS OTHERWISE SHOWN, ALL EXPOSED CONDUITS SHALL BE RUN PARALLEL TO OR AT RIGHT ANGLES WITH THE LINES OF THE STRUCTURE.
18. ALL STEEL CONDUITS, FITTINGS, NUTS, BOLTS, ETC. SHALL BE GALVANIZED.
19. USE CONDUIT BUSHINGS AT EACH CONDUIT TERMINATION. WHERE NO. 4 AWG OR LARGER UNDERGROUND WIRE IS INSTALLED, USE INSULATED BUSHINGS.
20. USE DOUBLE LOCK NUTS AT EACH CONDUIT TERMINATION.
21. WRAP ALL PRIMARY AND SECONDARY POWER TRANSFORMER CONNECTIONS WITH SUFFICIENT LAYERS OF INSULATING TAPE (3M SCOTCH 23 ALL-VOLTAGE SPLICING TAPE, 3M SCOTCH 130C LINERLESS RUBBER SPLICING TAPE, OR APPROVED EQUAL) AND COVER WITH VINYL ELECTRICAL TAPE (3M SCOTCH 88 VINYL ELECTRICAL TAPE OR APPROVED EQUAL) FOR FULL VALUE OF CABLE INSULATION VOLTAGE.
22. UNLESS OTHERWISE NOTED, ALL SINGLE CONDUCTOR CONTROL WIRING SHALL BE NO. 12 AWG. COPPER MINIMUM.
23. THE FOLLOWING SHALL APPLY TO RELAY/CONTACTOR PANELS/ENCLOSURES:
 - A. FOR INTERIOR LOCATIONS ALL COMPONENTS SHALL BE MOUNTED IN NEMA 12 (DUST TIGHT) ENCLOSURE(S) WITH VERTICALLY HINGED COVERS. FOR EXTERIOR/OUTDOOR LOCATIONS ALL COMPONENTS SHALL BE MOUNTED IN NEMA 4X STAINLESS STEEL ENCLOSURE(S) WITH VERTICALLY HINGED COVERS. ALL CONDUIT ENTRIES INTO NEMA 4, 4X ENCLOSURES SHALL HAVE NEMA 4 HUBS LISTED SUITABLE FOR THE RESPECTIVE ENCLOSURE TO MAINTAIN THE NEMA 4, 4X RATING OF THE ENCLOSURE.
 - B. THE ENCLOSURE(S) SHALL HAVE AMPLE SPACE FOR THE CIRCUIT COMPONENTS, TERMINAL BLOCKS AND INCOMING AND INTERNAL WIRING.
 - C. ALL CONTROL CONDUCTOR TERMINATIONS SHALL BE OF THE OPEN-EYE CONNECTOR/SCREW TYPE. SOLDERED CLOSED-EYE TERMINATIONS, OR TERMINATIONS WITHOUT CONNECTORS ARE NOT ACCEPTABLE.
 - D. WHEN THE ENCLOSURE COVER IS OPENED, ALL CIRCUIT COMPONENTS, WIRING AND TERMINALS SHALL BE EXPOSED AND ACCESSIBLE WITHOUT REMOVAL OF ANY PANELS, COVERS, ETC., EXCEPT THOSE COVERING HIGH VOLTAGE COMPONENTS.
 - E. ACCESS TO, OR REMOVAL OF A CIRCUIT COMPONENT OR TERMINAL BLOCK WILL NOT REQUIRE THE REMOVAL OF ANY OTHER CIRCUIT COMPONENT OR TERMINAL BLOCK.
 - F. EACH CIRCUIT COMPONENT SHALL BE CLEARLY IDENTIFIED INDICATING ITS CORRESPONDING NUMBER SHOWN IN THE DRAWINGS AND ITS FUNCTION.
 - G. A COMPLETE WIRING DIAGRAM SHALL BE MOUNTED ON THE INSIDE OF THE COVER. THE DIAGRAM SHALL REPRESENT EACH CONDUCTOR BY A SEPARATE LINE.
 - H. THE DIAGRAM SHALL IDENTIFY EACH CIRCUIT COMPONENT AN NUMBERING AND COLOR OF EACH TERMINAL CONDUCTOR AND TERMINAL.
 - I. ALL WIRING SHALL BE NEATLY TRAINED AND LACED.
 - J. MINIMUM WIRE SIZE SHALL BE NO. 12 AWG.
24. FURNISH & INSTALL A WEATHERPROOF WARNING LABEL FOR EACH METER SOCKET, SERVICE DISCONNECT, SAFETY SWITCH, CUTOFF, PANELBOARD, & CONTROL PANEL TO WARN PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS, PER THE REQUIREMENTS OF NEC 110.16 "FLASH PROTECTION".

DATE	REVISION	BY

**FLORA AIRPORT
FLORA, ILLINOIS**

A.I.P. PROJ.: 3-17-0044-B15
I.L. PROJ.: FOA-3786

REL. Project No. 08A0021D-0800	01/17/08
Drawings E-002.DWG	01/17/08
Scale N/A	02/01/08
Date 02/01/08	
LAYOUT MDR	
DRAWN MDR	
REVIEWED CAH/KNL	



**INSTALL REILS & PLASI
ON RUNWAY END 21**

**ELECTRICAL NOTES
SHEET 1**

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AIRFIELD LIGHTING NOTES

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

19. THE TOLERANCE FOR THE LATERAL SPACING (LIGHT LANE TO RUNWAY/TAXIWAY CENTERLINE) OF RUNWAY/TAXIWAY EDGE LIGHTS SHALL BE ONE (1) INCH. THIS ALSO APPLIES AT INTERSECTIONS TO LATERAL SPACING BETWEEN LIGHTS OF A RUNWAY/TAXIWAY AND THE INTERSECTING RUNWAY/TAXIWAY.
20. ENTRANCES INTO L-867 BASES SHALL HAVE CONDUIT COUPLINGS OR REDUCERS TO INTERFACE UNIT DUCT/CONDUIT TO L-867 BASE HUBS, OR SHALL BE SEALED WITH HEAT SHRINK AS SHOWN IN DETAIL "B" ON SHEET NO. 13.
21. GALVANIZED/PAINTED EQUIPMENT/COMPONENT SURFACES SHALL NOT BE DAMAGED BY DRILLING, FILING, ETC. DRAIN HOLES IN METAL TRANSFORMER HOUSINGS SHALL BE MADE BEFORE GALVANIZING.
22. EDGE LIGHT NUMBERING TAGS SHALL BE FACING THE PAVEMENT.
23. CABLE/SPLICE/DUCT MARKERS SHALL BE PRECAST CONCRETE OF THE SIZE SHOWN. LETTERS/NUMBERS/ARROWS FOR THE LEGEND TO BE IMPRESSED INTO THE TOPS OF THE MARKERS SHALL BE PRE-ASSEMBLED AND SECURED IN THE MOLD BEFORE THE CONCRETE IS POURED. LEGEND INSCRIBED BY HAND IN WET CONCRETE SHALL NOT BE ACCEPTABLE.
24. ALL UNDERGROUND CABLE RUNS SHALL BE IDENTIFIED BY CABLE MARKERS AT 400 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.
25. THERE SHALL BE NO SPLICES BETWEEN THE ISOLATION TRANSFORMERS. L-823 CONNECTORS ARE ALLOWED AT TRANSFORMER CONNECTIONS ONLY, UNLESS OTHERWISE SHOWN.
26. APPLY AN OXIDE INHIBITING, ANTI-SEIZING COMPOUND TO ALL SCREWS, NUTS AND BREAKAGE COUPLING THREADS.
27. LOCATIONS OF ENDS OF ALL UNDERGROUND DUCTS SHALL BE IDENTIFIED BY DUCT MARKERS.
28. WHERE A PARALLEL, CONSTANT VOLTAGE PAPI SYSTEM IS PROVIDED, THE "T" SPLICES SHALL BE OF THE CAST TYPE.
29. CONCRETE USED FOR SLABS, FOOTINGS, BACKFILL AROUND TRANSFORMER HOUSINGS, MARKINGS, ETC. SHALL BE 3000 PSI, AIR-ENTRAINED.
30. ALL POWER AND CONTROL CABLES IN MAN/HAND HOLES SHALL BE TAGGED. USE EMBOSSED COPPER STRIPS TO BE ATTACHED AT BOTH ENDS TO THE CABLE BY THE USE OF PLASTIC STRAPS. MINIMUM OF TWO TAGS SHALL BE PROVIDED ON EACH CABLE IN A MAN/HAND HOLE-ONE AT THE CABLE ENTRANCE AND ONE AT THE CABLE EXIT.
31. THE LOCATION, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ON THE PLANS IS NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. 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 ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT. CALL J.U.L.I.E. FOR UTILITY INFORMATION AT 1-800-892-0123. ALSO CONTACT AIRPORT MANAGER AND/OR RESPECTIVE AIRPORT PERSONNEL FOR ASSISTANCE IN LOCATING UNDERGROUND AIRPORT CABLES AND/OR UTILITIES. CONTACT FAA FOR ASSISTANCE IN LOCATING THEIR CABLES.

GROUNDING NOTES FOR AIRFIELD LIGHTING

1. GROUNDING FOR RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS SHALL BE AS DETAILED ON THE PLANS AND AS SPECIFIED HEREIN. PER FAA AC 150/5340-30C DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, CHAPTER 12, PART 12.6; A SAFETY GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. THE PURPOSE OF THE SAFETY GROUND IS TO PROTECT PERSONNEL FROM POSSIBLE CONTACT WITH AN ENERGIZED LIGHT BASE OR MOUNTING STAKE AS THE RESULT OF A SHORTED CABLE OR ISOLATION TRANSFORMER. A SAFETY GROUND SHALL BE INSTALLED AT EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. A SAFETY GROUND SHALL ALSO BE INSTALLED AT EACH STAKE MOUNTED LIGHT FIXTURE. THE SAFETY 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 5/8-INCH DIAMETER BY 8-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 GROUND RODS SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY ERICO PRODUCTS, INC., SOLON, OHIO, (PHONE: 800-248-9353), THERMOWELD BY CONTINENTAL INDUSTRIES, INC., TULSA, OKLAHOMA (PHONE: 918-663-1440) OR ULTRAWELD BY HARGER, GRAYSLAKE, ILLINOIS (PHONE: 800-842-7437). 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.
2. 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 2008 NATIONAL ELECTRICAL CODE ARTICLE 250-12.
3. PER FAA 150/5340-30C THE RESISTANCE TO GROUND OF THE RESPECTIVE MOUNTING STAKE OR LIGHT BASE (WITH GROUND ROD CONNECTED) MUST BE 25 OHMS OR LESS.
4. **GROUNDING FOR PLASI.** GROUNDING FOR PLASI SHALL CONFORM TO THE RESPECTIVE PLASI MANUFACTURER'S INSTALLATION INSTRUCTIONS, AS DETAILED ON THE PLANS, AND AS SPECIFIED HEREIN. THE POWER CIRCUIT TO THE PLASI UNIT SHALL INCLUDE AN EQUIPMENT GROUND WIRE. THE EXISTING POWER FEEDER CIRCUIT IS A 120 VAC, 2-WIRE CIRCUIT WITHOUT AN EQUIPMENT GROUND WIRE. TO COMPLY WITH THE REQUIREMENTS OF NATIONAL ELECTRICAL CODE AND THE PLASI MANUFACTURER'S INSTALLATION INSTRUCTIONS A SAFETY SWITCH/DISCONNECT SHALL BE INSTALLED AT THE PLASI. THE 120 VAC FEEDER CONDUCTORS FROM THE VAULT SHALL TERMINATE ON THIS SAFETY SWITCH/DISCONNECT. FURNISH AND INSTALL A 3/4-INCH DIAMETER BY 10-FOOT LONG COPPER CLAD GROUND ROD AT THE SITE OF THE PLASI UNIT. TOP OF GROUND ROD SHALL BE BURIED 30 INCHES BELOW GRADE. ALL CONNECTIONS TO THE GROUND ROD SHALL BE EXOTHERMIC WELD AS MANUFACTURED BY CADWELD, THERMOWELD, OR ULTRAWELD. CONNECT THE SAFETY SWITCH ENCLOSURE FRAME/GROUND BAR TO THE GROUND ROD WITH A #6 AWG STRANDED COPPER GROUNDING ELECTRODE CONDUCTOR. BOND THE NEUTRAL TO GROUND IN THIS SAFETY WITH A #6 AWG (MINIMUM) STRANDED COPPER BONDING JUMPER. FROM THE LOAD SIDE OF THE SAFETY SWITCH INSTALL 1 #10 THWN, 1 #10 THWN NEUTRAL, AND 1 #10 EQUIPMENT GROUND IN 3/4-INCH LIQUID TIGHT FLEXIBLE METAL CONDUIT TO THE PLASI UNIT. TERMINATE THE EQUIPMENT GROUND WIRE ON THE RESPECTIVE GROUND LUG INSIDE THE PLASI UNIT OR ON THE PLASI UNIT METAL FRAME.
5. **GROUNDING FOR REILS.** GROUNDING FOR REILS SHALL CONFORM TO THE RESPECTIVE REIL MANUFACTURER'S INSTALLATION INSTRUCTIONS, AS DETAILED ON THE PLANS, AND AS SPECIFIED HEREIN. THE POWER CIRCUIT TO MASTER REIL UNIT, AND EACH SLAVE UNIT, SHALL INCLUDE AN EQUIPMENT GROUND WIRE OF THE SAME SIZE AND TYPE AS THE PHASE CONDUCTORS. FURNISH AND INSTALL A 3/4-INCH DIAMETER BY 10-FOOT LONG COPPER CLAD GROUND ROD AT EACH REIL UNIT. BOND EACH REIL UNIT HOUSING AND THE REIL BASE CAN TO THE RESPECTIVE GROUND ROD IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS WITH A #6 AWG BARE SOLID OR STRANDED (PER REIL MANUFACTURER REQUIREMENTS) COPPER GROUNDING ELECTRODE CONDUCTOR. TOP OF GROUND RODS SHALL BE BURIED 30 INCHES BELOW GRADE. ALL CONNECTIONS TO GROUND RODS SHALL BE EXOTHERMIC WELD AS MANUFACTURED BY CADWELD, THERMOWELD, OR ULTRAWELD. CONNECTIONS TO REIL UNIT FRAMES SHALL BE AS RECOMMENDED BY THE MANUFACTURER OR WITH UL LISTED GROUNDING CONNECTORS. CONTRACTOR SHALL CONFIRM COUNTERPOISE REQUIREMENTS AND/OR ADDITIONAL GROUNDING REQUIREMENTS WITH THE RESPECTIVE REIL MANUFACTURER'S INSTALLATION INSTRUCTIONS AND/OR RECOMMENDATIONS.

Apr 11, 2008 4:44 PM HACL000382 AIRPORTS\FLORA\08A0021\AIRPORT\SHEETS\VE-003.DWG - Work

DATE	REVISION

**FLORA AIRPORT
FLORA, ILLINOIS**

A.I.P. PROJ.: 3-17-0044-815
I.L. PROJ.: FDA-3786

Proj. No. 08A0021D_0800	Scale N/A	Date 02/01/08
Drawn MDR	Checked MDR	Reviewed CAH/KNL
01/17/08	01/17/08	02/01/08



**INSTALL REILS & PLASE
ON RUNWAY END 21**

**ELECTRICAL NOTES
SHEET 2**