

CONSTRUCTION PLANS FOR VANDALIA MUNICIPAL AIRPORT

VANDALIA, FAYETTE COUNTY, ILLINOIS

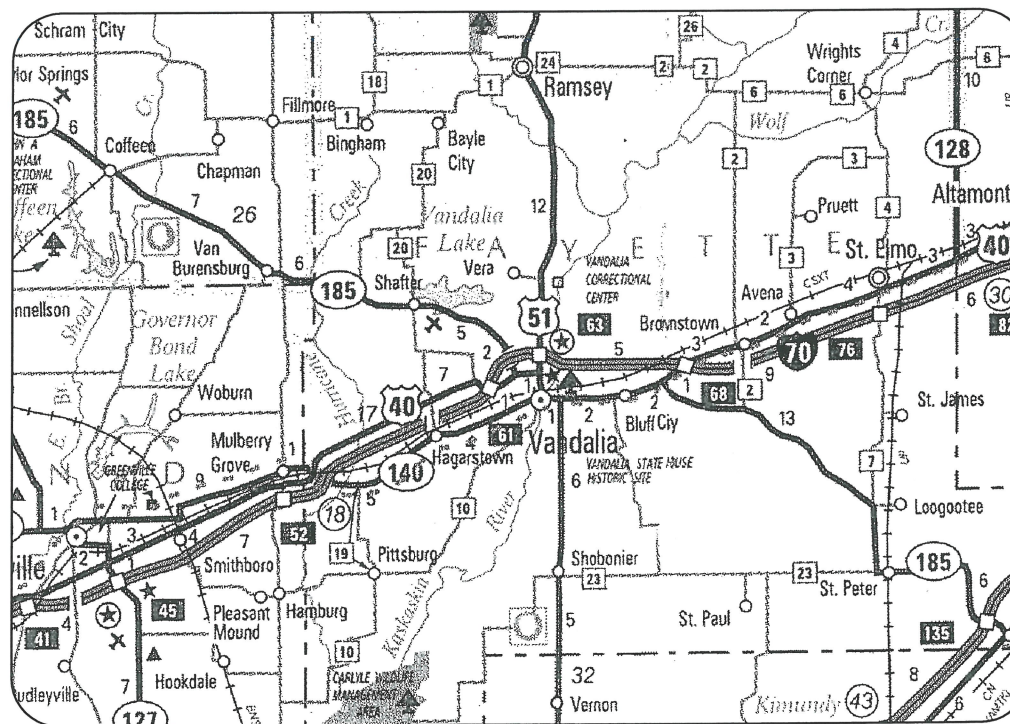
REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING ON RUNWAYS AND TAXIWAYS

SCOPE OF WORK

THIS PROJECT CONSISTS OF REMOVAL AND REPLACEMENT OF THE MEDIUM INTENSITY AIRFIELD LIGHTING ON THE RUNWAY AND TAXIWAYS AND THE ASSOCIATED CABLING, DUCT WORK, AND VAULT WORK. PROVIDING MANDATORY HOLD SIGNS AT THE RUNWAY/RUNWAY INTERSECTIONS AND THE RUNWAY/TAXIWAY INTERSECTIONS SHALL BE INCLUDED IN THIS PROJECT. ALSO ASSOCIATED WITH THIS PROJECT WILL BE THE REPLACEMENT OF THE EXISTING LIGHTED L-807 PRIMARY WIND CONE, REPLACEMENT OF THE AIRPORT ROTATING BEACON, ADDITION OF OBSTRUCTION LIGHTING AND LIGHTNING PROTECTION TO THE BEACON TOWER, AND ADDING A SET OF REIL'S ON RUNWAY END 36.

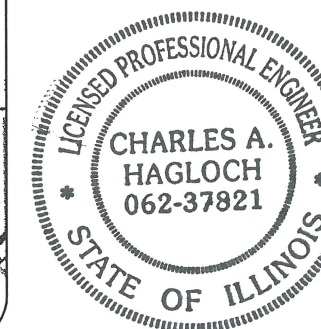
COVERING
ELECTRICAL
DESIGN

REVISED: 03/07/12
REVISED: 12/13/11



LOCATION

ILL. PROJ.: VLA-4111
A.I.P. PROJ.: 3-17-0102-B12
LATITUDE: 38° 59' 32"
LONGITUDE: 89° 09' 54"
ELEVATION: 538' M.S.L.
DATE: AUGUST 26, 2011



Hanson Professional Services Inc.
ELECTRICAL ENGINEER

Submitted by: *Kevin N. Lightfoot* ENG'R
Date Submitted: MARCH 7, 2012
Lic. Exp. Date: NOVEMBER 30, 2013



Hanson Professional Services Inc.
CIVIL ENGINEER

Submitted by: *Charles A. Hagloch* ENG'R
Date Submitted: MARCH 7, 2012
Lic. Exp. Date: NOVEMBER 30, 2013

VANDALIA PARK DISTRICT

Approved: *Walter A. Haller* CHAIRMAN
Date: Sept. 19, 2011
Approved: *Maryanne Blaylock* SECRETARY
Date: Sept. 19, 2011



LOCATION OF COUNTY

DATE	REVISION
12/15/11	RUNWAY 36 REIL'S

VANDALIA MUNICIPAL AIRPORT
VANDALIA, ILLINOIS

Hanson Project No. 11A00300_0800	Filename G-001-CVR.DWG
Scale NOT TO SCALE	Date 8/26/2011

LAYOUT	KNL	07/06/11
DRAWN	BAK	07/06/11
REVIEWED	CAH	08/26/11

REPLACE MEDIUM
INTENSITY AIRFIELD
LIGHTING

COVER SHEET

DATE	REVISION
12/02/11	AR125540 QUANTITY CHANGE TO 28
12/15/11	ADDED ITEM AR620520

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	TOTAL QUANTITIES	AS BUILT QUANTITIES
AR101580	REFURBISH 36" BEACON	L.S.	1	
AR107812	L-807 WC-12' INTERNALLY LIT	EACH	1	
AR107900	REMOVE WIND CONE	EACH	1	
AR108108	1/C #8 5 KV UG CABLE	L.F.	1,200	
AR108158	1/C #8 5 KV UG CABLE IN UD	L.F.	24,850	
AR109210	VAULT MODIFICATIONS	L.S.	1	
AR110012	2" DIRECTIONAL BORE	L.F.	600	
AR110014	4" DIRECTIONAL BORE	L.F.	750	
AR110504	4-WAY CONCRETE ENCASED DUCT	L.F.	66	
AR110610	ELECTRICAL HANDHOLE	EACH	4	
AR125410	MITL - STAKE MOUNTED	EACH	95	
AR125415	MITL - BASE MOUNTED	EACH	8	
AR125444	TAXI GUIDANCE SIGN, 4 CHARACTER	EACH	3	
AR125445	TAXI GUIDANCE SIGN, 5 CHARACTER	EACH	3	
AR125447	TAXI GUIDANCE SIGN, 7 CHARACTER	EACH	1	
AR125505	MIRL, STAKE MOUNTED	EACH	51	
AR125510	MIRL, BASE MOUNTED	EACH	17	
AR125540	MI THRESHOLD LIGHT STAKE MTD	EACH	28	
AR125610	REILS	PAIR	1	
AR125901	REMOVE STAKE MOUNTED LIGHT	EACH	125	
AR125902	REMOVE BASE MOUNTED LIGHT	EACH	21	
AR125904	REMOVE TAXI GUIDANCE SIGN	EACH	4	
AR150510	ENGINEER'S FIELD OFFICE	L.S.	1	
AR150520	MOBILIZATION	L.S.	1	
AR620520	PAVEMENT MARKING WATERBORNE	S.F.	1,181	
AR620900	PAVEMENT MARKING REMOVAL	S.F.	822	
AR800560	ARCTIC HEATER KIT	EACH	64	
AR800591	UPGRADE AIRPORT ROTATING BEACON	L.S.	1	

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6	EXISTING ELECTRICAL PLAN FOR RWY. 18-36 STA. 10+00 TO STA. 32+00
7	EXISTING ELECTRICAL PLAN FOR RWY. 9-27 STA. 100+00 TO 106+00
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VANDALIA MUNICIPAL AIRPORT
VANDALIA, ILLINOIS

Hanson Project No. 11A00300_0800	File Name G-002-EP.DWG	Scale NOT TO SCALE	Date 8/26/2011
LAYOUT	DRAWN	REVIEWED	
KNL	BAK	CAH	
07/06/11	07/06/11	08/26/11	



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REPLACE MEDIUM
INTENSITY AIRFIELD
LIGHTING

SUMMARY OF QUANTITIES
AND INDEX TO SHEETS

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 WHATEVER IN RESPECT TO THE ACCURACY, COMPLETENESS, OR SUFFICIENCY OF THE INFORMATION. THERE IS NO GUARANTEE, EITHER EXPRESSED OR IMPLIED, THAT THE LOCATIONS, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ARE REPRESENTATIVE OF THOSE TO BE ENCOUNTERED IN THE CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES OF HIS OPERATIONAL PLANS AND SHALL OBTAIN FROM THE RESPECTIVE UTILITY COMPANIES DETAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF THEIR FACILITIES AND THE WORKING SCHEDULE OF THE COMPANIES FOR REMOVAL OR ADJUSTMENT WHERE REQUIRED. IN THE EVENT AN UNEXPECTED UTILITY INTERFERENCE IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY COMPANY OF JURISDICTION. THE OWNER'S REPRESENTATIVE AND/OR THE RESIDENT ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY DAMAGE TO SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT. ALL UTILITY CABLES AND LINES SHALL BE LOCATED BY THE RESPECTIVE UTILITY. **CONTACT JULIE (JOINT UTILITY LOCATION INFORMATION FOR EXCAVATORS) FOR UTILITY INFORMATION, PHONE: 1-800-892-0123.** CONTACT THE FAA (FEDERAL AVIATION ADMINISTRATION) FOR ASSISTANCE IN LOCATING FAA CABLES AND UTILITIES. LOCATION OF FAA POWER, CONTROL, AND COMMUNICATION CABLES SHALL BE COORDINATED WITH AND/OR LOCATED BY THE FAA. ALSO CONTACT AIRPORT DIRECTOR/MANAGER AND AIRPORT PERSONNEL FOR ASSISTANCE IN LOCATING UNDERGROUND AIRPORT CABLES AND/OR UTILITIES. ALSO COORDINATE WORK WITH ALL ABOVEGROUND UTILITIES.

HAUL ROUTE AND VEHICLE PARKING

THE CONTRACTOR WILL USE THE DESIGNATED HAUL ROUTE AND PARKING AREA AS SHOWN ON THIS SHEET. THE PROPOSED PARKING AREA WILL BE 50' X 50'. THE CONTRACTOR WILL BE REQUIRED TO MAINTAIN THE PROPOSED HAUL ROUTE AND PARKING AREA THROUGHOUT THE COURSE OF THE PROJECT. ANY AREAS DAMAGED OUTSIDE OF THESE AREAS 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 HAUL ROUTE AND PARKING AREA AS NEEDED TO RESTORE IT TO ITS ORIGINAL STATE. RESTORATION OF THE HAUL ROUTE AND PARKING AREA WILL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

CONTRACTOR RESPONSIBILITIES

THE CONTRACTOR'S EQUIPMENT PARKING AND STORAGE AREA WILL BE AS SHOWN ON THIS SHEET. THE CONTRACTOR'S EMPLOYEES WILL PARK THEIR VEHICLES IN THIS AREA. 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.

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

BARRICADES AND TRAFFIC CONES

IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO PLACE AND MAINTAIN BARRICADES AND TRAFFIC CONES AS SHOWN AND 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. INCLUDE BARRICADES FOR TAXIWAYS TO COORDINATE WITH THE RESPECTIVE RUNWAY CLOSURE. WHEN TAXIWAYS ARE CLOSED PLACE BARRICADES AT EACH END OF TAXIWAY AS NEEDED. WHEN BOTH RUNWAYS ARE CLOSED BARRICADES SHALL BE PLACED ON ALL TAXIWAYS LEADING TO THE RUNWAYS.

LEGEND

- EXISTING IMPROVEMENTS
- PROPOSED IMPROVEMENTS
- EXISTING BUILDINGS
- PROPOSED HAUL ROUTE AND EQUIPMENT PARKING AREA
- PROPOSED BENCHMARK
- PROPOSED BARRICADES WHEN RWY. 9-27 IS CLOSED
- PROPOSED BARRICADES WHEN RWY. 18-36 IS CLOSED

SCOPE OF WORK

THIS PROJECT CONSISTS OF REMOVAL AND REPLACEMENT OF THE MEDIUM INTENSITY AIRFIELD LIGHTING ON THE RUNWAYS AND TAXIWAYS AND THE ASSOCIATED CABLING, DUCT WORK AND VAULT WORK. PROVIDING MANDATORY HOLD SIGNS AT THE RUNWAY/RUNWAY INTERSECTION AND RUNWAY/TAXIWAY INTERSECTIONS SHALL BE INCLUDED WITH THIS PROJECT. ALSO ASSOCIATED WITH THIS PROJECT WILL BE THE REPLACEMENT OF THE EXISTING LIGHTED L-807 PRIMARY WILD CONE, REPLACEMENT OF THE AIRPORT ROTATING BEACON, ADDITION OF OBSTRUCTION LIGHTING AND LIGHTNING PROTECTION TO THE BEACON TOWER, AND ADDING A SET OF REIL'S ON RUNWAY 36.

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.

NOTE

ALL CONSTRUCTION/OPERATIONS ARE TO BE PERFORMED IN ACCORDANCE WITH FAA ADVISORY CIRCULAR (AC) 150/5370-2F "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION" AND AC 150/5300-13 "AIRPORT DESIGN".

CRITICAL POINT DATA

- POINT NO. 1: LATITUDE: 38° 59' 17.07", LONGITUDE: 89° 09' 54.08", ELEVATION: 532.5 M.S.L.
- POINT NO. 2: LATITUDE: 38° 59' 26.84", LONGITUDE: 89° 10' 02.06", ELEVATION: 534.9 M.S.L.
- POINT NO. 3: LATITUDE: 38° 59' 22.89", LONGITUDE: 89° 10' 02.03", ELEVATION: 533.8 M.S.L.
- POINT NO. 4: LATITUDE: 38° 59' 24.90", LONGITUDE: 89° 09' 59.51", ELEVATION: 534.6 M.S.L.
- POINT NO. 5: LATITUDE: 38° 59' 24.84", LONGITUDE: 89° 10' 04.57", ELEVATION: 533.9 M.S.L.

HEIGHT OF CONSTRUCTION EQUIPMENT

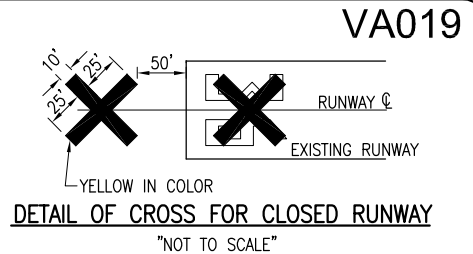
THE MAXIMUM ANTICIPATED HEIGHT OF THE CONSTRUCTION EQUIPMENT WILL BE 70 FEET, WHICH IS EXPECTED TO BE A CRANE OR A BUCKET TRUCK TO WORK ON THE BEACON TOWER. THE MAXIMUM ANTICIPATED HEIGHT OF THE CONSTRUCTION EQUIPMENT AT ALL OTHER LOCATIONS WILL BE 25 FEET, WHICH IS EXPECTED TO BE A CONCRETE TRUCK OR A LINE TRUCK. THE CRANE OR BUCKET TRUCK SHALL BE USED DURING THE DAYLIGHT HOURS AND VFR CONDITIONS ONLY AND SHALL BE LOWERED WHEN NOT IN USE, DURING THE HOURS BETWEEN SUNSET AND SUNRISE, AND/OR DURING IFR WEATHER CONDITIONS. WHEN IN USE, THE CRANE OR BUCKET TRUCK SHALL BE MARKED WITH THE 3' SQUARE CHECKERED FLAG.

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.



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: FAYETTE
CITY: VANDALIA
TOWNSHIP: BEAR GROVE
SECTION NO.: 2
ADDRESS: VANDALIA MUNICIPAL AIRPORT
R.R. #3
VANDALIA, ILLINOIS 62471

PROPOSED SAFETY PLAN

GENERAL - THE VANDALIA MUNICIPAL AIRPORT IS COMPRISED OF TWO RUNWAYS. THE PROPOSED CONSTRUCTION WILL NECESSITATE CLOSING BOTH RUNWAYS. ANY TIME THE CONTRACTOR IS WORKING WITHIN 200' OF THE RUNWAY CENTERLINE THE RUNWAY SHALL BE CLOSED. ANY TIME THE CONTRACTOR IS WORKING WITHIN 66' OF THE TAXIWAY CENTERLINE THE TAXIWAY SHALL BE CLOSED. THE CONTRACTOR WILL BE ALLOWED TO CLOSE ONE RUNWAY FOR THE CONSTRUCTION WEEK. AT THE END OF THE CONSTRUCTION WEEK HE MUST OPEN IT BACK UP FOR "DAYTIME OPERATIONS ONLY". THE CONTRACTOR MUST COMPLETE ALL THE PROPOSED WORK ON THAT RUNWAY BEFORE HE WILL BE ALLOWED TO START ON THE OTHER RUNWAY. THE CONTRACTOR WILL BE ALLOWED TO CLOSE BOTH RUNWAYS WHEN HE IS WORKING WITHIN THE INTERSECTION OF BOTH RUNWAYS. THE CONTRACTOR WILL EXPEDITE THIS WORK IN ORDER TO REDUCE THE AMOUNT OF TIME THE AIRPORT IS CLOSED. 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 (122.80 MHz.) WITH THE AIRPORT UNICOM. THIS WILL KEEP THE CONTRACTOR IN CONSTANT CONTACT WITH THE VANDALIA MUNICIPAL 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 PROPOSED ENGINEER'S FIELD OFFICE WILL BE FURNISHED, MAINTAINED, AND REMOVED IN ACCORDANCE WITH ITEM AR150510 "ENGINEER'S FIELD OFFICE" AS STATED ON PAGE 49 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS NOV. 2, 2009.

THE LOCATION OF THE PROPOSED ENGINEER'S FIELD OFFICE WILL BE DETERMINED AT THE PRE-CONSTRUCTION MEETING.

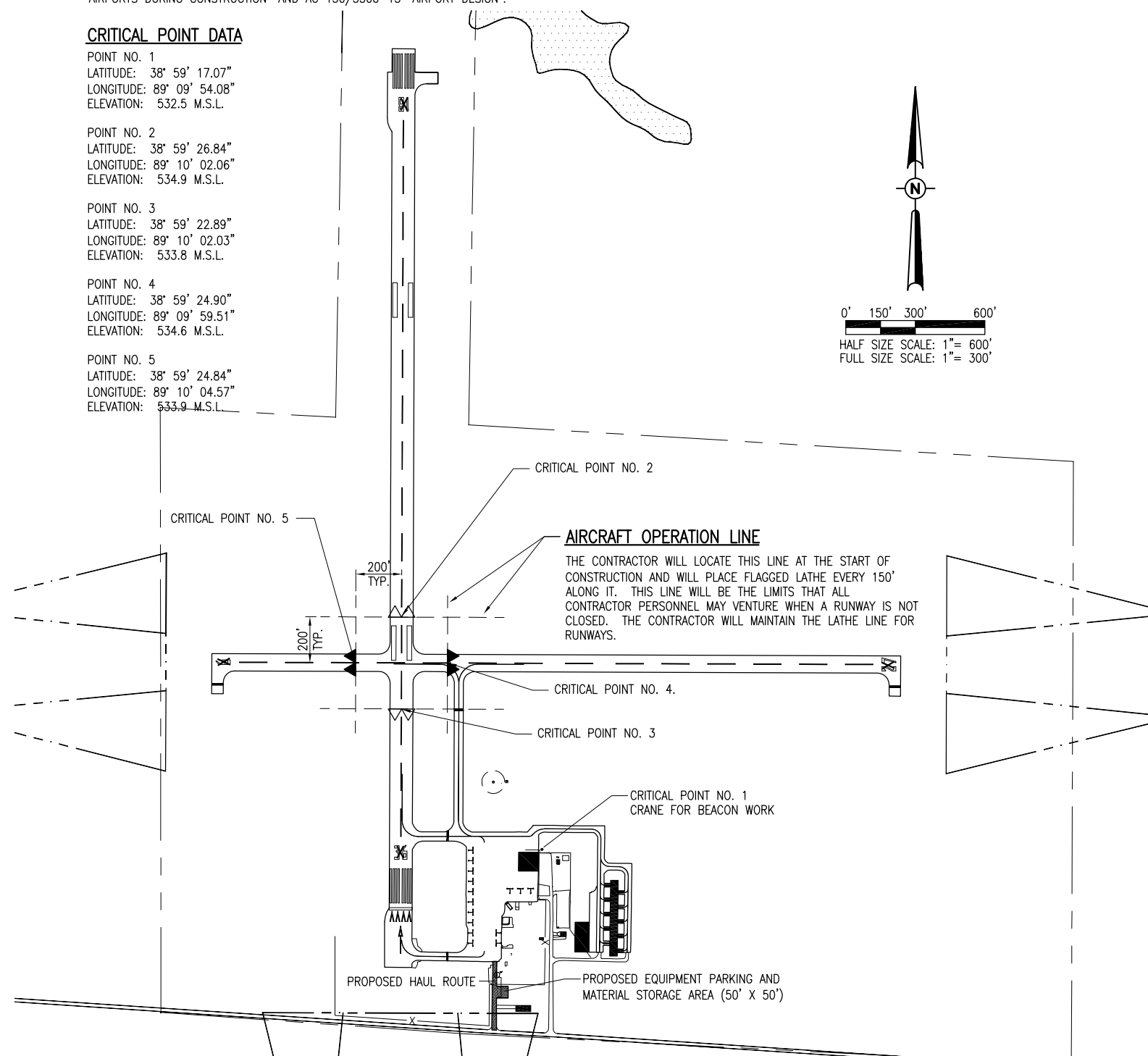
THE ENGINEERING FIRM WILL MAKE PAYMENT FOR ALL LONG DISTANCE TELEPHONE CALLS IN EXCESS OF ONE HUNDRED DOLLARS (\$100.00) PER MONTH.

THE CONTRACTOR WILL FURNISH A WIRELESS 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.

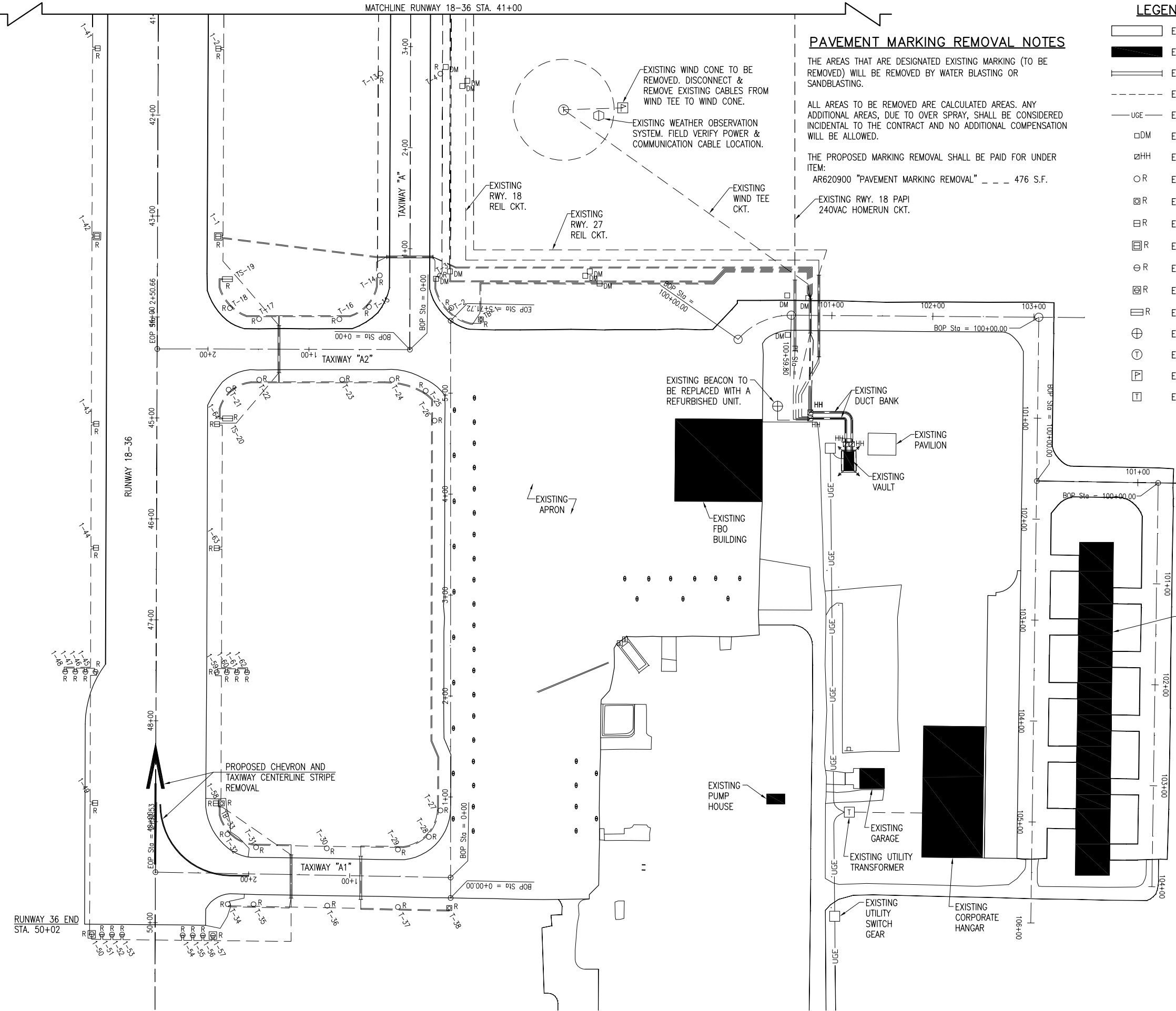
EROSION CONTROL

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



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Revision table, project title (VANDALIA MUNICIPAL AIRPORT), company logo (HANSON), and page number (3 of 31 sheets).



PAVEMENT MARKING REMOVAL NOTES

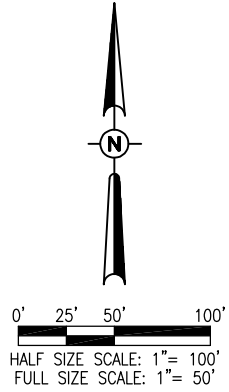
THE AREAS THAT ARE DESIGNATED EXISTING MARKING (TO BE REMOVED) WILL BE REMOVED BY WATER BLASTING OR SANDBLASTING.

ALL AREAS TO BE REMOVED ARE CALCULATED AREAS. ANY ADDITIONAL AREAS, DUE TO OVER SPRAY, SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

THE PROPOSED MARKING REMOVAL SHALL BE PAID FOR UNDER ITEM:
 AR620900 "PAVEMENT MARKING REMOVAL" --- 476 S.F.

LEGEND

- EXISTING PAVEMENT
- EXISTING BUILDING
- EXISTING ELECTRICAL DUCT
- EXISTING ELECTRICAL CABLE
- EXISTING UNDERGROUND ELECTRIC UTILITY PRIMARY
- EXISTING DUCT MARKER
- EXISTING HANDHOLE
- EXISTING STAKE MOUNTED TAXIWAY LIGHT (TO BE REMOVED)
- EXISTING BASE MOUNTED TAXIWAY LIGHT (TO BE REMOVED)
- EXISTING STAKE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
- EXISTING BASE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
- EXISTING L-861SE STAKE MOUNTED THRESHOLD LIGHT (TO BE REMOVED)
- EXISTING BASE MOUNTED THRESHOLD LIGHT (TO BE REMOVED)
- EXISTING TAXI GUIDANCE SIGN (TO BE REMOVED)
- EXISTING ROTATING BEACON
- EXISTING WIND TEE
- EXISTING WIND CONE
- EXISTING UTILITY TRANSFORMER



REVISION	DATE	DESCRIPTION
12/13/11		ADDED PAVT. MARKING REMOVAL

VANDALIA MUNICIPAL AIRPORT
 VANDALIA, ILLINOIS

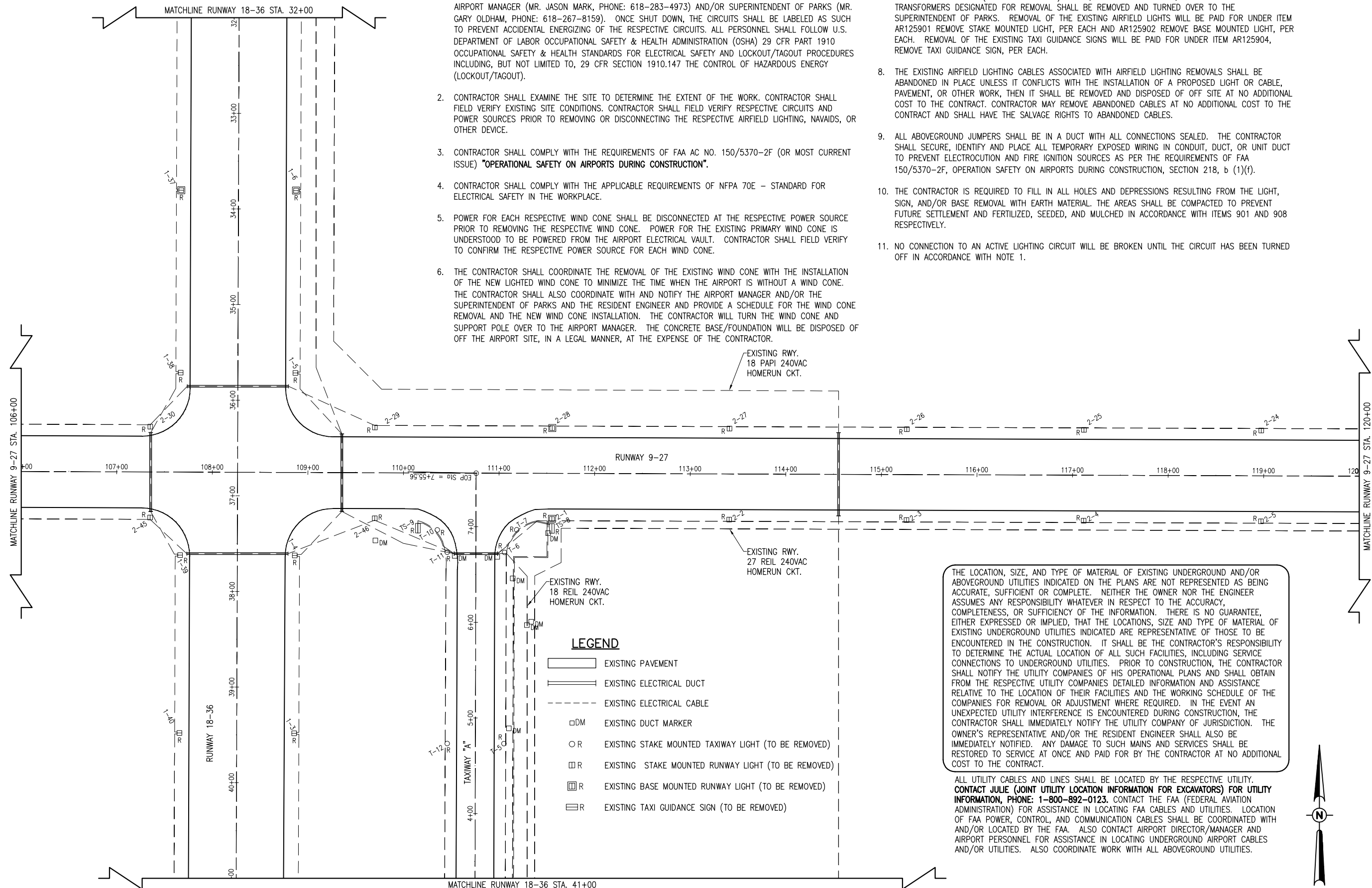
IL. PROJ.: VJA-4111 A.I.P. PROJ.: 3-17-0102-B12

Hanson Project No.	11A00300_0800
Filename	E-141ELE.DWG
Scale	1" = 50'
Date	8/26/2011
LAYOUT	KNL 07/06/11
DRAWN	BAK 07/06/11
REVIEWED	CAH 08/26/11

HANSON
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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING
 EXISTING ELECTRICAL PLAN FOR APRON & RWY. 36

DEC 14, 2011 10:35 AM KINC400394
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AIRFIELD LIGHTING REMOVAL NOTES

1. ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER (MR. JASON MARK, PHONE: 618-283-4973) AND/OR SUPERINTENDENT OF PARKS (MR. GARY OLDHAM, PHONE: 618-267-8159). ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
2. CONTRACTOR SHALL EXAMINE THE SITE TO DETERMINE THE EXTENT OF THE WORK. CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL FIELD VERIFY RESPECTIVE CIRCUITS AND POWER SOURCES PRIOR TO REMOVING OR DISCONNECTING THE RESPECTIVE AIRFIELD LIGHTING, NAVAIDS, OR OTHER DEVICE.
3. CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF FAA AC NO. 150/5370-2F (OR MOST CURRENT ISSUE) "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION".
4. CONTRACTOR SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF NFPA 70E - STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE.
5. POWER FOR EACH RESPECTIVE WIND CONE SHALL BE DISCONNECTED AT THE RESPECTIVE POWER SOURCE PRIOR TO REMOVING THE RESPECTIVE WIND CONE. POWER FOR THE EXISTING PRIMARY WIND CONE IS UNDERSTOOD TO BE POWERED FROM THE AIRPORT ELECTRICAL VAULT. CONTRACTOR SHALL FIELD VERIFY TO CONFIRM THE RESPECTIVE POWER SOURCE FOR EACH WIND CONE.
6. THE CONTRACTOR SHALL COORDINATE THE REMOVAL OF THE EXISTING WIND CONE WITH THE INSTALLATION OF THE NEW LIGHTED WIND CONE TO MINIMIZE THE TIME WHEN THE AIRPORT IS WITHOUT A WIND CONE. THE CONTRACTOR SHALL ALSO COORDINATE WITH AND NOTIFY THE AIRPORT MANAGER AND/OR THE SUPERINTENDENT OF PARKS AND THE RESIDENT ENGINEER AND PROVIDE A SCHEDULE FOR THE WIND CONE REMOVAL AND THE NEW WIND CONE INSTALLATION. THE CONTRACTOR WILL TURN THE WIND CONE AND SUPPORT POLE OVER TO THE AIRPORT MANAGER. THE CONCRETE BASE/FOUNDATION WILL BE DISPOSED OF OFF THE AIRPORT SITE, IN A LEGAL MANNER, AT THE EXPENSE OF THE CONTRACTOR.

AIRFIELD LIGHTING REMOVAL NOTES (CONT.)

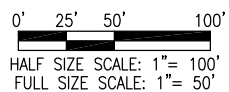
7. THE EXISTING AIRFIELD (RUNWAY & TAXIWAY) LIGHTS, TAXI GUIDANCE SIGNS, AND THEIR ISOLATED TRANSFORMERS DESIGNATED FOR REMOVAL SHALL BE REMOVED AND TURNED OVER TO THE SUPERINTENDENT OF PARKS. REMOVAL OF THE EXISTING AIRFIELD LIGHTS WILL BE PAID FOR UNDER ITEM AR125901 REMOVE STAKE MOUNTED LIGHT, PER EACH AND AR125902 REMOVE BASE MOUNTED LIGHT, PER EACH. REMOVAL OF THE EXISTING TAXI GUIDANCE SIGNS WILL BE PAID FOR UNDER ITEM AR125904, REMOVE TAXI GUIDANCE SIGN, PER EACH.
8. 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.
9. ALL ABOVEGROUND JUMPERS SHALL BE IN A DUCT WITH ALL CONNECTIONS SEALED. THE CONTRACTOR SHALL SECURE, IDENTIFY AND PLACE ALL TEMPORARY EXPOSED WIRING IN CONDUIT, DUCT, OR UNIT DUCT TO PREVENT ELECTROCUTION AND FIRE IGNITION SOURCES AS PER THE REQUIREMENTS OF FAA 150/5370-2F, OPERATION SAFETY ON AIRPORTS DURING CONSTRUCTION, SECTION 218, b (1)(f).
10. THE CONTRACTOR IS REQUIRED TO FILL IN ALL HOLES AND DEPRESSIONS RESULTING FROM THE LIGHT, SIGN, AND/OR BASE REMOVAL WITH EARTH MATERIAL. THE AREAS SHALL BE COMPACTED TO PREVENT FUTURE SETTLEMENT AND FERTILIZED, SEEDED, AND MULCHED IN ACCORDANCE WITH ITEMS 901 AND 908 RESPECTIVELY.
11. NO CONNECTION TO AN ACTIVE LIGHTING CIRCUIT WILL BE BROKEN UNTIL THE CIRCUIT HAS BEEN TURNED OFF IN ACCORDANCE WITH NOTE 1.

LEGEND

- EXISTING PAVEMENT
- EXISTING ELECTRICAL DUCT
- EXISTING ELECTRICAL CABLE
- EXISTING DUCT MARKER
- EXISTING STAKE MOUNTED TAXIWAY LIGHT (TO BE REMOVED)
- EXISTING STAKE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
- EXISTING BASE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
- EXISTING TAXI GUIDANCE SIGN (TO BE REMOVED)

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

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



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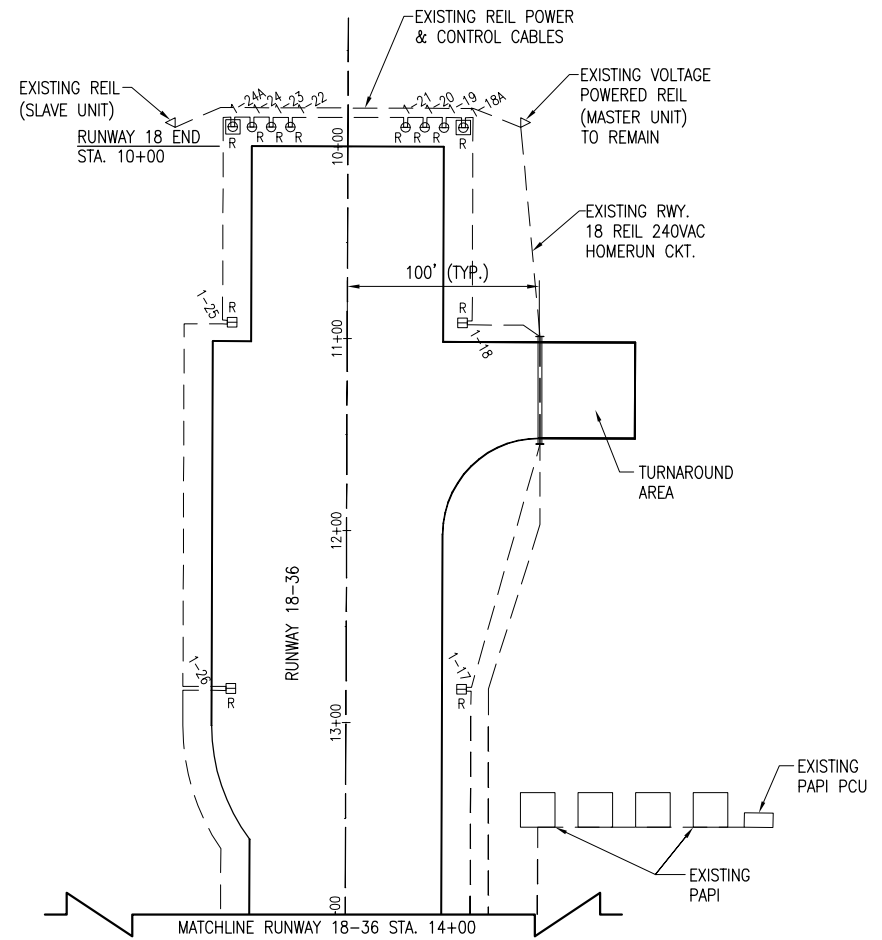
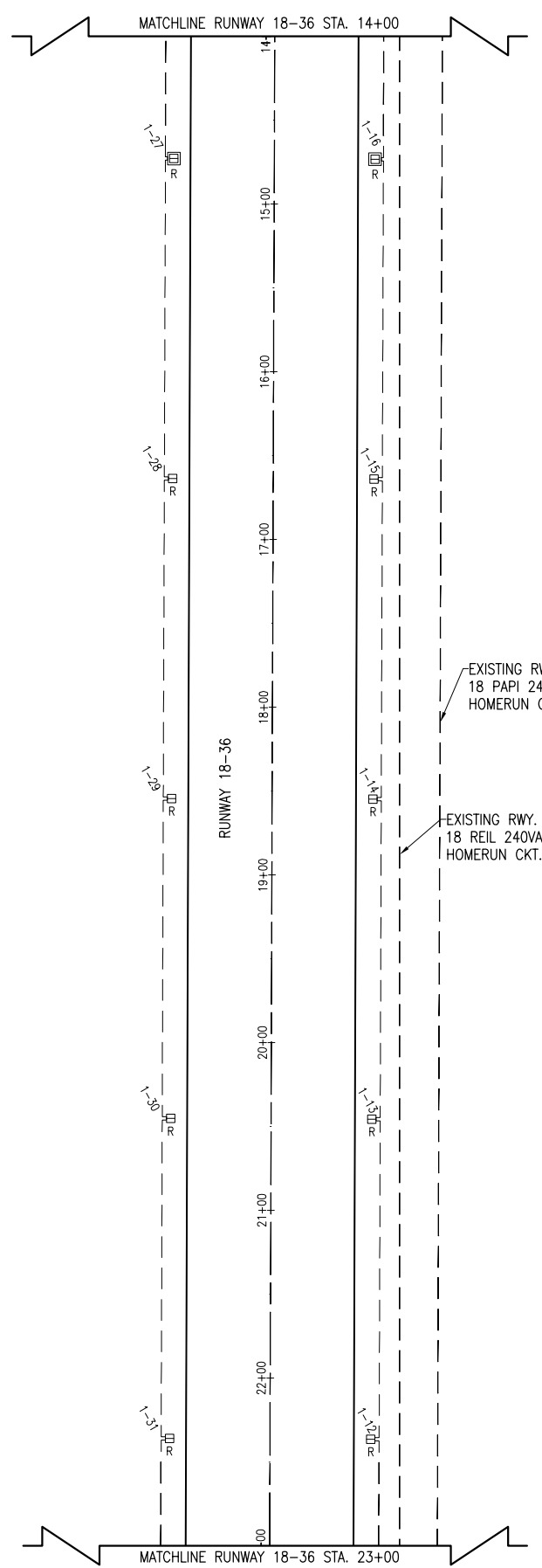
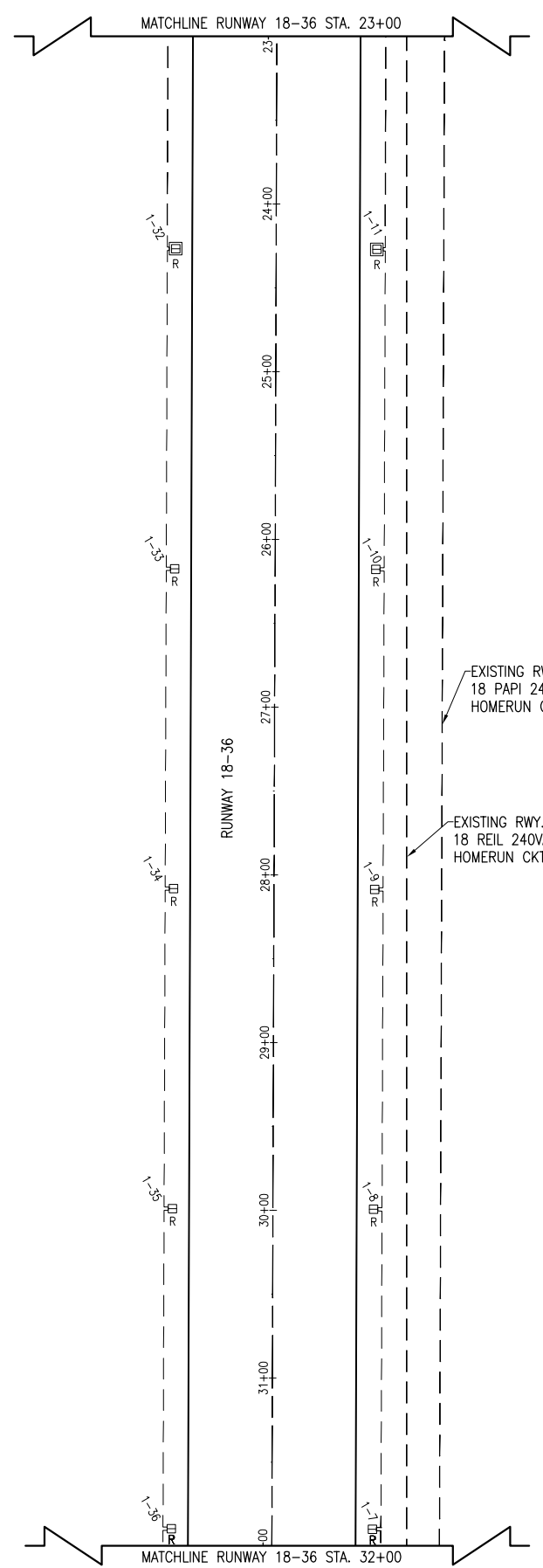
DATE	REVISION
12/02/11	REVISED PER FAA AC UPDATES
12/15/11	UPDATE NOTE 8 PER IDA REVIEW

VANDALIA MUNICIPAL AIRPORT
 VANDALIA, ILLINOIS
 IL. PROJ.: VJA-4111 A.I.P. PROJ.: 3-17-0102-B12

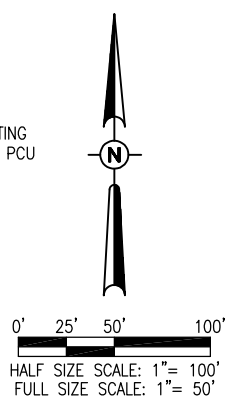
Hanson Project No.	11A00300_0800
Filename	E-141ELE.DWG
Scale	1" = 50'
Date	8/26/2011
LAYOUT	KNL 07/06/11
DRAWN	BAK 07/06/11
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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING
 EXISTING ELECTRICAL PLAN FOR RWY. 9-27 & RWY. 18-36 INTERSECTION



- LEGEND**
- EXISTING PAVEMENT
 - EXISTING ELECTRICAL DUCT
 - EXISTING ELECTRICAL CABLE
 - EXISTING STAKE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
 - EXISTING BASE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
 - EXISTING L-861SE STAKE MOUNTED THRESHOLD LIGHT (TO BE REMOVED)
 - EXISTING BASE MOUNTED THRESHOLD LIGHT (TO BE REMOVED)
 - EXISTING REILS

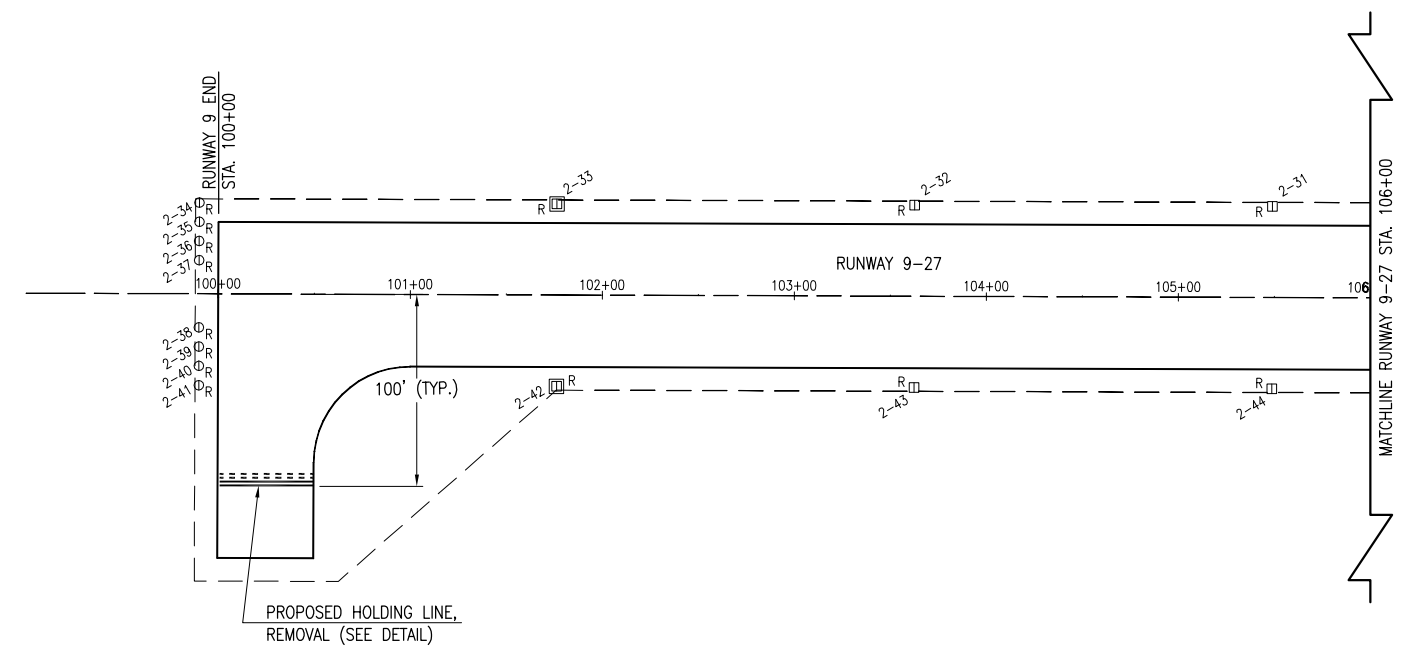


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REVISION		VANDALIA MUNICIPAL AIRPORT VANDALIA, ILLINOIS	I.L. PROJ.: VLA-4111 A.I.P. PROJ.: 3-17-0102-B12
DATE	DATE		
Hanson Project No. 11A00300_0800 Filename E-141ELE.DWG Scale 1" = 50' Date 8/26/2011		LAYOUT KNL 07/06/11 DRAWN BAK 07/06/11 REVIEWED CAH 08/26/11	
© Copyright Hanson Professional Services Inc. 2011 Hanson Professional Services Inc. 1525 South Sixth Street Springfield, Illinois 62703-2986 Ph: (217) 788-2450 Fax: (217) 788-2503 www.hanson-inc.com Offices Nationwide		REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING EXISTING ELECTRICAL PLAN FOR RWY. 18-36 STA. 10+00 TO STA. 32+00	
6		6 of 31 sheets	

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

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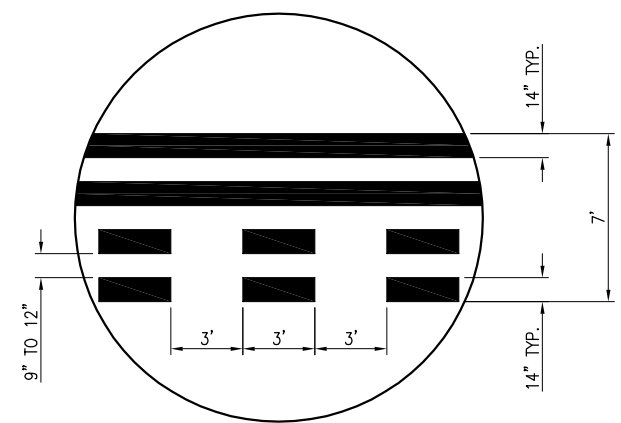


PAVEMENT MARKING REMOVAL NOTES

THE AREAS THAT ARE DESIGNATED EXISTING MARKING (TO BE REMOVED) WILL BE REMOVED BY WATER BLASTING OR SANDBLASTING.

ALL AREAS TO BE REMOVED ARE CALCULATED AREAS. ANY ADDITIONAL AREAS, DUE TO OVER SPRAY, SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

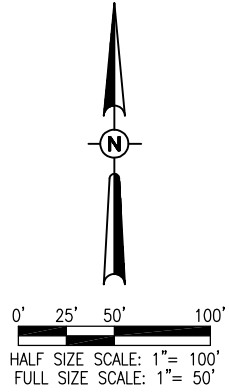
THE PROPOSED MARKING REMOVAL FOR THE TURNAROUNDS ON RUNWAY ENDS 9 AND 27 SHALL BE PAID FOR UNDER ITEM:
AR620900 "PAVEMENT MARKING REMOVAL" _ _ _ 346 S.F.



EXISTING HOLDING POSITION DETAIL
"NOT TO SCALE"

LEGEND







- EXISTING PAVEMENT
- EXISTING ELECTRICAL CABLE
- R EXISTING STAKE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
- R EXISTING BASE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
- R EXISTING L-861SE STAKE MOUNTED THRESHOLD LIGHT (TO BE REMOVED)



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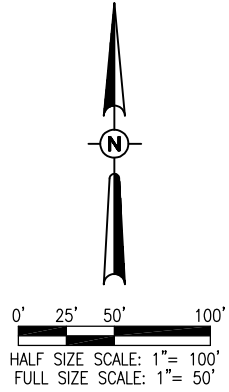
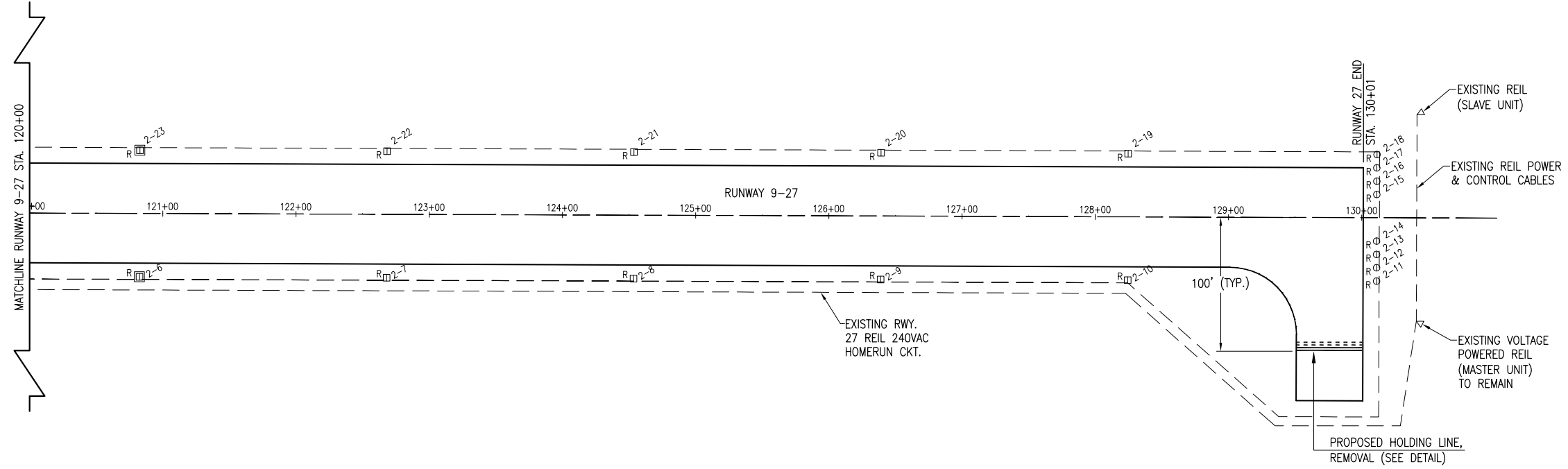
REVISION		VANDALIA MUNICIPAL AIRPORT VANDALIA, ILLINOIS	I.L. PROJ.: V/A-4111 A.I.P. PROJ.: 3-17-0102-B12
DATE			
Hanson Project No. 11A00300_0800 Filename E-141ELE.DWG Scale 1" = 50' Date 8/26/2011		LAYOUT KNL 07/06/11 DRAWN BAK 07/06/11 REVIEWED CAH 08/26/11	
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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING		EXISTING ELECTRICAL PLAN FOR RWY. 9-27 STA. 100+00 TO 106+00	
7		7 of 31 sheets	

LEGEND

-  EXISTING PAVEMENT
-  EXISTING ELECTRICAL CABLE
-  R EXISTING STAKE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
-  R EXISTING BASE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
-  R EXISTING L-861SE STAKE MOUNTED THRESHOLD LIGHT (TO BE REMOVED)
-  EXISTING REILS

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REVISION	DATE

VANDALIA MUNICIPAL AIRPORT
VANDALIA, ILLINOIS

IL. PROJ.: VLA-4111 A.I.P. PROJ.: 3-17-0102-B12

Hanson Project No. 11A00300_0800	Filename E-141ELE.DWG	Scale 1" = 50'	Date 8/26/2011
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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING

EXISTING ELECTRICAL PLAN FOR RWY. 9-27 STA. 120+00 TO 130+00

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LIGHT LENS SCHEDULE FOR RUNWAY 18-36		
LIGHT NUMBERS	LENS	ORIENTATION
R1-1 TO R1-8	CLEAR WHITE/AMBER	AMBER SIDE FACING NORTH
R1-9 TO R1-17	CLEAR WHITE/AMBER	AMBER SIDE FACING SOUTH
R1-18 TO R1-27	BLUE	- - -
R1-28	CLEAR WHITE/AMBER	AMBER SIDE FACING SOUTH
R1-29 TO R1-36	RED/GREEN	RED SIDE FACING SOUTH (TOWARDS THRESHOLD)
R1-37 TO R1-46	CLEAR WHITE/AMBER	AMBER SIDE FACING SOUTH
R1-47 TO R1-55	CLEAR WHITE/AMBER	AMBER SIDE FACING NORTH
R1-56 TO R1-63	RED/GREEN	RED SIDE FACING NORTH
R1-64	CLEAR WHITE/AMBER	AMBER SIDE FACING NORTH
LIGHT LENS SCHEDULE FOR RUNWAY 9-27		
R2-1 TO R2-10	CLEAR WHITE	- - -
R2-11 TO R2-20	BLUE	- - -
R2-21 TO R2-26	RED/GREEN	RED SIDE FACING WEST (TOWARDS THRESHOLD)
R2-27 TO R2-41	CLEAR WHITE	- - -
R2-42 TO R2-47	RED/GREEN	RED SIDE FACING EAST (TOWARDS THRESHOLD)
R2-48 TO R2-57	BLUE	- - -
R2-58 TO R2-62	CLEAR WHITE	- - -
LIGHT LENS SCHEDULE FOR TAXIWAY		
T1-1 TO T1-73	BLUE	- - -

NOTE:
THE RUNWAY, THRESHOLD AND TAXIWAY LIGHT FIXTURES FOR RUNWAY 18-36 CIRCUIT SHALL EACH INCLUDE AN ARCTIC HEATER KIT. THE ARCTIC HEATER KIT WILL BE PAID FOR UNDER ITEM AR800560 ARCTIC HEATER KIT PER EACH.

TAXI GUIDANCE SIGN NOTES

- THE PROPOSED TAXI GUIDANCE SIGNS SHALL CONFORM TO ADVISORY CIRCULAR 150/5345 44J (OR LATEST ISSUE IN FORCE) AND BE FAA-APPROVED FOR TYPE L-858Y(L) DIRECTION, DESTINATION, AND BOUNDARY SIGNS (BLACK LEGEND ON YELLOW BACKGROUND); TYPE L-858R(L) MANDATORY INSTRUCTION SIGN (BLACK OUTLINE ON OUTSIDE EDGE OF WHITE LEGEND ON RED BACKGROUND); AND/OR TYPE L-858L(L) LOCATION SIGN (YELLOW LEGEND AND BORDER ON BLACK BACKGROUND). THE SIGNS SHALL BE SIZE 1, 18-IN. SIGN FACE WITH A 12-IN. LEGEND; STYLE 2, POWERED FROM A 4.8 TO 6.6 AMP SERIES LIGHTING CIRCUIT; CLASS 2, FOR OPERATION FROM -40 DEGREES F TO 131 DEGREES F; MODE 2, TO WITHSTAND WIND LOADS OF 200 M.P.H., BASE-MOUNTED, DOUBLE-SIDED, AS SPECIFIED ON THE PLANS. THE PROPOSED TAXI GUIDANCE SIGNS SHALL USE LED (LIGHT EMITTING DIODE) TYPE ILLUMINATION. ALSO SEE FAA ENGINEERING BRIEF 67 (MOST CURRENT ISSUE) "LIGHT SOURCES OTHER THAN INCANDESCENT AND XENON FOR AIRPORT AND OBSTRUCTION LIGHTING FIXTURES".

TAXI GUIDANCE SIGN SCHEDULE			
SIGN NUMBERS	LOCATION	SIDE A	SIDE B
R1-TGS1	RWY 18 INTERSECTION WITH RWY 27-9 (NORTH SIDE)	27-9	BLANK
R1-TGS2	RWY 36 INTERSECTION WITH RWY 9-27 (SOUTH SIDE)	9-27	BLANK
R2-TGS1	RWY 27 INTERSECTION WITH RWY 36-18 (EAST SIDE)	36-18	BLANK
R2-TGS2	RWY 9 INTERSECTION WITH RWY 18-36 (WEST SIDE)	18-36	BLANK
T1-TGS1	TAXIWAY A INTERSECTION WITH RWY 9-27 (AT HOLD LINE)	A 9-27	RAMP ↑
T1-TGS2	TAXIWAY A2 INTERSECTION WITH RWY 36-18 (AT HOLD LINE)	A2 36-18	RAMP ↑
T1-TGS3	TAXIWAY A1 INTERSECTION WITH RWY 36 (AT HOLD LINE)	A1 36	BLANK

TAXI GUIDANCE SIGN LEGEND

- B** TYPE L-858L(L) LOCATION SIGN - YELLOW LEGEND AND BORDER ON A BLACK BACKGROUND
- 18-36** TYPE L-858R(L) MANDATORY INSTRUCTION SIGN - BLACK OUTLINE ON OUTSIDE EDGE OF WHITE LEGEND ON A RED BACKGROUND
- ← RAMP** TYPE L-858Y(L) DIRECTION, DESTINATION, AND BOUNDARY SIGN - BLACK LEGEND ON A YELLOW BACKGROUND
- BLANK** BLANK - BLACK BACKGROUND

AIRFIELD LIGHTING NOTES

- ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER AND/OR SUPERINTENDENT OF PARKS. 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 RUNWAY, THRESHOLD, AND TAXIWAY LIGHTS SHALL BE PLACED 10' (FT.) FROM THE PAVEMENT EDGE UNLESS SHOWN OTHERWISE ON THESE CONSTRUCTION DRAWINGS. PROPOSED TAXI GUIDANCE SIGNS SHALL BE LOCATED SUCH THAT THE CLOSEST SIDE OF THE SIGN IS 15' FROM THE PAVEMENT EDGE, UNLESS SHOWN OTHERWISE.
- PROPOSED RUNWAY LIGHTS, THRESHOLD LIGHTS, TAXIWAY LIGHTS, GUIDANCE SIGNS, OTHER AIRFIELD LIGHTING, SPLICE CANS, HANDHOLES, MANHOLES, ELECTRICAL DUCTS, AND CABLE SHALL BE INSTALLED AT THE LOCATIONS SHOWN AND IN COMPLIANCE WITH THE SPECIFICATIONS, SPECIAL PROVISIONS, RESPECTIVE DETAILS, AND MANUFACTURER'S RECOMMENDATIONS.
- PROPOSED CABLE FOR RUNWAY AND TAXIWAY LIGHTING SHALL BE INSTALLED APPROXIMATELY 12' FROM THE PAVEMENT EDGE. CABLES SHALL BE PLACED A MINIMUM OF 18" BELOW FINISHED GRADE.
- THE PROPOSED RUNWAY AND TAXIWAY LIGHTING CABLE SHALL BE 1/C, #8 AWG, FAA L-824, 5000 VOLT, TYPE C UNDERGROUND CABLE IN UNIT DUCT.
- IN AREAS WHERE THERE IS A CONGESTION OF CABLES OR WHERE THE PROPOSED CABLE CROSSES AN EXISTING CABLE, THE CONTRACTOR IS REQUIRED TO HAND DIG THE TRENCH NECESSARY FOR THE PROPOSED CABLE. AT OTHER LOCATIONS, THE PROPOSED CABLE MAY BE TRENCHED OR PLOWED INTO PLACE. HAND DIGGING, TRENCHING AND/OR PLOWING WILL BE CONSIDERED INCIDENTAL TO THE PROPOSED CABLES AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- PROPOSED RUNWAY LIGHTS SHALL BE FITTED WITH LENSES IN ACCORDANCE WITH THE "LIGHT LENS SCHEDULE". ALL PROPOSED TAXIWAY LIGHTS WILL BE FITTED WITH 360° BLUE LENSES.
- ALL PROPOSED RUNWAY, THRESHOLD, AND TAXIWAY LIGHTS SHALL BE TAGGED BY THE CONTRACTOR IN ACCORDANCE WITH THE LIGHT NUMBERS SHOWN ON THESE CONSTRUCTION DRAWINGS.
- SEE "TAXI GUIDANCE SIGN SCHEDULE" FOR INFO ON SIGN LEGENDS.
- THE CONTRACTOR SHALL SECURE, IDENTIFY AND PLACE ALL TEMPORARY EXPOSED WIRING IN CONDUIT, DUCT OR UNIT DUCT TO PREVENT ELECTROCUTION AND FIRE IGNITION SOURCES AS PER THE REQUIREMENTS OF FAA AC 150/5370-2F, PART 218, b (1)(f). 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 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.
- NO CONNECTION TO AN ACTIVE LIGHTING CIRCUIT WILL BE BROKEN UNTIL THE CIRCUIT HAS BEEN TURNED OFF IN ACCORDANCE WITH NOTE 1.

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REVISION DATE 12/02/11 REVISED PER FAA AC UPDATES 12/13/11 UPDATE PER ICA REVIEW 03/07/12 UPDATE PER FAA PGL 12-2 & EB67D		VANDALIA MUNICIPAL AIRPORT VANDALIA, ILLINOIS		I.L. PROJ.: VA-4111 A.I.P. PROJ.: 3-17-0102-B12
Hanson Project No. 11A00300_0800 Filename E-142-ELE.DWG Scale NOT TO SCALE Date 8/26/2011		LAYOUT KNL 07/06/11 DRAWN BAK 07/06/11 REVIEWED CAH 08/26/11		© Copyright Hanson Professional Services Inc. 2012 HANSON Hanson Professional Services Inc. 1525 South Sixth Street Springfield, Illinois 62703-2986 Ph: (217) 788-2450 Fax: (217) 788-2503 www.hanson-inc.com Offices Nationwide
REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING		AIRFIELD LIGHTING LEGEND, SCHEDULES, & NOTES		9 9 of 31 sheets

LEGEND

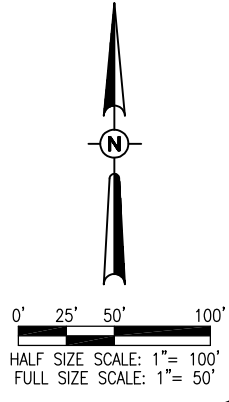
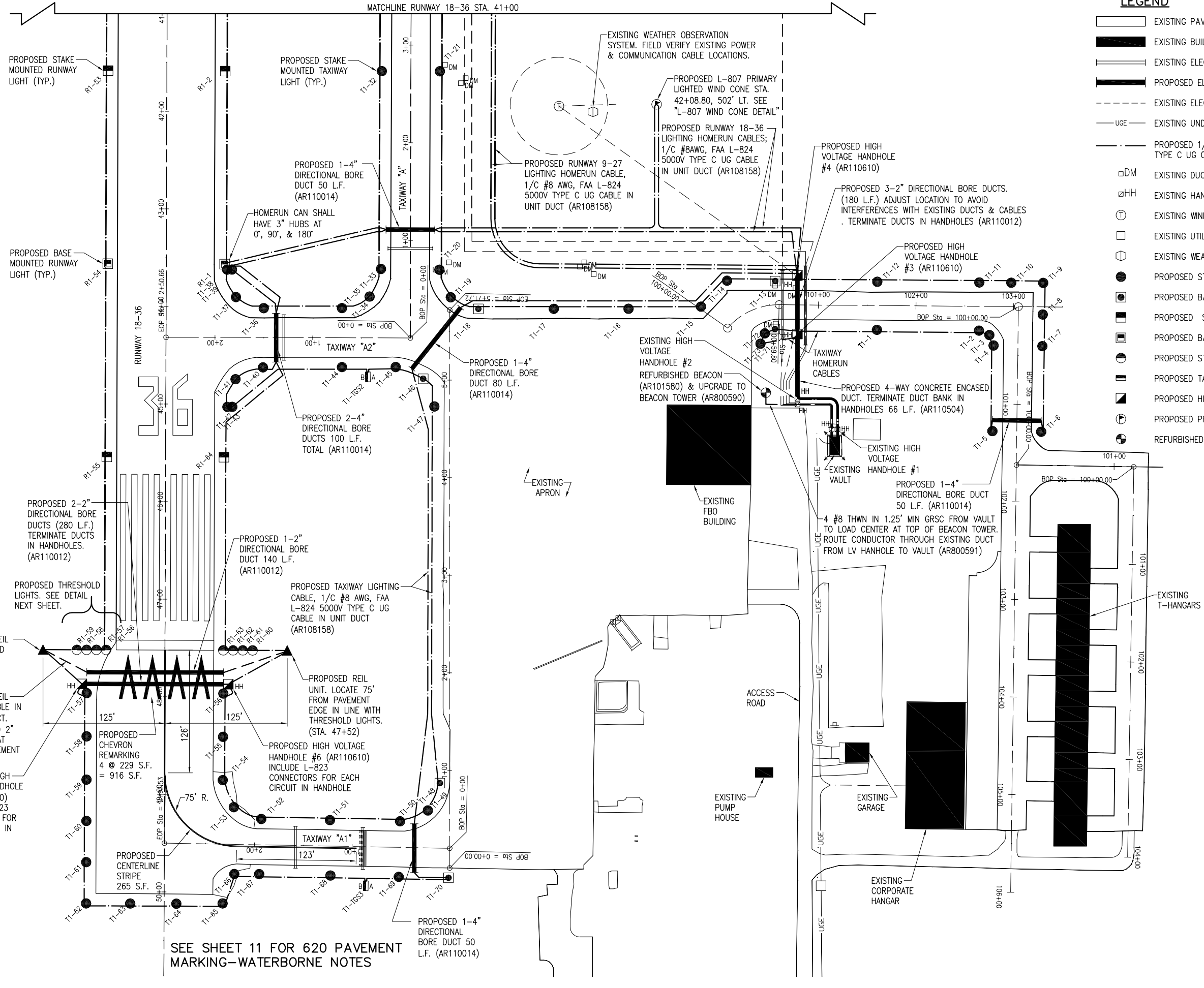
- EXISTING PAVEMENT
- EXISTING BUILDING
- EXISTING ELECTRICAL DUCT
- PROPOSED ELECTRICAL DUCT
- EXISTING ELECTRICAL CABLE
- EXISTING UNDERGROUND ELECTRIC UTILITY PRIMARY
- PROPOSED 1/C #8 AWG, FAA L-824, 5000 VOLT TYPE C UG CABLE IN UNIT DUCT
- EXISTING DUCT MARKER
- EXISTING HANDHOLE
- EXISTING WIND TEE
- EXISTING UTILITY TRANSFORMER
- EXISTING WEATHER OBSERVATION SYSTEM
- PROPOSED STAKE MOUNTED TAXIWAY LIGHT
- PROPOSED BASE MOUNTED TAXIWAY LIGHT
- PROPOSED STAKE MOUNTED RUNWAY LIGHT
- PROPOSED BASE MOUNTED RUNWAY LIGHT
- PROPOSED STAKE MOUNTED THRESHOLD LIGHT
- PROPOSED TAXI GUIDANCE SIGN
- PROPOSED HIGH VOLTAGE HANDHOLE
- PROPOSED PRIMARY LIGHTED WIND CONE
- REFURBISHED BEACON

REVISION	
12/11/11	ADDED L-823 CONNECTOR TO HH #5 & HH #6
DATE	
VANDALIA MUNICIPAL AIRPORT VANDALIA, ILLINOIS	
A.I.P. PROJ.: 3-17-0102-B12 I.L. PROJ.: VJA-4111	

Hanson Project No. 11A00300_0800	
Filename E-142-ELE.DWG	
Scale 1" = 50'	
Date 8/26/2011	
LAYOUT KNL 07/06/11	
DRAWN BAK 07/06/11	
REVIEWED CAH 08/26/11	

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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING
 PROPOSED ELECTRICAL PLAN FOR APRON & RWY. 36

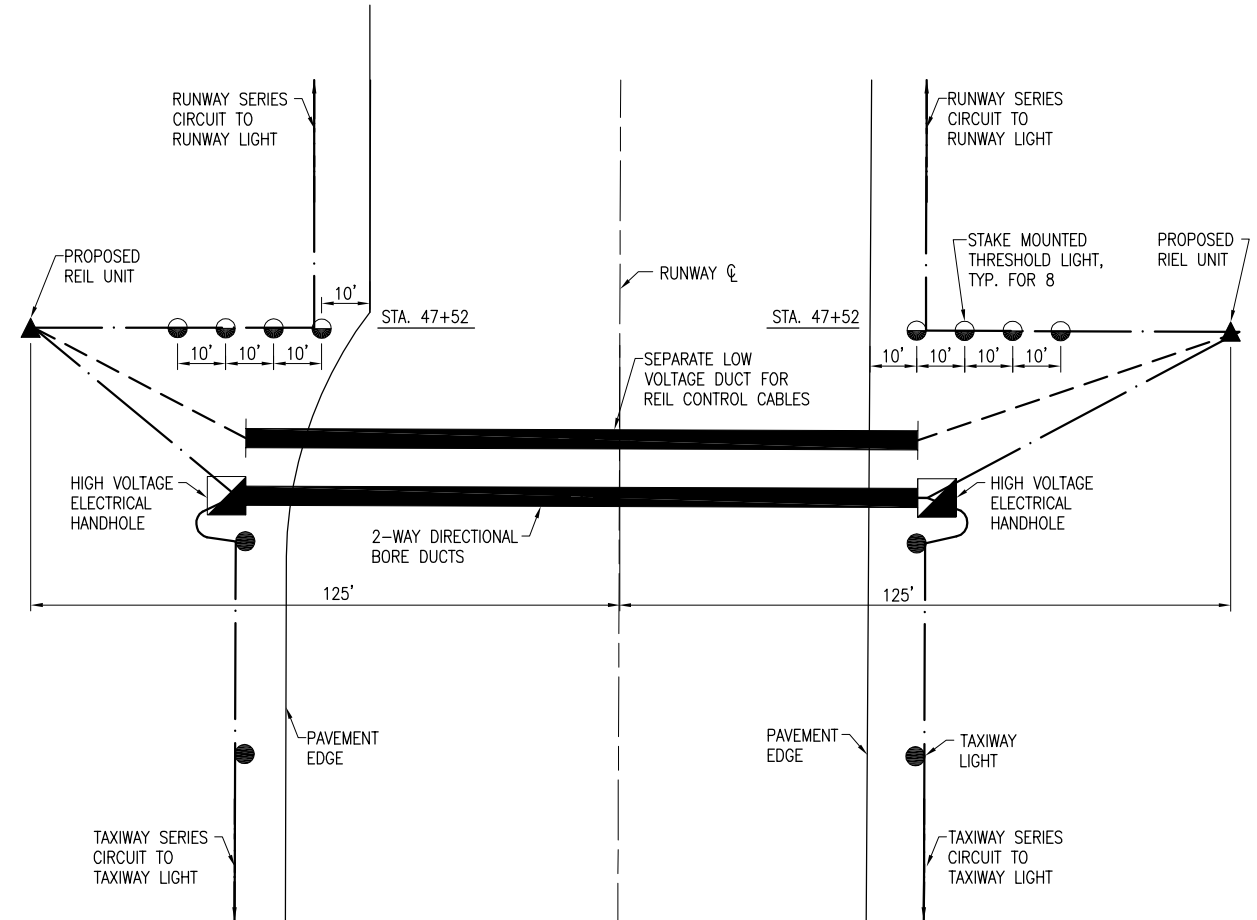


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SEE SHEET 11 FOR 620 PAVEMENT MARKING-WATERBORNE NOTES

LIGHT LOCATIONS (FROM SHEET NO. 10)

LIGHT NUMBERS	STATION	OFFSET	LIGHT NUMBERS	STATION	OFFSET
R1-1	43+56.20	60' LT. OF RUNWAY 18-36 CENTERLINE	T1-37	1+78.81	42.1' RT. OF TAXIWAY "A2" CENTERLINE
R1-2	41+58.30	60' LT. OF RUNWAY 18-36 CENTERLINE	T1-38	1+87.53	70' RT. OF TAXIWAY "A2" CENTERLINE
R1-53	41+58.30	60' RT. OF RUNWAY 18-36 CENTERLINE	T1-39	1+82.53	70' RT. OF TAXIWAY "A2" CENTERLINE
R1-54	43+56.20	60' RT. OF RUNWAY 18-36 CENTERLINE	T1-40	1+50.54	30' LT. OF TAXIWAY "A2" CENTERLINE
R1-55	45+54.01	60' RT. OF RUNWAY 18-36 CENTERLINE	T1-41	1+78.81	42.1' LT. OF TAXIWAY "A2" CENTERLINE
R1-56	47+52.00	60' RT. OF RUNWAY 18-36 CENTERLINE	T1-42	1+87.53	70' LT. OF TAXIWAY "A2" CENTERLINE
R1-57	47+52.00	70' RT. OF RUNWAY 18-36 CENTERLINE	T1-43	1+82.53	70' LT. OF TAXIWAY "A2" CENTERLINE
R1-58	47+52.00	80' RT. OF RUNWAY 18-36 CENTERLINE	T1-44	0+70.01	30' LT. OF TAXIWAY "A2" CENTERLINE
R1-59	47+52.00	90' RT. OF RUNWAY 18-36 CENTERLINE	T1-TGS2	0+43.41	35' LT. OF TAXIWAY "A2" CENTERLINE
R1-60	47+52.00	90' LT. OF RUNWAY 18-36 CENTERLINE	T1-45	0+14.93	30' LT. OF TAXIWAY "A2" CENTERLINE
R1-61	47+52.00	80' LT. OF RUNWAY 18-36 CENTERLINE	T1-46	5+01.35	27.2' LT. OF APRON BASELINE
R1-62	47+52.00	70' LT. OF RUNWAY 18-36 CENTERLINE	T1-47	4+72.96	15.7' LT. OF APRON BASELINE
R1-63	47+52.00	60' LT. OF RUNWAY 18-36 CENTERLINE	T1-48	0+11.26	66.6' RT. OF TAXIWAY "A1" CENTERLINE
R1-64	45+54.01	60' LT. OF RUNWAY 18-36 CENTERLINE	T1-49	0+23.05	38.3' RT. OF TAXIWAY "A1" CENTERLINE
T1-1	101+60.17	25' RT. OF TAXIWAY CENTERLINE	T1-50	0+51.51	30' RT. OF TAXIWAY "A1" CENTERLINE
T1-2	102+64.70	25' RT. OF TAXIWAY CENTERLINE	T1-51	1+22.44	30' RT. OF TAXIWAY "A1" CENTERLINE
T1-3	102+75.37	29.3' RT. OF TAXIWAY CENTERLINE	T1-52	1+94.03	30' RT. OF TAXIWAY "A1" CENTERLINE
T1-4	101+59.92	25' RT. OF TAXIWAY CENTERLINE	T1-53	2+20.88	38.1' RT. OF TAXIWAY "A1" CENTERLINE
T1-5	102+71.83	25' RT. OF TAXIWAY CENTERLINE	T1-54	48+85.14	60' LT. OF RUNWAY 18-36 CENTERLINE
T1-6	102+71.83	25' LT. OF TAXIWAY CENTERLINE	T1-55	48+40.80	60' LT. OF RUNWAY 18-36 CENTERLINE
T1-7	101+59.92	25' LT. OF TAXIWAY CENTERLINE	T1-56	47+96.46	60' LT. OF RUNWAY 18-36 CENTERLINE
T1-8	101+92.29	25' LT. OF TAXIWAY CENTERLINE	T1-57	47+96.46	80' RT. OF RUNWAY 18-36 CENTERLINE
T1-9	103+30.08	25' LT. OF TAXIWAY CENTERLINE	T1-58	48+40.80	80' RT. OF RUNWAY 18-36 CENTERLINE
T1-10	102+97.41	25' LT. OF TAXIWAY CENTERLINE	T1-59	48+85.14	80' RT. OF RUNWAY 18-36 CENTERLINE
T1-11	102+64.70	25' LT. OF TAXIWAY CENTERLINE	T1-60	49+27.43	80' RT. OF RUNWAY 18-36 CENTERLINE
T1-12	101+60.17	25' LT. OF TAXIWAY CENTERLINE	T1-61	49+69.70	80' RT. OF RUNWAY 18-36 CENTERLINE
T1-13	100+55.64	24.3' LT. OF TAXIWAY CENTERLINE	T1-62	50+12.00	80' RT. OF RUNWAY 18-36 CENTERLINE
T1-14	100+25.03	38.8' LT. OF TAXIWAY CENTERLINE	T1-63	50+12.00	34.78' RT. OF RUNWAY 18-36 CENTERLINE
T1-15	100+04.33	35.6' LT. OF TAXIWAY CENTERLINE	T1-64	50+12.00	12.44' LT. OF RUNWAY 18-36 CENTERLINE
T1-16	0+30.44	223' RT. OF TAXIWAY "A" CENTERLINE	T1-65	50+12.00	60' LT. OF RUNWAY 18-36 CENTERLINE
T1-17	0+30.44	147' RT. OF TAXIWAY "A" CENTERLINE	T1-66	2+20.88	30' LT. OF TAXIWAY "A1" CENTERLINE
T1-18	0+30.44	70' RT. OF TAXIWAY "A" CENTERLINE	T1-67	1+94.03	30' LT. OF TAXIWAY "A1" CENTERLINE
T1-19	0+41.99	41.6' RT. OF TAXIWAY "A" CENTERLINE	T1-68	1+22.44	30' LT. OF TAXIWAY "A1" CENTERLINE
T1-20	0+70.28	30' RT. OF TAXIWAY "A" CENTERLINE	T1-TGS3	0+85.28	35' LT. OF TAXIWAY "A1" CENTERLINE
T1-21	2+73.30	30' RT. OF TAXIWAY "A" CENTERLINE	T1-69	0+51.51	30' LT. OF TAXIWAY "A1" CENTERLINE
T1-32	2+73.30	30' LT. OF TAXIWAY "A" CENTERLINE	T1-70	0+00.69	30' LT. OF TAXIWAY "A1" CENTERLINE
T1-33	0+41.99	30' LT. OF TAXIWAY "A" CENTERLINE	T1-71	100+55.64	36.2' RT. OF TAXIWAY CENTERLINE
T1-34	0+70.28	41.6' LT. OF TAXIWAY "A" CENTERLINE	T1-72	100+25.03	36.2' RT. OF TAXIWAY CENTERLINE
T1-35	0+70.01	30' RT. OF TAXIWAY "A2" CENTERLINE	T1-73	100+04.33	36.2' RT. OF TAXIWAY CENTERLINE
T1-36	1+50.54	30' RT. OF TAXIWAY "A2" CENTERLINE			



PROPOSED RUNWAY END 36 THRESHOLD LIGHT DETAIL NOT TO SCALE

620-PAVEMENT MARKING-WATERBORNE NOTES

THE PAVEMENT MARKING-WATERBORNE (620) SHALL BE PLACED IN ACCORDANCE WITH ITEM 620 "PAVEMENT MARKING" AS STATED ON PAGE 277 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS, ADOPTED NOV. 2, 2009.

THIS ITEM SHALL CONSIST OF TAXIWAY CENTERLINE, AND CHEVRON MARKING IN ACCORDANCE WITH THESE SPECIFICATIONS AND AT THE LOCATIONS SHOWN ON THE CONSTRUCTION PLANS. ALL MARKING WILL BE YELLOW IN COLOR. THE PROPOSED PAVEMENT MARKING WILL BE APPLIED IN TWO APPLICATIONS.

ANY MATERIAL DELIVERED THAT FAILS TO MEET THE SPECIFICATIONS SHALL BE DISPOSED OF BY THE VENDOR AND IMMEDIATELY REPLACED WITH ACCEPTABLE MATERIAL ENTIRELY AT THE VENDOR'S EXPENSE, INCLUDING HANDLING AND TRANSPORTATION CHARGES.

ALL PROPOSED MARKING WILL BE COMPLETED IN ACCORDANCE WITH THE DETAILS SHOWN ON THE CONSTRUCTION PLANS.

GLASS BEADS SHALL BE REQUIRED ONLY ON THE SECOND APPLICATION OF YELLOW MARKING.

CUT-OFF SHEETS WILL BE REQUIRED TO INSURE STRAIGHT EDGES.

THE PROPOSED MARKING WILL BE PAID FOR UNDER ITEM: AR620520 PAVEMENT MARKING-WATERBORNE ____ PER S.F.

REVISION	DATE	DESCRIPTION
	12/13/11	ADJUSTED RUNWAY CENTERLINE

VANDALIA MUNICIPAL AIRPORT
VANDALIA, ILLINOIS
IL PROJ.: VJA-4111 A.I.P. PROJ.: 3-17-0102-B12

Hanson Project No. 11A00300_0800	Scale	NOT TO SCALE
Filename E-142-ELE.DWG	Date	8/26/2011
LAYOUT	KNL	07/06/11
DRAWN	BAK	07/06/11
REVIEWED	CAH	08/26/11

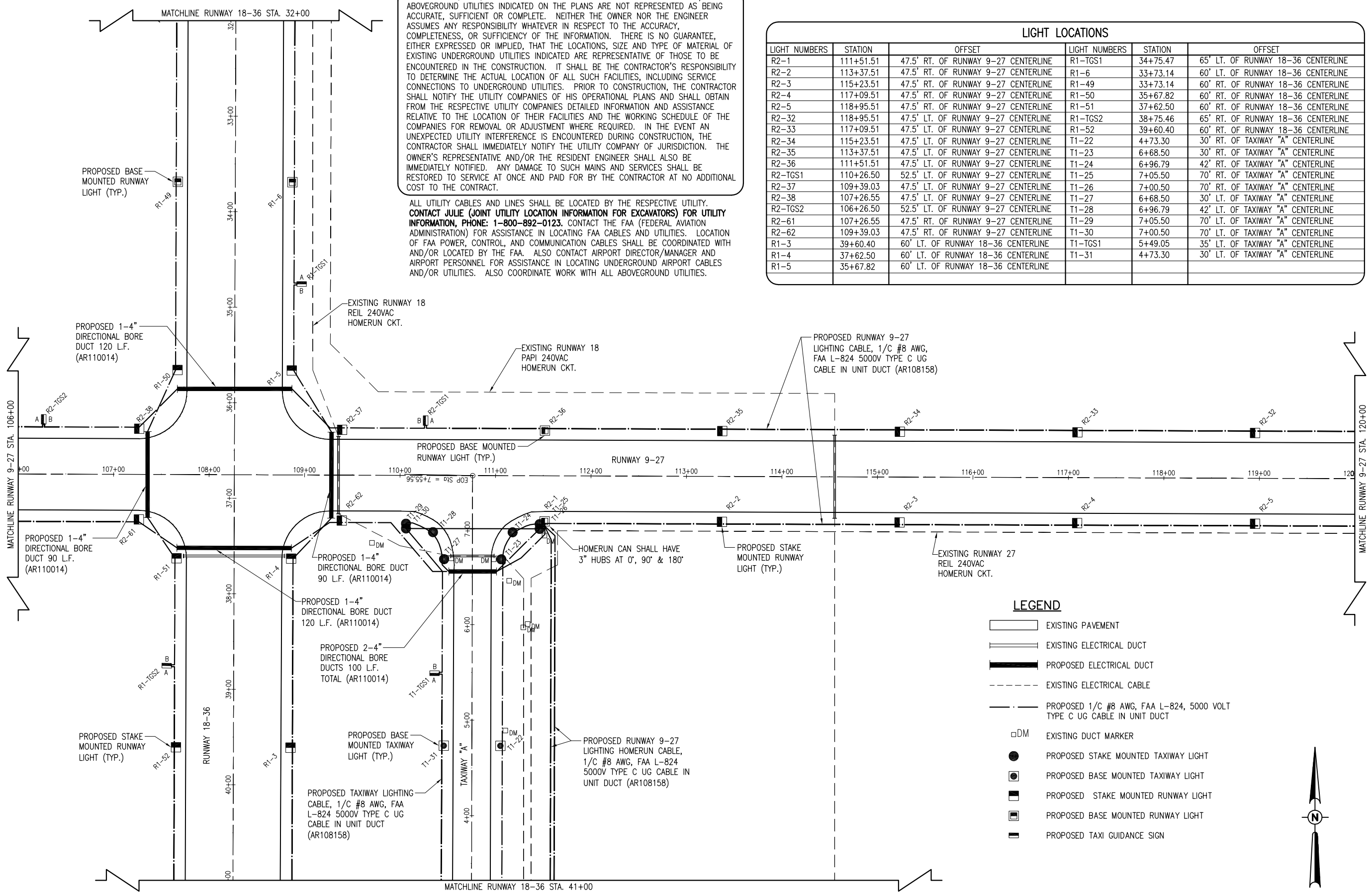
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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING
LIGHT LOCATIONS AND THRESHOLD DETAILS

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

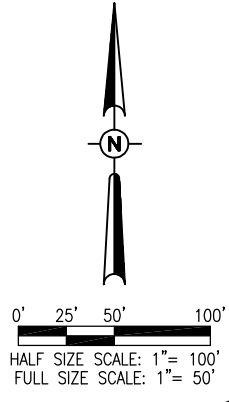
ALL UTILITY CABLES AND LINES SHALL BE LOCATED BY THE RESPECTIVE UTILITY. CONTACT JULIE (JOINT UTILITY LOCATION INFORMATION FOR EXCAVATORS) FOR UTILITY INFORMATION, PHONE: 1-800-892-0123. CONTACT THE FAA (FEDERAL AVIATION ADMINISTRATION) FOR ASSISTANCE IN LOCATING FAA CABLES AND UTILITIES. LOCATION OF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

LIGHT LOCATIONS					
LIGHT NUMBERS	STATION	OFFSET	LIGHT NUMBERS	STATION	OFFSET
R2-1	111+51.51	47.5' RT. OF RUNWAY 9-27 CENTERLINE	R1-TGS1	34+75.47	65' LT. OF RUNWAY 18-36 CENTERLINE
R2-2	113+37.51	47.5' RT. OF RUNWAY 9-27 CENTERLINE	R1-6	33+73.14	60' LT. OF RUNWAY 18-36 CENTERLINE
R2-3	115+23.51	47.5' RT. OF RUNWAY 9-27 CENTERLINE	R1-49	33+73.14	60' RT. OF RUNWAY 18-36 CENTERLINE
R2-4	117+09.51	47.5' RT. OF RUNWAY 9-27 CENTERLINE	R1-50	35+67.82	60' RT. OF RUNWAY 18-36 CENTERLINE
R2-5	118+95.51	47.5' RT. OF RUNWAY 9-27 CENTERLINE	R1-51	37+62.50	60' RT. OF RUNWAY 18-36 CENTERLINE
R2-32	118+95.51	47.5' LT. OF RUNWAY 9-27 CENTERLINE	R1-TGS2	38+75.46	65' RT. OF RUNWAY 18-36 CENTERLINE
R2-33	117+09.51	47.5' LT. OF RUNWAY 9-27 CENTERLINE	R1-52	39+60.40	60' RT. OF RUNWAY 18-36 CENTERLINE
R2-34	115+23.51	47.5' LT. OF RUNWAY 9-27 CENTERLINE	T1-22	4+73.30	30' RT. OF TAXIWAY "A" CENTERLINE
R2-35	113+37.51	47.5' LT. OF RUNWAY 9-27 CENTERLINE	T1-23	6+68.50	30' RT. OF TAXIWAY "A" CENTERLINE
R2-36	111+51.51	47.5' LT. OF RUNWAY 9-27 CENTERLINE	T1-24	6+96.79	42' RT. OF TAXIWAY "A" CENTERLINE
R2-TGS1	110+26.50	52.5' LT. OF RUNWAY 9-27 CENTERLINE	T1-25	7+05.50	70' RT. OF TAXIWAY "A" CENTERLINE
R2-37	109+39.03	47.5' LT. OF RUNWAY 9-27 CENTERLINE	T1-26	7+00.50	70' RT. OF TAXIWAY "A" CENTERLINE
R2-38	107+26.55	47.5' LT. OF RUNWAY 9-27 CENTERLINE	T1-27	6+68.50	30' LT. OF TAXIWAY "A" CENTERLINE
R2-TGS2	106+26.50	52.5' LT. OF RUNWAY 9-27 CENTERLINE	T1-28	6+96.79	42' LT. OF TAXIWAY "A" CENTERLINE
R2-61	107+26.55	47.5' RT. OF RUNWAY 9-27 CENTERLINE	T1-29	7+05.50	70' LT. OF TAXIWAY "A" CENTERLINE
R2-62	109+39.03	47.5' RT. OF RUNWAY 9-27 CENTERLINE	T1-30	7+00.50	70' LT. OF TAXIWAY "A" CENTERLINE
R1-3	39+60.40	60' LT. OF RUNWAY 18-36 CENTERLINE	T1-TGS1	5+49.05	35' LT. OF TAXIWAY "A" CENTERLINE
R1-4	37+62.50	60' LT. OF RUNWAY 18-36 CENTERLINE	T1-31	4+73.30	30' LT. OF TAXIWAY "A" CENTERLINE
R1-5	35+67.82	60' LT. OF RUNWAY 18-36 CENTERLINE			



LEGEND

- EXISTING PAVEMENT
- EXISTING ELECTRICAL DUCT
- PROPOSED ELECTRICAL DUCT
- EXISTING ELECTRICAL CABLE
- PROPOSED 1/C #8 AWG, FAA L-824, 5000 VOLT TYPE C UG CABLE IN UNIT DUCT
- EXISTING DUCT MARKER
- PROPOSED STAKE MOUNTED TAXIWAY LIGHT
- PROPOSED BASE MOUNTED TAXIWAY LIGHT
- PROPOSED STAKE MOUNTED RUNWAY LIGHT
- PROPOSED BASE MOUNTED RUNWAY LIGHT
- PROPOSED TAXI GUIDANCE SIGN



DATE	REVISION
12/02/11	UPDATED R/WY 9-27 LT. NUMBERS

VANDALIA MUNICIPAL AIRPORT
VANDALIA, ILLINOIS

IL. PROJ.: VJA-4111
A.I.P. PROJ.: 3-17-0102-B12

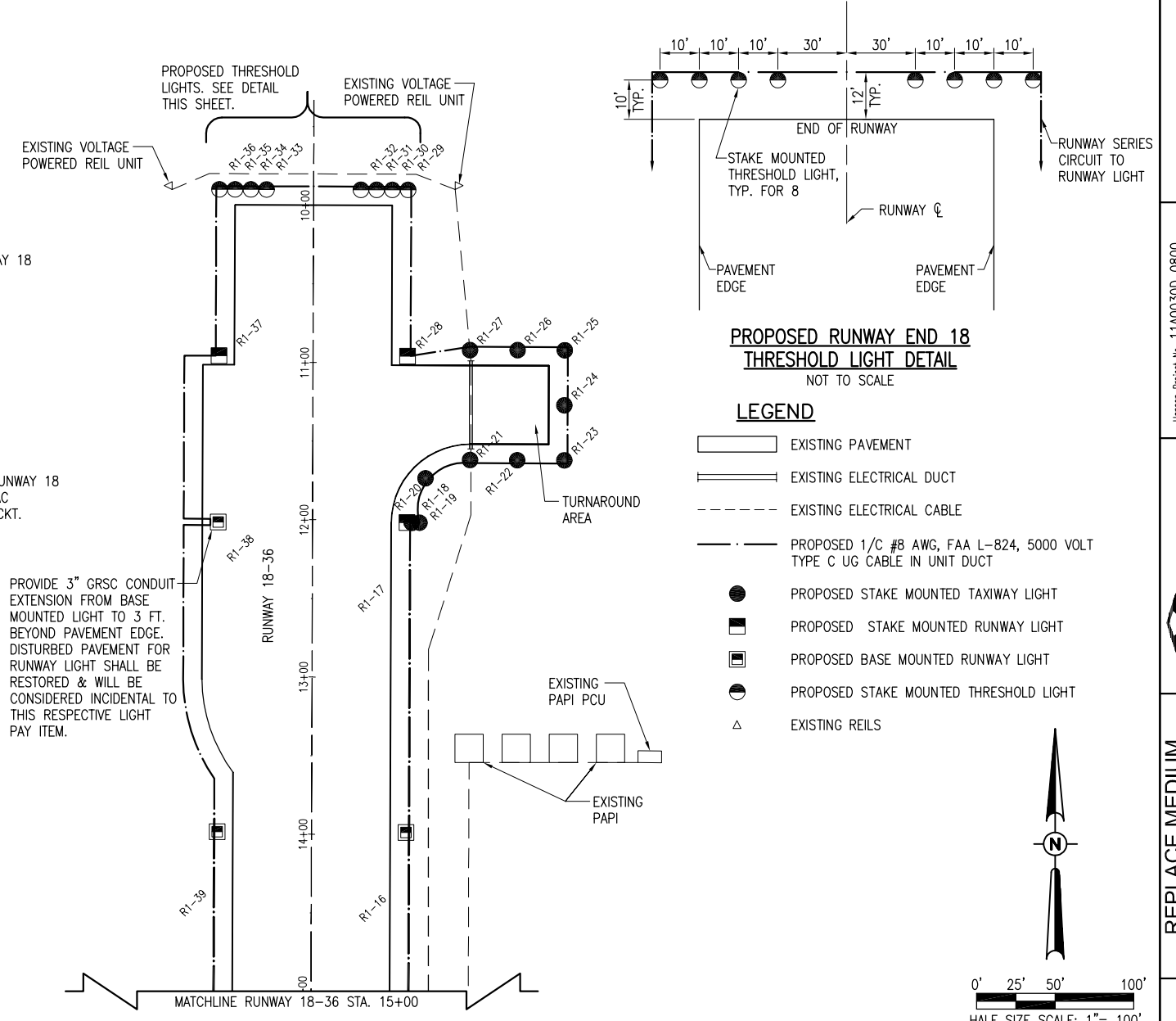
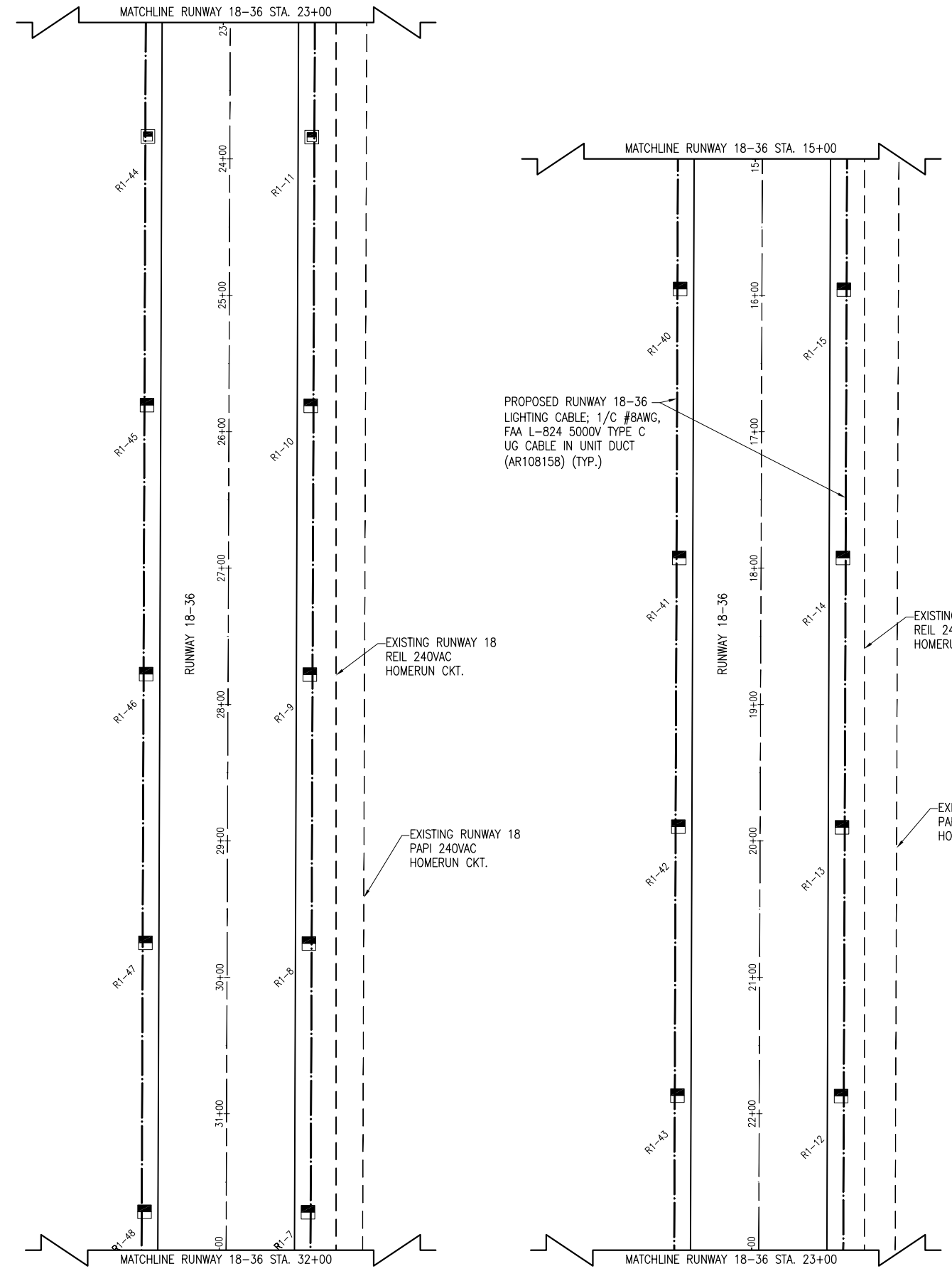
Hanson Project No.	11A00300_0800
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LAYOUT	KNL 07/06/11
DRAWN	BAK 07/06/11
REVIEWED	CAH 08/26/11

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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING
PROPOSED ELECTRICAL PLAN FOR RWY. 9-27 & RWY. 18-36 INTERSECTION

LIGHT LOCATIONS

LIGHT NUMBERS	STATION	OFFSET	LIGHT NUMBERS	STATION	OFFSET
R1-7	31+78.46	60' LT. OF RUNWAY 18-36 CENTERLINE	R1-28	10+95.80	60' LT. OF RUNWAY 18-36 CENTERLINE
R1-8	29+83.78	60' LT. OF RUNWAY 18-36 CENTERLINE	R1-29	9+90.00	60' LT. OF RUNWAY 18-36 CENTERLINE
R1-9	27+89.10	60' LT. OF RUNWAY 18-36 CENTERLINE	R1-30	9+90.00	50' LT. OF RUNWAY 18-36 CENTERLINE
R1-10	25+94.42	60' LT. OF RUNWAY 18-36 CENTERLINE	R1-31	9+90.00	40' LT. OF RUNWAY 18-36 CENTERLINE
R1-11	23+99.74	60' LT. OF RUNWAY 18-36 CENTERLINE	R1-32	9+90.00	30' LT. OF RUNWAY 18-36 CENTERLINE
R1-12	22+05.06	60' LT. OF RUNWAY 18-36 CENTERLINE	R1-33	9+90.00	30' RT. OF RUNWAY 18-36 CENTERLINE
R1-13	20+10.38	60' LT. OF RUNWAY 18-36 CENTERLINE	R1-34	9+90.00	40' RT. OF RUNWAY 18-36 CENTERLINE
R1-14	18+15.70	60' LT. OF RUNWAY 18-36 CENTERLINE	R1-35	9+90.00	50' RT. OF RUNWAY 18-36 CENTERLINE
R1-15	16+21.02	60' LT. OF RUNWAY 18-36 CENTERLINE	R1-36	9+90.00	60' RT. OF RUNWAY 18-36 CENTERLINE
R1-16	14+26.34	60' LT. OF RUNWAY 18-36 CENTERLINE	R1-37	10+95.80	60' RT. OF RUNWAY 18-36 CENTERLINE
R1-17	12+31.66	60' LT. OF RUNWAY 18-36 CENTERLINE	R1-38	12+31.66	60' RT. OF RUNWAY 18-36 CENTERLINE
R1-18	12+01.66	63' LT. OF RUNWAY 18-36 CENTERLINE	R1-39	14+26.34	60' RT. OF RUNWAY 18-36 CENTERLINE
R1-19	12+01.66	68' LT. OF RUNWAY 18-36 CENTERLINE	R1-40	16+21.02	60' RT. OF RUNWAY 18-36 CENTERLINE
R1-20	11+73.38	71.7' LT. OF RUNWAY 18-36 CENTERLINE	R1-41	18+15.70	60' RT. OF RUNWAY 18-36 CENTERLINE
R1-21	11+62.66	100' LT. OF RUNWAY 18-36 CENTERLINE	R1-42	20+10.38	60' RT. OF RUNWAY 18-36 CENTERLINE
R1-22	11+62.66	130' LT. OF RUNWAY 18-36 CENTERLINE	R1-43	22+05.06	60' RT. OF RUNWAY 18-36 CENTERLINE
R1-23	11+62.66	160' LT. OF RUNWAY 18-36 CENTERLINE	R1-44	23+99.74	60' RT. OF RUNWAY 18-36 CENTERLINE
R1-24	11+26.66	160' LT. OF RUNWAY 18-36 CENTERLINE	R1-45	25+94.42	60' RT. OF RUNWAY 18-36 CENTERLINE
R1-25	10+91.66	160' LT. OF RUNWAY 18-36 CENTERLINE	R1-46	27+89.10	60' RT. OF RUNWAY 18-36 CENTERLINE
R1-26	10+91.66	130' LT. OF RUNWAY 18-36 CENTERLINE	R1-47	29+83.78	60' RT. OF RUNWAY 18-36 CENTERLINE
R1-27	10+91.66	100' LT. OF RUNWAY 18-36 CENTERLINE	R1-48	31+78.46	60' RT. OF RUNWAY 18-36 CENTERLINE



REVISION

DATE

VANDALIA MUNICIPAL AIRPORT
VANDALIA, ILLINOIS

IL. PROJ.: V/A-4111 A.I.P. PROJ.: 3-17-0102-B12

Hanson Project No. 11A00300_0800
Filename: E-142-ELE.DWG
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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING

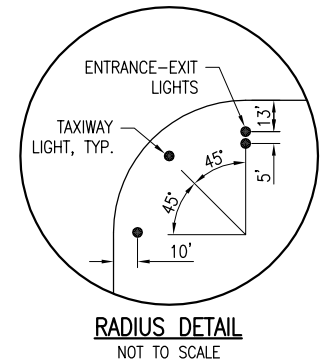
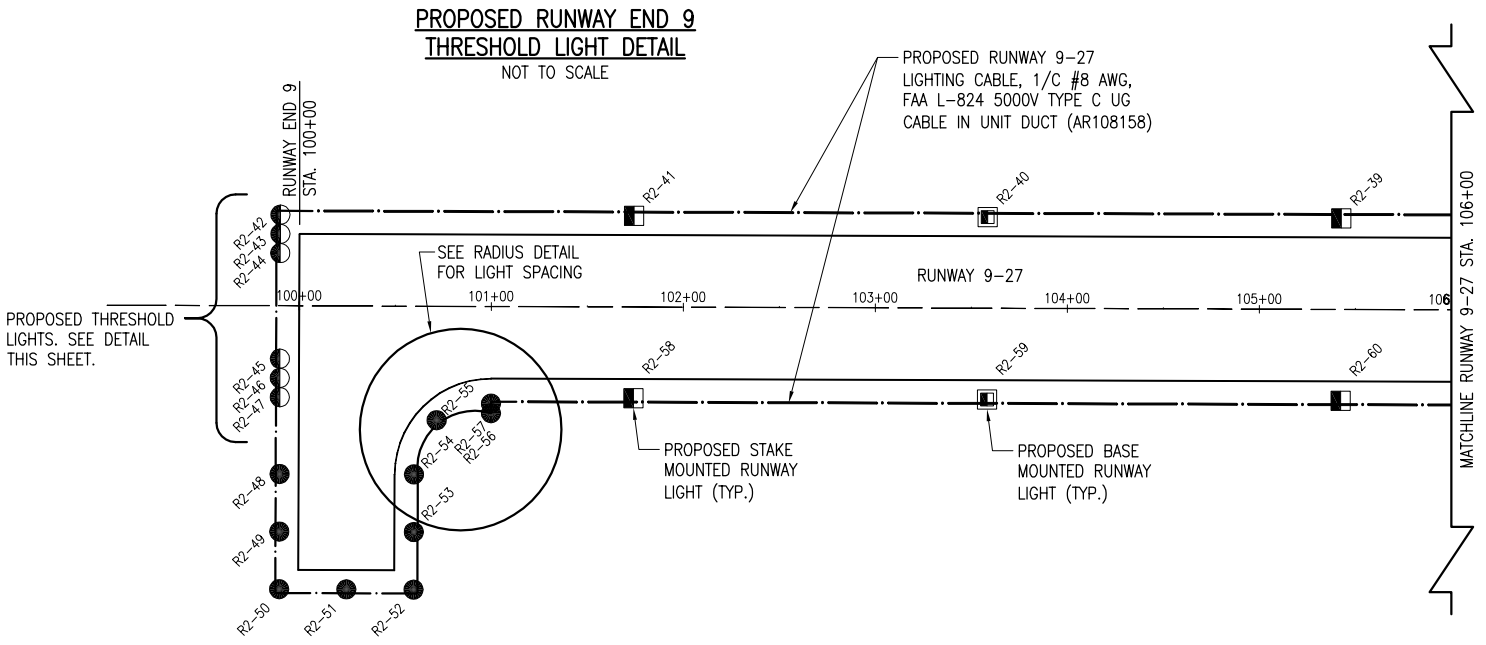
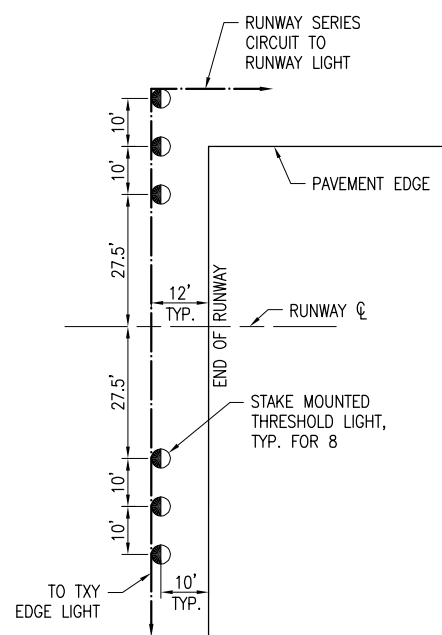
PROPOSED ELECTRICAL PLAN FOR RWY. 18-36 STA. 10+00 TO STA. 32+00

13

13 of 31 sheets

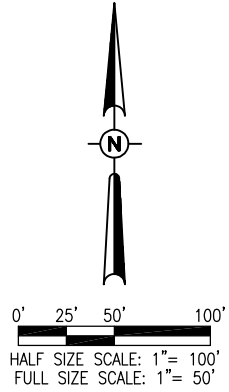
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LIGHT LOCATIONS		
LIGHT NUMBERS	STATION	OFFSET
R2-39	105+42.41	47.5' LT. OF RUNWAY 9-27 CENTERLINE
R2-40	103+58.27	47.5' LT. OF RUNWAY 9-27 CENTERLINE
R2-41	101+74.13	47.5' LT. OF RUNWAY 9-27 CENTERLINE
R2-42	90+90.00	47.5' LT. OF RUNWAY 9-27 CENTERLINE
R2-43	90+90.00	37.5' LT. OF RUNWAY 9-27 CENTERLINE
R2-44	90+90.00	27.5' LT. OF RUNWAY 9-27 CENTERLINE
R2-45	90+90.00	27.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-46	90+90.00	37.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-47	90+90.00	47.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-48	90+90.00	87.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-49	90+90.00	117.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-50	90+90.00	147.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-51	100+25.00	147.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-52	100+60.00	147.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-53	100+60.00	117.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-54	100+60.00	87.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-55	100+71.72	59.2' RT. OF RUNWAY 9-27 CENTERLINE
R2-56	101+00.00	55.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-57	101+00.00	50.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-58	101+74.13	47.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-59	103+58.27	47.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-60	105+42.41	47.5' RT. OF RUNWAY 9-27 CENTERLINE



LEGEND

- EXISTING PAVEMENT
- PROPOSED 1/C #8 AWG, FAA L-824, 5000 VOLT TYPE C UG CABLE IN UNIT DUCT
- PROPOSED STAKE MOUNTED RUNWAY LIGHT
- PROPOSED BASE MOUNTED RUNWAY LIGHT
- PROPOSED STAKE MOUNTED THRESHOLD LIGHT



DATE	REVISION
12/02/11	UPDATED RY 9 TO 6 THRESHOLD LIGHTS

VANDALIA MUNICIPAL AIRPORT
VANDALIA, ILLINOIS

IL. PROJ.: VJA-4111 A.I.P. PROJ.: 3-17-0102-B12

Hanson Project No.	11A00300_0800
Filename	E-142-ELE.DWG
Scale	1" = 50'
Date	8/26/2011
LAYOUT	KNL 07/06/11
DRAWN	BAK 07/06/11
REVIEWED	CAH 08/26/11

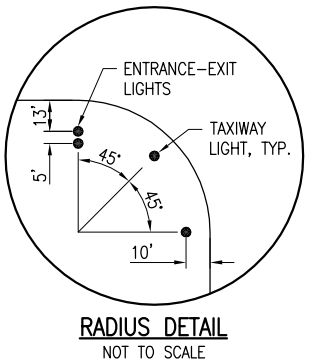
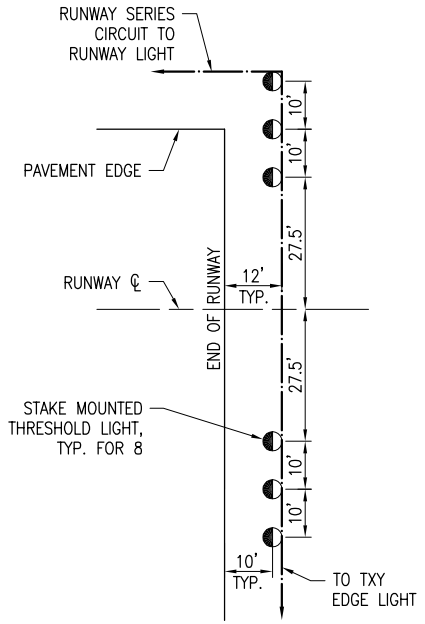
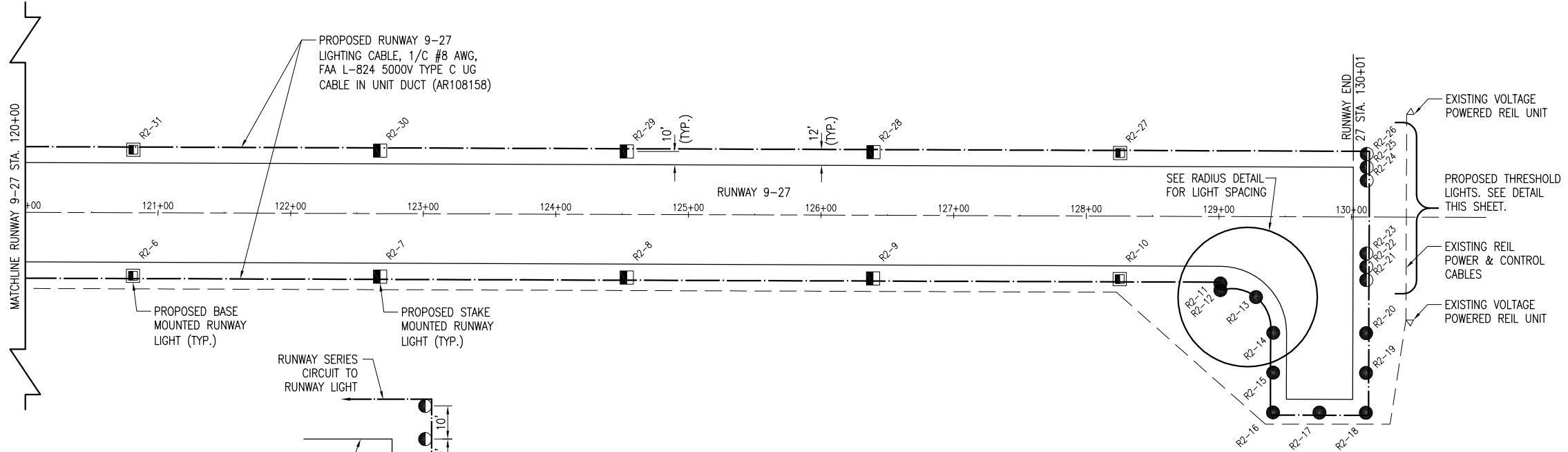
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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING

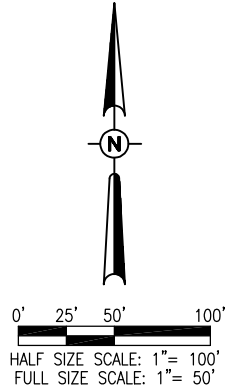
PROPOSED ELECTRICAL PLAN FOR RWY. 9-27 STA. 100+00 TO 106+00

MAR 07 2012 2:54 PM KINC00394
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LIGHT LOCATIONS		
LIGHT NUMBERS	STATION	OFFSET
R2-6	120+81.22	47.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-7	122+67.22	47.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-8	124+53.22	47.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-9	126+39.22	47.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-10	128+25.22	47.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-11	129+01.22	50.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-12	129+01.22	55.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-13	129+28.09	60.6' RT. OF RUNWAY 9-27 CENTERLINE
R2-14	129+41.22	87.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-15	129+41.22	117.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-16	129+41.22	147.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-17	129+76.22	147.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-18	130+11.22	147.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-19	130+11.22	117.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-20	130+11.22	87.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-21	130+11.22	47.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-22	130+11.22	37.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-23	130+11.22	27.5' RT. OF RUNWAY 9-27 CENTERLINE
R2-24	130+11.22	27.5' LT. OF RUNWAY 9-27 CENTERLINE
R2-25	130+11.22	37.5' LT. OF RUNWAY 9-27 CENTERLINE
R2-26	130+11.22	47.5' LT. OF RUNWAY 9-27 CENTERLINE
R2-27	128+25.22	47.5' LT. OF RUNWAY 9-27 CENTERLINE
R2-28	126+39.22	47.5' LT. OF RUNWAY 9-27 CENTERLINE
R2-29	124+53.22	47.5' LT. OF RUNWAY 9-27 CENTERLINE
R2-30	122+67.22	47.5' LT. OF RUNWAY 9-27 CENTERLINE
R2-31	120+81.22	47.5' LT. OF RUNWAY 9-27 CENTERLINE



- LEGEND**
- EXISTING PAVEMENT
 - EXISTING ELECTRICAL CABLE
 - PROPOSED 1/C #8 AWG, FAA L-824, 5000 VOLT TYPE C UG CABLE IN UNIT DUCT
 - EXISTING REILS
 - PROPOSED STAKE MOUNTED RUNWAY LIGHT
 - PROPOSED BASE MOUNTED RUNWAY LIGHT
 - PROPOSED STAKE MOUNTED THRESHOLD LIGHT
 - PROPOSED STAKE MOUNTED TAXIWAY LIGHT



DATE	REVISION
12/02/11	UPDATED RY 27 TO 6 THRESHOLD LIGHTS

VANDALIA MUNICIPAL AIRPORT
VANDALIA, ILLINOIS

IL. PROJ.: VA-A-4111 A.I.P. PROJ.: 3-17-0102-B12

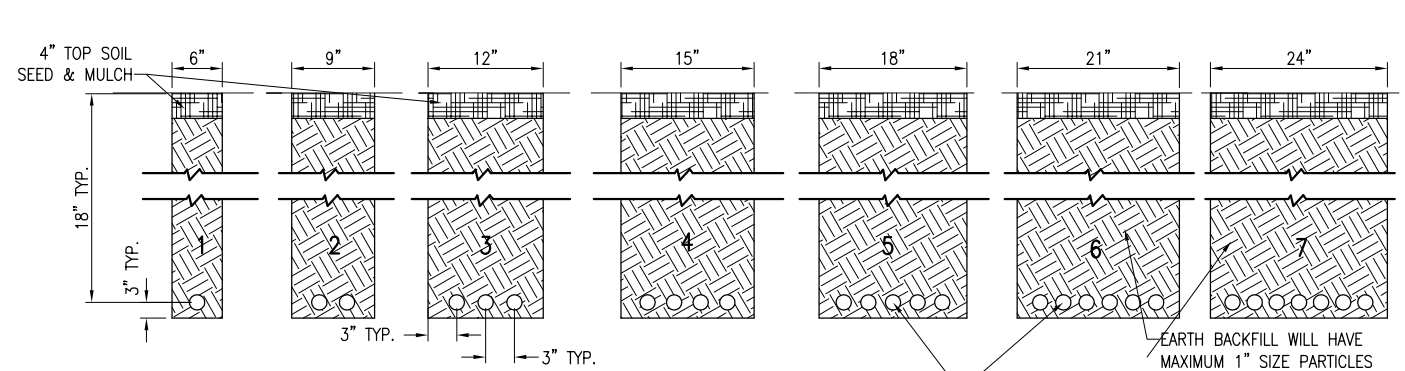
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Filename E-142-ELE.DWG	BAK
Scale 1" = 50'	CAH
Date 8/26/2011	REVIEWED
LAYOUT	DATE
DRAWN	07/06/11

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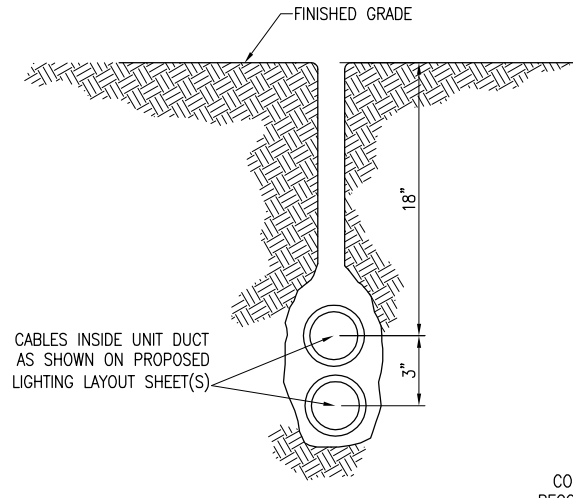
REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING

PROPOSED ELECTRICAL PLAN FOR RWY. 9-27 STA. 120+00 TO 130+00

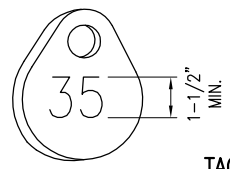
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NOTES:
 DETAIL NUMBERS INDICATE NO. OF CABLES.
 TRENCHES WITH MORE THAN SEVEN CABLES SHALL BE INCREASED 3" IN WIDTH FOR EACH ADDITIONAL CABLE; IF SPECIFIED ON PLANS TWO PARALLEL TRENCHES MAY BE CONSTRUCTED.
 DEPTH OF TRENCHES SHALL BE AS SHOWN ABOVE UNLESS OTHERWISE SPECIFIED ON THE PLANS.
 ALL DISTURBED SURFACES SHALL BE RESTORED TO THEIR ORIGINAL CONDITION. COST IS INCIDENTAL TO TRENCH.

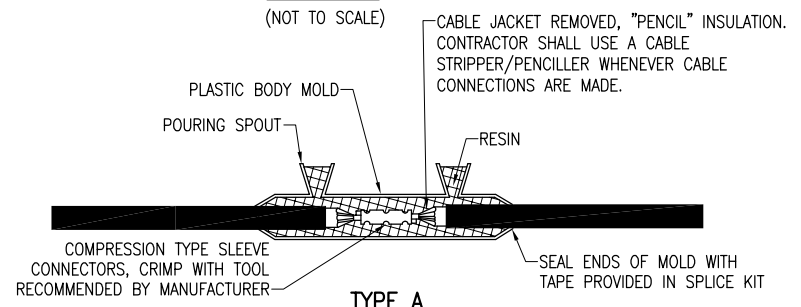


PLOWED CABLE
(NOT TO SCALE)



TAG DETAIL
(NOT TO SCALE)

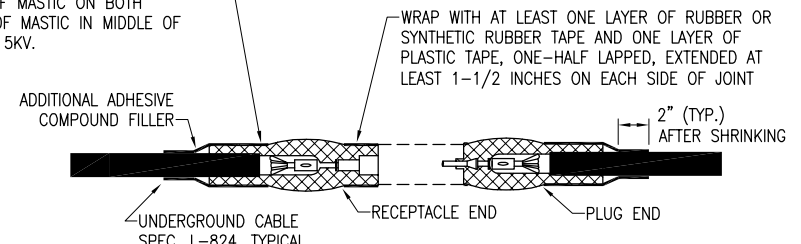
NOTE:
 AFFIX NON-CORROSIVE TAG TO FIXTURE FACING RUNWAY WITH SET SCREW, WIRE TIE, OR METAL BAND. NUMERALS SHALL BE ENGRAVED FOR PERMANENT READABILITY.



TYPE A

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.

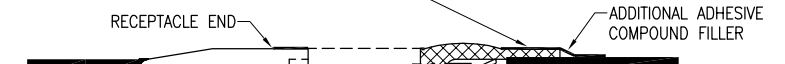
FOR SPLICES IN LOW VOLTAGE CABLE (600V) HOMERUNS FOR EXTENSIONS TO EXISTING LOW VOLTAGE CABLES ONLY. TYPE A SPLICES SHALL BE MADE IN SPLICE CANS, HANDHOLES, MANHOLES, OR JUNCTIONS BOXES



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

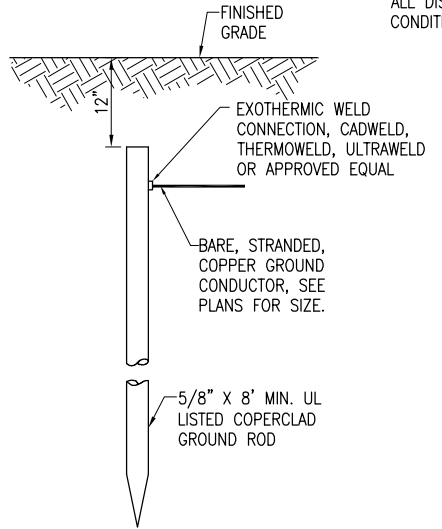
FOR SPLICES AT RUNWAY AND TAXIWAY LIGHTS

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



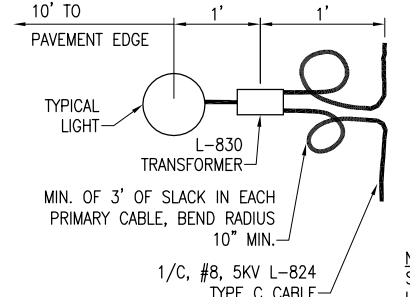
CABLE SPLICES
(NOT TO SCALE)

NOTES:
 SEE PROPOSED LIGHTING LAYOUT SHEET(S) FOR SPLICE TYPE.
 INSIDE DIAMETER OF CONNECTOR SHALL PROPERLY MATCH THE OUTSIDE DIAMETER OF CABLE.



CABLE TRENCHES
(NOT TO SCALE)

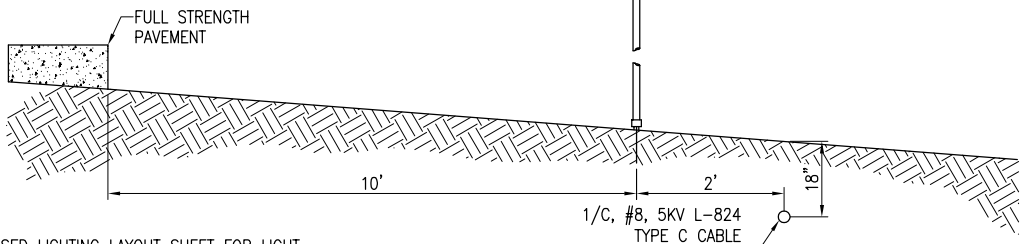
PER FAA AC 150/5340-30F DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, A LIGHT BASE GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. A LIGHT BASE GROUND SHALL BE INSTALLED AT EACH STAKE MOUNTED LIGHT AND EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. THE LIGHT BASE GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR BONDED 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.



PLAN VIEW

LIGHT AND CABLE INSTALLATION DETAIL
(NOT TO SCALE)

NOTES:
 SEE PROPOSED LIGHTING LAYOUT SHEET FOR LIGHT LOCATIONS.

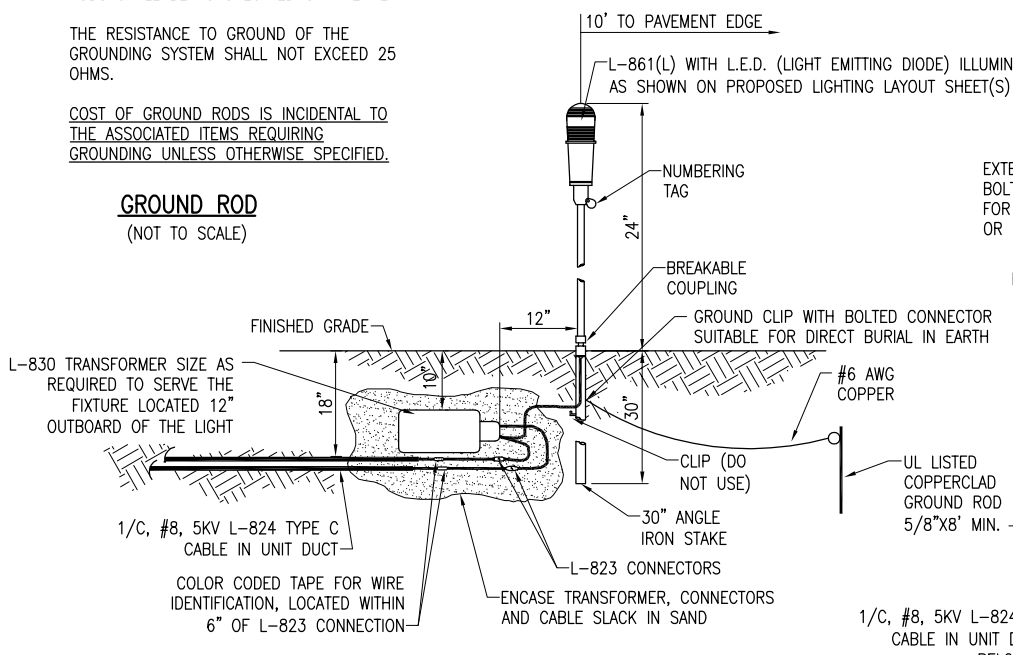


PROFILE VIEW

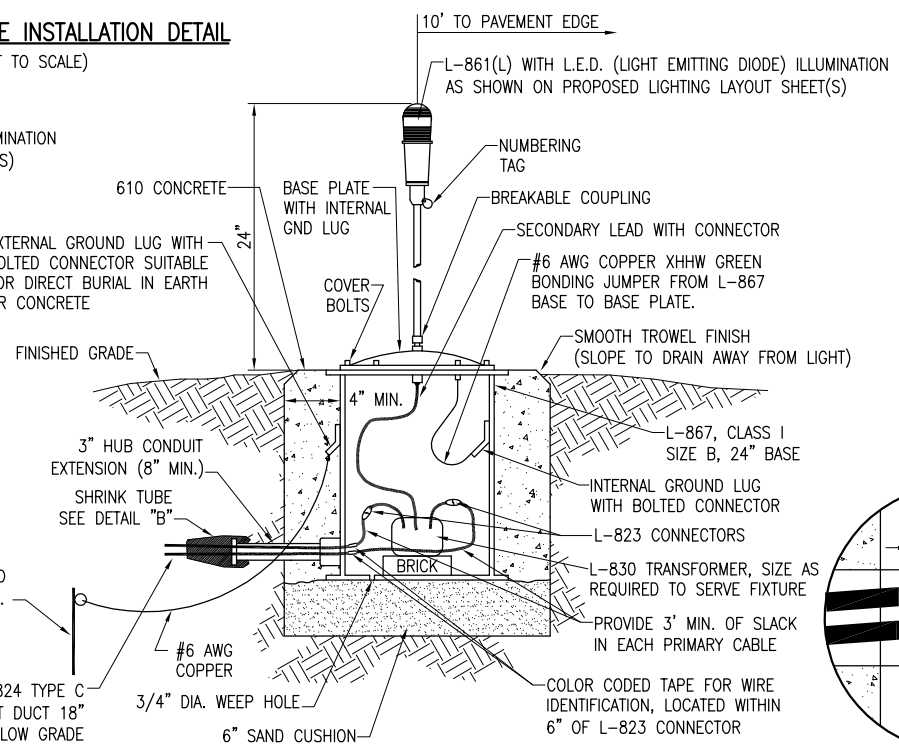
NOTES:
 TYPE AND MINIMUM NUMBER OF GROUND RODS SHALL BE AS SPECIFIED ON THE PLAN.
 THE RESISTANCE TO GROUND OF THE GROUNDING SYSTEM SHALL NOT EXCEED 25 OHMS.

COST OF GROUND RODS IS INCIDENTAL TO THE ASSOCIATED ITEMS REQUIRING GROUNDING UNLESS OTHERWISE SPECIFIED.

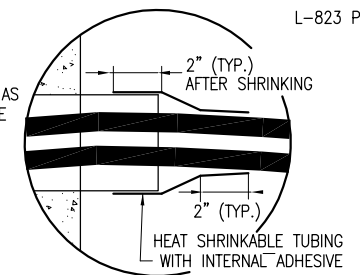
GROUND ROD
(NOT TO SCALE)



MEDIUM INTENSITY LIGHT - STAKE MOUNTED
(NOT TO SCALE)



MEDIUM INTENSITY LIGHT - BASE MOUNTED
(NOT TO SCALE)



DETAIL "B"
(NOT TO SCALE)

REVISION	DATE	DESCRIPTION
12/02/11	REVISED PER FAA AC UPDATES	
12/15/11	ADDED LED ILLUMINATION PER	
03/07/12	IDA REVIEW	
03/07/12	UPDATE PER FAA PGL 12-2 & EB67D	

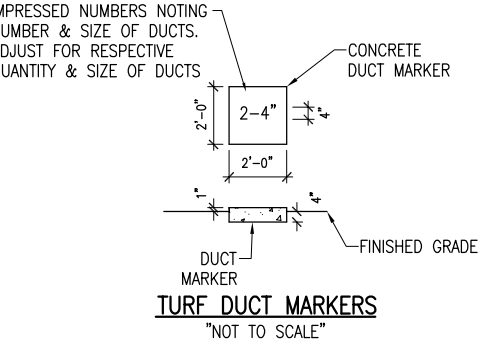
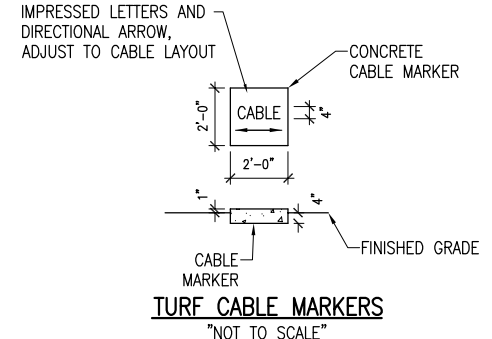
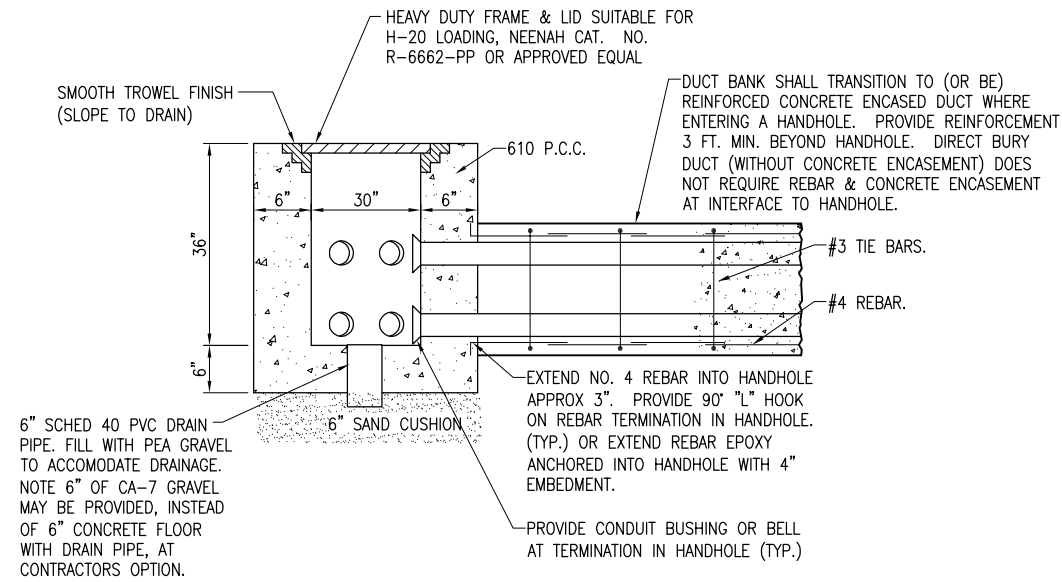
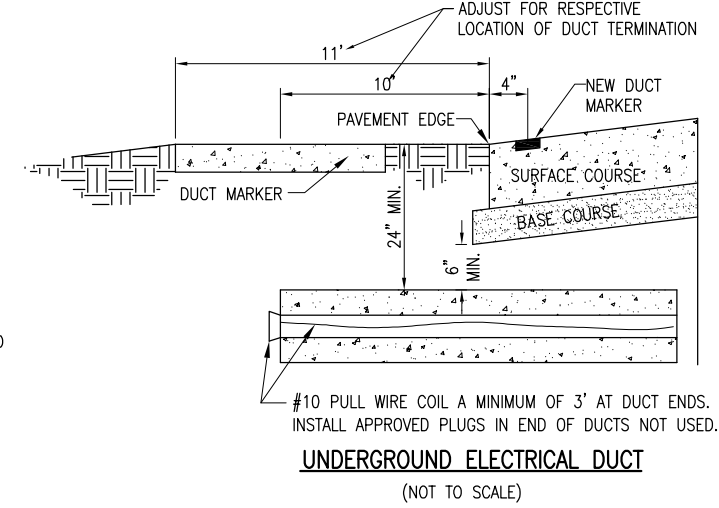
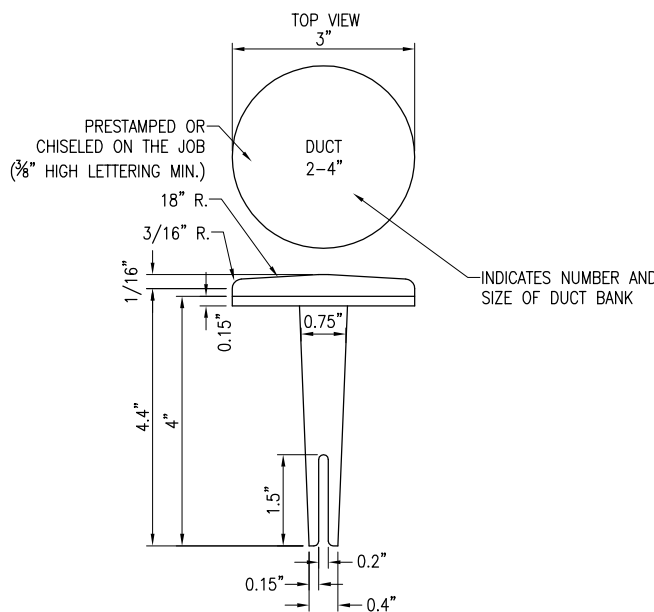
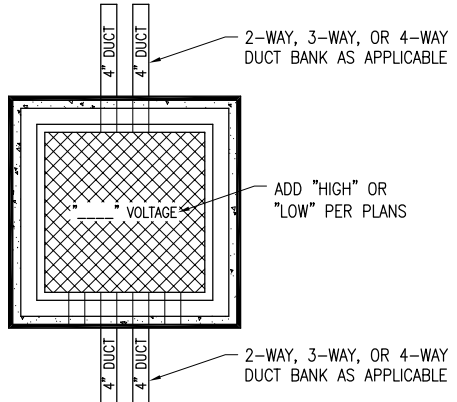
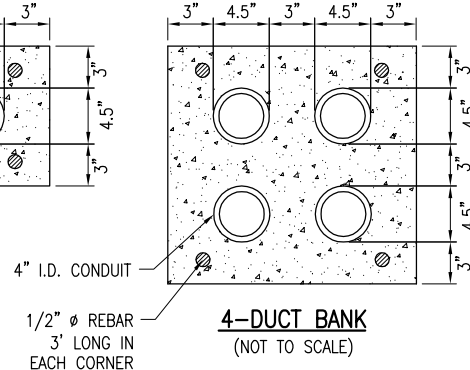
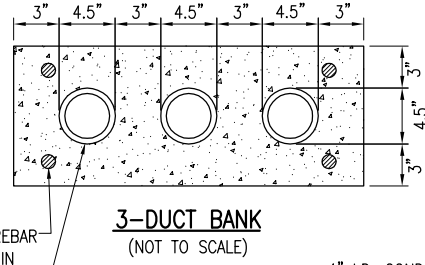
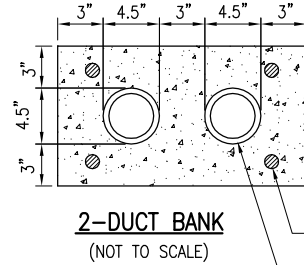
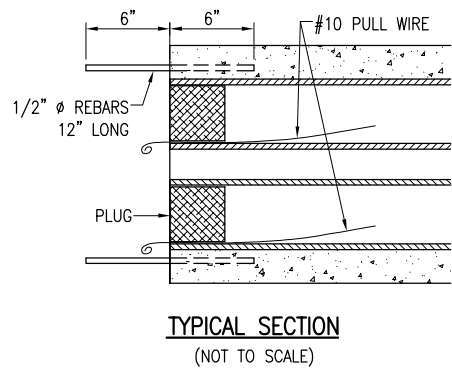
VANDALIA MUNICIPAL AIRPORT
 VANDALIA, ILLINOIS
 IL PROJ.: VJA-4111
 A.I.P. PROJ.: 3-17-0102-B12

Hanson Project No. 11A00300_0800	Scale	NOT TO SCALE	DATE	8/26/2011
File Name	E-501.DWG			
LAYOUT	KNL	07/06/11	REVIEWED	CAH
DRAWN	BAK	07/06/11		

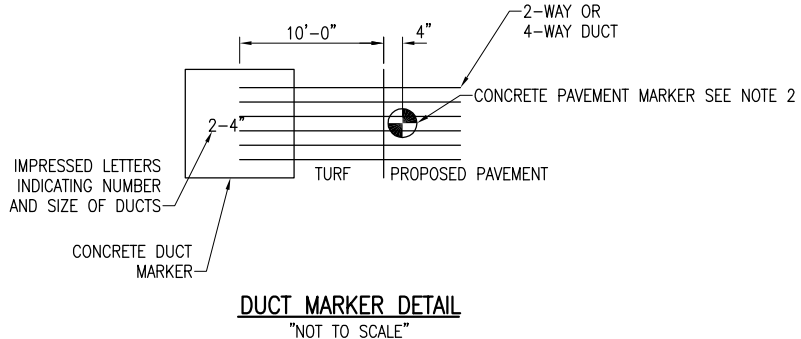
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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING
 ELECTRICAL DETAILS SHEET 1

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- NOTES:**
- 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.



- DUCT BANK NOTES:**
- DIMENSIONS FOR CONCRETE COVERAGE AND SEPARATION BETWEEN DUCTS ARE MINIMUM.
 - INCLUDE DUCT SPACERS AS MANUFACTURED BY UNDERGROUND DEVICES INC., OR APPROVED EQUAL TO MAINTAIN PROPER SEPARATION OF CONDUITS.
 - REBAR IS REQUIRED TO ACCOMMODATE FUTURE DUCT EXTENSIONS & INTERFACE AT DUCT BANK TERMINATIONS. CONCRETE ENCASED DUCT BANKS TERMINATING IN HANDHOLES REQUIRE REBAR AT TERMINATIONS.
 - CONDUITS FOR CONCRETE ENCASED DUCT SHALL BE SCHEDULE 40 PVC CONFORMING TO ITEM 110.
 - MINIMUM DEPTH OF TOP OF DUCT ENCASEMENT SHALL BE 18" BELOW FINISHED GRADE.
 - HIGH VOLTAGE AND LOW VOLTAGE CIRCUITS SHALL NOT BE INSTALLED IN THE SAME RACEWAY, CONDUIT, DUCT, HANDHOLE, OR MANHOLE.
 - HOMERUN CABLES FOR A RESPECTIVE CIRCUIT SHALL BE INSTALLED IN THE SAME RACEWAY OR DUCT.
 - DUCT INTERFACE TO HANDHOLES OR MANHOLES WILL BE CONSIDERED INCIDENTAL TO THE RESPECTIVE DUCT PAY ITEM.

- 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 FORMED AS DESCRIBED IN NOTE 4.
 - CABLE MARKERS SHALL BE PLACED AT CHANGES OF DIRECTION AND APPROXIMATELY EVERY 200' 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.

- NOTES:**
- LIDS FOR LOW VOLTAGE HANDHOLES SHALL BE LABELED "LOW VOLTAGE". LIDS FOR HIGH VOLTAGE HANDHOLES SHALL BE LABELED "HIGH VOLTAGE". COORDINATE LETTERING WITH MFR.
 - HANDHOLES MAY BE CAST IN PLACE OR PRECAST CONCRETE. PRECAST MANUFACTURERS MUST BE ON THE IDOT (ILLINOIS DEPT. OF TRANSPORTATION) APPROVED LIST OF CERTIFIED PRECAST CONCRETE PRODUCERS. FIBERGLASS HANDHOLES ARE NOT ACCEPTABLE.
 - ALL CORING, INTERFACE, AND LABOR ASSOCIATED WITH CONDUIT, DUCT, CABLE IN UNIT DUCT, AND / OR CABLE ENTRIES WILL BE CONSIDERED INCIDENTAL TO THE INSTALLATION OF THE HANDHOLE AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
 - ALL CORING, INTERFACE, AND LABOR ASSOCIATED WITH CONDUIT, DUCT, CABLE IN UNIT DUCT, AND/OR CABLE ENTRIES WILL BE CONSIDERED INCIDENTAL TO THE INSTALLATION OF THE HANDHOLE AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

ELECTRICAL HANDHOLE
"NOT TO SCALE"

DUCT MARKER DETAIL
"NOT TO SCALE"

TURF DUCT MARKERS
"NOT TO SCALE"

REVISION	
DATE	03/07/12
	ADDED DUCT MARKER NOTE

VANDALIA MUNICIPAL AIRPORT
VANDALIA, ILLINOIS

Hanson Project No.	11A00300_0800
Filename	E-502.DWG
Scale	NOT TO SCALE
Date	8/26/2011
LAYOUT	KNL 07/06/11
DRAWN	BAK 07/06/11
REVIEWED	CAH 08/26/11

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REPLACE MEDIUM
INTENSITY AIRFIELD
LIGHTING

ELECTRICAL DETAILS
SHEET 2

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IL PROJ.: VJA-4111 A.I.P. PROJ.: 3-17-0102-B12

DATE	REVISION
12/02/11	REVISED PER FAA AC UPDATES
12/15/11	ADDED LED ILLUMINATION PER
03/07/12	IDA REVIEW
	UPDATE PER FAA PGL 12-2 & EB67D

VANDALIA MUNICIPAL AIRPORT
VANDALIA, ILLINOIS

IL PROJ.: VJA-4111 A.I.P. PROJ.: 3-17-0102-B12

Hanson Project No. 11A00300_0800	Scale	NOT TO SCALE
File Name E-503.DWG	Date	8/26/2011
LAYOUT	KNL	07/06/11
DRAWN	BAK	07/06/11
REVIEWED	CAH	08/26/11

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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING ELECTRICAL DETAILS SHEET 3

L-858(L) SIGN (WITH LED ILLUMINATION)

NOTES:
SEE LIGHTING LAYOUT SHEET(S) FOR SIGN LEGEND, LOCATION, TYPE, SIZE, STYLE, AND CLASS.
NUMBER AND SPACING OF LEGS AS PER MANUFACTURER'S REQUIREMENTS.

CONNECT #6 AWG CU GND TO FRAME OF SIGN IN ACCORDANCE WITH SIGN MANUFACTURER RECOMMENDATIONS

PROVIDE A MINIMUM OF THREE FEET SLACK IN EACH PRIMARY CABLE AND SECONDARY EXTENSION

STAINLESS STEEL COVER BOLTS SLOPE TO DRAIN AWAY FROM L-867 BASE
EXTERNAL GROUND LUG WITH BOLTED CONNECTOR SUITABLE FOR DIRECT BURIAL IN EARTH OR CONCRETE

FINISHED GRADE
610 CONCRETE 4" MIN. THICK
L-830 TRANSFORMER, SIZE AS REQUIRED BY SIGN MANUFACTURER

SHRINK TUBE
1/C, #8, 5 KV, L-824 TYPE C CABLE

L-867 BASE
6" MINIMUM SAND BACKFILL

#6 AWG CU
UL LISTED COPPERCLAD GROUND ROD 5/8" DIA x 8'L (MIN.)

3" HUB CONDUIT EXTENSION

3" DIA. WEEP HOLE

BRICK

1/2" EXPANSION JOINT FILLER MATERIAL

METAL COVER

CONNECT #6 AWG CU GND TO FRAME OF SIGN IN ACCORDANCE WITH SIGN MANUFACTURER RECOMMENDATIONS

CONNECT #6 AWG CU GND TO FRAME OF SIGN IN ACCORDANCE WITH SIGN MANUFACTURER RECOMMENDATIONS

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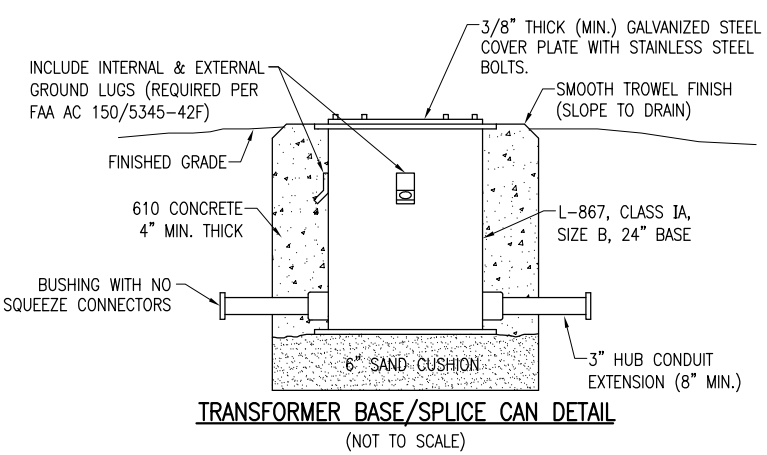
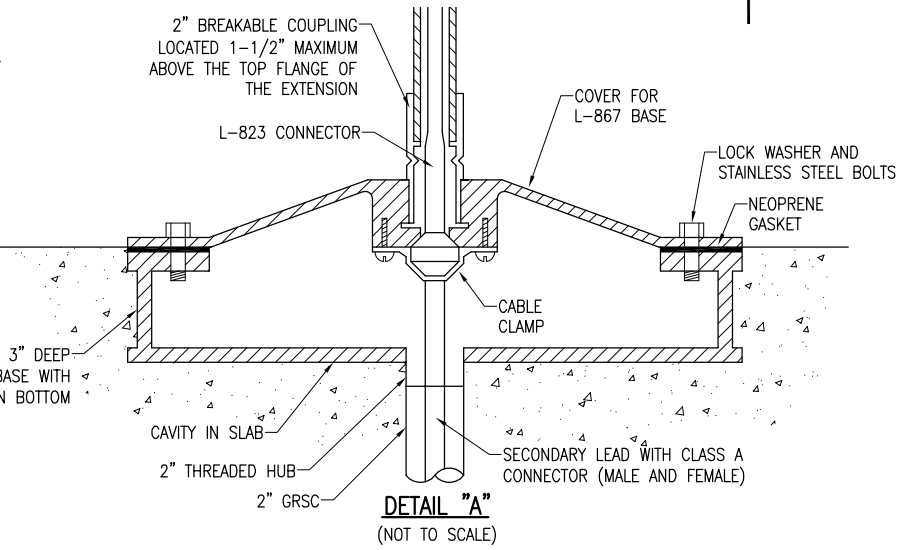
CONNECT #6 AWG CU GND TO FRAME OF SIGN IN ACCORDANCE WITH SIGN MANUFACTURER RECOMMENDATIONS

CONNECT #6 AWG CU GND TO FRAME OF SIGN IN ACCORDANCE WITH SIGN MANUFACTURER RECOMMENDATIONS

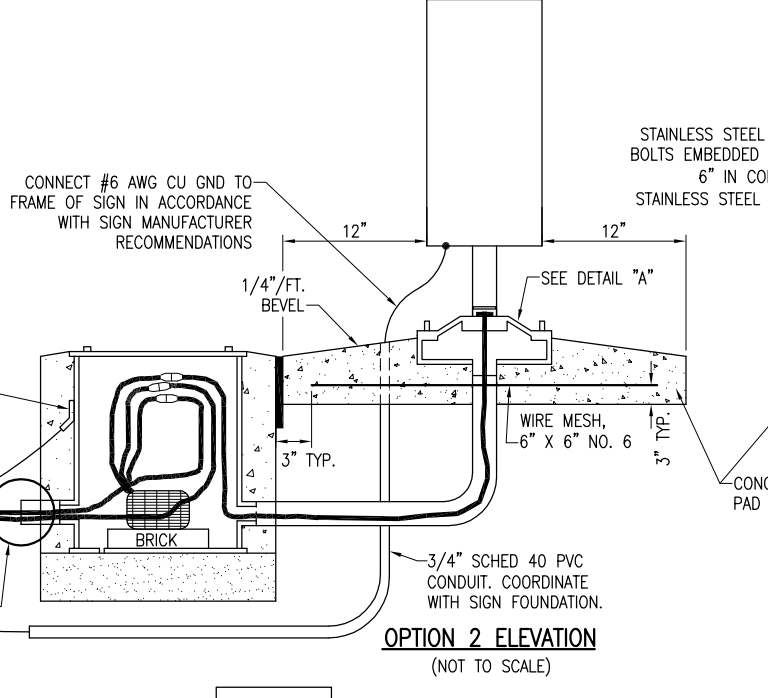
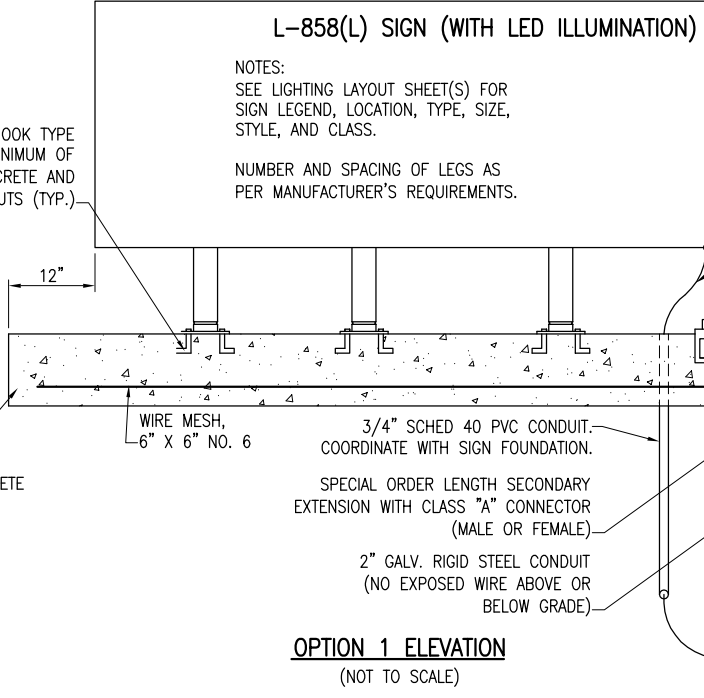
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CONNECT #6 AWG CU GND TO FRAME OF SIGN IN ACCORDANCE WITH SIGN MANUFACTURER RECOMMENDATIONS



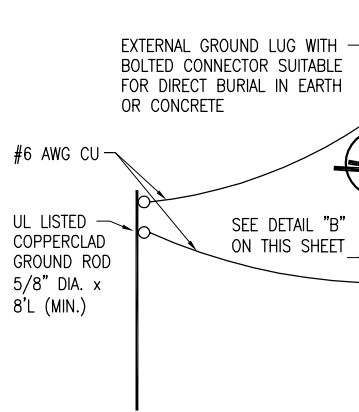
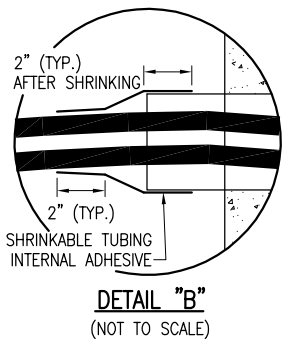
NOTE:
FOR THE PURPOSE OF ENHANCING SAFETY, EACH BASE MUST HAVE INSTALLED, BY THE MANUFACTURER, AN INTERNAL AND EXTERNAL GROUND STRAP THAT IS AVAILABLE FOR THE PURPOSE OF ATTACHING A GROUND LUG THAT IS CONNECTED TO AN EARTH GROUND OR A SAFETY GROUND CONDUCTOR INSTALLED WITH THE RESPECTIVE CIRCUIT. FOR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



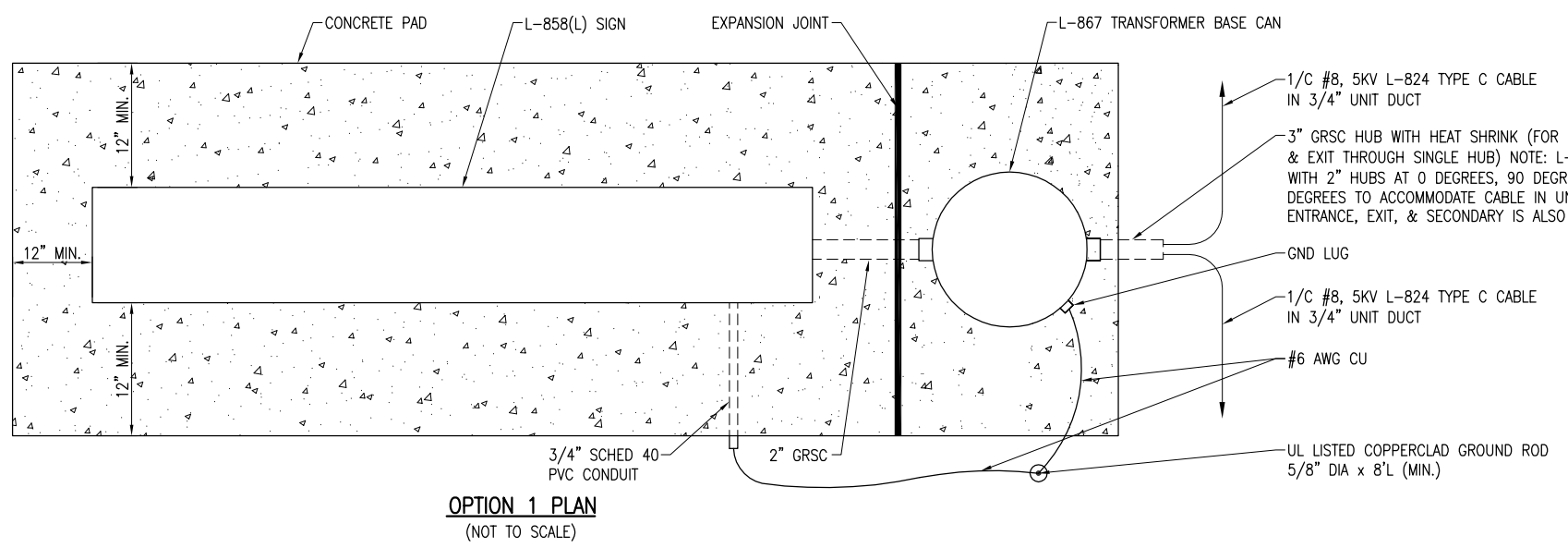
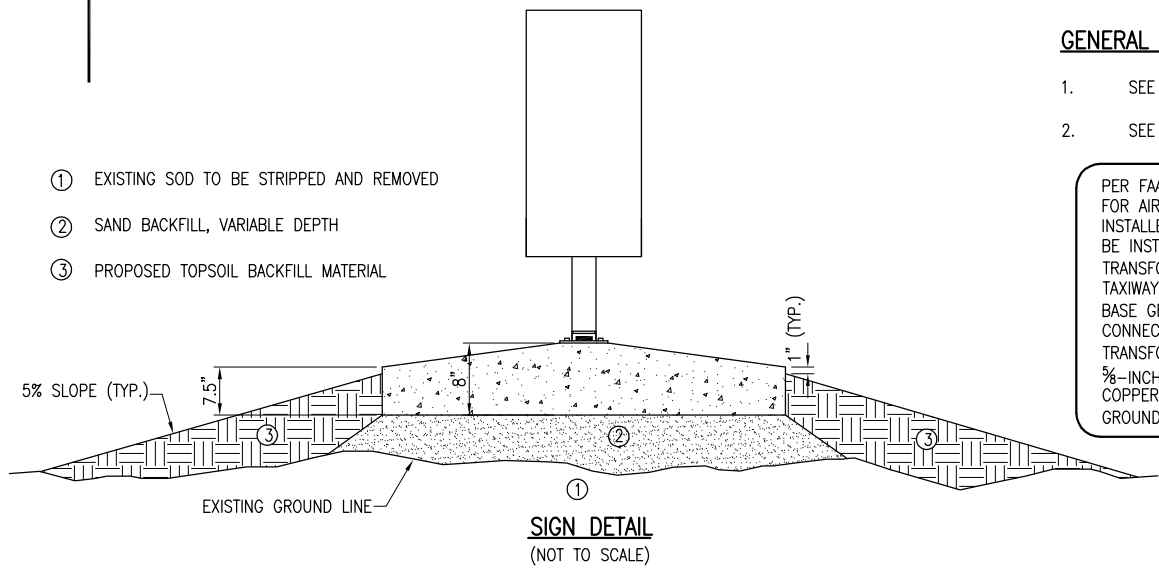
GENERAL NOTES:

- SEE LIGHTING LAYOUT SHEET FOR SIGN LEGEND, LOCATION, TYPE, SIZE, STYLE, AND CLASS.
- SEE ELECTRICAL NOTES SHEETS.

PER FAA AC 150/5340-30F DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, A LIGHT BASE GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. A LIGHT BASE GROUND SHALL BE INSTALLED AT EACH STAKE MOUNTED LIGHT AND EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. THE LIGHT BASE GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR CONNECTED TO THE GROUND LUG ON THE RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND A 3/8-INCH DIAMETER BY 8-FOOT LONG (MINIMUM) UL LISTED COPPER CLAD GROUND ROD. ALSO BOND THE SIGN FRAME TO THE GROUND ROD WITH A #6 AWG BARE COPPER CONDUCTOR.



- EXISTING SOD TO BE STRIPPED AND REMOVED
- SAND BACKFILL, VARIABLE DEPTH
- PROPOSED TOPSOIL BACKFILL MATERIAL



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REVISION	DATE	DESCRIPTION
12/02/11	REVISED PER FAA AC UPDATES	
12/15/11	ADDED LED ILLUMINATION PER	
03/07/12	IDA REVIEW	
	UPDATE PER FAA PGL 12-2 & EB67D	

VANDALIA MUNICIPAL AIRPORT
VANDALIA, ILLINOIS

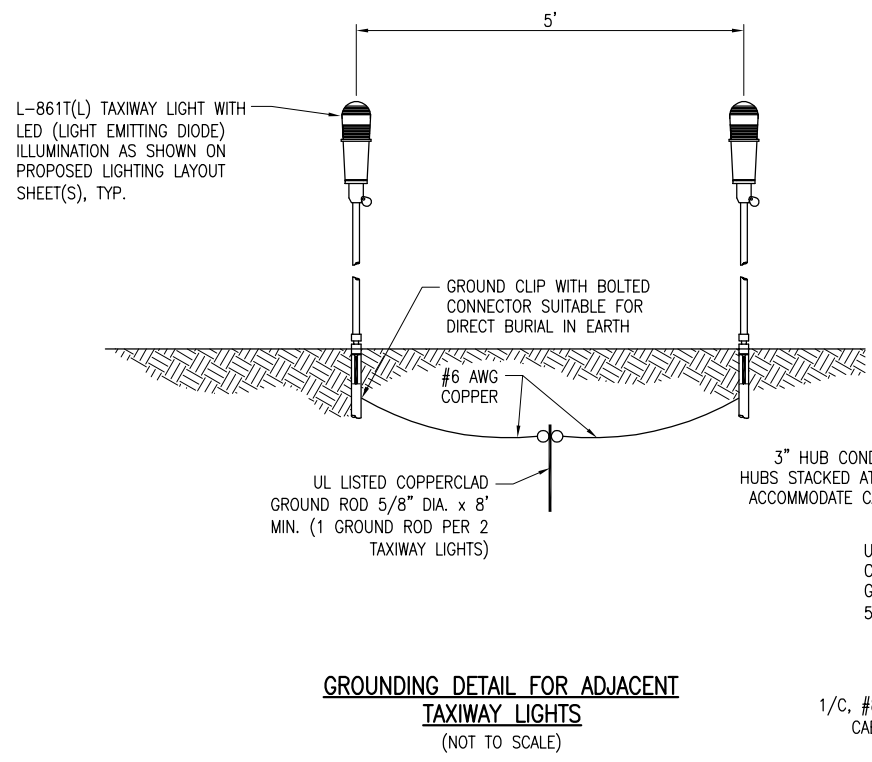
IL PROJ.: VJA-4111 A.I.P. PROJ.: 3-17-0102-B12

Hanson Project No. 11A00300_0800	File Name E-505.DWG	Scale NOT TO SCALE	Date 8/26/2011
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DRAWN	BAK	07/06/11	
REVIEWED	CAH	08/26/11	

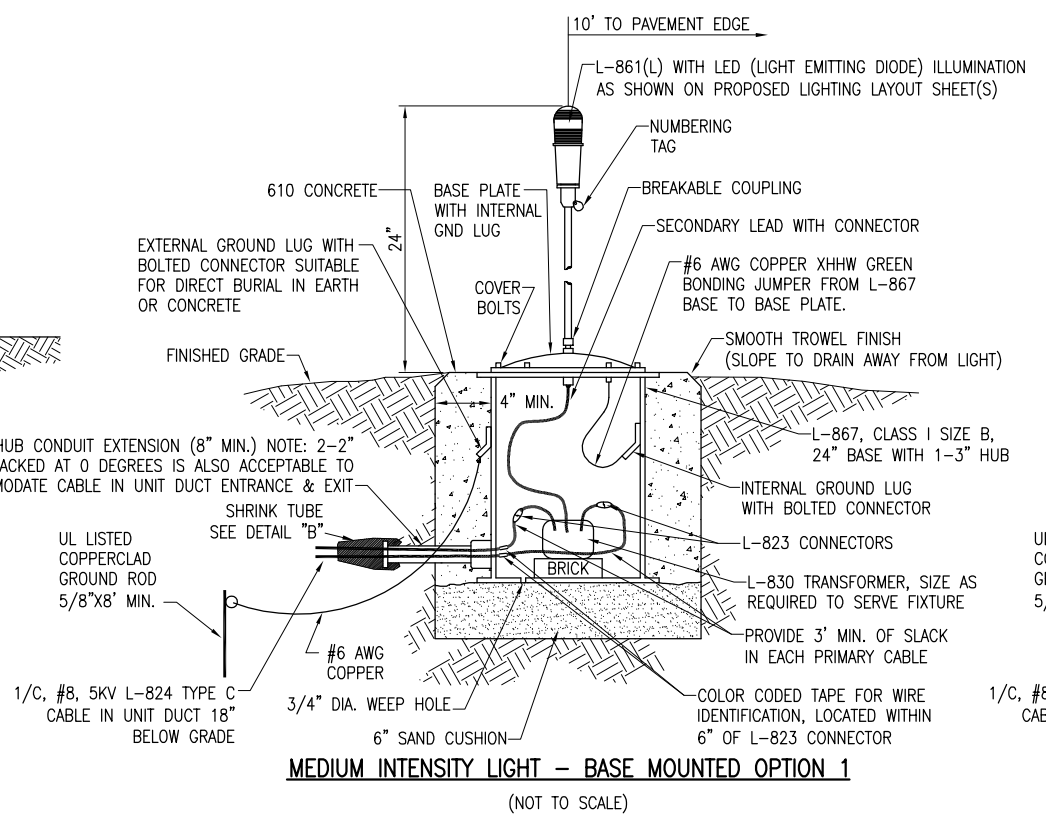
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www.hanson-inc.com
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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING

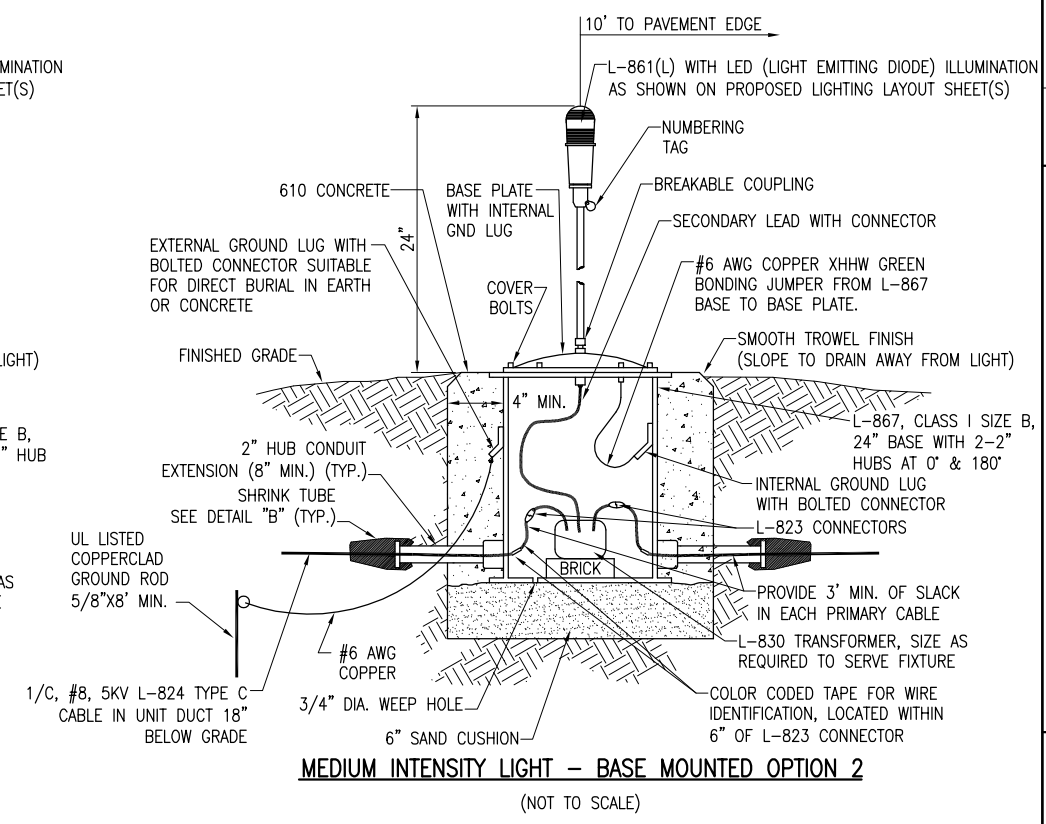
ELECTRICAL DETAILS SHEET 4



GROUNDING DETAIL FOR ADJACENT TAXIWAY LIGHTS
(NOT TO SCALE)



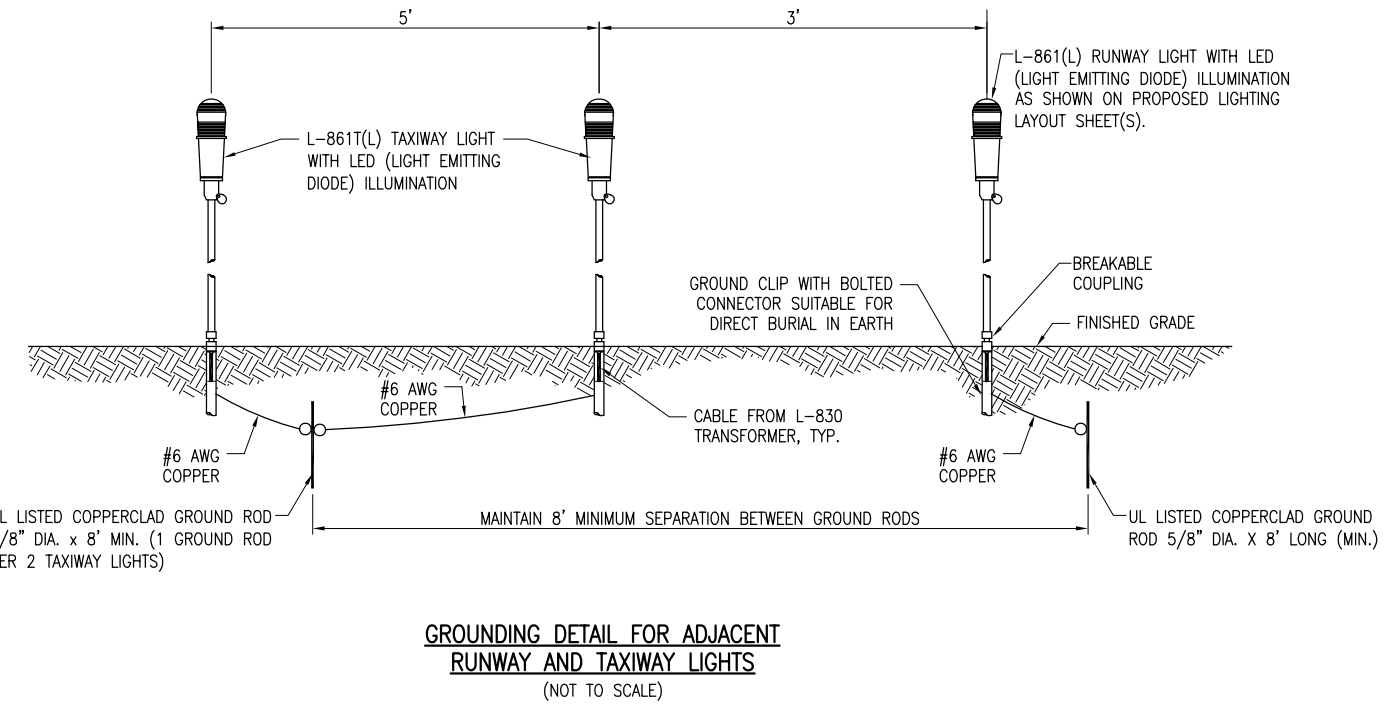
MEDIUM INTENSITY LIGHT - BASE MOUNTED OPTION 1
(NOT TO SCALE)



MEDIUM INTENSITY LIGHT - BASE MOUNTED OPTION 2
(NOT TO SCALE)

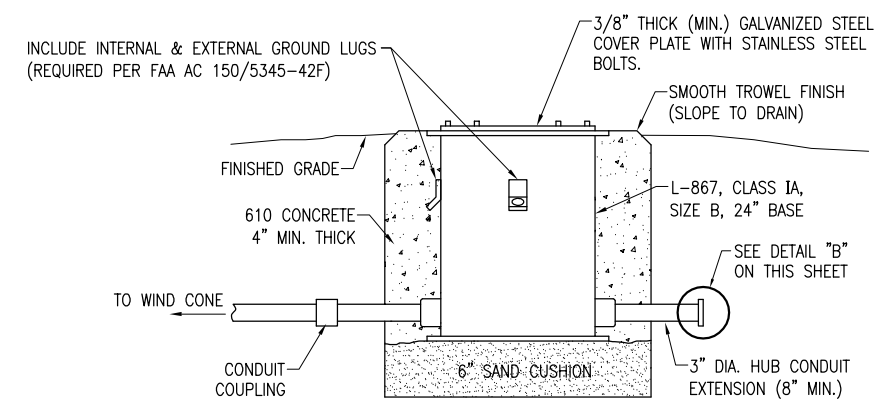
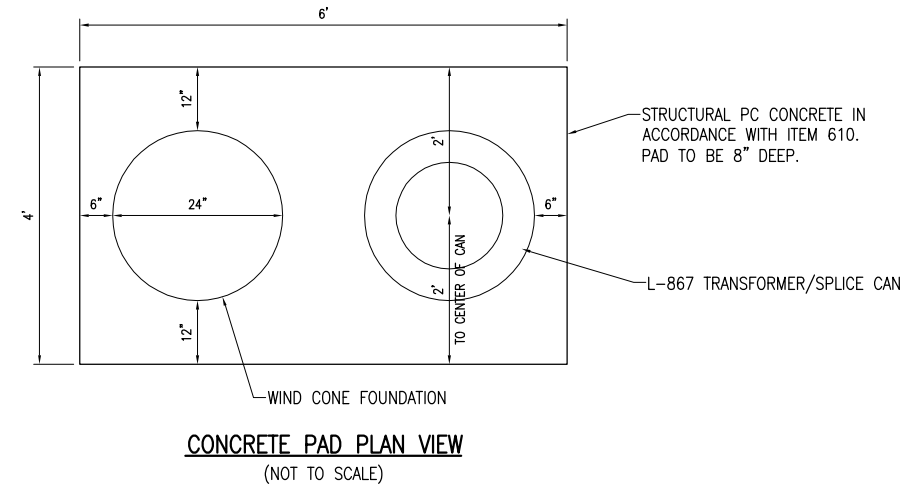
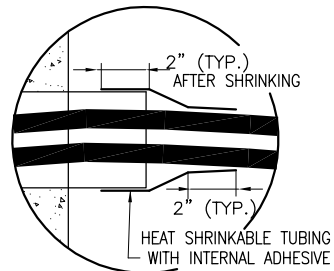
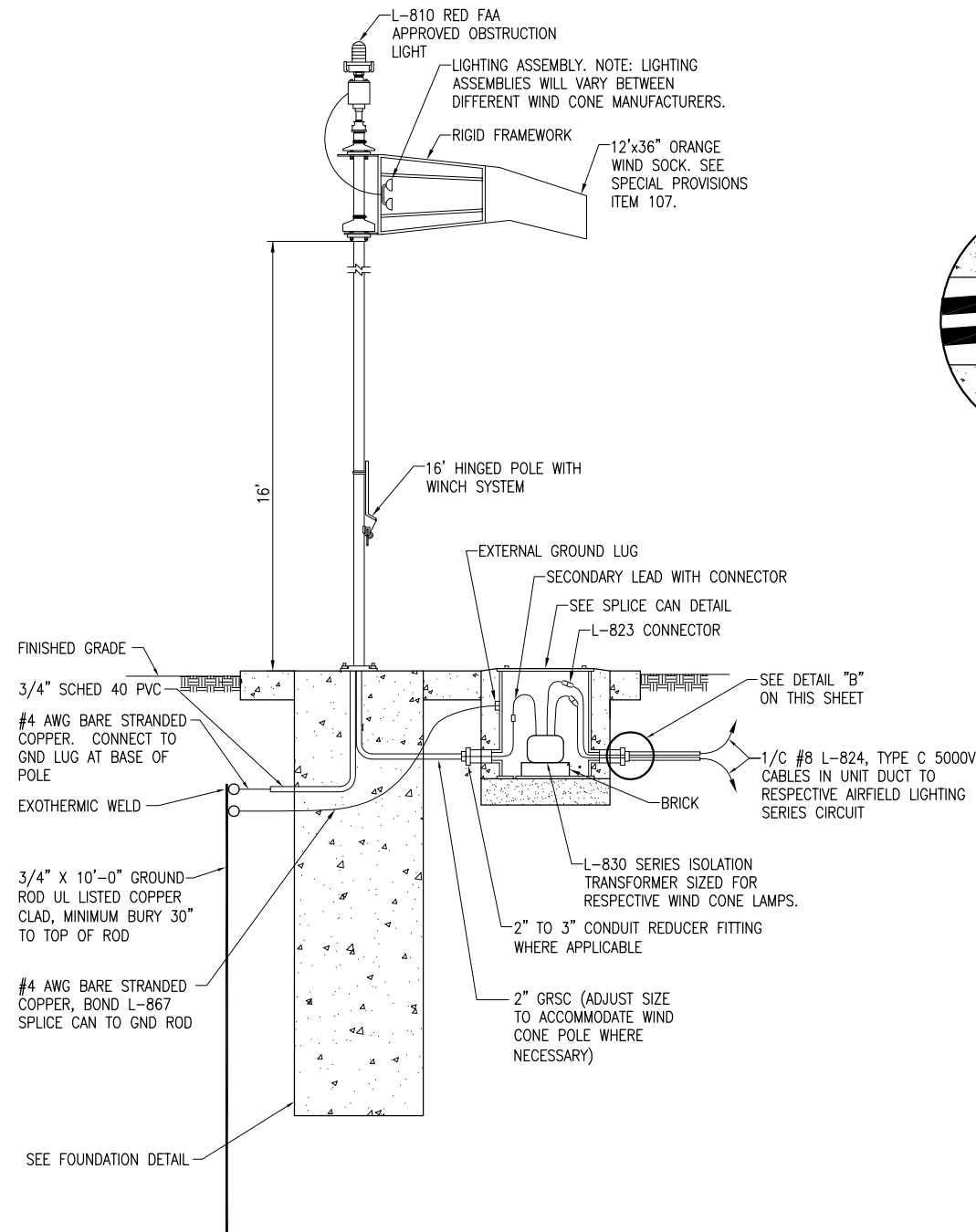
NOTES

- GROUNDING FOR RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS SHALL BE AS DETAILED ON THE PLANS AND AS SPECIFIED HEREIN. PER FAA AC 150/5340-30F DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, CHAPTER 12, PART 12.6; A GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. THE PURPOSE OF THE LIGHT BASE GROUND IS TO PROVIDE A DEGREE OF PROTECTION FOR MAINTENANCE PERSONNEL FROM POSSIBLE CONTACT WITH AN ENERGIZED LIGHT BASE OR MOUNTING STAKE THAT MAY RESULT FROM A SHORTED POWER CABLE OR ISOLATION TRANSFORMER. A LIGHT BASE GROUND SHALL BE INSTALLED AT EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. A LIGHT BASE GROUND SHALL ALSO BE INSTALLED AT EACH STAKE MOUNTED LIGHT FIXTURE. A LIGHT BASE GROUND SHALL BE INSTALLED AND CONNECTED TO THE METAL FRAME OF EACH TAXI GUIDANCE SIGN AS DETAILED ON THE PLANS AND IN ACCORDANCE WITH THE RESPECTIVE TAXI GUIDANCE SIGN MANUFACTURER RECOMMENDATIONS. THE LIGHT BASE GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR BONDED TO THE GROUND LUG ON THE RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND A 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), ULTRAWELD BY HARGER, GRAYSLAKE, ILLINOIS (PHONE: 800-842-7437), OR APPROVED EQUAL. EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS. TOP OF GROUND RODS SHALL BE BURIED 12 INCHES MINIMUM BELOW GRADE, UNLESS SPECIFIED OTHERWISE HEREIN, FOR RESPECTIVE APPLICATIONS
- FOR BASE MOUNTED LIGHT FIXTURES THE LIGHT FIXTURE MUST BE BONDED TO THE LIGHT BASE INTERNAL GROUND LUG VIA A #6 AWG STRANDED COPPER WIRE RATED FOR 600 VOLTS WITH GREEN XHHW OR USE INSULATION. THE GROUND WIRE LENGTH MUST BE SUFFICIENT TO ALLOW THE REMOVAL OF THE LIGHT FIXTURE FROM THE LIGHT BASE FOR ROUTINE MAINTENANCE. SEE THE LIGHT FIXTURE MANUFACTURER'S INSTRUCTIONS FOR PROPER METHODS OF ATTACHING A BONDING WIRE.
- FOR TAXIWAY LIGHTS THAT ARE SPACED WITH LESS THAN 10 FEET OF SEPARATION BETWEEN THEM PROVIDE ONE 5/8-INCH DIAMETER BY 8-FOOT LONG GROUND ROD PER TWO ADJACENT TAXIWAY LIGHTS.
- STEEL USED TO MANUFACTURE GROUND RODS SHALL BE 100% DOMESTIC STEEL.

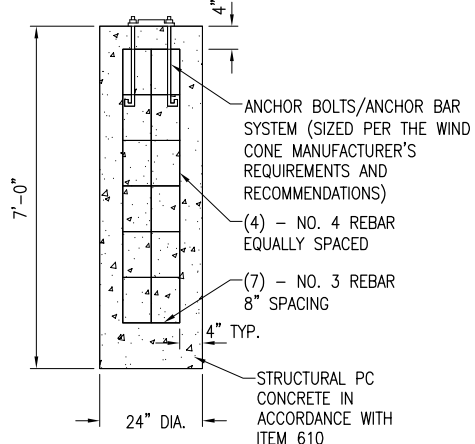


GROUNDING DETAIL FOR ADJACENT RUNWAY AND TAXIWAY LIGHTS
(NOT TO SCALE)

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NOTE:
 1. INCLUDE INTERNAL AND EXTERNAL GROUND LUGS.
 2. L-867 CAN FOR WIND CONE SHALL HAVE 2" HUB AT 0 DEGREES & 3" HUB AT 180 DEGREES, L-867 CAN WITH 2" HUBS AT 0 DEGREES, 90 DEGREES, & 180 DEGREES IS ALSO ACCEPTABLE.



NOTES

1. WIND CONE SHALL INCLUDE CONSTANT-BRIGHTNESS SERIES CIRCUIT POWER ADAPTER.
2. THE RUNWAY 18-36 LIGHTING SERIES CIRCUIT IS POWERED BY AN L-828 CLASS 1 - 6.6 AMP OUTPUT CURRENT, STYLE 1-3 BRIGHTNESS STEPS CONSTANT CURRENT REGULATOR. COORDINATE WITH THE RESPECTIVE WIND CONE MANUFACTURER TO PROVIDE A COMPATIBLE AND PROPERLY SIZED SERIES ISOLATION TRANSFORMER.
3. THE EXISTING CONSTANT CURRENT REGULATOR POWERING THE SERIES CIRCUIT FOR THE WIND CONE HAS BEEN SIZED FOR THE RESPECTIVE RUNWAY LIGHTING LOADS AND A WIND CONE THAT HAS A LOAD OF LESS THAN 200VA AND DOES NOT REQUIRE A SERIES ISOLATION TRANSFORMER LARGER THAN A 300 WATT RATING. IN THE EVENT THAT A WIND CONE IS PROPOSED THAT EXCEEDS THIS RATING, THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT THE RESPECTIVE CONSTANT CURRENT REGULATOR IS PROPERLY SIZED FOR THE TOTAL SERIES CIRCUIT LOAD. WHERE A WIND CONE IS PROPOSED THAT REQUIRES LOADS THAT EXCEED THE RATING OF THE EXISTING CONSTANT CURRENT REGULATOR, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ADJUSTMENTS INCLUDING PROVIDING A LARGER CONSTANT CURRENT REGULATOR AND ALL ASSOCIATED CIRCUIT BREAKERS, CONDUITS, WIRING AND VAULT WORK AS APPLICABLE TO ACCOMMODATE THE RESPECTIVE SERIES CIRCUIT LOAD WITH THE WIND CONE.
4. L-807 OR L-807(L) WIND CONE WILL BE PAID FOR UNDER ITEM AR107812 L-807 WC-12' INTERNALLY LIT PER EACH. SPLICE CANS FOR WIND CONE SERIES CIRCUIT TRANSFORMER WILL BE INCIDENTAL TO THE RESPECTIVE WIND CONE PAY ITEM.
5. REBAR SHALL BE MANUFACTURED FROM 100% DOMESTIC STEEL.

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

DATE	REVISION
12/13/11	AR107812 PER IDA REVIEW
03/07/12	UPDATE PER FAA PGL 12-2 & EB670

VANDALIA MUNICIPAL AIRPORT
 VANDALIA, ILLINOIS

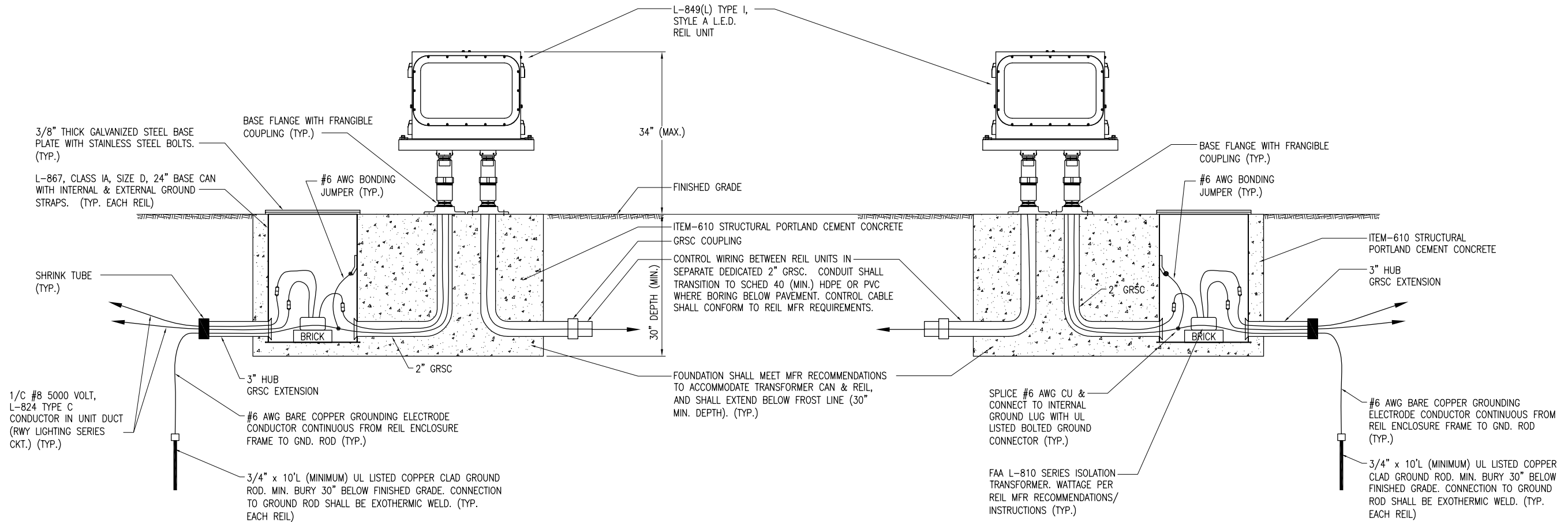
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Hanson Project No. 11A00300_0800	FILENAME E-508.DWG	SCALE NOT TO SCALE	DATE 8/26/2011
LAYOUT	KNL	07/06/11	
DRAWN	BAK	07/06/11	
REVIEWED	CAH	08/26/11	

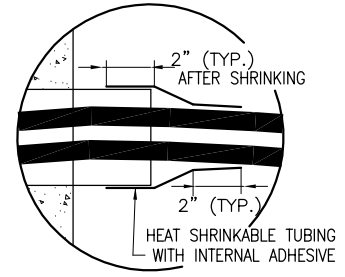
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 Hanson Professional Services Inc. 2012
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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING
 L-807 WIND CONE ELEVATION DETAIL

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REIL INSTALLATION DETAIL
NOT TO SCALE



DETAIL "B"
(NOT TO SCALE)

REIL NOTES

- REILS SHALL BE FAA APPROVED CONFORMING TO FAA AC 150/5345-51B "SPECIFICATION FOR DISCHARGE-TYPE FLASHING LIGHT EQUIPMENT", L-849(L) TYPE I REIL POWERED BY CONSTANT CURRENT 6.6 AMP POWER SUPPLY, STYLE A - UNIDIRECTIONAL, HIGH INTENSITY, ONE BRIGHTNESS STEP. SEE SPECIAL PROVISION SPECS AR125610 FOR ADDITIONAL REQUIREMENTS ON REILS.
- REILS SHALL BE AIMED AT ANGLE 10 DEGREES VERTICALLY AND TOED OUT 15 DEGREES FROM THE LINE PARALLEL TO THE RUNWAY CENTERLINE.
- 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 THE INSTALLATION OF THE REILS.
- 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. FURNISH AND INSTALL A 3/4-INCH DIAMETER BY 10-FOOT LONG COPPER CLAD GROUND ROD AT EACH REIL UNIT. GROUND RODS SHALL BE BURIED 30" MINIMUM BELOW GRADE. 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. ALL CONNECTIONS TO GROUND RODS SHALL BE EXOTHERMIC WELD AS MANUFACTURED BY CADWELD, THERMOWELD, ULTRAWELD, OR APPROVED EQUAL. CONNECTIONS TO REIL UNIT FRAMES SHALL BE AS RECOMMENDED BY THE MANUFACTURER OR WITH UL LISTED GROUNDING CONNECTORS. CONNECT TO THE BASE / TRANSFORMER CAN SHALL BE WITH UL LISTED BOLTED CONNECTOR OR ONE-HOLE COMPRESSION LUG & 3/8" STAINLESS STEEL BOLTS, NUTS, & WASHERS.
- PRIOR TO FINAL ACCEPTANCE AND ACTIVATION, THE COMPLETED REIL INSTALLATION WILL REQUIRE A FLIGHT CHECK TO BE SCHEDULED AND CONDUCTED BY THE FAA AND/OR IDA. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO HAVE A REPRESENTATIVE PRESENT TO MAKE ANY NECESSARY ADJUSTMENTS IN THE INSTALLATION AND/OR AIMING OF THE REIL UNITS FOR THE FLIGHT SYSTEM CHECKS.

REVISION	DATE	UPDATE PER	FAA PGL 12-2 & EB67D

VANDALIA MUNICIPAL AIRPORT
VANDALIA, ILLINOIS

IL PROJ.: VJA-4111 A.I.P. PROJ.: 3-17-0102-B12

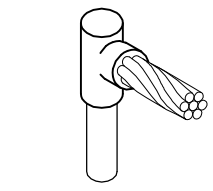
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File Name	E-509.DWG	Scale	NOT TO SCALE	DATE	8/26/2011
LAYOUT	KNL	DATE	07/06/11		
DRAWN	BAK	DATE	07/06/11		
REVIEWED	CAH	DATE	08/26/11		

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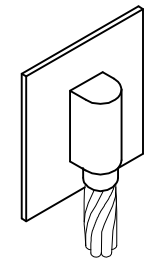
REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING

REIL DETAILS

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CABLE TO GROUND ROD



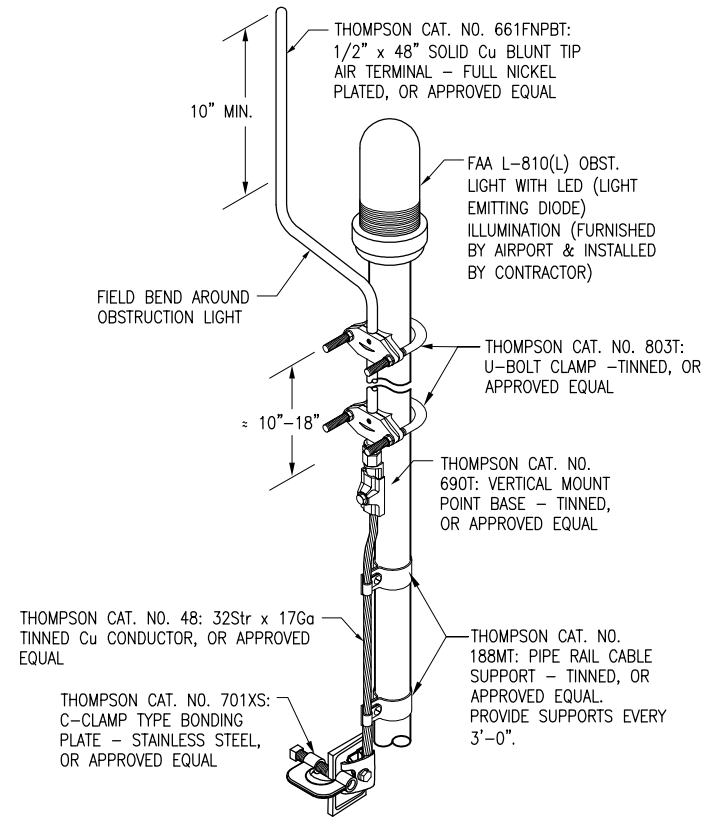
CABLE TO SURFACE

DETAIL NOTES

- EXOTHERMIC WELDS SHALL BE CADWELD AS MANUFACTURED BY ERICO PRODUCTS, SOLON, OHIO, ULTRAWELD AS MANUFACTURED BY HARGER LIGHTNING PROTECTION & GROUNDING EQUIPMENT, GRAYSLAKE, IL, THERMOWELD AS MANUFACTURED BY CONTINENTAL INDUSTRIES, TULSA, OKLAHOMA OR APPROVED EQUAL. VERIFY PROPER SIZES, MOLDS, TYPES, AND REQUIREMENTS FOR THE RESPECTIVE APPLICATION WITH THE MANUFACTURER, AND INSTALL PER THEIR DIRECTIONS.
- FOR APPLICATIONS TO GALVANIZED STEEL OR PAINTED STEEL, REMOVE GALVANIZING AND/OR PAINT & CLEAN THE SURFACE TO EXPOSE BARE STEEL BEFORE MAKING EXOTHERMIC WELD CONNECTION.
- VERIFY EXOTHERMIC MOLDS ARE SUITABLE FOR USE WITH THE RESPECTIVE TYPE (SOLID OR STRANDED) & SIZE CONDUCTOR.

EXOTHERMIC WELD DETAILS

NOT TO SCALE

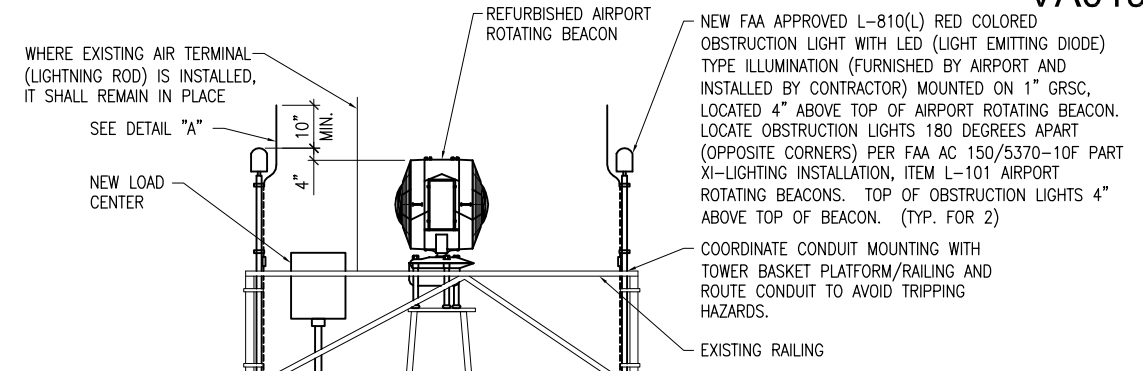


DETAIL A

NOT TO SCALE

NOTES

- REFERENCES TO THOMPSON ARE THOMPSON LIGHTNING PROTECTION INC., 901 SIBLEY MEMORIAL HWY, ST. PAUL, MN 55188, PHONE: 651-455-7661, 800-777-1230, FAX: 651-455-2545.
- VERIFY LIGHTNING PROTECTION COMPONENTS AND CATALOG NUMBERS WITH THE RESPECTIVE LIGHTNING PROTECTION EQUIPMENT MANUFACTURER.
- CLEAN ALL CONNECTIONS TO EXPOSE BARE METAL.



2#8 THWN
1#8 NEUTRAL
1#8 GND
IN 1" GRSC
FROM VAULT
TO BEACON
LOW CENTER

#1/0 AWG BARE COPPER GROUNDING ELECTRODE CONDUCTOR. BOND TO TOWER FRAME AT OPPOSITE CORNERS (2 LOCATIONS) WITH EXOTHERMIC WELD

NEW 3/4" DIA. X 10' LONG UL LISTED COPPER CLAD GROUND ROD. (TYPICAL FOR 4) LOCATE GROUND RODS AT EACH CORNER OF TOWER FOUNDATION. GROUND RODS SHALL NOT BE SPACED LESS THAN 10 FEET APART.

#1/0 BARE CU GROUND RING 30" MIN. BELOW GRADE.

EXISTING TOWER FOUNDATION

GROUND RING CONTINUES AROUND TOWER FOUNDATION

LIGHTNING PROTECTION DETAIL FOR AIRPORT ROTATING BEACON

NOT TO SCALE

AIRPORT ROTATING BEACON LOAD CENTER SCHEDULE			
CKT #	DUTY	SIZE	CKT #
1	BLANK		2
3	BLANK		4
5	AIRPORT ROTATING BEACON	15A 1P	6
7	OBSTRUCTION LIGHTS	15A 1P	8
9	BLANK		10
11	BLANK		12

SIZE	DUTY
30A 1P	SURGE PROTECTOR (PHASE A)
30A 1P	SURGE PROTECTOR (PHASE B)
	BLANK
	BLANK
	BLANK
	BLANK

100 AMP, 120/240 VAC, 1 PHASE, 3 WIRE, 12 CIRCUIT LOAD CENTER WITH MAIN LUGS IN A NEMA 3R RAIN PROOF ENCLOSURE, SQUARE D CAT. NO. Q0112L125GRB WITH EQUIPMENT GROUND BAR KIT OR APPROVED EQUAL. CONFIRM LOAD CENTER IS MADE IN THE USA TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN REQUIREMENT.

NOTES

- INCLUDE EQUIPT GROUND BAR KIT.
- ALL BREAKERS SHALL HAVE 10,000 AIC RATING AT 120/240 VAC.
- PHASE "A" SHALL BE SWITCHED THROUGH A LIGHTING CONTACTOR AT THE VAULT. PHASE "B" SHALL BE UNSWITCHED.
- INCLUDE ENGRAVED PHENOLIC LEGEND PLATE LABELED ARB PANEL, 120/240 VAC, 1PH, 3W, FED FROM VAULT.
- SURGE PROTECTORS SHALL BE SUITABLE FOR 120VAC, 1PH, 2W PLUS GROUND, 30KA (MINIMUM) SURGE CURRENT RATING, JOSLYN MODEL 1260-21 OR LIGHTING PROTECTION CORP. MODEL LPC 11765-132, OR APPROVED EQUAL. FURNISH & INSTALL TWO SURGE PROTECTORS (ONE FOR EACH PHASE).
- LOAD CENTER SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN REQUIREMENTS. PROVIDE CERTIFICATION OF MANUFACTURE IN THE UNITED STATES WITH SHOP DRAWING SUBMITTAL.

DATE	REVISION
12/02/11	REVISED PER FAA AC UPDATE
12/15/11	ADDED LED ILLUMINATION PER
03/07/12	IDA REVIEW
	UPDATE PER FAA PGL 12-2 & EB67D

VANDALIA MUNICIPAL AIRPORT
VANDALIA, ILLINOIS

IL PROJ.: VJA-4111 A.I.P. PROJ.: 3-17-0102-B12

Hanson Project No. 11A00300_0800	FILENAME E-510.DWG	NOT TO SCALE	8/26/2011
LAYOUT	KNL	07/06/11	
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REVIEWED	CAH	08/26/11	

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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING

AIRPORT ROTATING BEACON UPGRADE DETAILS AND NOTES

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

POWER AND CONTROL NOTES

- 1. PROVIDE LEGEND PLATES FOR ALL ELECTRICAL EQUIPMENT TO IDENTIFY FUNCTION, CIRCUIT VOLTAGE AND PHASE. WHERE THE EQUIPMENT CONTAINS FUSES, ALSO IDENTIFY THE FUSE OR FUSE LINK AMPERE RATING. WHERE THE EQUIPMENT DOES NOT HAVE SUFFICIENT AREA TO INSTALL LEGEND PLATES, THE LEGEND PLATES SHALL BE INSTALLED ON THE WALL NEXT TO THE UNIT. LEGEND PLATES SHALL BE WEATHERPROOF ENGRAVED PLASTIC OR PHENOLIC MATERIAL, 1/4" HIGH BLACK LETTERS ON A WHITE BACKGROUND UNLESS NOTED OTHERWISE. SECURE WITH WEATHERPROOF ADHESIVE AND MACHINE SCREWS. FURNISH ADDITIONAL LEGEND PLATES WHERE REQUIRED BY CODE, FOR ADDITIONAL EQUIPMENT, AS DETAILED HEREIN ON THE PLANS, AND AS NOTED IN THE SPECIAL PROVISION SPECIFICATIONS.
2. COLOR CODE ALL PHASE WIRING BY THE USE OF COLORED WIRE INSULATION AND/OR COLORED TAPE. WHERE TAPE IS USED, THE WIRE INSULATION SHALL BE BLACK. BLACK AND RED SHALL BE USED FOR PHASE CONDUCTORS ON 120/240VAC SINGLE-PHASE, THREE WIRE SYSTEMS AND BLACK, ORANGE (FOR HIGH LEG) AND BLUE SHALL BE USED FOR PHASE CONDUCTORS ON 240/120VAC THREE-PHASE, FOUR WIRE SYSTEMS. NEUTRAL CONDUCTORS, SIZE NO. 6 AWG OR SMALLER, SHALL BE IDENTIFIED BY A CONTINUOUS WHITE OR NATURAL GRAY OUTER FINISH ALONG ITS ENTIRE LENGTH. NEUTRAL CONDUCTORS LARGER THAN NO. 6 AWG SHALL BE IDENTIFIED EITHER BY A CONTINUOUS WHITE OR NATURAL GRAY OUTER FINISH ALONG ITS ENTIRE LENGTH OR BY THE USE OF WHITE TAPE AT ITS TERMINATIONS AND INSIDE ACCESSIBLE WIREWAYS. INSULATED GROUND CONDUCTORS SHALL HAVE GREEN COLORED INSULATION FOR ALL CONDUCTOR SIZES (AWG OR KCMIL).
3. ALL BRANCH CIRCUIT CONDUCTORS CONNECTED TO A PARTICULAR PHASE SHALL BE IDENTIFIED WITH THE SAME COLOR. THE COLOR CODING SHALL BE EXTENDED TO THE POINT OF UTILIZATION.
4. IN CONTROL WIRING THE SAME COLOR SHALL BE USED THROUGHOUT THE SYSTEM FOR THE SAME FUNCTION, SUCH AS 10%, 30%, 100% BRIGHTNESS CONTROL, ETC.
5. LOW VOLTAGE (600 V.) AND HIGH VOLTAGE (5000 V.) CONDUCTORS SHALL BE INSTALLED IN SEPARATE WIREWAYS.
6. NEATLY LACE WIRING IN DISTRIBUTION PANELS, WIREWAYS, SWITCHES AND JUNCTION/PULL BOXES.
7. THE MINIMUM SIZE OF PULL/JUNCTION BOXES, REGARDLESS OF THE QUANTITY AND SIZE OF THE CONDUCTORS SHOWN, SHALL BE AS FOLLOWS:
A. IN STRAIGHT PULLS THE LENGTH OF THE BOX SHALL NOT BE LESS THAN EIGHT TIMES THE TRADE DIAMETER OF THE LARGER CONDUIT. THE TOTAL AREA (INCLUDING THE CONDUIT CROSS-SECTIONAL AREA) OF A BOX END SHALL BE AT LEAST 3 TIMES GREATER THAN THE TOTAL TRADE CROSS-SECTIONAL AREA OF THE CONDUITS TERMINATING AT THE END.
B. IN ANGLE PULLS OR 'U' PULLS THE DISTANCE BETWEEN EACH CONDUIT ENTRY INSIDE THE BOX AND THE OPPOSITE WALL OF THE BOX SHALL NOT BE LESS THAN SIX (6) TIMES THE TRADE DIAMETER OF THE LARGEST CONDUIT. THIS DISTANCE SHALL BE INCREASED FOR ADDITIONAL ENTRIES BY THE AMOUNT OF THE SUM OF THE DIAMETERS OF ALL OTHER CONDUIT ENTRIES ON THE SAME WALL AS THE BOX. THE DISTANCE BETWEEN CONDUIT ENTRIES ENCLOSING THE SAME CONDUCTOR SHALL NOT BE LESS THAN SIX TIMES THE TRADE DIAMETER OF THE LARGEST CONDUIT.
8. A RUN OF CONDUIT BETWEEN TERMINATIONS AT EQUIPMENT ENCLOSURES, SQUARE DUCTS AND PULL/JUNCTION BOXES, SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF FOUR QUARTER BENDS (360 DEGREES TOTAL), INCLUDING THOSE BENDS LOCATED IMMEDIATELY AT THE TERMINATIONS, CAST, CONDUIT TYPE OUTLETS SHALL NOT BE TREATED AS PULL/JUNCTION BOXES.
9. EQUIPMENT CABINETS SHALL NOT BE USED AS PULL/JUNCTION BOXES. ONLY WIRING TERMINATING AT THE EQUIPMENT SHALL BE BROUGHT INTO THESE ENCLOSURES.
10. SPLICES AND JUNCTION POINTS SHALL BE PERMITTED ONLY IN JUNCTION BOXES, DUCTS EQUIPPED WITH REMOVABLE COVERS, AND AT EASILY ACCESSIBLE LOCATIONS.
11. CIRCUIT BREAKERS IN POWER DISTRIBUTION PANEL(S) SHALL BE THERMAL-MAGNETIC MOLDED CASE, PERMANENT TRIP WITH 100 AMPERE, MINIMUM FRAME.
12. DUAL LUGS SHALL BE USED WHERE TWO (2) WIRES, SIZE NO. 6 OR LARGER, ARE TO BE CONNECTED TO THE SAME TERMINAL.
13. ALL INTERIOR WALL MOUNTED EQUIPMENT ENCLOSURES SHALL BE MOUNTED ON HOT DIPPED GALVANIZED STEEL STRUT SUPPORT, OR STAINLESS STEEL STRUT SUPPORT, WITH CORROSION RESISTANT HARDWARE.
14. SUPPORT FOR EXTERIOR MOUNTED EQUIPMENT SHALL USE HOT DIPPED GALVANIZED STEEL STRUT SUPPORT OR STAINLESS STEEL STRUT SUPPORT WITH STAINLESS STEEL HARDWARE. PROVIDE ZINC RICH PAINT APPLIED TO FIELD CUTS OF GALVANIZED STEEL SUPPORT TO MINIMIZE THE POTENTIAL FOR CORROSION PER THE RESPECTIVE STRUT SUPPORT MANUFACTURER'S RECOMMENDATIONS.

- 15. CONDUITS FOR ELECTRIC SERVICE ENTRANCE AND FEEDERS SHALL BE AS DETAILED HEREIN ON THE PLANS. WHERE GALVANIZED RIGID STEEL CONDUIT IS SPECIFIED IT SHALL HAVE THREADED FITTINGS. SET SCREW TYPE FITTINGS WILL NOT BE ACCEPTABLE. CONDUITS FOR UNDERGROUND APPLICATIONS SHALL BE AS DETAILED HEREIN. CONDUITS FOR GROUNDING ELECTRODE CONDUCTORS OR INDIVIDUAL GROUNDING CONDUCTORS SHALL BE SCHEDULE 40 OR SCHEDULE 80 PVC.
16. PROVIDE LIQUID TIGHT FLEXIBLE METAL CONDUIT AT CONNECTIONS TO EQUIPMENT SUBJECT TO VIBRATION OR WHERE FLEXIBILITY IS REQUIRED. LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE U.L. LISTED TO MEET THE REQUIREMENTS OF NEC 350.6, SUITABLE FOR GROUNDING, SUNLIGHT RESISTANT, AND RESISTANT TO OIL, GASOLINE, AND GREASE. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO MOTORS, TRANSFORMERS, & CONSTANT CURRENT REGULATORS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. DO NOT INSTALL LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS NOT U.L. LISTED. CONFIRM LIQUID-TIGHT FLEXIBLE METAL CONDUIT BEARS THE UL LABEL PRIOR TO INSTALLING IT.
17. UNLESS OTHERWISE SHOWN, ALL EXPOSED CONDUITS SHALL BE RUN PARALLEL TO OR AT RIGHT ANGLES WITH THE LINES OF THE STRUCTURE.
18. ALL STEEL CONDUITS, FITTINGS, NUTS, BOLTS, ETC. SHALL BE GALVANIZED.
19. USE CONDUIT BUSHINGS AT EACH CONDUIT TERMINATION. WHERE NO. 4 AWG OR LARGER UNDERGROUND WIRE IS INSTALLED, USE INSULATED BUSHINGS.
20. USE DOUBLE LOCK NUTS AT EACH CONDUIT TERMINATION.
21. WRAP ALL PRIMARY AND SECONDARY POWER TRANSFORMER CONNECTIONS WITH SUFFICIENT LAYERS OF INSULATING TAPE (3M SCOTCH 23 ALL-VOLTAGE SPLICING TAPE, 3M SCOTCH 130C LINERLESS RUBBER SPLICING TAPE, OR APPROVED EQUAL) AND COVER WITH VINYL ELECTRICAL TAPE (3M SCOTCH 88 VINYL ELECTRICAL TAPE OR APPROVED EQUAL) FOR FULL VALUE OF CABLE INSULATION VOLTAGE.
22. UNLESS OTHERWISE NOTED, ALL SINGLE CONDUCTOR CONTROL WIRING SHALL BE NO. 12 AWG. COPPER MINIMUM.
23. THE FOLLOWING SHALL APPLY TO RELAY/CONTACTOR PANELS/ENCLOSURES:
A. FOR INTERIOR LOCATIONS ALL COMPONENTS SHALL BE MOUNTED IN NEMA 12 (DUST TIGHT) ENCLOSURE(S) WITH VERTICALLY HINGED COVERS. FOR EXTERIOR/OUTDOOR LOCATIONS ALL COMPONENTS SHALL BE MOUNTED IN NEMA 4X STAINLESS STEEL ENCLOSURE(S) WITH VERTICALLY HINGED COVERS. ALL CONDUIT ENTRIES INTO NEMA 4, 4X ENCLOSURES SHALL HAVE NEMA 4 HUBS LISTED SUITABLE FOR THE RESPECTIVE ENCLOSURE TO MAINTAIN THE NEMA 4, 4X RATING OF THE ENCLOSURE.
B. THE ENCLOSURE(S) SHALL HAVE AMPLE SPACE FOR THE CIRCUIT COMPONENTS, TERMINAL BLOCKS AND INCOMING AND INTERNAL WIRING.
C. ALL CONTROL CONDUCTOR TERMINATIONS SHALL BE OF THE OPEN-EYE CONNECTOR/SCREW TYPE. SOLDERED CLOSED-EYE TERMINATIONS, OR TERMINATIONS WITHOUT CONNECTORS ARE NOT ACCEPTABLE.
D. WHEN THE ENCLOSURE COVER IS OPENED, ALL CIRCUIT COMPONENTS, WIRING AND TERMINALS SHALL BE EXPOSED AND ACCESSIBLE WITHOUT REMOVAL OF ANY PANELS, COVERS, ETC., EXCEPT THOSE COVERING HIGH VOLTAGE COMPONENTS.
E. ACCESS TO, OR REMOVAL OF A CIRCUIT COMPONENT OR TERMINAL BLOCK WILL NOT REQUIRE THE REMOVAL OF ANY OTHER CIRCUIT COMPONENT OR TERMINAL BLOCK.
F. EACH CIRCUIT COMPONENT SHALL BE CLEARLY IDENTIFIED INDICATING ITS CORRESPONDING NUMBER SHOWN ON THE DRAWINGS AND ITS FUNCTION.
G. A COMPLETE WIRING DIAGRAM SHALL BE MOUNTED ON THE INSIDE OF THE COVER. THE DIAGRAM SHALL REPRESENT EACH CONDUCTOR BY A SEPARATE LINE.
H. THE DIAGRAM SHALL IDENTIFY EACH CIRCUIT COMPONENT AN NUMBERING AND COLOR OF EACH TERMINAL CONDUCTOR AND TERMINAL.
I. ALL WIRING SHALL BE NEATLY TRAINED AND LACED.
J. MINIMUM WIRE SIZE SHALL BE NO. 12 AWG.
24. FURNISH & INSTALL A WEATHERPROOF WARNING LABEL FOR EACH METER SOCKET, SERVICE DISCONNECT, SAFETY SWITCH, CUTOFF, PANELBOARD, & CONTROL PANEL TO WARN PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS, PER THE REQUIREMENTS OF NEC 110.16 "FLASH PROTECTION".

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REVISION DATE 12/13/11 UPDATES PER IDA REVIEW
VANDALIA MUNICIPAL AIRPORT VANDALIA, ILLINOIS
Hanson Project No. 11A00300_0800 E-002.DWG NOT TO SCALE 8/26/2011
LAYOUT KNL 07/06/11 DRAWN BAK 07/06/11 REVIEWED CAH 08/26/11
REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING ELECTRICAL NOTES SHEET 1
23 of 31 sheets

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 ELECTRICAL DETAILS SHEET 1.
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 ELECTRICAL DETAILS SHEET 1.
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 ELECTRICAL DETAILS SHEET 1.
21. GALVANIZED/PAINTED EQUIPMENT/COMPONENT SURFACES SHALL NOT BE DAMAGED BY DRILLING, FILING, ETC. DRAIN HOLES IN METAL TRANSFORMER HOUSINGS SHALL BE MADE BEFORE GALVANIZING.
22. 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 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.
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 3500 PSI, AIR-ENTRAINED, MEETING THE REQUIREMENTS OF ITEM 610 STRUCTURAL PORTLAND CEMENT CONCRETE.
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 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 J.U.L.I.E. FOR UTILITY INFORMATION AT 1-800-892-0123.** 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.
32. WHEN PREPARING CABLE FOR SPLICES, THE CONTRACTOR SHALL USE A CABLE STRIPPER/PENCILLER WHENEVER CABLE CONNECTIONS ARE MADE.

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 150/5340-30F DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, CHAPTER 12, PART 12.6; A GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. THE PURPOSE OF THE LIGHT BASE GROUND IS TO PROVIDE A DEGREE OF PROTECTION FOR MAINTENANCE PERSONNEL FROM POSSIBLE CONTACT WITH AN ENERGIZED LIGHT BASE OR MOUNTING STAKE THAT MAY RESULT FROM A SHORTED POWER CABLE OR ISOLATION TRANSFORMER. A LIGHT BASE GROUND SHALL BE INSTALLED AT EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. A LIGHT BASE GROUND SHALL ALSO BE INSTALLED AT EACH STAKE MOUNTED LIGHT FIXTURE. A LIGHT BASE GROUND SHALL BE INSTALLED AND CONNECTED TO THE METAL FRAME OF EACH TAXI GUIDANCE SIGN AS DETAILED ON THE PLANS AND IN ACCORDANCE WITH THE RESPECTIVE TAXI GUIDANCE SIGN MANUFACTURER RECOMMENDATIONS. THE LIGHT BASE GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR BONDED TO THE GROUND LUG ON THE RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND A 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), ULTRAWELD BY HARGER, GRAYSLAKE, ILLINOIS (PHONE: 800-842-7437), OR APPROVED EQUAL. EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS. TOP OF GROUND RODS SHALL BE BURIED 12 INCHES MINIMUM BELOW GRADE, UNLESS SPECIFIED OTHERWISE HEREIN, FOR RESPECTIVE APPLICATIONS.
2. FOR BASE MOUNTED LIGHT FIXTURES THE LIGHT FIXTURE MUST BE BONDED TO THE LIGHT BASE INTERNAL GROUND LUG VIA A #6 AWG STRANDED COPPER WIRE RATED FOR 600 VOLTS WITH GREEN XHHW OR USE INSULATION. THE GROUND WIRE LENGTH MUST BE SUFFICIENT TO ALLOW THE REMOVAL OF THE LIGHT FIXTURE FROM THE LIGHT BASE FOR ROUTINE MAINTENANCE. SEE THE LIGHT FIXTURE MANUFACTURER'S INSTRUCTIONS FOR PROPER METHODS OF ATTACHING A BONDING WIRE.
3. CLEAN ALL METAL SURFACES BEFORE MAKING GROUND CONNECTIONS. METALLIC SURFACES TO BE JOINED SHALL BE PREPARED BY THE REMOVAL OF ALL NON-CONDUCTIVE MATERIAL PER 2011 NATIONAL ELECTRICAL CODE ARTICLE 250-12.
4. PER FAA 150/5340-30F THE RESISTANCE TO GROUND OF THE RESPECTIVE MOUNTING STAKE OR LIGHT BASE (WITH GROUND ROD CONNECTED) MUST BE 25 OHMS OR LESS.

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DATE	REVISION
12/07/11	REVISED PER FAA AC UPDATES
12/15/11	UPDATED NOTE 29 PER IDA REVIEW

**VANDALIA MUNICIPAL AIRPORT
VANDALIA, ILLINOIS**

IL PROJ.: VJA-4111 A.I.P. PROJ.: 3-17-0102-B12

Hanson Project No. 11A00300_0800	File Name E-003.DWG	Scale NOT TO SCALE	Date 8/26/2011
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**REPLACE MEDIUM
INTENSITY AIRFIELD
LIGHTING**

**ELECTRICAL NOTES
SHEET 2**

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 CIRCUAR MIL
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MH	METAL HALIDE
MIN	MINIMUM
MLO	MAIN LUGS ONLY
NEC	NATIONAL ELECTRICAL CODE (NFPA 70)
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OHE	OVERHEAD ELECTRIC
OL	OVERLOAD

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

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

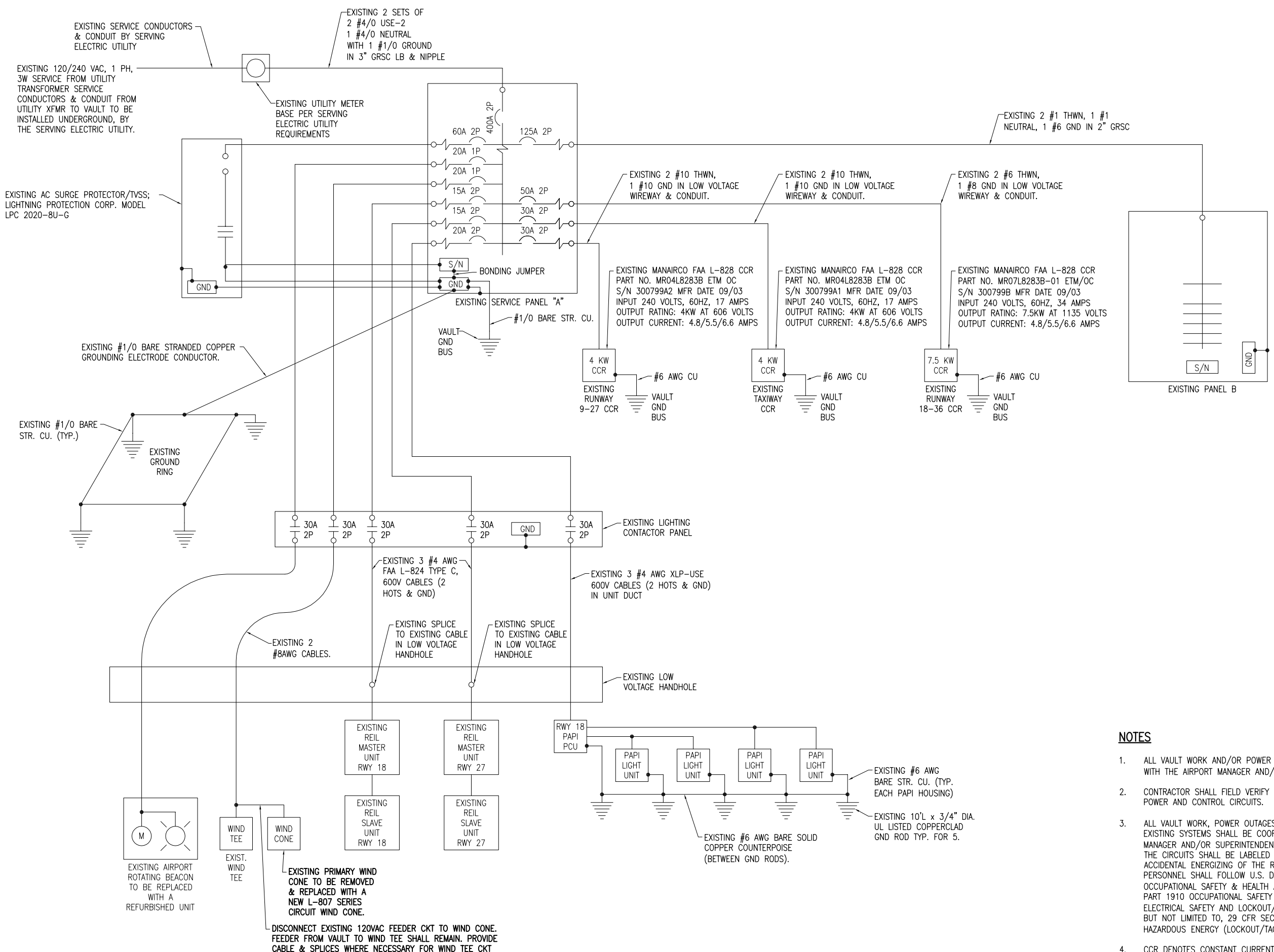
NOTES:

- ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 - NATIONAL ELECTRICAL CODE (NEC) MOST CURRENT ISSUE IN FORCE, THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES, AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L. LISTING, ETL LISTING (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE PERMITTED.
- ALL VAULT WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER AND/OR SUPERINTENDENT OF PARKS. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- COLOR CODE PHASE AND NEUTRAL CONDUCTOR INSULATION FOR NO. 6 AWG OR SMALLER. PROVIDE COLORED INSULATION OR COLORED MARKING TAPE FOR PHASE AND NEUTRAL CONDUCTORS FOR NO. 4 AWG AND LARGER. INSULATED GROUND CONDUCTORS SHALL HAVE GREEN COLORED INSULATION FOR ALL CONDUCTOR AWG AND/OR KCMIL TO COMPLY WITH NEC 250.119. NEUTRAL CONDUCTORS SHALL HAVE WHITE COLORED INSULATION FOR NO. 6 AWG AND SMALLER TO MEET THE REQUIREMENTS OF NEC 200.6. STANDARD COLORS FOR POWER WIRING AND BRANCH CIRCUITS SHALL BE AS FOLLOWS:

120/240 VAC, 1 PHASE, 3 WIRE	
PHASE A	BLACK
PHASE B	RED
NEUTRAL	WHITE
GROUND	GREEN
- SEE RESPECTIVE SITE PLANS FOR SITE LEGEND INFORMATION.
- LTFMC DENOTES LIQUID TIGHT FLEXIBLE METAL CONDUIT UL LISTED, SUNLIGHT RESISTANT, & SUITABLE FOR GROUNDING. LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE U.L. LISTED TO MEET THE REQUIREMENTS OF NEC 350.6. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO CCR'S & TRANSFORMERS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. EXTERNAL BONDING JUMPERS USED WITH CCR INSTALLATIONS SHALL BE #6 AWG COPPER (MINIMUM). DO NOT INSTALL LTFMC THAT IS NOT UL LISTED. CONFIRM LTFMC BEARS THE UL LABEL PRIOR TO INSTALLATION.
- ALL ENCLOSURES RATED NEMA 4, 4X SHALL HAVE WATERTIGHT HUBS AT CONDUIT ENTRANCES U.L. LISTED NEMA 4, 4X FOR THE RESPECTIVE ENCLOSURE, TO MAINTAIN THE NEMA 4, 4X RATING.
- HIGH VOLTAGE & LOW VOLTAGE CIRCUITS SHALL NOT BE INSTALLED IN THE SAME WIREWAY, CONDUIT, DUCT, OR HANDHOLE.

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VANDALIA MUNICIPAL AIRPORT VANDALIA, ILLINOIS					
Hanson Project No. 11A00300_0800 Filename E-001.DWG Scale NOT TO SCALE Date 8/26/2011					
LAYOUT	KNL	07/06/11	REVIEWED	CAH	08/26/11
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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING			ELECTRICAL LEGEND AND ABBREVIATIONS		
25					
25 of 31 sheets					



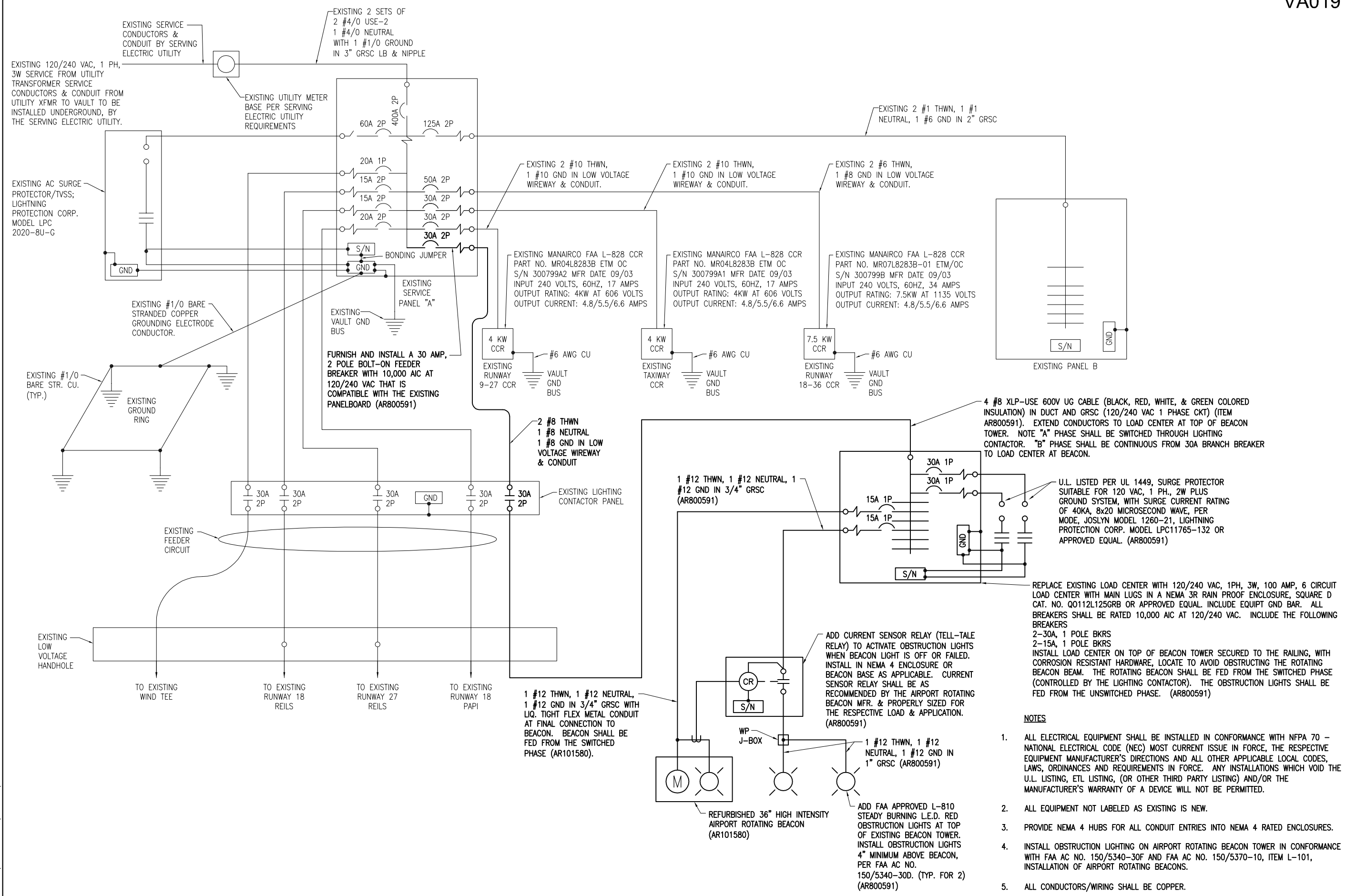
EXISTING VAULT ELECTRICAL ONE-LINE DIAGRAM FOR VAULT & AIRFIELD

NOTES

1. ALL VAULT WORK AND/OR POWER OUTAGES SHALL BE COORDINATED WITH THE AIRPORT MANAGER AND/OR SUPERINTENDENT OF PARKS.
2. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS TO CONFIRM POWER AND CONTROL CIRCUITS.
3. ALL VAULT WORK, POWER OUTAGES AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER AND/OR SUPERINTENDENT OF PARKS. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
4. CCR DENOTES CONSTANT CURRENT REGULATOR.

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Hanson Project No. 11A00300_0800 File Name E-601.DWG Scale NOT TO SCALE Date 8/26/2011		LAYOUT KNL 07/06/11 DRAWN BAK 07/06/11 REVIEWED CAH 08/26/11	
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		26 of 31 sheets	



PROPOSED ELECTRICAL ONE-LINE DIAGRAM FOR VAULT & AIRPORT ROTATING BEACON

REVISION	
DATE	12/02/11
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VANDALIA MUNICIPAL AIRPORT
VANDALIA, ILLINOIS

IL PROJ.: VJA-4111 A.I.P. PROJ.: 3-17-0102-B12

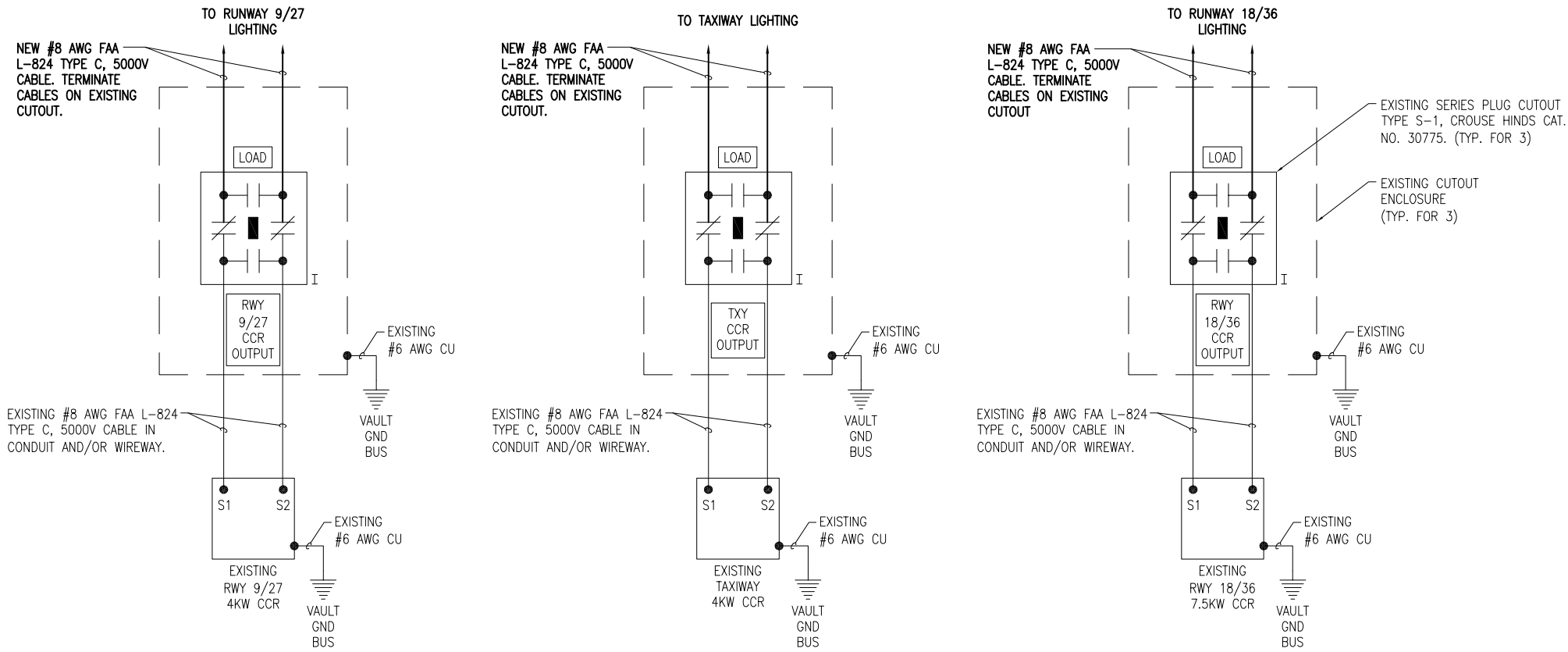
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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING

PROPOSED ELECTRICAL ONE-LINE DIAGRAM FOR VAULT & BEACON

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HIGH VOLTAGE WIRING SCHEMATIC



"DANGER - HIGH VOLTAGE KEEP OUT" SIGN

PROVIDE WARNING SIGN ON VAULT EXTERIOR DOORS LABELED "DANGER - HIGH VOLTAGE - KEEP OUT" PER THE REQUIREMENTS OF NEC 110.34 (C). PROVIDE MINIMUM OF 2 SIGNS (ONE ON EACH DOOR TO THE VAULT).



"DANGER - HIGH VOLTAGE" SIGN

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

NOTES

- HIGH VOLTAGE & LOW VOLTAGE CIRCUITS SHALL NOT BE INSTALLED IN THE SAME CONDUIT, WIREWAY, DUCT, RACEWAY, OR HANDHOLE.
- FURNISH & INSTALL A WEATHERPROOF WARNING LABEL FOR EACH CUTOUT, TO WARN PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS, PER THE REQUIREMENTS OF NEC 110.16 "FLASH PROTECTION". LABELS SHALL BE HAZARD COMMUNICATION SYSTEMS, LLC (190 OLD MILFORD RD., BOX 1174, MILFORD, PA 18337, PHONE: 1-877-748-0244) PART NO. H6010-9VWHBJ OR APPROVED EQUAL.
- FURNISH AND INSTALL A UL RATED, 10 POUND CARBON DIOXIDE FIRE EXTINGUISHER SUITABLE FOR USE ON CLASS C FIRES AND A 10 POUND CLASS 4A:80B:C DRY CHEMICAL ABC FIRE EXTINGUISHER SUITABLE FOR USE ON CLASS A,B,C FIRES, IN THE VAULT SHELTER. PER NFPA 10 "PORTABLE FIRE EXTINGUISHERS" CLASS C ARE FOR FIRES THAT INVOLVE ENERGIZED ELECTRICAL EQUIPMENT. FIRE EXTINGUISHERS SHALL BE MADE IN THE UNITED STATES OF AMERICA TO COMPLY WITH BUY AMERICAN REQUIREMENT. FIRE EXTINGUISHER TYPE CO2 SHALL BE AMEREX MODEL 330, ANSUL SENTRY 10 MODEL CD10A-1 OR APPROVED EQUAL. FIRE EXTINGUISHER DRY CHEMICAL TYPE ABC SHALL BE AMEREX MODEL B456, OR APPROVED EQUAL. PROVIDE WALL MOUNTING BRACKET FOR EACH FIRE EXTINGUISHER. CONFIRM MODEL NUMBERS WITH THE RESPECTIVE FIRE EXTINGUISHER MANUFACTURER.
- VAULT WORK WILL BE PAID FOR UNDER ITEM: AR109210 "VAULT MODIFICATION" PER LUMP SUM.

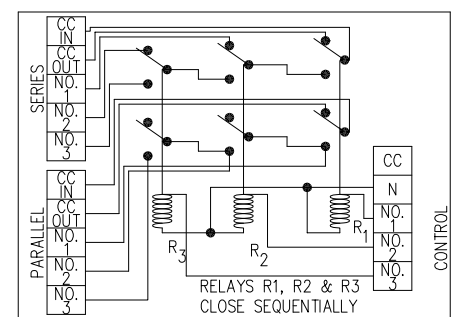
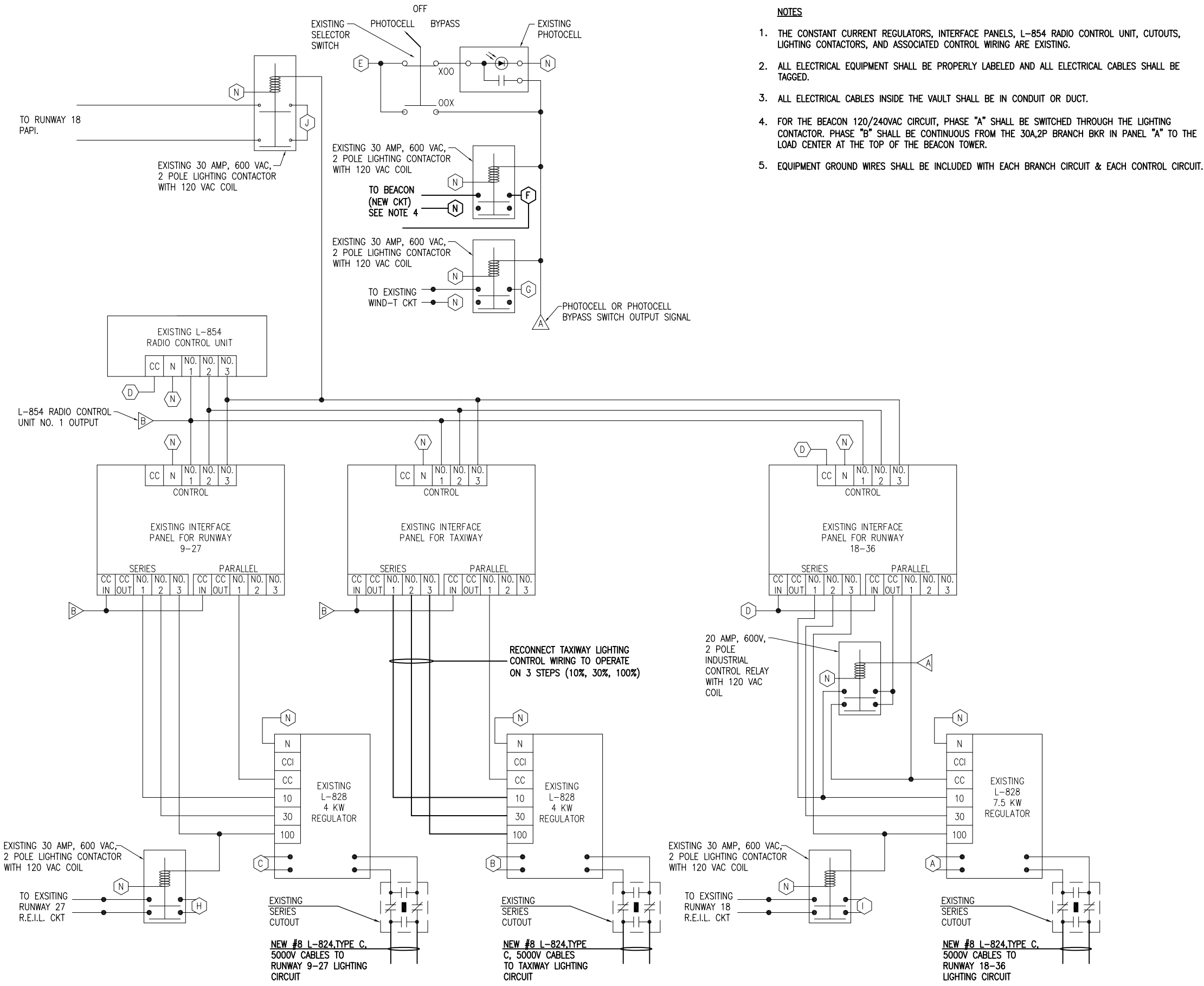
LEGEND

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

REVISION	DATE	VANDALIA MUNICIPAL AIRPORT VANDALIA, ILLINOIS	IL. PROJ.: V/A-4111	A.I.P. PROJ.: 3-17-0102-B12
Hanson Project No. 11A00300_0800	Filename E-603.DWG	LAYOUT KNL 07/06/11	DRAWN BAK 07/06/11	REVIEWED CAH 08/26/11
Scale NOT TO SCALE	Date 8/26/2011			
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28 of 31 sheets				

- NOTES**
1. THE CONSTANT CURRENT REGULATORS, INTERFACE PANELS, L-854 RADIO CONTROL UNIT, CUTOUPS, LIGHTING CONTACTORS, AND ASSOCIATED CONTROL WIRING ARE EXISTING.
 2. ALL ELECTRICAL EQUIPMENT SHALL BE PROPERLY LABELED AND ALL ELECTRICAL CABLES SHALL BE TAGGED.
 3. ALL ELECTRICAL CABLES INSIDE THE VAULT SHALL BE IN CONDUIT OR DUCT.
 4. FOR THE BEACON 120/240VAC CIRCUIT, PHASE "A" SHALL BE SWITCHED THROUGH THE LIGHTING CONTACTOR. PHASE "B" SHALL BE CONTINUOUS FROM THE 30A,2P BRANCH BKR IN PANEL "A" TO THE LOAD CENTER AT THE TOP OF THE BEACON TOWER.
 5. EQUIPMENT GROUND WIRES SHALL BE INCLUDED WITH EACH BRANCH CIRCUIT & EACH CONTROL CIRCUIT.

- SHEET LEGEND**
- (A) EXISTING PANEL A CKT 6, 8 (RWY 18-36 CCR)
 - (B) EXISTING PANEL A CKT 10, 12 (TXY CCR)
 - (C) EXISTING PANEL A CKT 14, 16 (RWY 9-27 CCR)
 - (D) EXISTING PANEL A CKT 5 (RADIO CONTROL)
 - (E) EXISTING PANEL A CKT 7 (PHOTOCELL)
 - (F) NEW 30AMP, 2 POLE, 120/240VAC CKT FOR AIRPORT ROTATING BEACON FROM PANEL A
 - (G) EXISTING PANEL A CKT 11 (WIND-T)
 - (H) EXISTING PANEL A CKT 17, 19 (RWY 27 REILS)
 - (I) EXISTING PANEL A CKT 13, 15 (RWY 18 REILS)
 - (J) EXISTING PANEL A CKT 21, 23 (RWY 18 PAPI)
 - (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.

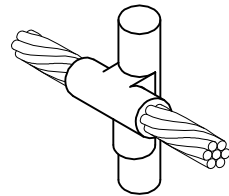


TYP. INTERFACE PANEL DETAIL

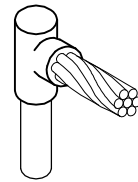
AIRFIELD LIGHTING CONTROL WIRING SCHEMATIC

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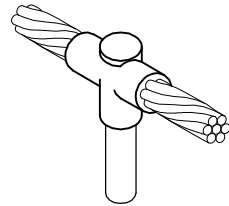
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Hanson Project No. 11A00300_0800 Filename: E-604.DWG Scale: NOT TO SCALE Date: 8/26/2011			
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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING		AIRFIELD LIGHTING CONTROL WIRING SCHEMATIC	
29 29 of 31 sheets			



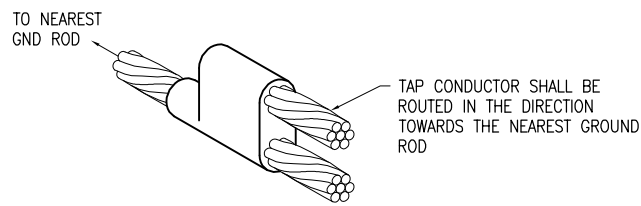
CABLE TO GROUND ROD



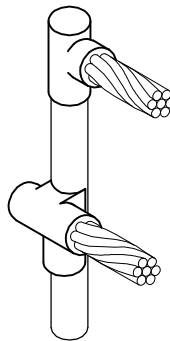
CABLE TO GROUND ROD



CABLE TO GROUND ROD



CABLE TO CABLE HORIZONTAL PARALLEL TAP

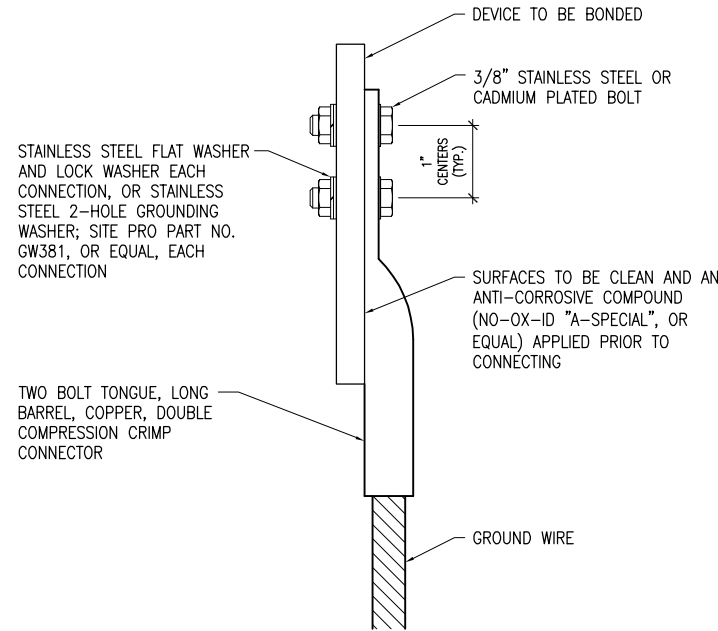


CABLES TO GROUND ROD

DETAIL NOTES

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

EXOTHERMIC WELD DETAILS

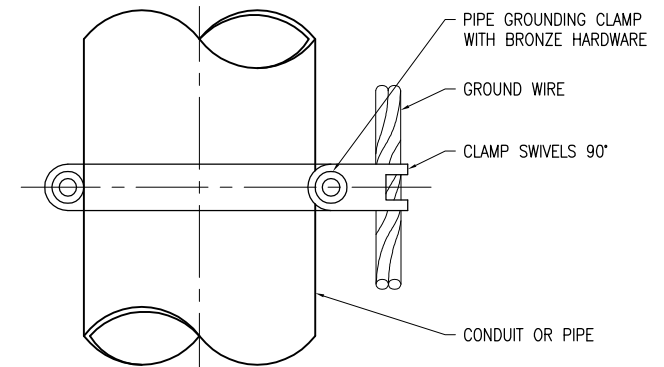
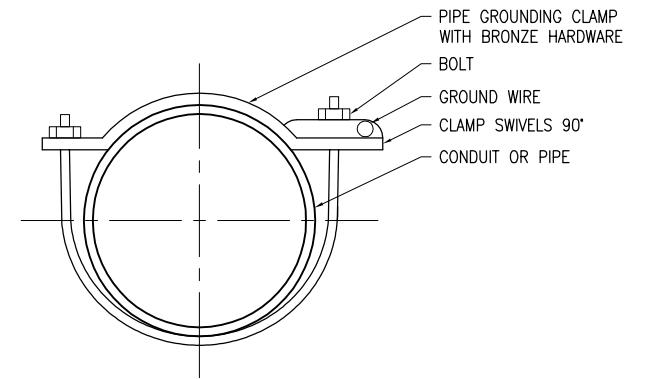


2 HOLE LONG BARREL COMPRESSION LUG TABLE			
WIRE SIZE	BURNDY CAT. NO.	THOMAS & BETTS CAT. NO.	PENN-UNION CAT. NO.
#8 AWG STRANDED	YA8C-2TC38	256-30695-1157	BBLU-8D-2TC38
#6 AWG SOLID	YA8C-2TC38 OR YGA6C-2TC38E2G1		
#6 AWG STRANDED	YA6C-2TC38	256-30695-1158	BBLU-6D-2TC38
#4 AWG STRANDED	YA4C-2TC38	256-30695-1159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

NOTES

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

GROUNDING LUG CONNECTION DETAIL



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

NOTES

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

PIPE/CONDUIT GROUNDING CLAMP DETAIL

DATE	REVISION

VANDALIA MUNICIPAL AIRPORT
VANDALIA, ILLINOIS

IL PROJ.: V/A-4111 A.I.P. PROJ.: 3-17-0102-B12

Hanson Project No. 11A00300_0800	FILENAME E-504.DWG	NOT TO SCALE	DATE 8/26/2011
LAYOUT KNL	DRAWN BAK	REVIEWED CAH	DATE 07/06/11

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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING

GROUNDING DETAILS

GROUNDING NOTES

1. 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 AS DETAILED HEREIN. 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:
2. FURNISH AND INSTALL GROUND RODS AS DETAILED HEREIN. GROUND RODS FOR AIRFIELD LIGHTING (RUNWAY LIGHTING, TAXIWAY LIGHTING, TAXI GUIDANCE SIGNS, & DISTANCE REMAINING SIGNS) SHALL BE MINIMUM 5/8-IN. DIAMETER BY 8-FT LONG, UL-LISTED COPPER CLAD WITH 10-MIL MINIMUM COPPER COATING. GROUND RODS FOR OTHER APPLICATIONS SHALL BE MINIMUM 3/4-IN. DIAMETER BY 10-FT LONG, UL-LISTED, COPPER CLAD WITH 10-MIL MINIMUM COPPER COATING. GROUND RODS SHALL BE SPACED OR AS DETAILED ON THE RESPECTIVE PLANS, AND IN NO CASE SPACED LESS THAN ONE ROD LENGTH APART. ALL CONNECTIONS TO GROUND RODS AND THE GROUND RING SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY ERICO PRODUCTS, INC., SOLON, OHIO, (PHONE 1-800-248-9353), THERMOWELD BY CONTINENTAL INDUSTRIES, INC., TULSA, OKLAHOMA (PHONE 918-663-1440), ULTRAWELD BY HARGER, GRAYSLAKE, ILLINOIS (PHONE 1-800-842-7437), OR APPROVED EQUAL. EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS OR AT BURIED GROUNDING ELECTRODE CONDUCTORS.
3. CONTRACTOR SHALL TEST EACH MADE ELECTRODE GROUND ROD/GROUND FIELD/GROUND RING WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUND FIELD SYSTEMS. IF GROUND RESISTANCE EXCEEDS 10 OHMS, CONTACT THE ENGINEER FOR FURTHER DIRECTION. COPIES OF GROUND FIELD TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER, UPON REQUEST, FOR REVIEW AND RECORD PURPOSES.
4. ALL PRODUCTS ASSOCIATED WITH THE GROUNDING SYSTEM SHALL BE UL-LISTED AND LABELED.
5. ALL BOLTED OR MECHANICAL CONNECTIONS SHALL BE COATED WITH A CORROSION PREVENTATIVE COMPOUND BEFORE JOINING, SANCHEM INC. "NO-OX-ID "A-SPECIAL" COMPOUND, BURNDY PENETROX E, OR EQUAL.
6. METALLIC SURFACES TO BE JOINED SHALL BE PREPARED BY THE REMOVAL OF ALL NON-CONDUCTIVE MATERIAL, PER 2011 NATIONAL ELECTRICAL CODE ARTICLE 250-12. ALL COPPER BUS BARS MUST BE CLEANED PRIOR TO MAKING CONNECTIONS TO REMOVE SURFACE OXIDATION.
7. METALLIC RACEWAY FITTINGS SHALL BE MADE UP TIGHT TO PROVIDE A PERMANENT LOW IMPEDANCE PATH FOR ALL CIRCUITS. METAL CONDUIT TERMINATIONS IN ENCLOSURES SHALL BE BONDED TO THE ENCLOSURE WITH UL-LISTED FITTINGS SUITABLE FOR GROUNDING. PROVIDE GROUNDING BUSHINGS WITH BONDING JUMPERS FOR ALL METAL CONDUITS ENTERING SERVICE EQUIPMENT (METER BASE, CT CABINET, MAIN SERVICE BREAKER ENCLOSURE, ETC.). PROVIDE GROUNDING BUSHINGS WITH BONDING JUMPERS FOR ALL METAL CONDUITS ENTERING AN ENCLOSURE THROUGH CONCENTRIC OR ECCENTRIC KNOCKOUTS THAT ARE PUNCHED OR OTHERWISE FORMED SO AS TO IMPAIR THE ELECTRICAL CONNECTION TO GROUND. STANDARD LOCKNUTS OR BUSHINGS SHALL NOT BE THE SOLE MEANS FOR BONDING WHERE A CONDUIT ENTERS AN ENCLOSURE THROUGH A CONCENTRIC OR ECCENTRIC KNOCKOUT
8. ALL CONNECTIONS, LOCATED ABOVE GRADE, BETWEEN THE DIFFERENT TYPES OF GROUNDING CONDUCTORS SHALL BE MADE USING UL-LISTED DOUBLE COMPRESSION CRIMP TYPE CONNECTORS OR UL-LISTED BOLTED GROUND CONNECTORS. FOR GROUND CONNECTIONS TO ENCLOSURES, CASES AND FRAMES OF ELECTRICAL EQUIPMENT NOT SUPPLIED WITH GROUND LUGS THE CONTRACTOR SHALL DRILL REQUIRED HOLES FOR MOUNTING A BOLTED GROUND CONNECTOR. ALL BOLTED GROUND CONNECTORS SHALL BE BURNDY, THOMAS AND BETTS, OR EQUAL. TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUES IN UL STANDARD 486A TO ASSURE PERMANENT AND EFFECTIVE GROUNDING.
9. ALL METAL EQUIPMENT ENCLOSURES, CONDUITS, CABINETS, BOXES, RECEPTACLES, MOTORS, ETC. SHALL BE BONDED TO THE RESPECTIVE GROUNDING SYSTEM.
10. PROVIDE ALL BOXES FOR PROPOSED OUTLETS, SWITCHES, CIRCUIT BREAKERS, ETC. WITH GROUNDING SCREWS. PROVIDE ALL PANELBOARD, SWITCHGEAR, ETC., ENCLOSURES WITH GROUNDING BARS WITH INDIVIDUAL SCREWS, LUGS, CLAMPS, ETC., FOR EACH OF THE GROUNDING CONDUCTORS THAT ENTER THEIR RESPECTIVE ENCLOSURES.
11. EACH NEW FEEDER CIRCUIT AND/OR BRANCH CIRCUIT SHALL INCLUDE AN EQUIPMENT GROUND WIRE. METAL RACEWAY OR CONDUIT SHALL NOT MEET THIS REQUIREMENT. THE EQUIPMENT GROUND WIRE FROM EQUIPMENT SHALL NOT BE SMALLER THAN ALLOWED BY 2011 NEC TABLE 250-122 "MINIMUM SIZE CONDUCTORS OR GROUNDING RACEWAY AND EQUIPMENT." WHEN CONDUCTORS ARE ADJUSTED IN SIZE TO COMPENSATE FOR VOLTAGE DROP, EQUIPMENT-GROUNDING CONDUCTORS SHALL BE ADJUSTED PROPORTIONATELY ACCORDING TO CIRCULAR MIL AREA. ALL EQUIPMENT GROUND WIRES SHALL BE COPPER, EITHER BARE OR INSULATED 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.
12. ALL EXTERIOR METAL CONDUIT, WHERE NOT ELECTRICALLY CONTINUOUS BECAUSE OF MANHOLES, HANDHOLES, NON-METALLIC JUNCTION BOXES, ETC., SHALL BE BONDED TO ALL OTHER METAL CONDUIT IN THE RESPECTIVE DUCT RUN, AND AT EACH END, WITH A COPPER-BONDING JUMPER SIZED IN CONFORMANCE WITH 2011 NEC 250-102. WHERE METAL CONDUITS TERMINATE IN AN ENCLOSURE (SUCH AS A MOTOR CONTROL CENTER, SWITCHBOARD, ETC) WHERE THERE IS NOT ELECTRICAL CONTINUITY WITH THE CONDUIT AND THE RESPECTIVE ENCLOSURE, PROVIDE A BONDING JUMPER FROM THE RESPECTIVE ENCLOSURE GROUND BUS TO THE CONDUIT SIZED PER 2011 NEC 250-102.
13. IT IS THE INTENT OF THIS SPECIFICATION THAT ALL MOTOR FRAMES, PUMP BASES ELECTRICAL EQUIPMENT ENCLOSURES, PANEL HOUSINGS, CONDUITS, BOXES, ETC. HAVE A CONTINUOUS COPPER WIRE GROUND CONNECTION AND SHALL BE POSITIVELY BONDED TO THE RESPECTIVE GROUNDING SYSTEM. CONDUIT CONNECTORS WILL NOT BE CONSIDERED AS ADEQUATE GROUNDING.
14. PROVIDE A POSITIVE GROUND BOND FOR ALL OUTLET BOXES, ELECTRICAL EQUIPMENT ENCLOSURES, GROUNDING RECEPTACLES, TOGGLE SWITCHES, ETC. INSTALL A GROUNDING CONDUCTOR IN ALL WIRE AND CABLE RACEWAYS. GROUND CONDUCTOR TO HAVE 600-VOLT INSULATION AND BE IDENTIFIED BY A CONTINUOUS GREEN COLOR COATING. THEY SHALL BE USED SOLELY FOR GROUNDING PURPOSES AND BE ENTIRELY SEPARATE FROM WHITE GROUNDED NEUTRAL CONDUCTOR, EXCEPT AT SUPPLY SIDE OF SERVICE DISCONNECTING MEANS, WHERE GROUNDING AND NEUTRAL SYSTEMS ARE TO BE CONNECTED TO SERVICE GROUND.
15. EACH AND ALL GROUNDED CASED AND METAL PARTS ASSOCIATED WITH ELECTRICAL EQUIPMENT SHALL BE TESTED FOR CONTINUITY OF CONNECTION WITH GROUND BUS SYSTEM BY CONTRACTOR IN PRESENCE OF OWNER'S REPRESENTATIVE.
16. ALL CONNECTIONS BETWEEN THE DIFFERENT TYPES OF GROUNDING CONDUCTORS ABOVE GRADE SHALL BE MADE USING BOLTED GROUND CONNECTORS. GROUND LUGS SHALL BE PROVIDED IN ALL ENCLOSURES AND WIRING TERMINATION JUNCTION BOXES. EQUIPMENT GROUNDS AND GROUNDING CONDUCTOR SHALL BE CONNECTED TO THESE GROUND LUGS. FOR GROUND CONNECTIONS TO ENCLOSURES, CASES AND FRAMES OF ELECTRICAL EQUIPMENT NOT SUPPLIED WITH GROUND LUGS THE CONTRACTOR SHALL DRILL REQUIRED HOLES FOR MOUNTING A BOLTED GROUND CONNECTOR. ALL BOLTED GROUND CONNECTORS SHALL BE BURNDY, OR EQUAL.
17. BOND ALL NONCURRENT-CARRYING PARTS OF METAL EQUIPMENT TO GROUND SYSTEM.
18. BUILDING STRUCTURAL STEEL SYSTEM SHALL BE BONDED TO ELECTRICAL GROUND SYSTEM.
19. INSTALL GROUNDING ELECTRODE CONDUCTORS, LIGHTNING PROTECTION DOWN CONDUCTORS AND SEPARATE GROUND CONDUCTORS IN SCHEDULE 40 OR SCHEDULE 80 PVC CONDUIT OR EXPOSED WHERE ACCEPTABLE TO LOCAL CODES. WHERE GROUNDING ELECTRODE CONDUCTORS, LIGHTNING PROTECTION DOWN CONDUCTORS OR INDIVIDUAL GROUND CONDUCTORS ARE RUN IN PVC CONDUIT, 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 GIRDLING DURING A LIGHTNING STRIKE RESULTS IN PHENOMENA KNOWN AS SURGE IMPEDANCE LOADING. SURGE IMPEDANCE LOADING IS A RESULT OF VOLTAGE AND CURRENT REACHING 500,000 VOLTS AND 10,000 AMPS FOR A SHORT DURATION. GIRDLING FURTHER INCREASES THE IMPEDANCE AT LIGHTNING FREQUENCIES OF 100 KILOHERTZ TO 100 MEGAHERTZ. AT THESE POWER AND FREQUENCY LEVELS ANY INCREASE IN THE IMPEDANCE OF THE GROUND CONDUCTOR MUST BE CONTROLLED. DURING LIGHTNING DISCHARGE CONDITIONS A LOW INDUCTIVE IMPEDANCE PATH IS MORE IMPORTANT THAN A LOW DC RESISTANCE PATH.
20. IF LOCAL CODES DICTATE THAT INDIVIDUAL GROUNDING CONDUCTORS MUST BE RUN IN METAL CONDUIT OR RACEWAY, THEN THE CONDUIT OR RACEWAY MUST BE BONDED AT EACH END OF THE RUN WITH A BONDING JUMPER SIZED EQUAL TO THE INDIVIDUAL GROUNDING CONDUCTOR OR AS REQUIRED BY 2011 NEC 250-102. NOTE THIS DOES NOT APPLY TO AC EQUIPMENT GROUNDING CONDUCTORS RUN WITH AC CIRCUITS.
21. WHERE A CONFLICT IS DETERMINED WITH RESPECT TO GROUNDING REQUIREMENTS PER MANUFACTURER INSTALLATION INSTRUCTIONS, NEC, AND/OR THE CONTRACT DOCUMENTS, CONTACT THE RESIDENT ENGINEER OR PROJECT ENGINEER FOR FURTHER DIRECTIONS.

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VANDALIA MUNICIPAL AIRPORT VANDALIA, ILLINOIS					
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REPLACE MEDIUM INTENSITY AIRFIELD LIGHTING			GROUNDING NOTES		
31 31 of 31 sheets					