

# CONSTRUCTION PLANS

FOR

## SOUTHERN ILLINOIS AIRPORT AUTHORITY

MURPHYSBORO/CARBONDALE, JACKSON COUNTY, ILLINOIS

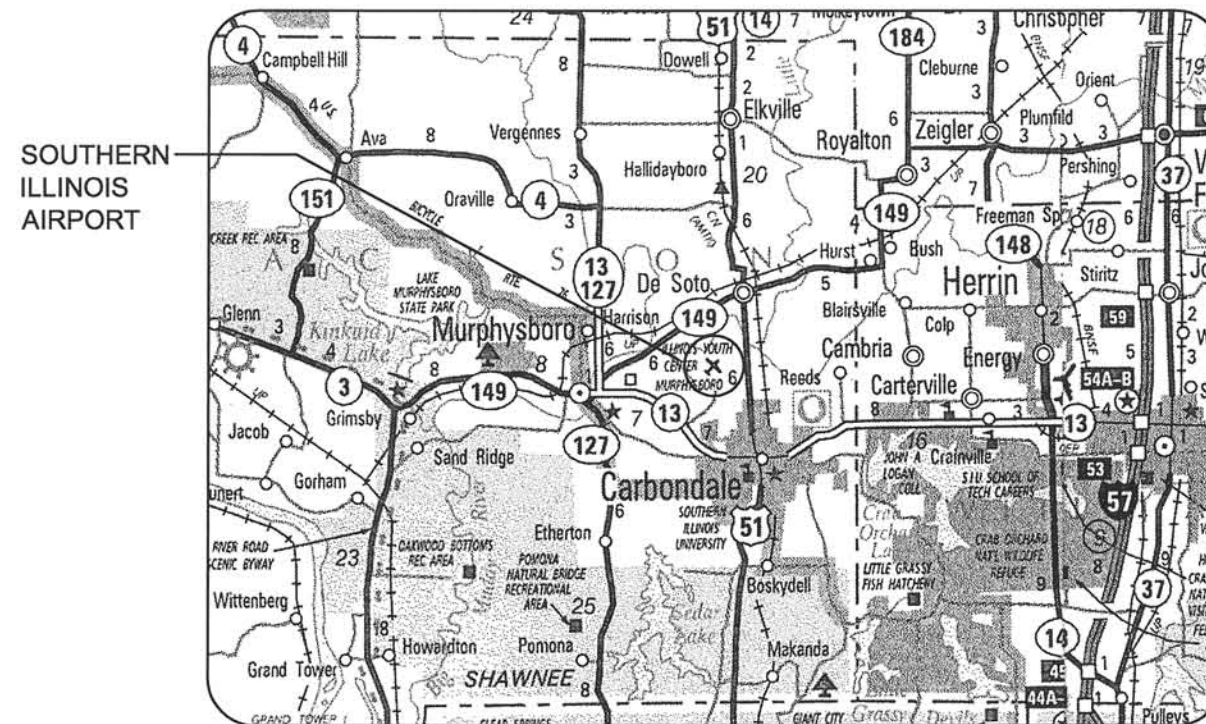
### REPLACE HIGH INTENSITY RUNWAY LIGHTING ON RUNWAY 18L-36R AND VARIOUS ELECTRICAL UPGRADES

**SCOPE OF WORK**

THIS PROJECT CONSISTS OF REMOVAL AND REPLACEMENT OF THE HIGH INTENSITY RUNWAY LIGHTING SYSTEM FOR RUNWAY 18L-36R. THIS PROJECT INCLUDES REMOVAL OF THE WIND TEE, REPLACING THE L-807 WIND CONE, REPLACING TWO L-806 SUPPLEMENTAL WIND CONES, RELOCATING RUNWAY 36R REILS, ASSOCIATED VAULT WORK AND IMPROVEMENTS. THIS PROJECT ALSO INCLUDES REPLACING THE L-821 CONTROL PANEL IN THE AIR TRAFFIC CONTROL TOWER AND THE RESPECTIVE AIRFIELD LIGHTING CONTROL SYSTEM IN THE VAULT.

**ADDITIVE ALTERNATE NO. 1**

INCLUDES REFURBISHING THE AIRPORT ROTATING BEACON AND THE INSTALLATION OF OBSTRUCTION LIGHTS AND LIGHTNING PROTECTION ON THE EXISTING AIRPORT ROTATING BEACON TOWER. ALSO INCLUDES FURNISHING REPLACEMENT SIGN PANELS FOR EXISTING TAXI GUIDANCE SIGNS



SOUTHERN ILLINOIS AIRPORT

### LOCATION

ILL. PROJ.: MDH-3920  
 A.I.P. PROJ.: 3-17-0009-B30  
 LATITUDE: 37° 46' 43"  
 LONGITUDE: 89° 15' 08"  
 ELEVATION: 411.0' M.S.L.  
 DATE: JAN. 8, 2010



Hanson Professional Services Inc.  
ELECTRICAL ENGINEER

Submitted by: *Kevin N. Lightfoot* ENG'R  
 Date Submitted: 1/14/2010  
 Lics. Exp. Date: 11/30/2011



Hanson Professional Services Inc.

Submitted by: *Jeffery S. Litherland* ENG'R  
 Date Submitted: 1/13/10  
 Lics. Exp. Date: 11/30/11

SOUTHERN ILLINOIS AIRPORT AUTHORITY

Approved: *John R. Bunge* CHAIRMAN  
 Date: 1/12/2010



LOCATION OF COUNTY

DATE	REVISION

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS



A.I.P. PROJ.: 3-17-0009-B30  
ILL. PROJ.: MDH-3920

Hanson Project No. 09A0060D_0800
Filename: R-001CVR.DWG
Scale: NOT TO SCALE
Date: 01/08/10
LAYOUT: KNL 11/12/09
DRAWN: MW 11/12/09
REVIEWED: CAH/JSL 01/08/10



Hanson Professional Services Inc.  
 1525 South Sixth Street  
 Springfield, Illinois 62703-2888  
 Offices Nationwide

REPLACE HIRL & VARIOUS ELECTRICAL UPGRADES

COVER SHEET

DATE	REVISION	BY

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	TOTAL QUANTITIES	AS BUILT QUANTITIES
AR107812	L-807 WC-12' INTERNALLY LIT	EACH	1	
AR107900	REMOVE WIND CONE	EACH	1	
AR107901	REMOVE WIND TEE	L.S.	1	
AR107920	REPLACE WIND CONE	EACH	2	
AR108108	1/C #8 5KV UG CABLE	L.F.	16,600	
AR108558	2/C #8 600V UG CABLE IN UD	L.F.	900	
AR108800	CONTROL CABLE	L.F.	1,200	
AR109200	INSTALL ELECTRICAL EQUIPT	L.S.	1	
AR109600	L-821 CONTROL PANEL	EACH	1	
AR109620	LIGHTING CONTROL SYSTEM	L.S.	1	
AR110012	2" DIRECTIONAL BORE	L.F.	820	
AR110014	4" DIRECTIONAL BORE	L.F.	780	
AR110202	2" PVC DUCT DIRECT BURY	L.F.	14,000	
AR110552	EXTEND 2-WAY DUCT	L.F.	17	
AR110610	ELECTRICAL HANDHOLE	EACH	6	
AR125515	HIRL, BASE MOUNTED	EACH	66	
AR125550	HI THRESHOLD LIGHT BASE MTD	EACH	16	
AR125565	SPLICE CAN	EACH	1	
AR125901	REMOVE STAKE MOUNTED LIGHT	EACH	50	
AR125902	REMOVE BASE MOUNTED LIGHT	EACH	31	
AR125944	ADJUST TAXI GUIDANCE SIGN	EACH	3	
AR125945	ADJUST RWY DISTANCE REMAIN SIGN	EACH	5	
AR125964	RELOCATE TAXI GUIDANCE SIGN	EACH	6	
AR125967	RELOCATE REILS	PAIR	1	
AR150530	TRAFFIC MAINTENANCE	L.S.	1	

SUMMARY OF QUANTITIES - ADDITIVE ALTERNATE NO. 1

ITEM NO.	DESCRIPTION	UNIT	TOTAL QUANTITIES	AS BUILT QUANTITIES
AS101580	REFURBISH 36" BEACON	EACH	1	
AS108088	1/C #8 XLP-USE	L.F.	1,200	
AS125470	MODIFY EXISTING SIGN PANEL	EACH	62	
AS800591	UPGRADE AIRPORT ROTATING BEACON	L.S.	1	

INDEX TO SHEETS

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	SUMMARY OF QUANTITIES AND INDEX TO SHEETS
3	PROPOSED SAFETY PLAN
4	PROPOSED CONSTRUCTION SEQUENCING PLAN
5	EXISTING LIGHTING PLAN STA. 0+00 TO STA. 10+50
6	EXISTING LIGHTING PLAN STA. 10+50 TO STA. 24+50
7	EXISTING LIGHTING PLAN STA. 24+50 TO STA. 38+50
8	EXISTING LIGHTING PLAN STA. 38+50 TO STA. 52+50
9	EXISTING LIGHTING PLAN STA. 52+50 TO STA. 65+06.32
10	PROPOSED LIGHTING PLAN STA. 0+00 TO STA. 10+50
11	PROPOSED LIGHTING PLAN STA. 10+50 TO STA. 24+50
12	PROPOSED LIGHTING PLAN STA. 24+50 TO STA. 38+50
13	PROPOSED LIGHTING PLAN STA. 38+50 TO STA. 52+50
14	PROPOSED LIGHTING PLAN STA. 52+50 TO STA. 65+06.32
15	GUIDANCE SIGN DATA
16	EXISTING SEGMENTED CIRCLE AND WIND TEE SITE PLAN
17	PROPOSED L-807 WIND CONE SITE PLAN
18	L-807 WIND CONE DETAIL
19	REIL INSTALLATION DETAIL
20	L-806 WIND CONE ELEVATION DETAIL
21	LIGHTNING PROTECTION DETAILS FOR BEACON
22	PROPOSED ELECTRICAL DETAILS SHEET 1
23	PROPOSED ELECTRICAL DETAILS SHEET 2
24	PROPOSED ELECTRICAL DETAILS SHEET 3
25	PROPOSED ELECTRICAL DETAILS SHEET 4
26	PROPOSED ELECTRICAL NOTES SHEET 1
27	PROPOSED ELECTRICAL NOTES SHEET 2
28	ELECTRICAL LEGEND AND ABBREVIATIONS
29	ELECTRICAL SITE PLAN
30	EXISTING ELECTRICAL PLAN FOR VAULT
31	PROPOSED ELECTRICAL PLAN FOR VAULT
32	PROPOSED GROUNDING PLAN FOR VAULT
33	EXISTING ELECTRICAL ONE LINE DIAGRAM FOR VAULT
34	PROPOSED ELECTRICAL ONE LINE DIAGRAM FOR VAULT
35	PROPOSED ELECTRICAL ONE LINE DIAGRAM FOR VAULT SHEET 2
36	CONTROL BLOCK DIAGRAM FOR AIRFIELD LIGHTING
37	L-821 CONTROL PANEL FOR ATCT
38	LIGHTING CONTACTOR PANEL DETAIL
39	LIGHTING CONTACTOR SCHEMATIC
40	HIGH VOLTAGE WIRING SCHEMATICS
41	SERIES PLUG CUTOUT INSTALLATION DETAIL
42	HIGH VOLTAGE WIRING SCHEMATIC FOR RUNWAY 18L-36R
43	LEGEND PLATE SCHEDULE
44	CCR GROUND BUS RISER
45	GROUNDING DETAILS
46	GROUNDING NOTES

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS



A.I.P. PROJ.: 3-17-0009-B30

IL PROJ.: MDH-3920

Hanson Project No. 09A00600\_0800

Filename: R-002ELP.DWG

Scale: NOT TO SCALE

Date: 01/08/10

LAYOUT	KNL	11/12/09
DRAWN	BAK	11/12/09
REVIEWED	CAH	xx/xx/xx



Hanson Professional Services Inc.  
1000 South Main Street  
Springfield, IL 62703-2886  
Offices Nationwide

REPLACE HIRL &  
VARIOUS ELECTRICAL  
UPGRADES  
AND  
SUMMARY OF QUANTITIES  
INDEX TO SHEETS

**SCOPE OF WORK**

THIS PROJECT CONSISTS OF THE REMOVAL AND REPLACEMENT OF THE HIGH INTENSITY LIGHTING SYSTEM ON RUNWAY 18L-36R. THIS PROJECT INCLUDES REMOVAL OF THE WIND TEE, REPLACING THE L-807 WIND CONE, REPLACING TWO L-806 SUPPLEMENTAL WIND CONES, REFURBISHING THE AIRPORT ROTATING BEACON WITH ASSOCIATED UPGRADES, RELOCATING RUNWAY 36R REELS, ASSOCIATED VAULT WORK AND IMPROVEMENTS. THIS PROJECT ALSO INCLUDES REPLACING THE L-821 CONTROL PANEL IN THE AIR TRAFFIC CONTROL TOWER AND THE RESPECTIVE AIRFIELD LIGHTING CONTROL SYSTEM IN THE VAULT.

**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.

**CONTRACTOR RESPONSIBILITIES**

THE CONTRACTOR'S EQUIPMENT PARKING AND STORAGE AREA WILL BE AS SHOWN. 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.

THE CONTRACTOR SHALL MAINTAIN CONTINUOUS TAXIWAY ACCESS TO ALL HANGARS AND ADMINISTRATIVE AREAS.

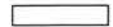



ALL WORK PERFORMED SHALL BE DONE IN A ORDERLY AND EFFECTIVE MANNER TO MINIMIZE RUNWAY CLOSURE(S).

NO TRENCHES OR HOLES WILL REMAIN OPEN OVERNIGHT, EXCEPT AS NOTED ON SHEET 4 OF PLANS. ANY HOLES LEFT OPEN WILL BE BARRICADED.

**BARRICADES AND TRAFFIC CONES**

SEE SHEET NO. 4 FOR LOCATIONS OF THE BARRICADES.

**LEGEND**

-  EXISTING IMPROVEMENTS
-  PROPOSED IMPROVEMENTS
-  EXISTING BUILDINGS
-  PROPOSED HAUL ROUTE AND EQUIPMENT PARKING AREA

**AIRPORT SECURITY NOTE**

AIRPORT SECURITY WILL BE MAINTAINED AT ALL TIMES. THE CONTRACTOR WILL ENSURE THE VEHICULAR GATE (1A) IS CLOSED WHEN ENTERING OR EXITING THE AIRFIELD.

**HEIGHT OF CONSTRUCTION EQUIPMENT**

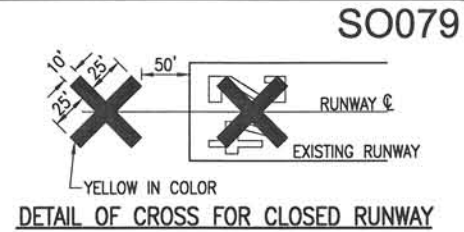
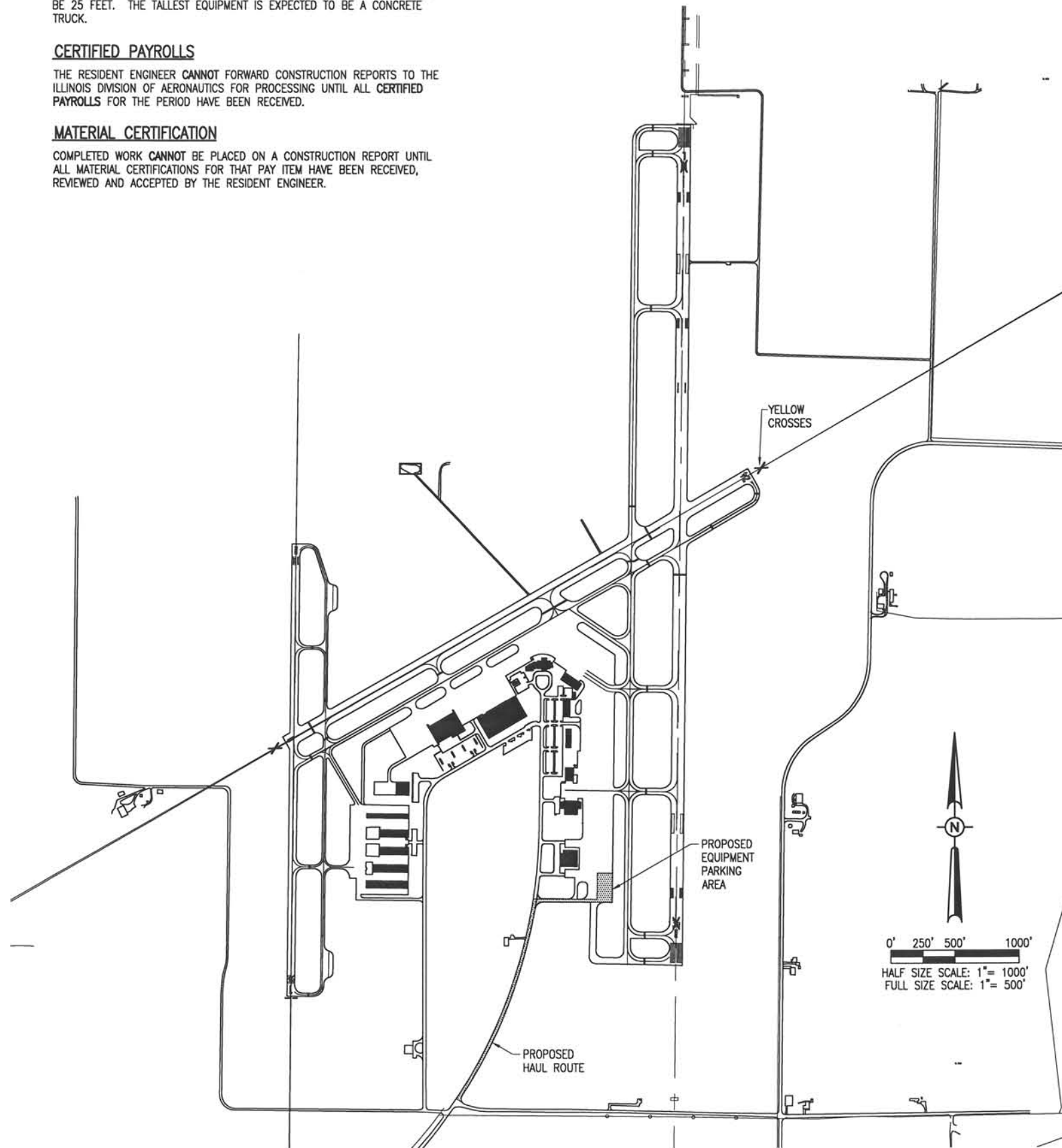
THE MAXIMUM ANTICIPATED HEIGHT OF THE CONSTRUCTION EQUIPMENT WILL BE 25 FEET. THE TALLEST EQUIPMENT IS EXPECTED TO BE A CONCRETE TRUCK.

**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 JACKSON  
 CITY CARBONDALE  
 TOWNSHIP 8 SOUTH  
 RANGE 1 WEST  
 SECTION NO. 31 & 32  
 ADDRESS P.O. BOX 1086  
 CARBONDALE, ILLINOIS 62903-1086

**CRITICAL POINT DATA**

FOR CRITICAL POINT DATA SEE SHEET NO. 4

**PROPOSED SAFETY PLAN**

GENERAL - THE SOUTHERN ILLINOIS AIRPORT IS COMPRISED OF THREE RUNWAYS. THE PROPOSED CONSTRUCTION WILL NECESSITATE THE CLOSING OF RUNWAY 18L-36R AND RUNWAY 6-24. ANY TIME THE CONTRACTOR IS WORKING WITHIN 200' OF ANY RUNWAY, THAT RUNWAY MUST BE CLOSED. RUNWAY CLOSURES WILL BE COORDINATED AS DESCRIBED ON SHEET 4 OF THESE PLANS. PRIOR TO RE-OPENING ANY RUNWAY THE CONTRACTOR WILL SMOOTH GRADE ALL AREAS WITHIN THE SAFETY AREA TO THE SATISFACTION OF THE RESIDENT ENGINEER AND RE-OPEN THE RUNWAY. ALL WORK INCLUDED IN OPENING AND CLOSING THE RUNWAY WILL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

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

RADIO CONTROL - THE CONTRACTOR WILL BE REQUIRED TO BE IN TWO-WAY RADIO CONTACT (121.80 MHz.) WITH THE AIRPORT CONTROL TOWER. THIS WILL 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.

THE CONTRACTOR SHALL BE REQUIRED TO RECEIVE FAR PART 139 TRAINING FOR ALL PERSONNEL WHO DRIVE VEHICLES INSIDE THE FENCED AREA OF THE AIRPORT. SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.

**EROSION CONTROL**


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

**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 100' X 100'. THE CONTRACTOR WILL BE REQUIRED TO PROTECT AND 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. CLEANING AND MAINTENANCE OF THE HAUL ROUTE AND PARKING AREA WILL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED. THE CONTRACTOR SHALL EXERCISE CARE SO AS TO NOT MAR THE PAVEMENT IN THE PARKING AND STORAGE AREA. ANY DAMAGE DONE BY THE CONTRACTOR SHALL BE REPAIRED AT NO EXPENSE TO THE CONTRACT.

SO079

DATE	REVISION	BY

SOUTHERN ILLINOIS AIRPORT  
 MURPHYSBORO / CARBONDALE, ILLINOIS  
  
 A.I.P. PROJ.: 3-17-0009-B30  
 ILL. PROJ.: MDH-3920

Hanson Project No. 09A00600_0800	11/12/09
Filename R-0035FY.DWG	KNL
Scale 1" = 500'	BAK
Date 01/08/10	CAH
LAYOUT	xx/xx/xx
DRAWN	
REVIEWED	

**HANSON**  
 Hanson Professional Services Inc.  
 1525 South Sixth Street  
 Springfield, Illinois 62762-5886  
 Offices Nationwide

REPLACE HIRL &  
 VARIOUS ELECTRICAL  
 UPGRADES  
 PROPOSED  
 SAFETY  
 PLAN

JAN 14, 2010 2:33 PM V00R408005 I:\AIRPORTS\SIA-CARBONDALE\09A00600\CADD\AIRPORT\SHEET\R-0035FY.DWG - Layout1



**BARRICADES:**

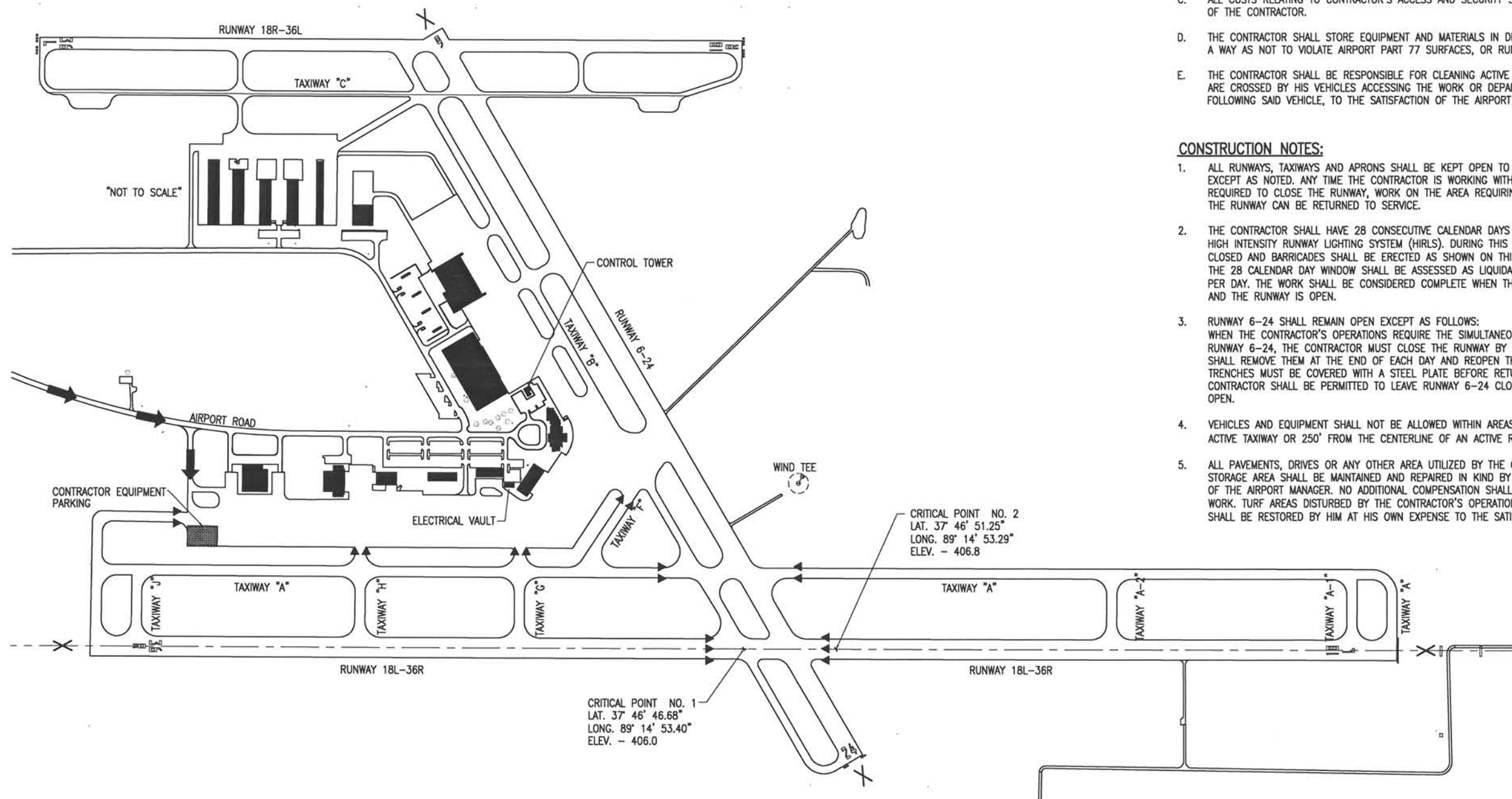
IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO PLACE AND MAINTAIN BARRICADES, TRAFFIC CONES, SIGNS AND OTHER TEMPORARY BARRIERS TO SEPARATE AIRCRAFT TRAFFIC AND CONSTRUCTION TRAFFIC. BARRICADES USED ON THE AIRFIELD WILL BE EQUIPPED WITH 20" SQUARE ORANGE FLAGS AND RED FLASHING LIGHTS. THE RESPONSIBILITY OF AND COST OF ERECTION, MAINTENANCE AND REMOVAL OF ALL TRAFFIC CONTROL MEASURES USED BY THE CONTRACTOR SHALL BE CONSIDERED AS PART OF PAY ITEM AR150530 TRAFFIC MAINTENANCE. COORDINATE ALL CLOSURES WITH RESIDENT ENGINEER.

**CONTRACTOR'S ACCESS SHALL BE AS FOLLOWS:**

- A. THE CONTRACTOR'S ACCESS TO THE WORK SHALL BE THROUGH THE EAST ACCESS GATE (1A), AS SHOWN. THE CONTRACTOR SHALL BE PROVIDED WITH TWO (2) ACCESS CARDS THAT WILL BE RETURNED TO THE AIRPORT PRIOR TO PROJECT ACCEPTANCE.
- B. THE CONTRACTOR SHALL ENSURE THAT HIS PERSONNEL OBEY ALL AIRPORT AND FAA VEHICULAR SAFETY REQUIREMENTS WHILE ON THE PREMISES OF THE AIRPORT. THE CONTRACTOR SHALL BE REQUIRED TO RECEIVE FAR PART 139 TRAINING FROM THE AIRPORT FOR ALL PERSONNEL WHO DRIVE ON THE FIELD. SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.
- C. ALL COSTS RELATING TO CONTRACTOR'S ACCESS AND SECURITY SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- D. THE CONTRACTOR SHALL STORE EQUIPMENT AND MATERIALS IN DESIGNATED AREAS AND IN SUCH A WAY AS NOT TO VIOLATE AIRPORT PART 77 SURFACES, OR RUNWAY AND TAXIWAY SAFETY.
- E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING ACTIVE AIRFIELD PAVEMENTS WHICH ARE CROSSED BY HIS VEHICLES ACCESSING THE WORK OR DEPARTING THE WORK IMMEDIATELY FOLLOWING SAID VEHICLE, TO THE SATISFACTION OF THE AIRPORT MANAGER.

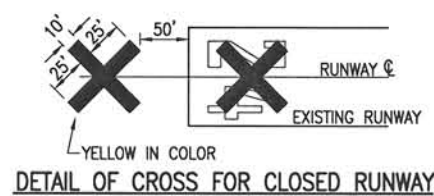
**CONSTRUCTION NOTES:**

- 1. ALL RUNWAYS, TAXIWAYS AND APRONS SHALL BE KEPT OPEN TO AIRCRAFT TRAFFIC DURING CONSTRUCTION EXCEPT AS NOTED. ANY TIME THE CONTRACTOR IS WORKING WITHIN ANY RUNWAY SAFETY AREA AND IS REQUIRED TO CLOSE THE RUNWAY, WORK ON THE AREA REQUIRING CLOSURE MUST BE CONTINUOUS UNTIL THE RUNWAY CAN BE RETURNED TO SERVICE.
- 2. THE CONTRACTOR SHALL HAVE 28 CONSECUTIVE CALENDAR DAYS TO COMPLETE THE INSTALLATION OF THE HIGH INTENSITY RUNWAY LIGHTING SYSTEM (HIRLS). DURING THIS TIME, RUNWAY 18L-36R SHALL BE CLOSED AND BARRICADES SHALL BE ERECTED AS SHOWN ON THIS SHEET. THE PENALTY FOR EXCEEDING THE 28 CALENDAR DAY WINDOW SHALL BE ASSESSED AS LIQUIDATED DAMAGES IN THE AMOUNT OF \$700 PER DAY. THE WORK SHALL BE CONSIDERED COMPLETE WHEN THE NEW HIRLS ARE PROPERLY OPERATING AND THE RUNWAY IS OPEN.
- 3. RUNWAY 6-24 SHALL REMAIN OPEN EXCEPT AS FOLLOWS: WHEN THE CONTRACTOR'S OPERATIONS REQUIRE THE SIMULTANEOUS CLOSURES OF RUNWAYS 18L-36R AND RUNWAY 6-24, THE CONTRACTOR MUST CLOSE THE RUNWAY BY INSTALLING THE YELLOW CROSSES, AND SHALL REMOVE THEM AT THE END OF EACH DAY AND REOPEN THE RUNWAY. ANY OPEN HOLES OR TRENCHES MUST BE COVERED WITH A STEEL PLATE BEFORE RETURNING RUNWAY 6-24 TO SERVICE. THE CONTRACTOR SHALL BE PERMITTED TO LEAVE RUNWAY 6-24 CLOSED OVERNIGHT IF RUNWAY 18L-36R IS OPEN.
- 4. VEHICLES AND EQUIPMENT SHALL NOT BE ALLOWED WITHIN AREAS 80' FROM THE CENTERLINE OF AN ACTIVE TAXIWAY OR 250' FROM THE CENTERLINE OF AN ACTIVE RUNWAY.
- 5. ALL PAVEMENTS, DRIVES OR ANY OTHER AREA UTILIZED BY THE CONTRACTOR AS A HAUL ROUTE OR STORAGE AREA SHALL BE MAINTAINED AND REPAIRED IN KIND BY THE CONTRACTOR TO THE SATISFACTION OF THE AIRPORT MANAGER. NO ADDITIONAL COMPENSATION SHALL BE MADE TO THE CONTRACTOR FOR THIS WORK. TURF AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS OUTSIDE OF THE CONSTRUCTION LIMITS SHALL BE RESTORED BY HIM AT HIS OWN EXPENSE TO THE SATISFACTION OF THE AIRPORT MANAGER.

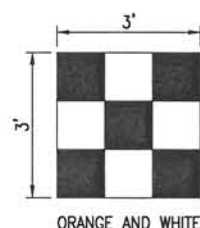


**NOTE:**

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.



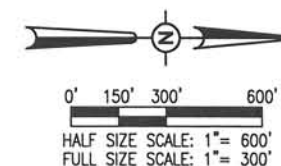
DETAIL OF CROSS FOR CLOSED RUNWAY



CONSTRUCTION EQUIPMENT AND TRUCK SIGNAL FLAG  
"NOT TO SCALE"

**LEGEND**

- EXISTING IMPROVEMENTS
- EXISTING BUILDINGS
- PROPOSED HAUL ROUTE
- PROPOSED EQUIPMENT PARKING AREA
- PROPOSED BARRICADES



DATE	REVISION	BY

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS

**SIA**  
SOUTHERN ILLINOIS AIRPORT

IL PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30

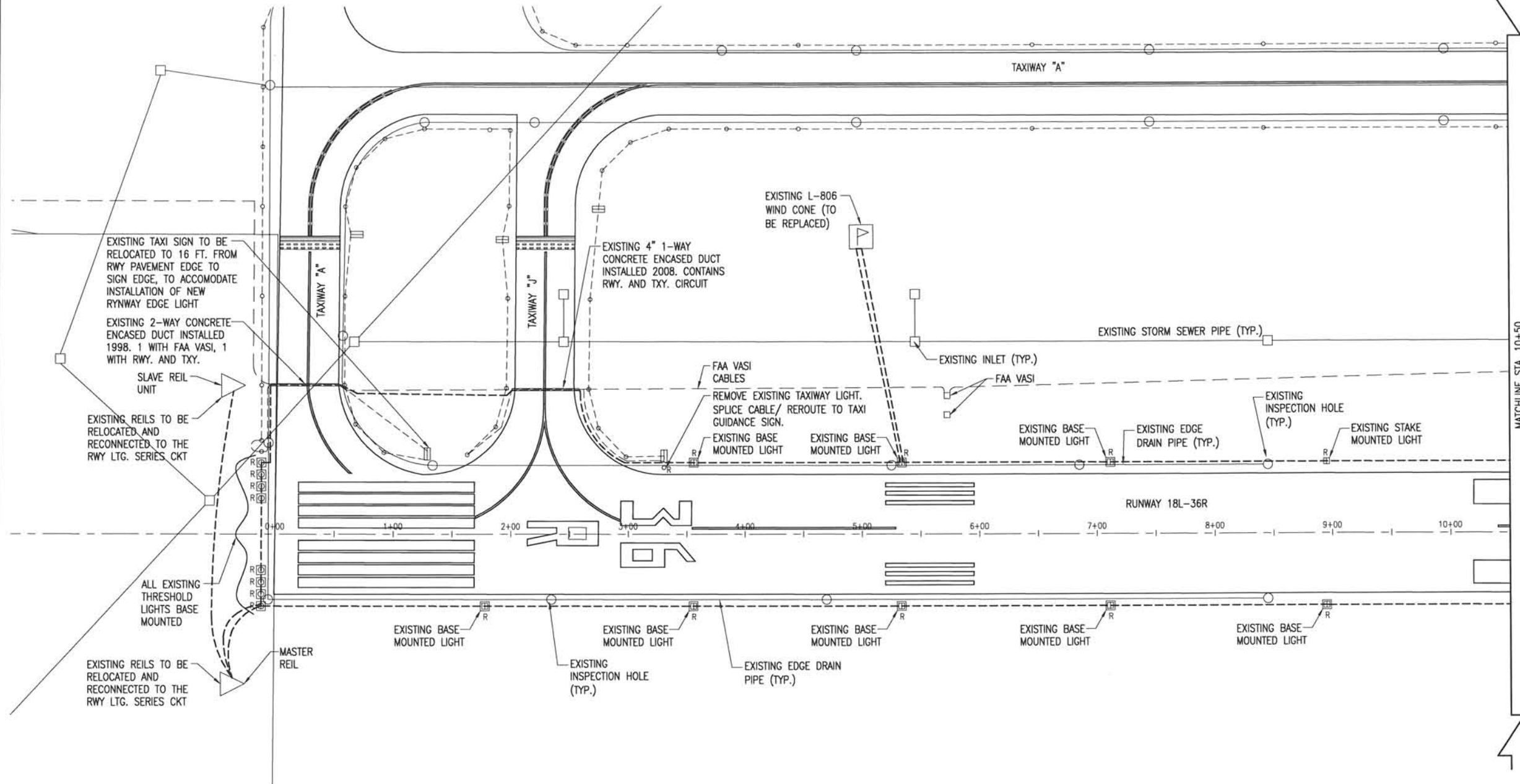
Hanson Project No. 09A00600_0800	FILENAME R-004STG.DWG	DATE 01/07/10
SCALE 1"=300'	DATE 01/08/10	DATE 01/07/10
LAYOUT	CAH	CAH
DRAWN	CAH	CAH
REVIEWED	JSL	JSL

**HANSON**  
Hanson Professional Services Inc.  
1026 South State Street  
Springfield, IL 62703-2886  
Offices Nationwide

REPLACE HIRL & VARIOUS ELECTRICAL UPGRADES  
PROPOSED CONSTRUCTION SEQUENCING PLAN

JAN 14, 2010 2:33 PM V00RH00805 I:\AIRPORTS\SI-M-CARBONDALE\09A00600\CADD\AIRPORT\SHEET\R-004STG.DWG - Layout1





MATCHLINE STA. 10+50

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.

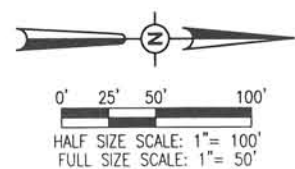
ALL UTILITY CABLES AND LINES SHALL BE LOCATED BY THE RESPECTIVE UTILITY. CONTACT JULIE (JOINT UTILITY LOCATION INFORMATION FOR EXCAVATORS) FOR UTILITY INFORMATION, PHONE: 1-800-892-0123. CONTACT THE FAA (FEDERAL AVIATION ADMINISTRATION) FOR ASSISTANCE IN LOCATING FAA CABLES AND UTILITIES. LOCATION OF 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 REMOVAL NOTES:**

- ALL EXISTING RUNWAY LIGHTS THAT ARE DESIGNATED FOR REMOVAL WILL BE REMOVED. THE LIGHTS AND THEIR ISOLATING TRANSFORMER WILL BE TURNED OVER TO THE AIRPORT MANAGER. THE CONCRETE LIGHT BASES WILL BE REMOVED AND DISPOSED OF LEGALLY OFF THE AIRPORT SITE.
- THE HOLE LEFT FROM THE LIGHT REMOVAL WILL BE FILLED IN WITH EARTH AND COMPACTED TO PREVENT FUTURE SETTLEMENT. THE DISTURBED AREAS WILL BE FERTILIZED AND SEEDING IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
- THE EXISTING RUNWAY CABLES WILL BE ABANDONED IN PLACE UNLESS IT CONFLICTS WITH THE INSTALLATION OF A PROPOSED LIGHT OR CABLE, THEN IT WILL BE REMOVED AT NO ADDITIONAL COST TO THE CONTRACT.
- REMOVAL OF THE EXISTING LIGHTS AND ISOLATING TRANSFORMERS WILL BE PAID FOR UNDER ITEMS:  
AR125901 "REMOVE STAKE MOUNTED LIGHT" PER EACH  
AR125902 "REMOVE BASE MOUNTED LIGHT" PER EACH.

**LEGEND**

	EXISTING PAVEMENT
	EXISTING PAVEMENT MARKING
	EXISTING ELECTRICAL CABLES
	EXISTING ELECTRICAL CABLES (TO BE ABANDONED)
	EXISTING TAXIWAY LIGHT
	EXISTING TAXIWAY LIGHT (TO BE REMOVED)
	EXISTING STAKE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
	EXISTING BASE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
	EXISTING BASE MOUNTED THRESHOLD LIGHT (TO BE REMOVED)



DATE	REVISION	BY

**SOUTHERN ILLINOIS AIRPORT**  
MURPHYSBORO / CARBONDALE, ILLINOIS

**SIA**  
SOUTHERN ILLINOIS AIRPORT

IL. PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30

Hanson Project No. 09A0060D_0800	Filename: R-141ELE.DWG	Scale: 1" = 50'	Date: 01/08/10
LAYOUT	KNL	01/04/2010	
DRAWN	BAK	01/06/2010	
REVIEWED	CAH/JSL	01/08/2010	

**HANSON**

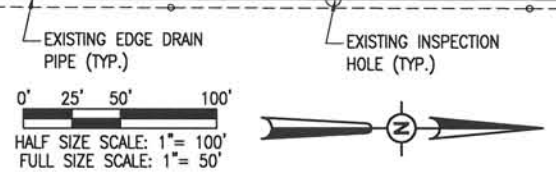
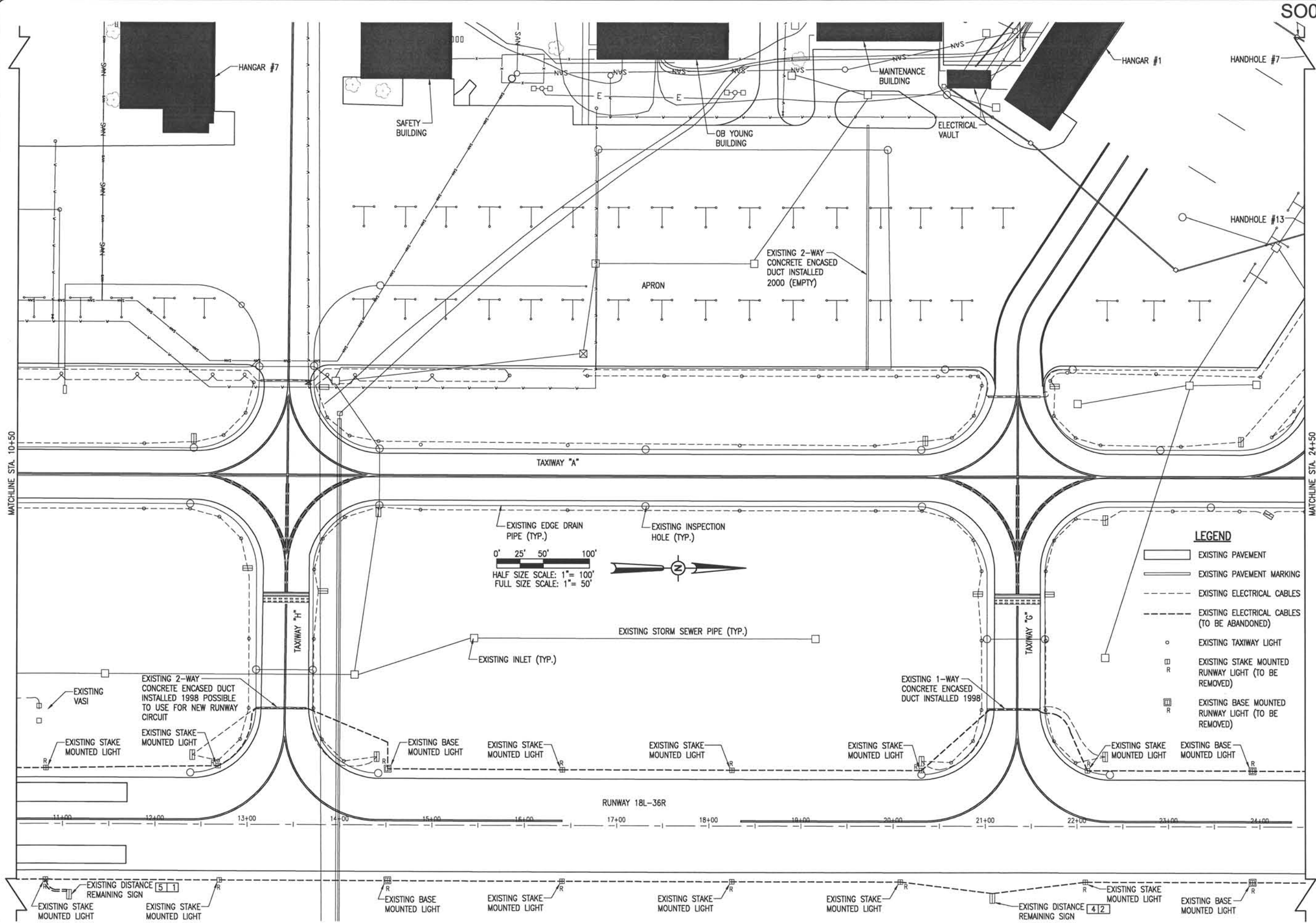
Hanson Professional Services Inc.  
1525 South State Street  
Springfield, IL 62703-2886  
Offices Nationwide

REPLACE HIRL & VARIOUS ELECTRICAL UPGRADES

EXISTING LIGHTING PLAN

STA. 0+00 TO STA. 10+50

JAN 14, 2010 4:28 PM HAGL000382 I:\AIRPORTS\ISA-CARBONDALE\09A0060D\CADD\AIRPORT\SSHEET\R-141ELE.DWG - Layout1



- LEGEND**
- EXISTING PAVEMENT
  - EXISTING PAVEMENT MARKING
  - EXISTING ELECTRICAL CABLES
  - EXISTING ELECTRICAL CABLES (TO BE ABANDONED)
  - EXISTING TAXIWAY LIGHT
  - EXISTING STAKE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
  - EXISTING BASE MOUNTED RUNWAY LIGHT (TO BE REMOVED)

DATE	REVISION	BY

**SOUTHERN ILLINOIS AIRPORT**  
MURPHYSBORO / CARBONDALE, ILLINOIS

**SIA**  
SOUTHERN ILLINOIS AIRPORT

IL PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30

Revision Project No.	09A0060D_0800
Filename	R-141ELE.DWG
Scale	1" = 50'
Date	01/08/10
LAYOUT	KNL 01/04/2010
DRAWN	BAK 01/06/2010
REVIEWED	CAH/JSL 01/08/2010

**HANSON**

Hanson Professional Services Inc.  
1625 E. State Street  
Springfield, Illinois 62703-2886  
Offices Nationwide

**REPLACE HIRL & VARIOUS ELECTRICAL UPGRADES**

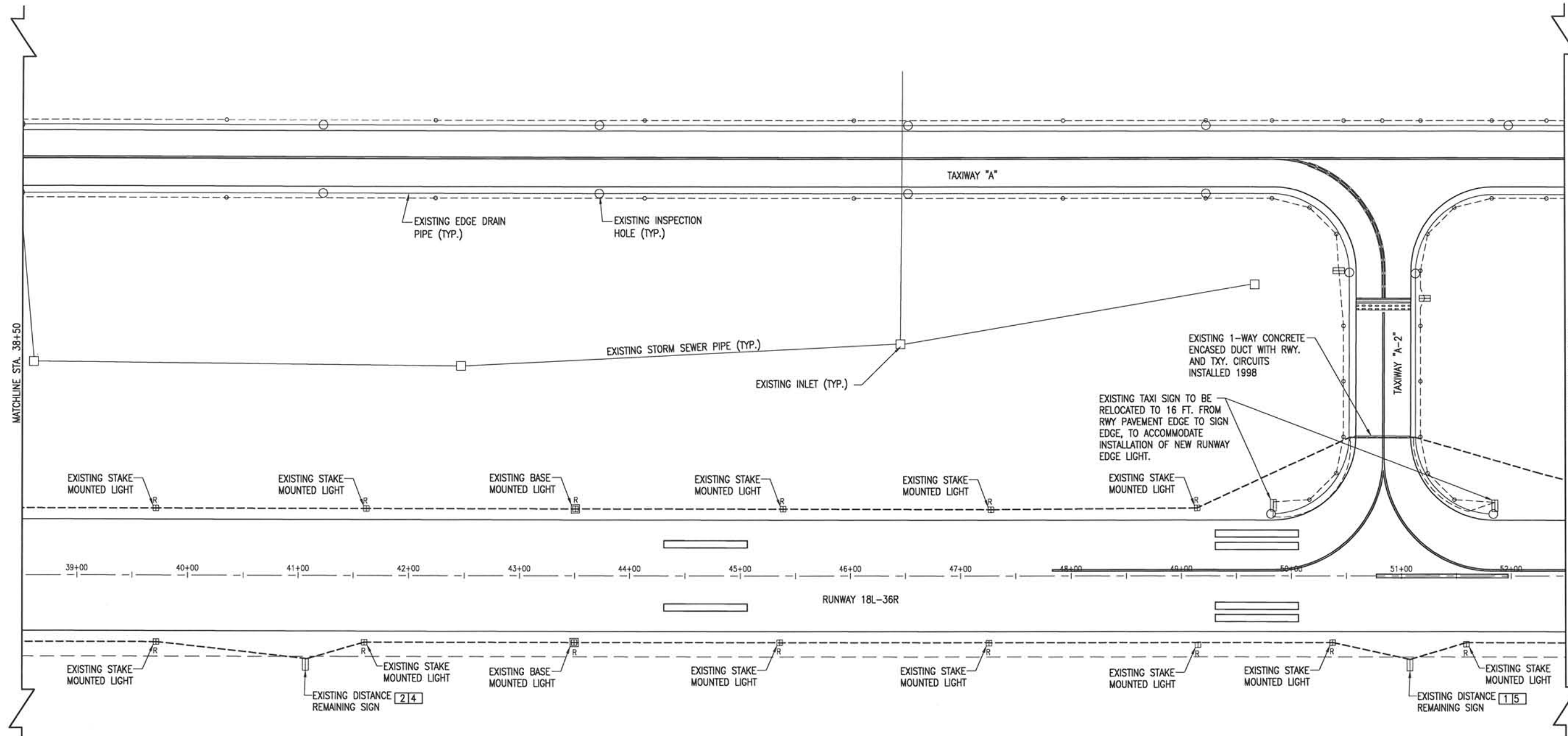
EXISTING LIGHTING PLAN

STA. 10+50 TO STA. 24+50

JAN 14, 2010 2:33 PM V00RH00805  
I:\AIRPORTS\SI-CARBONDALE\09A0060D\CADD\AIRPORT\SHEET\R-141ELE.DWG - Layout1 (2)





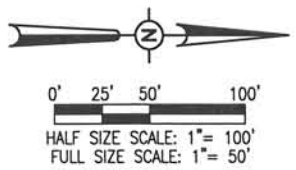


MATCHLINE STA. 38+50

MATCHLINE STA. 52+50

JAN 14, 2010 2:33 PM V00RH00805  
I:\AIRPORTS\SIA-CARBONDALE\09A0060\CADD\AIRPORT\PROJECT\141ELE.DWG -- Layout1 (4)

- LEGEND**
- EXISTING PAVEMENT
  - EXISTING PAVEMENT MARKING
  - EXISTING ELECTRICAL CABLES
  - EXISTING ELECTRICAL CABLES (TO BE ABANDONED)
  - EXISTING TAXIWAY LIGHT
  - EXISTING STAKE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
  - EXISTING BASE MOUNTED RUNWAY LIGHT (TO BE REMOVED)



DATE	REVISION	BY

**SOUTHERN ILLINOIS AIRPORT**  
MURPHYSBORO / CARBONDALE, ILLINOIS

**SIA**  
SOUTHERN ILLINOIS AIRPORT

IL. PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30

Hanson Project No. 09A0060D_0800	
Filename	R-141ELE.DWG
Scale	1" = 50'
Date	01/08/10
LAYOUT	KNL 01/04/2010
DRAWN	BAK 01/06/2010
REVIEWED	CAH/JSL 01/08/2010

**HANSON**

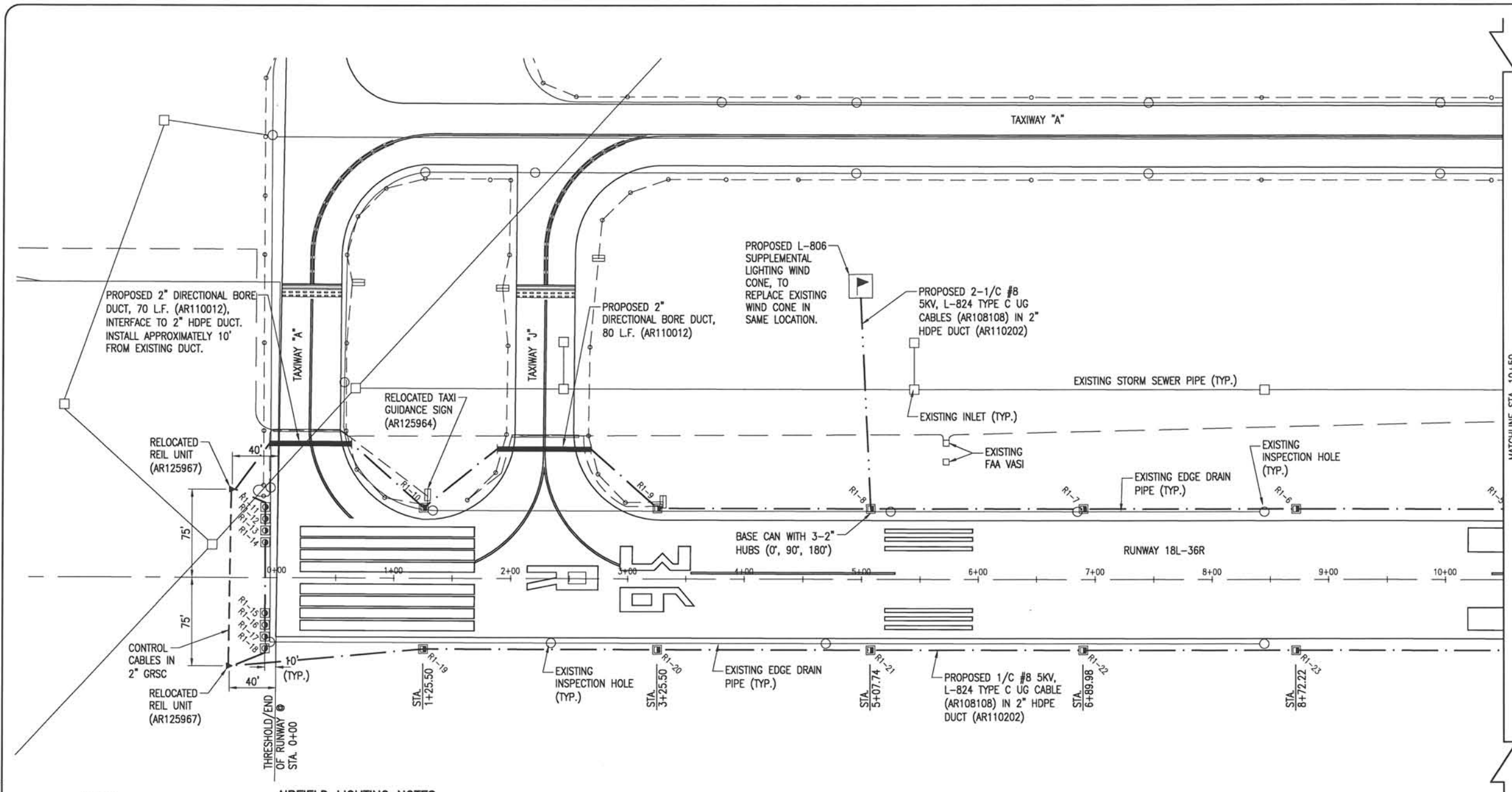
Hanson Professional Services Inc.  
1525 South Shawnee  
Springfield, IL 62703-2886  
Offices Nationwide

**REPLACE HIRL & VARIOUS ELECTRICAL UPGRADES**

EXISTING LIGHTING PLAN

STA. 38+50 TO STA. 52+50

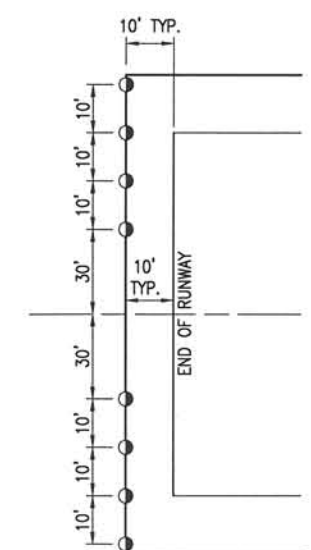




MATCHLINE STA. 10+50

**AIRFIELD LIGHTING NOTES**

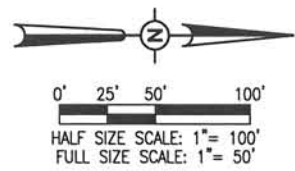
1. ALL PROPOSED RUNWAY AND THRESHOLD LIGHTS SHALL BE PLACED 10' FROM THE PAVEMENT EDGE UNLESS SHOWN OTHERWISE.
2. ALL PROPOSED RUNWAY AND THRESHOLD LIGHTS SHALL BE CONSTRUCTED AT THE LOCATIONS SHOWN ON THIS SHEET AND SHEETS NOS. 11, 12, 13 & 14 AND IN ACCORDANCE WITH THE ELECTRICAL DETAILS SHEETS (22 & 23) AND THE SPECIFICATIONS.
3. PROPOSED RUNWAY LIGHTING CABLES SHALL BE PLACED APPROXIMATELY 10' FROM THE PAVEMENT EDGE UNLESS SHOWN OTHERWISE. CABLES SHALL BE INSTALLED A MINIMUM OF 18" BELOW FINISH GRADE.
4. THE PROPOSED RUNWAY LIGHTING CABLE SHALL BE 1/C, #8, 5 KV, FAA L-824 TYPE C UNDERGROUND CABLE IN 2" HDPE UNIT DUCT.
5. IN AREAS WHERE THERE IS A CONGESTION OF CABLES OR WHERE THE PROPOSED CABLE/DUCT CROSSES AN EXISTING CABLE, THE PROPOSED CABLE/DUCT SHALL BE TRENCHED INTO PLACE. ALL OTHER LOCATIONS THE PROPOSED CABLE/DUCT MAY BE EITHER TRENCHED OR PLOWED INTO PLACE. TRENCHING AND/OR PLOWING WILL BE CONSIDERED INCIDENTAL TO THE PROPOSED CABLES AND/OR DUCT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
6. THE PROPOSED LIGHTS SHALL BE FITTED WITH LENSES ACCORDING TO THE SCHEDULE ON SHEET 12.
7. ALL PROPOSED RUNWAY LIGHTS WILL BE TAGGED IN ACCORDANCE WITH THE LIGHT'S NUMBER SHOWN ON THE PLANS.
8. SEE "REIL INSTALLATION DETAILS" SHEET 19 AND SPECIAL PROVISIONS SPECS FOR REQUIREMENTS ON RELOCATION OF REILS.
9. SEE "L-806 WIND CONE ELEVATIONS DETAIL" SHEET 20 AND SPECIAL PROVISION SPECS FOR REQUIREMENTS ON REPLACEMENT OF L-806 SUPPLEMENTAL LIGHTED WIND CONES.
10. SEE "ELECTRICAL DETAIL SHEET 4" (SHEET 25) AND SPECIAL PROVISION SPECS FOR REQUIREMENTS ON ITEM AR125944 ADJUST TAXI GUIDANCE SIGN AND ITEM AR125945 ADJUST RUNWAY DISTANCE REMAIN SIGN.
11. SEE "ELECTRICAL DETAIL SHEET 1" (SHEET 22) AND SPECIAL PROVISION SPECS FOR REQUIREMENTS ON ITEM AR125964 RELOCATE TAXI GUIDANCE SIGN.



**PROPOSED THRESHOLD LIGHT DETAIL**  
NOT TO SCALE

**LEGEND**

- EXISTING PAVEMENT
- EXISTING ELECTRICAL CABLES
- EXISTING TAXIWAY LIGHT
- EXISTING TAXI GUIDANCE SIGN/DISTANCE REMAINING SIGN
- PROPOSED BASE MOUNTED RUNWAY LIGHT
- PROPOSED BASE MOUNTED THRESHOLD LIGHT
- PROPOSED L-806 WIND CONE
- PROPOSED ELECTRICAL DUCT
- PROPOSED 2-1/C #8 5KV, L-824 TYPE C UG CABLE IN 2" HDPE DUCT
- PROPOSED 1/C #8 5KV, L-824 TYPE C UG CABLE IN 2" HDPE DUCT

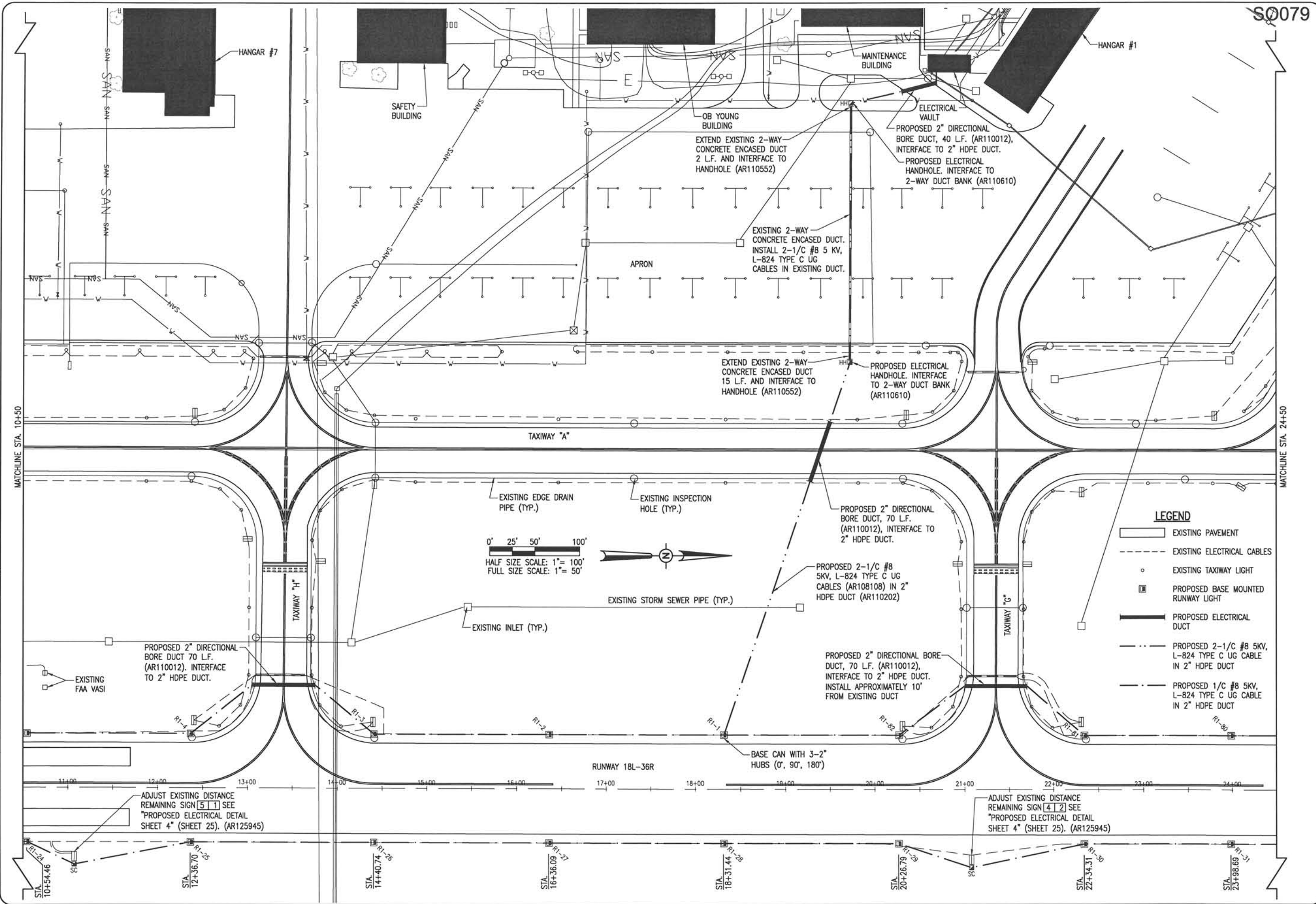


JAN 14, 2010 2:33 PM V00RH00805 I:\AIRPORTS\SM-CARBONDALE\09A0060\CADD\AIRPORT\SHEET\R-142ELE.DWG - Layout1



DATE	REVISION	BY	
<p><b>SOUTHERN ILLINOIS AIRPORT</b> MURPHYSBORO / CARBONDALE, ILLINOIS</p> <p style="text-align: right;">A.I.P. PROJ.: 3-17-0009-B30</p>			
<p>IL PROJ.: MDH-3920</p>			
<p>Revision Project No. 09A0060D_0800 Filename: R-142ELE.DWG Scale: 1" = 50' Date: 01/08/10</p>			
LAYOUT	KNL	01/04/2010	
DRAWN	BAK	01/06/2010	
REVIEWED	CAH/JSL	01/08/2010	
<p>Hanson Professional Services Inc. 1925 South State Street Springfield, IL 62703-2886 Offices Nationwide</p>			
<p><b>REPLACE HIRL &amp; VARIOUS ELECTRICAL UPGRADES</b></p>		<p><b>PROPOSED LIGHTING PLAN</b></p>	
<p>STA. 0+00 TO STA. 10+50</p>			
<p style="font-size: 2em; font-weight: bold;">10</p>			
<p>10 of 46 sheets</p>			



JAN 14, 2010 2:33 PM VOORH0805  
 I:\AIRPORTS\SIA-CARBONDALE\09A0000\CADD\AIRPORT\SHEET\R-142ELE.DWG - Layout1 (2)



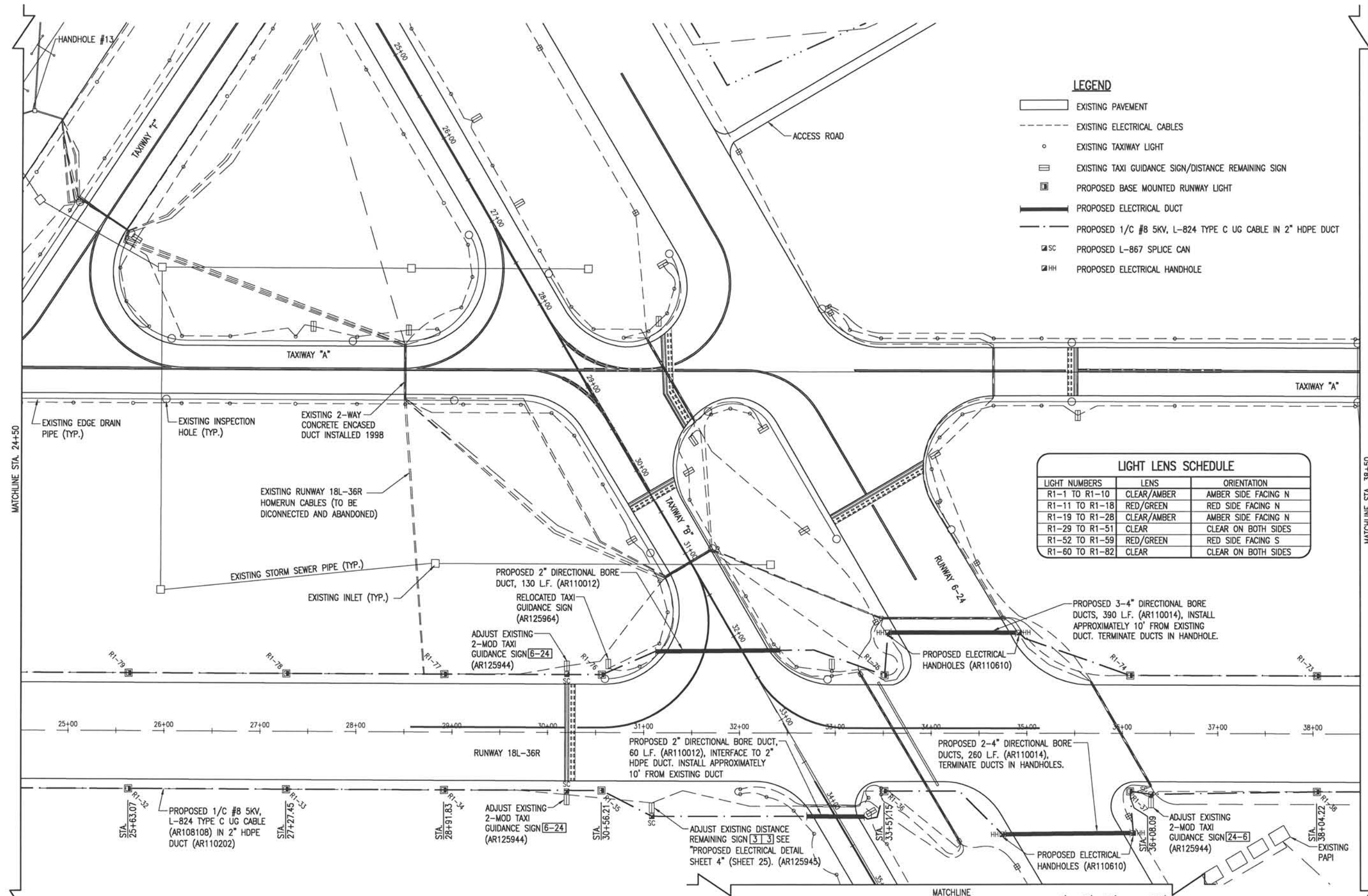
S0079

BY	
REVISION	
DATE	
<b>SOUTHERN ILLINOIS AIRPORT</b> MURPHYSBORO / CARBONDALE, ILLINOIS 	
A.I.P. PROJ.: 3-17-0009-B30 I.L. PROJ.: MDH-3920	
Horizon Project No. 09A00600_0800 Filename R-142ELE.DWG Scale 1" = 50' Date 01/08/10	LAYOUT KNL 01/04/2010 DRAWN BAK 01/06/2010 REVIEWED CAH/JSI 01/08/2010
 Hanson Professional Services Inc. 1525 South Sixth Street Springfield, Illinois 62705-2886 Offices Nationwide	
<b>REPLACE HIRL &amp; VARIOUS ELECTRICAL UPGRADES</b> PROPOSED LIGHTING PLAN STA. 10+50 TO STA. 24+50	
11	
11 of 46 sheets	

- LEGEND**
- EXISTING PAVEMENT
  - - - EXISTING ELECTRICAL CABLES
  - EXISTING TAXIWAY LIGHT
  - ▢ EXISTING TAXI GUIDANCE SIGN/DISTANCE REMAINING SIGN
  - ▣ PROPOSED BASE MOUNTED RUNWAY LIGHT
  - PROPOSED ELECTRICAL DUCT
  - - - PROPOSED 1/C #8 5KV, L-824 TYPE C UG CABLE IN 2" HDPE DUCT
  - SC PROPOSED L-867 SPLICE CAN
  - HH PROPOSED ELECTRICAL HANDHOLE

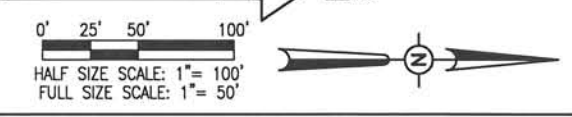
**LIGHT LENS SCHEDULE**

LIGHT NUMBERS	LENS	ORIENTATION
R1-1 TO R1-10	CLEAR/AMBER	AMBER SIDE FACING N
R1-11 TO R1-18	RED/GREEN	RED SIDE FACING N
R1-19 TO R1-28	CLEAR/AMBER	AMBER SIDE FACING N
R1-29 TO R1-51	CLEAR	CLEAR ON BOTH SIDES
R1-52 TO R1-59	RED/GREEN	RED SIDE FACING S
R1-60 TO R1-82	CLEAR	CLEAR ON BOTH SIDES



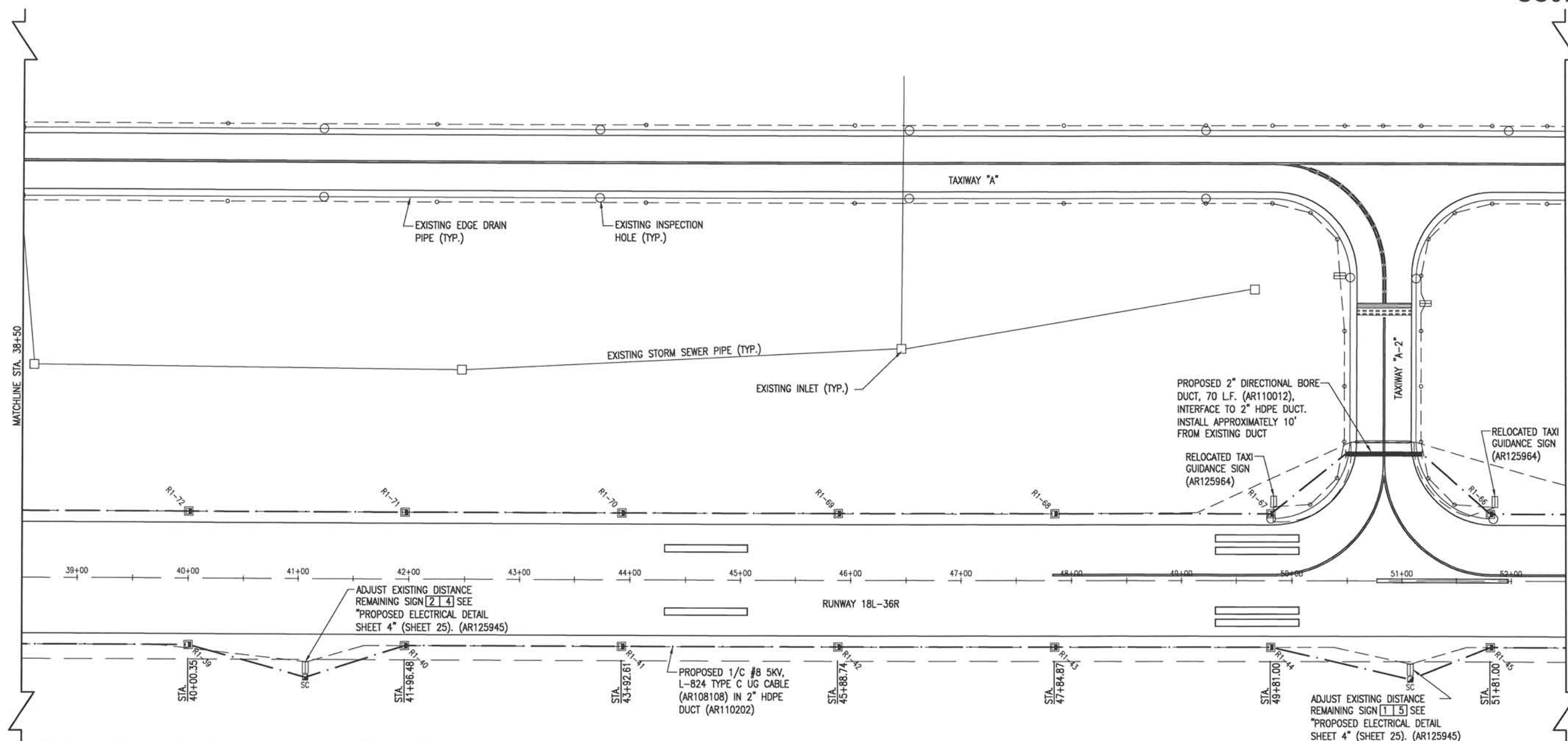
MATCHLINE STA. 24+50

MATCHLINE STA. 38+50



	BY				
	REVISION				
	DATE				
<p><b>SOUTHERN ILLINOIS AIRPORT</b> MURPHYSBORO / CARBONDALE, ILLINOIS</p> <p><b>SIA</b> SOUTHERN ILLINOIS AIRPORT</p> <p>IL PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30</p>					
<p>Hanson Project No. 09A00600_0800                  Filename: R-142ELE.DWG                  Scale: 1" = 50'                  Date: 01/08/10</p>					
LAYOUT	KNL	01/04/2010	BAK	01/06/2010	
DRAWN	CAH/JSI	01/08/2010	REVIEWED	CAH/JSI	01/08/2010
<p><b>HANSON</b>                  Hanson Professional Services Inc.                  1526 South Sixth Street                  Springfield, IL 62761-2886                  Offices Nationwide</p>					
<p><b>REPLACE HIRL &amp; VARIOUS ELECTRICAL UPGRADES</b>                  PROPOSED LIGHTING PLAN                  STA. 24+50 TO STA. 38+50</p>					
<p><b>12</b>                  12 of 46 sheets</p>					

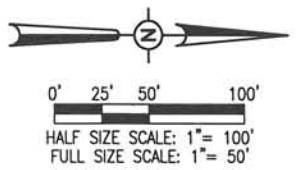
JAN 14, 2010 2:33 PM V00RH00805  
 I:\AIRPORTS\SIA-CARBONDALE\09A00600\CADD\AIRPORT\SHEET\142ELE.DWG - Layout1 (3)



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.

- LEGEND**
- EXISTING PAVEMENT
  - EXISTING ELECTRICAL CABLES
  - EXISTING TAXIWAY LIGHT
  - EXISTING TAXI GUIDANCE SIGN/DISTANCE REMAINING SIGN
  - PROPOSED BASE MOUNTED RUNWAY LIGHT
  - PROPOSED ELECTRICAL DUCT
  - PROPOSED 1/C #8 5KV, L-824 TYPE C UG CABLE IN 2" HDPE DUCT
  - PROPOSED L-867 SPLICE CAN



JAN 14, 2010 2:33 PM V00RH00805 I:\AIRPORTS\SIA-CARBONDALE\09A0060\CADD\AIRPORT\SHEET\R-142ELE.DWG - Layout1 (4)

DATE	REVISION	BY

**SOUTHERN ILLINOIS AIRPORT**  
MURPHYSBORO / CARBONDALE, ILLINOIS

IL PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30

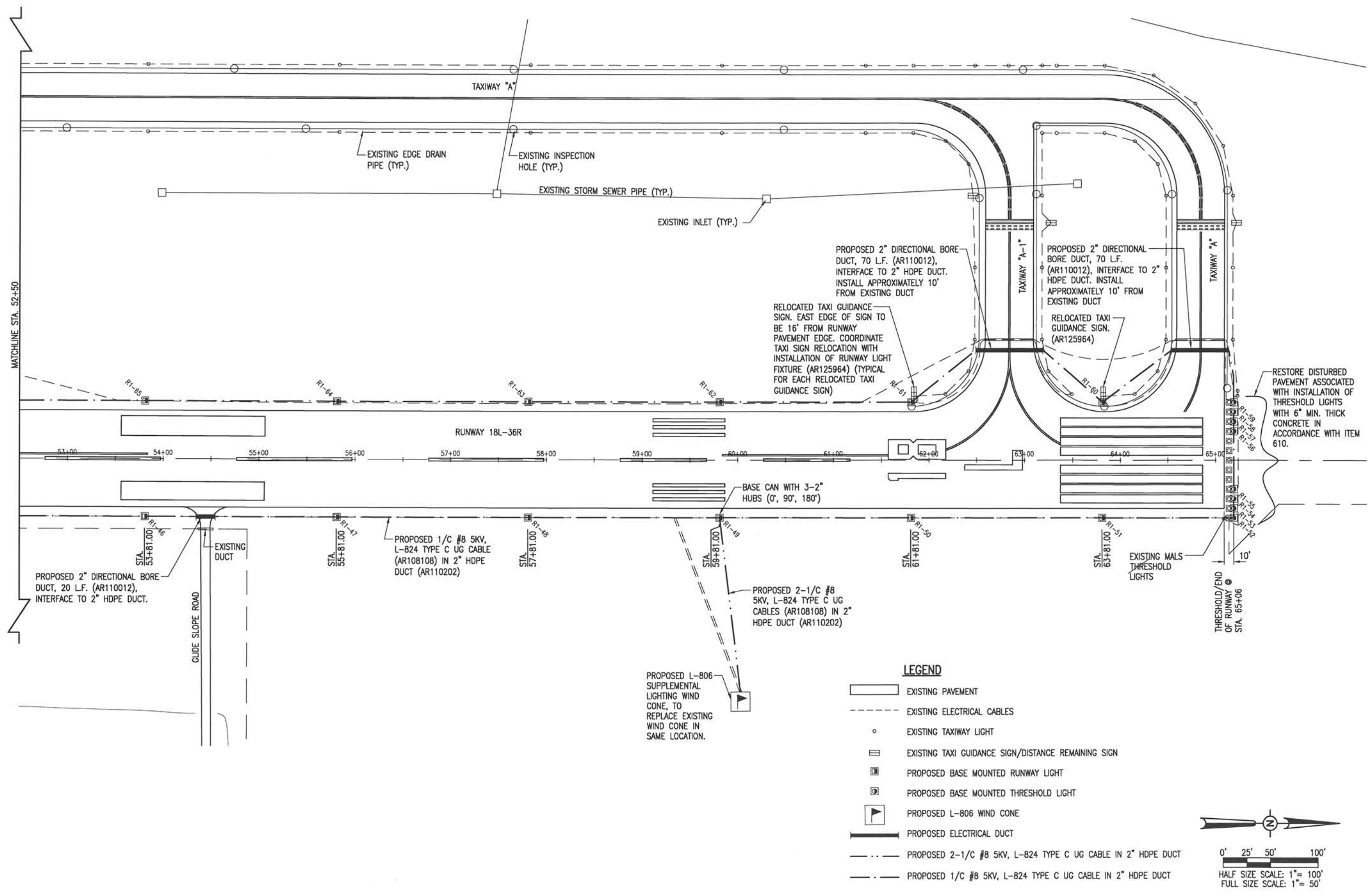
Hanson Project No. 09A00600\_0800  
Filename: R-142ELE.DWG  
Scale: 1" = 50'  
Date: 01/08/10

LAYOUT	KNL	01/04/2010
DRAWN	BAK	01/06/2010
REVIEWED	CAH/JSL	01/08/2010

Hanson Professional Services Inc.  
1025 South State Street  
Springfield, IL 62703-2886  
Offices Nationwide

**REPLACE HIRL & VARIOUS ELECTRICAL UPGRADES**  
PROPOSED LIGHTING PLAN  
STA. 38+50 TO STA. 52+50

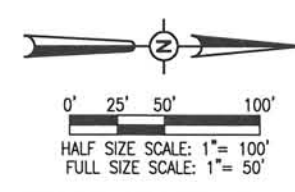




I:\AIRPORTS\SIA-CARBONDALE\09A0060\CADD\AIRPORT\PROJECT\142ELE.DWG - Layout1 (5)  
 JAN 14, 2010 2:33 PM V00R000805

PROPOSED L-806 SUPPLEMENTAL LIGHTING WIND CONE, TO REPLACE EXISTING WIND CONE IN SAME LOCATION.

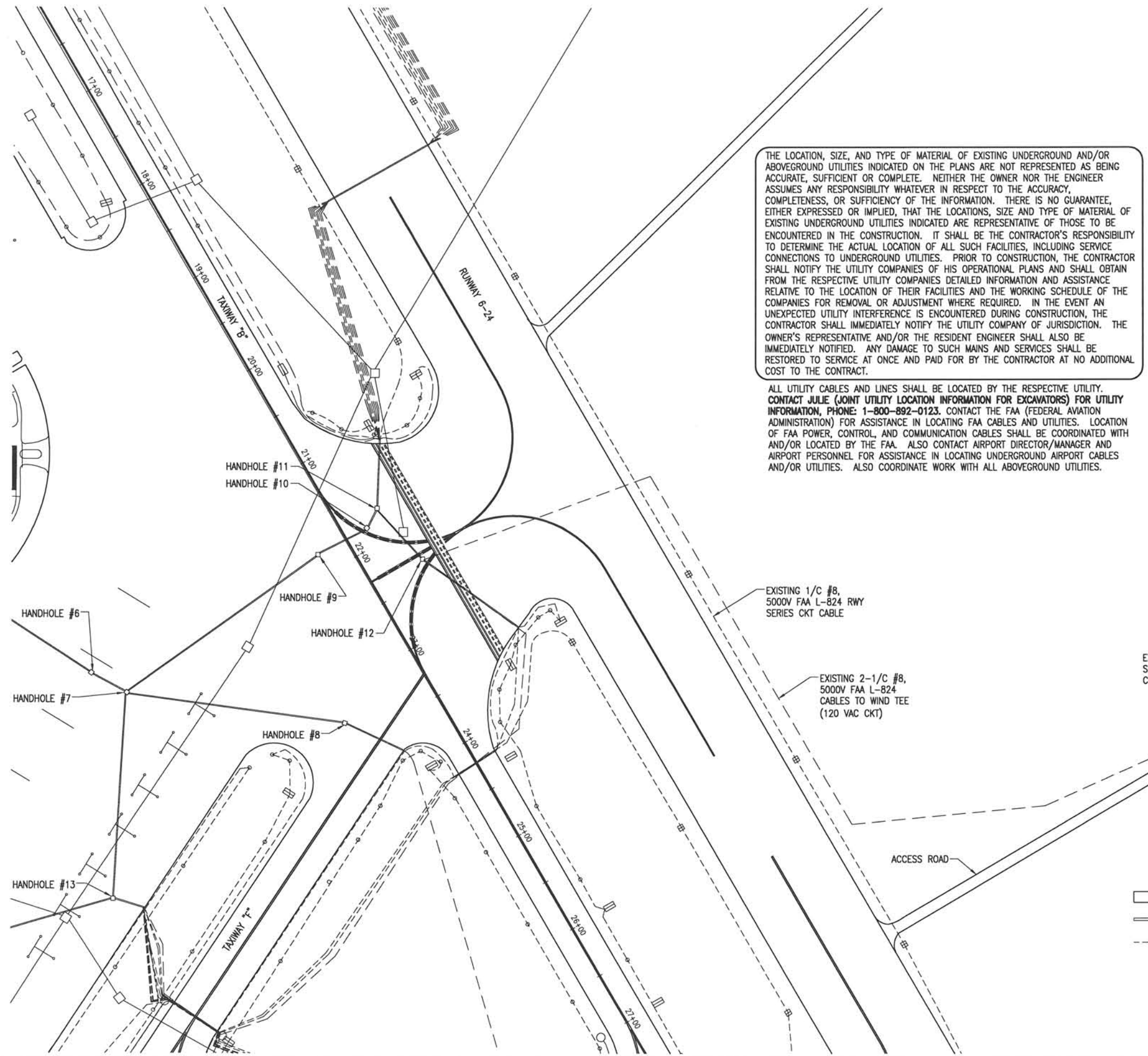
- LEGEND**
- EXISTING PAVEMENT
  - EXISTING ELECTRICAL CABLES
  - EXISTING TAXIWAY LIGHT
  - EXISTING TAXI GUIDANCE SIGN/DISTANCE REMAINING SIGN
  - PROPOSED BASE MOUNTED RUNWAY LIGHT
  - PROPOSED BASE MOUNTED THRESHOLD LIGHT
  - PROPOSED L-806 WIND CONE
  - PROPOSED ELECTRICAL DUCT
  - PROPOSED 2-1/2" #8 5KV, L-824 TYPE C UG CABLE IN 2" HDPE DUCT
  - PROPOSED 1/2" #8 5KV, L-824 TYPE C UG CABLE IN 2" HDPE DUCT



<b>SOUTHERN ILLINOIS AIRPORT</b> MURPHYSBORO / CARBONDALE, ILLINOIS				
IL PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30				
Hanson Project No. 09A0060D_0800 Filename: R-142ELE.DWG Scale: 1" = 50' Date: 01/08/10				
LAYOUT	KNL	01/04/2010		
DRAWN	BAK	01/06/2010		
REVIEWED	CAH/JSL	01/08/2010		
Hanson Professional Services Inc. 1525 South Sixth Street Springfield, IL 62761-2886 Offices Nationwide				
<b>REPLACE HIRL &amp; VARIOUS ELECTRICAL UPGRADES</b>		<b>PROPOSED LIGHTING PLAN</b>		
STA. 52+50 TO STA. 65+06.32				
<b>14</b>				
14 of 46 sheets				



I:\AIRPORTS\SI-CARBONDALE\09A0060\CADD\AIRPORT\SHEET\R-141ELE.DWG - Layout1 (6)  
 JAN 14, 2010 2:33 PM VOORH00805



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.

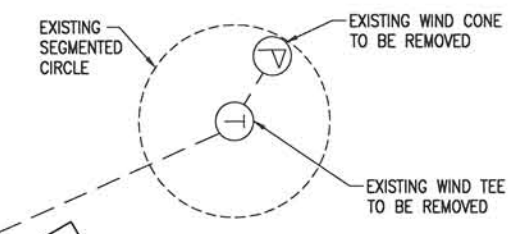
ALL UTILITY CABLES AND LINES SHALL BE LOCATED BY THE RESPECTIVE UTILITY. CONTACT JULIE (JOINT UTILITY LOCATION INFORMATION FOR EXCAVATORS) FOR UTILITY INFORMATION, PHONE: 1-800-892-0123. CONTACT THE FAA (FEDERAL AVIATION ADMINISTRATION) FOR ASSISTANCE IN LOCATING FAA CABLES AND UTILITIES. LOCATION OF 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.

**WIND CONE REMOVAL NOTES**

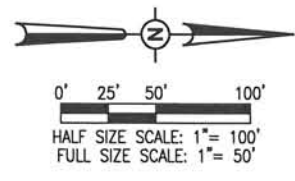
- EXISTING WIND CONE LOCATED NEAR THE WIND-TEE SHALL BE REMOVED. THE CONTRACTOR SHALL COORDINATE THE REMOVAL OF EXISTING WIND CONE WITH THE INSTALLATION OF THE NEW L-807 LIGHTED WIND CONE TO MINIMIZE THE TIME WHEN THE AIRPORT IS WITHOUT A MAIN WIND CONE. THE CONTRACTOR SHALL ALSO COORDINATE WITH AND NOTIFY THE AIRPORT MANAGER AND THE RESIDENT ENGINEER AND PROVIDE A SCHEDULE FOR WIND CONE REMOVAL AND THE INSTALLATION OF THE NEW L-807 LIGHTED WIND CONE. THE CONTRACTOR SHALL TURN EACH WIND CONE AND SUPPORT POLE OVER TO THE AIRPORT MANAGER AND/OR AIRPORT MAINTENANCE STAFF. THE CONCRETE BASE/FOUNDATION WILL BE DISPOSED OF OFF THE AIRPORT SITE, IN A LEGAL MANNER, AT THE EXPENSE OF THE CONTRACTOR.
- THE HOLES LEFT FROM THE BASE/FOUNDATION REMOVAL SHALL BE FILLED WITH EARTH MATERIAL. THE EARTH MATERIAL WILL BE COMPACTED TO PREVENT ANY FUTURE SETTLEMENT. THE EARTH MATERIAL WILL BE OBTAINED FROM OFF THE AIRPORT SITE. THE DISTURBED AREA WILL BE RESTORED, GRADED, AND SEEDED TO THE SATISFACTION OF THE ENGINEER AND IS CONSIDERED INCIDENTAL TO THE REMOVAL OF THE WIND CONE.
- REMOVAL OF EXISTING WIND CONE WILL BE PAID FOR UNDER ITEM AR107900 REMOVE WIND CONE - PER EACH.

**WIND TEE REMOVAL NOTES**

- EXISTING WIND-TEE SHALL BE REMOVED. THE CONTRACTOR SHALL COORDINATE THE REMOVAL OF EXISTING WIND-TEE WITH THE INSTALLATION OF THE NEW L-807 LIGHTED WIND CONE. THE CONTRACTOR SHALL ALSO COORDINATE WITH AND NOTIFY THE AIRPORT MANAGER AND THE RESIDENT ENGINEER AND PROVIDE A SCHEDULE FOR WIND-TEE REMOVAL AND THE INSTALLATION OF THE NEW L-807 LIGHTED WIND CONE. THE CONTRACTOR SHALL DELIVER THE WIND TEE TO A STORAGE FACILITY LOCATED ON THE AIRPORT. THE CONCRETE BASE/FOUNDATION WILL BE DISPOSED OF OFF THE AIRPORT SITE, IN A LEGAL MANNER, AT THE EXPENSE OF THE CONTRACTOR.
- THE HOLES LEFT FROM THE BASE/FOUNDATION REMOVAL SHALL BE FILLED WITH EARTH MATERIAL. THE EARTH MATERIAL WILL BE COMPACTED TO PREVENT ANY FUTURE SETTLEMENT. THE EARTH MATERIAL WILL BE OBTAINED FROM OFF THE AIRPORT SITE. THE DISTURBED AREA WILL BE RESTORED, GRADED, AND SEEDED TO THE SATISFACTION OF THE ENGINEER AND IS CONSIDERED INCIDENTAL TO THE REMOVAL OF THE WIND TEE.
- REMOVAL OF EXISTING WIND-TEE WILL BE PAID FOR UNDER ITEM AR107901 REMOVE WIND TEE - PER EACH.



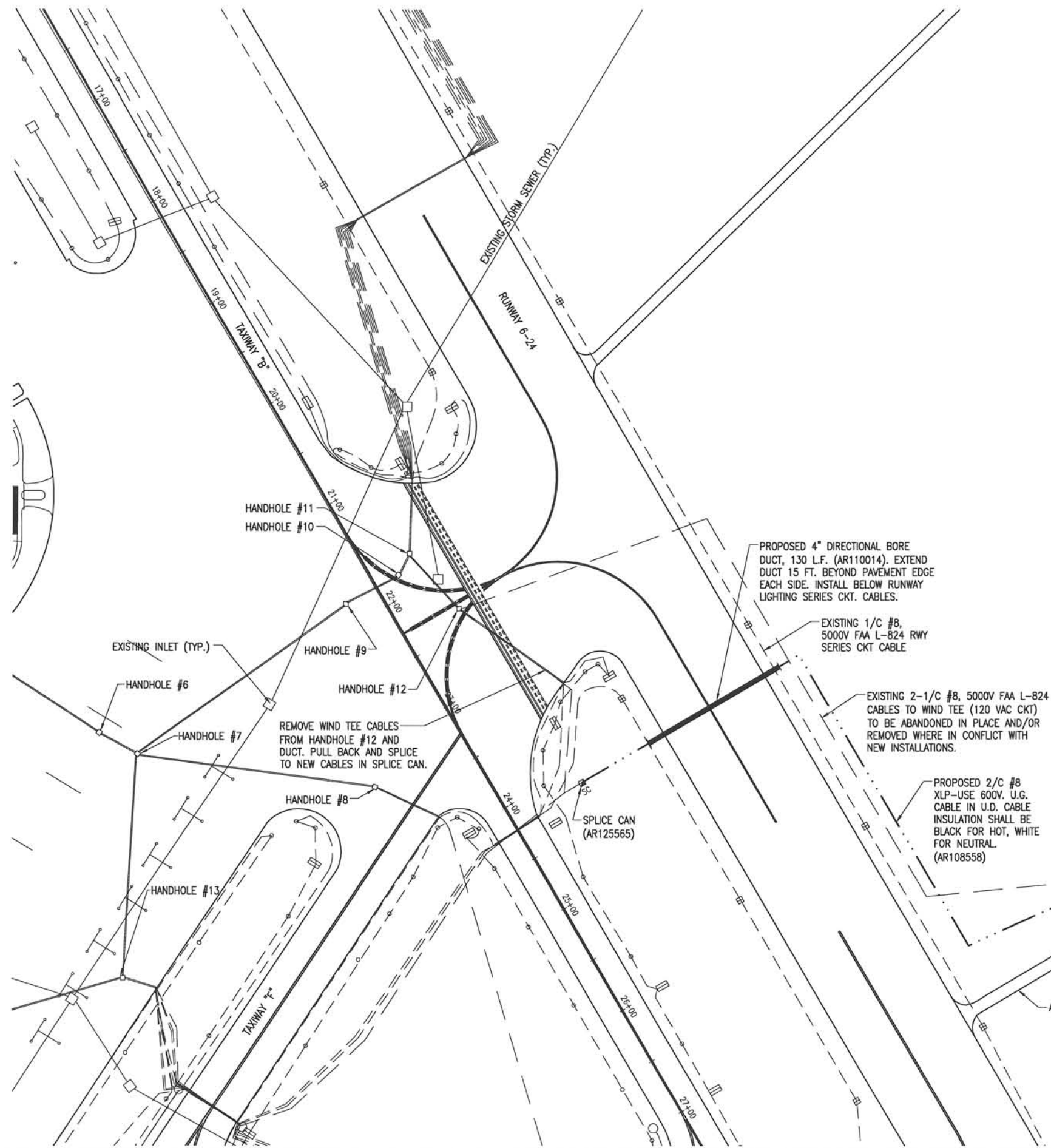
- LEGEND**
- EXISTING PAVEMENT
  - EXISTING PAVEMENT MARKING
  - EXISTING ELECTRICAL CABLES
  - EXISTING TAXIWAY LIGHT
  - EXISTING STAKE MOUNTED RUNWAY LIGHT
  - EXISTING BASE MOUNTED RUNWAY LIGHT
  - EXISTING TAXI GUIDANCE SIGN



SOUTHERN ILLINOIS AIRPORT MURPHYSBORO / CARBONDALE, ILLINOIS					
ILL. PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30					
Hanson Project No. 09A00600_0800 Filename R-141ELE.DWG Scale 1" = 50' Date 01/08/10		LAYOUT KNL 01/04/2010 DRAWN BAK 01/06/2010 REVIEWED CAH/JSI 01/08/2010			
Hanson Professional Services Inc. 1525 South Sixth Street Springfield, Illinois 62760-2886 Offices Nationwide					
REPLACE HIRL & VARIOUS ELECTRICAL UPGRADES			EXISTING SEGMENTED CIRCLE AND WIND TEE SITE PLAN		
<span style="font-size: 2em; font-weight: bold;">16</span>					
16 of 46 sheets					



JAN 14, 2010 2:33 PM VOORH00805  
 I:\AIRPORTS\SIA-CARBONDALE\09A0060\CADD\AIRPORT\SHEET\R-142ELE.DWG - Layout1 (6)



**L-807 WIND CONE NOTES**

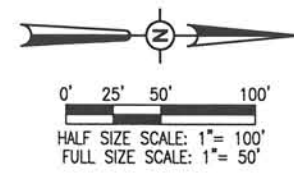
1. PROPOSED L-807 INTERNALLY LIGHTED WIND CONE SHALL BE INSTALLED IN THE CENTER OF THE EXISTING SEGMENTED CIRCLE.
2. SEE "L-807 WIND CONE DETAIL" SHEET FOR DETAILS ON WIND CONE REQUIREMENTS AND INSTALLATION.
3. L-807 WIND CONE 12' INTERNALLY LIT WILL BE PAID FOR UNDER ITEM AR107812.



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.

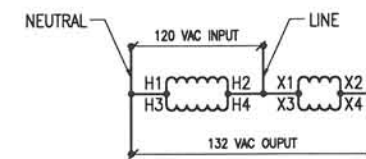
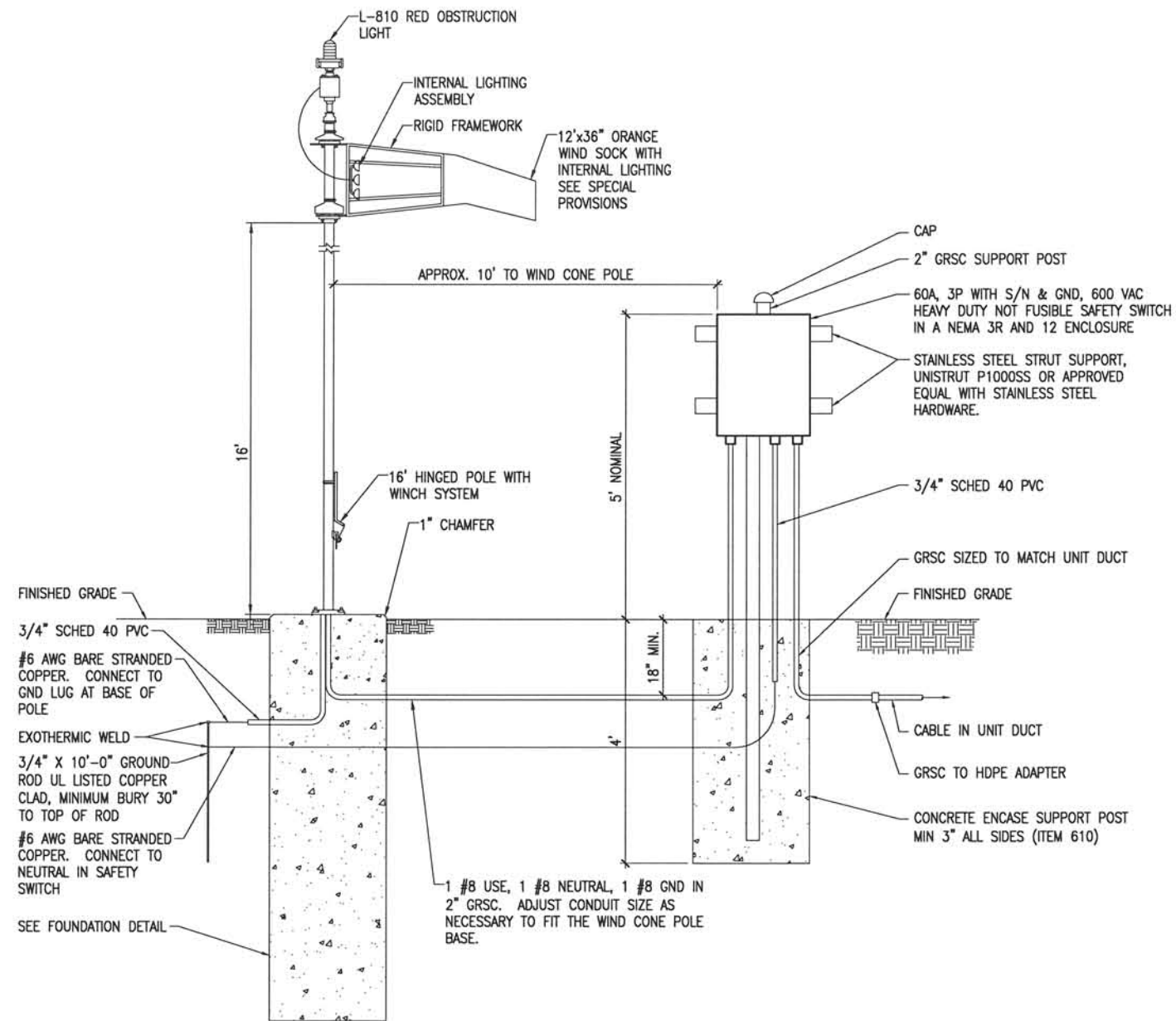
ALL UTILITY CABLES AND LINES SHALL BE LOCATED BY THE RESPECTIVE UTILITY. CONTACT JULIE (JOINT UTILITY LOCATION INFORMATION FOR EXCAVATORS) FOR UTILITY INFORMATION, PHONE: 1-800-892-0123. CONTACT THE FAA (FEDERAL AVIATION ADMINISTRATION) FOR ASSISTANCE IN LOCATING FAA CABLES AND UTILITIES. LOCATION OF 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.

**LEGEND**

- EXISTING PAVEMENT
- - - EXISTING PAVEMENT MARKING
- - - EXISTING ELECTRICAL CABLES
- o EXISTING TAXIWAY LIGHT
- EXISTING STAKE MOUNTED RUNWAY LIGHT
- ▣ EXISTING BASE MOUNTED RUNWAY LIGHT
- ≡ EXISTING TAXI GUIDANCE SIGN
- SC PROPOSED SPLICE CAN
- ⊙ PROPOSED WIND CONE
- PROPOSED ELECTRICAL DUCT
- - - PROPOSED 2/C #8 XLP-USE 600V. U.G. CABLE IN U.D.

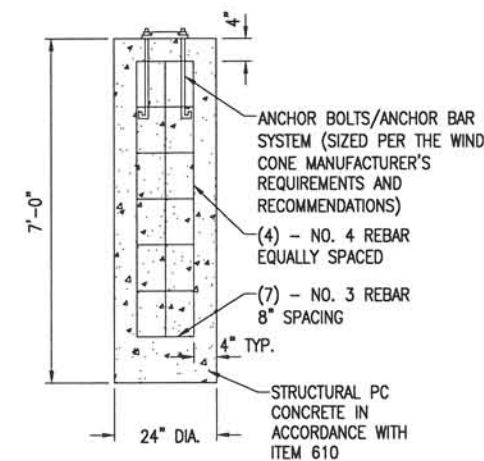


DATE	REVISION	BY	
			
SOUTHERN ILLINOIS AIRPORT MURPHYSBORO / CARBONDALE, ILLINOIS			
IL. PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30			
Hanson Project No. 09A00600_0800	Filename: R-142ELE.DWG	Scale: 1" = 50'	Date: 01/08/10
LAYOUT	KNL	01/04/2010	01/08/2010
DRAWN	BAK	01/06/2010	01/08/2010
REVIEWED	CAH/JSI	01/08/2010	01/08/2010
			
REPLACE HIRL & VARIOUS ELECTRICAL UPGRADES PROPOSED L-807 WIND CONE SITE PLAN			
17			
17 of 46 sheets			



NOTE:  
CONFIRM WIRING WITH RESPECTIVE  
TRANSFORMER MFR.

**120 VAC TO 132 VAC BOOST TRANSFORMER  
CONNECTION DIAGRAM FOR SQUARE D  
CAT. NO. 250SV43B OR CAT. NO. 500SV43B TRANSFORMER**



**FOUNDATION DETAIL**  
"NOT TO SCALE"

**NOTES**

1. WIND CONE SHALL BE FAA APPROVED L-807, STYLE 1B INTERNALLY LIGHTED, SIZE 2 WITH ORANGE WIND SOCK, 120 VAC, & WITH L-810 OBSTRUCTION LIGHT, SEE SPECIAL PROVISION SPECS.
2. THE NEW L-807 LIGHTED WIND CONE SHALL BE LOCATED IN THE CENTER OF THE EXISTING SEGMENTED CIRCLE.
3. A HEAVY DUTY 60 AMP, 2 POLE OR 3 POLE WITH SOLID NEUTRAL & GND, 600 VAC NOT FUSIBLE SAFETY SWITCH IN A NEMA 3R AND 12 ENCLOSURE SHALL BE FURNISHED & INSTALLED AT THE NEW L-807 LIGHTED WIND CONE. NEUTRAL SHALL BE BONDED TO GROUND IN SAFETY SWITCH & CONNECTED TO GND ROD TO CONFORM WITH NEC 250.32. SAFETY SWITCH SHALL BE CONSIDERED INCIDENTAL TO ITEM AR107812, L-807 WC-12' INTERNALLY LIT PER EACH.
4. L-807 WIND CONE 12' INTERNALLY LIT WILL BE PAID FOR UNDER ITEM AR107812.

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

BY	
REVISION	
DATE	

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS



A.I.P. PROJ.: 3-17-0009-B30

IL PROJ.: MDH-3920

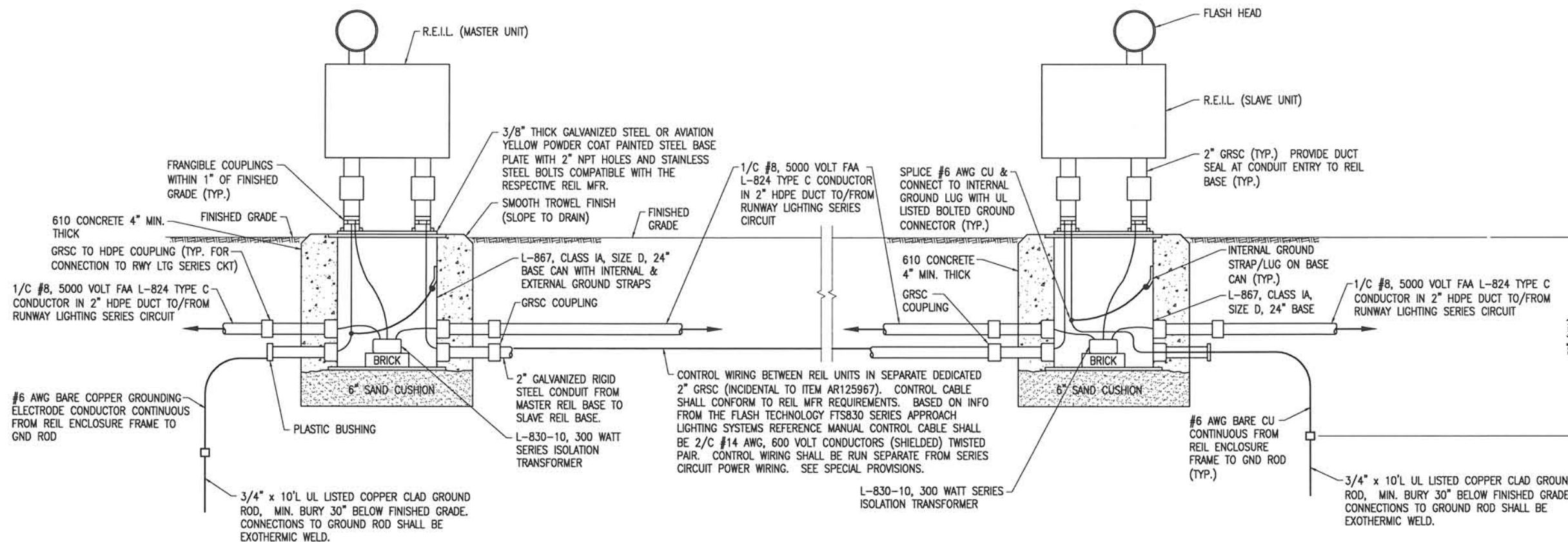
Hanson Project No.	09A00600_0800
Filename	E-505.DWG
Scale	NONE
Date	01/08/10
LAYOUT	KNL 11/16/09
DRAWN	MV 11/16/09
REVIEWED	CAH/JSL 01/08/10



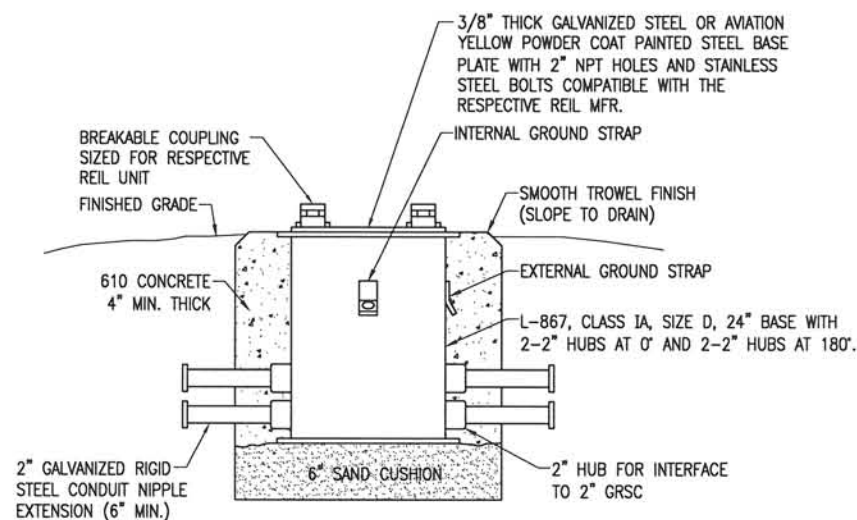
Hanson Professional Services Inc.  
1525 South Sixth Street  
Springfield, Illinois 62703-2886  
Offices Nationwide

REPLACE HIRL &  
VARIOUS ELECTRICAL  
UPGRADES

L-807 WIND CONE DETAIL



**REIL INSTALLATION DETAIL**  
NOT TO SCALE



**REIL BASE DETAIL**  
(NOT TO SCALE)

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

**REIL RELOCATION NOTES**

1. THE EXISTING REILS ARE FLASH TECHNOLOGY-ELECTROFLASH MODEL PC830-2, POS A, FAA TYPE L-849, STYLE A (UNIDIRECTIONAL, HIGH INTENSITY, ONE BRIGHTNESS STEP), 6.6 AMP SERIES CIRCUIT TYPE. DATE OF MANUFACTURE: 11-2002, SERIAL NO. 195767TN.
2. REILS SHALL BE AIMED AT ANGLE 10 DEGREES VERTICALLY AND TOED OUT 15 DEGREES FROM THE LINE PARALLEL TO THE RUNWAY CENTERLINE.
3. RELOCATION OF REILS WILL BE PAID FOR UNDER ITEM AR125967 RELOCATE REILS PER PAIR.
4. ANY AND ALL TRENCHES AND DISTURBED AREAS WILL BE BACKFILLED AND RESTORED TO A SMOOTH GRADE AND SEED TO THE SATISFACTION OF THE ENGINEER. ALL TRENCH SETTLEMENT SHALL BE CORRECTED FOR A PERIOD OF ONE YEAR. RESTORATION, GRADING, SEEDING, AND MULCHING OF AREAS DISTURBED DURING THE REIL INSTALLATION AND ASSOCIATED CABLE WILL BE INCIDENTAL TO ITEM AR125967 RELOCATE REILS.
5. **GROUNDING FOR REILS.** GROUNDING FOR REILS SHALL CONFORM TO THE RESPECTIVE REIL MANUFACTURER'S INSTALLATION INSTRUCTIONS, AS DETAILED ON THE PLANS, AND AS SPECIFIED HEREIN. 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, OR ULTRAWELD. CONNECTIONS TO REIL UNIT FRAMES SHALL BE AS RECOMMENDED BY THE MANUFACTURER OR WITH UL LISTED GROUNDING CONNECTORS.

REVISION	DATE

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS



A.I.P. PROJ.: 3-17-0009-B30

IL PROJ.: MDH-3920

Revision Project No. 09A00600\_0800

Element E-502.DWG

Scale NOT TO SCALE

Date 01/08/10

LAYOUT	KNL	11/12/09
DRAWN	MV	11/12/09
REVIEWED	CAHJSL	01/08/10



Hanson Professional Services Inc.  
1525 South Sixth Street  
Springfield, Illinois 62703-2886  
Offices Nationwide

REPLACE HIRL &  
VARIOUS ELECTRICAL  
UPGRADES

REIL INSTALLATION  
DETAIL





BY	
REVISION	
DATE	

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS

SIA  
SOUTHERN ILLINOIS AIRPORT

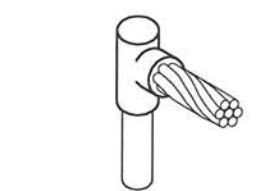
IL PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30

Hanson Project No. 09A00600.0800	11/12/09
Filename E-501.DWG	11/12/09
Scale NOT TO SCALE	
Date 01/08/10	
LAYOUT KNL	
DRAWN MW	
REVIEWED CHY/JSL	

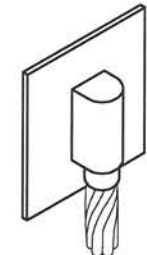
**HANSON**  
Hanson Professional Services Inc.  
1526 South Sixth Street  
Springfield, Illinois 62705-2886  
Offices Nationwide

REPLACE HIRL &  
VARIOUS ELECTRICAL  
UPGRADES

LIGHTNING PROTECTION  
DETAILS FOR BEACON



CABLE TO GROUND ROD

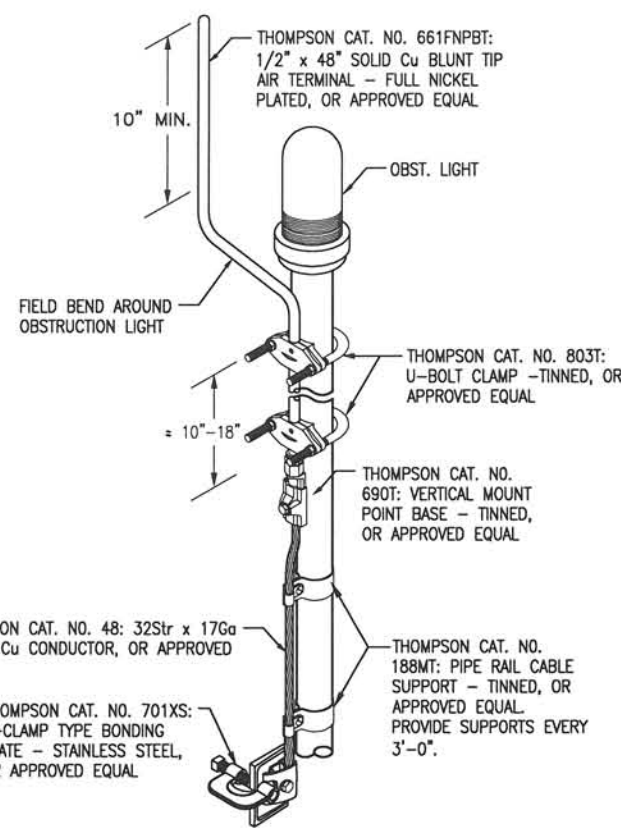


CABLE TO SURFACE

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, OR THERMOWELD AS MANUFACTURED BY CONTINENTAL INDUSTRIES, TULSA, OKLAHOMA. 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.

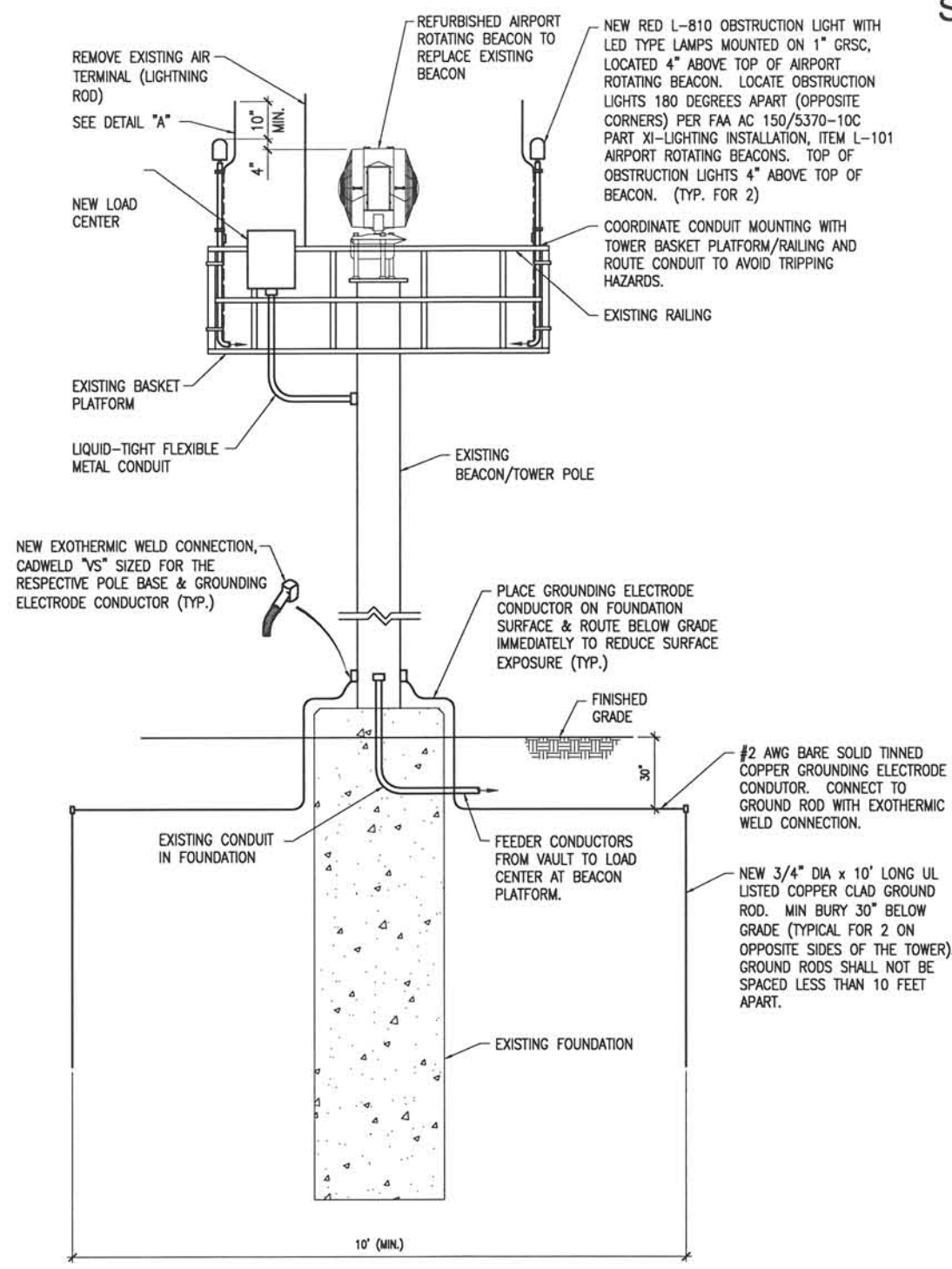
EXOTHERMIC WELD DETAILS



DETAIL A  
NTS

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.



LIGHTNING PROTECTION DETAIL  
FOR AIRPORT ROTATING BEACON  
NTS

REMOVAL & REPLACEMENT OF EXISTING AIRPORT ROTATING BEACON WILL BE PAID FOR UNDER ITEM AS101580 REFURBISH 36\"/>

AIRPORT ROTATING BEACON LOAD CENTER SCHEDULE

CKT #	DUTY	SIZE
1	SURGE PROTECTOR (PHASE A)	30A 1P
2	SURGE PROTECTOR (PHASE B)	30A 1P
3	AIRPORT ROTATING BEACON	15A 1P
4	OBSTRUCTION LIGHTS	15A 1P
5	BLANK	
6	BLANK	



100 AMP, 120/240 VAC, 1 PHASE, 3 WIRE, 6 CIRCUIT LOAD CENTER WITH MAIN LUGS IN A NEMA 3R RAIN PROOF ENCLOSURE, SQUARE D CAT. NO. Q0612L100RBCU WITH EQUIPMENT GROUND BAR KIT OR APPROVED EQUAL.

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, 40KA SURGE CURRENT RATING, & STATUS INDICATION LIGHTS, JOSLYN MODEL 1260-21 OR SQUARE D TVS120XR40S, OR APPROVED EQUAL. FURNISH & INSTALL TWO SURGE PROTECTORS (ONE FOR EACH PHASE). WHERE SQUARE D TVS120XR40S IS PROVIDED CONNECT BOTH BLACK WIRES TO 1-POLE CIRCUIT BREAKER (SAME PHASE).

BY	
REVISION	
DATE	

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS

**SIA**  
SOUTHERN ILLINOIS AIRPORT

ILL. PROJ.: MDH-3920  
A.I.P. PROJ.: 3-17-0009-830

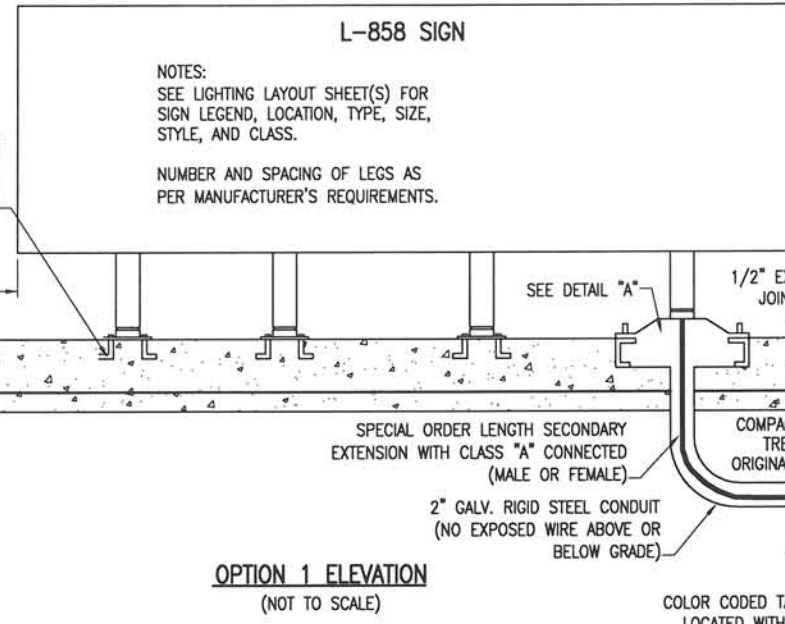
Hanson Project No.	09A00600_0800
Element	R-541ELE.DWG
Scale	NOT TO SCALE
Date	01/08/10
LAYOUT	KNL 01/07/10
DRAWN	MW 01/07/10
REVIEWED	CAH/JSL 01/08/10

**HANSON**

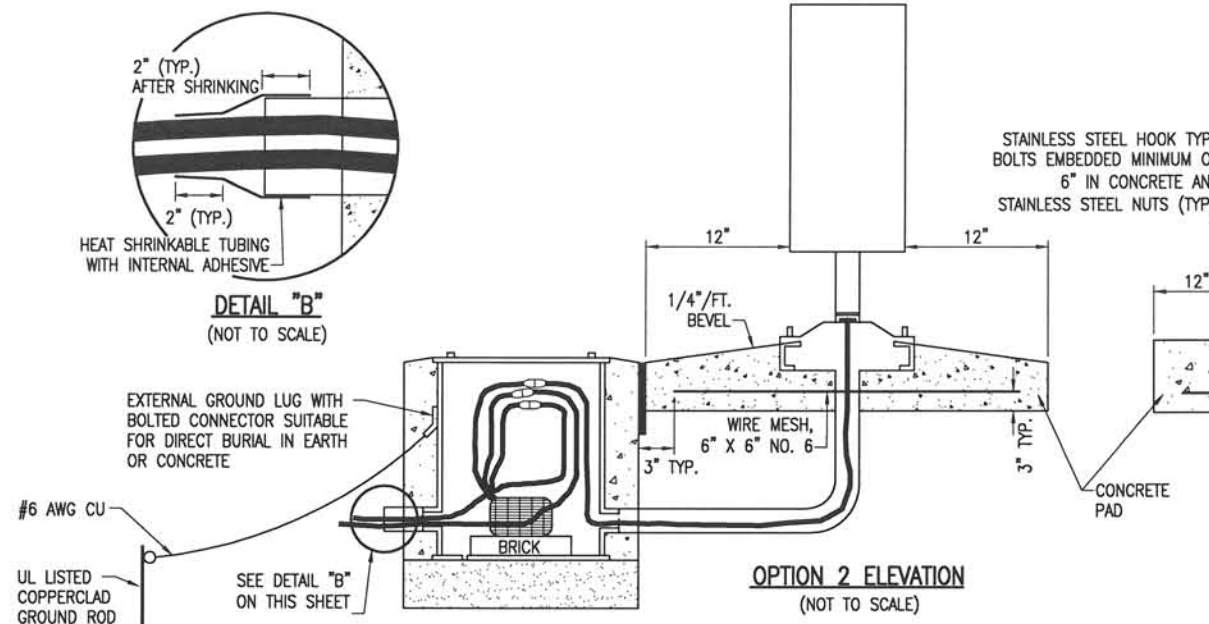
Hanson Professional Services Inc.  
1525 South Sixth Street  
Springfield, IL 62766  
Offices Nationwide

REPLACE HIRL &  
VARIOUS ELECTRICAL  
UPGRADES

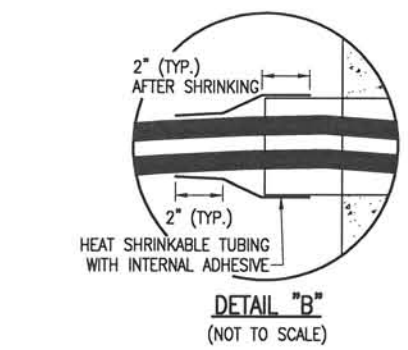
PROPOSED  
ELECTRICAL DETAILS  
SHEET 1



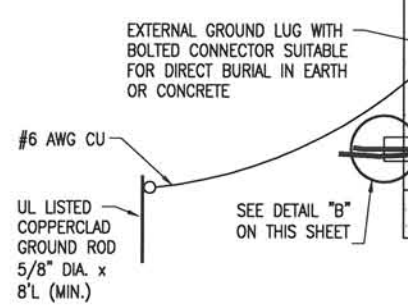
OPTION 1 ELEVATION  
(NOT TO SCALE)



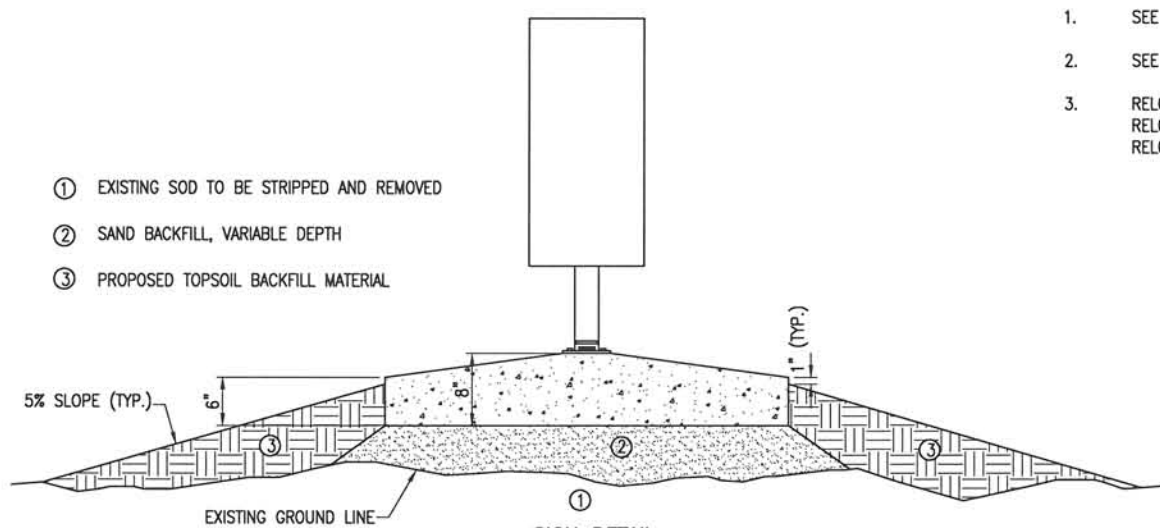
OPTION 2 ELEVATION  
(NOT TO SCALE)



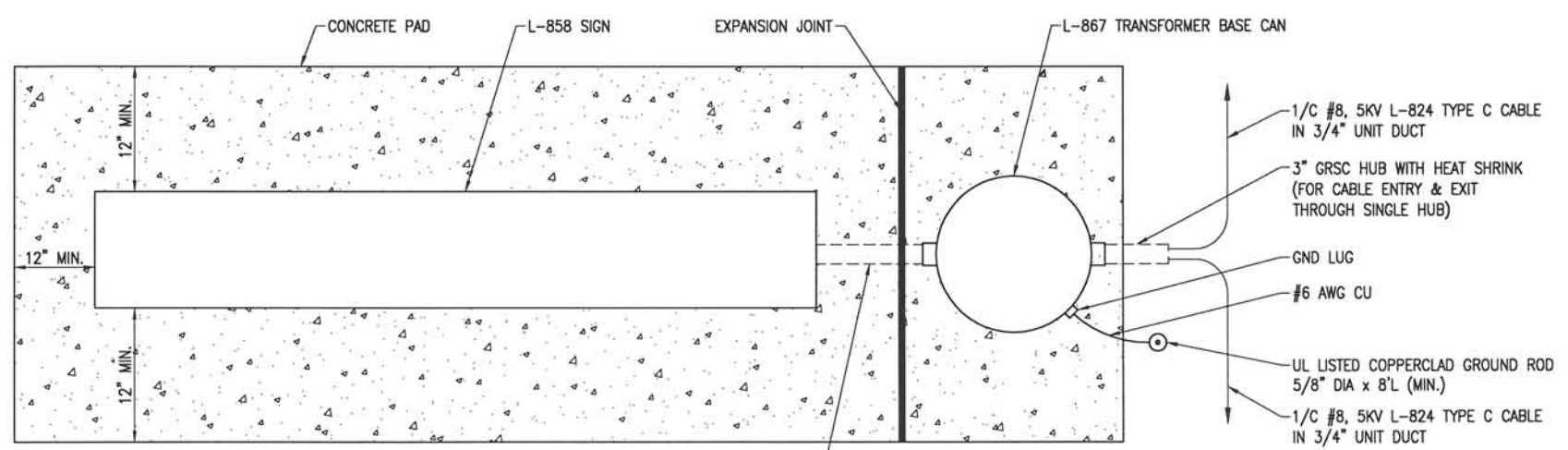
DETAIL "B"  
(NOT TO SCALE)



- ① EXISTING SOD TO BE STRIPPED AND REMOVED
- ② SAND BACKFILL, VARIABLE DEPTH
- ③ PROPOSED TOPSOIL BACKFILL MATERIAL



SIGN DETAIL  
(NOT TO SCALE)

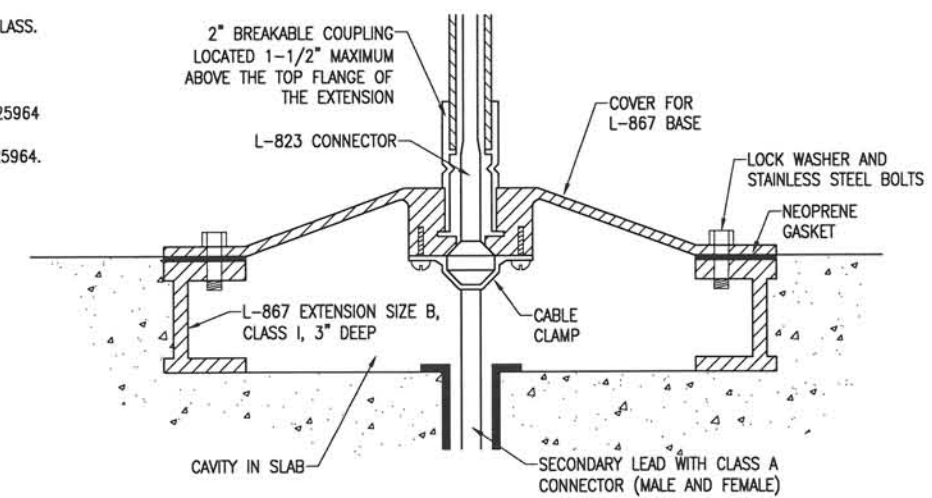


OPTION 1 PLAN  
(NOT TO SCALE)

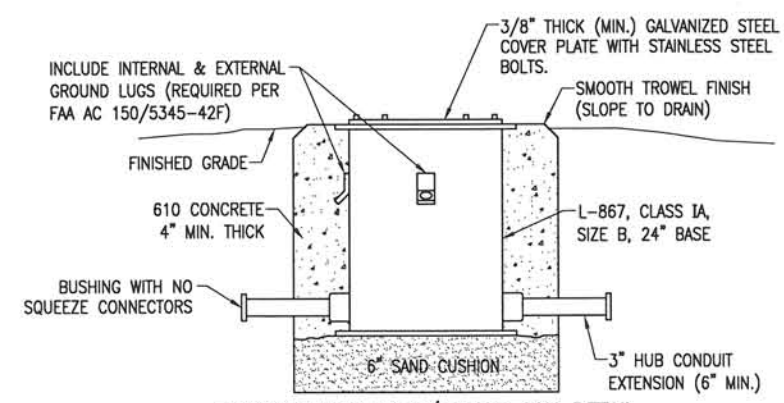
**GENERAL NOTES:**

1. SEE LIGHTING LAYOUT SHEET FOR SIGN LEGEND, LOCATION, TYPE, SIZE, STYLE, AND CLASS.
2. SEE ELECTRICAL NOTES SHEET 26 & 27.
3. RELOCATION OF EXISTING TAXI GUIDANCE SIGNS WILL BE PAID FOR UNDER ITEM AR125964 RELOCATE TAXI GUIDANCE SIGN PER EACH. CABLE IN UNIT DUCT ASSOCIATED WITH RELOCATION OF TAXI GUIDANCE SIGNS WILL BE CONSIDERED INCIDENTAL TO ITEM AR125964.

PER FAA AC 150/5340-30D DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, A SAFETY GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. A SAFETY 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 SAFETY GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR CONNECTED TO THE GROUND LUG ON THE RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND A 5/8-INCH DIAMETER BY 8-FOOT LONG (MINIMUM) UL LISTED COPPER CLAD GROUND ROD.



DETAIL "A"  
(NOT TO SCALE)



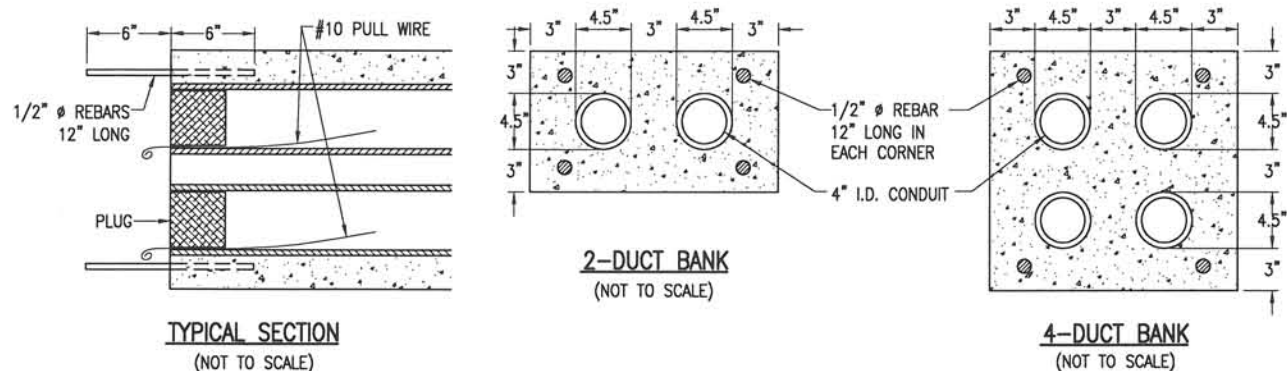
TRANSFORMER BASE/SPLICE CAN DETAIL  
(NOT TO SCALE)

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

JAN 14, 2010 1:24 PM V00RH00805  
E:\AIRPORTS\SIA-CARBONDALE\09A00600\CADD\AIRPORT\SHEET\R-541ELE.DWG - ELEC DETAILS



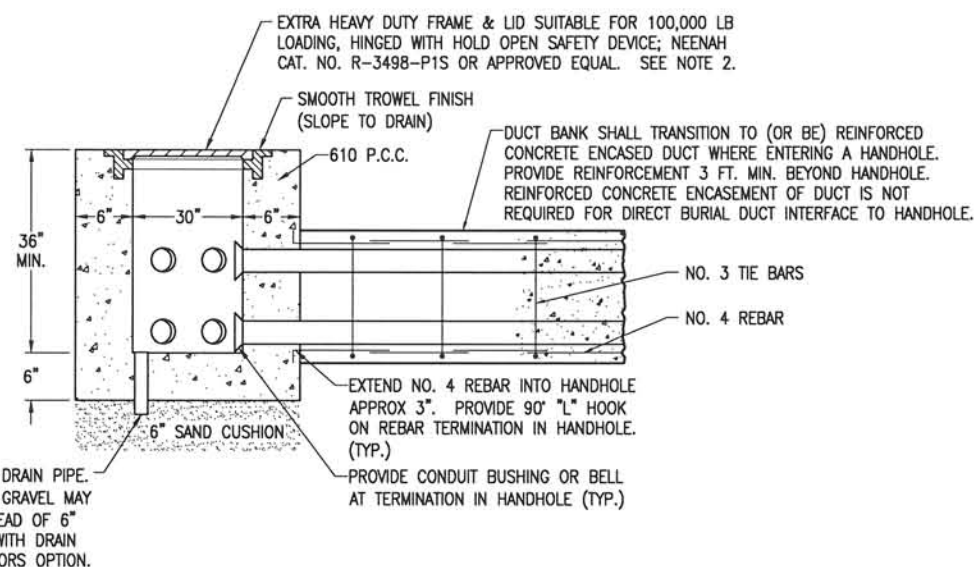
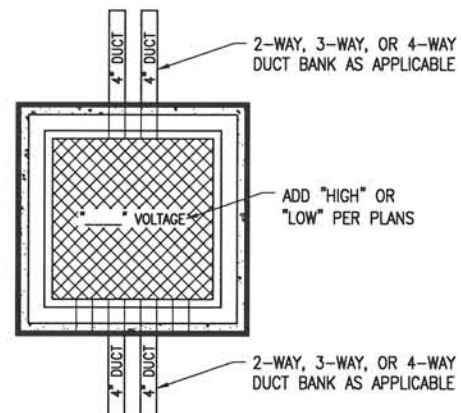




- DUCT BANK NOTES:**
1. ALL DIMENSION ARE MINIMUM.
  2. INCLUDE DUCT SPACERS AS MANUFACTURED BY UNDERGROUND DEVICES INC., TO MAINTAIN PROPER SEPARATION OF CONDUITS.
  3. REBAR IS REQUIRED TO ACCOMMODATE FUTURE DUCT EXTENSIONS & INTERFACE AT DUCT BANK TERMINATIONS. DUCT BANKS TERMINATING IN MANHOLES DO NOT REQUIRE REBAR AT TERMINATIONS.
  4. CONDUITS FOR CONCRETE ENCASED DUCT SHALL BE SCHEDULE 40 PVC CONFORMING TO ITEM 110.
  5. MINIMUM DEPTH OF TOP OF DUCT ENCASEMENT SHALL BE 30" BELOW FINISHED GRADE.
  6. HIGH VOLTAGE AND LOW VOLTAGE CIRCUITS SHALL NOT BE INSTALLED IN THE SAME RACEWAY, CONDUIT, DUCT, HANDHOLE, OR MANHOLE.
  7. HOMERUN CABLES FOR A RESPECTIVE CIRCUIT SHALL BE INSTALLED IN THE SAME RACEWAY OR DUCT.

**CABLE & DUCT MARKER NOTES:**

1. 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.
2. BITUMINOUS PAVEMENT DUCT MARKER AND CONCRETE DUCT MARKER TO BE PROVIDED AT EACH END OF EACH DUCT AS SHOWN ON THE LOCATION PLAN. FOR CONCRETE PAVEMENT, THE LETTER "D" SHALL BE IMPRESSED IN THE PAVEMENT INSTEAD OF THE MARKER. THE LETTER SHALL BE IMPRESSED AS DESCRIBED IN NOTE 4.
3. CABLE MARKERS SHALL BE PLACED AT CHANGES OF DIRECTION AND APPROXIMATELY EVERY 200' ALONG CABLE RUNS.
4. 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.

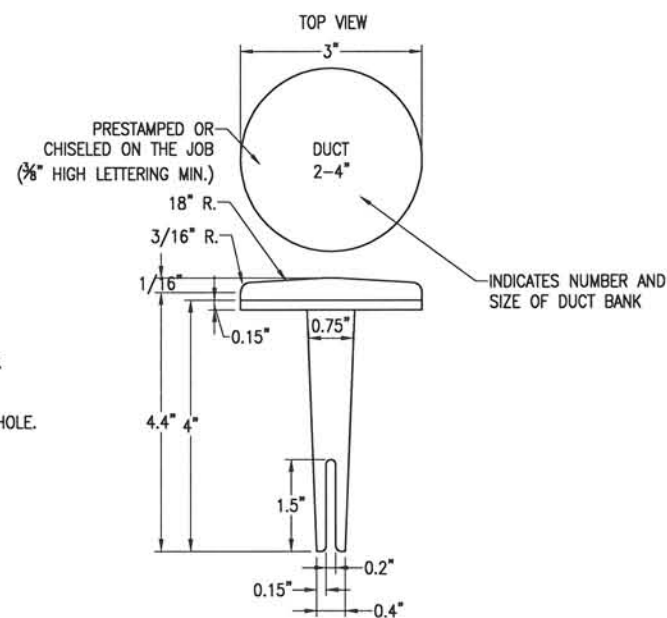


2" SCHED 40 PVC DRAIN PIPE. NOTE 6" OF CA-7 GRAVEL MAY BE PROVIDED, INSTEAD OF 6" CONCRETE FLOOR WITH DRAIN PIPE, AT CONTRACTORS OPTION.

**NOTES:**

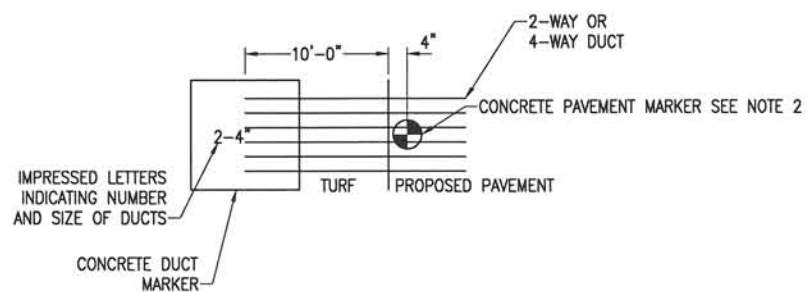
1. LIDS FOR LOW VOLTAGE HANDHOLES SHALL BE LABELED "LOW VOLTAGE". LIDS FOR HIGH VOLTAGE HANDHOLES SHALL BE LABELED "HIGH VOLTAGE". COORDINATE LETTERING WITH MFR.
2. ELECTRICAL HANDHOLE FRAME & LID SHALL BE CAPABLE OF WITHSTANDING MINIMUM 100,000 POUND LOADS AS CALLED FOR IN FAA ADVISORY CIRCULAR AC 150/5320-6D APPENDIX 3 ITEM 2.d. (1). AIRPORT MANHOLE FRAME & LID SHALL BE NEENAH CATALOG NO. R-3498-P1S OR APPROVED EQUAL.
3. REINFORCING FOR DUCT BANK SHALL CONSIST OF NO. 4 DEFORMED REBARS SPACED SIX INCHES (6") ON CENTER, PARALLELING THE DUCTS ON TOP AND BOTTOM WITH NO. 3 FORMED TIE BARS SPACED 12" ON CENTERS. BARS SHALL OVERLAP 1'-8" MIN. REINFORCING SHALL EXTEND THREE FEET BEYOND INTERFACE TO HANDHOLE.
4. HANDHOLES MAY BE CAST IN PLACE OR PRECAST. PRECAST MANUFACTURERS MUST BE ON IDOT (ILLINOIS DEPT. OF TRANSPORTATION) APPROVED LIST OF CERTIFIED PRECAST CONCRETE PRODUCERS.
5. HANDHOLES WILL BE PAID FOR UNDER ITEM AR110610 ELECTRICAL HANDHOLE PER EACH. SEE SPECIAL PROVISIONS.

**ELECTRICAL HANDHOLE**  
"NOT TO SCALE"

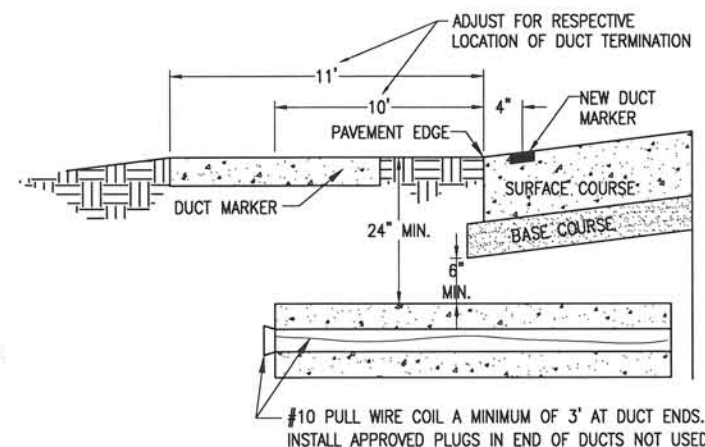


**BITUMINOUS PAVEMENT DUCT MARKERS**  
"NOT TO SCALE"

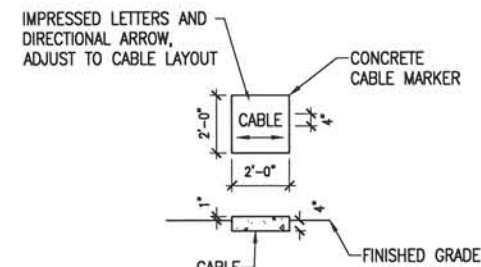
**NOTE:** TOP OF MARKER SHALL BE FLUSH WITH FINISHED PAVEMENT SURFACE. MARKER MAY BE INSTALLED IN A DRILLED HOLE AND SECURED WITH EPOXY GLUE.



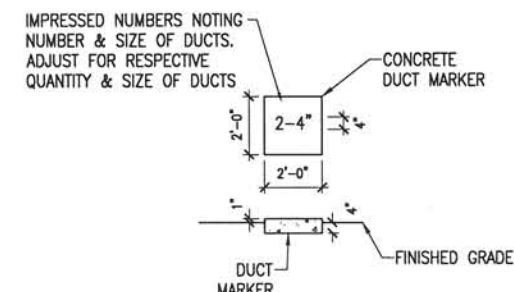
**DUCT MARKER DETAIL**  
"NOT TO SCALE"



**UNDERGROUND ELECTRICAL DUCT**  
"NOT TO SCALE"



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



**TURF DUCT MARKERS**  
"NOT TO SCALE"

JAN 14, 2010 1:24 PM VOORH00805 I:\AIRPORTS\SIH-CARBONDALE\09A0060\CA00\AIRPORT\SHHEET\R-543ELE.DWG - Layout1

BY	
REVISION	
DATE	

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS



A.I.P. PROJ.: 3-17-0009-B30

IL PROJ.: MDH-3920

Hanson Project No.	09A00600_0800
Filename	R-543ELE.DWG
Scale	NO SCALE
Date	01/08/10
LAYOUT	KNL 11/16/09
DRAWN	MV 11/16/09
REVIEWED	CAH/JSI 01/08/10



Hanson Professional Services Inc.  
1525 South Sixth Street  
Springfield, Illinois 62703-2886  
Offices Nationwide

REPLACE HIRL &  
VARIOUS ELECTRICAL  
UPGRADES

PROPOSED  
ELECTRICAL DETAILS  
SHEET 3







DATE	REVISION

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS

**SIA**  
SOUTHERN ILLINOIS AIRPORT

A.I.P. PROJ.: 3-17-0009-B30  
IL. PROJ.: MDH-3920

Hanson Project No. 09A00600_0800	10/02/08
Filename E-002.DWG	KNL
Scale N/A	BAK
Date 01/08/10	CAHJSL
LAYOUT	10/03/08
DRAWN	01/08/10
REVIEWED	

**HANSON**

Hanson Professional Services Inc.  
1526 South Sixth Street  
Springfield, Illinois 62703-2886  
Offices Nationwide

REPLACE HIRL &  
VARIOUS ELECTRICAL  
UPGRADES

PROPOSED  
ELECTRICAL NOTES  
SHEET 1

**GENERAL NOTES**

- ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 - NATIONAL ELECTRICAL CODE (NEC) MOST CURRENT ISSUE IN FORCE, THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES, AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L. LISTING, ETL LISTING (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE PERMITTED.
- CONTRACTOR SHALL KEEP A COPY OF THE LATEST NEC IN FORCE ON SITE AT ALL TIMES DURING CONSTRUCTION FOR USE AS A REFERENCE.
- CONTRACTOR SHALL COORDINATE WORK AND ANY POWER OUTAGES AND/OR SHUT DOWN OF SYSTEMS WITH THE RESPECTIVE FACILITY OWNER PERSONNEL AND THE AIRPORT MANAGER/DIRECTOR. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- THE CONTRACTOR SHALL ASCERTAIN THAT ALL LIGHTING SYSTEM COMPONENTS FURNISHED BY HIM, INCLUDING FAA APPROVED EQUIPMENT, ARE COMPATIBLE IN ALL RESPECTS WITH EACH OTHER AND THE REMAINDER OF THE NEW/EXISTING SYSTEM. ANY NONCOMPATIBLE COMPONENTS FURNISHED BY THIS CONTRACTOR SHALL BE REPLACED BY HIM AT NO ADDITIONAL COST TO THE AIRPORT SPONSOR WITH A SIMILAR UNIT, APPROVED BY THE ENGINEER (DIFFERENT MODEL OR DIFFERENT MANUFACTURER) THAT IS COMPATIBLE WITH THE REMAINDER OF THE AIRPORT LIGHTING SYSTEM.
- IN CASE THE CONTRACTOR ELECTS TO FURNISH AND INSTALL AIRPORT LIGHTING EQUIPMENT REQUIRING ADDITIONAL WIRING, TRANSFORMERS, ADAPTORS, MOUNTINGS, ETC., TO THOSE SHOWN ON THE DRAWINGS AND/OR LISTED IN THE SPECIFICATION, ANY COST FOR THESE ITEMS SHALL BE INCIDENTAL TO THE EQUIPMENT COST.
- THE CONTRACTOR INSTALLED EQUIPMENT (INCLUDING FAA APPROVED) SHALL NOT GENERATE ANY ELECTROMAGNETIC INTERFERENCE IN THE EXISTING AND/OR NEW COMMUNICATIONS, WEATHER, AIR NAVIGATION, AND AIR TRAFFIC CONTROL EQUIPMENT. ANY EQUIPMENT GENERATING SUCH INTERFERENCE SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST WITH THE EQUIPMENT MEETING THE APPLICABLE SPECIFICATIONS AND NOT GENERATING ANY INTERFERENCE.
- WHEN A SPECIFIC TYPE, STYLE, CLASS, ETC. OF FAA APPROVED EQUIPMENT IS SPECIFIED ONLY THAT TYPE, STYLE, CLASS, WILL BE ACCEPTABLE, EVEN THOUGH EQUIPMENT OF OTHER TYPES STYLES, CLASSES, ETC. MAY BE APPROVED.
- ANY AND ALL INSTRUCTIONS FROM THE ENGINEER TO THE CONTRACTOR REGARDING CHANGES IN OR DEVIATIONS FROM THE PLANS AND SPECIFICATIONS SHALL BE IN WRITING WITH COPIES SENT TO THE AIRPORT SPONSOR AND THE FAA FIELD OFFICE (ADO/AFO). THE CONTRACTOR SHALL NOT ACCEPT ANY VERBAL INSTRUCTIONS FROM THE RESIDENT ENGINEER REGARDING ANY CHANGES FROM THE PLANS AND SPECIFICATIONS.
- A MINIMUM OF THREE COPIES OF THE INSTRUCTION BOOK SHALL BE SUPPLIED WITH EACH DIFFERENT TYPE OF EQUIPMENT. THE BOOKS DESCRIBING A MORE SOPHISTICATED TYPE OF EQUIPMENT, SUCH AS REGULATORS, PAPI, REIL, ETC. AS A MINIMUM SHALL CONTAIN THE FOLLOWING:
  - A DETAILED DESCRIPTION OF THE OVERALL EQUIPMENT AND ITS INDIVIDUAL COMPONENTS.
  - THEORY OF OPERATION INCLUDING THE FUNCTION OF EACH COMPONENT.
  - INSTALLATION INSTRUCTION.
  - START-UP INSTRUCTIONS.
  - PREVENTATIVE MAINTENANCE REQUIREMENTS.
  - CHART FOR TROUBLE-SHOOTING.
- COMPLETE POWER AND CONTROL DETAILED WIRING DIAGRAM(S), SHOWING EACH CONDUCTOR/CONNECTION/COMPONENT - "BLACK" BOXES ARE NOT ACCEPTABLE. THE DIAGRAM OF THE NARRATIVE SHALL SHOW VOLTAGE/CURRENTS/WAVE SHAPES AT STRATEGIC LOCATIONS TO BE USED WHEN CHECKING AND/OR TROUBLE-SHOOTING THE EQUIPMENT. WHEN THE EQUIPMENT HAS SEVERAL MODES OF OPERATION, SUCH AS SEVERAL BRIGHTNESS STEPS, THESE PARAMETERS SHALL BE INDICATED FOR ALL DIFFERENT MODES.
- PARTS LIST WHICH WILL INCLUDE ALL MAJOR AND MINOR COMPONENTS SUCH AS RESISTORS, DIODES, ETC. IT SHALL INCLUDE A COMPLETE NOMENCLATURE OF EACH COMPONENT AND, IF APPLICABLE, THE NAME OF ITS MANUFACTURER AND THE CATALOG NUMBER.
- SAFETY INSTRUCTIONS.

**POWER AND CONTROL NOTES**

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

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

**AIRFIELD LIGHTING NOTES**

1. UNLESS OTHERWISE NOTED, ALL UNDERGROUND AIRFIELD LIGHTING SERIES CIRCUIT CONDUCTORS WHETHER DEB OR IN DUCT/CONDUIT SHALL BE FAA APPROVED 5000 VOLT L-824 TYPE. ALL UNDERGROUND FIELD POWER LOW VOLTAGE (600 VOLT & BELOW) CIRCUIT CONDUCTORS WHETHER DEB OR IN DUCT/CONDUIT SHALL BE UL LISTED 600 VOLT, TYPE XLP-USE-2 COPPER CONDUCTORS. CONDUCTOR SIZES SHALL BE AS SPECIFIED, HEREIN.
2. NO COMPONENTS OF PRIMARY CIRCUIT SUCH AS CABLE, CONNECTORS AND TRANSFORMERS SHALL BE BROUGHT ABOVE GROUND AT EDGE LIGHTS, SIGNS, REIL, PAPI, ETC.
3. THERE SHALL BE NO EXPOSED POWER/CONTROL CABLES BETWEEN THE POINT WHERE THEY LEAVE THE UNDERGROUND (DEB OR L-867 BASES) AND WHERE THEY ENTER THE EQUIPMENT (SUCH AS TAXIWAY SIGNS, PAPI, REIL, ETC.) ENCLOSURES. THESE CABLES SHALL BE ENCLOSED IN RIGID CONDUIT OR IN FLEXIBLE, WATERTIGHT CONDUIT WITH BREAKABLE COUPLING(S) AT THE GRADE OR THE HOUSING COVER, AS SHOWN IN APPLICABLE DETAILS.
4. THE JOINTS OF THE L-823 PRIMARY CONNECTORS SHALL BE WRAPPED WITH AT LEAST ONE LAYER OF RUBBER OR SYNTHETIC RUBBER TAPE AND ONE LAYER OF PLASTIC TAPE, ONE-HALF LAPPED, EXTENDING AT LEAST 1-1/2 INCHES ON EACH SIDE OF THE JOINT, AS SHOWN ON SHEET NO. 9.
5. THE CABLE ENTRANCE INTO THE FIELD-ATTACHED L-823 CONNECTORS SHALL BE ENCLOSED BY A HEAT-SHRINKABLE TUBING WITH CONTINUOUS INTERNAL ADHESIVE, AS SHOWN ON SHEET NO. 9.
6. L-823 TYPE II, TWO-CONDUCTOR SECONDARY CONNECTORS SHALL BE CLASS 'A' (FACTORY MOLDED).
7. THERE SHALL BE NO SPLICES IN THE SECONDARY CABLE(S) WITHIN THE STEMS OF A RUNWAY/TAXIWAY EDGE/THRESHOLD LIGHTING FIXTURE AND THE WIREWAYS LEADING TO TAXIWAY SIGNS AND PAPI/REIL EQUIPMENT.
8. ELECTRICAL INSULATING GREASE SHALL BE APPLIED WITHIN THE L-823, SECONDARY, TWO CONDUCTOR CONNECTORS TO PREVENT WATER ENTRANCE. THESE CONNECTORS SHALL NOT BE TAPED.
9. DEB ISOLATION TRANSFORMERS SHALL BE BURIED AT A DEPTH OF TEN (10") INCHES ON A LINE CROSSING THE LIGHT AND PERPENDICULAR TO THE RUNWAY/TAXIWAY CENTERLINE AT A LOCATION TWELVE (12") INCHES FROM THE LIGHT OPPOSITE FROM THE RUNWAY/TAXIWAY.
10. A SLACK OF THREE (3') FEET, MINIMUM, SHALL BE PROVIDED IN THE PRIMARY CABLE AT EACH TRANSFORMER/CONNECTOR TERMINATION. AT STAKE-MOUNTED LIGHTS, THE SLACK SHALL BE LOOSELY COILED IMMEDIATELY BELOW THE ISOLATION TRANSFORMER.
11. DIRECTION OF PRIMARY CABLES SHALL BE IDENTIFIED BY COLOR CODING AS FOLLOWS: WHEN FACING LIGHT WITH BACK TO PAVEMENT, CABLE TO THE LEFT IS CODED RED AND CABLE TO RIGHT IS CODED BLUE. THIS APPLIES TO STAKE MOUNTED LIGHTS AND BASE MOUNTED LIGHTS WHERE THE BASE HAS ONLY ONE ENTRANCE.
12. L-867 BASES SHALL BE SIZE B, 24" DEEP, CLASS I, UNLESS OTHERWISE NOTED.
13. BASE MOUNTED BREAKABLE COUPLINGS SHALL NOT HAVE WEEP HOLES TO THE OUTSIDE. PLUGGED UP HOLES SHALL NOT BE ACCEPTABLE. IT SHALL BE A 1/4" DIAMETER, MINIMUM, OR EQUIVALENT OPENING FOR DRAINAGE FROM THE SPACE AROUND THE SECONDARY CONNECTOR INTO THE L-867 BASE.
14. THE ELEVATION OF THE BREAKABLE COUPLING GROOVE SHALL NOT EXCEED 1-1/2" ABOVE THE EDGE OF THE COVER IN CASE OF BASE MOUNTED COUPLINGS, OR THE TOP OF THE STAKE IN CASE OF STAKE MOUNTED COUPLINGS.
15. WHERE THE BREAKABLE COUPLING IS NOT AN INTEGRAL PART OF THE LIGHT FIXTURE STEM OR MOUNTING LEG, A BEAD OF SILICON SEAL SHALL BE APPLIED COMPLETELY AROUND LIGHT STEM OR WIREWAY AT BREAKABLE COUPLING TO PROVIDE A WATERTIGHT SEAL.
16. TOPS OF THE STAKES SUPPORTING LIGHT FIXTURES SHALL BE FLUSH WITH THE SURROUNDING GRADE.
17. PLASTIC LIGHTING FIXTURE COMPONENTS, SUCH AS LAMP HEADS, STEMS, BREAKABLE COUPLINGS, BASE COVERS, BRACKETS, STAKES, SHALL NOT BE ACCEPTABLE.
18. THE TOLERANCE FOR THE HEIGHT OF RUNWAY/TAXIWAY EDGE LIGHTS SHALL BE: ONE (1) INCH. IN CASE OF STAKE MOUNTED LIGHTS, THE SPECIFIED LIGHTING FIXTURE HEIGHT SHALL BE MEASURED BETWEEN THE TOP OF THE STAKE AND THE TOP OF THE LENS. IN CASE OF BASE MOUNTED LIGHTS, THE SPECIFIED LIGHTING FIXTURE HEIGHT SHALL BE MEASURED BETWEEN THE TOP OF THE BASE FLANGE AND THE TOP OF THE LENS, THUS INCLUDING THE BASE COVER, THE FRANGIBLE COUPLING, THE STEM, THE LAMP HOUSING AND THE LENS.
19. THE TOLERANCE FOR THE LATERAL SPACING (LIGHT LANE TO RUNWAY/TAXIWAY CENTERLINE) OF RUNWAY/TAXIWAY EDGE LIGHTS SHALL BE ONE (1) INCH. THIS ALSO APPLIES AT INTERSECTIONS TO LATERAL SPACING BETWEEN LIGHTS OF A RUNWAY/TAXIWAY AND THE INTERSECTING RUNWAY/TAXIWAY.

20. ENTRANCES INTO L-867 BASES SHALL HAVE CONDUIT COUPLINGS OR REDUCERS TO INTERFACE UNIT DUCT/CONDUIT TO L-867 BASE HUBS, OR SHALL BE SEALED WITH HEAT SHRINK AS SHOWN IN DETAIL "B" ON SHEET NO. 8.
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 3000 PSI, AIR-ENTRAINED.
30. ALL POWER AND CONTROL CABLES IN MAN/HAND HOLES SHALL BE TAGGED. USE EMBOSSED COPPER STRIPS TO BE ATTACHED AT BOTH ENDS TO THE CABLE BY THE USE OF PLASTIC STRAPS. MINIMUM OF TWO TAGS SHALL BE PROVIDED ON EACH CABLE IN A MAN/HAND HOLE-ONE AT THE CABLE ENTRANCE AND ONE AT THE CABLE EXIT.
31. THE LOCATION, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ON THE PLANS IS NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES OF HIS OPERATIONAL PLANS AND SHALL OBTAIN FROM THE RESPECTIVE UTILITY COMPANIES DETAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF THEIR FACILITIES AND THE WORKING SCHEDULE OF THE COMPANIES FOR REMOVAL OR ADJUSTMENT WHERE REQUIRED. IN THE EVENT AN UNEXPECTED UTILITY INTERFERENCE IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY COMPANY OF JURISDICTION. THE ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT. CALL J.U.L.I.E. FOR UTILITY INFORMATION AT 1-800-892-0123. ALSO CONTACT AIRPORT MANAGER AND/OR RESPECTIVE AIRPORT PERSONNEL FOR ASSISTANCE IN LOCATING UNDERGROUND AIRPORT CABLES AND/OR UTILITIES. CONTACT FAA FOR ASSISTANCE IN LOCATING THEIR CABLES.
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 150/5340-30D DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, CHAPTER 12, PART 12.6; A SAFETY GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. THE PURPOSE OF THE SAFETY GROUND IS TO PROTECT PERSONNEL FROM POSSIBLE CONTACT WITH AN ENERGIZED LIGHT BASE OR MOUNTING STAKE AS THE RESULT OF A SHORTED CABLE OR ISOLATION TRANSFORMER. A SAFETY GROUND SHALL BE INSTALLED AT EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. A SAFETY GROUND SHALL ALSO BE INSTALLED AT EACH STAKE MOUNTED LIGHT FIXTURE. THE SAFETY GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR CONNECTED TO THE GROUND LUG ON THE RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND A 5/8-INCH DIAMETER BY 8-FOOT LONG (MINIMUM) UL LISTED COPPER CLAD GROUND ROD. CONNECTIONS TO GROUND LUGS ON THE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE SHALL BE WITH A UL LISTED GROUNDING CONNECTOR. CONNECTIONS TO GROUND RODS SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY ERICO PRODUCTS, INC., SOLON, OHIO, (PHONE: 800-248-9353), THERMOWELD BY CONTINENTAL INDUSTRIES, INC., TULSA, OKLAHOMA (PHONE: 918-663-1440) OR ULTRAWELD BY HARGER, GRAYSLAKE, ILLINOIS (PHONE: 800-842-7437). EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS. TOP OF GROUND RODS SHALL BE BURIED 12 INCHES MINIMUM BELOW GRADE, UNLESS SPECIFIED OTHERWISE HEREIN, FOR RESPECTIVE APPLICATIONS.
2. CLEAN ALL METAL SURFACES BEFORE MAKING GROUND CONNECTIONS. METALLIC SURFACES TO BE JOINED SHALL BE PREPARED BY THE REMOVAL OF ALL NON-CONDUCTIVE MATERIAL PER 2008 NATIONAL ELECTRICAL CODE ARTICLE 250-12.
3. PER FAA 150/5340-30D THE RESISTANCE TO GROUND OF THE RESPECTIVE MOUNTING STAKE OR LIGHT BASE (WITH GROUND ROD CONNECTED) MUST BE 25 OHMS OR LESS.

JAN 14, 2010 1:17 PM VOORH00805 E:\AIRPORTS\SIA-CARBONDALE\09A0060\CADD\AIRPORT\SHEET\E-003.DWG - ELEC NOTES

DATE	REVISION	BY

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS



IL PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30

Hanson Project No.	09A00600_0800
Filename	E-003.DWG
Scale	N/A
Date	01/08/10
LAYOUT	KNL 08/22/08
DRAWN	BAK 08/22/08
REVIEWED	CAH/JSL 01/08/10

**HANSON**  
Hanson Professional Services Inc.  
1526 South Sixth Street  
Springfield, Illinois 62705-2886  
Offices Nationwide

REPLACE HIRL &  
VARIOUS ELECTRICAL  
UPGRADES  
PROPOSED  
ELECTRICAL NOTES  
SHEET 2









BY	
REVISION	
DATE	

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS

**SIA**  
SOUTHERN ILLINOIS AIRPORT

IL. PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30

Hanson Project No.	09A00600_0800
Filename	E-102.DWG
Scale	3/8" = 1'-0"
Date	01/08/10
LAYOUT	KNL 01/26/09
DRAWN	MV 01/26/09
REVIEWED	CAH/JSL 01/08/10

**HANSON**

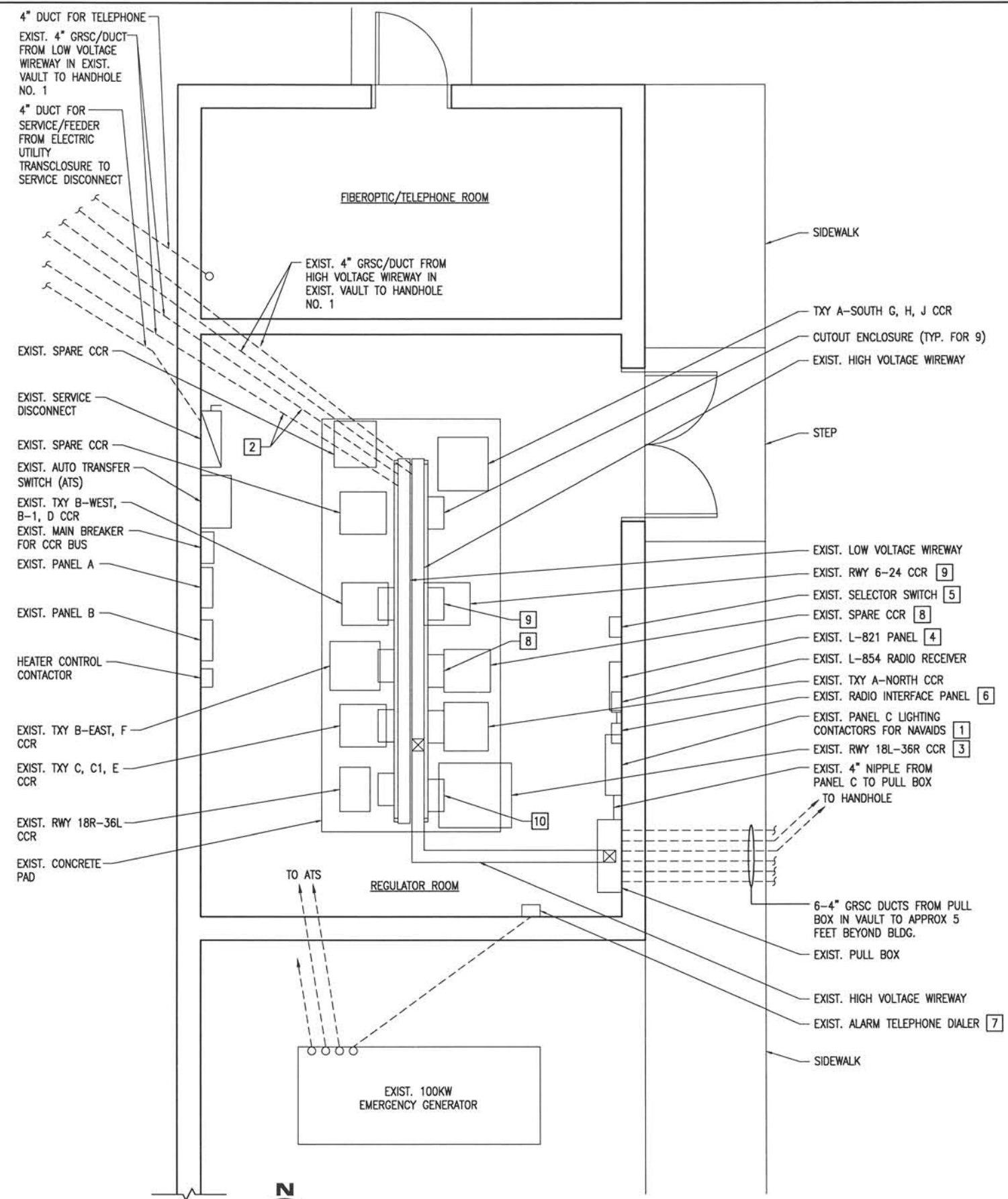
Hanson Professional Services Inc.  
1525 South Sixth Street  
Springfield, Illinois 62703-2886  
Offices Nationwide

REPLACE HIRL &  
VARIOUS ELECTRICAL  
UPGRADES

EXISTING ELECTRICAL  
PLAN FOR VAULT

- NOTES:**
1. ALL WORK SHALL BE COORDINATED WITH THE AIRPORT MANAGER AND THE AIRPORT MAINTENANCE STAFF. ANY WORK AFFECTING AIRFIELD LIGHTING SHALL ALSO BE COORDINATED WITH THE AIR TRAFFIC CONTROL TOWER PERSONNEL.
  2. CAUTION THE AIRPORT VAULT BUILDING HAS BEEN OBSERVED TO HAVE BROWN RECLUSE SPIDERS. USE CAUTION WHEN WORKING IN THE VAULT.
  3. COORDINATE REMOVAL OF EXISTING AIRFIELD LIGHTING CONTROL SYSTEM WITH INSTALLATION OF NEW AIRFIELD LIGHTING CONTROL SYSTEM TO MINIMIZE DOWNTIME.
  4. FIELD VERIFY EXISTING SITE CONDITIONS.
  5. ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT DIRECTOR/MANAGER. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).

- KEYED NOTES:**
- 1 EXISTING PANEL C/LIGHTING CONTACTORS SHALL BE REPLACED WITH A NEW LIGHTING CONTACTOR PANEL FOR NAVAIDS. EXISTING ENCLOSURE MAY BE REUSED IN PLACE. EXISTING FEEDER FROM PANEL B TO PANEL C TO BE REMOVED.
  - 2 EXISTING CONTROL CABLES FROM VAULT TO AIR TRAFFIC CONTROL TOWER SHALL BE REMOVED. EXISTING TERMINAL PANELS LOCATED IN HANDHOLES SHALL BE REMOVED & DISPOSED OF OFF SITE IN A LEGAL MANNER.
  - 3 EXISTING RWY 18L-36R CCR SHALL REMAIN AND BE RECONNECTED FOR USE AS A SPARE/BACKUP UNIT TO THE NEW RWY 18L-36R CCR.
  - 4 EXISTING L-821 PANEL TO BE REMOVED AND TURNED OVER TO THE AIRPORT.
  - 5 EXISTING SELECTOR SWITCH & ENCL. TO BE REMOVED AND TURNED OVER TO THE AIRPORT.
  - 6 EXISTING RADIO INTERFACE PANEL TO BE REMOVED AND TURNED OVER TO THE AIRPORT.
  - 7 REMOVE ALARM TELEPHONE DIALER TO ACCOMMODATE SPACE FOR MANUAL TRANSFER SWITCH. ALARM TELEPHONE DIALER TO REMAIN PROPERTY OF AIRPORT.
  - 8 EXISTING SPARE CCR SHALL BE RELOCATED TO STORAGE SITE ON THE AIRPORT AS DESIGNATED BY AIRPORT MAINT. STAFF. SPARE CUTOUPS SHALL BE REMOVED & TURNED OVER TO THE AIRPORT.
  - 9 RUNWAY 6-24 CCR AND ASSOCIATED CUTOUPS TO BE RELOCATED TO ACCOMMODATE SPACE FOR NEW RUNWAY 18L-36R CCR.
  - 10 EXISTING CUTOUPS FOR RWY 18L-36R CCR TO BE REMOVED WITH THE INSTALLATION OF THE NEW RWY 18L-36R CCR AND ASSOCIATED CUTOUPS.

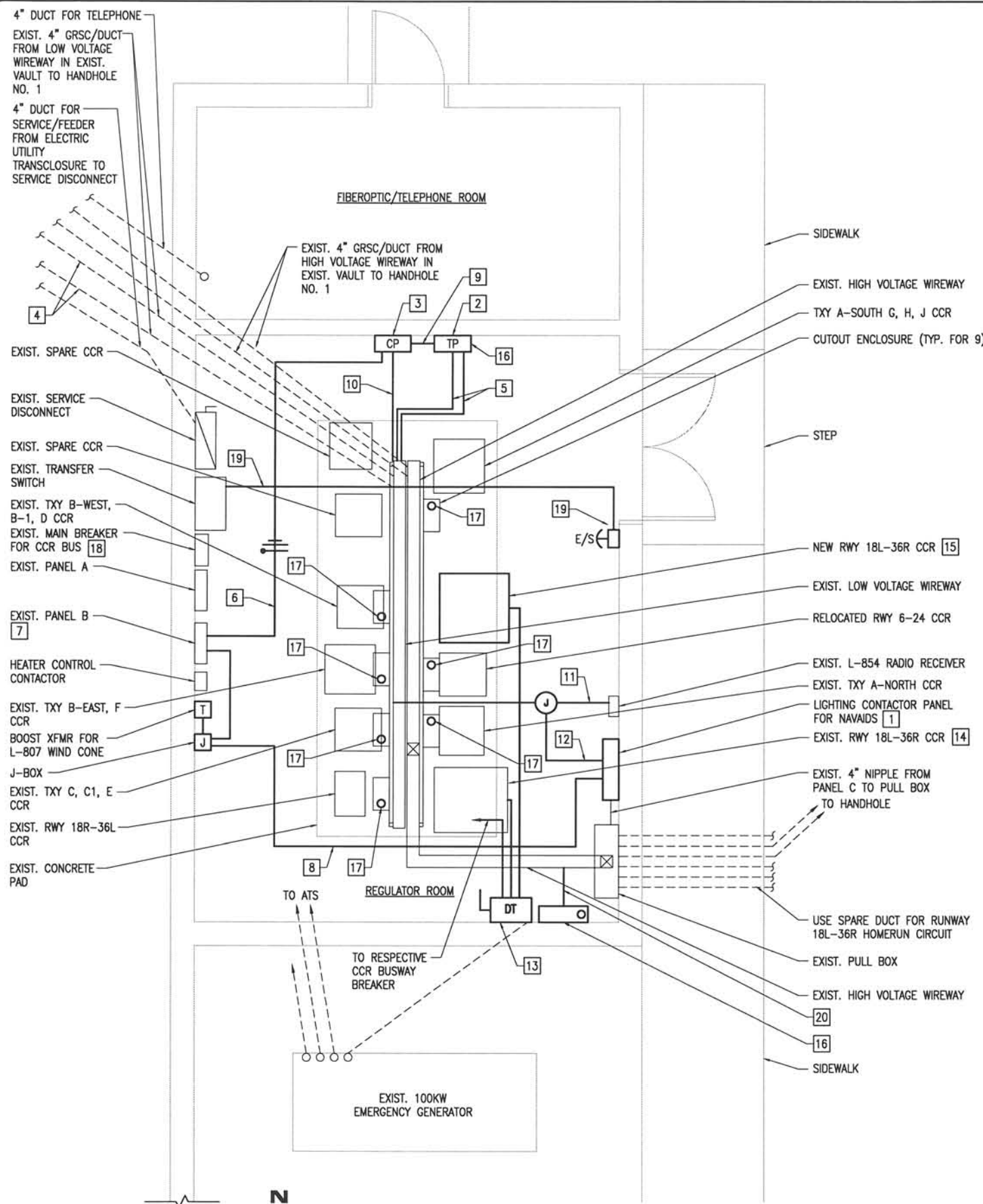


**EXISTING VAULT FLOOR PLAN**

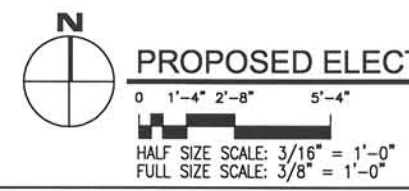
0 1'-4" 2'-8" 5'-4"

HALF SIZE SCALE: 3/16" = 1'-0"  
FULL SIZE SCALE: 3/8" = 1'-0"

JAN 14, 2010 1:17 PM V00R00805  
I:\AIRPORTS\SIA-CARBONDALE\09A00600\CADD\AIRPORT\SHEET\E-102.DWG - Work



**PROPOSED ELECTRICAL PLAN FOR VAULT**



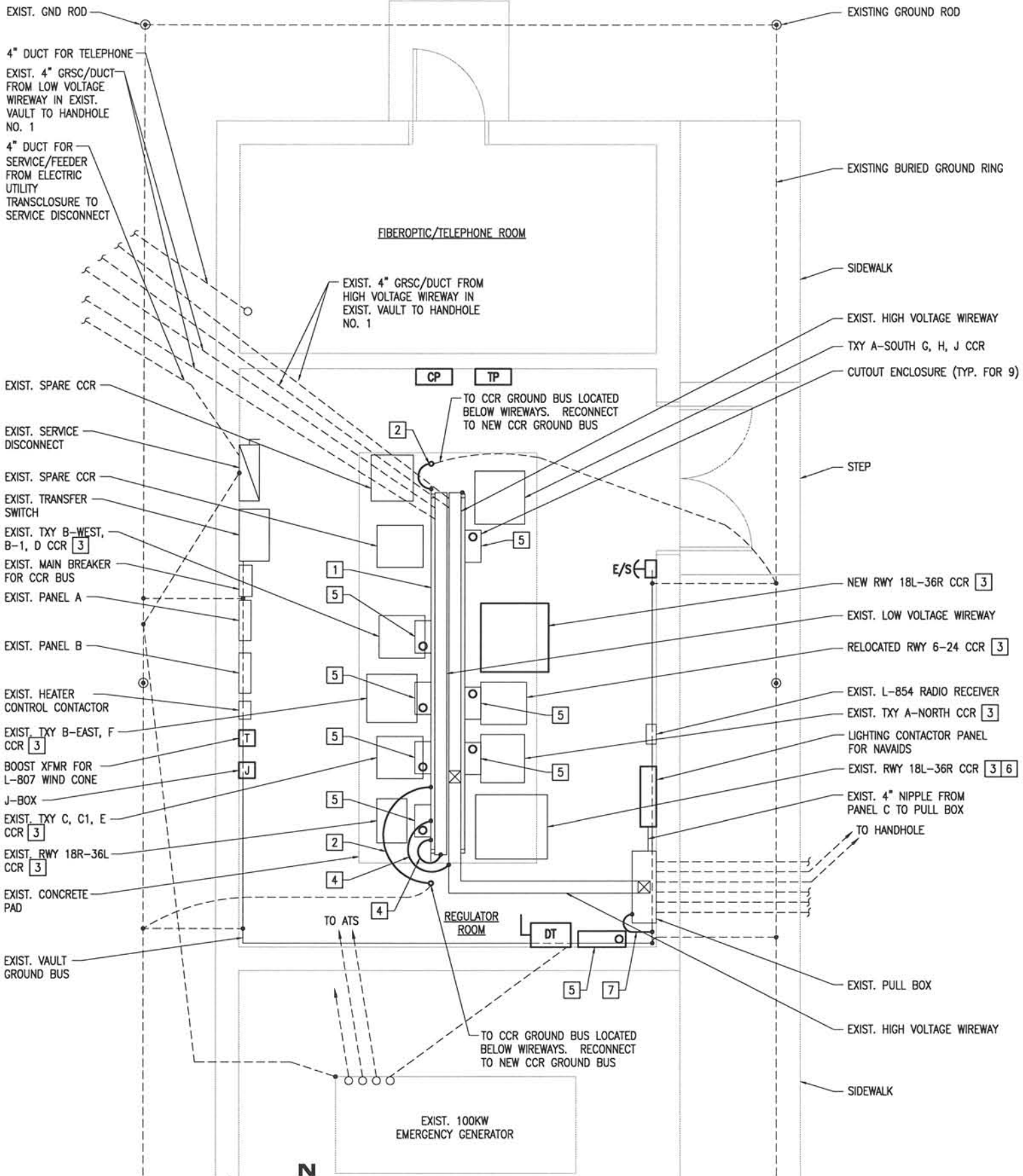
- KEYED NOTES**
- 1 LIGHTING CONTACTOR PANEL FOR NAVAIDS TO REPLACE EXISTING PANEL C/LIGHTING CONTACTORS.
  - 2 TERMINAL PANEL FOR 37/C CABLES FROM ATCT.
  - 3 NEW RADIO INTERFACE/RELAY INTERFACE PANEL.
  - 4 FURNISH AND INSTALL 2-37/C #12 AWG, 600 VOLT TYPE TC CONTROL CABLE FROM VAULT TO ATCT (AIR TRAFFIC CONTROL TOWER) IN EXISTING DUCT BANK SYSTEM. EXTEND CONTROL CABLES TO NEW L-821 PANEL AT THE ATCT AND TO THE TERMINAL PANEL IN THE VAULT. EXISTING CONTROL CABLES SHALL BE REMOVED.
  - 5 37/C #12 AWG 600 VOLT TYPE TC CONTROL CABLE IN 2" GRSC FROM LOW VOLTAGE WIREWAY TO TRANSFER RELAY PANEL. PROVIDE J-BOX AND/OR CONDUIT FITTINGS TO INTERFACE TO LOW VOLTAGE WIREWAY.
  - 6 1 #12 THWN, 1 #12 NEUTRAL, 1 #12 GND (120VAC CONTROL POWER) IN 3/4" GRSC FROM PANEL B TO RADIO INTERFACE/RELAY INTERFACE PANEL.
  - 7 FURNISH AND INSTALL A 10 AMP, 1-POLE BOLT-ON BRANCH BREAKER IN PANEL B; SQUARE D CAT. NO. QOB110. BREAKER SHALL PROVIDE 120 VAC CONTROL POWER FOR THE AIRFIELD LIGHTING CONTROL SYSTEM AND L-854 RADIO RECEIVER. 10 AMP BREAKER SHALL REPLACE THE EXISTING 25 AMP, 1 POLE BREAKER THAT POWERS THE L-854 RADIO RECEIVER. FURNISH & INSTALL THREE 30 AMP, 2-POLE BOLT-ON BRANCH BREAKERS (SQUARE D CAT. NO. QOB230) & ONE 20 AMP, 1-POLE BRANCH BREAKER (SQUARE D CAT. NO. QOB120) FOR NAVAIDS.
  - 8 6 #8 THWN, 1 #8 NEUTRAL, 1 #10 THWN, 1 #10 NEUTRAL, 1 #8 GND (POWER WIRING FOR AIRPORT ROTATING BEACON, L-807 WIND CONE, RWY 18R PLASI, & RWY 36L PLASI) IN 1.5" GRSC FROM PANEL B TO LIGHTING CONTACTOR PANEL. SEE "PROPOSED ELECTRICAL ONE LINE DIAGRAM FOR VAULT".
  - 9 CONTROL WIRING IN 2" GRSC NIPPLE FROM TERMINAL PANEL TO RADIO INTERFACE/RELAY INTERFACE PANEL.
  - 10 CONTROL WIRING FOR CONSTANT CURRENT REGULATORS, AIRFIELD NAVAIDS, LIGHTING CONTACTORS, L-854 RADIO RECEIVER IN 2" GRSC FROM RADIO INTERFACE/RELAY INTERFACE PANEL TO LOW VOLTAGE WIREWAY AND ON TO EACH CCR, LIGHTING CONTACTOR PANEL, & L-854 RADIO RECEIVER. SEE NOTE 4 FOR COLOR CODING REQUIREMENTS FOR CONTROL WIRES TO CCR'S.
  - 11 3 #12 THWN, 1 #12 GND (L-854 RADIO RECEIVER OUTPUT CONTROL WIRING) IN 3/4" GRSC.
  - 12 CONTROL WIRING FOR LIGHTING CONTACTORS IN 3/4" GRSC.
  - 13 DOUBLE THROW NOT FUSIBLE SAFETY SWITCH/MANUAL TRANSFER SWITCH FOR RWY 18L-36R CONSTANT CURRENT REGULATORS. SEE "PROPOSED ELECTRICAL ONE LINE DIAGRAM FOR VAULT" FOR WIRING REQUIREMENTS.
  - 14 EXISTING RWY 18L-36R CCR SHALL BE REWIRED AS A BACKUP UNIT TO THE NEW RWY 18L-36R CCR.
  - 15 NEW RWY 18L-36R CCR TO BE NORMAL USAGE UNIT FOR RWY 18L-36R LIGHTING.
  - 16 NEW CUTOUTS FOR RWY 18L-36R RWY LIGHTING. PROVIDE CLEAR WORKING SPACE IN FRONT OF CUTOUT ENCLOSURE TO MEET NEC CLEARANCE REQUIREMENTS. SEE "HIGH VOLTAGE WIRING SCHEMATIC FOR RWY 18L-36R".
  - 17 FURNISH AND INSTALL L-861 LIGHT FIXTURE ON EACH CUTOUT CABINET, FOR GROUND FAULT INDICATION. SEE HIGH VOLTAGE WIRING SCHEMATICS FOR REQUIREMENTS ON CUTOUT WIRING.
  - 18 FURNISH & INSTALL TRANSIENT VOLTAGE SURGE SUPPRESSOR ABOVE POWER DISTRIBUTION BLOCK ENCLOSURE LOCATED ABOVE MAIN BREAKER FOR CCR BUS. SEE "PROPOSED ELECTRICAL ONE LINE DIAGRAM FOR VAULT" FOR EQUIPMENT & WIRING REQUIREMENTS.
  - 19 ENGINE GENERATOR REMOTE EMERGENCY SHUT DOWN PUSH BUTTON STATION. FURNISH & INSTALL EMERGENCY SHUT DOWN CONTROL WIRING IN 3/4" GRSC & INTERFACE TO ENGINE GENERATOR STANDBY POWER SYSTEM.
  - 20 6 #8 5KV L-824 TYPE C CABLES, 1 #8 GND IN 1.5" GRSC AND 1.5" LTFMC.

- NOTES:**
1. ALL WORK SHALL BE COORDINATED WITH THE AIRPORT MANAGER AND THE AIRPORT MAINTENANCE STAFF.
  2. AIRFIELD LIGHTING MUST BE OPERABLE AT NIGHTFALL. WHERE THE ATCT CONTROLLED LIGHTING SYSTEM IS DOWN FOR REPAIR, RELOCATION, AND/OR UPGRADE WORK, COORDINATE WITH THE AIRPORT MANAGER FOR MANUAL OPERATION OF AIRFIELD LIGHTING, AND FOR ISSUING NOTAMS. DOWN TIME OF ATCT CONTROLLED LIGHTING SYSTEM SHALL BE KEPT TO A MINIMUM. MAXIMUM ALLOWABLE DOWN TIME OF ATCT CONTROLLED LIGHTING SYSTEM IS 10 NIGHTS. COORDINATE INSTALLATION OF NEW RELAY L-821 PANELS, TRANSFER RELAY PANEL, & RADIO INTERFACE/RELAY INTERFACE AIRFIELD LIGHTING CONTROL PANEL WITH REMOVAL OF EXISTING AIRFIELD LIGHTING CONTROL SYSTEM TO MINIMIZE DOWN TIME OF ATCT CONTROLLED LIGHTING SYSTEM.
  3. HIGH VOLTAGE AND LOW VOLTAGE WIRING SHALL NOT BE INSTALLED IN THE SAME RACEWAY, CONDUIT, WIREWAY, OR JUNCTION BOX.
  4. ESTABLISH A COLOR CODING FOR THE CONTROL WIRING TO EACH CONSTANT CURRENT REGULATOR AND BE CONSISTENT FOR ALL REGULATORS. EXAMPLE:
- | 3-STEP      |         | 5-STEP      |         |
|-------------|---------|-------------|---------|
| CCI         | -BLACK  | CC          | -BLACK  |
| CC          | -RED    | CC          | -RED    |
| 10%         | -ORANGE | B1-0.1%     | -VIOLET |
| 30%         | -YELLOW | B2-1.2%     | -BROWN  |
| 100%        | -BLUE   | B3-5%       | -ORANGE |
| EQUIPT. GND | -GREEN  | B4-25%      | -YELLOW |
|             |         | B5-100%     | -BLUE   |
|             |         | EQUIPT. GND | -GREEN  |
- ALSO TAG THE CONTROL WIRES WITH THE RESPECTIVE DESIGNATION (CCI, CC, 10%, 30%, 100%).
5. EQUIPMENT GROUND WIRES SHALL BE INCLUDED WITH EACH BRANCH CIRCUIT & EACH CONTROL CIRCUIT.

BY		REVISION		DATE	
<p><b>SOUTHERN ILLINOIS AIRPORT</b> MURPHYSBORO / CARBONDALE, ILLINOIS</p> <p>Hanson Professional Services Inc. 1525 South Sixth Street Springfield, Illinois 62703-2886 Offices Nationwide</p>					
<p><b>REPLACE HIRL &amp; VARIOUS ELECTRICAL UPGRADES</b></p> <p><b>PROPOSED ELECTRICAL PLAN FOR VAULT</b></p>					
<p><b>31</b></p> <p>31 of 46 sheets</p>					

JAN 14, 2010 1:18 PM V00RH0805  
 I:\AIRPORTS\SIACARBONDALE\09A0060\CADD\AIRPORT\1SHEET\E-103.DWG - Work





**NOTES**

1. ALL VAULT WORK AND/OR POWER OUTAGES SHALL BE COORDINATED WITH THE AIRPORT MANAGER AND AIRPORT MAINTENANCE STAFF.
2. ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 (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 UL LISTING, ETL LISTING, OR OTHER THIRD PARTY LISTING AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE PERMITTED.
3. SEE "CCR GROUND BUS RISER" AND "GROUNDING DETAILS" SHEETS FOR ADDITIONAL INFO ON THE NEW GROUND BAR FOR CCR'S.
4. SEE HIGH VOLTAGE WIRING SCHEMATICS FOR REQUIREMENTS ON CUTOUT WIRING.
5. HIGH VOLTAGE & LOW VOLTAGE CIRCUITS SHALL NOT BE INSTALLED IN THE SAME RACEWAY.
6. LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE UL LISTED TO MEET THE REQUIREMENTS OF NEC 350.6, SUITABLE FOR GROUNDING AND SUNLIGHT RESISTANT. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO CCR'S & TRANSFORMERS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. INTERNAL EQUIPMENT GROUND WIRES FOR CCR SERIES CIRCUITS SHALL BE #8 AWG COPPER (MINIMUM). EXTERNAL BONDING JUMPERS USED WITH CCR INSTALLATIONS SHALL BE #6 AWG COPPER (MINIMUM). DO NOT INSTALL LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS NOT UL LISTED. CONFIRM LIQUID TIGHT FLEXIBLE METAL CONDUIT BEARS THE UL LABEL PRIOR TO INSTALLATION.
7. ALL CONNECTIONS TO GROUND BUS BAR SHALL BE WITH 2 HOLE TONGUE LONG BARREL COMPRESSION LUGS BOLTED TO THE BUS BAR WITH 3/8" (MIN.) STAINLESS STEEL BOLTS, NUTS, & WASHERS.
8. GROUND WIRE CONNECTIONS TO EQUIPMENT SHALL BE WITH 2 HOLE TONGUE LONG BARREL COMPRESSION LUGS BOLTED TO THE DEVICE WITH 3/8" (MIN.) STAINLESS STEEL BOLTS, NUTS, & WASHERS OR WITH THE RESPECTIVE EQUIP MANUFACTURER'S LUG OR TERMINAL WHERE APPLICABLE.
9. GROUNDING ELECTRODE CONDUCTORS, BONDING JUMPERS, & INDIVIDUAL GROUND WIRES SHALL NOT BE INSTALLED IN METAL CONDUIT.
10. ALL CONNECTIONS SHALL BE COATED WITH A CORROSION PREVENTATIVE COMPOUND (SANCHEM NO-OX-ID "A-SPECIAL", OR EQUAL) BEFORE JOINING. ALL COPPER BUS BARS SHALL BE CLEANED PRIOR TO MAKING CONNECTION TO REMOVE SURFACE OXIDATION. CLEAN SURFACES, OF RESPECTIVE DEVICES TO BE BONDED, TO BARE METAL, PER NEC 250-12.

**KEYED NOTES**

- 1 NEW GROUND BAR FOR CCR'S; 1/4" THICK BY 2" WIDE BY 16'-6" LONG COPPER BUS BAR WITH STANDOFF INSULATORS AND MOUNTING HARDWARE. NEW GROUND BAR SHALL REPLACE EXISTING 1/4" THICK BY 1" WIDE GROUND BAR AT CCR'S. MOUNT TO EXISTING STRUT SUPPORT STRUCTURE. SEE NOTE 3.
- 2 CONNECT EXISTING #1/0 GROUNDING ELECTRODE CONDUCTOR TO NEW GROUND BAR.
- 3 BOND EACH CCR FRAME TO NEW GROUND BAR WITH #6 AWG (MIN.) STRANDED COPPER CONDUCTOR. SEE NOTE 3.
- 4 BOND HIGH VOLTAGE & LOW VOLTAGE WIREWAYS TO NEW GROUND BAR WITH #6 AWG (MIN.) STRANDED COPPER CONDUCTOR. ALSO BOND STRUT SUPPORT RACK TO NEW GROUND BAR WITH #6 AWG (MIN.) STRANDED COPPER CONDUCTOR.
- 5 BOND EACH CUTOUT ENCLOSURE TO NEW GROUND BAR WITH #6 AWG (MIN.) STRANDED COPPER CONDUCTOR. FURNISH AND INSTALL AN L-861 LIGHT FIXTURE, ON EACH CUTOUT CABINET, FOR GROUND FAULT INDICATION. SEE NOTES 3 & 4.
- 6 FURNISH & INSTALL AN AC POWER SURGE ARRESTER AT THE INCOMING POWER TERMINALS OF THE EXISTING RWY 18L-36R CCR. SURGE ARRESTER SHALL BE SUITABLE FOR 240VAC, 1 PHASE WITH GND, WITH 45KA MAX SINGLE PULSE RATING, 8/20 MICROSECOND PER LINE, LIGHTNING PROTECTION CORP MODEL LPC 11765U-13 OR APPROVED EQUAL.
- 7 BOND PULL BOX FRAME TO VAULT GROUND BUS WITH #6 AWG STRANDED COPPER CONDUCTOR.

**PROPOSED GROUNDING PLAN FOR VAULT**



0 1'-4" 2'-8" 5'-4"  
 HALF SIZE SCALE: 3/16" = 1'-0"  
 FULL SIZE SCALE: 3/8" = 1'-0"

BY	
REVISION	
DATE	

SOUTHERN ILLINOIS AIRPORT  
 MURPHYSBORO / CARBONDALE, ILLINOIS  
 SIA  
 SOUTHERN ILLINOIS AIRPORT  
 I.L. PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30

Hanson Project No. 09A00600_0800	Filename E-104.DWG	Scale 3/8" = 1'-0"	Date 01/08/10
LAYOUT	KNL	12/22/09	
DRAWN	MV	12/28/09	
REVIEWED	CAH/JSL	01/08/10	

**HANSON**  
 Hanson Professional Services Inc.  
 1525 South Sixth Street  
 Springfield, Illinois 62703-2886  
 Offices Nationwide

REPLACE HIRL &  
 VARIOUS ELECTRICAL  
 UPGRADES  
 PROPOSED GROUNDING  
 PLAN FOR VAULT

240/120 VAC, 3PH, 4W ELECTRIC SERVICE 3-500 MCM XHHW-2, 1-500 MCM XHHW-2 NEUTRAL IN 4" GRSC

SQUARE D SDSA3650

GOULD SHAWMUT TR400R

3-500 MCM XHHW-2, 1-500 MCM XHHW-2 NEUTRAL, 1 #1/0 GND 4" GRSC NIPPLE

3-350 MCM USE-2, 1-350 MCM NEUTRAL, 1 #1/0 GND IN 3" (UNDERGROUND)

ENGINE GENERATOR SET. KOHLER MODEL 100ROZJ01, SERIAL 362601, 100KW/125KVA STANDBY

1/0 BONDING JUMPER TO GND BUSHING ON SERVICE CONDUIT

GND LUGS POSSIBLY FLOATED FROM ENCL FRAME

GND ELECTRODE CONDUCTOR IN 1" PVC

400 AMP, 3 POLE, 240 VAC, 3 PHASE, 60 HZ AUTO TRANSFER SWITCH, ASCO SERIES 300, CAT. NO. E00300030400F100 SER. NO. 263100-001RE

3-500 MCM XHHW-2, 1-500 MCM XHHW-2 NEUTRAL, 1 #1/0 GND IN 3.5" GRSC

3 #1/0 THWN, 1 #1/0 NEUTRAL, 1 #3 GND IN 2" GRSC NIPPLE

4-1 POLE ILSCO LDB-22-500 PD BLOCKS & SMALLER PDB FOR GNDS IN A HOFFMAN A-24N20ALP NEMA 1 ENCL.

FLOATED

APPEAR TO BE 3 #350 MCM, 1 #350 MCM NEUTRAL, 1 #3 GND IN 3" GRSC NIPPLE

PANEL A; SQUARE D NQ0D430L225CU, SER E2, 225 AMP, 240/120 VAC, 3PH, 4W, 30 CIRCUIT PANELBOARD. PHASE B IS THE HIGH LEG.

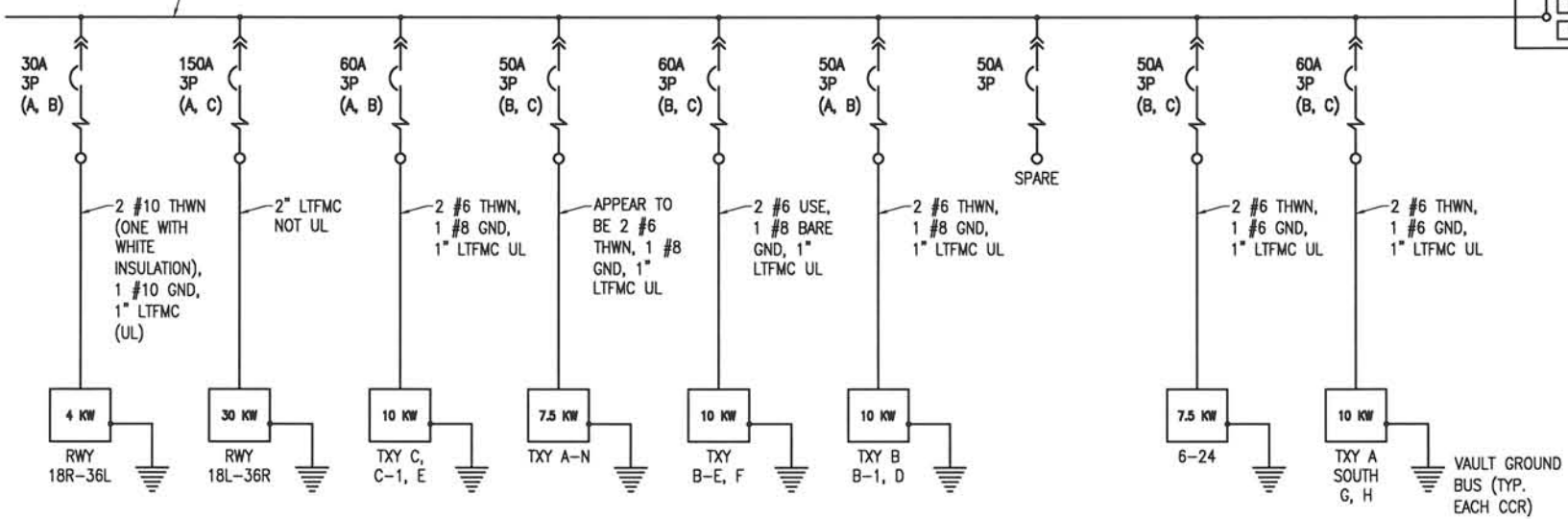
PANEL B; SQUARE D NQ0D20L100CU, SER E2, 100 AMP, 120/240 VAC, 1PH, 3W, 20 CIRCUIT PANELBOARD

2 #6 THWN, 1 #6 NEUTRAL, 1 #8 GND IN 2" GRSC

LIGHTING CONTACTOR PANEL FOR NAVAIDS TO BE REPLACED

SQUARE D I-LINE ALUMINUM PLUG-IN BUSWAY CAT. NO. AP504G10, SERIES 4, SYSTEM: 3P, 4W, 600 VOLTS, 400 AMPS, 100% NEUTRAL CAPACITY.

CABLE TO BUSWAY TAP BOX SQUARE D CAT NO PBTB506G SER 7, 3P, 4W MAX VOLTS 277/480 600 AMPS, 22,000 S.C. RATING



EXISTING ELECTRICAL ONE LINE DIAGRAM FOR VAULT

DATE	REVISION	BY

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS

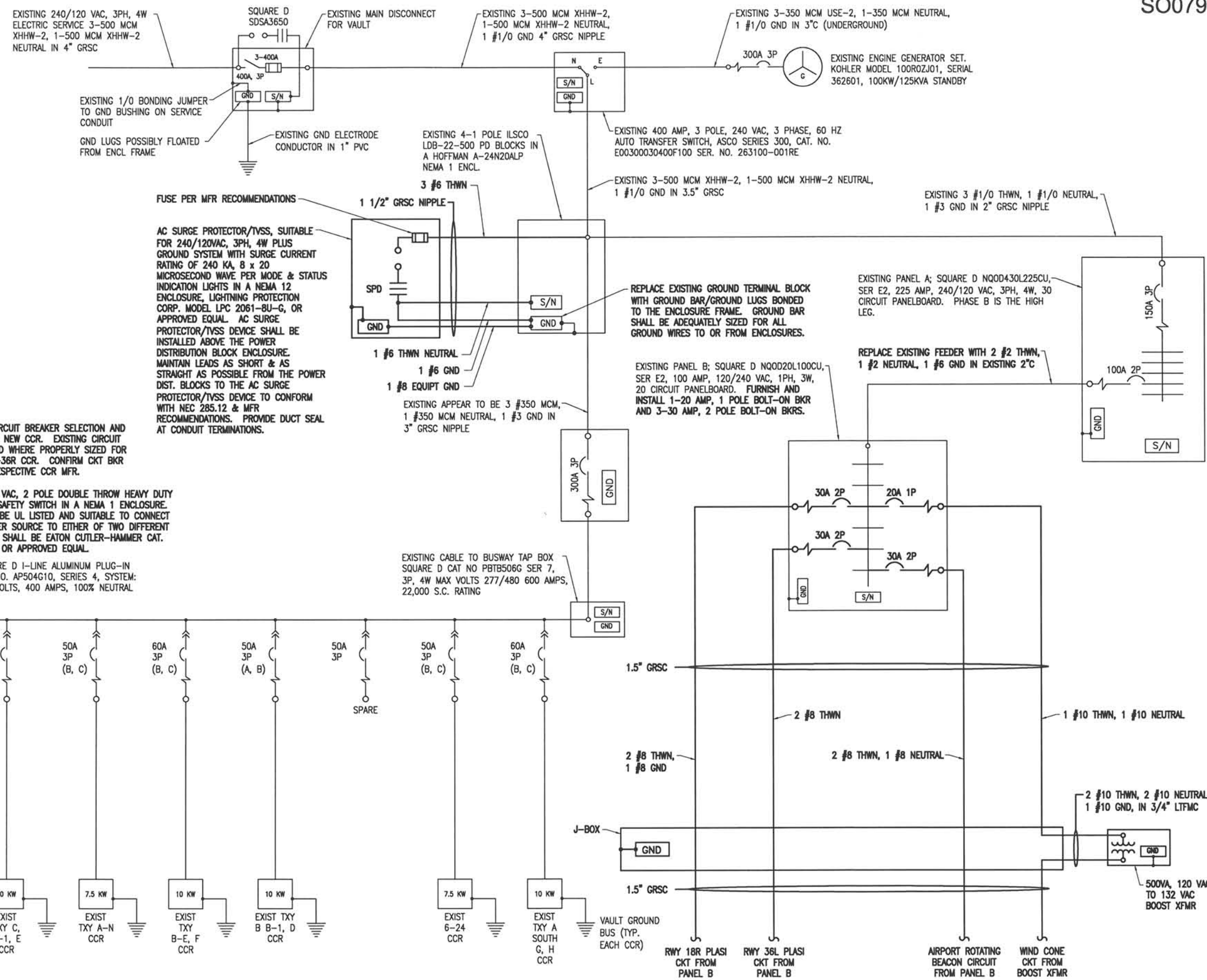
IL PROJ.: MDH-3970 A.I.P. PROJ.: 3-17-0009-B30

Hanson Project No. 09A0060D_0800	11/12/09
Element E-601.DWG	11/12/09
Scale NOT TO SCALE	
Date 01/08/10	
LAYOUT KNL	
DRAWN MV	
REVIEWED CAH/JSL	

Hanson Professional Services Inc.  
1925 South Shawnee Rd  
Springfield, IL 62761-2886  
Offices Nationwide

REPLACE HIRL & VARIOUS ELECTRICAL UPGRADES  
EXISTING ELECTRICAL ONE LINE DIAGRAM FOR VAULT

JAN 14, 2010 2:05 PM V00RH00805  
I:\AIRPORTS\SI-M-CARBONDALE\09A0060\CAD\AIRPORT\SH001.E-601.DWG - Work

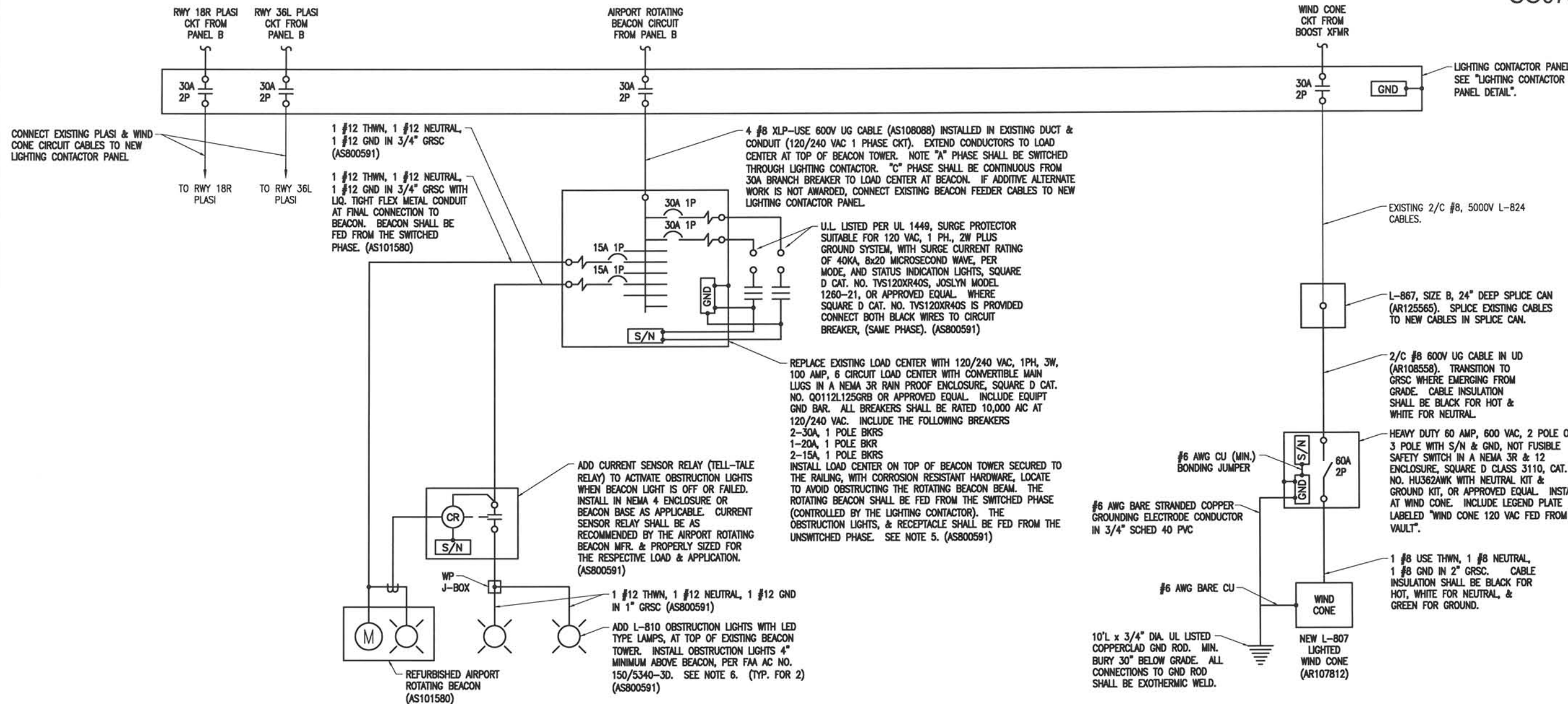


PROPOSED ELECTRICAL ONE LINE DIAGRAM FOR VAULT

JAN 14, 2010 5:02 PM HINDS00609  
 E:\AIRPORTS\SIA-CARBONDALE\GSA0600\CADD\AIRPORT\SHEET\E-607.DWG - Work

BY		REVISION		DATE					
<b>SOUTHERN ILLINOIS AIRPORT</b> MURPHYSBORO / CARBONDALE, ILLINOIS SOUTHERN ILLINOIS AIRPORT ILL. PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30									
Horizon Project No. 09A00600_0800 Filename E-607.DWG Scale NOT TO SCALE Date 01/08/10									
LAYOUT	KNL	12/15/09	REVIEWED	CAH/JSI	01/08/10	DRAWN	MV	12/17/09	
<b>HANSON</b> Hanson Professional Services Inc. 1526 South Sixth Street Springfield, Illinois 62705-2886 Office: Nationwide									
REPLACE HIRL & VARIOUS ELECTRICAL UPGRADES PROPOSED ELECTRICAL ONE LINE DIAGRAM FOR VAULT									
34									
34 of 46 sheets									





**NOTES**



- ALL VAULT WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- 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 EQUIPMENT NOT LABELED AS EXISTING IS NEW.
- BEACON FEEDER SHALL HAVE COLOR CODED INSULATION AS FOLLOWS:

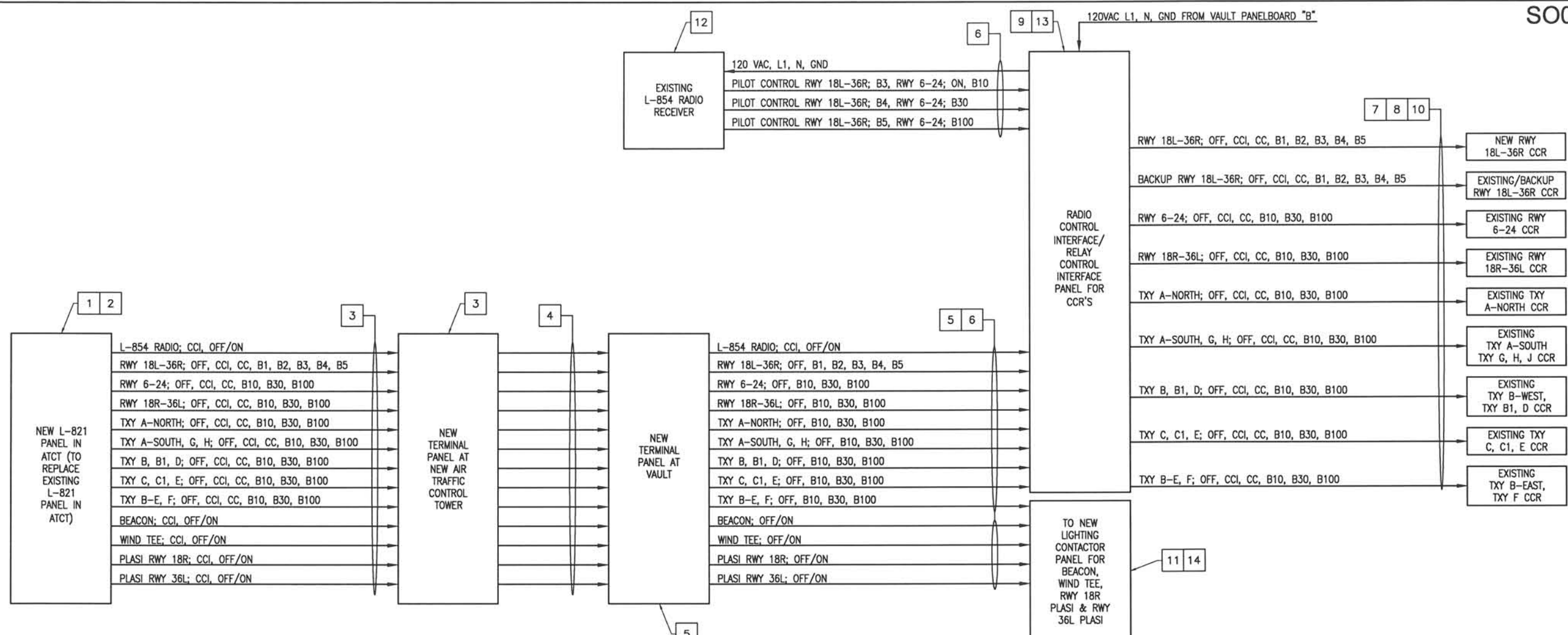
**120/240 VAC CIRCUITS**

PHASE A	BLACK
PHASE C	BLUE OR BLACK WITH BLUE TAPE
NEUTRAL	WHITE
GROUND	GREEN

- PROVIDE NEMA 4 HUBS FOR ALL CONDUIT ENTRIES INTO NEMA 4 RATED ENCLOSURES. PROVIDE NEMA 4 HUBS FOR ALL CONDUIT ENTRIES INTO THE NEMA 3R LOAD CENTER ENCLOSURE.
- INSTALL OBSTRUCTION LIGHTING ON AIRPORT ROTATING BEACON TOWER IN CONFORMANCE WITH FAA AC NO. 150/5340-3D AND FAA AC NO. 150/5370-10, ITEM L-101, INSTALLATION OF AIRPORT ROTATING BEACONS.
- ALL CONDUCTORS/WIRING SHALL BE COPPER.
- CONTRACTOR SHALL CONFIRM POWER REQUIREMENTS WITH THE ACTUAL NAMEPLATE ON EACH CONSTANT CURRENT REGULATOR (OR OTHER RESPECTIVE EQUIPMENT) AND ADJUST CIRCUIT BREAKER, WIRE SIZES & CONDUIT SIZES TO CONFORM WITH NEC & MANUFACTURER'S RECOMMENDATIONS WHERE APPLICABLE. WIRE SIZES SHOWN ON THE PLANS ARE MINIMUM.
- HIGH VOLTAGE & LOW VOLTAGE CIRCUITS SHALL NOT BE INSTALLED IN THE SAME WIREWAY, CONDUIT, HANDHOLE, JUNCTION BOX, OR RACEWAY.
- 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.

**PROPOSED ELECTRICAL ONE-LINE DIAGRAM FOR VAULT (CONTINUED)**

BY	
REVISION	
DATE	
<p><b>SOUTHERN ILLINOIS AIRPORT</b> MURPHYSBORO / CARBONDALE, ILLINOIS</p>  <p>ILL. PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30</p>	
Hanson Project No.	09A00600_0800
Filename	E-608.DWG
Scale	NONE
Date	01/08/10
LAYOUT	KNL 12/16/09
DRAWN	MV 12/17/09
REVIEWED	CAH/JSL 01/08/10
 <p>Hanson Professional Services Inc. 1525 South Sixth Street Springfield, Illinois 62703-2986 Offices Nationwide</p>	
<p><b>REPLACE HIRL &amp; VARIOUS ELECTRICAL UPGRADES</b></p> <p><b>PROPOSED ELECTRICAL ONE-LINE DIAGRAM FOR VAULT - SHEET 2</b></p>	
<p><b>35</b></p> <p>35 of 46 sheets</p>	



**CONTROL BLOCK DIAGRAM FOR AIRFIELD LIGHTING**

**KEYED NOTES:**

- 1 COORDINATE INSTALLATION OF NEW L-821 CONTROL PANEL WITH FAA AIR TRAFFIC CONTROL TOWER PERSONNEL AND THE AIRPORT MANAGER. SEE "L-821 CONTROL PANEL FOR ATCT SHEET, FOR PANEL LAYOUT & REQUIREMENTS.
- 2 CCI FOR L-821 PANEL AT THE ATCT SHALL BE A 120 VAC, 10 AMP CIRCUIT FROM PANELBOARD "B" IN THE VAULT.
- 3 PROVIDE A TERMINAL BLOCK ENCLOSURE AT THE ATCT LOCATION TO TERMINATE OR SPLICE THE CONTROL WIRING CONDUCTORS. TERMINAL BLOCKS SHALL BE NEMA RATED 600 VOLT, 30 AMP, SUITABLE FOR THE RESPECTIVE WIRE SIZES, SQUARE D CLASS 9080, TYPE GK6 OR APPROVED EQUAL, HOUSED IN A NEMA 12 ENCLOSURE WITH HINGED COVER SIZED AS REQUIRED FOR THE CABLE AND TERMINATIONS. TERMINALS SHALL BE LABELED AND NUMBERED 1 THROUGH 74. EXTEND #12 THWN COPPER CONDUCTORS IN GRSC FROM TERMINAL PANEL TO L-821 PANEL AT ATCT. DO NOT USE INSULATION COLORS THAT ARE WHITE OR GREEN FOR CONTROL WIRING. WHITE INSULATED CONDUCTORS SHALL BE FOR NEUTRAL CONDUCTORS. GREEN INSULATED CONDUCTORS SHALL BE FOR GROUND WIRES. SEE SPECIAL PROVISION SPECS.
- 4 CONTROL WIRING FROM L-821 PANEL AT THE ATCT (AIR TRAFFIC CONTROL TOWER) TO THE VAULT SHALL BE 2 SETS OF 37/C #12 AWG, 600 VOLT TYPE TC CONTROL CABLE. CABLE SHALL BE SUITABLE FOR INSTALLATION IN CABLE TRAY, WIREWAYS, DUCT, CONDUIT, AND DIRECT BURIAL APPLICATIONS. PROVIDE CABLE SUPPORTS AND SLEEVES THROUGH WALL & FLOOR PENETRATIONS. INCLUDE FIRE STOP AT WALL & FLOOR PENETRATIONS. CABLES SHALL BE CONTINUOUS (WITHOUT SPLICES) FROM THE VAULT TO THE ATCT.
- 5 PROVIDE A TERMINAL BLOCK ENCLOSURE AT THE VAULT LOCATION TO TERMINATE OR SPLICE THE CONTROL WIRING CONDUCTORS. TERMINAL BLOCKS SHALL BE NEMA RATED 600V, 30 AMP, SUITABLE FOR THE RESPECTIVE WIRE SIZES, SQUARE D CLASS 9080, TYPE GK6 OR APPROVED EQUAL, HOUSED IN A NEMA 12 ENCLOSURE WITH HINGED COVER SIZED AS REQUIRED FOR THE CABLE AND TERMINATIONS.; TERMINALS SHALL BE LABELED AND NUMBERED 1 THROUGH 74 CORRESPONDING TO THE SAME CABLE TERMINATIONS AT THE ATCT. EXTEND #12 THWN COPPER CONDUCTORS IN GRSC FROM TERMINAL PANEL TO RADIO CONTROL INTERFACE/RELAY CONTROL INTERFACE PANEL FOR CCR'S AND TO LIGHTING CONTACTOR PANEL FOR NAVAIDS. DO NOT USE INSULATION COLORS THAT ARE WHITE OR GREEN FOR CONTROL WIRING. WHITE INSULATED CONDUCTORS SHALL BE FOR NEUTRAL CONDUCTORS. GREEN INSULATED CONDUCTORS SHALL BE FOR GROUND WIRES.
- 6 CONTROL WIRING BETWEEN PANELS & EQUIPMENT LOCATED AT THE VAULT SHALL BE #12 AWG THWN COPPER IN WIREWAY & GRSC. DO NOT USE INSULATION COLORS THAT ARE WHITE OR GREEN FOR CONTROL WIRING. WHITE INSULATED CONDUCTORS SHALL BE FOR NEUTRAL CONDUCTORS. GREEN INSULATED CONDUCTORS SHALL BE FOR GROUND WIRES.
- 7 CCI FOR THE CONSTANT CURRENT REGULATORS SHALL BE FROM EACH RESPECTIVE CONSTANT CURRENT REGULATOR INTERNAL CONTROL VOLTAGE POWER SUPPLY.
- 8 ESTABLISH A COLOR CODING FOR THE CONTROL WIRING TO EACH CONSTANT CURRENT REGULATOR AND BE CONSISTENT FOR ALL REGULATORS. EXAMPLE:

3-STEP		5-STEP	
CCI	-BLACK	CCI	-BLACK
CC	-RED	CC	-RED
10%	-ORANGE	B1-0.1%	-VIOLET
30%	-YELLOW	B2-1.2%	-BROWN
100%	-BLUE	B3-5%	-ORANGE
EQUIPT. GND	-GREEN	B4-25%	-YELLOW
		B5-100%	-BLUE
		EQUIPT. GND	-GREEN

- 9 CONTROL RELAYS FOR THE RADIO CONTROL INTERFACE/RELAY CONTROL INTERFACE PANEL SHALL HAVE 10 AMP CONTACT RATINGS AT 240 VAC WITH 120 VAC COILS. TERMINALS SHALL BE NEMA RATED TERMINAL BLOCKS. PROVIDE 3 SPARE RELAYS FOR EACH TYPE USED IN THE RELAY INTERFACE PANEL.
- 10 CONTROL WIRING FROM RESPECTIVE RELAY INTERFACE PANEL TO EACH RESPECTIVE CCR SHALL BE 5 #12 THWN (7 #12 THWN FOR RWY EACH 18L-36R CCR), 1 #12 GND IN LOW VOLTAGE WIREWAY AND GRSC. PROVIDE LTFMC AT FINAL CONNECTIONS TO CCR'S. EXISTING CONTROL WIRING CONDUITS TO CCR'S MAY BE REUSED IN PLACE.
- 11 120 VAC CONTROL POWER FOR LIGHTING CONTACTOR COILS SHALL BE THE SAME SOURCE AS FOR THE RADIO RELAY CONTROL INTERFACE PANEL.
- 12 L-854 RADIO RECEIVER SHALL BE POWERED "ON" 24 HRS PER DAY. PROVIDE INTERFACING RELAYS TO ACTIVATE/ENABLE OUTPUT OF L-854 RADIO WHEN L-821 PANEL AT THE ATCT SWITCHES TO RADIO CONTROL.

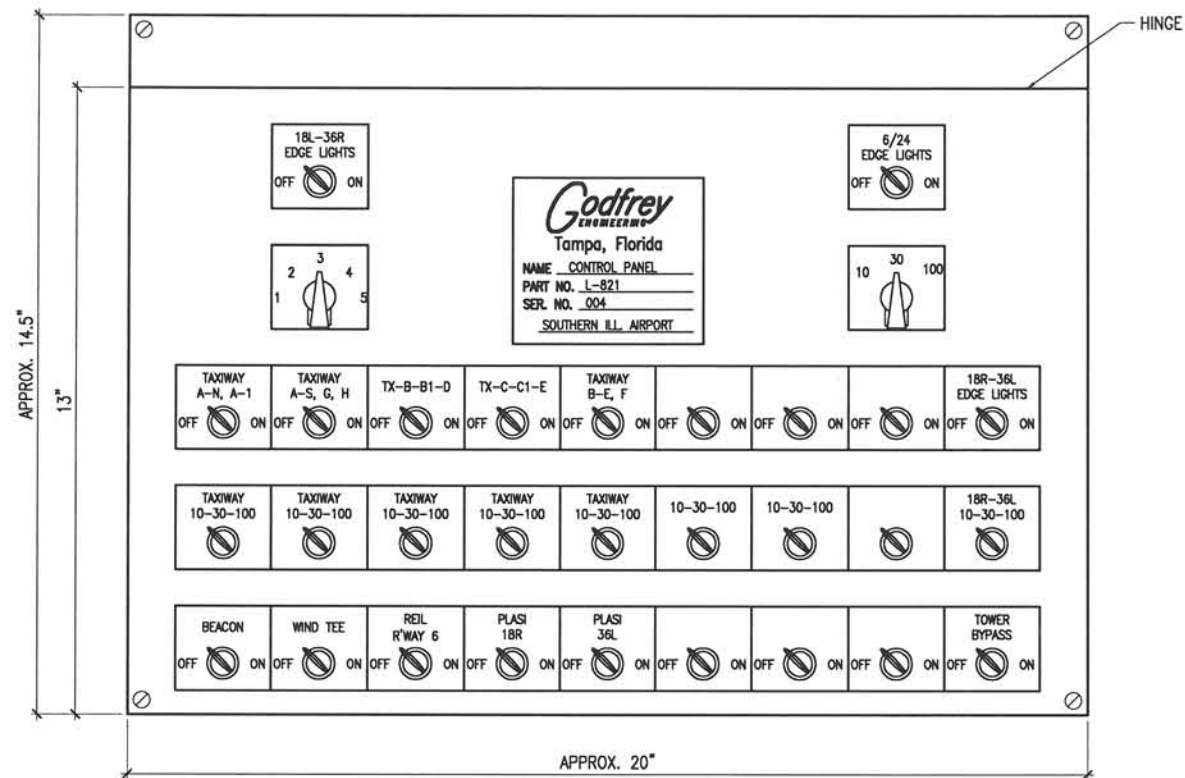
- 13 INCLUDE TWO POSITION SELECTOR SWITCH AND CONTROL RELAY TO SELECT BETWEEN NORMAL RWY 18L-36R CCR AND BACKUP RWY 18L-36R CCR.
- 14 SEE "LIGHTING CONTACTOR PANEL DETAIL" SHEET AND "LIGHTING CONTACTOR SCHEMATIC" SHEET FOR DETAILS ON NEW LIGHTING CONTACTOR PANEL FOR NAVAIDS.

**NOTES**

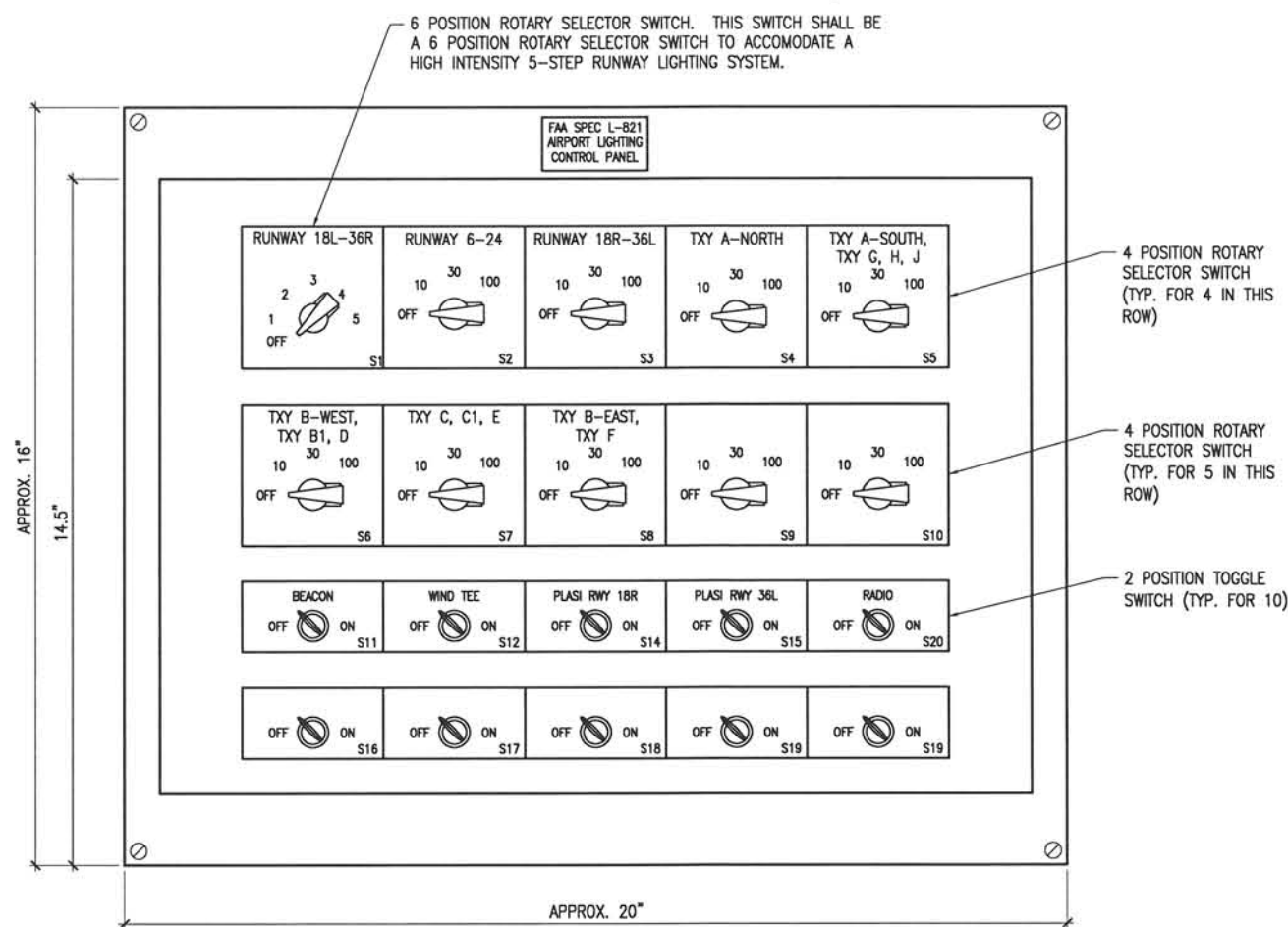
- 1. NEW L-821 PANEL FOR ATCT, AND RADIO CONTROL INTERFACE/RELAY CONTROL INTERFACE PANEL SHALL ALL BE PROVIDED BY THE SAME MANUFACTURER TO ENSURE COMPATIBILITY. SHOP DRAWINGS SHALL INCLUDE PANEL LAYOUT & WIRING DIAGRAMS WITH TERMINAL BLOCK NUMBER DESIGNATIONS.
- 2. EQUIPMENT GROUND WIRES SHALL BE INCLUDED WITH EACH BRANCH CIRCUIT & EACH CONTROL CIRCUIT.
- 3. L-821 PANEL FOR ATCT AND ALL ASSOCIATED CONTROL WIRING, RACEWAYS, & WORK AT THE ATCT WILL BE PAID FOR UNDER ITEM AR109600 L-821 CONTROL PANEL.
- 4. 37/C #12 AWG, 600 VOLT CONTROL CABLES FROM THE VAULT TO THE ATCT WILL BE PAID FOR UNDER ITEM AR108800 CONTROL CABLE.
- 5. TERMINAL PANEL IN VAULT, RADIO CONTROL INTERFACE/RELAY CONTROL INTERFACE PANEL, LIGHTING CONTACTOR PANEL FOR NAVAIDS AND ALL ASSOCIATED POWER & CONTROL WIRING, RACEWAYS, AND WORK AT THE VAULT WILL BE PAID FOR UNDER ITEM AR109620 LIGHTING CONTROL SYSTEM.

JAN 14, 2010 1:18 PM V00RH0805 I:\AIRPORTS\SIA-CARBONDALE\09A0060\CADD\AIRPORT\PROJECT SHEET\E-606.DWG - Work

REVISION		DATE			
<p><b>SOUTHERN ILLINOIS AIRPORT</b> MURPHYSBORO / CARBONDALE, ILLINOIS</p> <p><b>SIA</b> SOUTHERN ILLINOIS AIRPORT</p> <p>ALP. PROJ.: 3-17-0009-B30 IL. PROJ.: MDH-3920</p>					
Horizon Project No. 09A0060D_0800 Filename E-606.DWG Scale NOT TO SCALE Date 01/08/10		LAYOUT KNL 11/17/09 DRAWN MW 11/17/09 REVIEWED CAH/JSI 01/08/10		<p><b>HANSON</b> Hanson Professional Services Inc. 1525 South Sixth Street Springfield, Illinois 62703-2886 Offices Nationwide</p>	
REPLACE HIRL & VARIOUS ELECTRICAL UPGRADES			CONTROL BLOCK DIAGRAM FOR AIRFIELD LIGHTING		
36					
36 of 46 sheets					



**EXISTING L-821 CONTROL PANEL FOR ATCT**



**NEW L-821 CONTROL PANEL FOR ATCT**

**NOTES**

1. THE NEW L-821 CONTROL PANEL SHALL REPLACE THE EXISTING L-821 CONTROL PANEL LOCATED IN THE AIR TRAFFIC CONTROL TOWER. THE EXISTING L-821 PANEL IS AN FAA SPEC TYPE I (CONVENTIONAL PANEL), CLASS F (FLUSH MOUNT IN A CONSOLE), STYLE 1 (UNLIGHTED), MODE 1. THE TOP PLATE DIMENSIONS ARE APPROXIMATELY 20" WIDE BY 14.5" HIGH. THE CONSOLE OPENING IS APPROXIMATELY 19" WIDE BY 17.5" HIGH. CONTRACTOR SHALL FIELD VERIFY EXISTING DIMENSIONS TO CONFIRM.
2. THE NEW L-821 CONTROL PANEL SHALL BE COMPATIBLE WITH THE CONSOLE AT THE EXISTING AIR TRAFFIC CONTROL TOWER. CONTRACTOR SHALL COORDINATE DIMENSIONS OF THE NEW L-821 CONTROL PANEL TO BE COMPATIBLE WITH THE RESPECTIVE CONSOLE. THE NEW L-821 CONTROL PANEL SHALL BE TYPE I (CONVENTIONAL PANEL), CLASS F (FLUSH MOUNT), STYLE 1 (UNLIGHTED), MODE 1 CONFORMING TO FAA A/C 150/5345-3F, AS DETAILED ON THIS SHEET, AND PER THE SPECIAL PROVISION SPECIFICATIONS. THE NEW L-821 CONTROL PANEL SHALL BE MANUFACTURED BY AN FAA-APPROVED L-821 CONTROL PANEL MANUFACTURER; SIEMENS AIRFIELD SOLUTIONS, INC., 977 GAHANNA PARKWAY, COLUMBUS, OHIO 43230, PHONE: (614)-861-1304 OR (800)-545-4157, FAX (614)-864-2069, OR AN EQUIVALENT FAA APPROVED L-821 CONTROL PANEL MANUFACTURER.
3. NEW L-821 PANEL FOR ATCT AND RADIO CONTROL INTERFACE/RELAY CONTROL INTERFACE PANEL SHALL BE PROVIDED BY THE SAME MANUFACTURER TO ENSURE COMPATIBILITY. SHOP DRAWINGS SHALL INCLUDE PANEL LAYOUT & WIRING DIAGRAMS WITH TERMINAL BLOCK NUMBER DESIGNATIONS.
4. L-821 CONTROL PANEL FOR THE ATCT WILL BE PAID FOR UNDER ITEM AR109600 L-821 CONTROL PANEL PER EACH. CONTROL WIRING AND ASSOCIATED CONDUITS, RACEWAYS, SUPPORTS, TERMINAL PANEL(S), JUNCTION BOXES, PULL BOXES, LABOR, TOOLS, COORDINATION AND INCIDENTALS REQUIRED TO COMPLETE THE WORK IN THE AIR TRAFFIC CONTROL TOWER WILL BE PAID FOR UNDER ITEM AR109600.

BY	
REVISION	
DATE	

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS

**SIA**  
SOUTHERN ILLINOIS AIRPORT

IL. PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30

Horizon Project No. 09A00600_0800	11/17/09
Filename E-506.DWG	KNL
Scale NOT TO SCALE	MV
Date 01/08/10	11/17/09
LAYOUT	CAH/JSI
DRAWN	01/08/10
REVIEWED	

**HANSON**

Hanson Professional Services Inc.  
1525 South Sixth Street  
Springfield, Illinois 62703-2886  
Offices Nationwide

REPLACE HIRL &  
VARIOUS ELECTRICAL  
UPGRADES  
L-821 CONTROL PANEL  
FOR ATCT



BY	
REVISION	
DATE	

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS

ALP. PROJ.: 3-17-0009-B30  
IL. PROJ.: MDH-3920

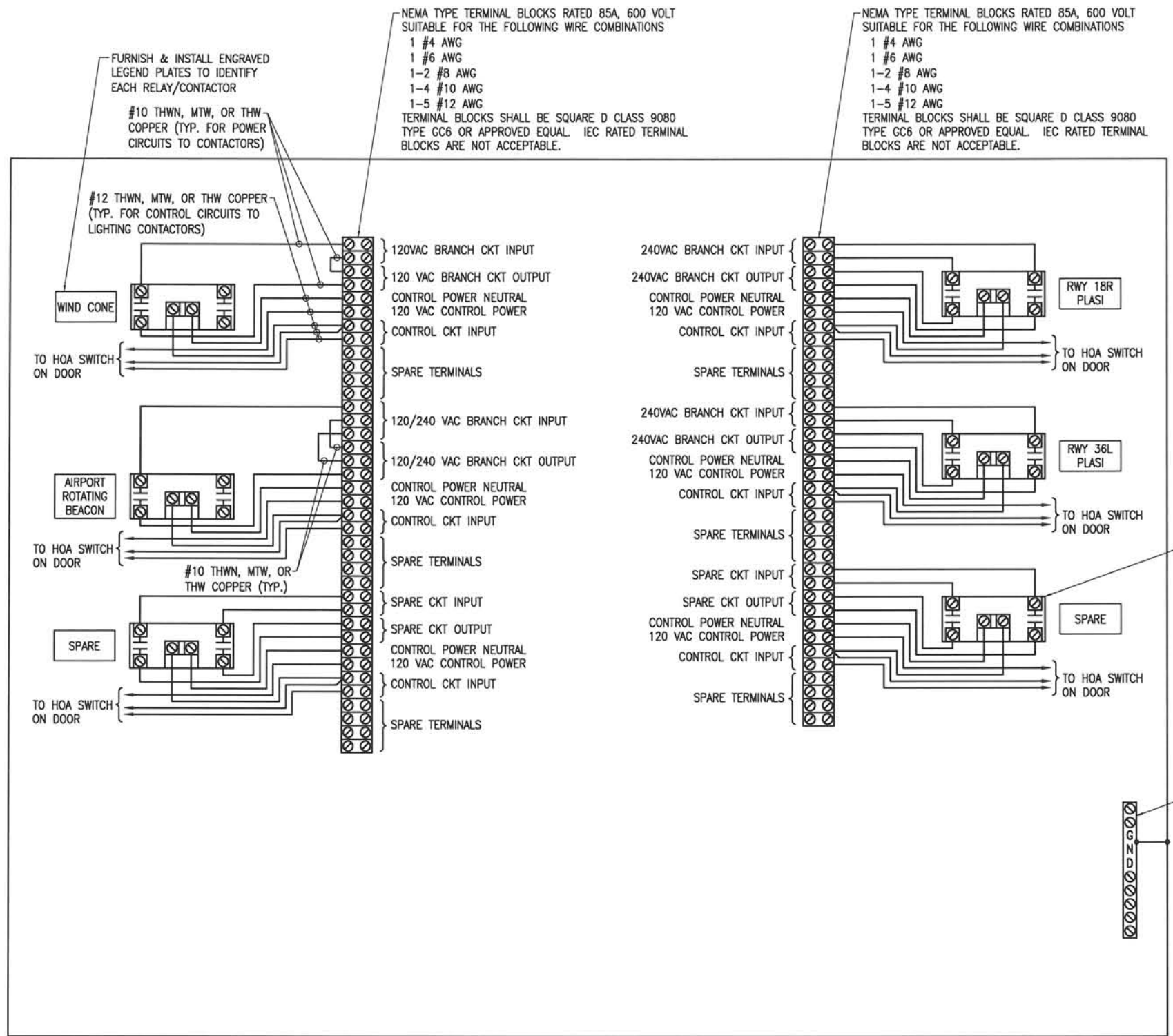
Hanson Project No.	09A00600_0800
Filename	E-604.DWG
Scale	NOT TO SCALE
Date	01/08/10
LAYOUT	KNL 11/12/09
DRAWN	MV 11/12/09
REVIEWED	CAH/JSL 01/08/10

**HANSON**  
Hanson Professional Services Inc.  
1525 South Sixth Street  
Springfield, Illinois 62703-2886  
Offices Nationwide

REPLACE HIRL &  
VARIOUS ELECTRICAL  
UPGRADES  
LIGHTING CONTACTOR  
PANEL DETAIL

NOTES

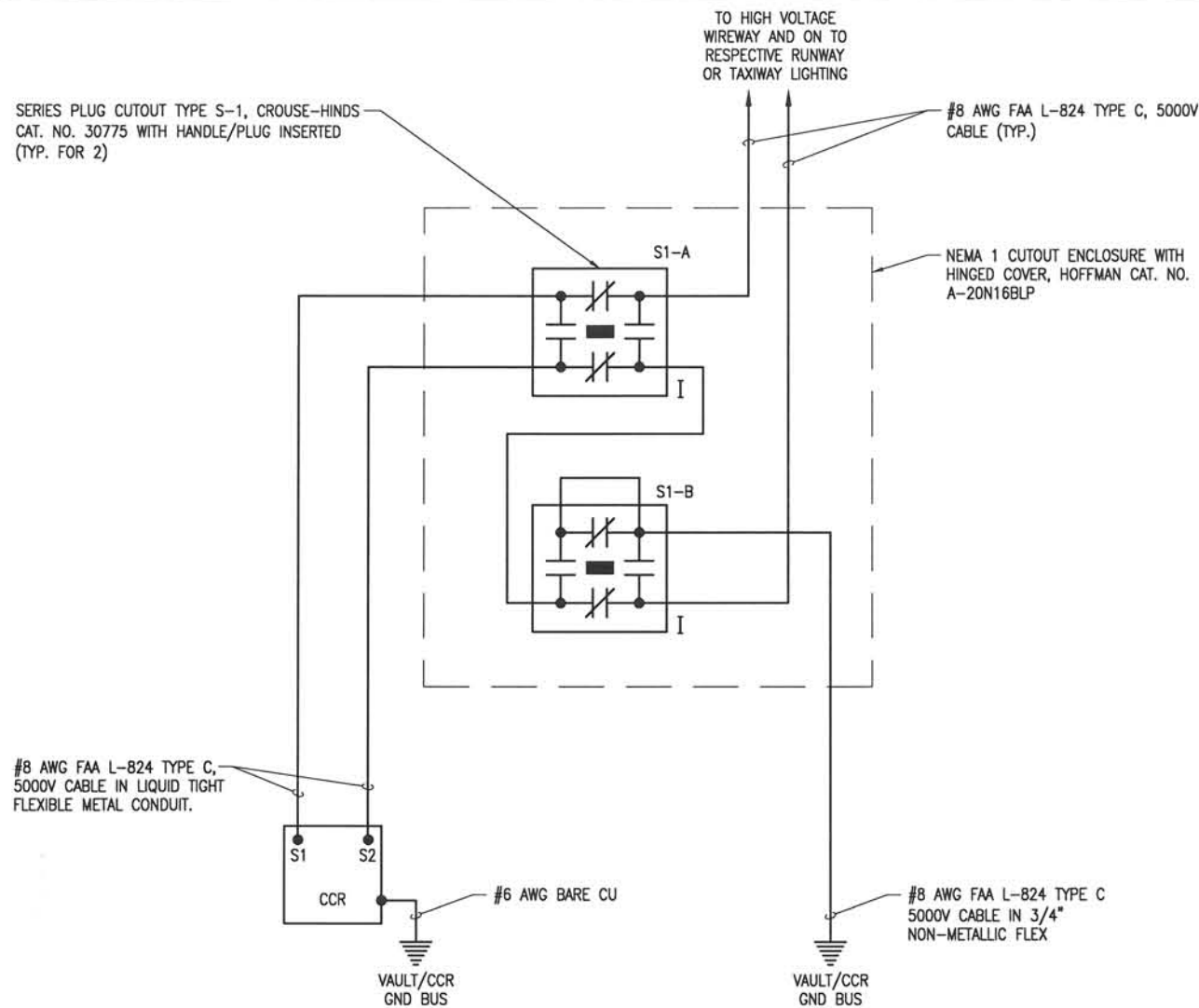
- 15 AMP & 20 AMP INPUT POWER/BRANCH CIRCUITS SHALL BE #10 AWG COPPER THWN FROM THE RESPECTIVE POWER SOURCE TO THE LIGHTING CONTACTOR/RELAY PANEL. 30 AMP INPUT POWER/BRANCH CIRCUITS SHALL BE #8 AWG COPPER THWN (MIN.) FROM THE RESPECTIVE POWER SOURCE TO THE LIGHTING CONTACTOR/RELAY PANEL.
- INPUT CONTROL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



NEMA 12 ENCLOSURE WITH HINGED DOOR AS REQUIRED TO HOUSE LIGHTING CONTACTORS, TERMINAL BLOCKS, WIRING & INTERFACE TO EXISTING CONDUITS, MINIMUM 30"Hx24"Wx12"D AS MANUFACTURED BY HOFFMAN OR APPROVED EQUAL. NOTE EXISTING PANEL C ENCLOSURE TO BE REPLACED BY THIS PANEL IS 30"Hx24"Wx12"D.

CONTROL PANEL FOR AIRFIELD NAVAIDS

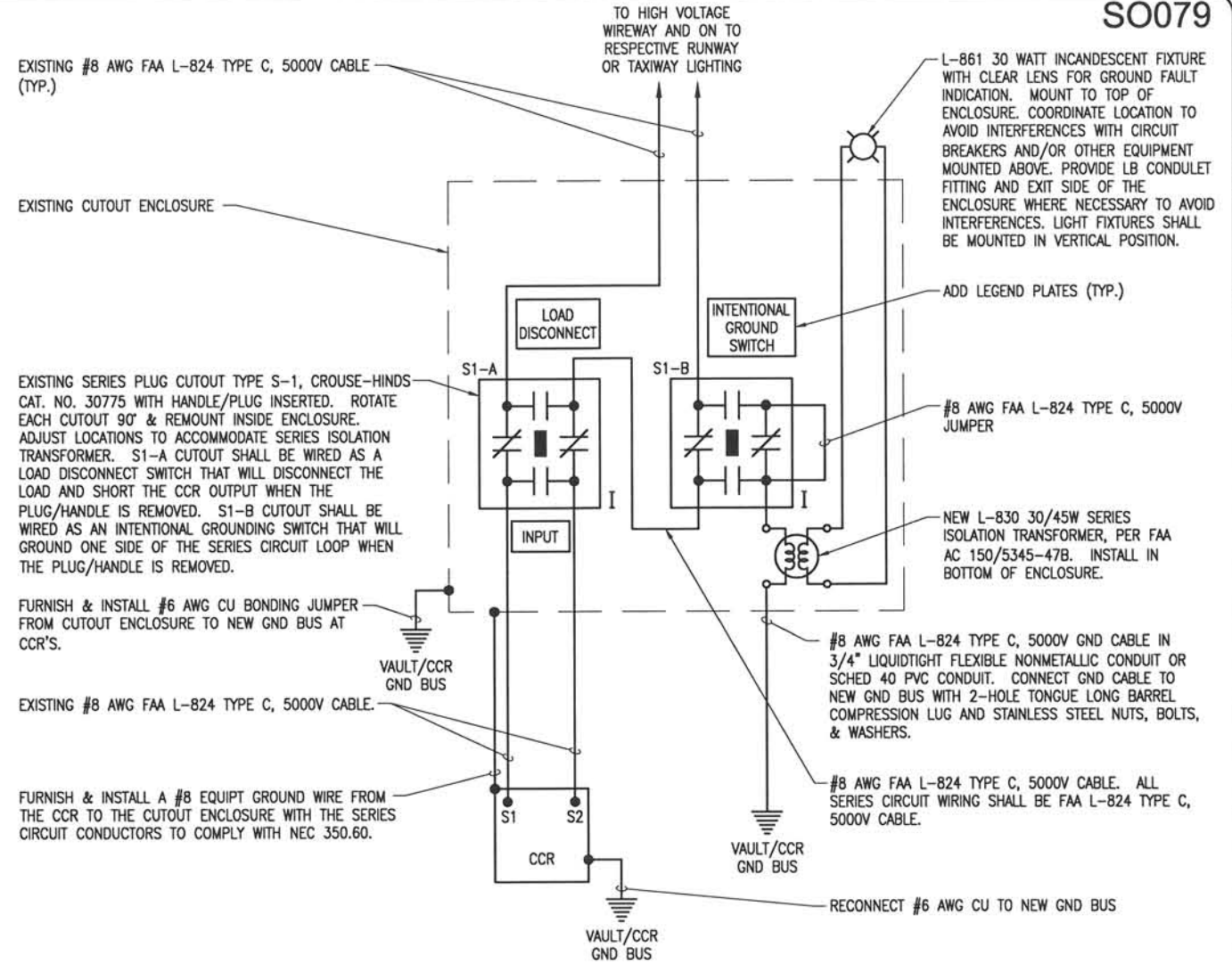




**EXISTING HIGH VOLTAGE WIRING SCHEMATIC**  
 (TYP. FOR EACH CCR)

**LEGEND**

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




**PROPOSED HIGH VOLTAGE WIRING SCHEMATIC**  
 (TYP. FOR 7 CCR'S)

**NOTES**

1. PROPOSED HIGH VOLTAGE WIRING SCHEMATIC SHOWN ON THIS SHEET IS FOR THE FOLLOWING CONSTANT CURRENT REGULATORS:  
 RWY 18R-36L CCR  
 TXY C, C1, E CCR  
 TXY B-EAST, F CCR  
 TXY B-WEST, B-1, D CCR  
 TXY A-SOUTH, G, H, J CCR  
 RWY 6-24 CCR  
 TXY A-NORTH CCR
2. REFER TO COOPER CROUSE-HINDS "TROUBLESHOOTING AIRFIELD SERIES CIRCUITS" GUIDE FOR INFORMATION ON INTENTIONAL GROUNDING METHOD TO ASSIST IN LOCATING GROUND FAULTS ON AIRFIELD LIGHTING CIRCUITS.
3. EACH PLUG CUTOUT CABINET SHALL BE FURNISHED WITH A PHENOLIC ENGRAVED LEGEND PLATE TO IDENTIFY THE RESPECTIVE RUNWAY OR TAXIWAY SERVED AND AN ADDITIONAL PHENOLIC ENGRAVED LEGEND PLATE LABELED "CAUTION OPERATE CUTOUTS WITH CCR SHUT OFF".
4. PROVIDE PHENOLIC ENGRAVED LEGEND PLATES FOR EACH CUTOUT TO IDENTIFY THE FUNCTION OF EACH RESPECTIVE CUTOUT.
5. LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE U.L. LISTED TO MEET THE REQUIREMENTS OF NEC 350.6, SUITABLE FOR GROUNDING AND SUNLIGHT RESISTANT. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO CCR'S & TRANSFORMERS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. INTERNAL EQUIPMENT GROUNDING CONDUCTOR SHALL BE #8 AWG COPPER (MINIMUM). EXTERNAL BONDING JUMPERS USED WITH CCR INSTALLATIONS SHALL BE #6 AWG COPPER (MINIMUM). DO NOT INSTALL LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS NOT UL LISTED. CONFIRM LIQUID TIGHT FLEXIBLE METAL CONDUIT BEARS THE UL LABEL PRIOR TO INSTALLATION.
6. FURNISH & INSTALL A WARNING LABEL FOR EACH CUTOUT ENCLOSURE TO WARN PERSONS OF POTENTIAL ARC FLASH HAZARDS, PER THE REQUIREMENTS OF NEC 110.16 "FLASH PROTECTION".

SO079

BY	REVISION	DATE

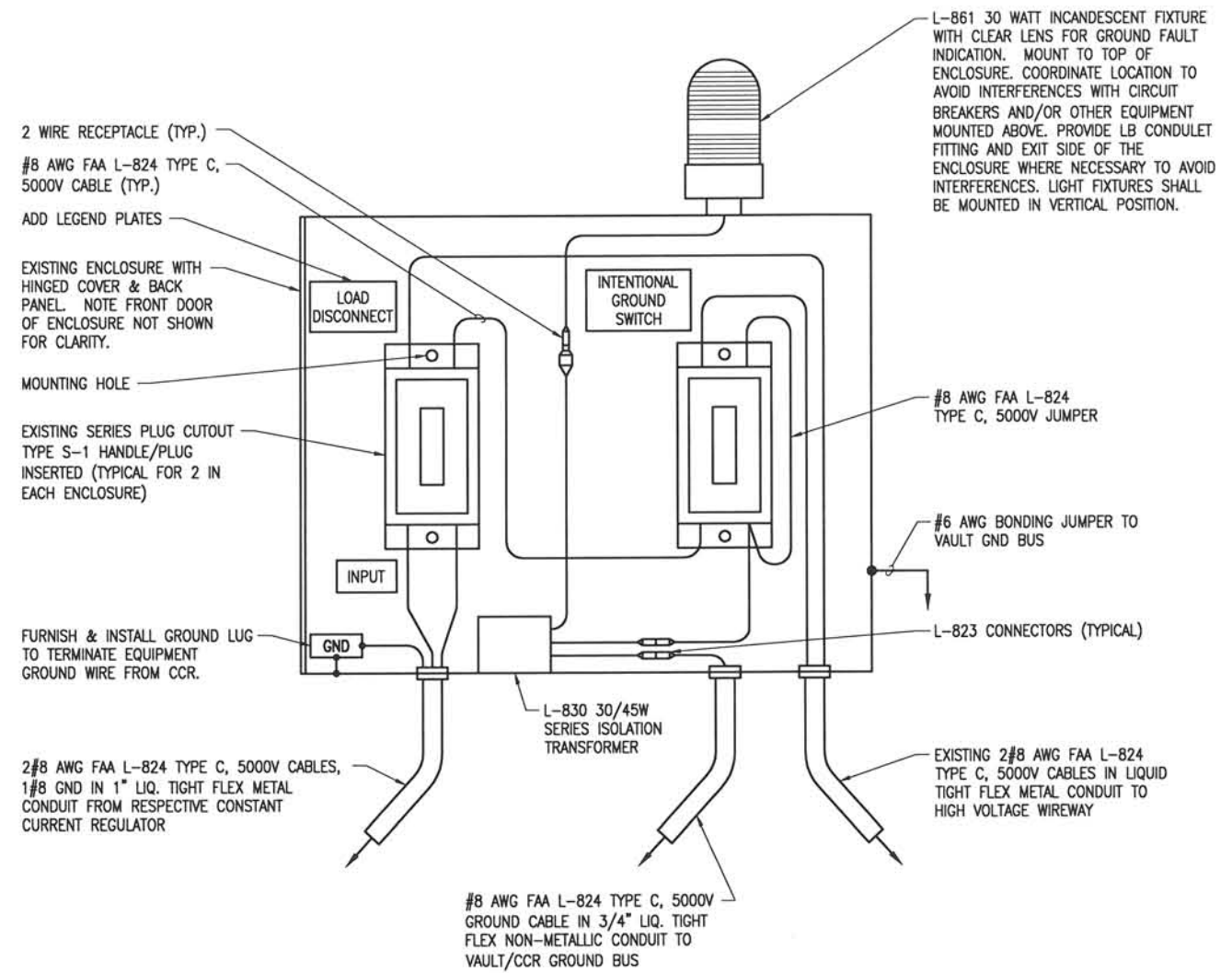
SOUTHERN ILLINOIS AIRPORT  
 MURPHYSBORO / CARBONDALE, ILLINOIS  
  
 ILL. PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30

Hanson Project No. 09A0060D_0800	File Name: E-611.DWG	Scale: NONE	Date: 01/08/10
LAYOUT	KNL	12/15/09	
DRAWN	MV	12/21/09	
REVIEWED	CAH/JSL	01/08/10	

**HANSON**  
  
 Hanson Professional Services Inc.  
 1525 South Sixth Street  
 Springfield, Illinois 62703-2886  
 Offices Nationwide

REPLACE HIRL &  
 VARIOUS ELECTRICAL  
 UPGRADES  
 HIGH VOLTAGE  
 WIRING SCHEMATICS





PROPOSED SERIES PLUG CUTOUT INSTALLATION DETAIL FOR AIRFIELD LIGHTING CIRCUITS  
(TYPICAL FOR 7)

NOTES

- PROPOSED SERIES PLUG CUTOUT INSTALLATION DETAIL SHOWN ON THIS SHEET IS FOR THE FOLLOWING CONSTANT CURRENT REGULATORS:  
RWY 18R-36L CCR  
TXY C, C1, E CCR  
TXY B-EAST, F CCR  
TXY B-WEST, B-1, D CCR  
TXY A-SOUTH, G, H, J CCR  
RWY 6-24 CCR  
TXY A-NORTH CCR
- SEE "HIGH VOLTAGE WIRING SCHEMATICS" SHEET FOR ADDITIONAL INFORMATION AND REQUIREMENTS REGARDING INSTALLATION OF CUTOUTS AND WIRING..

DATE	REVISION	BY

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS

**SIA**  
SOUTHERN ILLINOIS AIRPORT

IL PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30

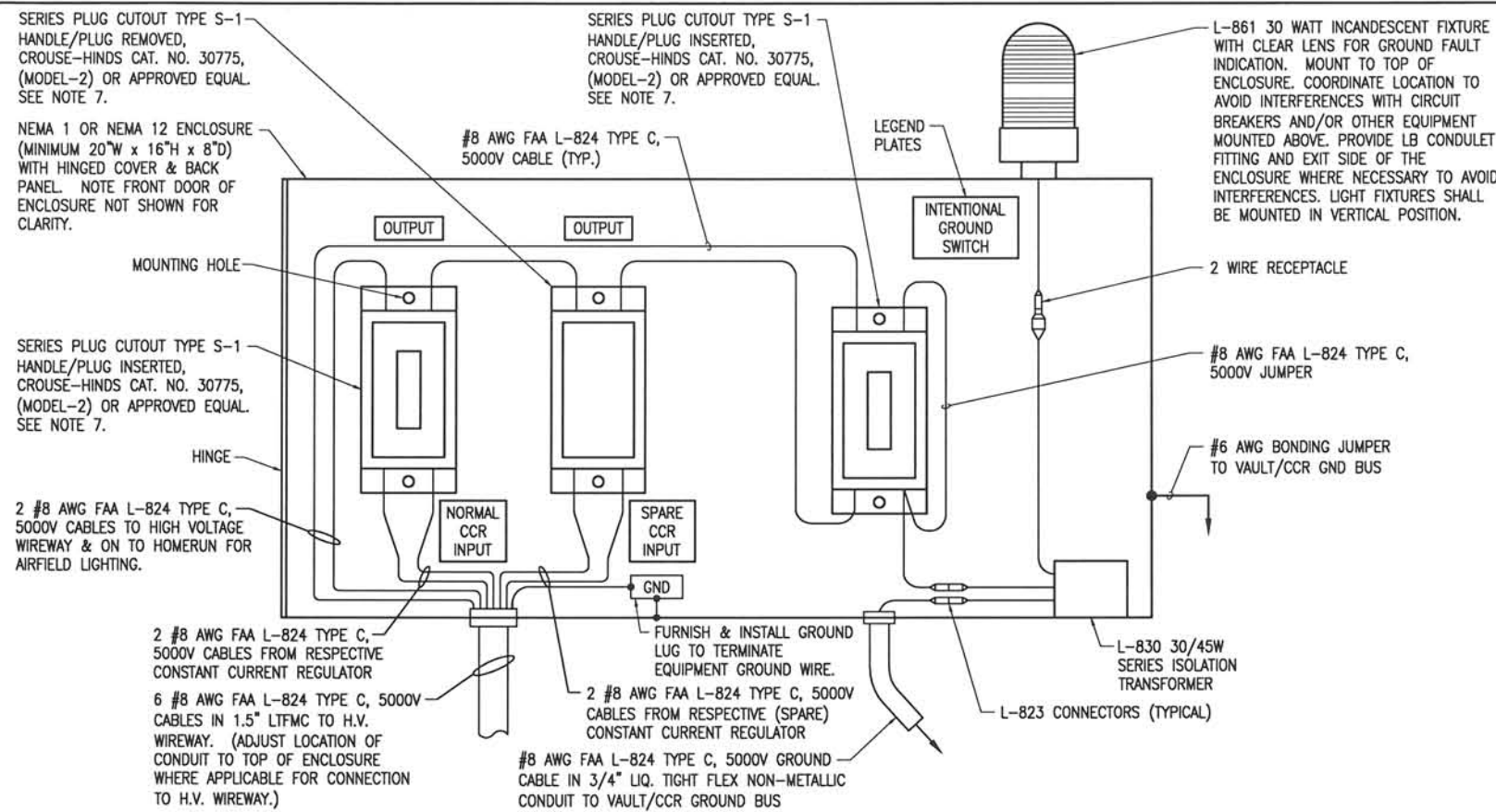
Hanson Project No. 09A00600_0800	Filename E-613.DWG	Scale NONE	Date 01/08/10
LAYOUT	KNL	12/30/09	
DRAWN	MV	12/30/09	
REVIEWED	CAH/JSI	01/08/10	

**HANSON**

Hanson Professional Services Inc.  
1625 South Sixth Street  
Springfield, Illinois 62705-2866  
Offices Nationwide

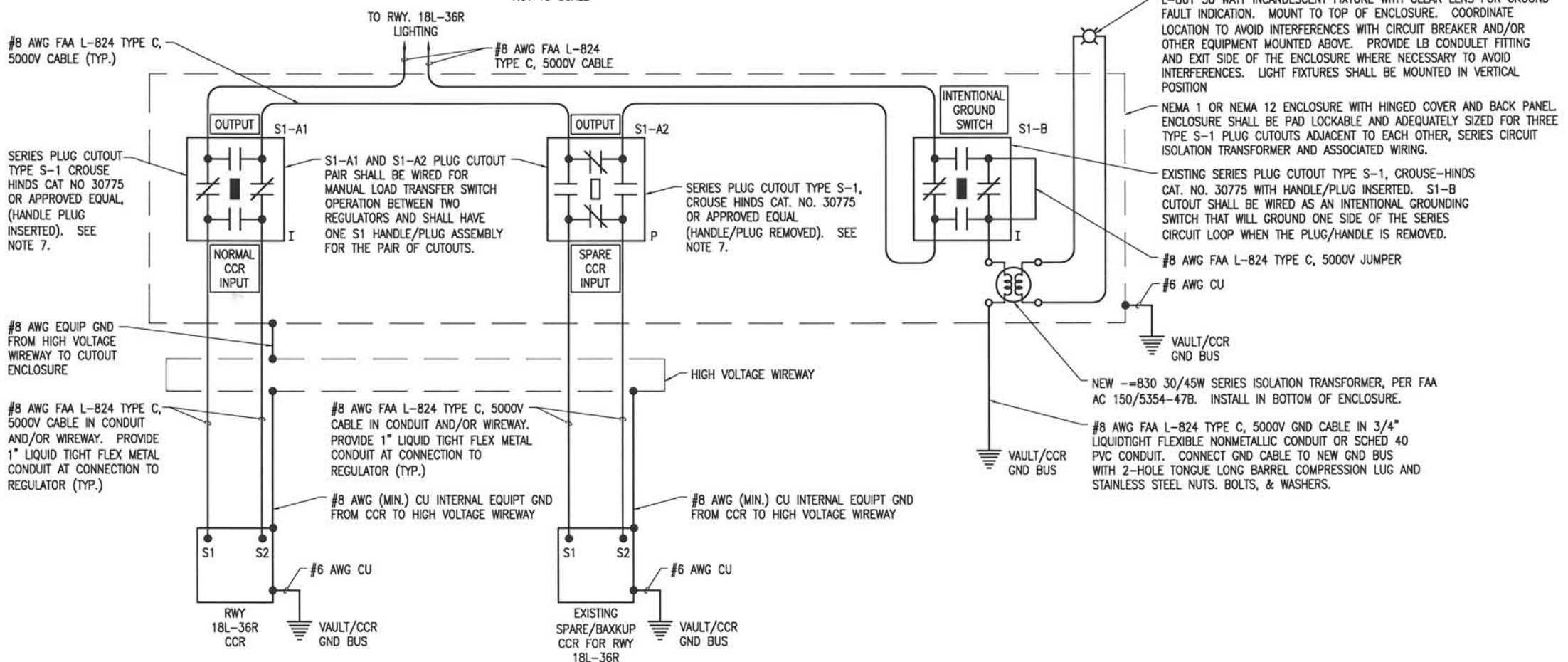
REPLACE HIRL &  
VARIOUS ELECTRICAL  
UPGRADES

SERIES PLUG CUTOUT  
INSTALLATION DETAIL



PROPOSED SERIES PLUG CUTOUT INSTALLATION DETAIL FOR RUNWAY 18L-36R

NOT TO SCALE



HIGH VOLTAGE WIRING SCHEMATIC FOR RUNWAY 18L-36R

NOTES:

1. PROVIDE PHENOLIC ENGRAVED LEGEND PLATES FOR EACH CONSTANT CURRENT REGULATOR NOTING THE REGULATOR DESIGNATION AND THE RUNWAY OR TAXIWAY SERVED.
2. EACH PLUG CUTOUT CABINET SHALL BE FURNISHED WITH A PHENOLIC ENGRAVED LEGEND PLATE THAT IDENTIFIES THE RESPECTIVE CIRCUIT OR REGULATOR. INCLUDE AN ADDITIONAL LEGEND PLATE LABELED "CAUTION OPERATE CUTOUTS WITH CCR SHUT OFF". FURNISH & INSTALL A WARNING LABEL FOR CUTOUT ENCLOSURE TO WARN PERSONS OF POTENTIAL ARC FLASH HAZARDS, PER THE REQUIREMENTS OF NEC 110.16 "FLASH PROTECTION".
3. PROVIDE PHENOLIC ENGRAVED LEGEND PLATES FOR EACH CUTOUT TO IDENTIFY THE RESPECTIVE CUTOUT INPUT CONNECTION AND THE RESPECTIVE CUTOUT OUTPUT CONNECTION.
4. PROVIDE ADEQUATE WORKING SPACE IN FRONT OF EACH CUTOUT ENCLOSURE TO MEET NEC CLEARANCE REQUIREMENTS.
5. PROVIDE WARNING SIGN ON VAULT DOOR LABELED "DANGER - HIGH VOLTAGE - KEEP OUT" PER THE REQUIREMENTS OF NEC 110.34 (C).
6. LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE U.L. LISTED TO MEET THE REQUIREMENTS OF NEC 350.6, SUITABLE FOR GROUNDING AND SUNLIGHT RESISTANT. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO CCR'S & TRANSFORMERS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. EXTERNAL BONDING JUMPERS USED WITH CCR INSTALLATIONS SHALL BE #6 AWG COPPER (MINIMUM). DO NOT INSTALL LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS NOT UL LISTED. CONFIRM LIQUID TIGHT FLEXIBLE METAL CONDUIT BEARS THE UL LABEL PRIOR TO INSTALLATION.
7. CROUSE-HINDS CAT. NO. 30771, (MODEL-3) SERIES PLUG CUTOUTS ARE NOT ACCEPTABLE, BECAUSE THE HANDLE IS NOT REMOVABLE. SIEMENS SCO SERIES CUTOUTS ARE NOT ACCEPTABLE BECAUSE THEY DO NOT FUNCTION THE SAME AS THE CROUSE-HINDS CAT. NO. 30775 CUTOUT. AIRPORT LIGHTING COMPANY S-1 SERIES CUTOUTS ARE NOT ACCEPTABLE BECAUSE THE MANUFACTURER HAS NOTED THEIR CUTOUTS ARE NOT RECOMMENDED TO OPERATE WITH THE HANDLE PULLED/REMOVED. OTHER CUTOUTS THAT DO NOT FUNCTION THE SAME AS CROUSE-HINDS CAT. NO. 30775 (MODEL-2) ARE NOT ACCEPTABLE.
8. HIGH VOLTAGE & LOW VOLTAGE CIRCUITS SHALL NOT BE INSTALLED IN THE SAME WIREWAY.
9. BOND ALL REGULATORS TO THE RESPECTIVE VAULT GROUND BUS WITH A DEDICATED #6 AWG BONDING JUMPER FOR EACH REGULATOR.

LEGEND

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

BY	
REVISION	
DATE	

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS



A.I.P. PROJ.: 3-17-0009-B30

IL PROJ.: MDH-3920

Hanson Project No.	09A0060D_0800
Filename	E-609.DWG
Scale	NONE
Date	01/08/10
LAYOUT	KNL 12/17/09
DRAWN	MV 12/17/09
REVIEWED	CMH/JSL 01/08/10



Hanson Professional Services Inc.  
1525 South Sixth Street  
Springfield, Illinois 62703-2886  
Offices Nationwide

REPLACE HIRL &  
VARIOUS ELECTRICAL  
UPGRADES  
HIGH VOLTAGE  
WIRING SCHEMATIC  
FOR RWY 18L-36R

JAN 14, 2010 1:18 PM V00RH00805  
F:\AIRPORTS\SIA-CARBONDALE\09A0060\CADD\AIRPORT\SHEET\E-609.DWG - Work

VAULT LEGEND PLATE SCHEDULE	
DEVICE	LABEL
SERVICE DISCONNECT	SERVICE DISCONNECT 240/120 VAC, 3PH, 4W WITH HIGH LEG
SERVICE DISCONNECT	NOTE ENGINE GENERATOR NEUTRAL IS ALSO BONDED TO GROUND AT THE SERVICE DISCONNECT
AUTO TRANSFER SWITCH	AUTO TRANSFER SWITCH 240/120 VAC, 3PH, 4W
POWER DISTRIBUTION BLOCK ENCLOSURE	POWER DISTRIBUTION TERMINAL
PANELBOARD A	PANEL A 240/120 VAC, 3PH, 4W WITH HIGH LEG
PANELBOARD B	PANEL B 120/240 VAC, 1PH, 3W
BREAKER FOR CCR BUSWAY	CCR BUSWAY BREAKER 240/120 VAC, 3PH, 4W WITH HIGH LEG
LIGHTING CONTACTOR PANEL FOR NAVAIDS	NAVAID LIGHTING CONTROL PANEL NOTE POWER FROM MULTIPLE BRANCH CIRCUITS
CUTOUT ENCLOSURE FOR RUNWAY 18L-36R CCR'S	RUNWAY 18L-36R
CUTOUT ENCLOSURE FOR TAXIWAY A-NORTH CCR	TAXIWAY A-NORTH
CUTOUT ENCLOSURE FOR RUNWAY 6-24 CCR	RUNWAY 6-24
CUTOUT ENCLOSURE FOR TAXIWAY A-SOUTH, G, H, J CCR	TAXIWAY A-SOUTH, G, H, J
CUTOUT ENCLOSURE FOR RUNWAY 18R-36L CCR	RUNWAY 18R-36L
CUTOUT ENCLOSURE FOR TAXIWAY C, C1, E CCR	TAXIWAY C, C1, E
CUTOUT ENCLOSURE FOR TAXIWAY B-EAST, F CCR	TAXIWAY B-EAST, F
CUTOUT ENCLOSURE FOR TAXIWAY B-WEST, B-1, D CCR	TAXIWAY B-WEST, B-1, D
EXISTING/BACKUP CCR FOR RUNWAY 18L-36R	RUNWAY 18L-36R BACKUP UNIT
NEW CCR FOR RUNWAY 18L-36R	RUNWAY 18L-36R
EXISTING/BACKUP RUNWAY 18L-36R CCR CUTOUT INPUT SIDE	SPARE CCR INPUT
NEW RUNWAY 18L-36R CCR CUTOUT INPUT SIDE	NORMAL CCR INPUT
EXISTING/BACKUP RUNWAY 18L-36R CCR CUTOUT OUTPUT SIDE	OUTPUT

VAULT LEGEND PLATE SCHEDULE	
DEVICE	LABEL
NEW RUNWAY 18L-36R CCR CUTOUT OUTPUT SIDE	OUTPUT
MANUAL TRANSFER SWITCH FOR RUNWAY 18L-36R NORMAL CCR AND SPARE/BACKUP CCR	TRANSFER SWITCH FOR RUNWAY 18L-36R CONSTANT CURRENT REGULATORS
MANUAL TRANSFER SWITCH FOR RUNWAY 18L-36R NORMAL CCR AND SPARE/BACKUP CCR - NORMAL SWITCH POSITION	NORMAL CCR
MANUAL TRANSFER SWITCH FOR RUNWAY 18L-36R NORMAL CCR AND SPARE/BACKUP CCR - BACKUP SWITCH POSITION	SPARE/BACKUP CCR
EACH CCR (EXCEPT RUNWAY 18L-36R) LOAD DISCONNECT CUTOUT INPUT SIDE (TYP. FOR 7)	INPUT
EACH CCR (EXCEPT RUNWAY 18L-36R) LOAD DISCONNECT CUTOUT (TYP. FOR 7)	LOAD DISCONNECT
EACH INTENTIONAL GROUND SWITCH CUTOUT (TYP. FOR 8)	INTENTIONAL GROUND SWITCH
EACH CUTOUT ENCLOSURE (TYP. FOR 8)	CAUTION OPERATE CUTOUTS WITH CCR SHUT OFF
EACH GROUND FAULT INDICATOR LIGHT (TYP. FOR 8)	GROUND FAULT
HIGH VOLTAGE WIREWAY (TYP. FOR 4)	HIGH VOLTAGE
LOW VOLTAGE WIREWAY (TYP. FOR 4)	LOW VOLTAGE

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

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

DIRECTIONS TO TEST FOR AIRFIELD GROUND FAULTS IN LIGHTING CIRCUITS.

1. TURN OFF RESPECTIVE CCR.
2. PULL INTENTIONAL GROUND SWITCH CUTOUT.
3. TURN ON RESPECTIVE CCR TO 100%.
4. IF GROUND FAULT LIGHT IS DIM CHECK AIRFIELD CIRCUIT FOR LOCATION OF BRIGHT TO DIM LIGHTS TO ASSIST IN LOCATING AREA OF GROUND FAULT.

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

**GROUND FAULT TESTING PLACARD DETAIL**

DIRECTIONS TO TRANSFER RUNWAY 18L-36R LIGHTING FROM NORMAL CCR TO SPARE/BACKUP CCR.

1. SHUT OFF INPUT POWER (CIRCUIT BREAKER) TO BOTH RWY 18L-36R CCR'S & TURN CCR SELECTOR SWITCHES TO OFF.
2. OPERATE MANUAL TRANSFER SWITCH AND MOVE HANDLE FROM "NORMAL" POSITION TO "SPARE/BACKUP" POSITION.
3. PULL CUTOUT HANDLE FROM NORMAL CCR UNIT & INSERT INTO SPARE CCR CUTOUT.
4. TURN ON INPUT POWER (CIRCUIT BREAKER) TO SPARE RWY 18L-36R CCR.
5. GO TO CONTACTOR PANEL & TURN "RWY 18L-36R CCR TRANSFER" SELECTOR SWITCH FROM "NORMAL" TO "SPARE" POSITION.
6. TURN SELECTOR SWITCH ON SPARE CCR TO "REMOTE" POSITION.

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

**CCR TRANSFER PROCEDURE PLACARD DETAIL**



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

BY	
REVISION	
DATE	

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS

**SIA**  
SOUTHERN ILLINOIS AIRPORT

IL PROJ.: MDH-3820 A.I.P.: 3-17-0009-B30

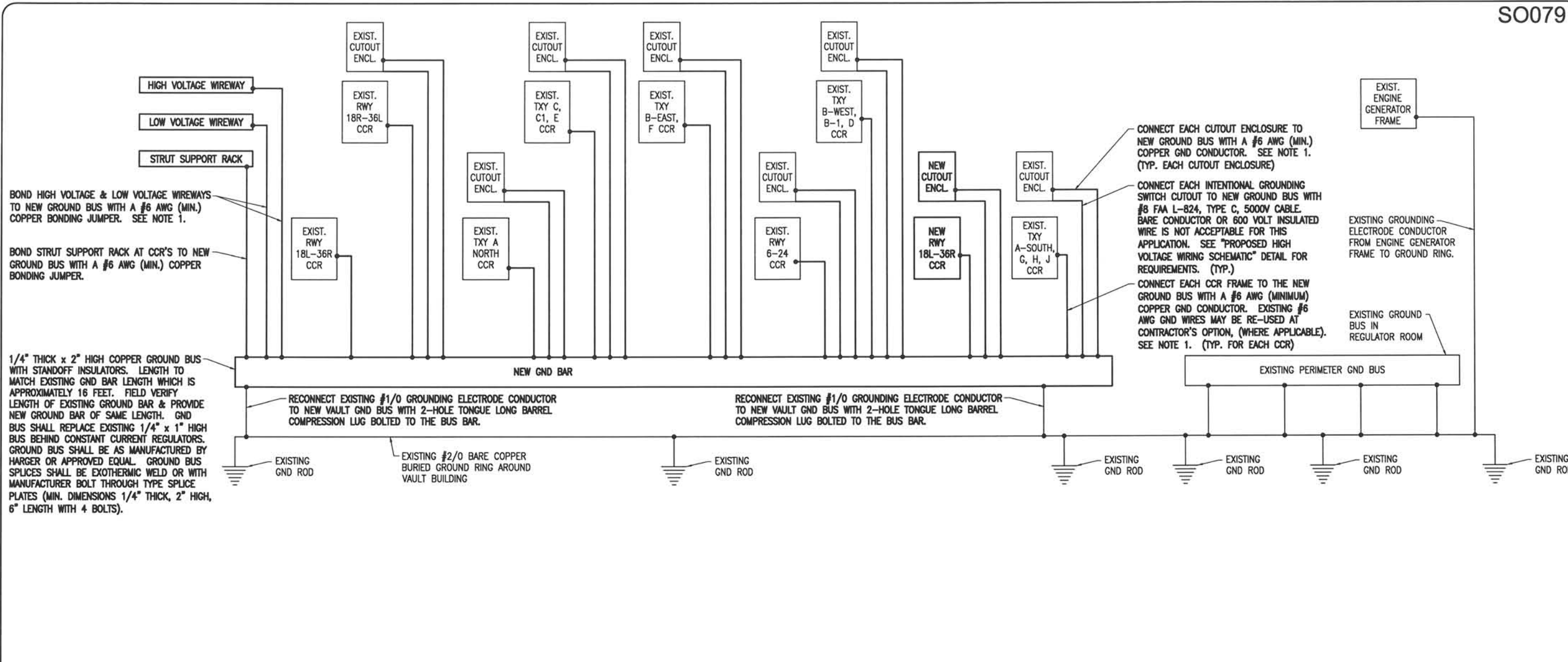
Horizon Project No. 09A00600_0800	File Name: E-612.DWG	Scale: NONE	Date: 01/08/10	LAYOUT: KNL	12/15/09
				DRAWN: MV	12/21/09
				REVIEWED: CAH/JSL	01/08/10

**HANSON**

Hanson Professional Services Inc.  
1525 South Sixth Street  
Springfield, Illinois 62703-2886  
Offices Nationwide

REPLACE HIRL &  
VARIOUS ELECTRICAL  
UPGRADES  
LEGEND PLATE  
SCHEDULE





CCR GROUND BUS RISER

**NOTES**

1. CONNECTIONS TO GROUND BUS BARS SHALL BE WITH 2-HOLE TONGUE LONG BARREL COMPRESSION LUGS BOLTED TO THE BUS BAR.
2. GROUND WIRES FOR INTENTIONAL GROUNDING SWITCH SHALL BE FAA L-824, TYPE C, 5000V CABLE. ALL OTHER INSULATED GROUND WIRES SHALL HAVE GREEN COLORED INSULATION FOR ALL CONDUCTOR AWG AND KCMIL.
3. CONSTANT CURRENT REGULATORS SHALL BE SHUT OFF PRIOR TO DISCONNECTING EXISTING FRAME GROUNDS AND SHALL REMAIN OFF UNTIL GROUNDING UPGRADES AND NEW GROUND CONNECTIONS ARE COMPLETED.
4. ALL WORK SHOWN ON THIS SHEET SHALL BE PAID FOR UNDER ITEM AR109200 "INSTALL ELECTRICAL EQUIPMENT" PER LUMP SUM.

BY	
REVISION	
DATE	

SOUTHERN ILLINOIS AIRPORT  
MURPHYSBORO / CARBONDALE, ILLINOIS

**SIA**  
SOUTHERN ILLINOIS AIRPORT

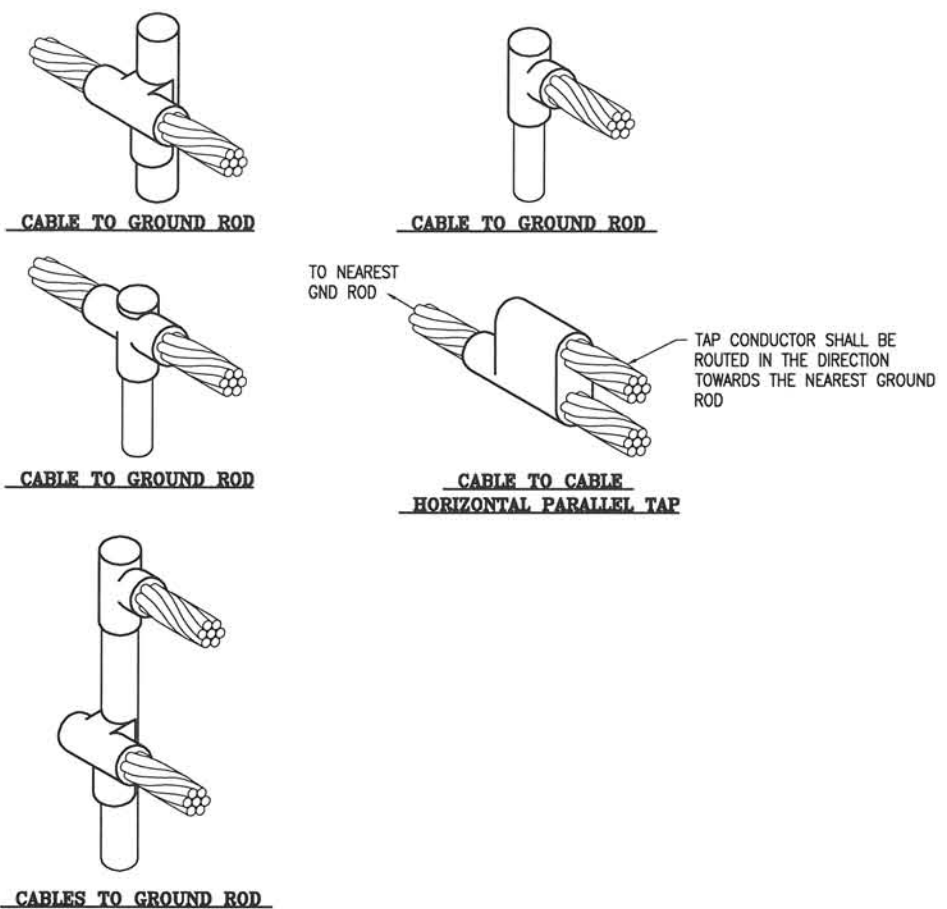
IL. PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30

Revision	01/08/10
Drawn	MV
Checked	CAH/JSL
Reviewed	CAH/JSL
Date	01/08/10
Scale	NONE
Element	E-610.DWG
Project No.	09A0060D_0800

**HANSON**

Hanson Professional Services Inc.  
1525 South Sixth Street  
Springfield, Illinois 62703-2866  
Offices Nationwide

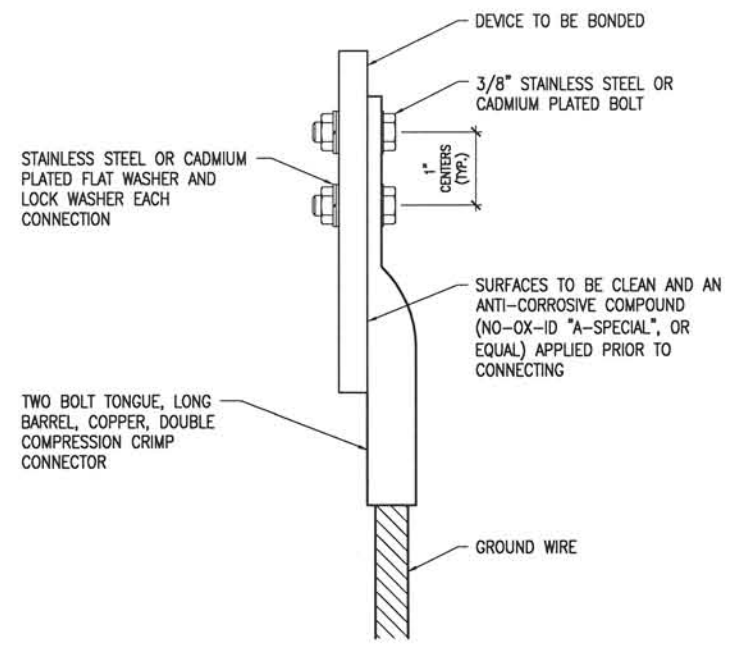
REPLACE HIRL &  
VARIOUS ELECTRICAL  
UPGRADES  
CCR GROUND BUS  
RISER



**DETAIL NOTES**

1. ALL BELOW GRADE CONNECTIONS TO GROUND RODS & GROUND RING CONDUCTORS SHALL BE EXOTHERMIC WELD TYPE CONNECTIONS. EXOTHERMIC WELDS SHALL BE CADWELD AS MANUFACTURED BY ERICO PRODUCTS, SOLON, OHIO, ULTRAWELD AS MANUFACTURED BY HARGER LIGHTNING PROTECTION & GROUNDING EQUIPMENT, GRAYSLAKE, IL, OR THERMOWELD AS MANUFACTURED BY CONTINENTAL INDUSTRIES, TULSA, OKLAHOMA. VERIFY PROPER SIZES, MOLDS, TYPES, AND REQUIREMENTS FOR THE RESPECTIVE APPLICATION WITH THE MANUFACTURER, AND INSTALL PER THEIR DIRECTIONS.
2. FOR APPLICATIONS TO GALVANIZED STEEL OR PAINTED STEEL, REMOVE GALVANIZING AND/OR PAINT & CLEAN THE SURFACE TO EXPOSE BARE STEEL BEFORE MAKING EXOTHERMIC WELD CONNECTION.
3. INDIVIDUAL GROUNDING ELECTRODE CONDUCTORS SHALL NOT BE INSTALLED IN METAL CONDUIT. INSTALL GROUNDING ELECTRODE CONDUCTORS IN SCHED 40 PVC CONDUIT AS REQUIRED IN FOUNDATIONS, FOR PROTECTION, WHERE ENTERING ENCLOSURES, ETC. WHERE PLASTIC CONDUIT IS USED FOR INDIVIDUAL GROUND WIRES, DO NOT COMPLETELY 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**



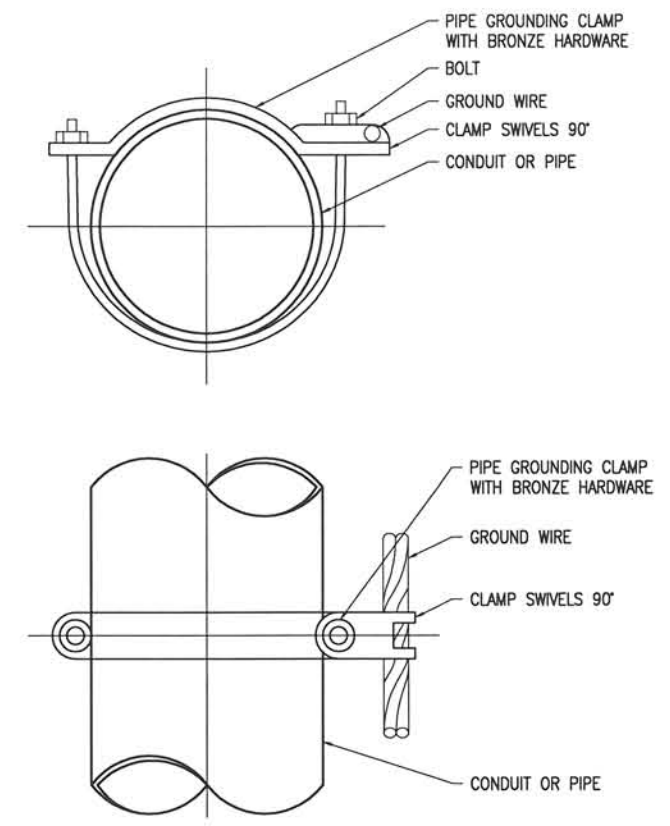
**2 HOLE LONG BARREL COMPRESSION LUG TABLE**

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**

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

1. 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**

JAN 14, 2010 1:18 PM V00RH00805 I:\AIRPORTS\51A-CARBONDALE\09A0060\CADD\AIRPORT\51A-E-503.DWG - Work

DATE	REVISION	BY

**SOUTHERN ILLINOIS AIRPORT**  
MURPHYSBORO / CARBONDALE, ILLINOIS

**SIA**  
Submittal Location: Airport

A.I.P. PROJ.: 3-17-0009-B30  
IL PROJ.: MDH-3920

Hanson Project No. 09A00600_0800	Filename E-503.DWG	Scale NONE	Date 01/08/10
LAYOUT	KNL	06/09/08	01/08/10
DRAWN	MV	06/09/08	01/08/10
REVIEWED	CAH/JSL	01/08/10	01/08/10

**HANSON**

Hanson Professional Services Inc.  
1525 South Sixth Street  
Springfield, Illinois 62705-2888  
Offices Nationwide

**REPLACE HIRL & VARIOUS ELECTRICAL UPGRADES**

**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 FAA-STD-019e (LIGHTNING AND SURGE PROTECTION, GROUNDING, BONDING, AND SHIELDING REQUIREMENTS FOR FACILITIES AND ELECTRONIC EQUIPMENT). THE RELIABILITY OF THE GROUNDING SYSTEM IS DEPENDENT ON CAREFUL, PROPER INSTALLATION AND CHOICE OF MATERIALS. IMPROPER PREPARATION OF SURFACES TO BE JOINED TO MAKE AN ELECTRICAL PATH, LOOSE JOINTS OR CORROSION CAN INTRODUCE IMPEDANCE THAT WILL SERIOUSLY IMPAIR THE ABILITY OF THE GROUND PATH TO PROTECT PERSONNEL AND EQUIPMENT AND TO ABSORB TRANSIENTS THAT CAN CAUSE NOISE IN COMMUNICATIONS CIRCUITS. THE FOLLOWING FUNCTIONS ARE PARTICULARLY IMPORTANT TO ENSURE A RELIABLE GROUND SYSTEM:
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) OR ULTRAWELD BY HARGER, GRAYSLAKE, ILLINOIS (PHONE 1-800-842-7437). EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS 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 2008 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 2008 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 2008 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 2008 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 GROUND 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 GROUNDING 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 ENCIRCLE CONDUIT WITH FERROUS AND/OR MAGNETIC MATERIALS. USE NON-METALLIC REINFORCED FIBERGLASS STRUT SUPPORT. WHERE METAL CONDUIT CLAMPS ARE INSTALLED, USE NYLON BOLTS, NUTS, WASHERS AND SPACERS TO INTERRUPT A COMPLETE METALLIC PATH FROM ENCIRCLING THE CONDUIT. THIS IS REQUIRED TO AVOID GIRDLING OF GROUND CONDUCTORS. GIRDLING OF A GROUND CONDUCTOR IS THE RESULT OF PLACING THE CONDUCTOR IN A RING OF MAGNETIC MATERIAL. THIS RING COULD BE A METALLIC CONDUIT, U-BOLT OR STRUT SUPPORT PIPE CLAMP, OR OTHER SUPPORT HARDWARE. THE RESULT OF GIRDLING GROUND CONDUCTORS SIGNIFICANTLY INCREASES THE INDUCTIVE IMPEDANCE OF THE GROUND CONDUCTOR. INDUCTIVE AND CAPACITIVE IMPEDANCE IS A TYPE OF RESISTANCE THAT OPPOSES THE FLOW OF ALTERNATING CURRENT. ANY INCREASE IN THE IMPEDANCE OF A GROUND CONDUCTOR REDUCES ITS ABILITY TO EFFECTIVELY MITIGATE RADIO FREQUENCY NOISE IN THE GROUND SYSTEM. THE CONDITION WHERE A GROUND CONDUCTOR IS GIRDLED DURING A LIGHTNING STRIKE RESULTS IN PHENOMENA KNOWN AS SURGE IMPEDANCE LOADING. SURGE IMPEDANCE LOADING IS A RESULT OF VOLTAGE AND CURRENT REACHING 500,000 VOLTS AND 10,000 AMPS FOR A SHORT DURATION. GIRDLING FURTHER INCREASES THE IMPEDANCE AT LIGHTNING FREQUENCIES OF 100 KILOHERTZ TO 100 MEGAHERTZ. AT THESE POWER AND FREQUENCY LEVELS ANY INCREASE IN THE IMPEDANCE OF THE GROUND CONDUCTOR MUST BE CONTROLLED. DURING LIGHTNING DISCHARGE CONDITIONS A LOW INDUCTIVE IMPEDANCE PATH IS MORE IMPORTANT THAN A LOW DC RESISTANCE PATH.
20. IF LOCAL CODES DICTATE THAT INDIVIDUAL GROUNDING CONDUCTORS MUST BE RUN IN METAL CONDUIT OR RACEWAY, THEN THE CONDUIT OR RACEWAY MUST BE BONDED AT EACH END OF THE RUN WITH A BONDING JUMPER SIZED EQUAL TO THE INDIVIDUAL GROUNDING CONDUCTOR OR AS REQUIRED BY 2008 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.

BY	
REVISION	
DATE	

**SOUTHERN ILLINOIS AIRPORT**  
MURPHYSBORO / CARBONDALE, ILLINOIS

**SIA**  
SOUTHERN ILLINOIS AIRPORT

IL. PROJ.: MDH-3920 A.I.P. PROJ.: 3-17-0009-B30

Hanson Project No. 09A0060D_0800	01/08/10	06/27/09
Filename E-004.DWG	KNL	PJG
Scale NONE	LAYOUT	CAH/JSL
Date 01/08/10	DRAWN	06/29/09
	REVIEWED	01/08/10

**HANSON**

Hanson Professional Services Inc.  
1525 South Sixth Street  
Springfield, Illinois 62703-2886  
Offices Nationwide

**REPLACE HIRL & VARIOUS ELECTRICAL UPGRADES**

**GROUNDING NOTES**

JAN 14, 2010 1:17 PM VOORH00805  
I:\AIRPORTS\SIA-CARBONDALE\09A0060D\CADD\AIRPORT\SHEET\E-004.DWG - Work