

# CONSTRUCTION PLANS

## FOR

# MACOMB MUNICIPAL AIRPORT

## MACOMB, MCDONOUGH COUNTY, ILLINOIS

### REPLACE ELECTRICAL VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

**SCOPE OF WORK**

THIS PROJECT CONSISTS OF REPLACING THE AIRPORT ELECTRICAL VAULT, MIRL'S, MITL'S, TAXI GUIDANCE SIGNS, AND REILS ON RUNWAY 9-27 AND THE ASSOCIATED TAXIWAYS, AND THE ASSOCIATED CABLING, DUCT WORK AND VAULT WORK. ALSO INCLUDED IS THE REPLACEMENT OF THE WIND TEE WITH A LIGHTED L-807 PRIMARY WIND CONE, AND ADDITION OF OBSTRUCTION LIGHTING AND LIGHTNING PROTECTION TO THE BEACON TOWER ALONG WITH THE ASSOCIATED CABLING AND DUCT WORK.

**ADDITIVE ALTERNATE NO. 1**

ADDITIVE ALTERNATE NO. 1 WILL CONSIST OF THE UPGRADE OF THE MEDIUM INTENSITY RUNWAY LIGHTS TO TYPE L-861(L) WITH LED (LIGHT EMITTING DIODE) ILLUMINATION, UPGRADE OF THE MEDIUM INTENSITY THRESHOLD LIGHTS TO TYPE L-861E(L) WITH LED ILLUMINATION, UPGRADE OF THE MEDIUM INTENSITY TAXIWAY LIGHTS TO TYPE L-861T(L) WITH LED ILLUMINATION AND UPGRADE OF THE TAXI GUIDANCE SIGNS TO TYPE L-858(L) WITH LED ILLUMINATION

ILL. PROJ.: MQB-4206  
SBG PROJ.: 3-17-0064-B21

LATITUDE: 40° 31' 22"  
LONGITUDE: 90° 39' 15"  
ELEVATION: 705.0' M.S.L.  
DATE: FEB 22, 2013  
REVISED: JUNE 12, 2013

MACOMB MUNICIPAL AIRPORT



LOCATION



Hanson Professional Services Inc.

ELECTRICAL ENGINEER

Submitted by: *Kevin N. Lightfoot* ENG'R

Date Submitted: JUNE 17, 2013

Lics. Exp. Date: NOVEMBER 30, 2013

MACOMB AIRPORT AUTHORITY

Approved: *Kevin Jones* AIRPORT TREASURER

Date: 2/20/13

REVISION	DATE	DESCRIPTION
06/12/13		REMOVED PAPER FROM PROJECT

MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS

BLOCK GRANT PROJ.: 3-17-0064-B21  
ILL. PROJ.: MQB-4206

FILENAME	SCALE	DATE	LAYOUT	KNL	TRR	KNL/CAH
C-001-CVR.dwg	NOT TO SCALE	06/17/13	LAYOUT	01/13/13	01/15/13	02/04/13
			REVIEWED	KNL/CAH		



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Springfield, Illinois 62703-2886

REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

COVER SHEET

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**UTILITY NOTE**

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

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

COUNTY.....McDONOUGH  
 CITY.....MACOMB  
 TOWNSHIP.....MACOMB T-6-N, R-2-W  
 SECTION NO.....7 & 8  
 ADDRESS.....MACOMB MUNICIPAL AIRPORT  
 RR #1  
 MACOMB, ILLINOIS 61455



Know what's below.  
 Call before you dig.

**SUMMARY OF QUANTITIES - BASE BID**

ITEM NO.	DESCRIPTION	UNIT	TOTAL QUANTITIES	AS BUILT QUANTITIES
AR107812	L-807 WC-12' INTERNALLY LIT	EA	1	
AR107901	REMOVE WIND TEE	LS	1	
AR108158	1/C #8 5 KV UG CABLE IN UD	LF	25,600	
AR108258	2/C #8 5 KV UG CABLE IN UD	LF	1,800	
AR109110	ERECT PREFABRICATED VAULT	LS	1	
AR109200	INSTALL ELECTRICAL EQUIPMENT	LS	1	
AR109901	REMOVE ELECTRICAL VAULT	LS	1	
AR110013	3" DIRECTIONAL BORE	LF	660	
AR110014	4" DIRECTIONAL BORE	LF	410	
AR110503	3-WAY CONCRETE ENCASED DUCT	LF	200	
AR110610	ELECTRICAL HANDHOLE	EA	10	
AR110710	ELECTRICAL MANHOLE	EA	4	
AR125410	MITL - STAKE MOUNTED	EA	147	
AR125415	MITL - BASE MOUNTED	EA	15	
AR125442	TAXI GUIDANCE SIGN, 2 CHARACTER	EA	1	
AR125445	TAXI GUIDANCE SIGN, 5 CHARACTER	EA	7	
AR125505	MIRL, STAKE MOUNTED	EA	42	
AR125510	MIRL, BASE MOUNTED	EA	12	
AR125540	MI THRESHOLD LIGHT STAKE MTD	EA	16	
AR125610	REILS	PAIR	2	
AR125901	REMOVE STAKE MOUNTED LIGHT	EA	147	
AR125902	REMOVE BASE MOUNTED LIGHT	EA	29	
AR125904	REMOVE TAXI GUIDANCE SIGN	EA	13	
AR125906	REMOVE SPLICE CAN	EA	3	
AR125907	REMOVE REILS	PAIR	1	
AR150510	ENGINEER'S FIELD OFFICE	LS	1	
AR150520	MOBILIZATION	LS	1	
AR150540	HAUL ROUTE	LS	1	
AR800415	TAXI SIGN, 4 CHARACTER, UNLIGHTED	EA	2	
AR800591	UPGRADE AIRPORT ROTATING BEACON	LS	1	

**SUMMARY OF QUANTITIES - ADDITIVE ALTERNATE NO. 1**

ITEM NO.	DESCRIPTION	UNIT	TOTAL QUANTITIES	AS BUILT QUANTITIES
AS800411	2 CHARACTER SIGN LED UPGRADE	EA	1	
AS800413	MIRL LED UPGRADE	EA	54	
AS800414	MI THRESHOLD LIGHT LED UPGRADE	EA	16	
AS800592	MITL LED UPGRADE	EA	162	
AS800593	5 CHARACTER SIGN LED UPGRADE	EA	7	

**NOTES:**

**QUANTITIES**

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

**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 CERTIFICATIONS**

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.

REVISION	DATE	QTY. CHANGED TO
02/19/13	AR125410	147
05/19/13	REVISED AR107901	
06/12/13	REMOVED PAPER'S FROM PROJECT	

MACOMB MUNICIPAL AIRPORT  
 MACOMB, ILLINOIS

IL PROJ.: MGB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21

Hanson Proj. No. 12A0053	02/01/13
Filename G-002-QTY.dwg	MLH
Scale NONE	02/01/13
Date 06/17/13	REVIEWED
	KNL/CAH
	02/04/13

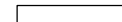


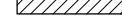


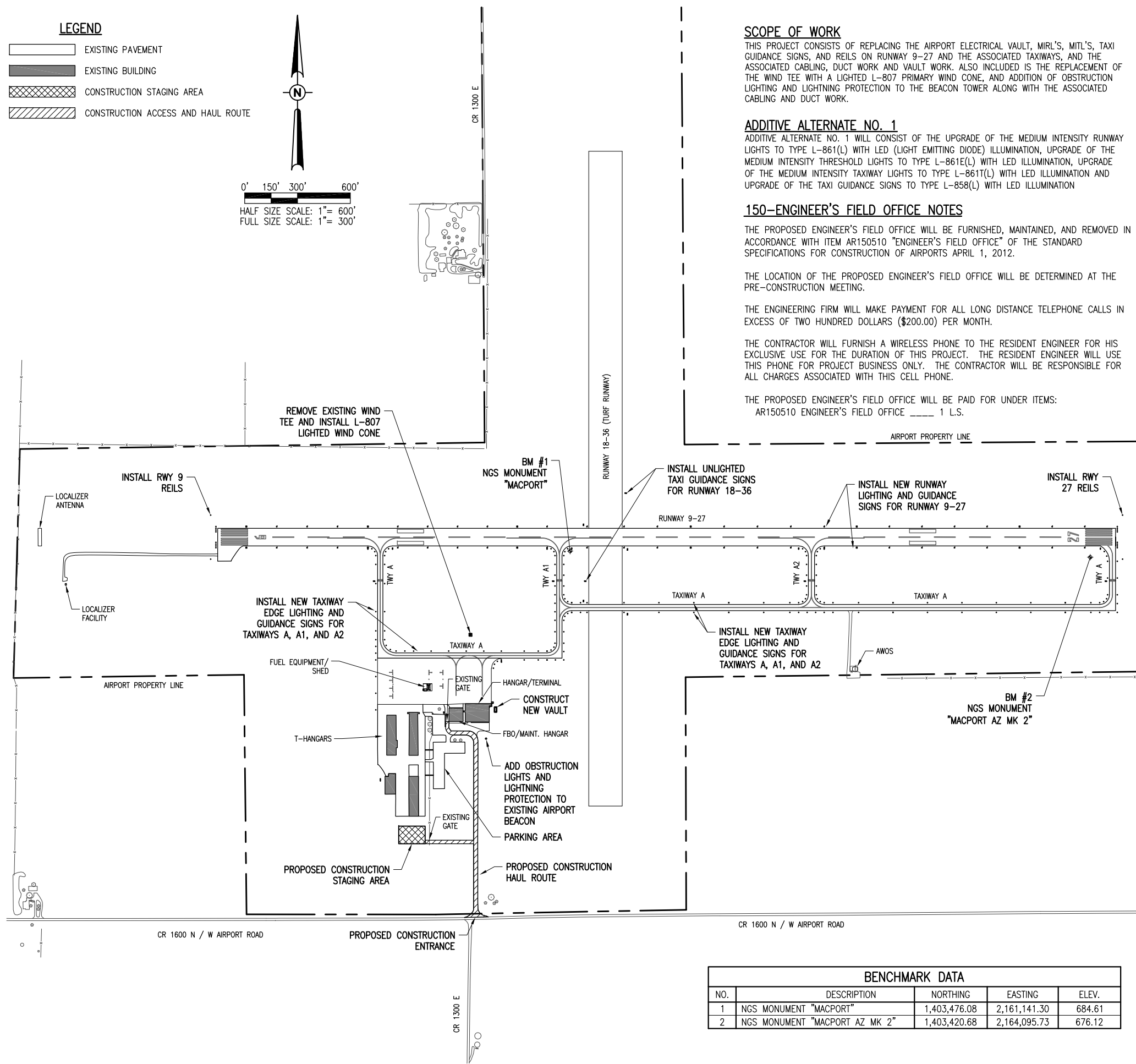
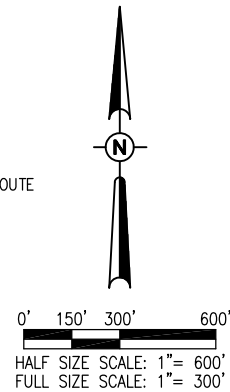
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REPLACE VAULT, AIRFIELD  
 LIGHTING AND GUIDANCE SIGNS

SUMMARY OF QUANTITIES  
 AND INDEX TO SHEETS

**LEGEND**

-  EXISTING PAVEMENT
-  EXISTING BUILDING
-  CONSTRUCTION STAGING AREA
-  CONSTRUCTION ACCESS AND HAUL ROUTE



**SCOPE OF WORK**

THIS PROJECT CONSISTS OF REPLACING THE AIRPORT ELECTRICAL VAULT, MRL'S, MITL'S, TAXI GUIDANCE SIGNS, AND REILS ON RUNWAY 9-27 AND THE ASSOCIATED TAXIWAYS, AND THE ASSOCIATED CABLING, DUCT WORK AND VAULT WORK. ALSO INCLUDED IS THE REPLACEMENT OF THE WIND TEE WITH A LIGHTED L-807 PRIMARY WIND CONE, AND ADDITION OF OBSTRUCTION LIGHTING AND LIGHTNING PROTECTION TO THE BEACON TOWER ALONG WITH THE ASSOCIATED CABLING AND DUCT WORK.

**ADDITIVE ALTERNATE NO. 1**

ADDITIVE ALTERNATE NO. 1 WILL CONSIST OF THE UPGRADE OF THE MEDIUM INTENSITY RUNWAY LIGHTS TO TYPE L-861(L) WITH LED (LIGHT EMITTING DIODE) ILLUMINATION, UPGRADE OF THE MEDIUM INTENSITY THRESHOLD LIGHTS TO TYPE L-861E(L) WITH LED ILLUMINATION, UPGRADE OF THE MEDIUM INTENSITY TAXIWAY LIGHTS TO TYPE L-861T(L) WITH LED ILLUMINATION AND UPGRADE OF THE TAXI GUIDANCE SIGNS TO TYPE L-858(L) WITH LED ILLUMINATION

**150-ENGINEER'S FIELD OFFICE NOTES**

THE PROPOSED ENGINEER'S FIELD OFFICE WILL BE FURNISHED, MAINTAINED, AND REMOVED IN ACCORDANCE WITH ITEM AR150510 "ENGINEER'S FIELD OFFICE" OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS APRIL 1, 2012.

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

THE ENGINEERING FIRM WILL MAKE PAYMENT FOR ALL LONG DISTANCE TELEPHONE CALLS IN EXCESS OF TWO HUNDRED DOLLARS (\$200.00) PER MONTH.

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

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

**GENERAL NOTES**

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

**BENCHMARK DATA**

NO.	DESCRIPTION	NORTHING	EASTING	ELEV.
1	NGS MONUMENT "MACPORT"	1,403,476.08	2,161,141.30	684.61
2	NGS MONUMENT "MACPORT AZ MK 2"	1,403,420.68	2,164,095.73	676.12

**MB029**

REVISION	DATE	ADDED	OFFICE	REMOVED
ENGINEER'S FIELD	02/19/13		NOTES	
	06/12/13			PAP1'S FROM PROJECT

MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS

BLOCK GRANT PROJ.: 3-17-0064-B21  
IL PROJ.: MOB-4206

Hanson Proj. No. 12A0053	01/28/13
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	02/04/13



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REPLACE VAULT, AIRFIELD  
LIGHTING AND GUIDANCE SIGNS

PROPOSED SCOPE OF  
WORK PLAN

**3**

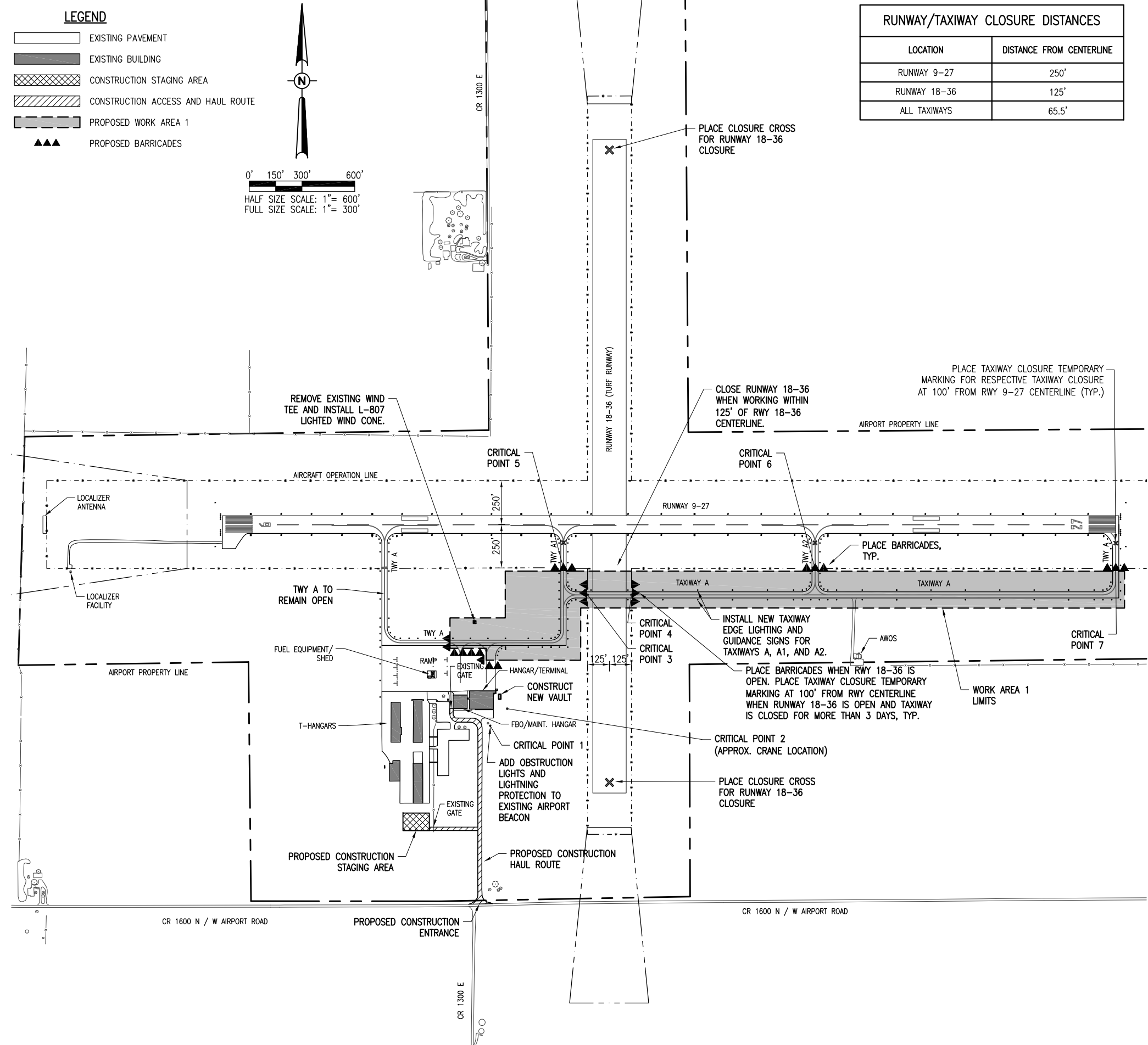
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Filename G-004-SFY.dwg	MLH
Scale AS SHOWN	01/28/13
Date 06/17/13	MLH
	02/04/13
	REVIEWED
	KNL/CAH

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 Springfield, Illinois 62703-2886

REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS  
 PROPOSED SAFETY AND PHASING PLAN - WORK AREA 1



LOCATION	DISTANCE FROM CENTERLINE
RUNWAY 9-27	250'
RUNWAY 18-36	125'
ALL TAXIWAYS	65.5'

**WORK AREA 1 NOTES**

1. WORK AREA 1 INCLUDES INSTALLATION OF AIRFIELD LIGHTING OUTSIDE OF THE RUNWAY 9-27 SAFETY AREA ALONG TAXIWAYS A1, A2 AND TAXIWAY A EAST OF THE RAMP. THESE TAXIWAYS WILL BE CLOSED FOR THE DURATION OF THE WORK FOR THIS PHASE. THE EAST PART OF THE RAMP SHALL BE CLOSED WHEN WORKING IN THIS AREA. RUNWAY 18-36 WILL BE OPEN EXCEPT WHEN WORKING WITHIN 125' OF THE RUNWAY 18-36 CENTERLINE. RUNWAY 9-27 AND TAXIWAY A WEST OF THE RAMP SHALL REMAIN OPEN FOR THE DURATION OF THIS PHASE.
2. IT IS ANTICIPATED THAT CONSTRUCTION OF THE PROPOSED ELECTRICAL VAULT AND BEACON MAY OCCUR CONCURRENTLY WITH OTHER SCOPE ITEMS IN MULTIPLE WORK AREAS. THEREFORE THE VAULT WORK IS EXCLUDED FROM THE INDIVIDUAL WORK AREA CONTRACT TIME DURATIONS, BUT SHALL BE COMPLETED WITHIN THE OVERALL PROJECT CONTRACT TIME.
3. THE CONTRACTOR SHALL HAVE A MAXIMUM OF 32 CALENDAR DAYS TO COMPLETE THE WORK IN WORK AREA 1 OR A TOTAL OF 42 CALENDAR DAYS TO COMPLETE THE WORK IN WORK AREAS 1 AND 2.
4. CLOSURE CROSSES AND BARRICADES SHALL BE IN PLACE PRIOR TO BEGINNING CONSTRUCTION.
5. RUNWAY 18-36 SHALL BE NOTAMED "CLOSED" WHENEVER WORK IS OCCURRING WITHIN 125' OF THE RUNWAY CENTERLINE. THE CONTRACTOR SHALL COORDINATE WITH THE AIRPORT AT LEAST 48 HOURS PRIOR TO WORK WITHIN THE RUNWAY 18-36 CLOSURE LIMIT SO THAT NOTAMS MAY BE COORDINATED.
6. AT ALL TIMES, THE CONTRACTOR'S OPERATIONS SHALL BE SUCH AS TO MINIMIZE CLOSURES.
7. PER THE DIRECTION OF THE FAA IF A TAXIWAY IS CLOSED FOR MORE THAN THREE DAYS PROVIDE A TAXIWAY CLOSURE MARKER AT THE RUNWAY/TAXIWAY INTERSECTION USING TEMPORARY MARKING PAINT. AVOID THE USE OF TAXIWAY CLOSURE MARKERS CONSTRUCTED OF TEMPORARY PAVEMENT TAPE, PLYWOOD, PLASTIC SHEETS AND/OR TARPS WITH SANDBAGS, WHERE THE MARKERS ARE LOCATED WITHIN THE RUNWAY SAFETY AREA. TEMPORARY MARKING PAINT SHALL BE SUITABLE FOR THE APPLICATION AND REMOVABLE WITH WATER OR A PRESSURE WASHER TO AVOID DAMAGE TO THE PAVEMENT. TEMPORARY MARKING PAINT SHALL BE SEYMOUR PAINT HI VIZ YELLOW TEMPORARY MARKER 20-636, OR APPROVED EQUAL.

POINT #	DESCRIPTION	GROUND ELEVATION	LATITUDE	LONGITUDE
1	CRITICAL PT. 1	685.0	N 040° 30' 59.58"	W 090° 39' 20.05"
2	CRITICAL PT. 2	685.0	N 040° 31' 00.53"	W 090° 39' 18.79"
3	CRITICAL PT. 3	685.0	N 040° 31' 06.93"	W 090° 39' 12.87"
4	CRITICAL PT. 4	685.0	N 040° 31' 06.93"	W 090° 39' 09.63"
5	CRITICAL PT. 5	686.0	N 040° 31' 08.45"	W 090° 39' 14.64"
6	CRITICAL PT. 6	683.0	N 040° 31' 08.39"	W 090° 38' 56.11"
7	CRITICAL PT. 7	677.0	N 040° 31' 08.36"	W 090° 38' 33.95"

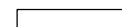


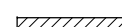


**HEIGHT OF CONSTRUCTION EQUIPMENT**

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

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**LEGEND**

-  EXISTING PAVEMENT
-  EXISTING BUILDING
-  CONSTRUCTION STAGING AREA
-  CONSTRUCTION ACCESS AND HAUL ROUTE
-  PROPOSED WORK AREA 2
-  PROPOSED BARRICADES

0' 150' 300' 600'  
 HALF SIZE SCALE: 1" = 600'  
 FULL SIZE SCALE: 1" = 300'

RUNWAY/TAXIWAY CLOSURE DISTANCES	
LOCATION	DISTANCE FROM CENTERLINE
RUNWAY 9-27	250'
RUNWAY 18-36	125'
ALL TAXIWAYS	65.5'

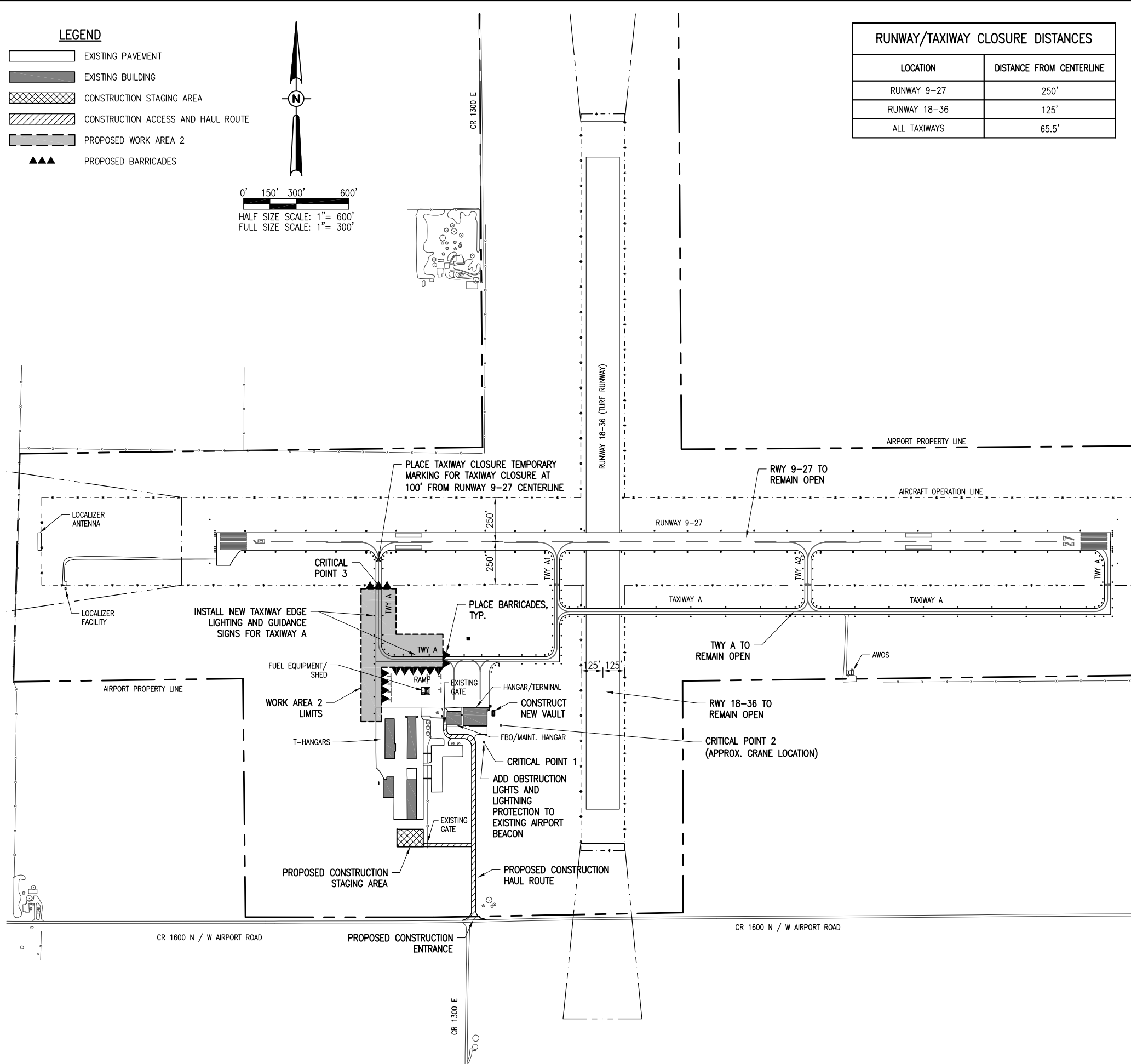
**WORK AREA 2 NOTES**

- WORK AREA 2 INCLUDES INSTALLATION OF AIRFIELD LIGHTING ALONG TAXIWAY A WEST OF THE RAMP TO THE RUNWAY 9-27 SAFETY AREA. WORK WILL BE OUTSIDE OF THE RUNWAY 9-27 SAFETY AREA. TAXIWAY A WEST OF THE RAMP WILL BE CLOSED FOR THE DURATION OF THE WORK FOR THIS PHASE. THE WEST PART OF THE RAMP WILL BE CLOSED WHEN WORKING IN THIS AREA. RUNWAY 18-36 WILL BE OPEN. RUNWAY 9-27 WILL BE OPEN.
- IT IS ANTICIPATED THAT CONSTRUCTION OF THE PROPOSED ELECTRICAL VAULT AND BEACON MAY OCCUR CONCURRENTLY WITH OTHER SCOPE ITEMS IN MULTIPLE WORK AREAS. THEREFORE THE VAULT WORK IS EXCLUDED FROM THE INDIVIDUAL WORK AREA CONTRACT TIME DURATIONS, BUT SHALL BE COMPLETED WITHIN THE OVERALL PROJECT CONTRACT TIME.
- THE CONTRACTOR SHALL HAVE A MAXIMUM OF 10 CALENDAR DAYS TO COMPLETE THE WORK IN WORK AREA 2, OR A TOTAL OF 42 CALENDAR DAYS TO COMPLETE THE WORK IN WORK AREAS 1 AND 2.
- CLOSURE CROSSES AND BARRICADES SHALL BE IN PLACE PRIOR TO BEGINNING CONSTRUCTION.
- AT ALL TIMES, THE CONTRACTOR'S OPERATIONS SHALL BE SUCH AS TO MINIMIZE CLOSURES.
- PER THE DIRECTION OF THE FAA IF A TAXIWAY IS CLOSED FOR MORE THAN THREE DAYS PROVIDE A TAXIWAY CLOSURE MARKER AT THE RUNWAY/TAXIWAY INTERSECTION USING TEMPORARY MARKING PAINT. AVOID THE USE OF TAXIWAY CLOSURE MARKERS CONSTRUCTED OF TEMPORARY PAVEMENT TAPE, PLYWOOD, PLASTIC SHEETS AND/OR TARPS WITH SANDBAGS, WHERE THE MARKERS ARE LOCATED WITHIN THE RUNWAY SAFETY AREA. TEMPORARY MARKING PAINT SHALL BE SUITABLE FOR THE APPLICATION AND REMOVABLE WITH WATER OR A PRESSURE WASHER TO AVOID DAMAGE TO THE PAVEMENT. TEMPORARY MARKING PAINT SHALL BE SEYMOUR PAINT HI VIZ YELLOW TEMPORARY MARKER 20-636, OR APPROVED EQUAL.

CRITICAL POINTS				
POINT #	DESCRIPTION	GROUND ELEVATION	LATITUDE	LONGITUDE
1	CRITICAL PT. 1	685.0	N 040° 30' 59.58"	W 090° 39' 20.05"
2	CRITICAL PT. 2	685.0	N 040° 31' 00.53"	W 090° 39' 18.79"
3	CRITICAL PT. 3	694.5	N 040° 31' 08.43"	W 090° 39' 27.81"

**HEIGHT OF CONSTRUCTION EQUIPMENT**

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



REVISION	DATE

MACOMB MUNICIPAL AIRPORT  
 MACOMB, ILLINOIS

IL PROJ.: MOB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21

DESCRIPTION	DATE
LAYOUT	01/28/13
DRAWN	01/28/13
REVIEWED	02/04/13



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REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

PROPOSED SAFETY AND PHASING PLAN - WORK AREA 2

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REVISION	DATE	DESCRIPTION
02/19/13	02/19/13	UPDATED PER IDA REVIEW
06/12/13	06/12/13	REMOVED PAPI'S FROM PROJECT

MACOMB MUNICIPAL AIRPORT  
 MACOMB, ILLINOIS  
 BLOCK GRANT PROJ.: 3-17-0064-B21  
 ILL. PROJ.: MOB-4206

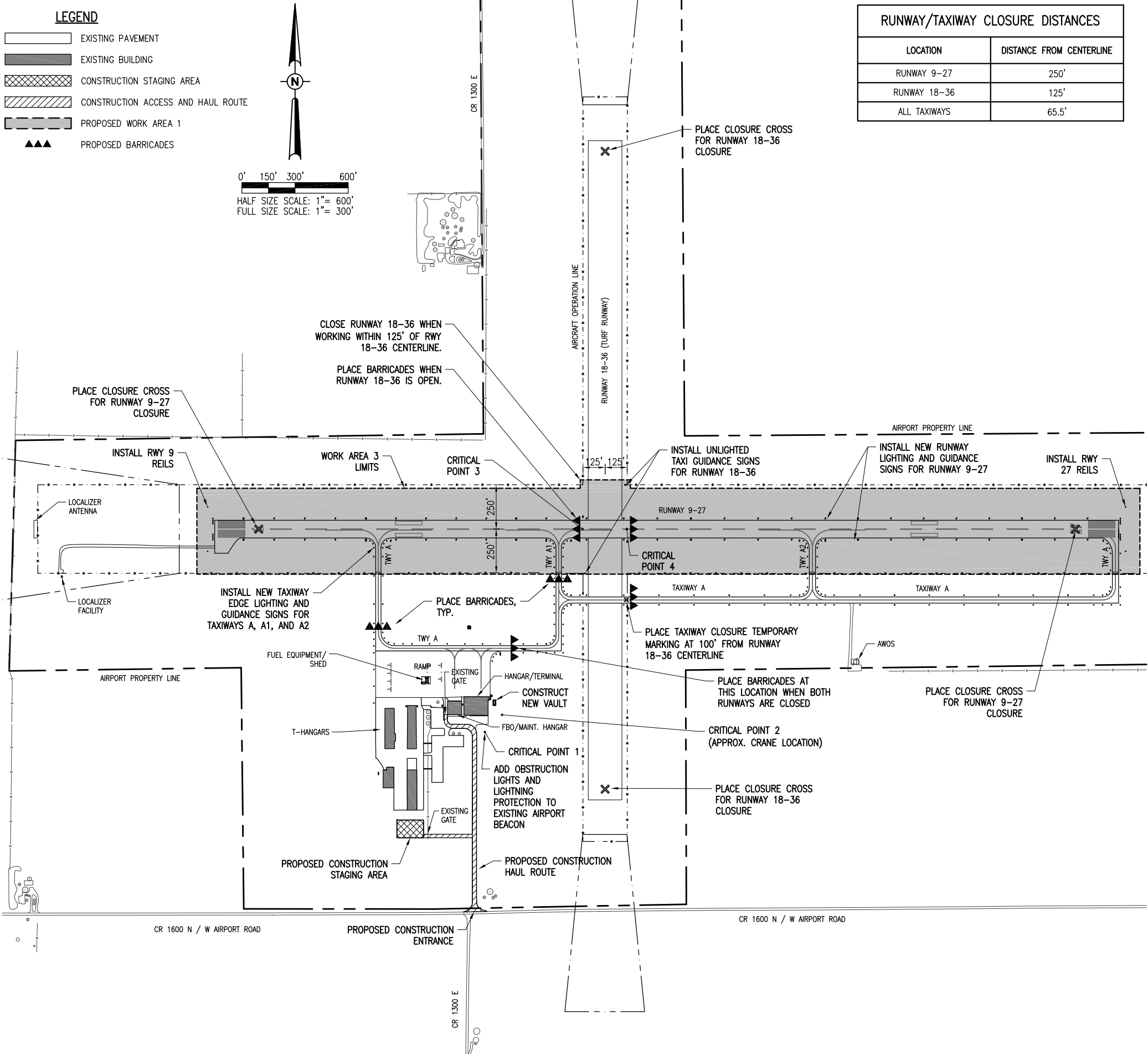
DATE	BY	REVIEWED
01/28/13	MLH	MLH
01/28/13	MLH	MLH
02/04/13	KNL/CAH	KNL/CAH

Hanson Proj. No. 12A0053  
 Filename: G-006-SFY.dwg  
 Scale: AS SHOWN  
 Date: 06/17/13



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REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS  
 PROPOSED SAFETY AND PHASING PLAN - WORK AREA 3



LOCATION	DISTANCE FROM CENTERLINE
RUNWAY 9-27	250'
RUNWAY 18-36	125'
ALL TAXIWAYS	65.5'

**WORK AREA 3 NOTES**

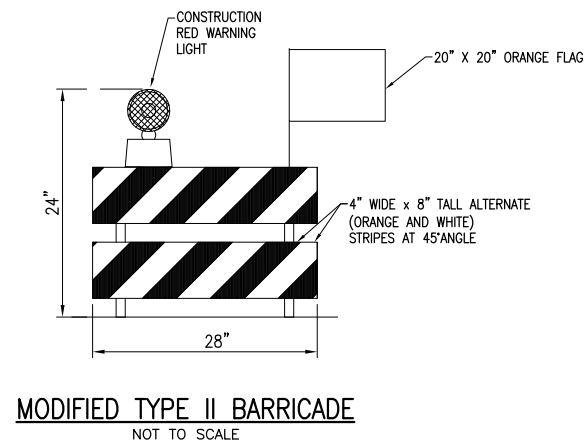
- WORK AREA 3 INCLUDES INSTALLATION OF AIRFIELD LIGHTING AND NAVAIDS FOR RUNWAY 9-27 AND THE INTERSECTING TAXIWAYS WITHIN THE RUNWAY 9-27 SAFETY AREA. RUNWAY 9-27 AND THE RESPECTIVE INTERSECTING TAXIWAYS WILL BE CLOSED. RUNWAY 18-36 AND THE TAXIWAY FROM THE RAMP TO RUNWAY 18-36 WILL BE OPEN, EXCEPT WHEN WORKING WITHIN 125' OF THE RUNWAY 18-36 CENTERLINE, THEN RUNWAY 18-36 WILL ALSO BE CLOSED.
- IT IS ANTICIPATED THAT CONSTRUCTION OF THE PROPOSED ELECTRICAL VAULT AND BEACON MAY OCCUR CONCURRENTLY WITH OTHER SCOPE ITEMS IN MULTIPLE WORK AREAS. THEREFORE THE VAULT WORK IS EXCLUDED FROM THE INDIVIDUAL WORK AREA CONTRACT TIME DURATIONS, BUT SHALL BE COMPLETED WITHIN THE OVERALL PROJECT CONTRACT TIME.
- RUNWAY 9-27 WILL BE ALLOWED TO BE CLOSED CONTINUOUSLY DURING THE WEEK (MONDAY MORNING TO FRIDAY EVENING), BUT WILL BE REQUIRED TO BE OPEN OVER THE WEEKEND. WEEKLY CLOSURES WILL BE LIMITED TO 4 WEEKS. IF ADDITIONAL TIME IS REQUIRED AFTER THE 4 WEEK CLOSURE LIMIT, DAILY CLOSURES SHALL BE COORDINATED WITH THE AIRPORT MANAGEMENT THROUGH THE RESIDENT ENGINEER/RESIDENT PROJECT REPRESENTATIVE.
- THE CONTRACTOR SHALL HAVE A MAXIMUM OF 28 CALENDAR DAYS TO COMPLETE THE WORK IN WORK AREA 3.
- CLOSURE CROSSES AND BARRICADES SHALL BE IN PLACE PRIOR TO BEGINNING CONSTRUCTION.
- RUNWAY 9-27 SHALL BE NOTAMED "CLOSED" OR "OPEN FOR DAYTIME OPERATIONS" AS APPROPRIATE AND THE STATUS OF THE VASIS, REILS AND LIGHTING AS "SHUTDOWN". THE CONTRACTOR SHALL COORDINATE WITH THE AIRPORT AT LEAST 48 HOURS BEFORE BEGINNING THIS PHASE SO THAT NOTAMS MAY BE COORDINATED.
- RUNWAY 18-36 SHALL BE NOTAMED "CLOSED" WHENEVER WORK IS OCCURRING WITHIN 125' OF THE RUNWAY CENTERLINE. THE CONTRACTOR SHALL COORDINATE WITH THE AIRPORT AT LEAST 48 HOURS PRIOR TO WORK WITHIN THE RUNWAY 18-36 CLOSURE LIMIT SO THAT NOTAMS MAY BE COORDINATED.
- AT ALL TIMES, THE CONTRACTOR'S OPERATIONS SHALL BE SUCH AS TO MINIMIZE CLOSURES.
- PER THE DIRECTION OF THE FAA IF A TAXIWAY IS CLOSED FOR MORE THAN THREE DAYS PROVIDE A TAXIWAY CLOSURE MARKER AT THE RUNWAY/TAXIWAY INTERSECTION USING TEMPORARY MARKING PAINT. AVOID THE USE OF TAXIWAY CLOSURE MARKERS CONSTRUCTED OF TEMPORARY PAVEMENT TAPE, PLYWOOD, PLASTIC SHEETS AND/OR TARPS WITH SANDBAGS, WHERE THE MARKERS ARE LOCATED WITHIN THE RUNWAY SAFETY AREA. TEMPORARY MARKING PAINT SHALL BE SUITABLE FOR THE APPLICATION AND REMOVABLE WITH WATER OR A PRESSURE WASHER TO AVOID DAMAGE TO THE PAVEMENT. TEMPORARY MARKING PAINT SHALL BE SEYMOUR PAINT HI VIZ YELLOW TEMPORARY MARKER 20-636, OR APPROVED EQUAL.

POINT #	DESCRIPTION	GROUND ELEVATION	LATITUDE	LONGITUDE
1	CRITICAL PT. 1	685.0	N 040° 30' 59.58"	W 090° 39' 20.05"
2	CRITICAL PT. 2	685.0	N 040° 31' 00.53"	W 090° 39' 18.79"
3	CRITICAL PT. 3	686.5	N 040° 31' 10.88"	W 090° 39' 12.90"
4	CRITICAL PT. 4	685.0	N 040° 31' 10.88"	W 090° 39' 09.66"

**HEIGHT OF CONSTRUCTION EQUIPMENT**

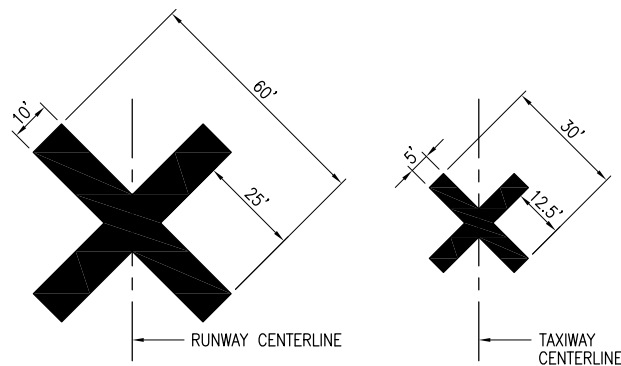
THE MAXIMUM ANTICIPATED HEIGHT OF THE CONSTRUCTION EQUIPMENT WILL BE 70 FEET, WHICH IS EXPECTED TO BE A CRANE TO SET THE VAULT OR A BUCKET TRUCK TO WORK ON THE BEACON TOWER. THE MAXIMUM ANTICIPATED HEIGHT OF THE CONSTRUCTION EQUIPMENT AT ALL OTHER LOCATIONS WILL BE 25 FEET, WHICH IS EXPECTED TO BE A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

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**BARRICADE NOTES**

- IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO PLACE AND MAINTAIN BARRICADES AS SHOWN ON THE PLANS AND AS DIRECTED BY THE AIRPORT MANAGER.
- ALL CONSTRUCTION SIGNS AND TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES INCLUDING THE ILLINOIS SUPPLEMENT (LATEST EDITION) AND THE FAA ADVISORY CIRCULARS (LATEST EDITION) UNLESS NOTED OTHERWISE. THE FAA OR MORE STRINGENT SPECIFICATIONS SHALL GOVERN.
- MODIFIED TYPE II BARRICADES SHALL BE SPACED END TO END THE WIDTH OF THE PAVEMENT IN 4' INCREMENTS AS DIRECTED BY THE ENGINEER. BARRICADES ARE TO BE SET BACK 66' FROM THE ACTIVE TAXIWAY CENTERLINE OR AS SHOWN ON THE PLANS.
- CONSTRUCTION RED WARNING LIGHT: THESE ARE PORTABLE, LENS DIRECTED, ENCLOSED LIGHTS. THE COLOR OF THE LIGHT EMITTED SHALL BE RED. THEY MAY BE USED IN EITHER A STEADY BURN (TYPE C) OR LOW INTENSITY FLASHING MODE (TYPE A) UNLESS NOTED OTHERWISE.
- THE LIGHTING SHALL BE MAINTAINED IN OPERATION DURING THE HOURS OF DARKNESS BETWEEN 1/2 HOUR AFTER SUNSET AND 1/2 HOUR BEFORE SUNRISE AND WHEN CONDITIONS EXIST WHICH TEND TO OBSCURE VISION.
- BARRICADES SHALL BE SECURED TO THE GROUND BY APPROVED METHODS TO PREVENT MOVEMENT BY PROP WASH, JET BLAST OR OTHER WIND CURRENTS.
- THE COLOR COMBINATION ON TYPE II BARRICADES IS ORANGE AND WHITE. THE ORANGE STRIPES SHALL BE ENCAPSULATED LENS REFLECTIVE SHEETING. THE WHITE STRIPES SHALL BE EITHER ENCAPSULATED OR ENCLOSED LENS REFLECTIVE SHEETING AND MUST BE IN ACCEPTABLE CONDITION.
- COST FOR PLACING, MAINTAINING, AND REMOVING BARRICADES WILL BE CONSIDERED AS AN INCIDENTAL ITEM TO THE CONTRACT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.



- TEMPORARY "CLOSED RUNWAY" AND "CLOSED TAXIWAY" MARKINGS SHALL BE "AVIATION YELLOW"
- TEMPORARY "CLOSED RUNWAY" MARKINGS SHALL BE CONSTRUCTED OF PLYWOOD, DOUBLE-LAYERED SNOW FENCE OR APPROVED FABRIC AND SHALL BE SECURED TO PAVEMENT BY SANDBAGS OR OTHER APPROVED METHOD.
- PER THE DIRECTION OF THE FAA IF A TAXIWAY IS CLOSED FOR MORE THAN THREE DAYS PROVIDE A TAXIWAY CLOSURE MARKER AT THE RUNWAY/TAXIWAY INTERSECTION USING TEMPORARY MARKING PAINT. AVOID THE USE OF TAXIWAY CLOSURE MARKERS CONSTRUCTED OF TEMPORARY PAVEMENT TAPE, PLYWOOD, PLASTIC SHEETS AND/OR TARPS WITH SANDBAGS, WHERE THE MARKERS ARE LOCATED WITHIN THE RUNWAY SAFETY AREA. TEMPORARY MARKING PAINT SHALL BE SUITABLE FOR THE APPLICATION AND REMOVABLE WITH WATER OR A PRESSURE WASHER TO AVOID DAMAGE TO THE PAVEMENT. TEMPORARY MARKING PAINT SHALL BE SEYMOUR PAINT HI VIZ YELLOW TEMPORARY MARKER 20-636, OR APPROVED EQUAL.
- TEMPORARY "CLOSED RUNWAY" MARKINGS SHALL BE PLACED OVER THE RUNWAY DESIGNATION NUMBERS UNLESS OTHERWISE DIRECTED BY THE AIRPORT MANAGER AND/OR ENGINEER.
- TEMPORARY "CLOSED TAXIWAY" MARKINGS SHALL BE PLACED WHEN THE RUNWAY IS OPEN AND THE TAXIWAY IS CLOSED. THE "CLOSED TAXIWAY" MARKINGS SHALL BE PLACED AS SHOWN ON THE PLANS AT A DISTANCE OF 100' FROM RUNWAY 9-27 CENTERLINE.
- THE PROPOSED CROSSES WILL BE PLACED EACH DAY THE RUNWAY OR TAXIWAY IS CLOSED AND REMOVED WHEN THE RUNWAY OR TAXIWAY IS RE-OPENED. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE PLACEMENT AND REMOVAL OF THE CROSSES. "CLOSED RUNWAY" AND "CLOSED TAXIWAY" MARKINGS SHALL NOT BE A PAY ITEM AND SHALL BE INCIDENTAL TO OTHER CONTRACT BID ITEMS.

**TEMPORARY CLOSURE CROSS DETAIL**  
NOT TO SCALE

**SAFETY NOTES**

- FOLLOWING ARE THE CONSTRUCTION SAFETY PROCEDURES THAT THE CONTRACTOR SHALL FOLLOW THROUGHOUT THIS PROJECT. ADDITIONAL REQUIREMENTS ARE SHOWN ON THE SAFETY AND PHASING NOTES AND DETAILS SHEET.
- ALL PROVISIONS OF THE LATEST EDITION OF FAA ADVISORY CIRCULAR AC 150/5370-2 (CURRENT EDITION), "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION", APPLY TO THIS CONTRACT, EXCEPT AS MODIFIED BY THIS SAFETY PLAN, OR AS MODIFIED BY THE OWNER THROUGH THE RESIDENT ENGINEER AT THE PRECONSTRUCTION CONFERENCE, OR DURING THE COURSE OF THE CONTRACT.
- THE CONTRACTORS SHALL MINIMIZE DISRUPTION OF STANDARD OPERATING PROCEDURES FOR AERONAUTICAL ACTIVITY BY REMAINING WITHIN THE PRESCRIBED STAGING, CONSTRUCTION, AND PHASING AREAS PRESENTED ON THE PROJECT SAFETY AND PHASING PLANS.
- NO UNAUTHORIZED PERSONNEL SHALL ENTER ANY AREA OF THE AIRPORT THAT COULD POTENTIALLY BE HAZARDOUS. THE ENGINEER, ENGINEER'S REPRESENTATIVE AND/OR AIRPORT MANAGER RESERVE THE RIGHT TO SUSPEND OPERATIONS IN ORDER TO MAINTAIN SAFETY AT THE AIRPORT.
- CONTRACTOR EQUIPMENT, VEHICLES, AND PROJECT MATERIALS SHALL BE STORED AT THE STAGING AREA SHOWN ON THE PLAN VIEW, EXCEPT AS OTHERWISE PROVIDED FOR AT THE PRECONSTRUCTION CONFERENCE.
- ALL CONSTRUCTION EQUIPMENT OPERATING IN THE PRESCRIBED CONSTRUCTION AREA IS REQUIRED TO DISPLAY A CHECKERBOARD FLAG PROPERLY LOCATED OR A ROTATING BEACON (STROBE) AS SPECIFIED IN AC 150/5210-5, "PAINTING, MARKING, AND LIGHTING OF VEHICLES USED ON AN AIRPORT" LATEST EDITION.
- NO CONSTRUCTION MATERIAL STOCKPILES SHALL BE LOCATED WITHIN 250' OF RUNWAY 9-27 CENTERLINE WHEN ACTIVE, WITHIN 125' OF RUNWAY 18-36 CENTERLINE WHEN ACTIVE, WITHIN 66' OF AN ACTIVE TAXIWAY CENTERLINE, WITHIN 58' OF AN ACTIVE TAXI LANE CENTERLINE, OR PENETRATE A PART 77 IMAGINARY SURFACE (PROVIDED BY THE ENGINEER) EXTENDING OUT AND UPWARDS FROM ALL SIDES OF AN ACTIVE RUNWAY.
- CLOSED AIRFIELD PHASING AREAS, OPEN TRENCHES, AND STOCKPILED MATERIALS AT THE CONSTRUCTION SITE SHALL BE PROMINENTLY MARKED WITH LIGHTED BARRICADES WITH STEADY BURNING OR FLASHING RED LIGHTS AS SPECIFIED IN 150/5370-2, "OPERATIONAL SAFETY ON AIRPORT DURING CONSTRUCTION, LATEST EDITION. LIGHTED BARRICADES MUST BE NO TALLER THAN 18" (EXCLUSIVE OF SUPPLEMENTARY LIGHTS AND FLAGS) ON THE TAXIWAYS AND COMPLY WITH ADVISORY CIRCULAR 150/5370-2, LATEST EDITION. CONTRACTOR SHALL NIGHT CHECK BARRICADES DAILY FOR PROPER OPERATION.
- NO OPEN TRENCHES WITHIN 250' OF RUNWAY 9-27 CENTERLINE WHEN ACTIVE, WITHIN 125' OF RUNWAY 18-36 CENTERLINE WHEN ACTIVE, WITHIN 66' OF AN ACTIVE TAXIWAY CENTERLINE, OR WITHIN 58' OF AN ACTIVE TAXI LANE CENTERLINE, WILL BE PERMITTED. OTHER TRENCHES SHALL BE MAINTAINED SAFE, I.E., BARRICADED OR COVERED WITH STEEL PLATES IN ALL OTHER AREAS.
- OPEN TRENCHES, EXCAVATIONS, AND STOCKPILED MATERIALS AT THE CONSTRUCTION SITE SHOULD BE PROMINENTLY MARKED WITH ORANGE FLAGS AND LIGHTED WITH FLASHING YELLOW LIGHTS DURING HOURS OF RESTRICTED VISIBILITY AND/OR DARKNESS.
- NO OPEN FLAME WELDING OR TORCH CUTTING OPERATION IS PERMITTED UNLESS ADEQUATE FIRE AND SAFETY PRECAUTIONS ARE PROVIDED AND HAVE BEEN APPROVED BY THE AIRPORT MANAGER. NO FLARE POTS ARE ALLOWED ON THE PROJECT.
- SOIL, DEBRIS, AND LOOSE MATERIAL DROPPED OR TRUCKED ONTO AIRPORT ROADS, TAXIWAYS, AND SOD SURFACES, OR WHICH CAN BE BLOWN ONTO SUCH SURFACES, SHALL BE IMMEDIATELY SWEEP, PICKED UP AND REMOVED, OR PLACED INTO CLOSED CONTAINERS. ANY DAMAGE TO AIRPORT PROPERTY SHALL BE REPAIRED IMMEDIATELY AT NO COST TO THE OWNER.
- EACH CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND MAINTAINING AIRPORT LIGHTING AND NAVIGATIONAL ELECTRICAL SYSTEMS DURING CONSTRUCTION. A CONTACT PERSON AND TELEPHONE NUMBER FOR 24 HOUR EMERGENCY IMMEDIATE REPAIR SHALL BE SUBMITTED TO THE AIRPORT MANAGER AND ENGINEER. HAUL ROUTES CROSSING PAVEMENT, DRAINAGE, MISCELLANEOUS. STRUCTURES AND/OR AIRFIELD CABLES SHALL BE PROTECTED FROM DAMAGE.
- ALL AIRCRAFT AND AIRPORT OPERATIONS HAVE THE RIGHT-OF-WAY. CONTRACTOR TO YIELD TO VEHICLES AND REMAIN CLEAR AT ALL TIMES.
- CONTRACTOR SHALL PLACE, SECURE, AND MAINTAIN LIGHTED BARRICADES AND CLOSURE CROSSES WHEN A RUNWAY/TAXIWAY/APRON IS CLOSED OR AS REQUIRED BY THE PLANS AND DESIGNATED BY THE ENGINEER.
- CONTRACTOR SHALL MARK HAZARDOUS AREA WITH STEADY-BURNING OR FLASHING RED AND YELLOW LIGHTS DURING PERIODS OF LOW VISIBILITY AS REQUIRED.
- THE CONTRACTOR SHALL PERIODICALLY PERFORM ONSITE INSPECTIONS THROUGHOUT THE DURATION OF THE PROJECT WITH THE IMMEDIATE REMEDY OF ANY DIFFERENCES, WHETHER CAUSED BY NEGLIGENCE, OVERSIGHT, OR PROJECT SCOPE CHANGE.
- CONTRACTOR SHALL MOVE MAINTENANCE OF TRAFFIC COMPONENTS AT THE WRITTEN DIRECTION OF THE ENGINEER AT NO ADDITIONAL COST.
- CONTRACTOR SHALL NOT REMOVE THE BARRICADES WITHOUT THE APPROVAL BY THE AIRPORT MANAGER AND/OR RESIDENT PROJECT REPRESENTATIVE/RESIDENT ENGINEER.
- CONTRACTOR SHALL MAINTAIN FLASHERS, SIGNS AND/OR BARRICADES AS REQUIRED BY THE PLANS, CITY OR COUNTY REGULATIONS OR CONTRACTOR ACTIVITIES. CONTRACTOR SHALL OBTAIN ANY AND ALL REQUIRED LOCAL PERMITS UNLESS SPECIFIED OTHERWISE.
- THE CONTRACTOR SHALL UTILIZE WATER AND/OR CHEMICALS APPROVED BY THE ENGINEER AS NECESSARY TO CONTROL DUST.
- CONSTRUCTION EQUIPMENT OR CONSTRUCTION ACTIVITY WILL NOT BE PERMITTED WITHIN THE RUNWAY SAFETY AREA OF ANY ACTIVE RUNWAY CENTERLINE OR WITHIN THE OBJECT FREE AREA OF AN ACTIVE TAXIWAY OR APRON.
- UNLESS SPECIFIED OTHERWISE, COST FOR THE ABOVE IS TO BE CONSIDERED INCIDENTAL TO THE PROJECT. SEPARATE PAYMENT SHALL NOT BE MADE.

REVISION	06/17/13	UPDATED NOTE 19
DATE	06/17/13	

MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS

IL PROJ.: MGB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21

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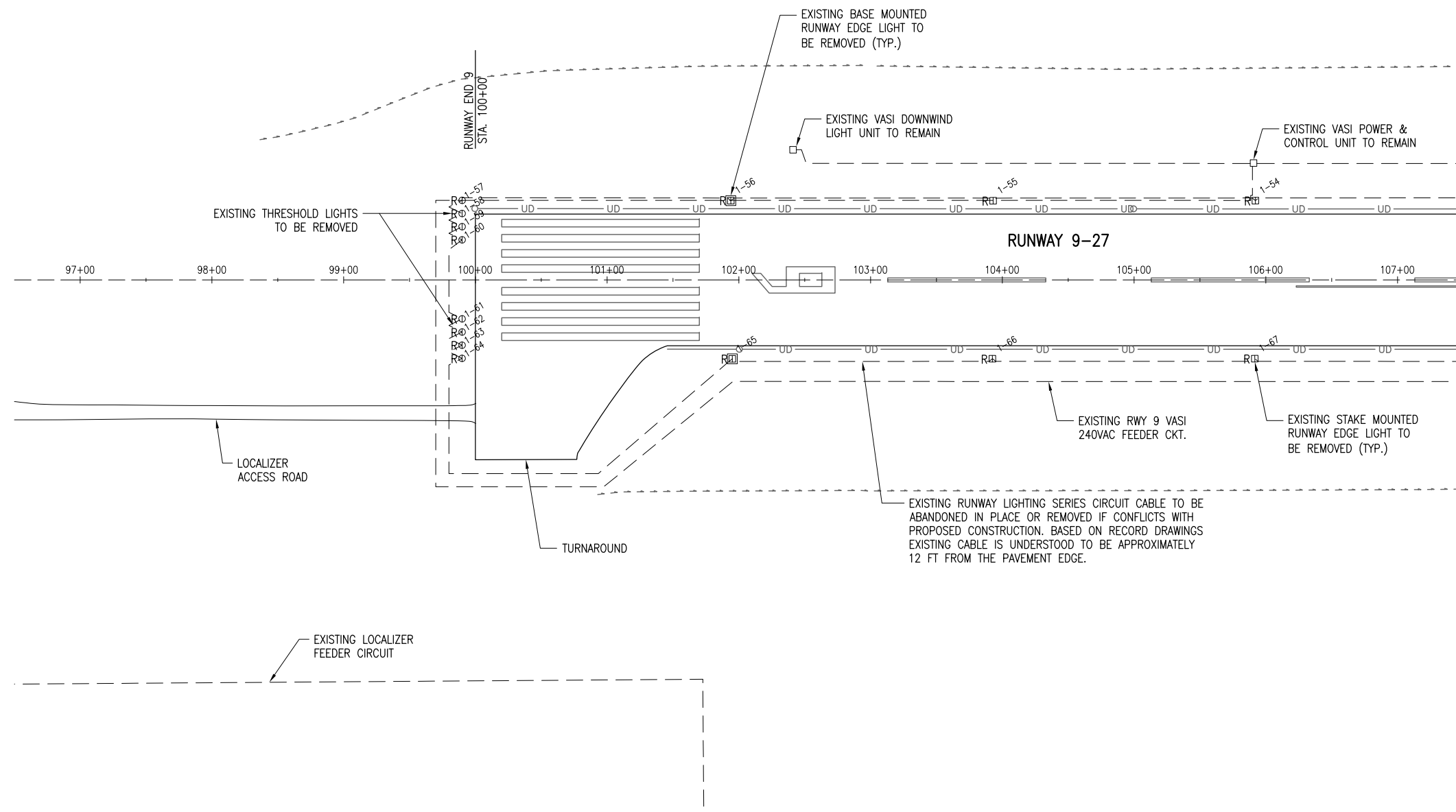
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REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

CONSTRUCTION SAFETY AND PHASING DETAILS AND NOTES

**AIRFIELD LIGHTING REMOVAL NOTES**

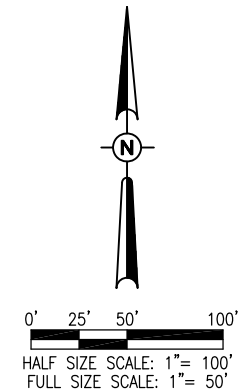
- ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER AND THE AIR TRAFFIC CONTROL TOWER. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- CONTRACTOR SHALL EXAMINE THE SITE TO DETERMINE THE EXTENT OF THE WORK. CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL FIELD VERIFY RESPECTIVE CIRCUITS AND POWER SOURCES PRIOR TO REMOVING OR DISCONNECTING THE RESPECTIVE AIRFIELD LIGHTING, TAXI SIGN, NAVAID, OR OTHER DEVICE.
- CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF FAA AC NO. 150/5370-2F (OR MOST CURRENT ISSUE) "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION".
- CONTRACTOR SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF NFPA 70E - STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE.
- THE EXISTING AIRFIELD (RUNWAY & TAXIWAY) LIGHTS, TAXI GUIDANCE SIGNS, AND THEIR ISOLATED TRANSFORMERS DESIGNATED FOR REMOVAL SHALL BE REMOVED AND TURNED OVER TO THE AIRPORT. THE CONCRETE LIGHT BASES AND FOUNDATIONS SHALL BE REMOVED AND DISPOSED OF, OFF THE AIRPORT SITE IN A LEGAL MANNER. REMOVAL OF THE EXISTING AIRFIELD LIGHTS AND TAXI GUIDANCE SIGNS WILL BE PAID FOR UNDER ITEMS AR125901, AR125902, & AR125904.
- THE EXISTING WIND TEE SHALL BE REMOVED AND TURNED OVER TO THE AIRPORT MANAGER. THE EXISTING CONCRETE FOUNDATION SHALL BE REMOVED AND DISPOSED OF OFF THE AIRPORT SITE. THE HOLE LEFT FROM THE WIND TEE FOUNDATION REMOVAL SHALL BE FILLED WITH EARTH MATERIAL AND COMPACTED TO PREVENT FUTURE SETTLEMENT. REMOVAL OF THE WIND TEE WILL BE PAID FOR UNDER ITEM AR107901 REMOVE WIND TEE PER EACH.
- EXISTING REILS THAT ARE DESIGNATED FOR REMOVAL SHALL BE REMOVED AND SHALL BE TURNED OVER TO THE AIRPORT. THE CONCRETE REIL BASES SHALL BE REMOVED AND DISPOSED OF LEGALLY OFF THE AIRPORT SITE. THE HOLE LEFT FROM THE REIL BASE REMOVAL SHALL BE FILLED WITH EARTH AND COMPACTED TO PREVENT FUTURE SETTLEMENT. REMOVAL OF REILS WILL BE PAID FOR UNDER ITEM AR125907 REMOVE REILS PER PAIR.
- THE EXISTING AIRFIELD LIGHTING CABLES ASSOCIATED WITH AIRFIELD LIGHTING REMOVALS SHALL BE ABANDONED IN PLACE UNLESS IT CONFLICTS WITH THE INSTALLATION OF A PROPOSED LIGHT, NAVAID, SIGN, CABLE, PAVEMENT, OR OTHER WORK, THEN IT SHALL BE REMOVED AND DISPOSED OF OFF SITE AT NO ADDITIONAL COST TO THE CONTRACT. CONTRACTOR MAY REMOVE ABANDONED CABLES AT NO ADDITIONAL COST TO THE CONTRACT AND SHALL HAVE THE SALVAGE RIGHTS TO ABANDONED CABLES.
- ALL ABOVEGROUND JUMPERS SHALL BE IN A DUCT WITH ALL CONNECTIONS SEALED. THE CONTRACTOR SHALL SECURE, IDENTIFY AND PLACE ALL TEMPORARY EXPOSED WIRING IN CONDUIT, DUCT, OR UNIT DUCT TO PREVENT ELECTROCUTION AND FIRE IGNITION SOURCES AS PER THE REQUIREMENTS OF FAA 150/5370-2F, OPERATION SAFETY ON AIRPORTS DURING CONSTRUCTION, SECTION 218, PARAGRAPH c.
- THE CONTRACTOR IS REQUIRED TO FILL IN ALL HOLES AND DEPRESSIONS RESULTING FROM THE LIGHT, BASE, AND/OR FOUNDATION REMOVAL WITH EARTH MATERIAL. THE EARTH MATERIAL WILL COME FROM OFF-SITE AND WILL BE CONSIDERED INCIDENTAL TO REMOVE AIRFIELD LIGHTING. THE AREAS SHALL BE COMPACTED TO PREVENT FUTURE SETTLEMENT AND FERTILIZED, SEEDDED, AND MULCHED IN ACCORDANCE WITH ITEMS 901 AND 908 RESPECTIVELY.
- NO CONNECTION TO AN ACTIVE LIGHTING CIRCUIT, NAVAID, OR OTHER CIRCUIT SHALL BE BROKEN UNTIL THE CIRCUIT HAS BEEN TURNED OFF IN ACCORDANCE WITH THE ABOVE NOTE 1.



MATCHLINE - STA. 107+50 RUNWAY 9-27

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 REIL (TO BE REMOVED)                          |
|  | EXISTING BUILDING               |  | EXISTING TAXI GUIDANCE SIGN (TO BE REMOVED)            |
|  | EXISTING ELECTRICAL DUCT        |  | EXISTING STAKE MOUNTED TAXIWAY LIGHT (TO BE REMOVED)   |
|  | EXISTING DITCH                  |  | EXISTING BASE MOUNTED TAXIWAY LIGHT (TO BE REMOVED)    |
|  | EXISTING ELECTRICAL CABLE       |  | EXISTING STAKE MOUNTED RUNWAY LIGHT (TO BE REMOVED)    |
|  | EXISTING WATER                  |  | EXISTING BASE MOUNTED RUNWAY LIGHT (TO BE REMOVED)     |
|  | EXISTING TELEPHONE              |  | EXISTING STAKE MOUNTED THRESHOLD LIGHT (TO BE REMOVED) |
|  | EXISTING UNDERDRAIN             |  | EXISTING BASE MOUNTED THRESHOLD LIGHT (TO BE REMOVED)  |
|  | EXISTING STORM SEWER            |  | EXISTING AIRPORT ROTATING BEACON                       |
|  | EXISTING SANITARY               |  |                                                        |
|  | EXISTING UNDERGROUND ELECTRICAL |  |                                                        |

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REVISION	DATE	DESCRIPTION
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MACOMB, ILLINOIS**

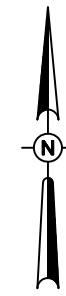
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ILL. PROJ.: MOB-4206

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Filename C-141-ELE.dwg	DAW
Scale AS SHOWN	12/03/12
Date 06/17/13	REVIEWED
	KNL/CAH
	02/04/13



REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

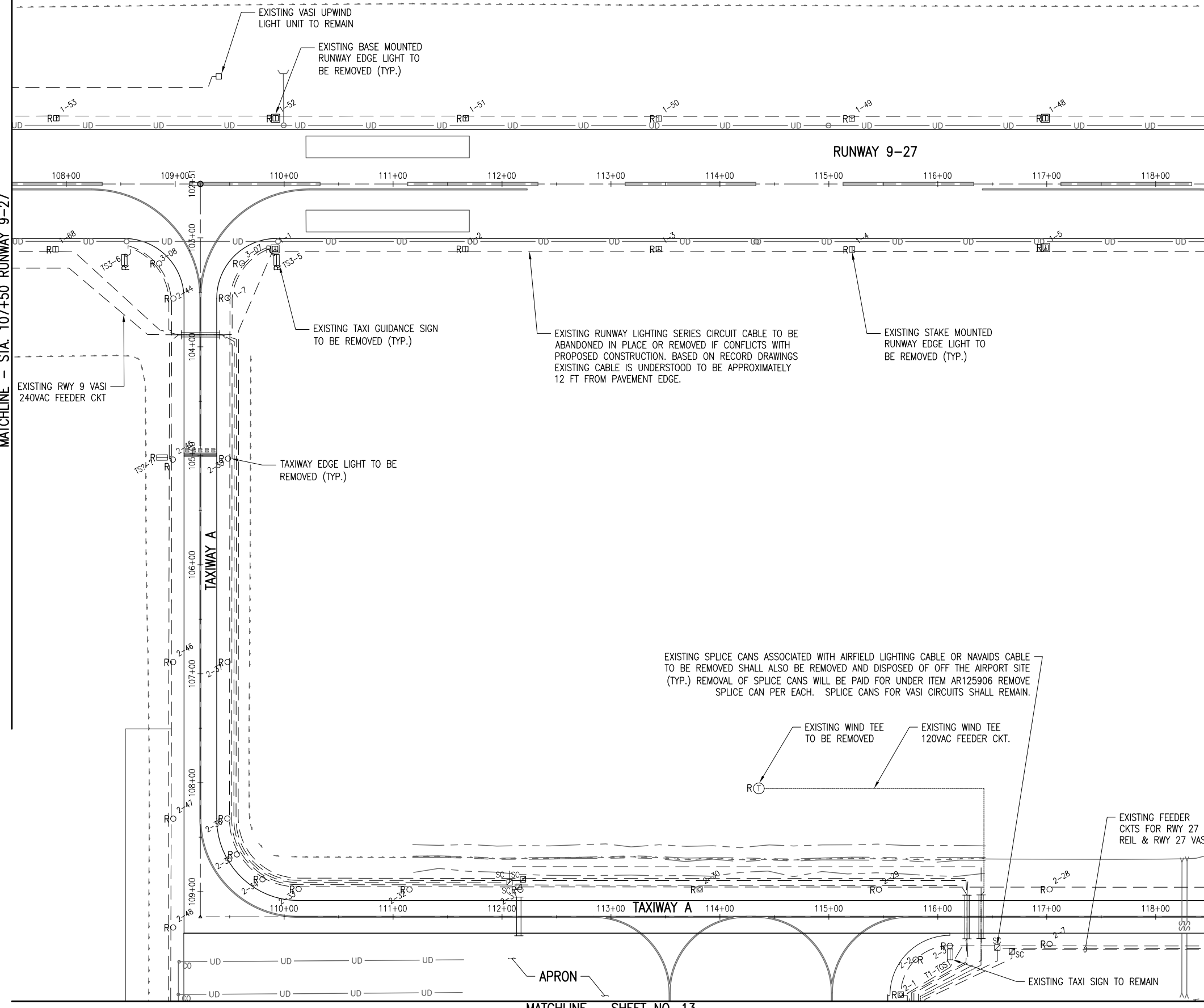
EXISTING ELECTRICAL PLAN STA. 96+50 TO 107+50



0' 25' 50' 100'  
 HALF SIZE SCALE: 1" = 100'  
 FULL SIZE SCALE: 1" = 50'

MATCHLINE - STA. 107+50 RUNWAY 9-27

MATCHLINE - STA. 118+50 RUNWAY 9-27



MATCHLINE - SHEET NO. 13

**LEGEND**

- EXISTING PAVEMENT
- EXISTING BUILDING
- EXISTING ELECTRICAL DUCT
- EXISTING DITCH
- EXISTING ELECTRICAL CABLE
- EXISTING WATER
- EXISTING TELEPHONE
- EXISTING UNDERDRAIN
- EXISTING STORM SEWER
- EXISTING SANITARY
- EXISTING UNDERGROUND ELECTRICAL
- EXISTING REIL (TO BE REMOVED)
- EXISTING WIND TEE (TO BE REMOVED)
- EXISTING TAXI GUIDANCE SIGN (TO BE REMOVED)
- EXISTING STAKE MOUNTED TAXIWAY LIGHT (TO BE REMOVED)
- EXISTING BASE MOUNTED TAXIWAY LIGHT (TO BE REMOVED)
- EXISTING STAKE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
- EXISTING BASE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
- EXISTING STAKE MOUNTED THRESHOLD LIGHT (TO BE REMOVED)
- EXISTING BASE MOUNTED THRESHOLD LIGHT (TO BE REMOVED)
- EXISTING AIRPORT ROTATING BEACON

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REVISION	DATE	DESCRIPTION
06/12/13		VASI'S TO REMAIN

**MACOMB MUNICIPAL AIRPORT**  
**MACOMB, ILLINOIS**  
 BLOCK GRANT PROJ.: 3-17-0064-B21  
 IL PROJ.: MGB-4206

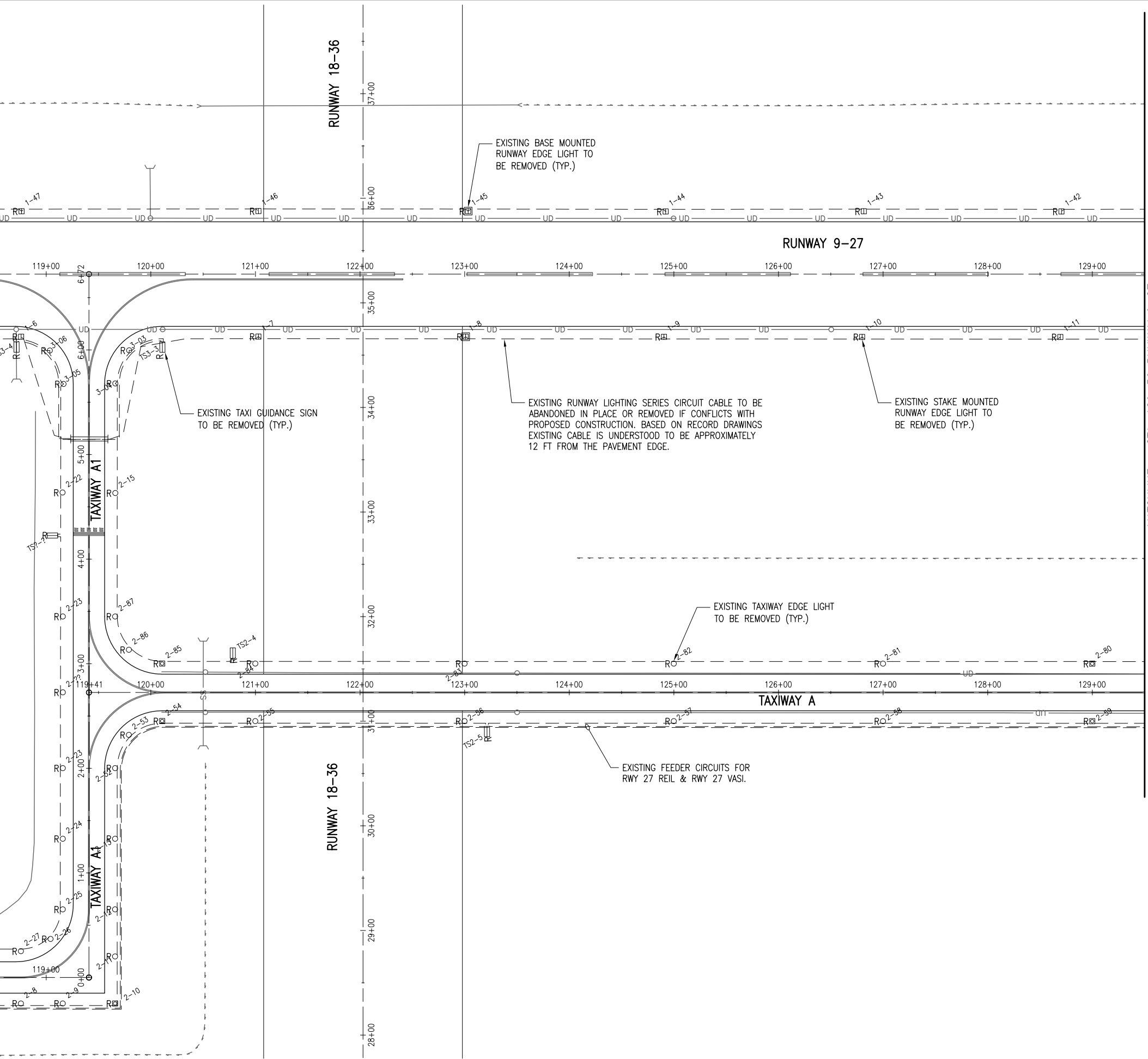
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C-141-ELE.dwg	06/17/13	AS	AS
AS SHOWN			
Scale			
Date			



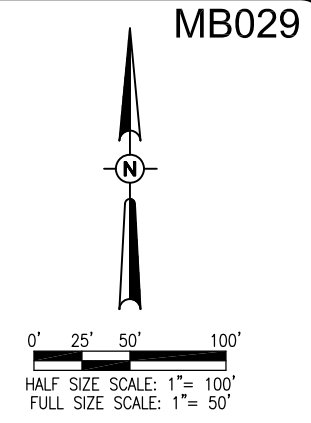
**REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS**  
**EXISTING ELECTRICAL PLAN STA. 107+50 TO STA. 118+50**

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MATCHLINE - STA. 118+50 RUNWAY 9-27



MATCHLINE - STA. 129+50 RUNWAY 9-27



**LEGEND**

- EXISTING PAVEMENT
- EXISTING BUILDING
- EXISTING ELECTRICAL DUCT
- EXISTING DITCH
- EXISTING ELECTRICAL CABLE
- EXISTING WATER
- EXISTING TELEPHONE
- EXISTING UNDERDRAIN
- EXISTING STORM SEWER
- EXISTING SANITARY
- EXISTING UNDERGROUND ELECTRICAL
- EXISTING REIL (TO BE REMOVED)
- EXISTING TAXI GUIDANCE SIGN (TO BE REMOVED)
- EXISTING STAKE MOUNTED TAXIWAY LIGHT (TO BE REMOVED)
- EXISTING BASE MOUNTED TAXIWAY LIGHT (TO BE REMOVED)
- EXISTING STAKE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
- EXISTING BASE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
- EXISTING STAKE MOUNTED THRESHOLD LIGHT (TO BE REMOVED)
- EXISTING BASE MOUNTED THRESHOLD LIGHT (TO BE REMOVED)
- EXISTING AIRPORT ROTATING BEACON

MB029

REVISION	DATE

MACOMB MUNICIPAL AIRPORT  
 MACOMB, ILLINOIS  
 IL PROJ.: MCB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21

FILENAME	SCALE	DATE	LAYOUT	DATE
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			DAW	12/03/12
			KNL/CAH	02/04/13

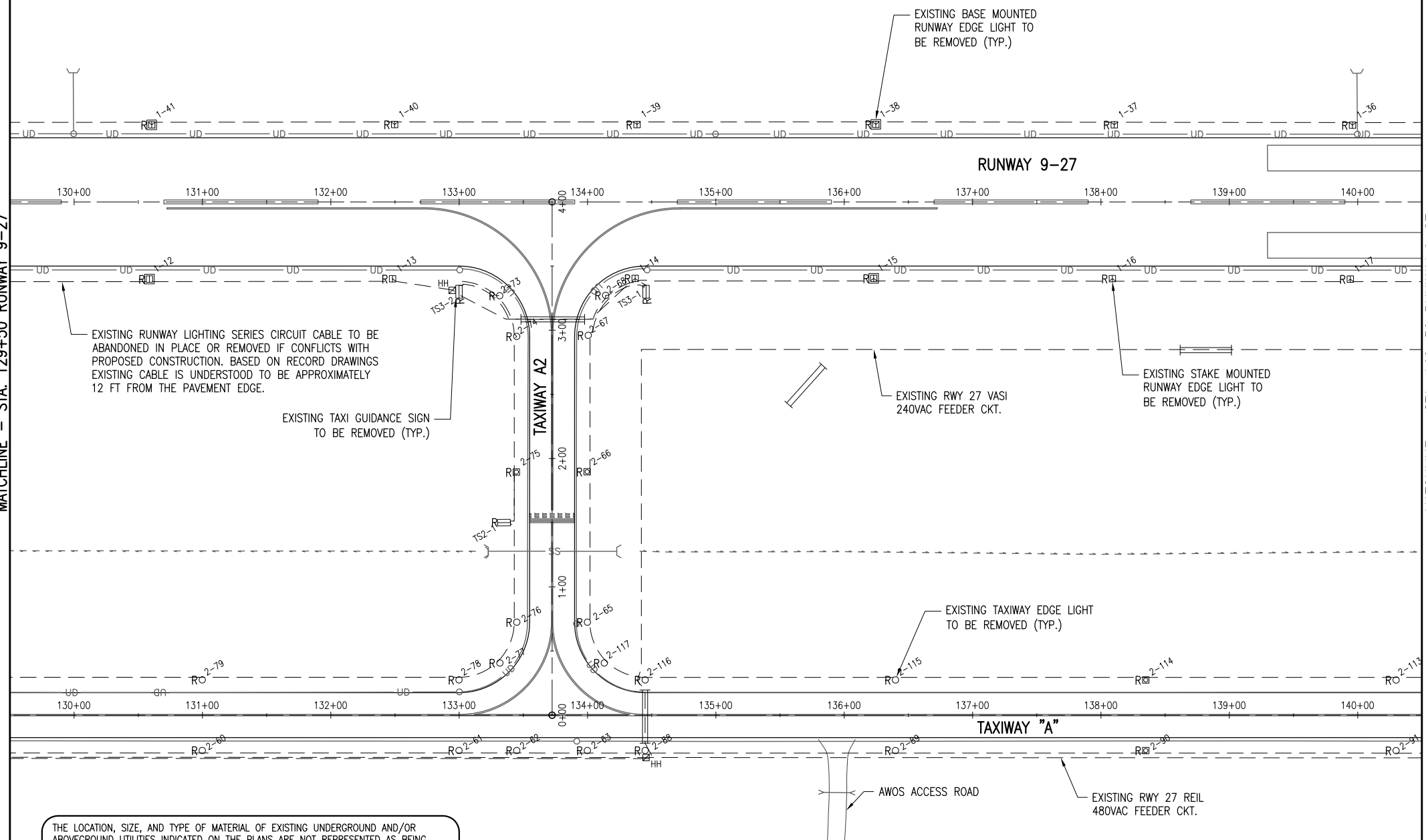
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REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS  
 EXISTING ELECTRICAL PLAN  
 STA. 118+50 TO 129+50

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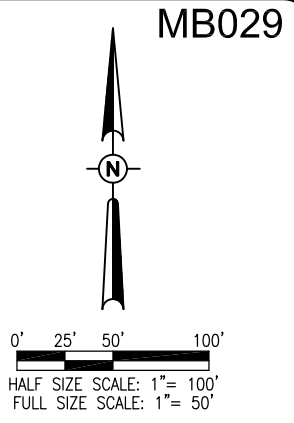
MATCHLINE - STA. 129+50 RUNWAY 9-27

MATCHLINE - STA. 140+50 RUNWAY 9-27



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**LEGEND**

- EXISTING PAVEMENT
- EXISTING BUILDING
- EXISTING ELECTRICAL DUCT
- EXISTING DITCH
- EXISTING ELECTRICAL CABLE
- EXISTING WATER
- EXISTING TELEPHONE
- EXISTING UNDERDRAIN
- EXISTING STORM SEWER
- EXISTING SANITARY
- EXISTING UNDERGROUND ELECTRICAL
- EXISTING REIL (TO BE REMOVED)
- EXISTING TAXI GUIDANCE SIGN (TO BE REMOVED)
- EXISTING STAKE MOUNTED TAXIWAY LIGHT (TO BE REMOVED)
- EXISTING BASE MOUNTED TAXIWAY LIGHT (TO BE REMOVED)
- EXISTING STAKE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
- EXISTING BASE MOUNTED RUNWAY LIGHT (TO BE REMOVED)
- EXISTING STAKE MOUNTED THRESHOLD LIGHT (TO BE REMOVED)
- EXISTING BASE MOUNTED THRESHOLD LIGHT (TO BE REMOVED)
- EXISTING AIRPORT ROTATING BEACON

REVISION	DATE

MACOMB MUNICIPAL AIRPORT  
 MACOMB, ILLINOIS  
 IL PROJ.: MCB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21

DESCRIPTION	DATE
LAYOUT	12/03/12
DRAWN	DAW
REVIEWED	KNL/CAH

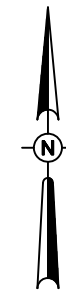
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REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS  
 EXISTING ELECTRICAL PLAN STA. 129+50 TO 140+50

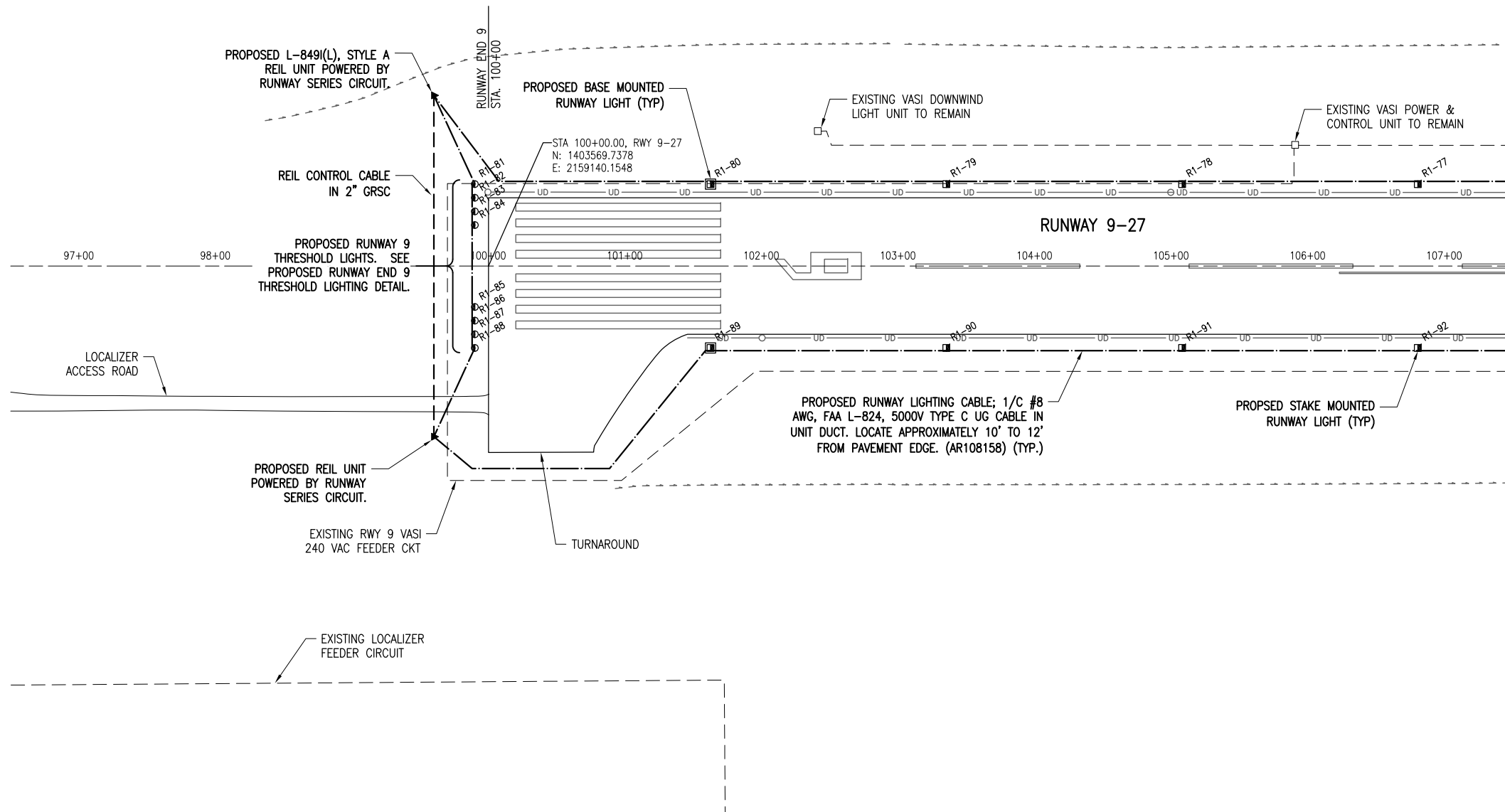








0' 25' 50' 100'  
 HALF SIZE SCALE: 1" = 100'  
 FULL SIZE SCALE: 1" = 50'



MATCHLINE - STA. 107+50 RUNWAY 9-27

**LEGEND**

- EXISTING PAVEMENT
- EXISTING BUILDING
- EXISTING ELECTRICAL DUCT
- PROPOSED ELECTRICAL DUCT
- EXISTING DRAINAGE DITCH
- EXISTING ELECTRIC
- PROPOSED 1/C #8 AWG, FAA L-824, 5000 VOLT TYPE C UNDERGROUND CABLE IN UNIT DUCT
- PROPOSED 2-1/C #8 AWG, FAA L-824, 5000V TYPE C UNDERGROUND CABLE IN UNIT DUCT.
- PROPOSED 3-1/C #6 XLP-USE 600V UG CABLE IN UNIT DUCT
- EXISTING WATER
- EXISTING TELEPHONE
- EXISTING UNDERDRAIN
- EXISTING STORM SEWER
- EXISTING SANITARY
- EXISTING UNDERGROUND ELECTRIC UTILITY PRIMARY
- PROPOSED REIL
- PROPOSED WIND CONE
- EXISTING TAXI GUIDANCE SIGN
- PROPOSED TAXI GUIDANCE SIGN
- PROPOSED STAKE MOUNTED TAXIWAY LIGHT
- PROPOSED BASE MOUNTED TAXIWAY LIGHT
- PROPOSED STAKE MOUNTED RUNWAY LIGHT
- PROPOSED BASE MOUNTED RUNWAY LIGHT
- PROPOSED STAKE MOUNTED THRESHOLD LIGHT
- PROPOSED BASE MOUNTED THRESHOLD LIGHT
- PROPOSED ELECTRICAL HANDHOLE
- PROPOSED ELECTRICAL MANHOLE
- EXISTING UTILITY TRANSFORMER
- PROPOSED UTILITY TRANSFORMER
- EXISTING AIRPORT ROTATING BEACON

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**RUNWAY 9 REIL LOCATION NOTE**

THE REILS ON RUNWAY 9 SHALL BE LOCATED 40 FEET DOWNWIND OF THE RUNWAY THRESHOLD & 75 FEET FROM THE RUNWAY EDGE TO COMPLY WITH FAA AC 150/5340-30G, FAA ORDER J06850.2B, AND ACCOMMODATE THE ADJACENT TAXIWAY TURNAROUND AND THE RUNWAY 9 VASI.

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REVISION	DATE	DESCRIPTION
02/19/13	ADDED PAPI/PCU NOTE PER IDA REVIEW	
06/12/13	REMOVED PAPI'S/VASI'S TO REMAIN	

**MACOMB MUNICIPAL AIRPORT  
 MACOMB, ILLINOIS**

IL PROJ.: MGB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21

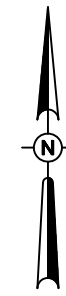
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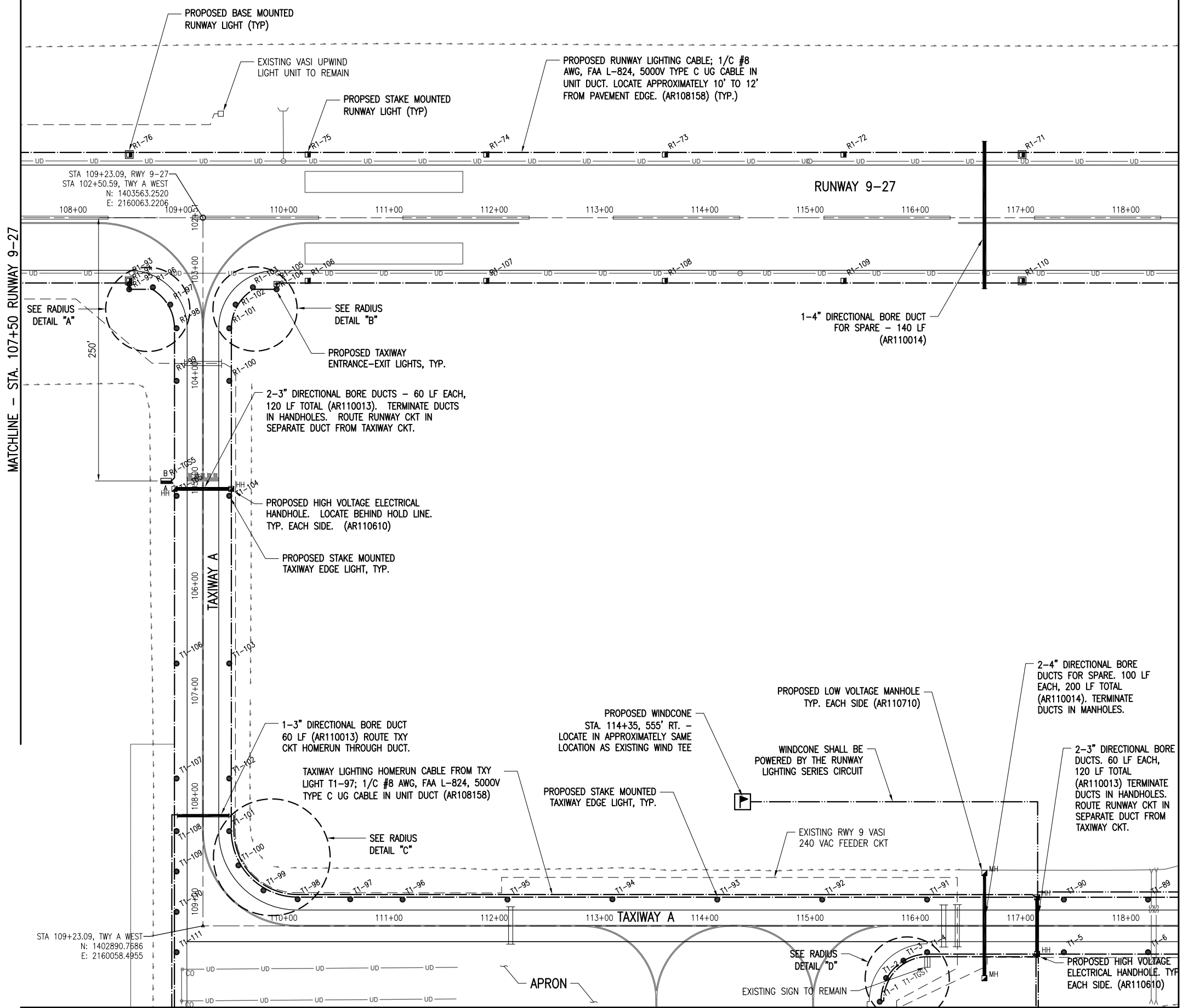
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REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS  
 PROPOSED ELECTRICAL PLAN STA. 96+50 TO 107+50

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0' 25' 50' 100'  
HALF SIZE SCALE: 1" = 100'  
FULL SIZE SCALE: 1" = 50'



MATCHLINE - STA. 107+50 RUNWAY 9-27  
MATCHLINE - STA. 118+50 RUNWAY 9-27

LEGEND

- EXISTING PAVEMENT
- EXISTING BUILDING
- EXISTING ELECTRICAL DUCT
- PROPOSED ELECTRICAL DUCT
- EXISTING DRAINAGE DITCH
- EXISTING ELECTRIC
- PROPOSED 1/C #8 AWG, FAA L-824, 5000 VOLT TYPE C UNDERGROUND CABLE UNIT DUCT
- PROPOSED 2-1/C #8 AWG, FAA L-824, 5000V TYPE C UNDERGROUND CABLE IN UNIT DUCT
- PROPOSED 3-1/C #6 XLP-USE 600V UG CABLE IN UNIT DUCT
- EXISTING WATER
- EXISTING TELEPHONE
- EXISTING UNDERDRAIN
- EXISTING STORM SEWER
- EXISTING SANITARY
- EXISTING UNDERGROUND ELECTRIC UTILITY PRIMARY
- PROPOSED REIL
- PROPOSED WIND CONE
- EXISTING TAXI GUIDANCE SIGN
- PROPOSED TAXI GUIDANCE SIGN
- PROPOSED STAKE MOUNTED TAXIWAY LIGHT
- PROPOSED BASE MOUNTED TAXIWAY LIGHT
- PROPOSED STAKE MOUNTED RUNWAY LIGHT
- PROPOSED BASE MOUNTED RUNWAY LIGHT
- PROPOSED STAKE MOUNTED THRESHOLD LIGHT
- PROPOSED BASE MOUNTED THRESHOLD LIGHT
- PROPOSED ELECTRICAL HANDHOLE
- PROPOSED ELECTRICAL MANHOLE
- EXISTING UTILITY TRANSFORMER
- PROPOSED UTILITY TRANSFORMER
- EXISTING AIRPORT ROTATING BEACON

REVISION	DATE	ADDED END INDICATORS
02/19/13		PER IDA REVIEW
06/12/13		REMOVED PAPI'S/VASI'S TO REMAIN

MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS

IL PROJ.: MGB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21

Hanson Proj. No. 12A0053	01/26/13
Filename: C-142-ELE.dwg	MLP/KNL
Scale: AS SHOWN	TRR
Date: 06/17/13	01/28/13
	KNL/CAH
	02/04/13
	REVIEWED

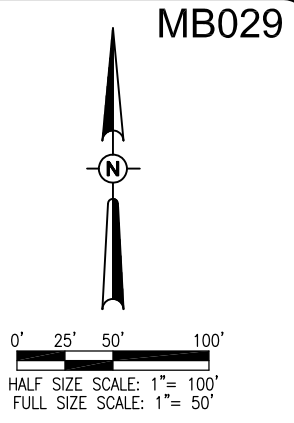
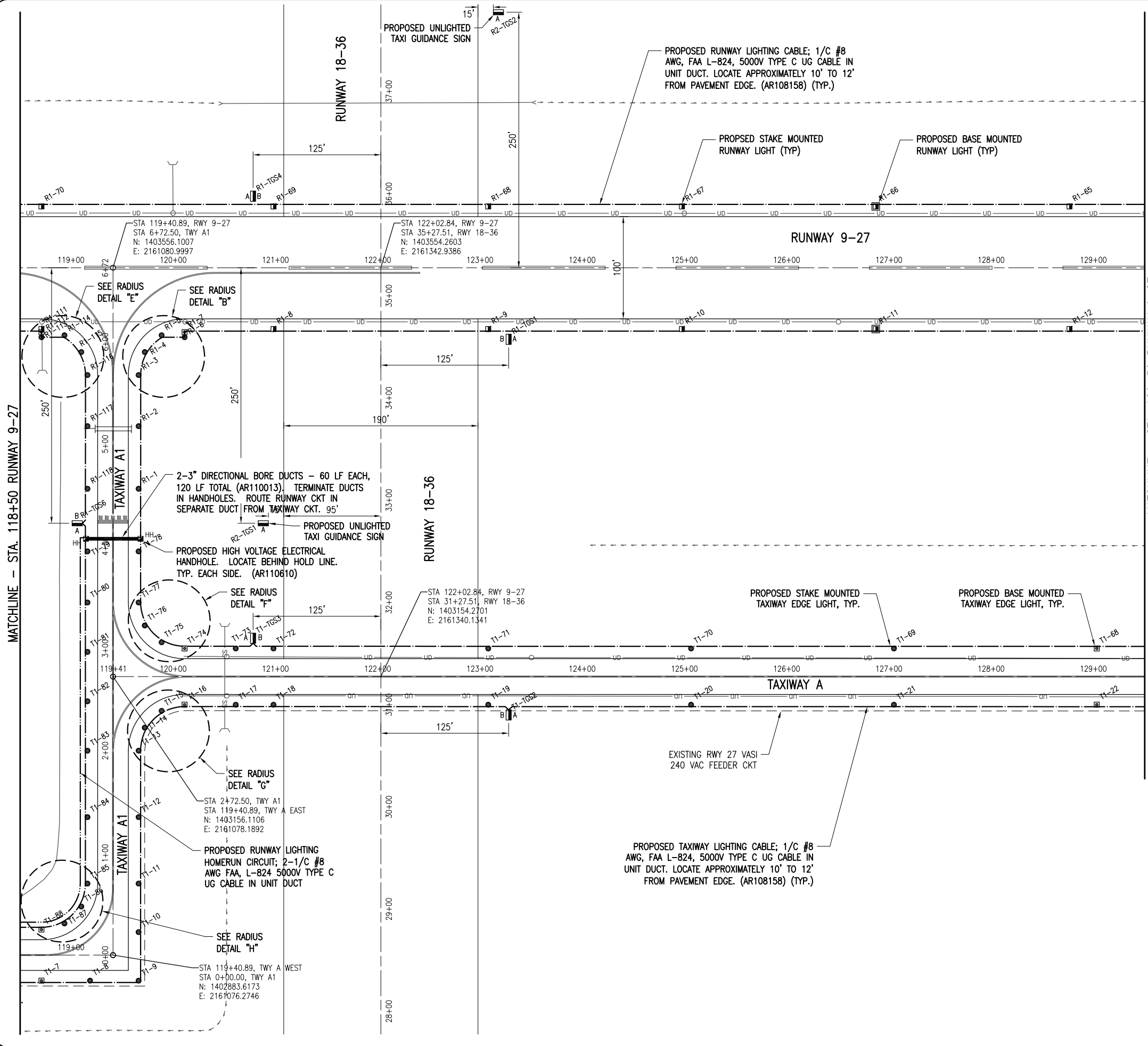


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REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS  
PROPOSED ELECTRICAL PLAN STA. 107+50 TO STA. 118+50

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MB029

MATCHLINE - STA. 129+50 RUNWAY 9-27

MATCHLINE - STA. 118+50 RUNWAY 9-27

**LEGEND**

- EXISTING PAVEMENT
- EXISTING BUILDING
- EXISTING ELECTRICAL DUCT
- PROPOSED ELECTRICAL DUCT
- EXISTING DRAINAGE DITCH
- EXISTING ELECTRIC
- PROPOSED 1/C #8 AWG, FAA L-824, 5000 VOLT TYPE C UNDERGROUND CABLE IN UNIT DUCT
- PROPOSED 2-1/C #8 AWG, FAA L-824, 5000V TYPE C UNDERGROUND CABLE IN UNIT DUCT.
- PROPOSED 3-1/C #6 XLP-USE 600V UG CABLE IN UNIT DUCT
- EXISTING WATER
- EXISTING TELEPHONE
- EXISTING UNDERDRAIN
- EXISTING STORM SEWER
- EXISTING SANITARY
- EXISTING UNDERGROUND ELECTRIC UTILITY PRIMARY
- PROPOSED REIL
- PROPOSED WIND CONE
- EXISTING TAXI GUIDANCE SIGN
- PROPOSED TAXI GUIDANCE SIGN
- PROPOSED STAKE MOUNTED TAXIWAY LIGHT
- PROPOSED BASE MOUNTED TAXIWAY LIGHT
- PROPOSED STAKE MOUNTED RUNWAY LIGHT
- PROPOSED BASE MOUNTED RUNWAY LIGHT
- PROPOSED STAKE MOUNTED THRESHOLD LIGHT
- PROPOSED BASE MOUNTED THRESHOLD LIGHT
- PROPOSED ELECTRICAL HANDHOLE
- PROPOSED ELECTRICAL MANHOLE
- EXISTING UTILITY TRANSFORMER
- PROPOSED UTILITY TRANSFORMER
- EXISTING AIRPORT ROTATING BEACON

REVISION	DATE	ADDED END INDICATORS
02/19/13		PER IDA REVIEW
06/12/13		REMOVED PAPI'S/VASI'S TO REMAIN

**MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS**

BLOCK GRANT PROJ.: 3-17-0064-B21  
IL PROJ.: MGB-4206

Hanson Proj. No. 120053	01/26/13
Filename: C-142-ELE.dwg	MLH/KNL
Scale: AS SHOWN	TRR
Date: 06/17/13	01/28/12
	KNL/CAH
	02/04/13

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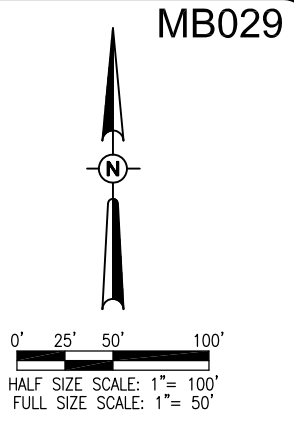
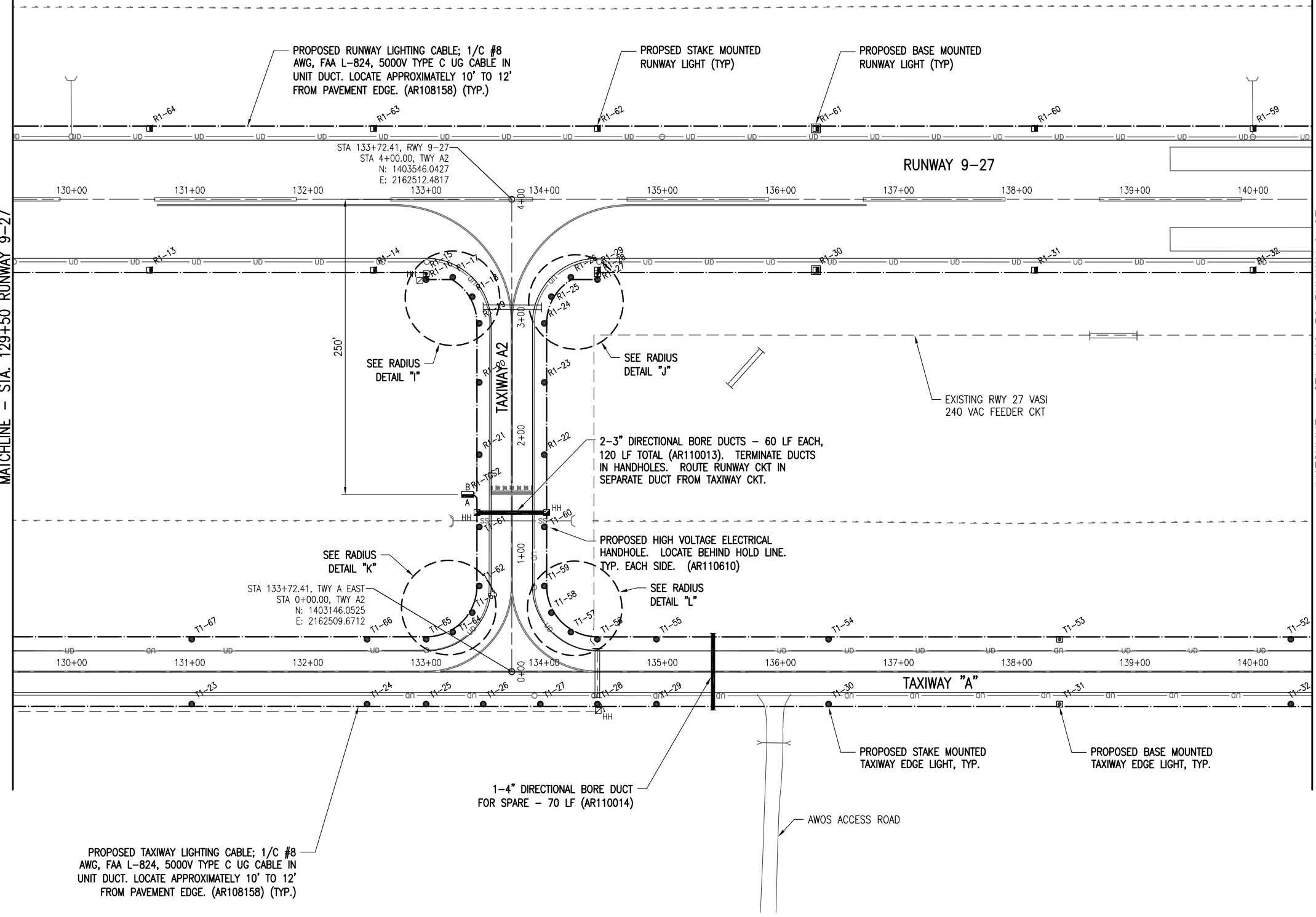
REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

PROPOSED ELECTRICAL PLAN  
 STA. 118+50 TO 129+50

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MATCHLINE - STA. 129+50 RUNWAY 9-27

MATCHLINE - STA. 140+50 RUNWAY 9-27



**LEGEND**

- EXISTING PAVEMENT
- EXISTING BUILDING
- EXISTING ELECTRICAL DUCT
- PROPOSED ELECTRICAL DUCT
- EXISTING DRAINAGE DITCH
- EXISTING ELECTRIC
- PROPOSED 1/C #8 AWG, FAA L-824, 5000 VOLT TYPE C UNDERGROUND CABLE UNIT DUCT
- PROPOSED 2-1/C #8 AWG, FAA L-824, 5000V TYPE C UNDERGROUND CABLE IN UNIT DUCT.
- PROPOSED 3-1/C #6 XLP-USE 600V UG CABLE IN UNIT DUCT
- EXISTING WATER
- EXISTING TELEPHONE
- EXISTING UNDERDRAIN
- EXISTING STORM SEWER
- EXISTING SANITARY
- EXISTING UNDERGROUND ELECTRIC UTILITY PRIMARY
- PROPOSED REIL
- PROPOSED WIND CONE
- EXISTING TAXI GUIDANCE SIGN
- PROPOSED TAXI GUIDANCE SIGN
- PROPOSED STAKE MOUNTED TAXIWAY LIGHT
- PROPOSED BASE MOUNTED TAXIWAY LIGHT
- PROPOSED STAKE MOUNTED RUNWAY LIGHT
- PROPOSED BASE MOUNTED RUNWAY LIGHT
- PROPOSED STAKE MOUNTED THRESHOLD LIGHT
- PROPOSED BASE MOUNTED THRESHOLD LIGHT
- PROPOSED ELECTRICAL HANDHOLE
- PROPOSED ELECTRICAL MANHOLE
- EXISTING UTILITY TRANSFORMER
- PROPOSED UTILITY TRANSFORMER
- EXISTING AIRPORT ROTATING BEACON

PROPOSED TAXIWAY LIGHTING CABLE: 1/C #8 AWG, FAA L-824, 5000V TYPE C UG CABLE IN UNIT DUCT. LOCATE APPROXIMATELY 10' TO 12' FROM PAVEMENT EDGE. (AR108158) (TYP.)

PROPOSED RUNWAY LIGHTING CABLE: 1/C #8 AWG, FAA L-824, 5000V TYPE C UG CABLE IN UNIT DUCT. LOCATE APPROXIMATELY 10' TO 12' FROM PAVEMENT EDGE. (AR108158) (TYP.)

PROPOSED STAKE MOUNTED RUNWAY LIGHT (TYP)

PROPOSED BASE MOUNTED RUNWAY LIGHT (TYP)

SEE RADIUS DETAIL "I"

SEE RADIUS DETAIL "J"

SEE RADIUS DETAIL "K"

SEE RADIUS DETAIL "L"

2-3" DIRECTIONAL BORE DUCTS - 60 LF EACH, 120 LF TOTAL (AR110013). TERMINATE DUCTS IN HANDHOLES. ROUTE RUNWAY CKT IN SEPARATE DUCT FROM TAXIWAY CKT.

PROPOSED HIGH VOLTAGE ELECTRICAL HANDHOLE. LOCATE BEHIND HOLD LINE. TYP. EACH SIDE. (AR110610)

1-4" DIRECTIONAL BORE DUCT FOR SPARE - 70 LF (AR110014)

PROPOSED STAKE MOUNTED TAXIWAY EDGE LIGHT, TYP.

PROPOSED BASE MOUNTED TAXIWAY EDGE LIGHT, TYP.

AWOS ACCESS ROAD

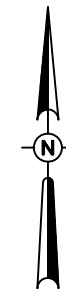
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02/19/13		PER IDA REVIEW
06/12/13		REMOVED PAPI'S/VASI'S TO REMAIN

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 MACOMB, ILLINOIS  
 IL PROJ.: MGB-4206  
 BLOCK GRANT PROJ.: 3-17-0064-B21

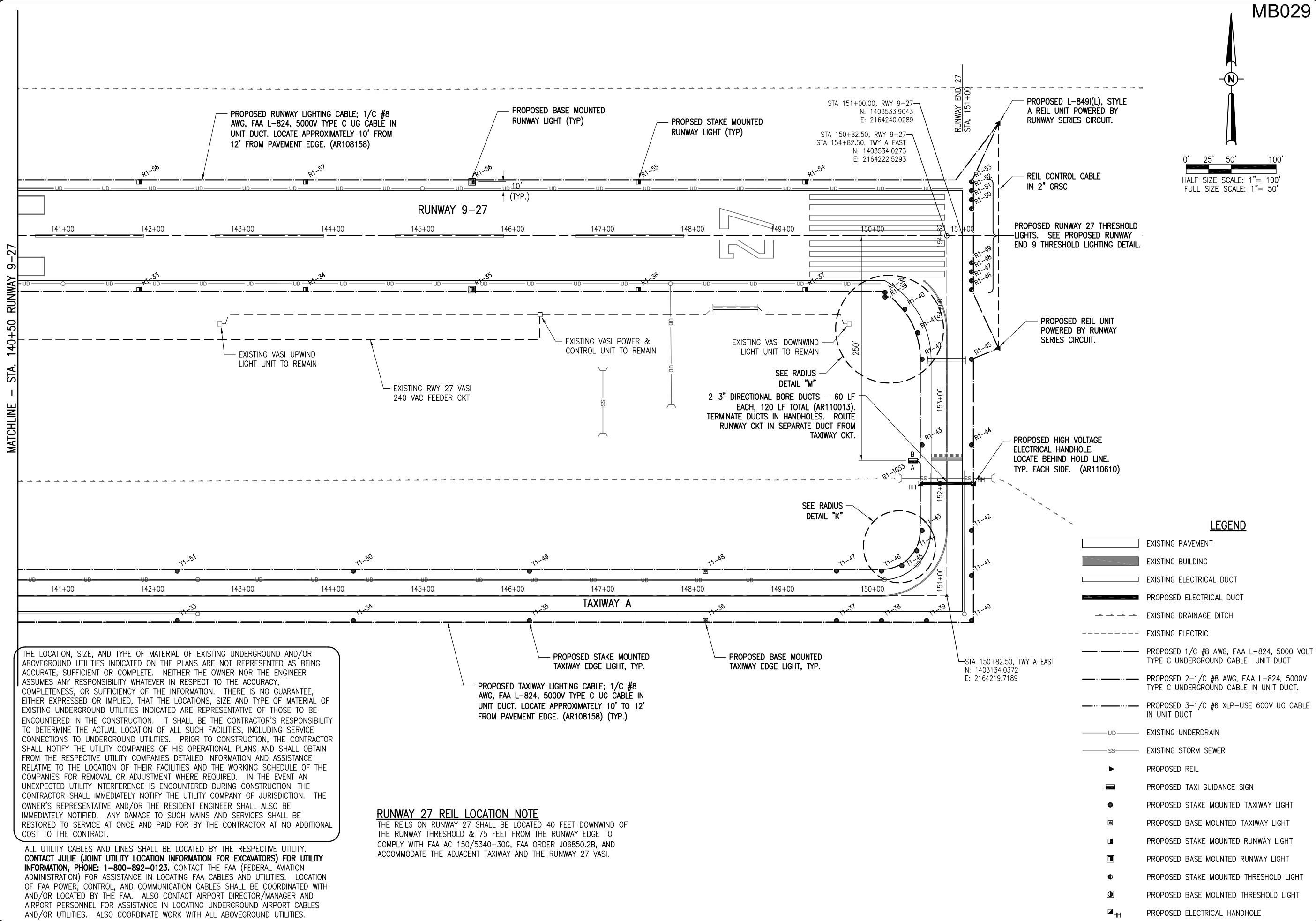
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Filename: C-142-ELE.dwg	MLH/KNL
Scale: AS SHOWN	TRR
Date: 06/17/13	01/28/13
	KNL/CAH
	02/04/13
LAYOUT	REVIEWED
DRAWN	



REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS  
 PROPOSED ELECTRICAL PLAN  
 STA. 129+50 TO 140+50



0' 25' 50' 100'  
 HALF SIZE SCALE: 1" = 100'  
 FULL SIZE SCALE: 1" = 50'



MATCHLINE - STA. 140+50 RUNWAY 9-27

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.

**RUNWAY 27 REIL LOCATION NOTE**

THE REILS ON RUNWAY 27 SHALL BE LOCATED 40 FEET DOWNWIND OF THE RUNWAY THRESHOLD & 75 FEET FROM THE RUNWAY EDGE TO COMPLY WITH FAA AC 150/5340-30G, FAA ORDER J06850.2B, AND ACCOMMODATE THE ADJACENT TAXIWAY AND THE RUNWAY 27 VASI.

**LEGEND**

	EXISTING PAVEMENT
	EXISTING BUILDING
	EXISTING ELECTRICAL DUCT
	PROPOSED ELECTRICAL DUCT
	EXISTING DRAINAGE DITCH
	EXISTING ELECTRIC
	PROPOSED 1/C #8 AWG, FAA L-824, 5000 VOLT TYPE C UNDERGROUND CABLE UNIT DUCT
	PROPOSED 2-1/C #8 AWG, FAA L-824, 5000V TYPE C UNDERGROUND CABLE IN UNIT DUCT
	PROPOSED 3-1/C #6 XLP-USE 600V UG CABLE IN UNIT DUCT
	EXISTING UNDERDRAIN
	EXISTING STORM SEWER
	PROPOSED REIL
	PROPOSED TAXI GUIDANCE SIGN
	PROPOSED STAKE MOUNTED TAXIWAY LIGHT
	PROPOSED BASE MOUNTED TAXIWAY LIGHT
	PROPOSED STAKE MOUNTED RUNWAY LIGHT
	PROPOSED BASE MOUNTED RUNWAY LIGHT
	PROPOSED STAKE MOUNTED THRESHOLD LIGHT
	PROPOSED BASE MOUNTED THRESHOLD LIGHT
	PROPOSED ELECTRICAL HANDHOLE

REVISION	DATE	ADDED END INDICATORS
02/19/13		PER IDA REVIEW
06/12/13		REMOVED PAPI'S/VASI'S TO REMAIN

MACOMB MUNICIPAL AIRPORT  
 MACOMB, ILLINOIS  
 BLOCK GRANT PROJ.: 3-17-0064-B21  
 IL PROJ.: MQB-4206

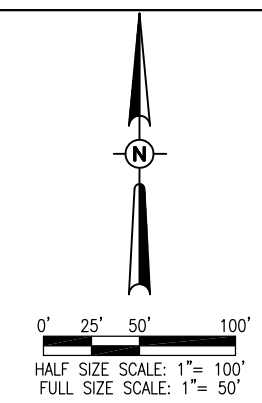
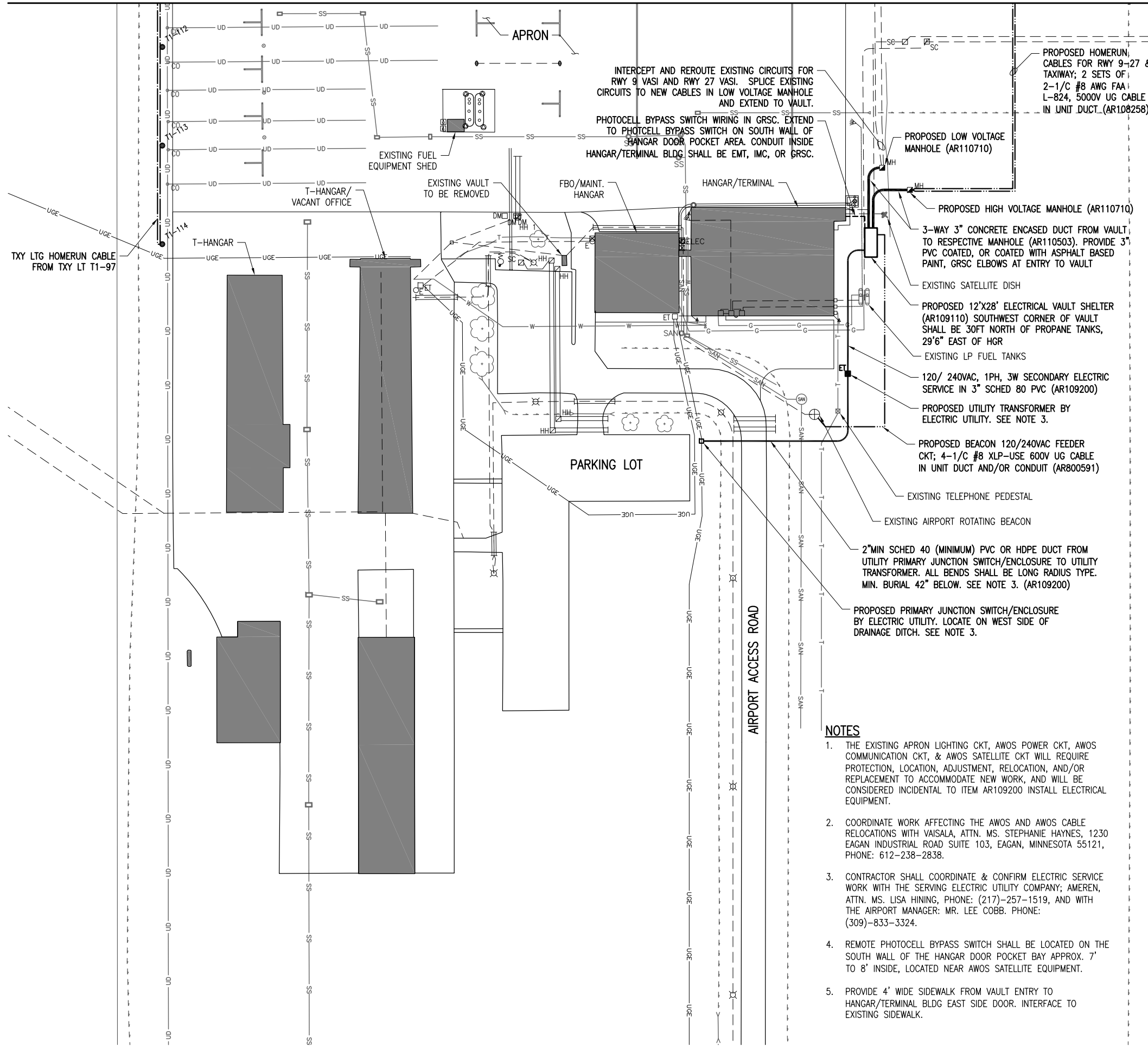
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Filename C-142-ELE.dwg	01/26/13
Scale AS SHOWN	02/04/13
Date 06/17/13	
LAYOUT	MLP/KNL
DRAWN	TRR
REVIEWED	KNL/CAH



REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS  
 PROPOSED ELECTRICAL PLAN  
 STA. 140+50 TO STA. 151+50

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**LEGEND**

- EXISTING PAVEMENT
- EXISTING BUILDING
- EXISTING ELECTRICAL DUCT
- PROPOSED ELECTRICAL DUCT
- EXISTING DRAINAGE DITCH
- EXISTING ELECTRIC
- PROPOSED 1/C #8 AWG, FAA L-824, 5000 VOLT TYPE C UNDERGROUND CABLE IN UNIT DUCT
- PROPOSED 2-1/C #8 AWG, FAA L-824, 5000V TYPE C UNDERGROUND CABLE IN UNIT DUCT
- PROPOSED 3-1/C #6 XLP-USE 600V UG CABLE IN UNIT DUCT
- EXISTING WATER
- EXISTING TELEPHONE
- EXISTING UNDERDRAIN
- EXISTING STORM SEWER
- EXISTING SANITARY
- EXISTING UNDERGROUND ELECTRIC UTILITY PRIMARY
- PROPOSED REIL
- PROPOSED WIND CONE
- EXISTING TAXI GUIDANCE SIGN
- PROPOSED TAXI GUIDANCE SIGN
- PROPOSED STAKE MOUNTED TAXIWAY LIGHT
- PROPOSED BASE MOUNTED TAXIWAY LIGHT
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- PROPOSED BASE MOUNTED RUNWAY LIGHT
- PROPOSED STAKE MOUNTED THRESHOLD LIGHT
- PROPOSED BASE MOUNTED THRESHOLD LIGHT
- PROPOSED ELECTRICAL HANDHOLE
- PROPOSED ELECTRICAL MANHOLE
- EXISTING UTILITY TRANSFORMER
- PROPOSED UTILITY TRANSFORMER
- EXISTING AIRPORT ROTATING BEACON

**NOTES**

1. THE EXISTING APRON LIGHTING CKT, AWOS POWER CKT, AWOS COMMUNICATION CKT, & AWOS SATELLITE CKT WILL REQUIRE PROTECTION, LOCATION, ADJUSTMENT, RELOCATION, AND/OR REPLACEMENT TO ACCOMMODATE NEW WORK, AND WILL BE CONSIDERED INCIDENTAL TO ITEM AR109200 INSTALL ELECTRICAL EQUIPMENT.
2. COORDINATE WORK AFFECTING THE AWOS AND AWOS CABLE RELOCATIONS WITH VAISALA, ATTN. MS. STEPHANIE HAYNES, 1230 EAGAN INDUSTRIAL ROAD SUITE 103, EAGAN, MINNESOTA 55121, PHONE: 612-238-2838.
3. CONTRACTOR SHALL COORDINATE & CONFIRM ELECTRIC SERVICE WORK WITH THE SERVING ELECTRIC UTILITY COMPANY; AMEREN, ATTN. MS. LISA HINING, PHONE: (217)-257-1519, AND WITH THE AIRPORT MANAGER: MR. LEE COBB. PHONE: (309)-833-3324.
4. REMOTE PHOTOCELL BYPASS SWITCH SHALL BE LOCATED ON THE SOUTH WALL OF THE HANGAR DOOR POCKET BAY APPROX. 7' TO 8' INSIDE, LOCATED NEAR AWOS SATELLITE EQUIPMENT.
5. PROVIDE 4' WIDE SIDEWALK FROM VAULT ENTRY TO HANGAR/TERMINAL BLDG EAST SIDE DOOR. INTERFACE TO EXISTING SIDEWALK.

REVISION	DATE	DESCRIPTION
02/19/13	02/19/13	MOVED UTILITY XEMR 10FT SOUTH PER AMEREN REVIEW
06/12/13	06/12/13	REMOVED PAPI/VAISALS TO REMAIN

**MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS**

BLOCK GRANT PROJ.: 3-17-0064-B21  
IL PROJ.: M08-4206

Hanson Proj. No. 12A0053	01/26/13
Filename: C-142-ELE.dwg	MLP/KNL
Scale: AS SHOWN	TRR
Date: 06/17/13	01/28/13
LAYOUT	REVIEWED
DRAWN	KNL/CAH
02/04/13	

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REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

PROPOSED ELECTRICAL PLAN - HOMERUNS AND VAULT

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REVISION	DATE	DESCRIPTION
	06/12/13	REMOVED PAPI'S/VASIS TO REMAIN

MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS

IL PROJ.: MQB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21

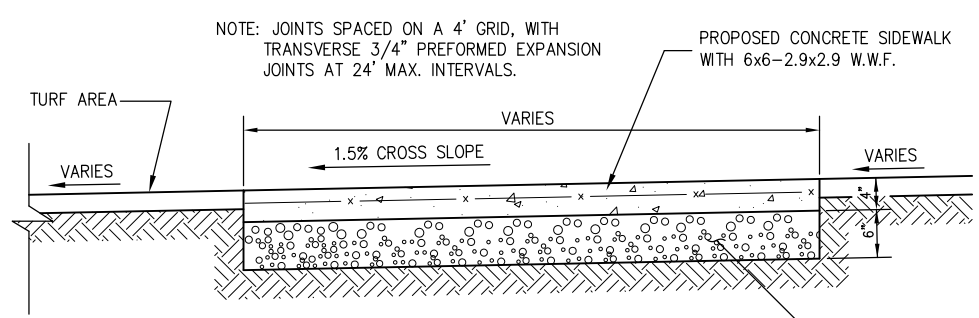
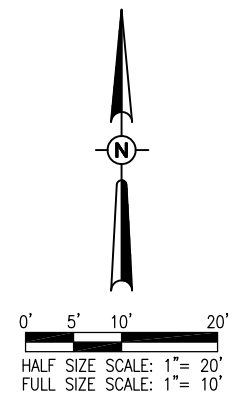
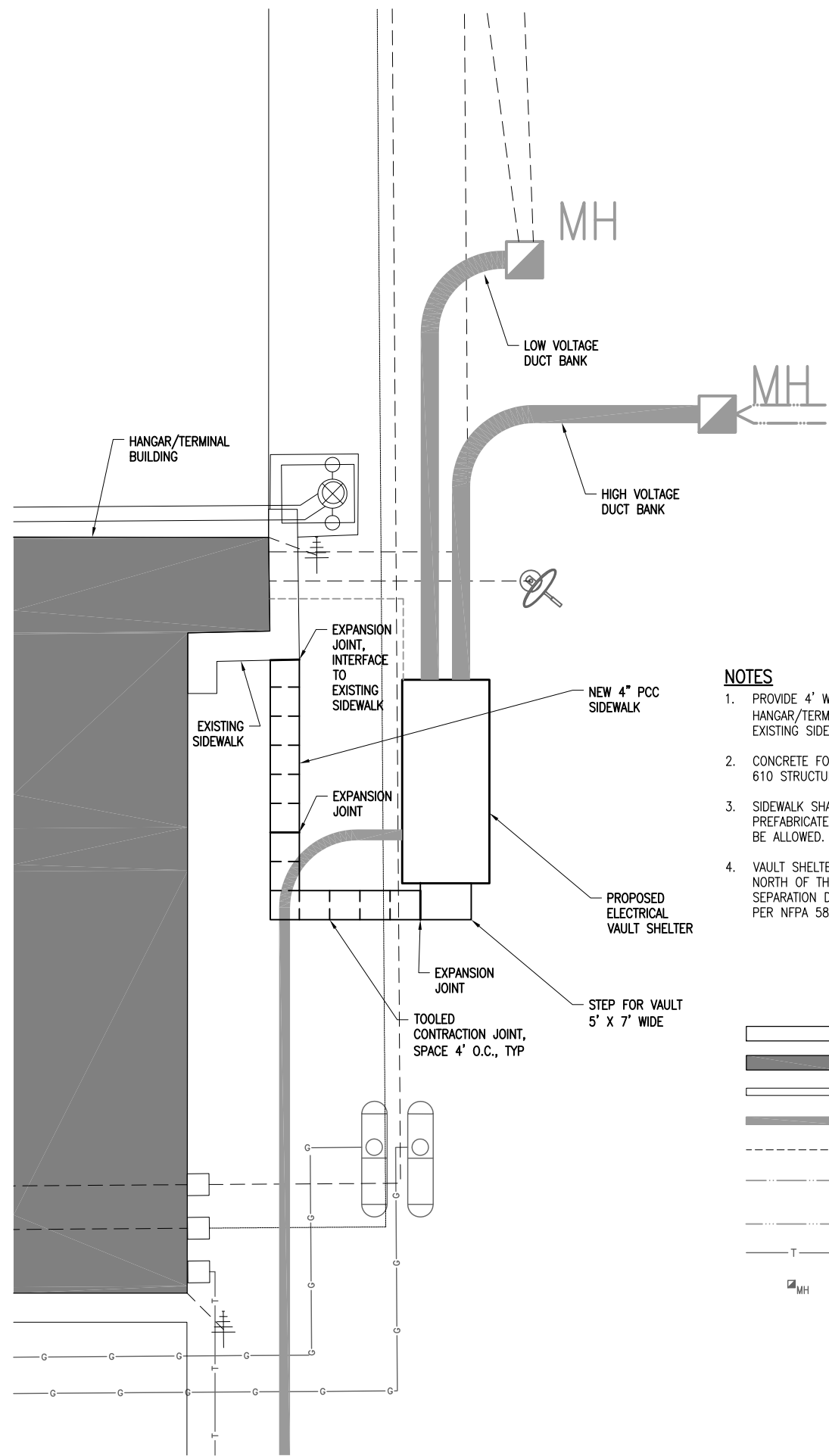
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Date 06/17/13	02/01/13
LAYOUT	REVIEWED
DRAWN	DATE
MLH/KNL	02/04/13
MLH	
KNL/CAH	



REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

SIDEWALK JOINTING PLAN AND DETAILS

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NOTE: JOINTS SPACED ON A 4' GRID, WITH TRANSVERSE 3/4" PREFORMED EXPANSION JOINTS AT 24' MAX. INTERVALS.

CRUSHED AGGREGATE BASE COURSE, 6 INCH, ITEM AR209606

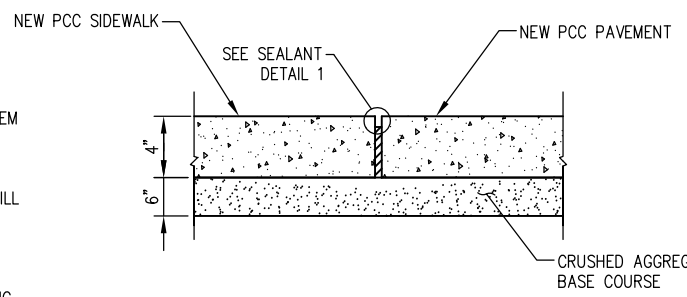
SIDEWALK CROSS SECTION DETAIL

NOTES

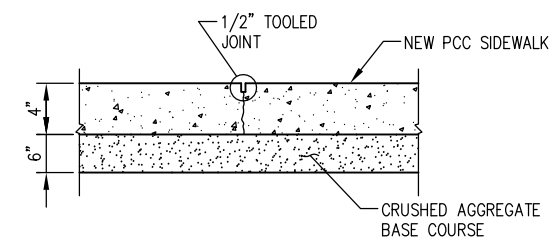
1. PROVIDE 4' WIDE SIDEWALK FROM VAULT ENTRY TO HANGAR/TERMINAL BLDG EAST SIDE DOOR. INTERFACE TO EXISTING SIDEWALK.
2. CONCRETE FOR SIDEWALK SHALL BE IN ACCORDANCE WITH ITEM 610 STRUCTURAL PORTLAND CEMENT CONCRETE.
3. SIDEWALK SHALL BE INCIDENTAL TO ITEM AR109110 ERECT PREFABRICATED VAULT, AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
4. VAULT SHELTER SHALL BE LOCATED APPROXIMATELY 30 FEET NORTH OF THE PROPANE TANKS TO MAINTAIN THE MINIMUM SEPARATION DISTANCE BETWEEN THE TANKS AND THE BUILDING PER NFPA 58 LIQUIFIED PETROLEUM GAS CODE.

LEGEND

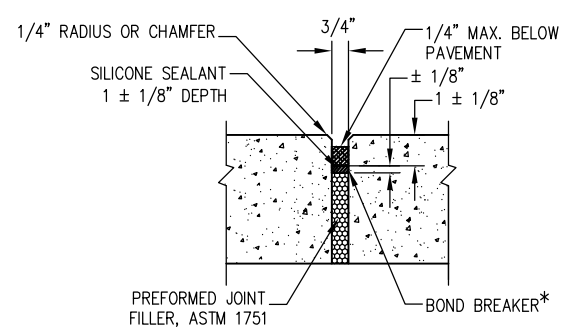
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- EXISTING ELECTRICAL DUCT
- PROPOSED ELECTRICAL DUCT
- EXISTING ELECTRIC
- PROPOSED 2-1/C #8 AWG, FAA L-824, 5000V TYPE C UNDERGROUND CABLE IN UNIT DUCT.
- PROPOSED 3-1/C #6 XLP-USE 600V UG CABLE IN UNIT DUCT
- EXISTING TELEPHONE
- PROPOSED ELECTRICAL MANHOLE



EXPANSION JOINT



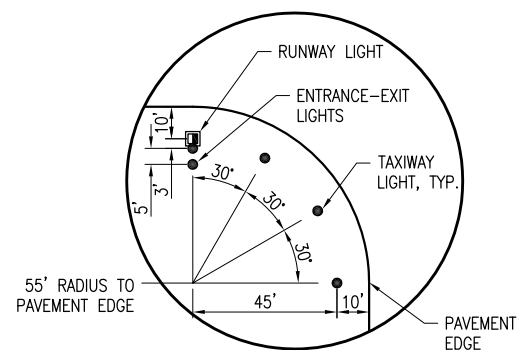
TOOLED CONTRACTION JOINT



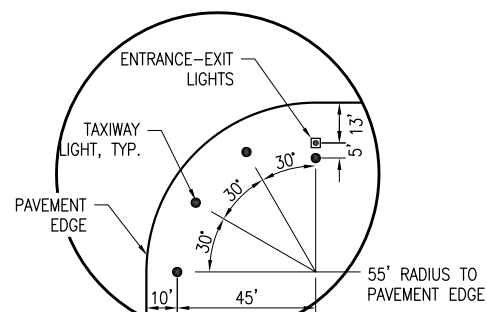
DETAIL 1 - SEALANT

\* POLYETHYLENE OR POLYESTER TAPE (3 MIL. MIN.) OR MARKING TAPE, RUBBER TAPE, 1/8" WIDER THAN WIDTH OF JOINT.

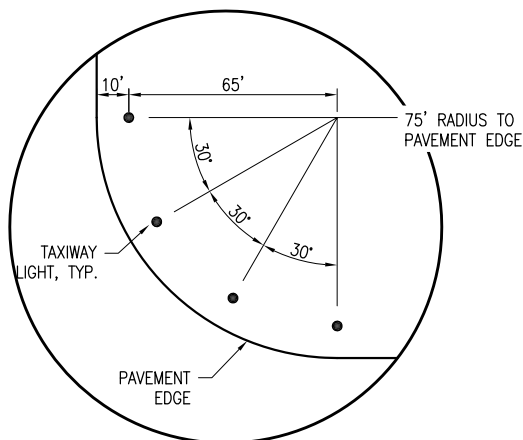
JOINT SEALER SHALL MEET THE REQUIREMENTS OF ASTM D 6690-STANDARD SPECIFICATION FOR JOINT AND CRACK SEALANTS, HOT APPLIED, FOR CONCRETE AND ASPHALT PAVEMENT.



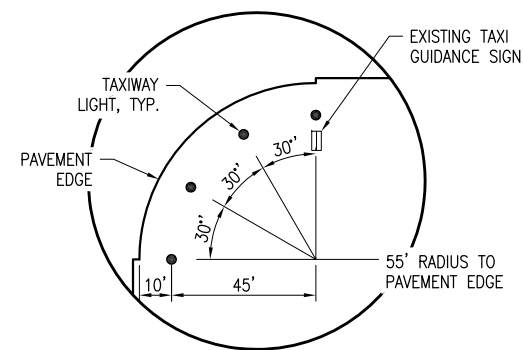
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NOT TO SCALE



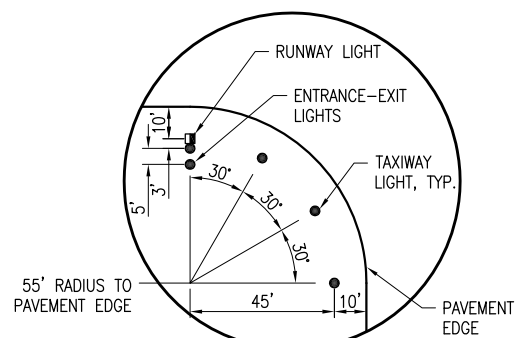
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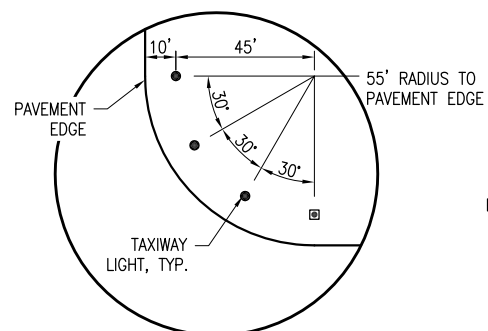
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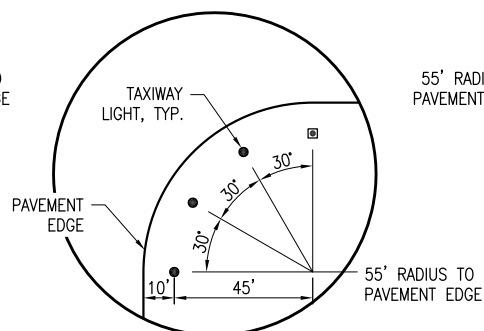
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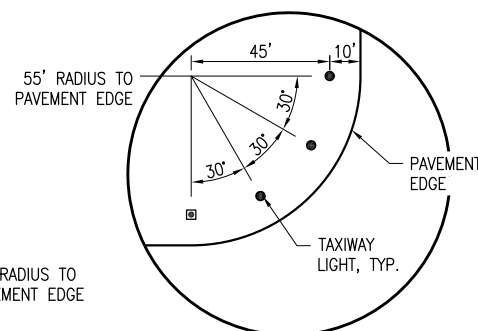
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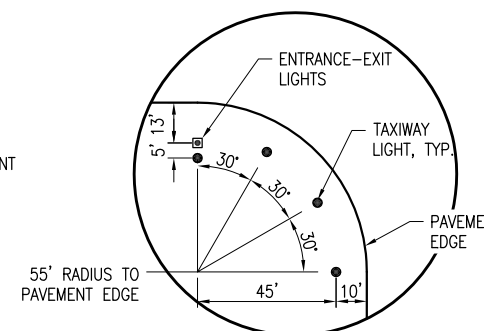
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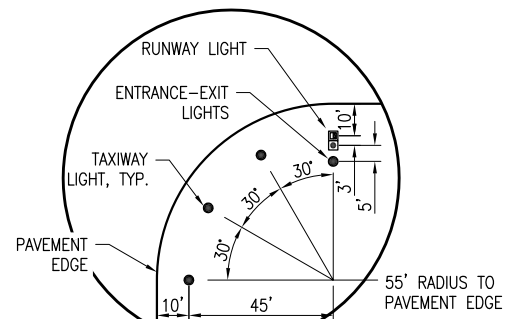
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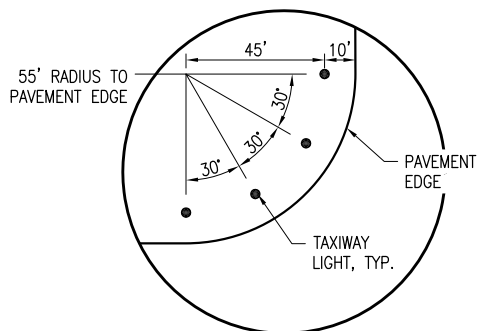
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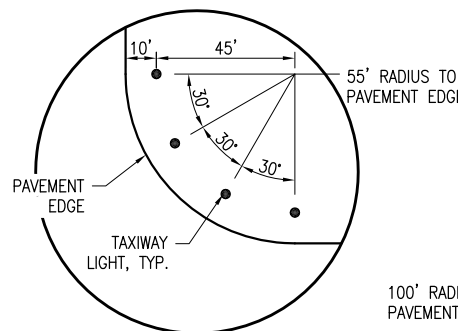
**RADIUS DETAIL I**  
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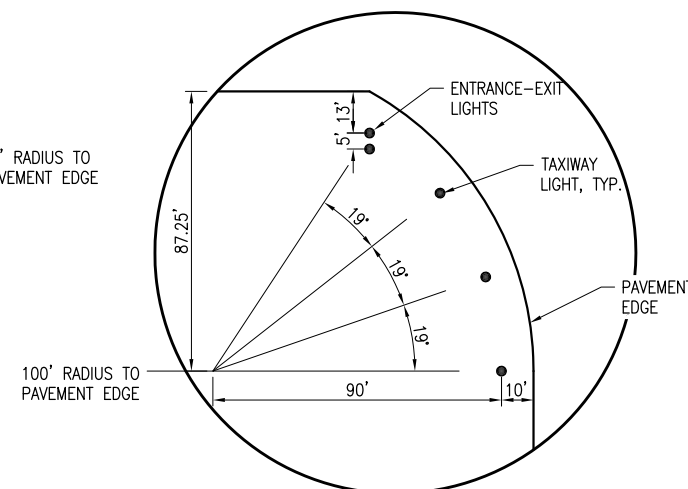
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NOT TO SCALE



**RADIUS DETAIL K**  
NOT TO SCALE



**RADIUS DETAIL L**  
NOT TO SCALE



**RADIUS DETAIL M**  
NOT TO SCALE

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REVISION  
DATE

**MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS**

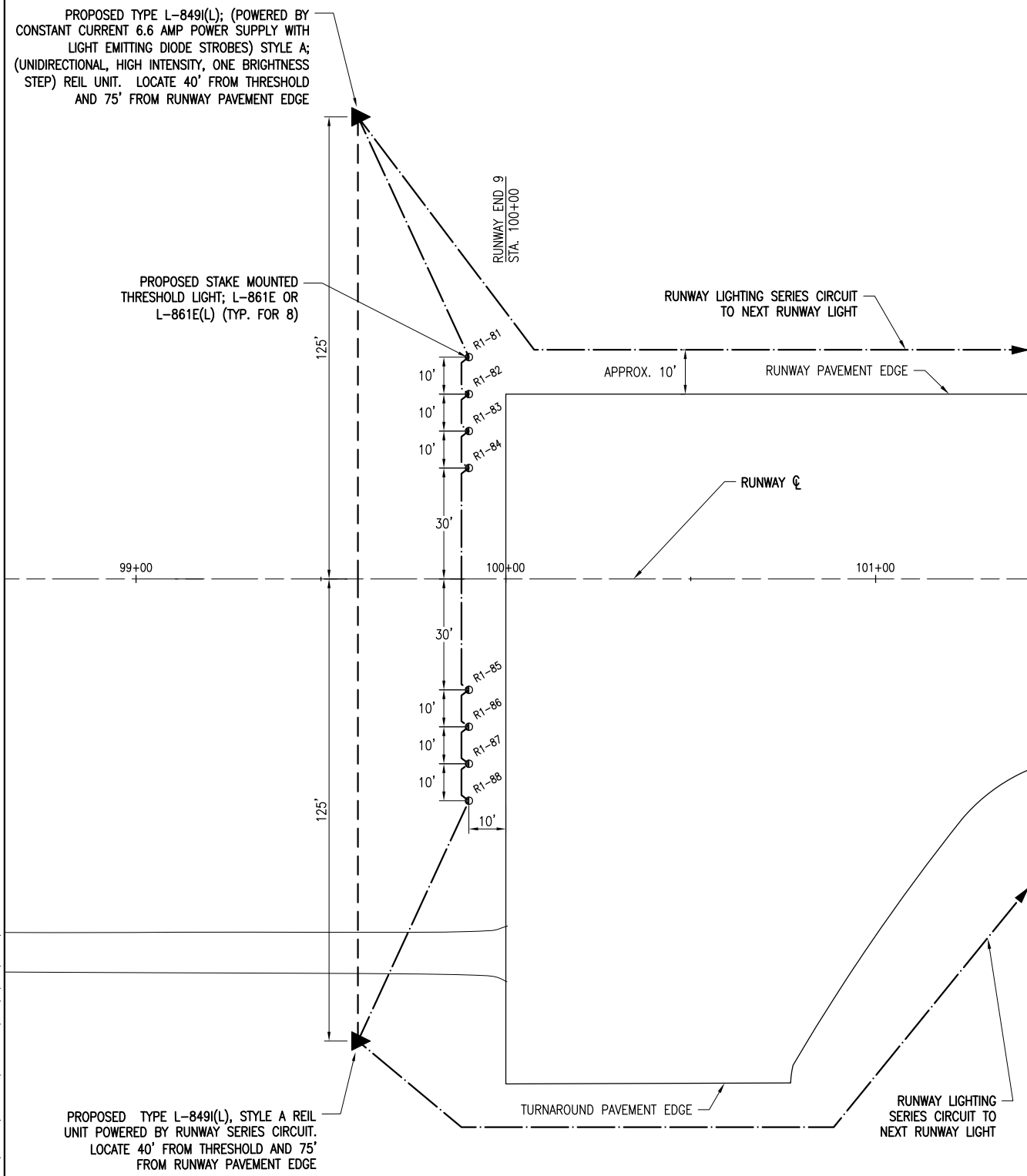
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LAYOUT	MLH/KNL 01/26/13
DRAWN	TRR 01/26/13
REVIEWED	KNL/CAH 02/04/13

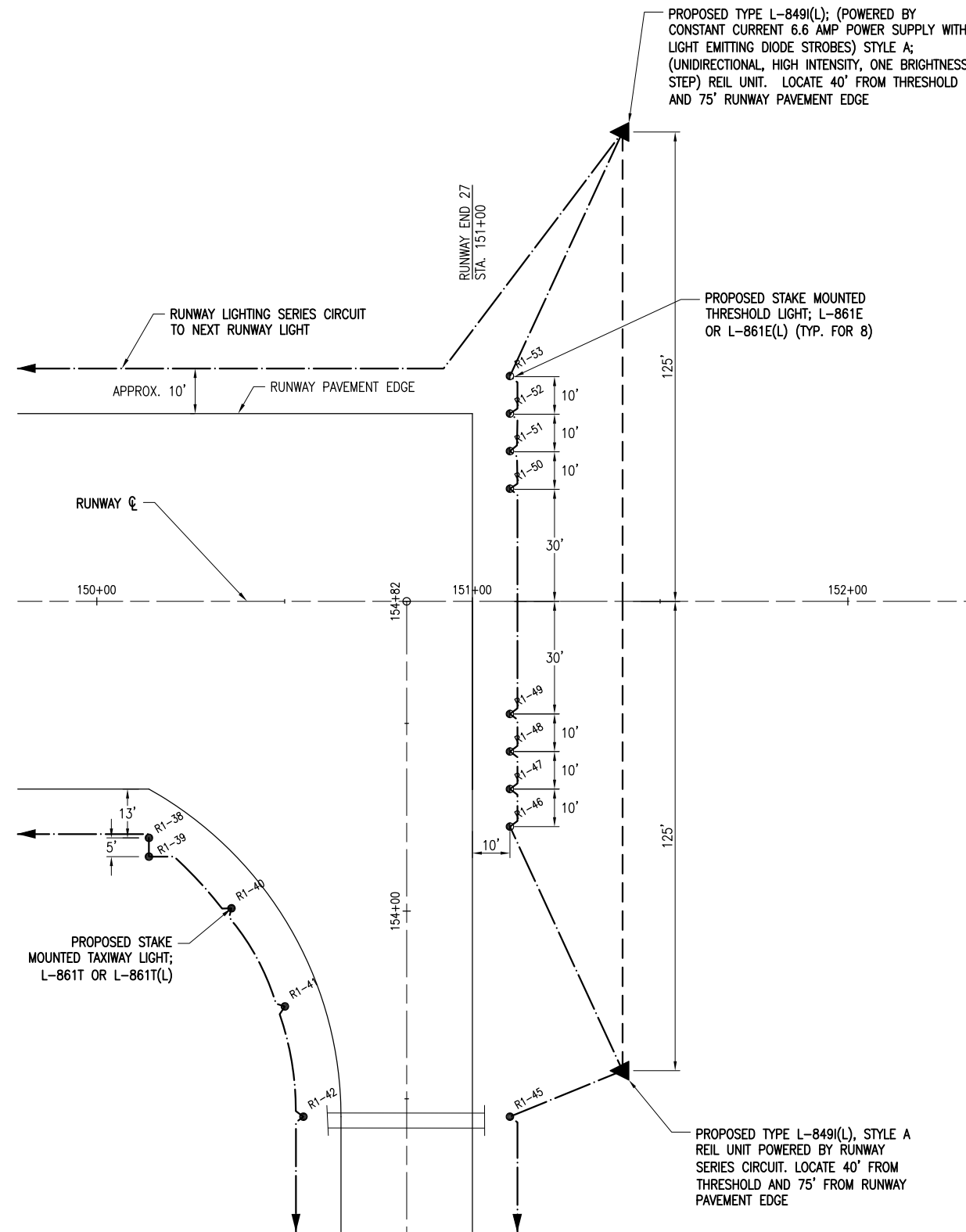
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Springfield, Illinois 62703-2886

REPLACE VAULT, AIRFIELD  
LIGHTING AND GUIDANCE SIGNS

RADIUS DETAILS



**PROPOSED RUNWAY END 9 THRESHOLD LIGHTING DETAIL**  
SCALE: 1" = 20' (FOR 22"x34" SHEET)



**PROPOSED RUNWAY END 27 THRESHOLD LIGHTING DETAIL**  
SCALE: 1" = 20' (FOR 22"x34" SHEET)

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REVISION	DATE	DESCRIPTION
1	06/12/13	UPDATED REIL LOCATION (VASI'S TO REMAIN)

**MACOMB MUNICIPAL AIRPORT**  
MACOMB, ILLINOIS  
IL PROJ.: MQB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21

Hanson Proj. No. 12A0053	DATE	12/03/12
Filename C-542-DETL.dwg	DRAWN	TRR
Scale AS SHOWN	REVIEWED	KNL/CAH
Date 06/17/13		



REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS  
RUNWAY 9-27 THRESHOLD DETAILS

**AIRFIELD LIGHTING NOTES**

- ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT DIRECTOR/MANAGER. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL FIELD VERIFY RESPECTIVE CIRCUITS AND POWER SOURCES PRIOR TO REMOVING OR DISCONNECTING THE RESPECTIVE AIRFIELD LIGHTING, NAVAID, OR OTHER DEVICE.
- PROPOSED RUNWAY, THRESHOLD, AND TAXIWAY LIGHTS SHALL BE PLACED 10' (FT.) FROM THE PAVEMENT EDGE UNLESS SHOWN OTHERWISE ON THESE CONSTRUCTION DRAWINGS. PROPOSED TAXI GUIDANCE SIGNS SHALL BE LOCATED SUCH THAT THE CLOSEST SIDE OF THE SIGN IS 15' FROM THE PAVEMENT EDGE, UNLESS SHOWN OTHERWISE.
- PROPOSED RUNWAY LIGHTS, THRESHOLD LIGHTS, TAXIWAY LIGHTS, GUIDANCE SIGNS, OTHER AIRFIELD LIGHTING, SPLICE CANS, HANDHOLES, MANHOLES, ELECTRICAL DUCTS, AND CABLE SHALL BE INSTALLED AT THE LOCATIONS SHOWN AND IN COMPLIANCE WITH THE SPECIFICATIONS, SPECIAL PROVISIONS, RESPECTIVE DETAILS, AND MANUFACTURER'S RECOMMENDATIONS.
- PROPOSED CABLE FOR RUNWAY AND TAXIWAY LIGHTING SHALL BE INSTALLED APPROXIMATELY 10' FROM THE PAVEMENT EDGE. CABLES SHALL BE PLACED A MINIMUM OF 18" BELOW FINISHED GRADE.
- THE PROPOSED RUNWAY AND TAXIWAY LIGHTING CABLE SHALL BE 1/C, #8 AWG, FAA L-824, 5000 VOLT, TYPE C UNDERGROUND CABLE IN UNIT DUCT.
- IN AREAS WHERE THERE IS A CONGESTION OF CABLES OR WHERE THE PROPOSED CABLE CROSSES AN EXISTING CABLE, THE CONTRACTOR IS REQUIRED TO HAND DIG THE TRENCH NECESSARY FOR THE PROPOSED CABLE. AT OTHER LOCATIONS, THE PROPOSED CABLE MAY BE TRENCHED OR PLOWED INTO PLACE. HAND DIGGING, TRENCHING AND/OR PLOWING WILL BE CONSIDERED INCIDENTAL TO THE PROPOSED CABLES AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- PROPOSED RUNWAY LIGHTS SHALL BE FITTED WITH LENSES IN ACCORDANCE WITH THE "LIGHT LENS SCHEDULE". ALL PROPOSED TAXIWAY LIGHTS WILL BE FITTED WITH 360° BLUE LENSES.
- ALL PROPOSED RUNWAY, THRESHOLD, AND TAXIWAY LIGHTS SHALL BE TAGGED BY THE CONTRACTOR IN ACCORDANCE WITH THE LIGHT NUMBERS SHOWN ON THESE CONSTRUCTION DRAWINGS.
- SEE "TAXI GUIDANCE SIGN SCHEDULE" FOR INFO ON SIGN LEGENDS.
- THE CONTRACTOR SHALL SECURE, IDENTIFY AND PLACE ALL TEMPORARY EXPOSED WIRING IN CONDUIT, DUCT OR UNIT DUCT TO PREVENT ELECTROCUTION AND FIRE IGNITION SOURCES AS PER THE REQUIREMENTS OF FAA AC 150/5370-2F, PART 218, PARAGRAPH C. ALL LABOR, MATERIALS, AND TIME NECESSARY TO COMPLY WITH THIS REQUIREMENT SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- HOMERUN CABLES FOR A RESPECTIVE CIRCUIT THAT ARE INSTALLED IN CONDUIT OR DUCT SHALL BE RUN TOGETHER IN THE SAME RACEWAY OR DUCT.
- EXISTING AIRFIELD LIGHTING CABLES (SCHEDULED FOR REPLACEMENT) IN AREAS OF NEW WORK SHALL BE DISCONNECTED & REMOVED WHERE IN CONFLICT WITH NEW CONSTRUCTION. IN OTHER AREAS CABLES MAY BE ABANDONED IN PLACE.
- THE CONTRACTOR IS REQUIRED TO FILL IN ALL HOLES AND DEPRESSIONS RESULTING FROM THE NEW WORK, WITH EARTH MATERIAL. THE AREAS SHALL BE COMPACTED TO PREVENT FUTURE SETTLEMENT AND FERTILIZED, SEEDED, AND MULCHED IN ACCORDANCE WITH ITEMS 901 AND 908 RESPECTIVELY.
- IN THE EVENT THAT OTHER CONSTRUCTION PROJECTS ARE IN PROGRESS AT THE AIRPORT AT THE SAME TIME AS THIS PROJECT, THE CONTRACTOR WILL BE REQUIRED TO COOPERATE WITH ALL OTHER CONTRACTORS AND THE AIRPORT MANAGER IN THE COORDINATION OF THE WORK.
- NO CONNECTION TO AN ACTIVE LIGHTING CIRCUIT WILL BE BROKEN UNTIL THE CIRCUIT HAS BEEN TURNED OFF IN ACCORDANCE WITH NOTE 1.

TAXI GUIDANCE SIGN SCHEDULE			
SIGN NUMBERS	LOCATION	SIDE A	SIDE B
R1-TGS1	RUNWAY 27 INTERSECTION WITH RUNWAY 36-18	36-18	BLANK
R1-TGS2	TAXIWAY A2 INTERSECTION WITH RUNWAY 9-27 (AT HOLD LINE)	9-27	RAMP →
R1-TGS3	TAXIWAY INTERSECTION WITH RUNWAY 27 (AT HOLD LINE)	27	BLANK
R1-TGS4	RUNWAY 9 INTERSECTION WITH RUNWAY 18-36	18-36	BLANK
R1-TGS5	CONNECTING TAXIWAY FROM WEST SIDE OF RAMP TO RUNWAY 9-27 (AT HOLD LINE)	9-27	RAMP ↑
R1-TGS6	TAXIWAY A1 INTERSECTION WITH RUNWAY 9-27 (AT HOLD LINE)	9-27	RAMP ↑
T1-TGS2	TAXIWAY A INTERSECTION WITH RUNWAY 36-18	36-18	27 ↑
T1-TGS3	TAXIWAY A INTERSECTION WITH RUNWAY 18-36	18-36	← RAMP
R2-TGS1**	RUNWAY 36 INTERSECTION WITH RUNWAY 9-27	9-27	BLANK
R2-TGS2**	RUNWAY 18 INTERSECTION WITH RUNWAY 27-9	27-9	BLANK

\*\* UNLIGHTED SIGN


**TAXI GUIDANCE SIGN SCHEDULE**

- A** TYPE L-858L LOCATION SIGN - YELLOW LEGEND AND BORDER ON A BLACK BACKGROUND
- 9-27** TYPE L-858R MANDATORY INSTRUCTION SIGN - BLACK OUTLINE ON OUTSIDE EDGE OF WHITE LEGEND ON A RED BACKGROUND
- RAMP ↑** TYPE L-858Y DIRECTION, DESTINATION, AND BOUNDARY SIGN - BLACK LEGEND ON A YELLOW BACKGROUND
- BLANK** BLANK - BLACK BACKGROUND

**TAXI GUIDANCE SIGN NOTES**

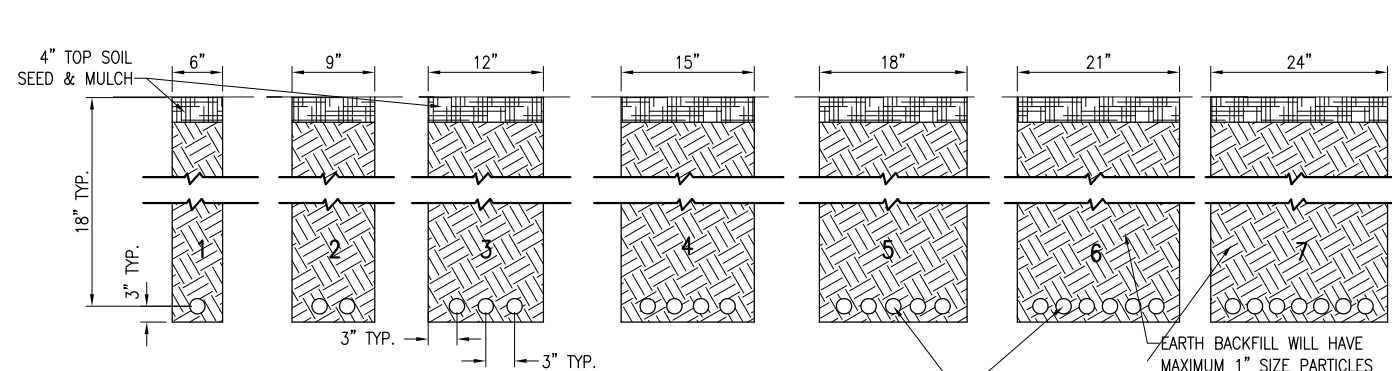
- THE PROPOSED TAXI GUIDANCE SIGNS SHALL CONFORM TO ADVISORY CIRCULAR 150/5345 44J (OR LATEST ISSUE IN FORCE) AND BE FAA-APPROVED FOR TYPE L-858Y OR L-858Y(L) DIRECTION, DESTINATION, AND BOUNDARY SIGNS (BLACK LEGEND ON YELLOW BACKGROUND); TYPE L-858R OR L-858R(L) MANDATORY INSTRUCTION SIGN (BLACK OUTLINE ON OUTSIDE EDGE OF WHITE LEGEND ON RED BACKGROUND); AND/OR TYPE L-858L OR L-858L(L) LOCATION SIGN (YELLOW LEGEND AND BORDER ON BLACK BACKGROUND).
- THE SIGNS SHALL BE SIZE 1, 18-IN. SIGN FACE WITH A 12-IN. LEGEND; STYLE 2, POWERED FROM A 4.8 TO 6.6 AMP SERIES LIGHTING CIRCUIT; CLASS 2, FOR OPERATION FROM -40 DEGREES F TO 131 DEGREES F; MODE 2, TO WITHSTAND WIND LOADS OF 200 M.P.H., BASE-MOUNTED, DOUBLE-SIDED, AS SPECIFIED ON THE PLANS.
- THE PROPOSED TAXI GUIDANCE SIGNS SHALL BE LOCATED SUCH THAT THE CLOSEST SIDE OF THE SIGN IS 15' FROM THE PAVEMENT EDGE OR RESPECTIVE RUNWAY SURFACE EDGE.
- THE PROPOSED LIGHTED TAXI GUIDANCE SIGNS WILL BE PAID FOR UNDER THE FOLLOWING ITEMS:  
 AR125442 TAXI GUIDANCE SIGN, 2 CHARACTER \_\_\_\_\_ PER EACH.  
 AR125445 TAXI GUIDANCE SIGN, 5 CHARACTER \_\_\_\_\_ PER EACH.  
 AND ADDITIVE ALTERNATE FOR UPGRADE TO LED TYPE ILLUMINATION  
 AS800411 2 CHARACTER SIGN LED UPGRADE \_\_\_\_\_ PER EACH.  
 AS800593 5 CHARACTER SIGN LED UPGRADE \_\_\_\_\_ PER EACH.
- THE PROPOSED UNLIGHTED TAXI GUIDANCE SIGNS SHALL CONFORM TO ADVISORY CIRCULAR 150/5345-44J (OR LATEST ISSUE IN FORCE) AND BE FAA-APPROVED FOR TYPE L-858 TAXIWAY AND RUNWAY SIGNS. THE SIGNS SHALL BE SIZE 1, 18-IN. SIGN FACE WITH A 12-IN. LEGEND; STYLE 4, UNLIGHTED SIGNS; MODE 2, TO WITHSTAND WIND LOADS OF 200 M.P.H., BASE-MOUNTED.

LIGHT LENS SCHEDULE			
LIGHT NUMBERS	LENS	ORIENTATION	FIXTURE TYPE
R1-1 TO R1-7	BLUE	---	L-861T OR L-861T(L)
R1-8 TO R1-13	CLEAR WHITE	---	L-861 OR L-861(L)
R1-14	CLEAR WHITE/YELLOW	YELLOW SIDE FACING WEST (TOWARD RUNWAY 9 APPROACH)	L-861 OR L-861(L)
R1-15 TO R1-28	BLUE	---	L-861T OR L-861T(L)
R1-29 TO R1-37	CLEAR WHITE/YELLOW	YELLOW SIDE FACING WEST (TOWARD RUNWAY 9 APPROACH)	L-861 OR L-861(L)
R1-38 TO R1-45	BLUE	---	L-861T OR L-861T(L)
R1-46 TO R1-53	RED/GREEN	GREEN SIDE FACING EAST (TOWARD RUNWAY 27 APPROACH)	L-861E OR L-861E(L)
R1-54 TO R1-63	CLEAR WHITE/YELLOW	YELLOW SIDE FACING WEST (TOWARD RUNWAY 9 APPROACH)	L-861 OR L-861(L)
R1-64 TO R1-69	CLEAR WHITE	---	L-861 OR L-861(L)
R1-70 TO R1-80	CLEAR WHITE/YELLOW	YELLOW SIDE FACING EAST (TOWARD RUNWAY 27 APPROACH)	L-861 OR L-861(L)
R1-81 TO R1-88	RED/GREEN	GREEN SIDE FACING WEST (TOWARD RUNWAY 9 APPROACH)	L-861E OR L-861E(L)
R1-89 TO R1-93	CLEAR WHITE/YELLOW	YELLOW SIDE FACING EAST (TOWARD RUNWAY 27 APPROACH)	L-861 OR L-861(L)
R1-94 TO R1-105	BLUE	---	L-861T OR L-861T(L)
R1-106 TO R1-111	CLEAR WHITE/YELLOW	YELLOW SIDE FACING EAST (TOWARD RUNWAY 27 APPROACH)	L-861 OR L-861(L)
R1-112 TO R1-118	BLUE	---	L-861T OR L-861T(L)
T1-1 TO T1-114	BLUE	---	L-861T OR L-861T(L)

REVISION	DATE	ADDED TWY LIGHTS PER ICA REVIEW
	02/19/13	
<b>MACOMB MUNICIPAL AIRPORT</b> <b>MACOMB, ILLINOIS</b>		
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	DRAWN	TRR 01/21/13
	REVIEWED	KNL/CAH 02/04/13
		
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REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS	AIRFIELD LIGHTING NOTES AND SCHEDULES	
<span style="font-size: 2em; font-weight: bold;">23</span> 23 of 53 sheets		

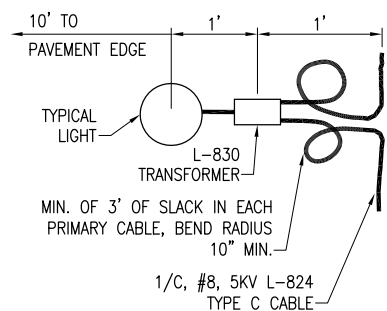
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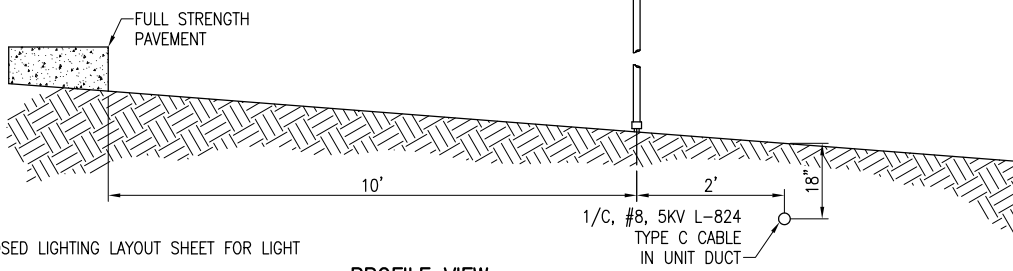


**NOTES:**  
 DETAIL NUMBERS INDICATE NO. OF CABLES.  
 TRENCHES WITH MORE THAN SEVEN CABLES SHALL BE INCREASED 3" IN WIDTH FOR EACH ADDITIONAL CABLE; IF SPECIFIED ON PLANS TWO PARALLEL TRENCHES MAY BE CONSTRUCTED.  
 DEPTH OF TRENCHES SHALL BE AS SHOWN ABOVE UNLESS OTHERWISE SPECIFIED ON THE PLANS.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

**CABLE TRENCHES**  
 (NOT TO SCALE)

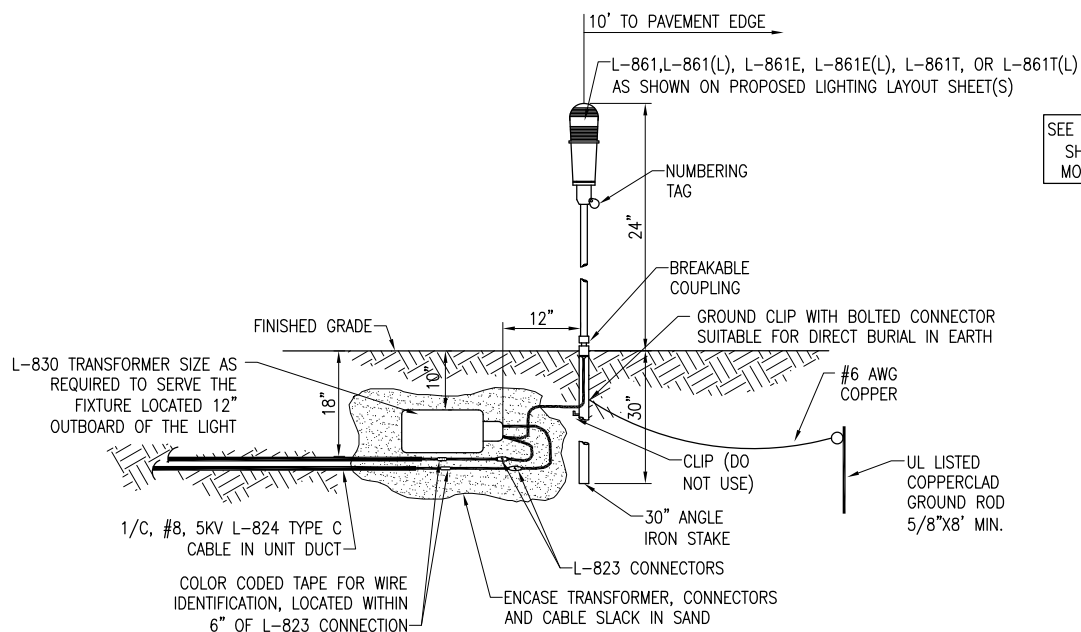


**PLAN VIEW**

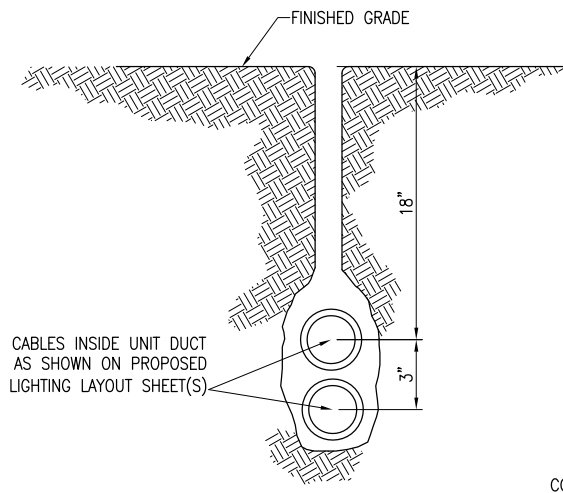


**PROFILE VIEW**

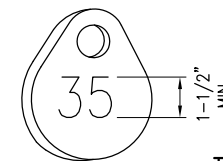
**LIGHT AND CABLE INSTALLATION DETAIL**  
 (NOT TO SCALE)



**MEDIUM INTENSITY LIGHT - STAKE MOUNTED**  
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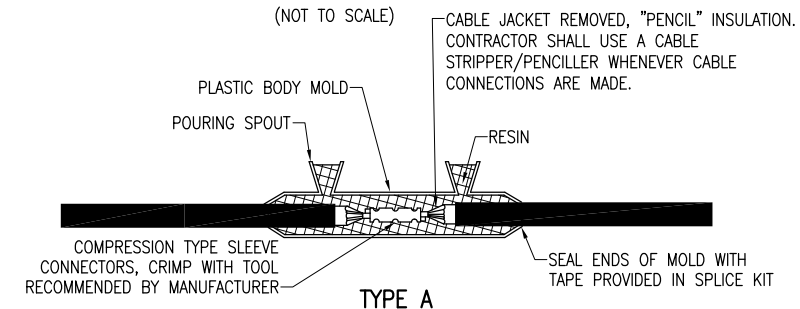


**PLOWED CABLE**  
 (NOT TO SCALE)



**TAG DETAIL**  
 (NOT TO SCALE)

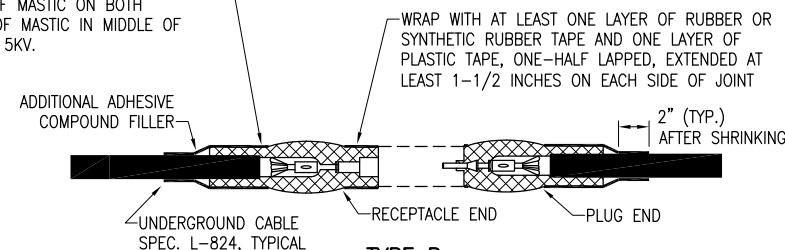
**NOTE:**  
 AFFIX NON-CORROSIVE TAG TO FIXTURE FACING RUNWAY WITH SET SCREW, WIRE TIE, OR METAL BAND. NUMERALS SHALL BE ENGRAVED FOR PERMANENT READABILITY.



**TYPE A**

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

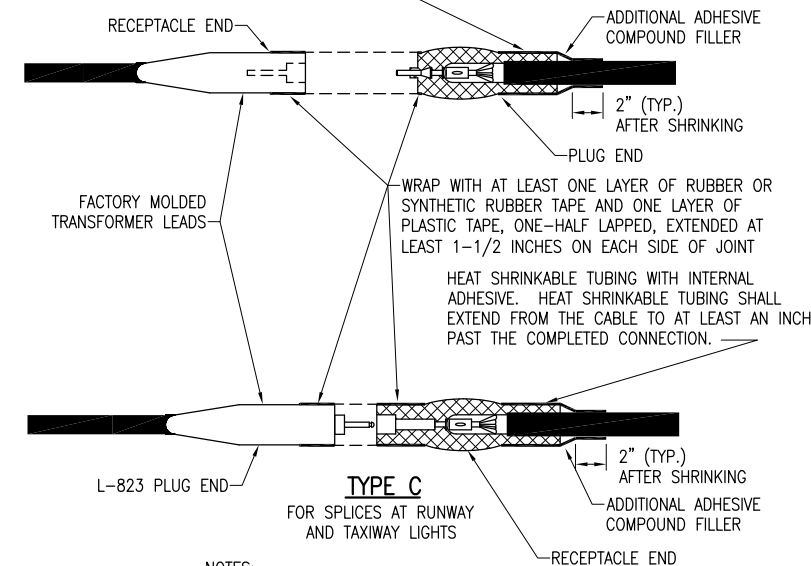
FOR SPLICES IN LOW VOLTAGE CABLE (600V) HOMERUNS FOR EXTENSIONS TO EXISTING LOW VOLTAGE CABLES ONLY. TYPE A SPLICES SHALL BE MADE IN SPLICE CANS, HANDHOLES, MANHOLES, OR JUNCTIONS BOXES



**TYPE B**

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

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



**TYPE C**

FOR SPLICES AT RUNWAY AND TAXIWAY LIGHTS

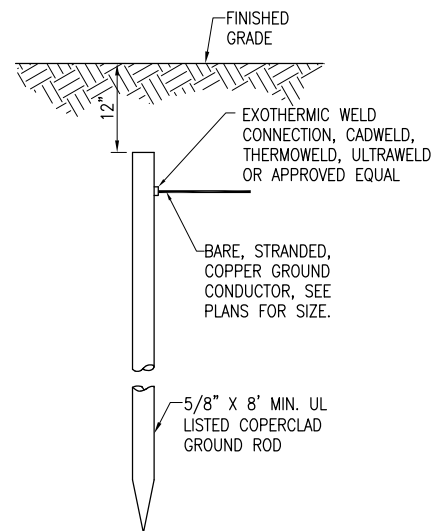
**NOTES:**  
 SEE PROPOSED LIGHTING LAYOUT SHEET(S) FOR SPLICE TYPE.  
 INSIDE DIAMETER OF CONNECTOR SHALL PROPERLY MATCH THE OUTSIDE DIAMETER OF CABLE.

**CABLE SPLICES**  
 (NOT TO SCALE)

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

**NOTES:**  
 SEE PROPOSED LIGHTING LAYOUT SHEET FOR LIGHT LOCATIONS.

SEE "ELECTRICAL DETAILS SHEET 2" FOR BASE MOUNT LIGHT DETAILS



**NOTES:**  
 TYPE AND MINIMUM NUMBER OF GROUND RODS SHALL BE AS SPECIFIED ON THE PLAN.

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

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

**GROUND ROD**  
 (NOT TO SCALE)

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MACOMB MUNICIPAL AIRPORT  
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BLOCK GRANT PROJ.: 3-17-0064-B21  
 IL PROJ.: MGB-4206

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Date 06/17/13		



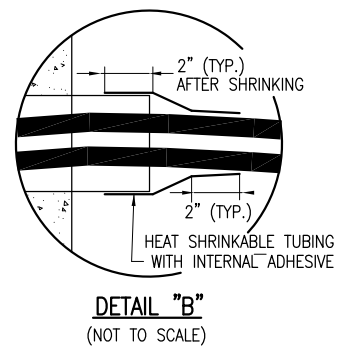
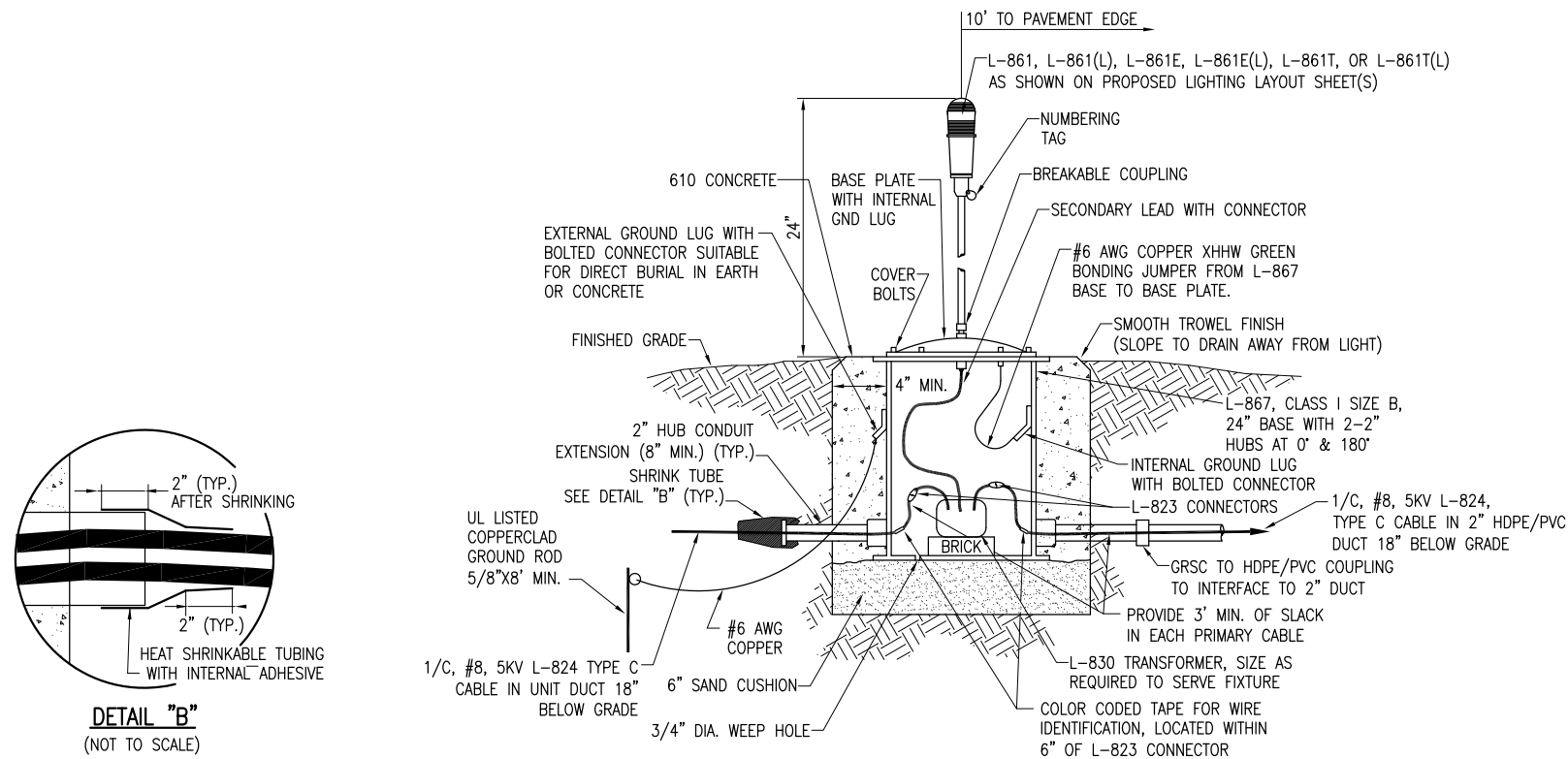
REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

ELECTRICAL DETAILS SHEET 1



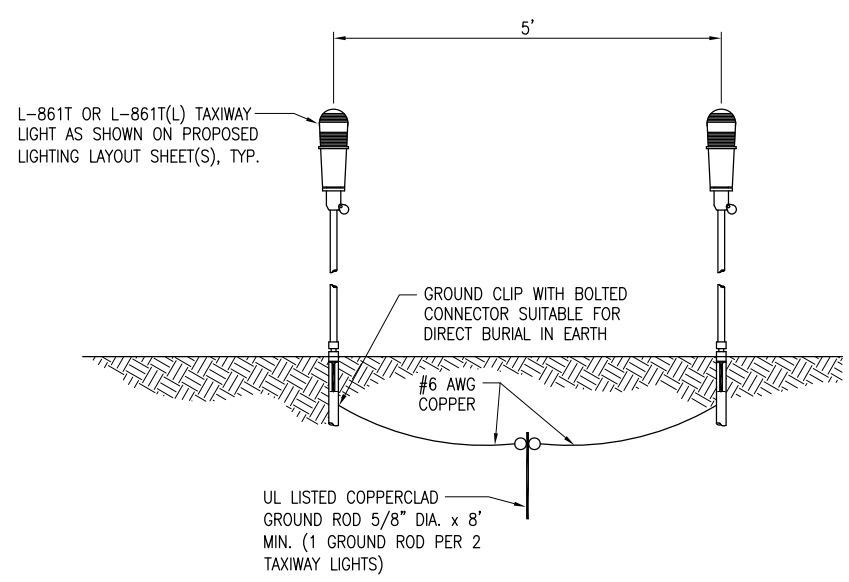
NOTES

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 150/5340-30G DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, CHAPTER 12, PART 12.6; A GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. THE PURPOSE OF THE LIGHT BASE GROUND IS TO PROVIDE A DEGREE OF PROTECTION FOR MAINTENANCE PERSONNEL FROM POSSIBLE CONTACT WITH AN ENERGIZED LIGHT BASE OR MOUNTING STAKE THAT MAY RESULT FROM A SHORTED POWER CABLE OR ISOLATION TRANSFORMER. A LIGHT BASE GROUND SHALL BE INSTALLED AT EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. A LIGHT BASE GROUND SHALL ALSO BE INSTALLED AT EACH STAKE MOUNTED LIGHT FIXTURE. A LIGHT BASE GROUND SHALL BE INSTALLED AND CONNECTED TO THE METAL FRAME OF EACH TAXI GUIDANCE SIGN AS DETAILED ON THE PLANS AND IN ACCORDANCE WITH THE RESPECTIVE TAXI GUIDANCE SIGN MANUFACTURER RECOMMENDATIONS. THE LIGHT BASE GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR BONDED TO THE GROUND LUG ON THE RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND A 5/8-INCH DIAMETER BY 8-FOOT LONG (MINIMUM) UL LISTED COPPER CLAD GROUND ROD. CONNECTIONS TO GROUND LUGS ON THE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE SHALL BE WITH A UL LISTED GROUNDING CONNECTOR. CONNECTIONS TO GROUND RODS SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY ERICO PRODUCTS, INC., SOLON, OHIO, (PHONE: 800-248-9353), THERMOWELD BY CONTINENTAL INDUSTRIES, INC., TULSA, OKLAHOMA (PHONE: 918-663-1440), ULTRAWELD BY HARGER, GRAYSLAKE, ILLINOIS (PHONE: 800-842-7437), OR APPROVED EQUAL. EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS. TOP OF GROUND RODS SHALL BE BURIED 12 INCHES MINIMUM BELOW GRADE, UNLESS SPECIFIED OTHERWISE HEREIN, FOR RESPECTIVE APPLICATIONS
2. FOR BASE MOUNTED LIGHT FIXTURES THE LIGHT FIXTURE MUST BE BONDED TO THE LIGHT BASE INTERNAL GROUND LUG VIA A #6 AWG STRANDED COPPER WIRE RATED FOR 600 VOLTS WITH GREEN XHHW OR USE INSULATION. THE GROUND WIRE LENGTH MUST BE SUFFICIENT TO ALLOW THE REMOVAL OF THE LIGHT FIXTURE FROM THE LIGHT BASE FOR ROUTINE MAINTENANCE. SEE THE LIGHT FIXTURE MANUFACTURER'S INSTRUCTIONS FOR PROPER METHODS OF ATTACHING A BONDING WIRE.
3. FOR TAXIWAY LIGHTS THAT ARE SPACED WITH LESS THAN 10 FEET OF SEPARATION BETWEEN THEM PROVIDE ONE 5/8-INCH DIAMETER BY 8-FOOT LONG GROUND ROD PER TWO ADJACENT TAXIWAY LIGHTS.
4. STEEL USED TO MANUFACTURE GROUND RODS SHALL BE 100% DOMESTIC STEEL.
5. CLEAN ALL METAL SURFACES BEFORE MAKING GROUND CONNECTIONS. METALLIC SURFACES TO BE JOINED SHALL BE PREPARED BY THE REMOVAL OF ALL NON-CONDUCTIVE MATERIAL PER 2011 NATIONAL ELECTRICAL CODE ARTICLE 250-12.
6. PER FAA 150/5430-30G THE RESISTANCE TO THE GROUND OF THE RESPECTIVE MOUNTING STAKE OR LIGHT BASE (WITH GROUND RCD CONNECTED) MUST BE 25 OHMS OR LESS.
7. FOR EACH GROUNDING ELECTRODE SYSTEM THE CONTRACTOR SHALL TEST THE MADE ELECTRODE GROUND SYSTEM WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUNDING SYSTEMS. TEST RESULTS SHALL BE RECORDED FOR EACH GROUNDING ELECTRODE SYSTEM. IF GROUND RESISTANCE EXCEEDS 25 OHMS, CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION. COPIES OF THE GROUND SYSTEM TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT PROJECT REPRESENTATIVE/RESIDENT ENGINEER.

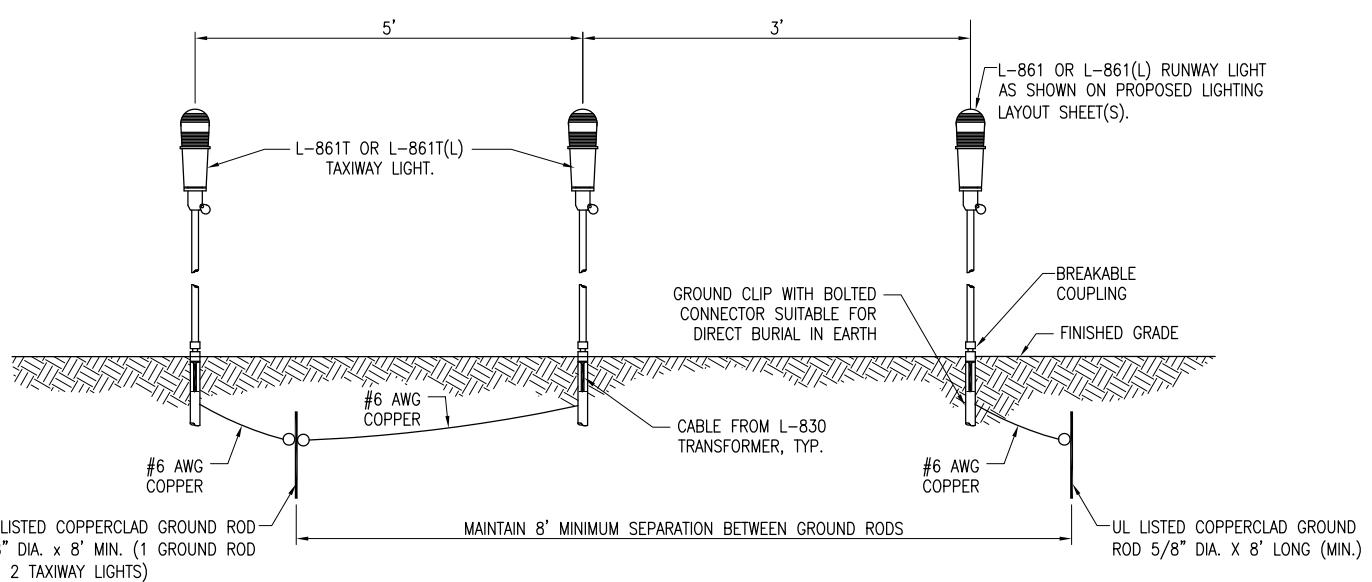


**MEDIUM/HIGH INTENSITY LIGHT – BASE MOUNTED**  
(NOT TO SCALE)

NOTE: SEE PROPOSED ELECTRICAL PLANS FOR LOCATIONS OF BASE MOUNTED LIGHTS WITH 2\"/>



**GROUNDING DETAIL FOR ADJACENT TAXIWAY LIGHTS**  
(NOT TO SCALE)



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

REVISION	DATE

MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS

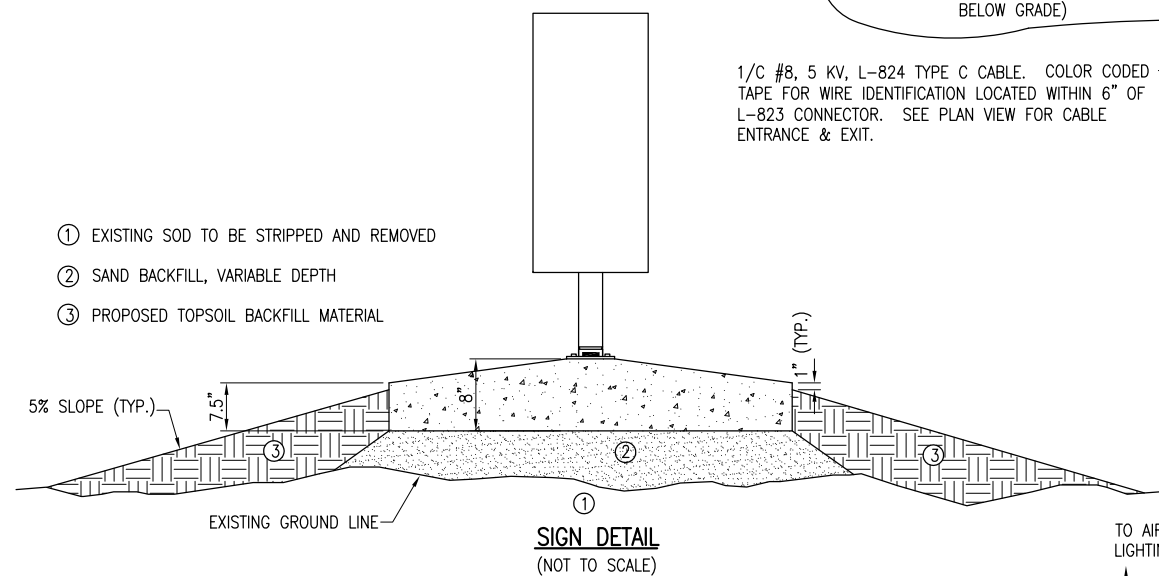
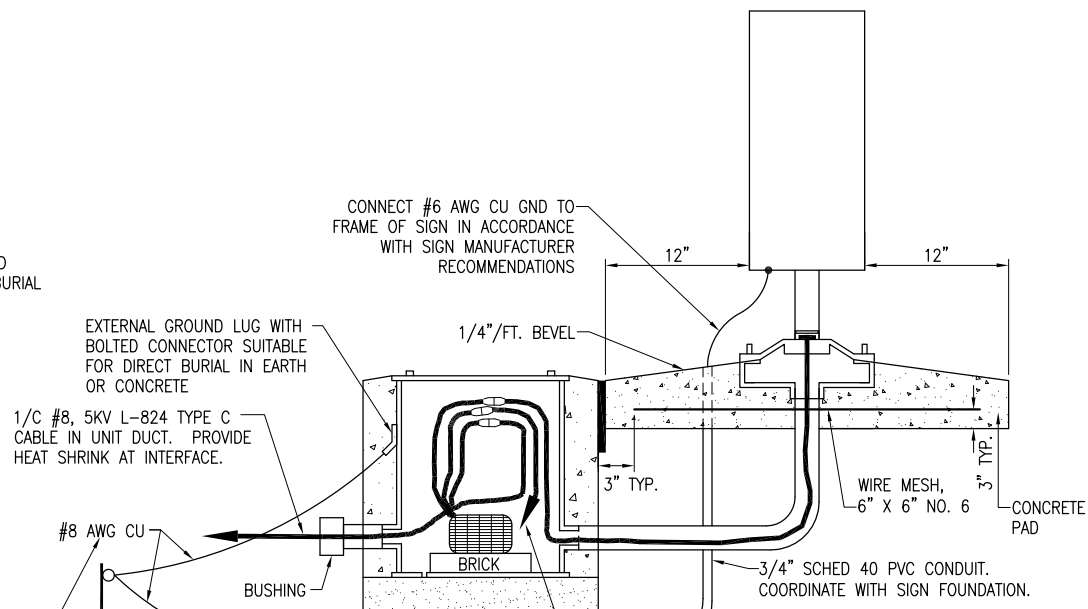
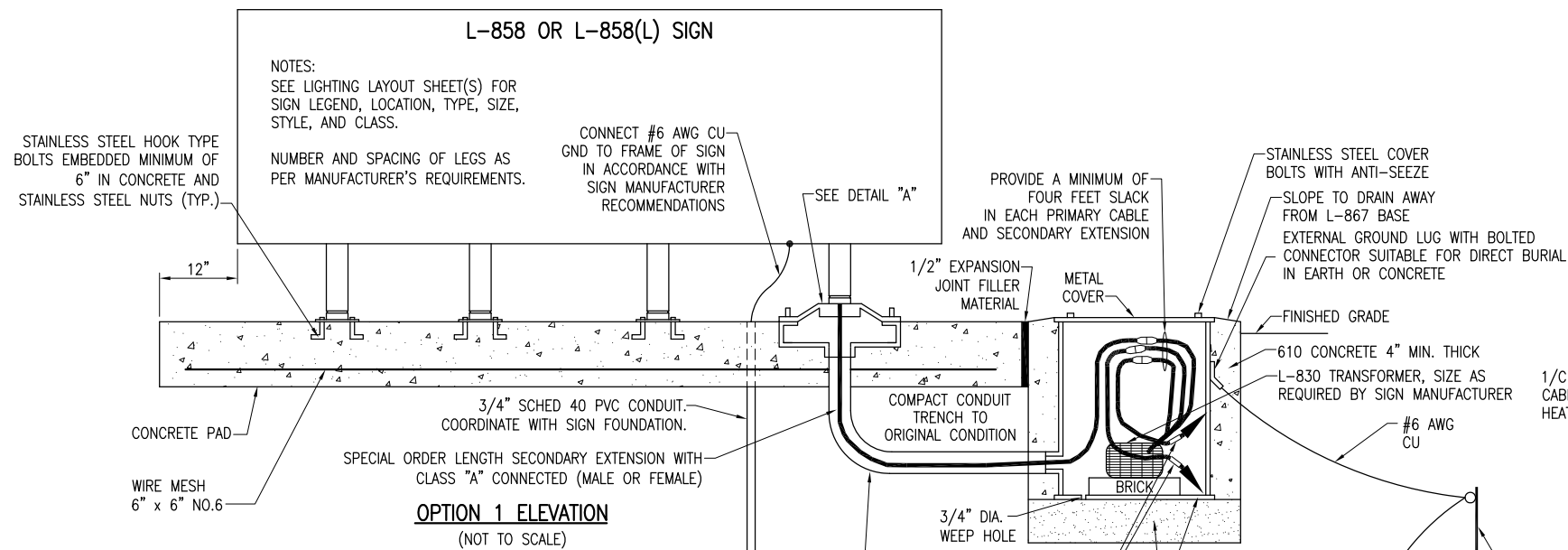
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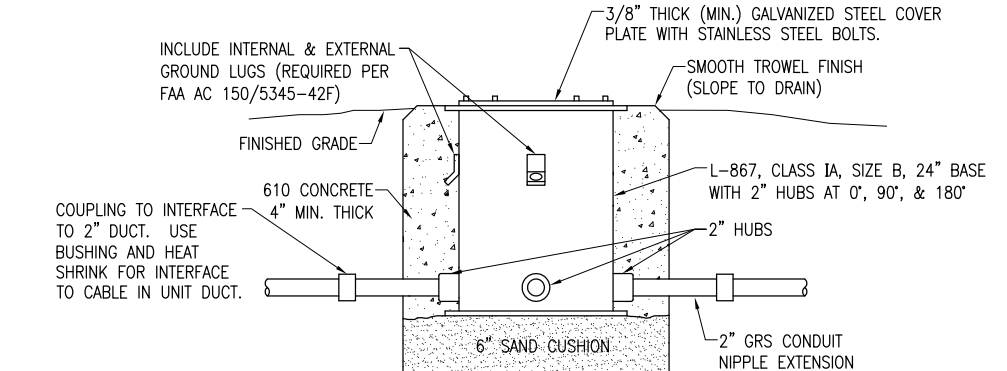
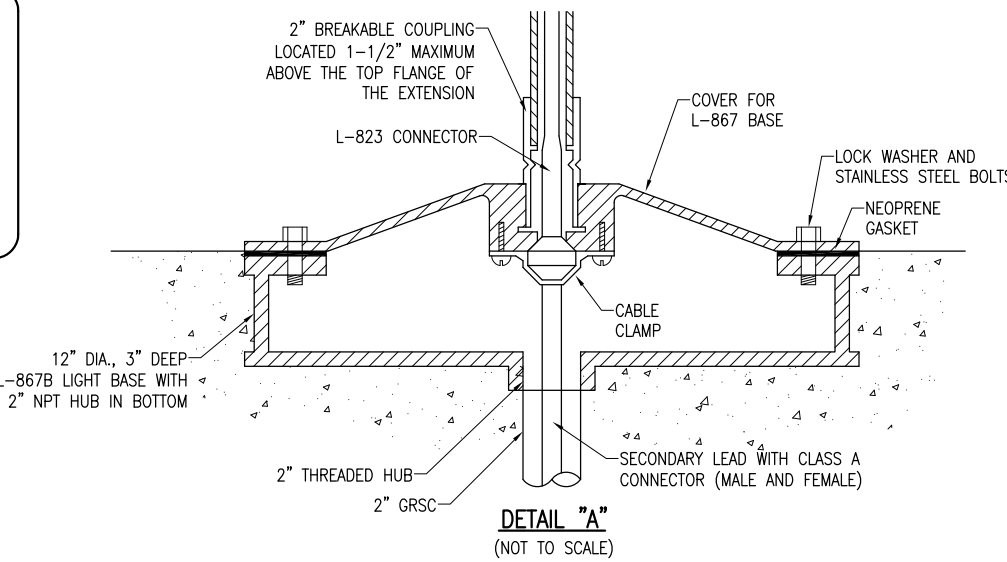
REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS  
ELECTRICAL DETAILS SHEET 2

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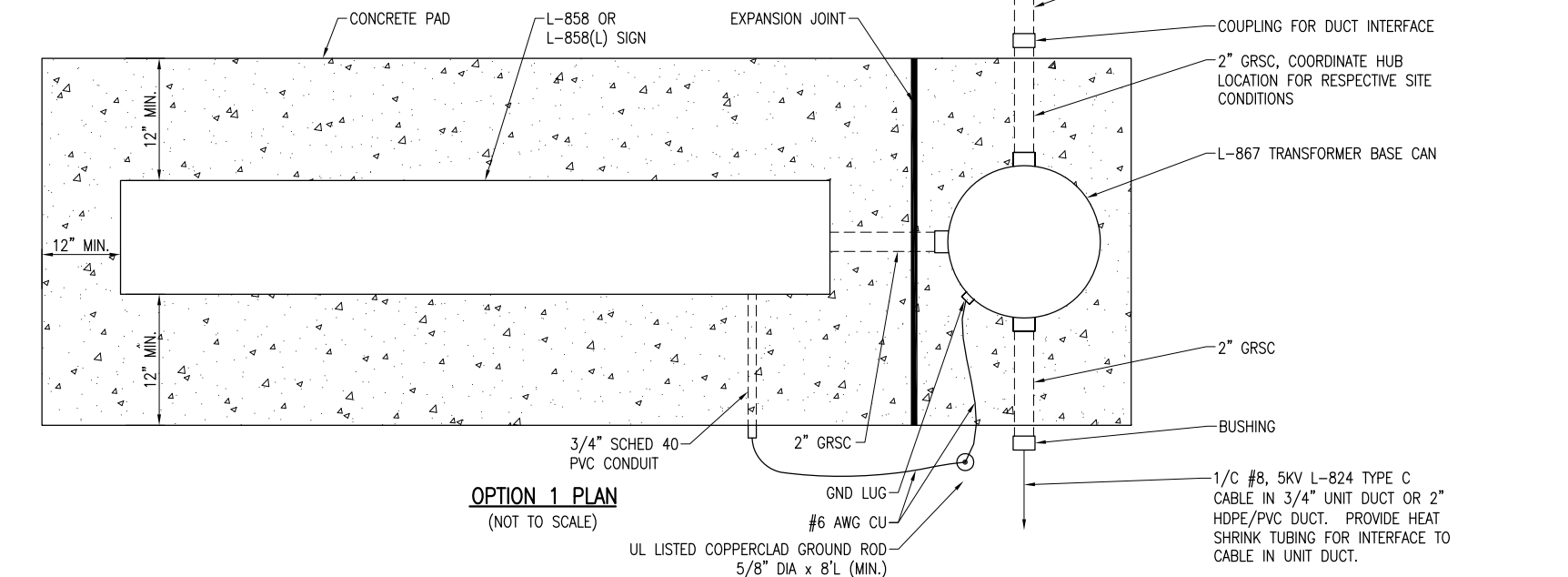


PER FAA AC 150/5340-30G DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, A LIGHT BASE GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. A LIGHT BASE GROUND SHALL BE INSTALLED AT EACH STAKE MOUNTED LIGHT AND EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED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

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



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.



REVISION	DATE

MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS

BLOCK GRANT PROJ.: 3-17-0064-B21  
IL PROJ.: MOB-4206

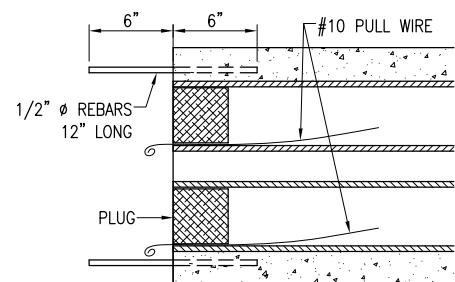
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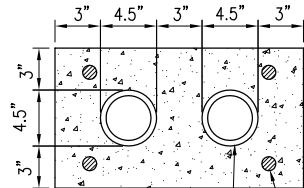
REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

ELECTRICAL DETAILS SHEET 3

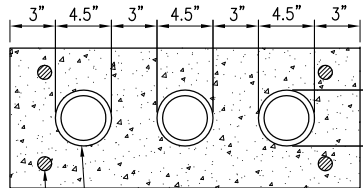
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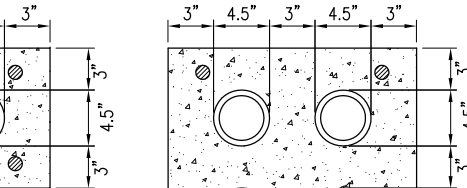
**TYPICAL SECTION**  
"NOT TO SCALE"



**2-DUCT BANK**  
"NOT TO SCALE"



**3-DUCT BANK**  
"NOT TO SCALE"



**4-DUCT BANK**  
"NOT TO SCALE"

1/2" Ø REBAR  
3' LONG IN  
EACH CORNER

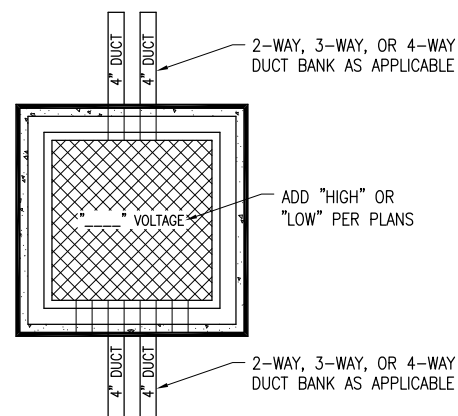
4" I.D. DUCT FOR 4" DUCT  
SIZE SHALL BE DETAILED  
HEREIN FOR RESPECTIVE  
APPLICATION

4" I.D. CONDUIT

1/2" Ø REBAR  
3' LONG IN  
EACH CORNER

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

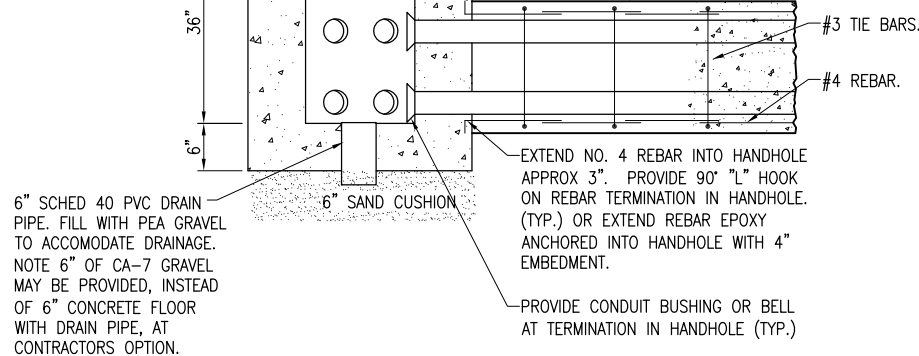
- CABLE & DUCT MARKER NOTES:**
- THE COST OF ALL TURF AND PAVEMENT DUCT MARKERS SHALL BE INCIDENTAL TO THE DUCT. THE COST OF ALL CABLE MARKERS SHALL BE INCIDENTAL TO THE CABLE.
  - BITUMINOUS PAVEMENT DUCT MARKER AND CONCRETE DUCT MARKER TO BE PROVIDED AT EACH END OF EACH DUCT AS SHOWN ON THE LOCATION PLAN. FOR CONCRETE PAVEMENT, THE LETTER "D" SHALL BE IMPRESSED IN THE PAVEMENT INSTEAD OF THE MARKER. THE LETTER SHALL BE FORMED AS DESCRIBED IN NOTE 4.
  - CABLE MARKERS SHALL BE PLACED AT CHANGES OF DIRECTION AND APPROXIMATELY EVERY 200' ALONG CABLE RUNS.
  - CONCRETE CABLE MARKERS AND DUCT MARKERS SHALL HAVE LETTERS 4" HIGH, 3" WIDE WITH WIDTH OF STROKE 1/2" AND 3/4" DEEP. ALL LETTERS, NUMBERS AND ARROWS TO BE IMPRESSED.



HEAVY DUTY FRAME & LID SUITABLE FOR  
H-20 LOADING, NEENAH CAT. NO.  
R-6662-PP OR APPROVED EQUAL

SMOOTH TROWEL FINISH  
(SLOPE TO DRAIN)

DUCT BANK SHALL TRANSITION TO (OR BE)  
REINFORCED CONCRETE ENCASED DUCT WHERE  
ENTERING A HANDHOLE. PROVIDE REINFORCEMENT  
3 FT. MIN. BEYOND HANDHOLE. DIRECT BURY  
DUCT (WITHOUT CONCRETE ENCASEMENT) DOES  
NOT REQUIRE REBAR & CONCRETE ENCASEMENT  
AT INTERFACE TO HANDHOLE.



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

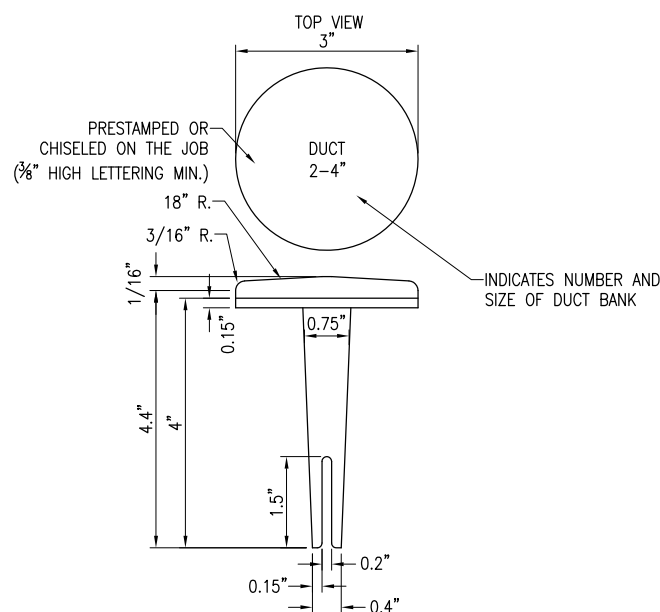
EXTEND NO. 4 REBAR INTO HANDHOLE  
APPROX 3". PROVIDE 90° "L" HOOK  
ON REBAR TERMINATION IN HANDHOLE.  
(TYP.) OR EXTEND REBAR EPOXY  
ANCHORED INTO HANDHOLE WITH 4"  
EMBEDMENT.

PROVIDE CONDUIT BUSHING OR BELL  
AT TERMINATION IN HANDHOLE (TYP.)

**NOTES:**

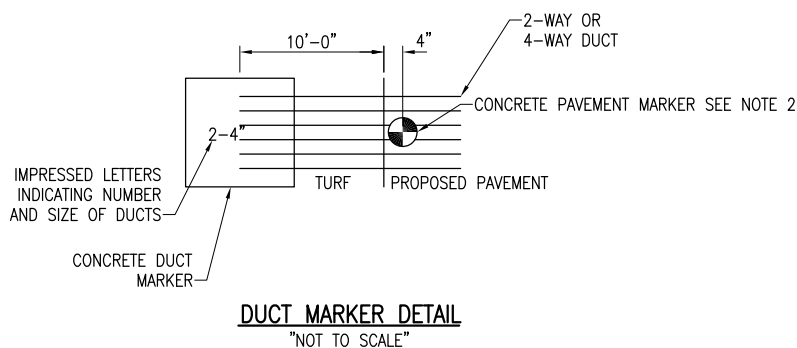
- LIDS FOR LOW VOLTAGE HANDHOLES SHALL BE LABELED "LOW VOLTAGE". LIDS FOR HIGH VOLTAGE HANDHOLES SHALL BE LABELED "HIGH VOLTAGE". COORDINATE LETTERING WITH MFR.
- HANDHOLES MAY BE CAST IN PLACE OR PRECAST. PRECAST MANUFACTURERS MUST BE ON THE IDOT (ILLINOIS DEPT. OF TRANSPORTATION) APPROVED LIST OF CERTIFIED PRECAST CONCRETE PRODUCERS.
- ALL CORING, INTERFACE, AND LABOR ASSOCIATED WITH CONDUIT, DUCT, CABLE IN UNIT DUCT, AND / OR CABLE ENTRIES WILL BE CONSIDERED INCIDENTAL TO THE INSTALLATION OF THE HANDHOLE AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

**ELECTRICAL HANDHOLE**  
"NOT TO SCALE"

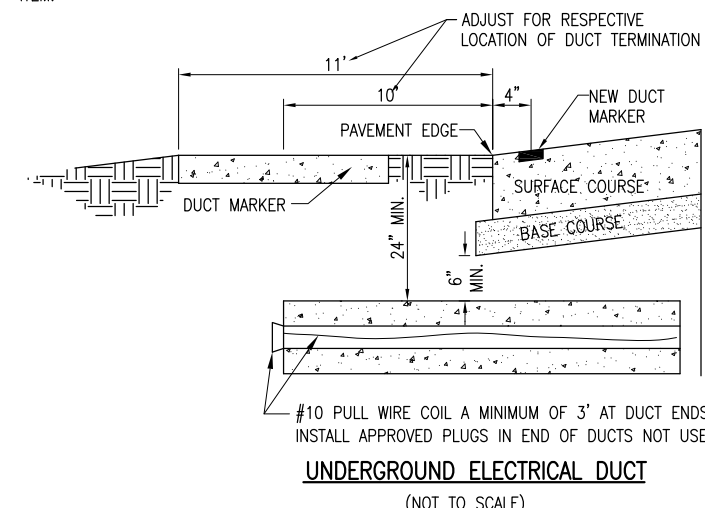


**BITUMINOUS PAVEMENT DUCT MARKERS**  
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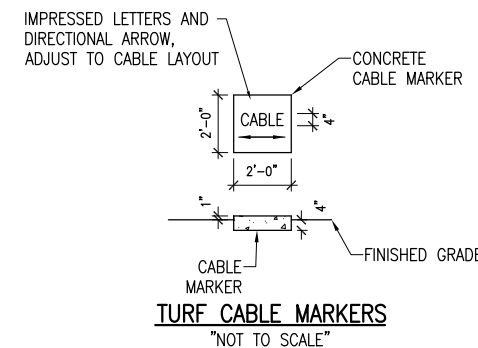
- NOTES:**
- TOP OF MARKER SHALL BE FLUSH WITH FINISHED PAVEMENT SURFACE. MARKER MAY BE INSTALLED IN A DRILLED HOLE AND SECURED WITH EPOXY GLUE.
  - BRASS DUCT MARKERS ARE AVAILABLE FROM G&S FOUNDRY & MANUFACTURING CO., INC., 210 KASKASKIA DRIVE, RED BUD, IL 62278, PHONE: (618)-282-4114



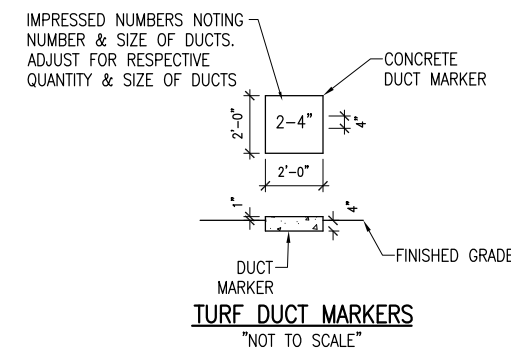
**DUCT MARKER DETAIL**  
"NOT TO SCALE"



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



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



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

REVISION	
DATE	

MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS

ILL. PROJ.: MCB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21

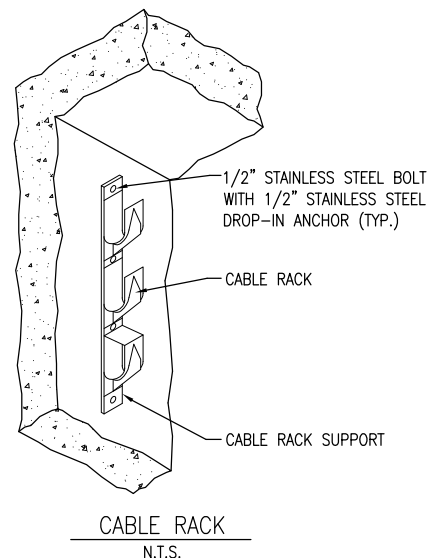
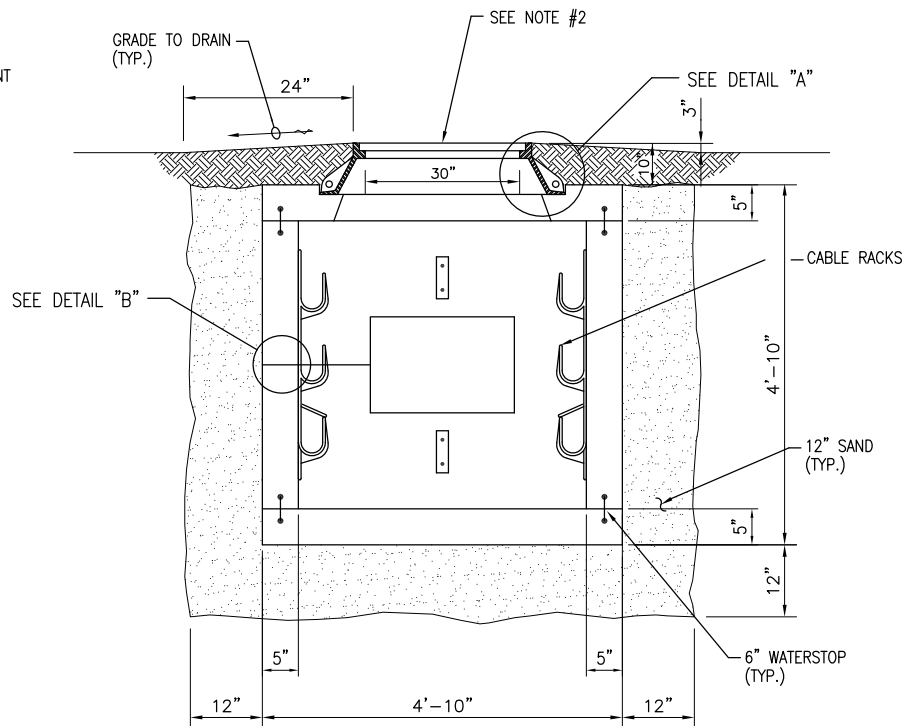
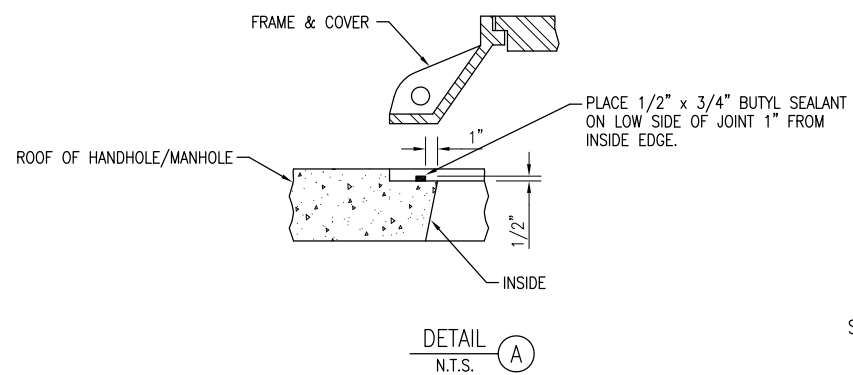
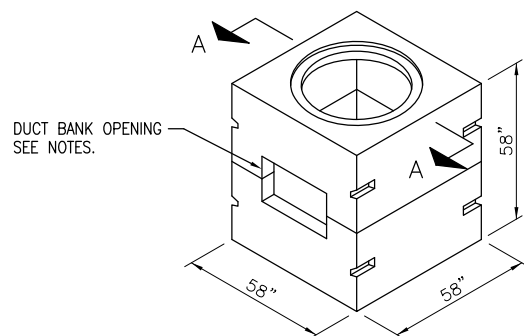
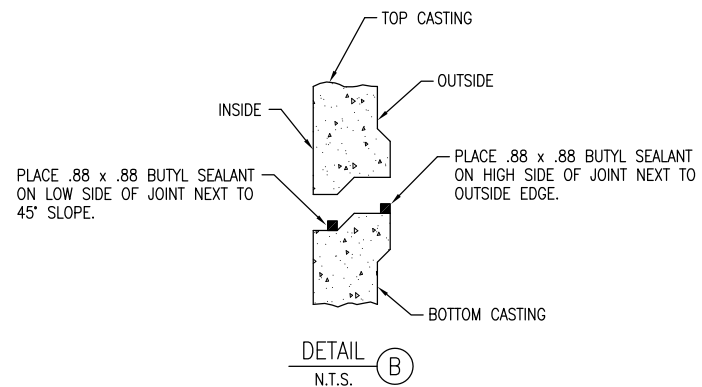
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REPLACE VAULT, AIRFIELD  
LIGHTING AND GUIDANCE SIGNS

ELECTRICAL DETAILS  
SHEET 4

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PRECAST 4' x 4' x 4' MANHOLE DETAILS  
N.T.S. (NOT TO SCALE)

PRECAST 4'x4'x4' ELECTRICAL MANHOLE NOTES

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

DESIGN CRITERIA:

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

DESIGN ASSUMPTIONS:

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

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

2. MANHOLE FRAME & LID SHALL BE CAPABLE OF WITHSTANDING MINIMUM 50,000 POUND LOADS. MANHOLE FRAME & LID SHALL BE NEENAH CATALOG NO. R-1640-C OR APPROVED EQUAL. LID FOR HIGH VOLTAGE MANHOLE SHALL BE LABELED "HIGH VOLTAGE". LID FOR LOW VOLTAGE MANHOLE SHALL BE LABELED "LOW VOLTAGE" OR "OV-600V".
3. COORDINATE DUCT BANK INTERFACE & OPENINGS WITH THE MANHOLE MFR. CONTRACTOR SHALL SLOPE DUCT BANK TO PRECAST MANHOLE OPENINGS. ALL OPENINGS SHALL BE SEALED WATERTIGHT AFTER DUCT BANK INSTALLATION.
4. 4'x4'x4' MANHOLE SHALL BE MANUFACTURED BY A CONCRETE ELECTRICAL MANHOLE PRODUCER ON THE ILLINOIS DEPARTMENT OF TRANSPORTATION APPROVED LIST OF CERTIFIED PRECAST CONCRETE PRODUCERS. MANHOLE PRODUCER SHALL SUBMIT CERTIFICATION THAT THE RESPECTIVE PRE-CAST MANHOLES ARE MANUFACTURED IN THE UNITED STATES.
5. 4'x4'x4' MANHOLE SHALL BE PAID FOR UNDER ITEM AR110710 ELECTRICAL MANHOLE PER EACH.
6. CABLE RACKS SHALL BE HEAVY DUTY CORROSION RESISTANT NYLON MATERIAL WITH CORROSION RESISTANT STAINLESS STEEL MOUNTING HARDWARE; UNDERGROUND DEVICES, INC. CAT. NO. 3SR1N, 3SR2N OR 3SR3N OR EQUAL. PROVIDE AT LEAST TWO TRIPLE HOOK CABLE RACKS ON EACH MANHOLE WALL, SPACED TO SUPPORT RESPECTIVE CABLES.
7. COORDINATE INSTALLATION OF MANHOLES WITH RESPECTIVE FINISHED GRADE ELEVATIONS.

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MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS

IL PROJ.: MOB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21

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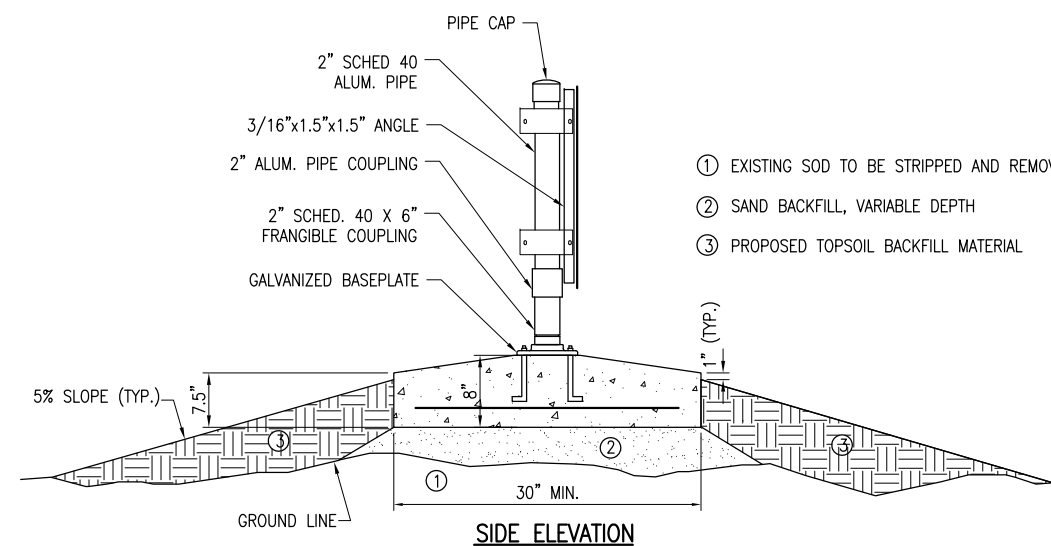
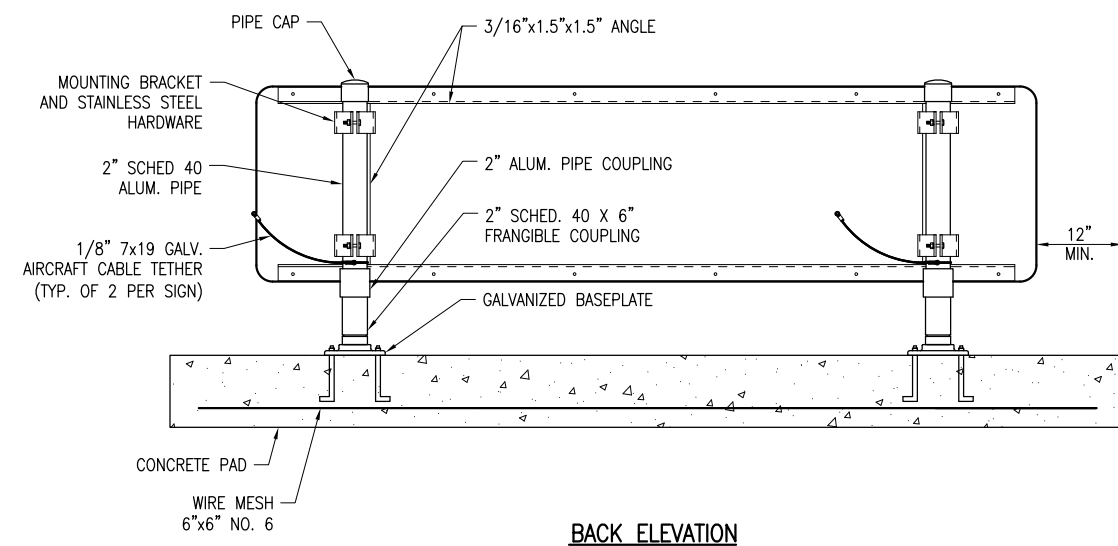
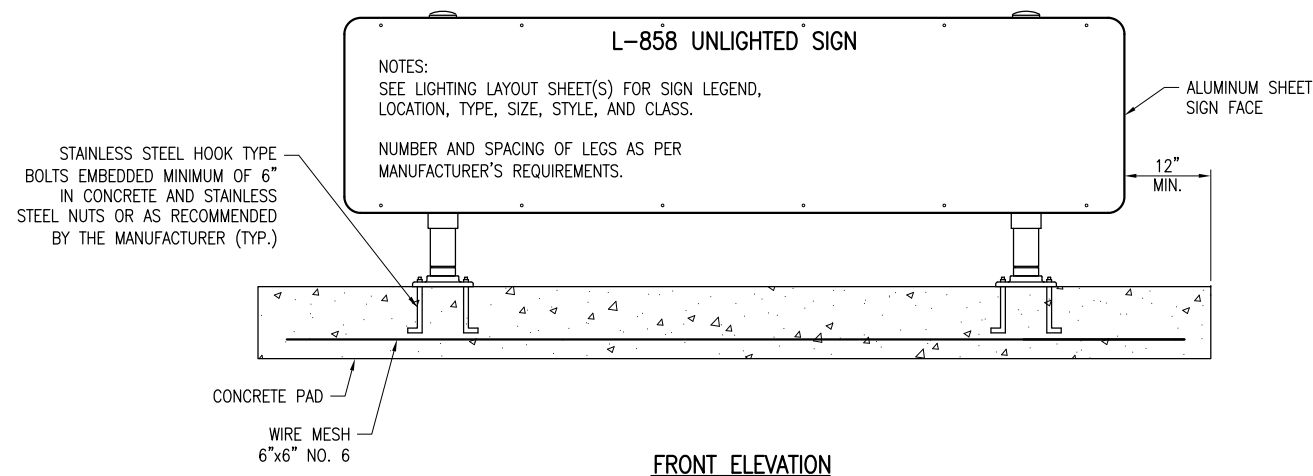
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Springfield, Illinois 62703-2886

REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

4' X 4' X 4' ELECTRICAL MANHOLE

**UNLIGHTED TAXI GUIDANCE SIGN NOTES**

1. THE PROPOSED UNLIGHTED TAXI GUIDANCE SIGNS SHALL CONFORM TO ADVISORY CIRCULAR 150/5345-44J (OR LATEST ISSUE IN FORCE) AND BE FAA-APPROVED FOR TYPE L-858 TAXIWAY AND RUNWAY SIGNS. THE SIGNS SHALL BE SIZE 1, 18-IN. SIGN FACE WITH A 12-IN. LEGEND; STYLE 4, UNLIGHTED SIGNS; MODE 2, TO WITHSTAND WIND LOADS OF 200 M.P.H., BASE-MOUNTED.
2. THE SIGNS SHALL READ AS DESCRIBED ON THE TAXI GUIDANCE SIGN SCHEDULE. THE PROPOSED TAXI GUIDANCE SIGNS WILL BE TYPE L-858-Y DIRECTION, DESTINATION, AND BOUNDARY SIGNS (BLACK LEGEND ON YELLOW BACKGROUND); TYPE L-858-R MANDATORY INSTRUCTION SIGN (BLACK OUTLINE ON OUTSIDE EDGE OF WHITE LEGEND ON RED BACKGROUND); AND TYPE L-858-L LOCATION SIGN (YELLOW LEGEND AND BORDER ON BLACK BACKGROUND).
3. THE CONCRETE USED IN THE CONSTRUCTION OF THESE ITEMS SHALL BE IN ACCORDANCE WITH ITEM 610 STRUCTURAL PORTLAND CEMENT CONCRETE.



**UNLIGHTED SIGN DETAILS**  
(NOT TO SCALE)

REVISION	DATE

MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS

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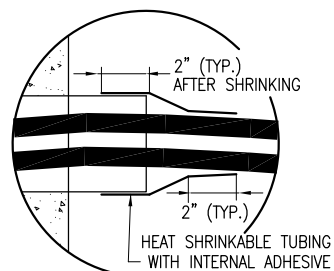
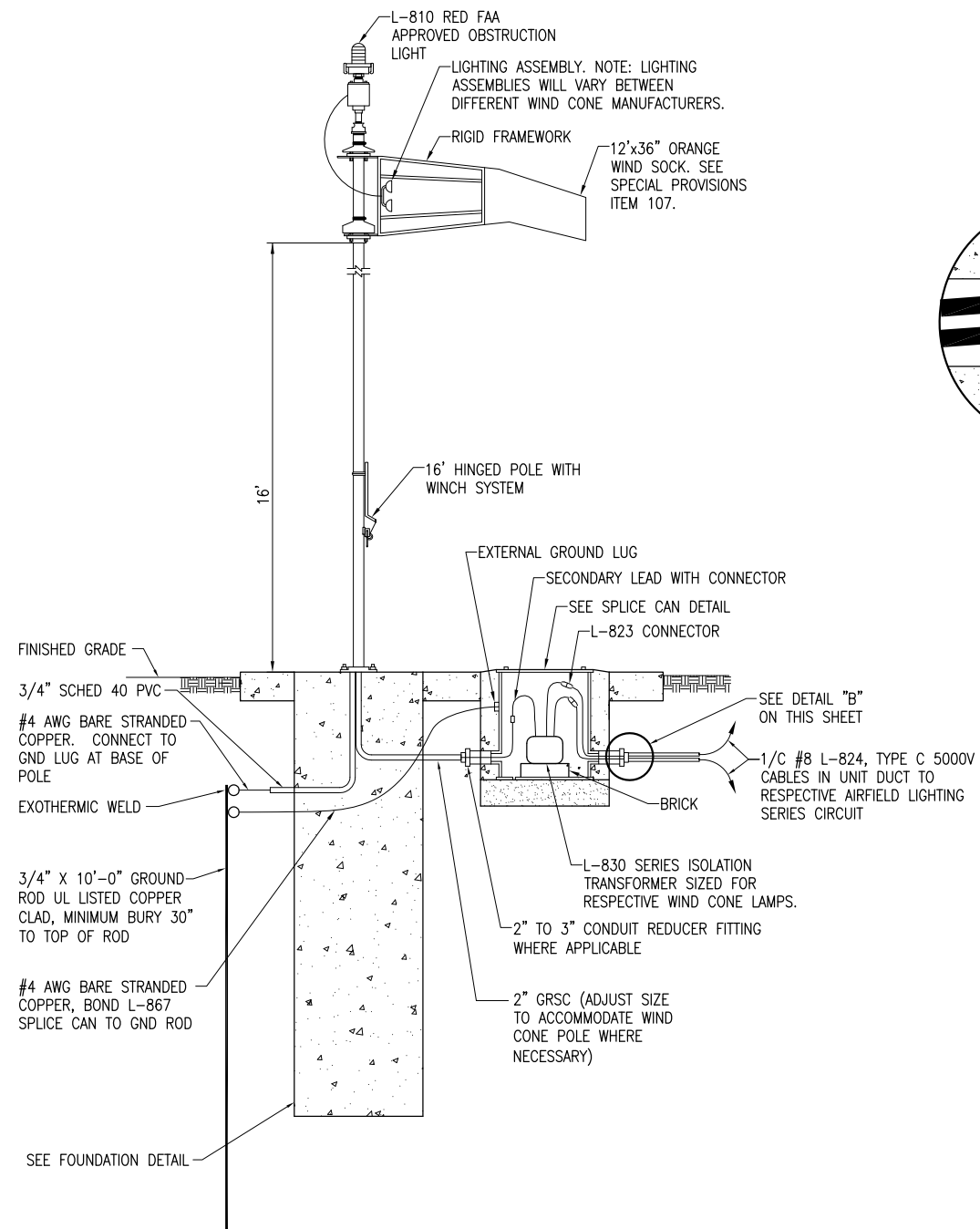
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Date: 06/17/13			

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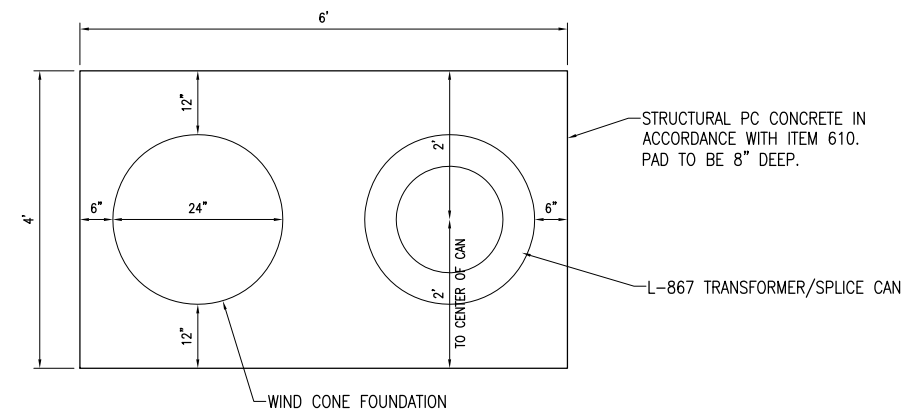
REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

UNLIGHTED SIGN DETAILS

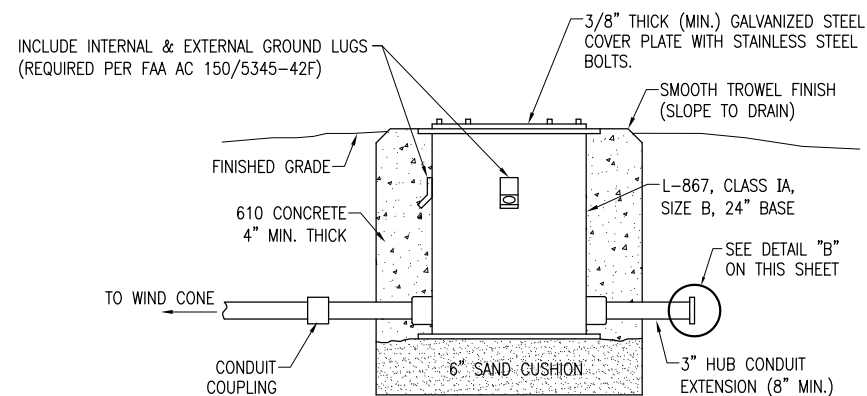
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DETAIL "B"  
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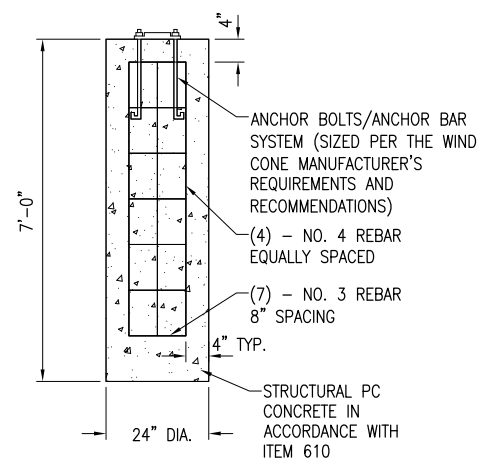


CONCRETE PAD PLAN VIEW  
(NOT TO SCALE)



TRANSFORMER/SPLICE CAN DETAIL  
(NOT TO SCALE)

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



FOUNDATION DETAIL  
"NOT TO SCALE"

**NOTES**

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

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

REVISION	DATE	UPDATE PER
12-2 & EB67D	03/09/12	PER FAA PGL

MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS

BLOCK GRANT PROJ.: 3-17-0064-B21

IL PROJ.: MGB-4206

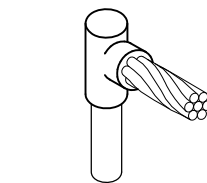
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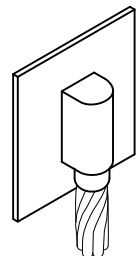
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REPLACE VAULT, AIRFIELD  
LIGHTING AND GUIDANCE SIGNS

L-807 WIND CONE  
ELEVATION DETAIL



CABLE TO GROUND ROD

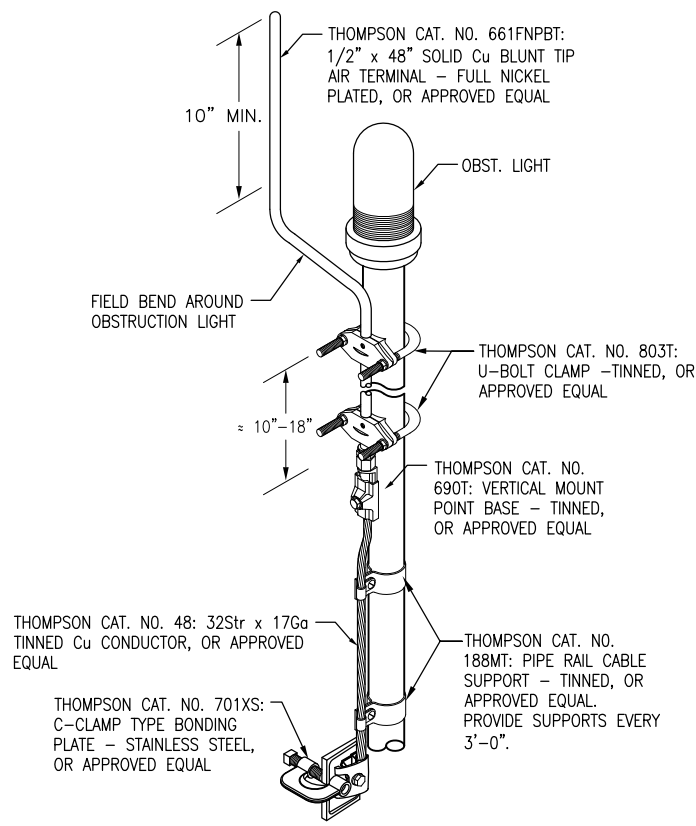


CABLE TO SURFACE

**DETAIL NOTES**

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

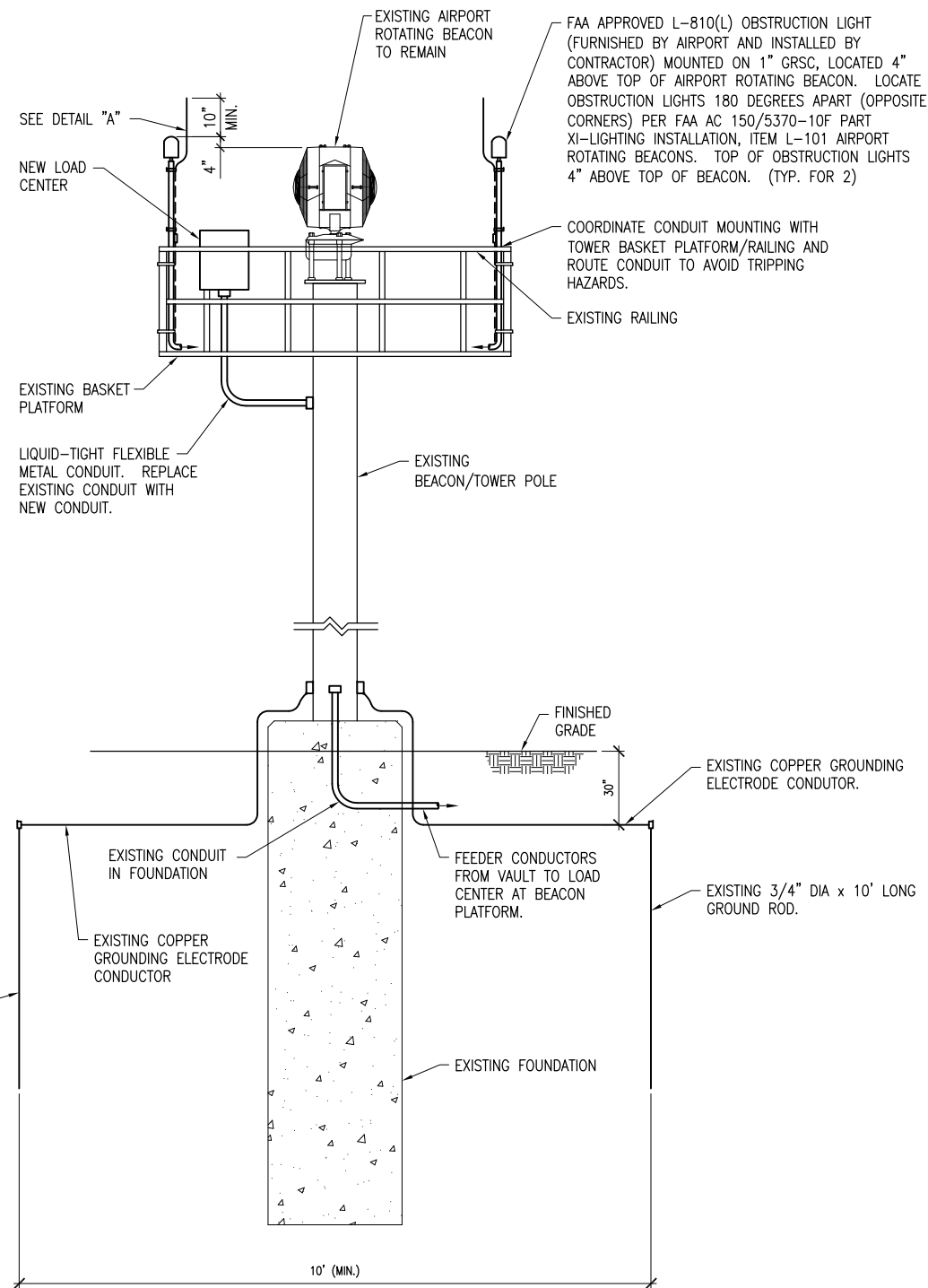
**EXOTHERMIC WELD DETAILS**



**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.
- CLEAN ALL CONNECTIONS TO EXPOSE BARE METAL.



**LIGHTNING PROTECTION DETAIL FOR AIRPORT ROTATING BEACON**  
NTS

AIRPORT ROTATING BEACON LOAD CENTER SCHEDULE			
CKT #	DUTY	SIZE	CKT #
1	BLANK		2
3	BLANK		4
5	AIRPORT ROTATING BEACON	20A 1P	6
7	OBSTRUCTION LIGHTS	15A 1P	8
9	BLANK		10
11	BLANK		12



100 AMP (MINIMUM), 120/240 VAC, 1 PHASE, 3 WIRE, 12 CIRCUIT LOAD CENTER WITH MAIN LUGS IN A NEMA 3R RAIN PROOF ENCLOSURE, SQUARE D CAT. NO. QO112L125GRB WITH EQUIPMENT GROUND BAR KIT OR APPROVED EQUAL. CONFIRM LOAD CENTER IS MADE IN USA TO COMPLY WITH AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCE REQUIREMENT.

**NOTES**

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

WORK SHOWN ON THIS SHEET SHALL BE PAID FOR UNDER ITEM AR800591 - UPGRADE AIRPORT ROTATING BEACON - PER L.S.

REVISION	DATE

MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS

IL PROJ.: MGB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21

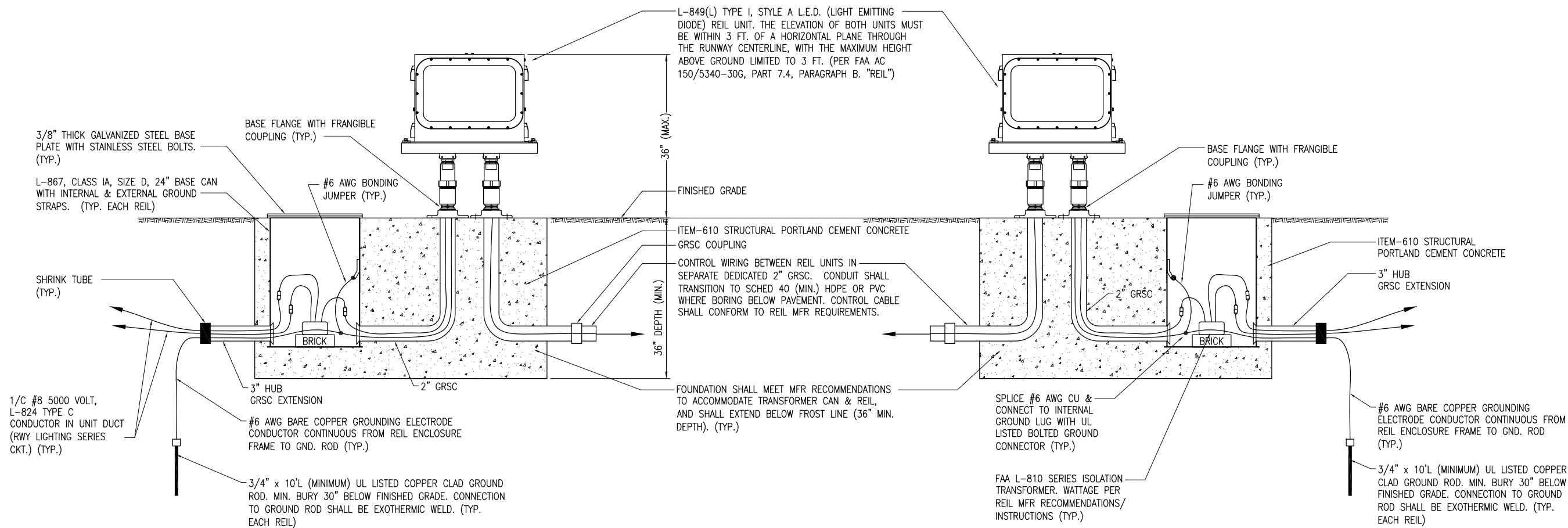
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Filename	NOT TO SCALE
Scale	06/17/13
Date	
LAYOUT	01/13/13
DRAWN	TRR 01/15/13
REVIEWED	KNL/CAH 02/04/13



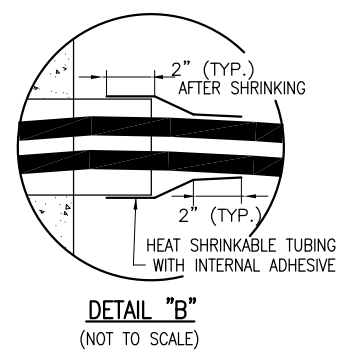
REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS  
LIGHTNING PROTECTION DETAILS FOR BEACON

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**REIL INSTALLATION DETAIL**  
NOT TO SCALE



**REIL NOTES**

- REILS SHALL BE FAA APPROVED CONFORMING TO FAA AC 150/5345-51B "SPECIFICATION FOR DISCHARGE-TYPE FLASHING LIGHT EQUIPMENT", L-849(L) TYPE I REIL POWERED BY CONSTANT CURRENT 6.6 AMP POWER SUPPLY, STYLE A - UNIDIRECTIONAL, HIGH INTENSITY, ONE BRIGHTNESS STEP. SEE SPECIAL PROVISION SPECS AR125610 FOR ADDITIONAL REQUIREMENTS ON REILS.
- REILS SHALL BE AIMED AT ANGLE 10 DEGREES VERTICALLY AND TOED OUT 15 DEGREES FROM THE LINE PARALLEL TO THE RUNWAY CENTERLINE.
- ANY AND ALL TRENCHES AND DISTURBED AREAS WILL BE BACKFILLED AND RESTORED TO A SMOOTH GRADE AND SEEDED TO THE SATISFACTION OF THE ENGINEER. ALL TRENCH SETTLEMENT SHALL BE CORRECTED FOR A PERIOD OF ONE YEAR. RESTORATION, GRADING, SEEDING, AND MULCHING OF AREAS DISTURBED DURING THE REIL INSTALLATION AND ASSOCIATED CABLE WILL BE INCIDENTAL TO THE INSTALLATION OF THE REILS.
- GROUNDING FOR REILS.** GROUNDING FOR REILS SHALL CONFORM TO THE RESPECTIVE REIL MANUFACTURER'S INSTALLATION INSTRUCTIONS, AS DETAILED ON THE PLANS, AND AS SPECIFIED HEREIN. FURNISH AND INSTALL A 3/4-INCH DIAMETER BY 10-FOOT LONG COPPER CLAD GROUND ROD AT EACH REIL UNIT. GROUND RODS SHALL BE BURIED 30" MINIMUM BELOW GRADE. BOND EACH REIL UNIT HOUSING AND THE REIL BASE CAN TO THE RESPECTIVE GROUND ROD IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS WITH A #6 AWG BARE SOLID OR STRANDED (PER REIL MANUFACTURER REQUIREMENTS) COPPER GROUNDING ELECTRODE CONDUCTOR. ALL CONNECTIONS TO GROUND RODS SHALL BE EXOTHERMIC WELD AS MANUFACTURED BY CADWELD, THERMOWELD, ULTRAWELD, OR APPROVED EQUAL. CONNECTIONS TO REIL UNIT FRAMES SHALL BE AS RECOMMENDED BY THE MANUFACTURER OR WITH UL LISTED GROUNDING CONNECTORS. CONNECT TO THE BASE / TRANSFORMER CAN SHALL BE WITH UL LISTED BOLTED CONNECTOR OR ONE-HOLE COMPRESSION LUG & 3/8" STAINLESS STEEL BOLTS, NUTS, & WASHERS.
- PRIOR TO FINAL ACCEPTANCE AND ACTIVATION, THE COMPLETED REIL INSTALLATION WILL REQUIRE A FLIGHT CHECK TO BE SCHEDULED AND CONDUCTED BY THE FAA AND/OR IDA. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO HAVE A REPRESENTATIVE PRESENT TO MAKE ANY NECESSARY ADJUSTMENTS IN THE INSTALLATION AND/OR AIMING OF THE REIL UNITS FOR THE FLIGHT SYSTEM CHECKS.

REVISION	DATE	UPDATE PER
1	03/07/12	FAA PGL 12-2 & EB67D

MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS  
BLOCK GRANT PROJ.: 3-17-0064-B21  
IL PROJ.: MOB-4206

DESCRIPTION	DATE
LAYOUT	01/13/13
DRAWN	01/15/13
REVIEWED	02/04/13

**HANSON**  
Hanson Professional Services Inc. 2013  
1425 South Main Street  
Springfield, Illinois 62703-2886

REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS  
REIL DETAILS AND NOTES

**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 RESIDENT ENGINEER TO THE CONTRACTOR REGARDING CHANGES IN OR DEVIATIONS FROM THE PLANS AND SPECIFICATIONS SHALL BE IN WRITING WITH COPIES SENT TO THE AIRPORT SPONSOR AND THE ILLINOIS DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS). THE CONTRACTOR SHALL NOT ACCEPT ANY VERBAL INSTRUCTIONS FROM THE RESIDENT ENGINEER REGARDING ANY CHANGES FROM THE PLANS AND SPECIFICATIONS.
- 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".

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REVISION	
DATE	

MACOMB MUNICIPAL AIRPORT  
 MACOMB, ILLINOIS  
 BLOCK GRANT PROJ.: 3-17-0064-B21  
 IL PROJ.: MOB-4206

Hanson Proj. No. 12A0053	Filename E-001-NOTE.dwg	Scale NONE	Date 06/17/13
LAYOUT	KNL	01/13/13	
DRAWN	TRR	01/15/13	
REVIEWED	KNL/CAH	02/04/13	



REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS  
 ELECTRICAL NOTES SHEET 1

**AIRFIELD LIGHTING NOTES**

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

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

**GROUNDING NOTES FOR AIRFIELD LIGHTING**

1. GROUNDING FOR RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS SHALL BE AS DETAILED ON THE PLANS AND AS SPECIFIED HEREIN. PER FAA AC 150/5340-30G DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, CHAPTER 12, PART 12.6; A GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. THE PURPOSE OF THE LIGHT BASE GROUND IS TO PROVIDE A DEGREE OF PROTECTION FOR MAINTENANCE PERSONNEL FROM POSSIBLE CONTACT WITH AN ENERGIZED LIGHT BASE OR MOUNTING STAKE THAT MAY RESULT FROM A SHORTED POWER CABLE OR ISOLATION TRANSFORMER. A LIGHT BASE GROUND SHALL BE INSTALLED AT EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. A LIGHT BASE GROUND SHALL ALSO BE INSTALLED AT EACH STAKE MOUNTED LIGHT FIXTURE. A LIGHT BASE GROUND SHALL BE INSTALLED AND CONNECTED TO THE METAL FRAME OF EACH TAXI GUIDANCE SIGN AS DETAILED ON THE PLANS AND IN ACCORDANCE WITH THE RESPECTIVE TAXI GUIDANCE SIGN MANUFACTURER RECOMMENDATIONS. THE LIGHT BASE GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR BONDED TO THE GROUND LUG ON THE RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND A 5/8-INCH DIAMETER BY 8-FOOT LONG (MINIMUM) UL LISTED COPPER CLAD GROUND ROD. CONNECTIONS TO GROUND LUGS ON THE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE SHALL BE WITH A UL LISTED GROUNDING CONNECTOR. CONNECTIONS TO GROUND RODS SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY ERICO PRODUCTS, INC., SOLON, OHIO, (PHONE: 800-248-9353), THERMOWELD BY CONTINENTAL INDUSTRIES, INC., TULSA, OKLAHOMA (PHONE: 918-663-1440), ULTRAWELD BY HARGER, GRAYSLAKE, ILLINOIS (PHONE: 800-842-7437), OR APPROVED EQUAL. EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS. TOP OF GROUND RODS SHALL BE BURIED 12 INCHES MINIMUM BELOW GRADE, UNLESS SPECIFIED OTHERWISE HEREIN, FOR RESPECTIVE APPLICATIONS.
2. FOR BASE MOUNTED LIGHT FIXTURES THE LIGHT FIXTURE MUST BE BONDED TO THE LIGHT BASE INTERNAL GROUND LUG VIA A #6 AWG STRANDED COPPER WIRE RATED FOR 600 VOLTS WITH GREEN XHHW INSULATION OR A BRAIDED GROUNDING STRAP OF EQUIVALENT CURRENT RATING. THE GROUND WIRE LENGTH MUST BE SUFFICIENT TO ALLOW THE REMOVAL OF THE LIGHT FIXTURE FROM THE LIGHT BASE FOR ROUTINE MAINTENANCE. SEE THE LIGHT FIXTURE MANUFACTURER'S INSTRUCTIONS FOR PROPER METHODS OF ATTACHING A BONDING WIRE.
3. CLEAN ALL METAL SURFACES BEFORE MAKING GROUND CONNECTIONS. METALLIC SURFACES TO BE JOINED SHALL BE PREPARED BY THE REMOVAL OF ALL NON-CONDUCTIVE MATERIAL PER 2011 NATIONAL ELECTRICAL CODE ARTICLE 250-12.
4. PER FAA 150/5340-30G THE RESISTANCE TO GROUND OF THE RESPECTIVE MOUNTING STAKE OR LIGHT BASE (WITH GROUND ROD CONNECTED) MUST BE 25 OHMS OR LESS.
5. FOR EACH GROUNDING ELECTRODE SYSTEM THE CONTRACTOR SHALL TEST THE MADE ELECTRODE GROUND SYSTEM WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUNDING SYSTEMS. TEST RESULTS SHALL BE RECORDED FOR EACH GROUNDING ELECTRODE SYSTEM. IF GROUND RESISTANCE EXCEEDS 25 OHMS. CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION. COPIES OF THE GROUND SYSTEM TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT PROJECT REPRESENTATIVE/RESIDENT ENGINEER.

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REVISION	
DATE	

**MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS**

BLOCK GRANT PROJ.: 3-17-0064-B21  
ILL PROJ.: MOB-4206

Hanson Proj. No. 120053	Filename E-002-NOTE.dwg	Scale AS SHOWN	Date 06/17/13
LAYOUT	KNL	01/13/13	
DRAWN	THR	01/15/13	
REVIEWED	KNL/CAH	02/04/13	



REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

ELECTRICAL NOTES SHEET 2

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

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

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

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

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

NOTES:

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

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

REVISION	DATE

MACOMB MUNICIPAL AIRPORT  
 MACOMB, ILLINOIS  
 BLOCK GRANT PROJ.: 3-17-0064-B21  
 ILL PROJ.: MOB-4206

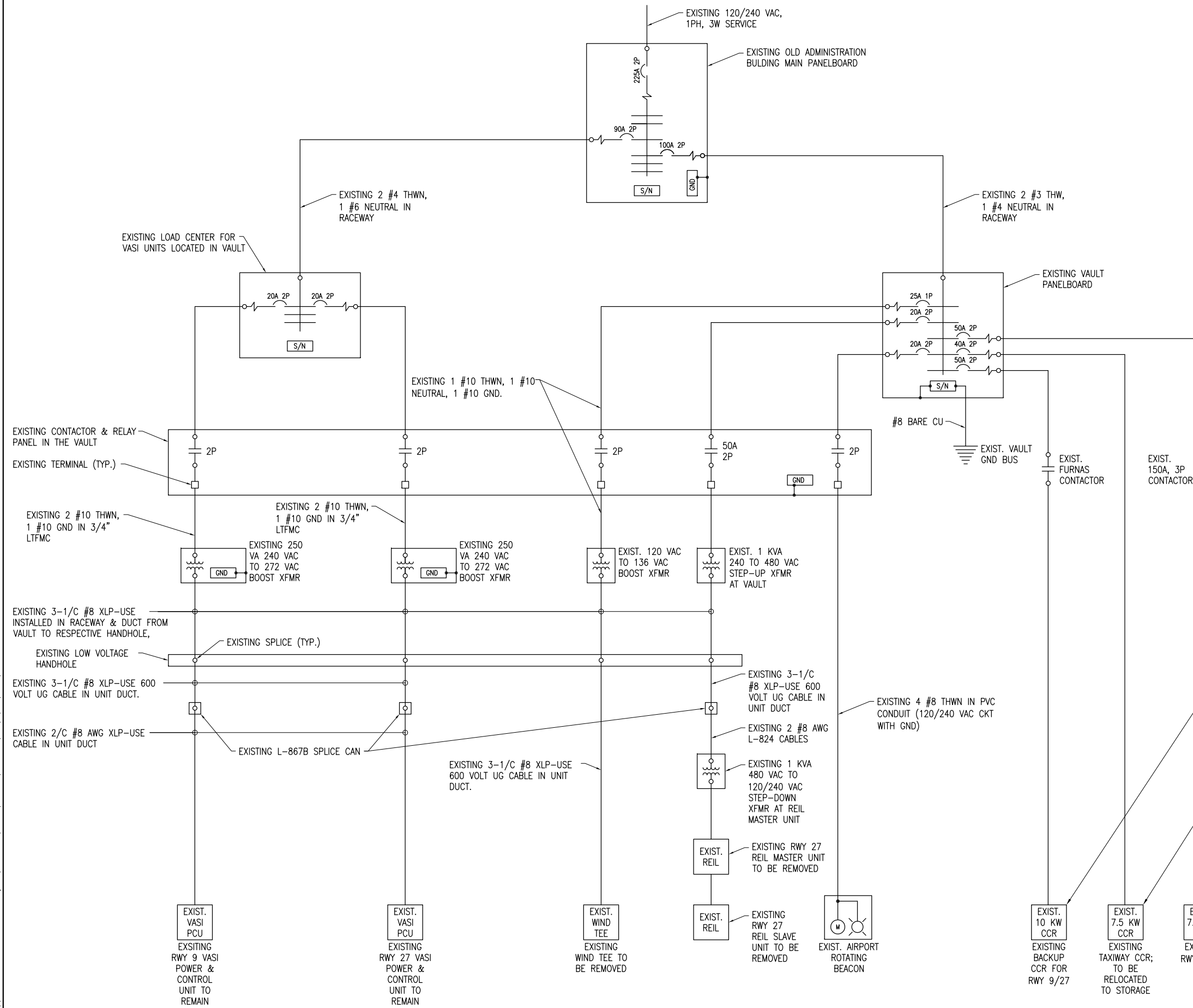
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LAYOUT	KNL	01/13/13	
DRAWN	TRR	01/15/13	
REVIEWED	KNL/CAH	02/04/13	



REPLACE VAULT, AIRFIELD  
 LIGHTING AND GUIDANCE SIGNS  
 ELECTRICAL LEGEND AND  
 ABBREVIATIONS

NOTES

1. CONTRACTOR SHALL EXAMINE THE SITE TO FIELD VERIFY EXISTING CONDITIONS.
2. ALL VAULT WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER AND/OR AIRPORT REPRESENTATIVE. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)
3. SEE "ELECTRICAL LEGEND AND ABBREVIATIONS" SHEET FOR GENERAL NOTES AND REQUIREMENTS.
4. EQUIPMENT DESIGNATED FOR REMOVAL SHALL BE TURNED OVER TO THE AIRPORT. IN THE EVENT THE AIRPORT DOES NOT WANT THE RESPECTIVE EQUIPMENT, THE CONTRACTOR SHALL DISPOSE OF IT OFF SITE AT NO ADDITIONAL COST TO THE CONTRACT.
5. REMOVAL OF EXISTING VAULT AND EQUIPMENT WILL BE PAID FOR UNDER ITEM AR109901, REMOVE ELECTRICAL VAULT, PER LUMP SUM.



EXISTING VAULT & AIRFIELD ELECTRICAL ONE-LINE DIAGRAM

REVISION	DATE	DESCRIPTION
06/12/13	06/12/13	VASIS TO REMAIN

MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS

IL PROJ.: MGB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21

Hanson Proj. No. 12A0053	01/13/13
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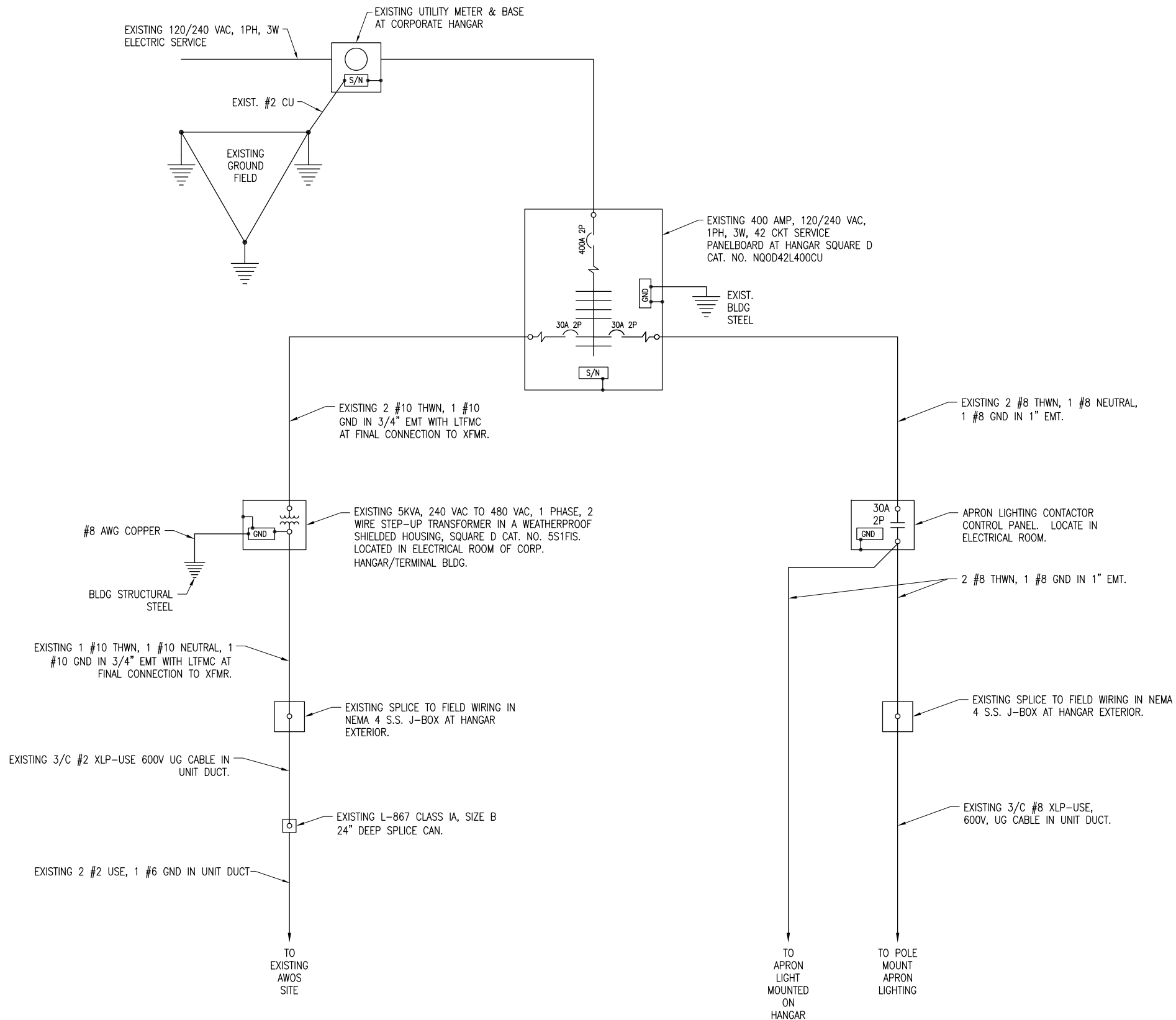


REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

EXISTING ELECTRICAL ONE-LINE DIAGRAM FOR VAULT AND AIRFIELD

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- EXISTING GS HEVI DUTY ELECTRIC  
TYPE: FAA 10L828A5D6  
PART NO. 64413071200  
10KW @ 6.6 AMPERES  
INPUT VOLTS: 240-VOLTS + 10% -5%  
OUTPUT CURRENT ADJUSTMENT: 6.6/5.5/4.8 AMPERES  
S/N: 87TS23959-2  
APPROX WT: 750 LBS
  - EXISTING CROUSE-HINDS  
TYPE: FAA-L-828  
PART NO. 31360-071-3  
7.5KW OUTPUT @ 6.6 AMPERES  
INPUT VOLTS: 208V, 60HZ,  
INPUT AMPS: 30 AMPS  
OUTPUT CURRENT: 4.8/5.5/6.6 AMPERES  
CONTROL: 120-VOLTS, 60HZ  
S/N: 3158  
BRIGHTNESS STEPS: 3
  - EXISTING MANAIRCO  
TYPE: FAA L-828 MANAIRCO  
PART NO. MR07L8283B-01 OVM\*  
7.5KW OUTPUT @ 1,136-VOLTS AC  
INPUT VOLTS: 208/220/230/240/250/460/480-VOLTS, 60 HZ 1PH  
INPUT AMPS: 36/34/33/31/30/17/16 AMPS  
OUTPUT CURRENT: 4.8/5.5/6.6 AMPERES  
CONTROL POWER INT/EXT: 120-VOLTS, 60HZ  
S/N: 1000683  
APPROX WT: 650 LBS
- \*WITH OUTPUT VOLTMETER



- NOTES**
- CONTRACTOR SHALL EXAMINE SITE TO FIELD VERIFY EXISTING CONDITIONS.
  - ALL 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 AND HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
  - PER NEC 513 THE ENTIRE AREA OF THE HANGAR INCLUDING ANY ADJACENT AND COMMUNICATING AREAS NOT SUITABLE CUT OFF FROM THE HANGAR, SHALL BE CLASSIFIED AS A CLASS 1, DIVISION 2 HAZARDOUS LOCATION UP TO A LEVEL 18 INCHES ABOVE THE FLOOR. AREAS IN THE VICINITY OF AIRCRAFT ARE ALSO CLASSIFIED AS HAZARDOUS AS DEFINED BY NEC 513. ALL ELECTRICAL INSTALLATIONS IN CLASSIFIED HAZARDOUS LOCATIONS SHALL BE AVOIDED SPECIFICALLY APPROVED FOR SUCH LOCATIONS AND INSTALLED IN CONFORMANCE WITH NEC 500, 501, AND 513 AS WELL AS ANY OTHER APPLICABLE CODES AND REQUIREMENTS
  - THE EXISTING APRON LIGHTING CKT, AWOS POWER CKT, AWOS COMMUNICATION CKT, AND AWOS SATELLITE CKT WILL REQUIRE LOCATION, PROTECTION, ADJUSTMENT, RELOCATION, AND/OR REPLACEMENT TO ACCOMMODATE NEW WORK, AND WILL BE CONSIDERED INCIDENTAL TO ITEM AR109200 INSTALL ELECTRICAL EQUIPMENT.
  - COORDINATE WORK AFFECTING THE AWOS AND AWOS CABLE RELOCATIONS WITH VAISALA, ATTN. MS. STEPHANIE HAYNES, 1230 EAGAN INDUSTRIAL ROAD SUITE 103, EAGAN, MINNESOTA 55121, PHONE: 612-238-2838.

**EXISTING ONE-LINE FOR APRON LIGHTING & AWOS**

REVISION	DATE

**MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS**

IL PROJ.: MQB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21

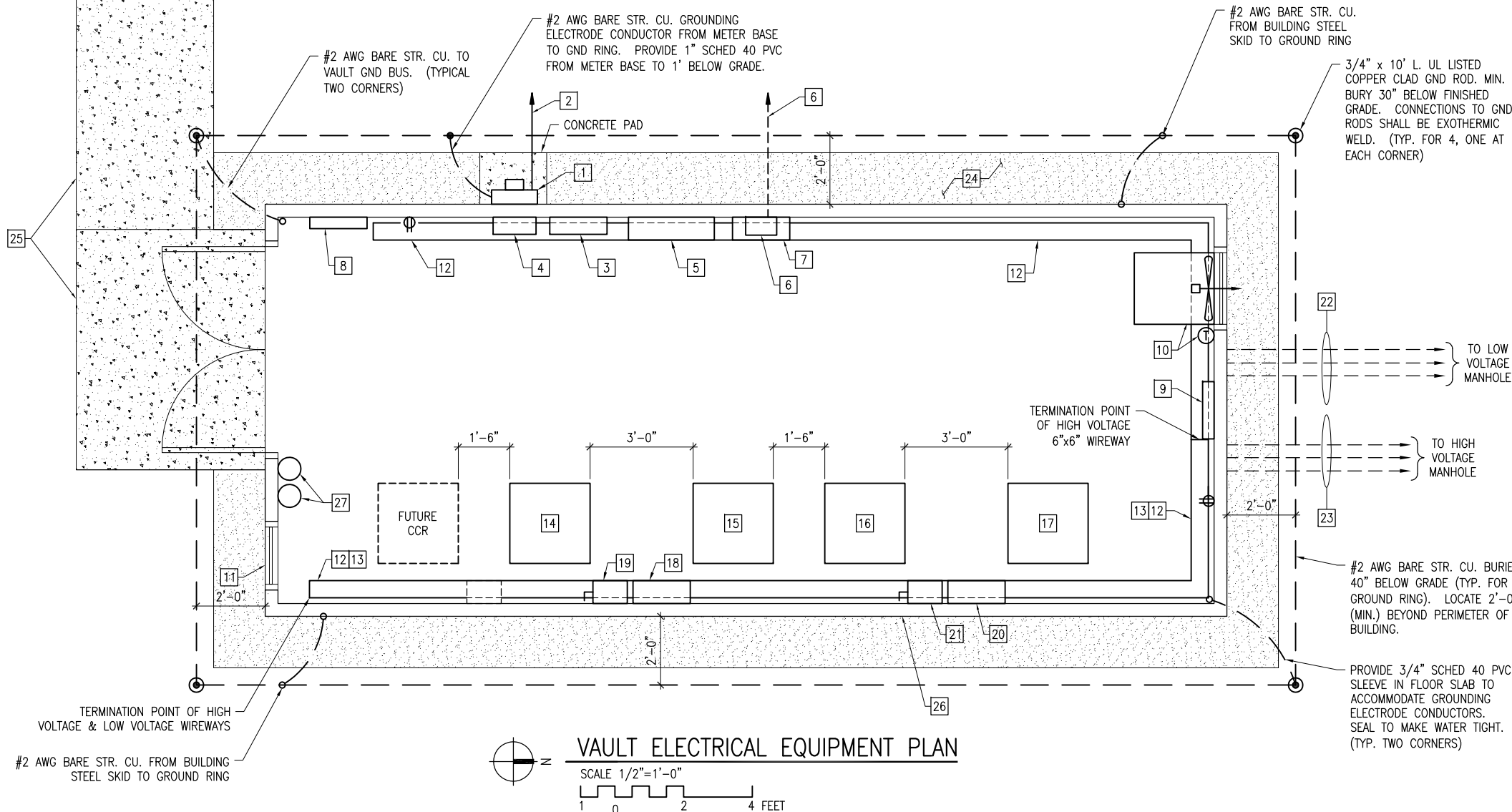
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LAYOUT	KNL	01/26/13	
DRAWN	TRR	01/28/13	
REVIEWED	KNL/CAH	02/04/13	



REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

EXISTING ONE-LINE DIAGRAM FOR APRON LIGHTING & AWOS

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**VAULT ELECTRICAL EQUIPMENT PLAN**  
SCALE 1/2"=1'-0"  
1 0 2 4 FEET

**VAULT BUILDING NOTES**  
THE PROPOSED ELECTRICAL VAULT BUILDING SHALL CONSIST OF A PRE-FRABRICATED, PRE-ENGINEERED EQUIPMENT ENCLOSURE BUILDING WITH A CONCRETE FLOOR, STEEL SKID STRUCTURE AND FOUNDATION PIERS OR WITH CONCRETE SLAB FOUNDATION.

THE PROPOSED ELECTRICAL VAULT BUILDING SHALL HAVE A NOMINAL 12 FOOT WIDE EXTERIOR (INTERIOR WIDTH SHALL NOT BE LESS THAN 11 FEET, ADJUST EXTERIOR WIDTH AS APPLICABLE) BY NOMINAL 28 FEET IN LENGTH (INTERIOR LENGTH SHALL NOT BE LESS THAN 27 FEET, ADJUST EXTERIOR LENGTH AS APPLICABLE) BY NOMINAL 9 FEET HIGH INTERIOR (FLOOR TO CEILING).

**GENERAL NOTES**

1. SEE "PROPOSED ELECTRICAL ONE-LINE FOR VAULT AND AIRFIELD" FOR LOW VOLTAGE INPUT POWER WIRING REQUIREMENTS TO CCR'S (CONSTANT CURRENT REGULATORS). SEE HIGH VOLTAGE WIRING SCHEMATICS FOR CCR OUTPUT WIRING REQUIREMENTS. SEE "AIRFIELD LIGHTING CONTROL WIRING SCHEMATIC" AND FOR CCR CONTROL WIRING REQUIREMENTS. PROVIDE 5 FEET MINIMUM CLEAR WORKING SPACE IN FRONT OF EACH CCR AND EACH SERIES PLUG CUTOUT.
2. CONSTANT CURRENT REGULATORS AND THEIR RESPECTIVE SERIES PLUG CUTOUTS SHALL BE CLEARLY LABELED TO IDENTIFY THE RESPECTIVE REGULATOR DESIGNATION, AND RUNWAY OR TAXIWAY SERVED.
3. SEE ELEVATION VIEWS FOR ADDITIONAL INFORMATION ON PROPOSED EQUIPMENT LAYOUTS.
4. COORDINATE CONDUIT & SLEEVE ENTRANCES THROUGH FLOOR SLAB AND WALLS.

**KEYED NOTES**

- 1 ELECTRIC UTILITY METER WITH SUPPORT HARDWARE PER SERVING ELECTRIC UTILITY COMPANY REQUIREMENTS. ADJUST LOCATION TO COORDINATE WITH VAULT LAYOUT AND CONDUIT TO SERVICE PANELBOARD.
- 2 UTILITY SERVICE CONDUCTORS IN 3" SCHED. 80 PVC C. FROM UTILITY TRANSFORMER TO METER BASE. CONTRACTOR SHALL FURNISH AND INSTALL SERVICE CONDUCTORS AND CONDUIT FROM METER BASE TO SERVICE PANEL. SEE "PROPOSED ELECTRICAL ONE-LINE DIAGRAM FOR VAULT AND AIRFIELD".
- 3 VAULT SERVICE AND DISTRIBUTION PANEL. SEE SCHEDULE.
- 4 AC SURGE PROTECTION DEVICE.
- 5 LIGHTING CONTACTOR PANEL. SEE "LIGHTING CONTACTOR PANEL DETAIL".
- 6 L-854 RADIO CONTROL UNIT. EXTEND RADIO ANTENNA CABLE IN 3/4" GRSC AND MOUNT ANTENNA ABOVE ROOF PEAK OF ADJACENT HANGAR FOR PROPER OPERATION. PROVIDE SCHED 40 PVC NIPPLE AT ENTRY TO VAULT FOR ISOLATION. BOND EXTERIOR METAL CONDUIT TO GND RING WITH PIPE CLAMP AND #2 AWG BARE CU BONDING CONDUCTOR.
- 7 RADIO RELAY INTERFACE PANEL WITH PHOTOCELL BYPASS SWITCH FOR AIRFIELD LIGHTING SYSTEM. SEE "AIRFIELD LIGHTING CONTROL WIRING SCHEMATIC" FOR WIRING REQUIREMENTS. MOUNT PHOTOCELL ABOVE VAULT ROOF LEVEL. FIELD VERIFY LOCATION FOR PROPER CONTROL AND OPERATION. PROVIDE SCHED 40 PVC NIPPLE AT ENTRY TO VAULT FOR ISOLATION. BOND EXTERIOR METAL CONDUIT TO GND RING WITH PIPE CLAMP AND #2 AWG CU BONDING CONDUCTOR.
- 8 ELECTRIC WALL HEATER EH-1, 4000 WATT, 240 VAC, 1 PHASE, SUITABLE FOR SURFACE MOUNTING WITH INTEGRAL THERMOSTAT, Q-MARK MODEL CWH3404, OR EQUAL. HEATER SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCE REQUIREMENTS. LOCATE HEATER SUCH THAT IT IS NOT LESS THAN 8" FROM ADJACENT WALLS OR EQUIPMENT.
- 9 ELECTRIC WALL HEATER EH-2 4000 WATT, 240 VAC, 1 PHASE, SUITABLE FOR SURFACE MOUNTING WITH INTEGRAL THERMOSTAT, Q-MARK MODEL CWH3404 OR APPROVED EQUAL. HEATER SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCE REQUIREMENTS. BOTTOM OF HEATER SHALL BE 8" (MIN.) ABOVE THE UPPER ELECTRICAL WIREWAY. COORDINATE WITH CCR INSTALLATION & FAN INSTALLATION. LOCATE HEATER ON WALL SUCH THAT IT IS NOT DIRECTLY BEHIND CCR. LOCATE HEATER SUCH THAT IT IS NOT LESS THAN 8" FROM ADJACENT WALLS OR EQUIPMENT.
- 10 EXHAUST FAN EF-1, 3100 CFM (MINIMUM) AT .25" STATIC PRESSURE WITH 1/3 HP (MINIMUM), 120 VAC MOTOR, COOK MODEL 20S10D, OR APPROVED EQUAL. INCLUDE WALL HOUSING WITH GUARD, HEAVY DUTY BACK DRAFT DAMPER, ALUMINUM WEATHER-HOOD PAINTED TO MATCH BUILDING EXTERIOR, STAINLESS STEEL INSECT SCREEN, AND FRACTIONAL HP ELECTRICAL DISCONNECT. INSTALL FAN AS HIGH AS POSSIBLE. PROVIDE 120 VAC THERMOSTAT, AT 48" AFF. SEE EXHAUST FAN CONTROL SCHEMATIC FOR WIRING REQUIREMENTS. FAN SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCE REQUIREMENTS.
- 11 INTAKE LOUVER L-1, 24" WIDE BY 48" HIGH INTAKE LOUVER WITH STAINLESS STEEL INSECT SCREEN, FLANGED FRAME, 120 VAC LOW LEAK MOTORIZED DAMPER WITH LIMIT SWITCH, KYNAR FINISH MATCHING BUILDING EXTERIOR, RUSKIN MODEL ELF375DX, OR APPROVED EQUAL. SEE EXHAUST FAN CONTROL SCHEMATIC FOR WIRING REQUIREMENTS. LOUVER / DAMPER SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCE REQUIREMENTS.
- 12 6" BY 6" LOW VOLTAGE WIREWAY. LABEL "LOW VOLTAGE" EVERY 6 FEET. INSTALL ABOVE HIGH VOLTAGE WIREWAY.
- 13 6" BY 6" HIGH VOLTAGE WIREWAY. LABEL "HIGH VOLTAGE" EVERY 6 FEET. INSTALL BELOW LOW VOLTAGE WIREWAY.
- 14 NEW RUNWAY 9-27 CONSTANT CURRENT REGULATOR. SEE GENERAL NOTE 1.
- 15 BACKUP/SPARE CCR FOR RUNWAY 9-27 RELOCATED FROM EXISTING VAULT. SEE GENERAL NOTE 1.
- 16 NEW TAXIWAY CONSTANT CURRENT REGULATOR. SEE GENERAL NOTE 1.
- 17 BACKUP/SPARE CCR FOR TAXIWAY RELOCATED FROM EXISTING VAULT. SEE GENERAL NOTE 1.
- 18 TRANSFER PAIR SERIES PLUG CUTOUTS (TYPE S-1) WITH ENCLOSURE, FOR RUNWAY 9-27.
- 19 100 AMP, 240 VAC, 2P DOUBLE THROW FUSIBLE SAFETY SWITCH FOR RUNWAY 9-27 CCR'S.
- 20 TRANSFER PAIR SERIES PLUG CUTOUTS (TYPE S-1) WITH ENCLOSURE, FOR TAXIWAY.
- 21 60 AMP, 240 VAC, 2P DOUBLE THROW FUSIBLE SAFETY SWITCH FOR TAXIWAY CCR'S.
- 22 3-WAY 3" CONCRETE ENCASED DUCT FROM LOW VOLTAGE WIREWAY TO LOW VOLTAGE MANHOLE. PROVIDE 3-3" PVC COATED GRSC WITH PVC COATED GRSC ELBOWS AT ENTRY TO VAULT. 3" GRSC AND ELBOWS WITH ASPHALT BASED PAINT IS ALSO ACCEPTABLE.
- 23 3-WAY 3" CONCRETE ENCASED DUCT FROM HIGH VOLTAGE WIREWAY TO HIGH VOLTAGE MANHOLE. PROVIDE 3-3" PVC COATED GRSC WITH PVC COATED GRSC ELBOWS AT ENTRY TO VAULT. 3" GRSC AND ELBOWS WITH ASPHALT BASED PAINT IS ALSO ACCEPTABLE.
- 24 VEGETATION BARRIER CONSISTING OF A 6" (MINIMUM) IDOT GRADATION CA-7 SURFACE OVER FILTER OR LANDSCAPING FABRIC. PROPOSED SURFACE TREATMENT WILL COVER ENTIRE AREA BENEATH VAULT STRUCTURE AS WELL AS 18" AROUND THE PERIMETER OF THE BUILDING. THE STONE AND FABRIC AS WELL AS ANY EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS TASK WILL BE CONSIDERED INCIDENTAL TO THE INSTALLATION OF THE PROPOSED ELECTRICAL VAULT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- 25 ENTRANCE PAD AND 4' WIDE SIDEWALK CONSTRUCTED OF 6" MIN. CONCRETE SLAB W/ 6X6-W5XW5 WELDED WIRE FABRIC ON A COMPACTED SUBGRADE. MINIMUM DIMENSIONS OF PAD WILL BE 7'Wx5'-6"Dx6"H, SLOPED AT A MIN. OF 0.5"/FT AWAY FROM THE VAULT ENTRANCE. THE CONCRETE PAD WILL BE PLACED AT LEAST 3" INTO THE EXISTING GRADE. STEP INTO VAULT BUILDING SHALL NOT EXCEED 7". PCC USED TO CONSTRUCT THE PAD WILL CONFORM TO ITEM 610. ALL MATERIALS, LABOR AND EQUIPMENT USED TO CONSTRUCT THE PAD AND 4' WIDE SIDEWALK INCLUDING ANY GRADING REQUIRED WILL BE CONSIDERED INCIDENTAL TO THE CONSTRUCTION OF THE PROPOSED ELECTRICAL VAULT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- 26 THE NUMBER, SIZE, DEPTH, REINFORCEMENT, AND LOCATION OF THE PROPOSED CONCRETE PIERS WILL BE COORDINATED WITH THE MANUFACTURER OF THE PROPOSED ELECTRICAL VAULT BUILDING. THE TOP OF THE PROPOSED PIERS WILL BE AT LEAST 4" ABOVE THE EXISTING GRADE.
- 27 FURNISH AND INSTALL A UL RATED, 10 POUND CARBON DIOXIDE FIRE EXTINGUISHER SUITABLE FOR USE ON CLASS C FIRES AND A 10 POUND CLASS 4A:80B:C DRY CHEMICAL ABC FIRE EXTINGUISHER SUITABLE FOR USE ON CLASS A,B,C FIRES, IN THE VAULT SHELTER. PER NFPA 10 "PORTABLE FIRE EXTINGUISHERS" CLASS C ARE FOR FIRES THAT INVOLVE ENERGIZED ELECTRICAL EQUIPMENT. FIRE EXTINGUISHERS SHALL BE MADE IN THE UNITED STATES OF AMERICA TO COMPLY WITH BUY AMERICAN REQUIREMENT. FIRE EXTINGUISHER TYPE CO2 SHALL BE AMEREX MODEL 330, ANSUL SENTRY 10 MODEL CD10A-1 OR APPROVED EQUAL. FIRE EXTINGUISHER DRY CHEMICAL TYPE ABC SHALL BE AMEREX MODEL B456, OR APPROVED EQUAL. PROVIDE WALL MOUNTING BRACKET FOR EACH FIRE EXTINGUISHER. CONFIRM MODEL NUMBERS WITH THE RESPECTIVE FIRE EXTINGUISHER MANUFACTURER.

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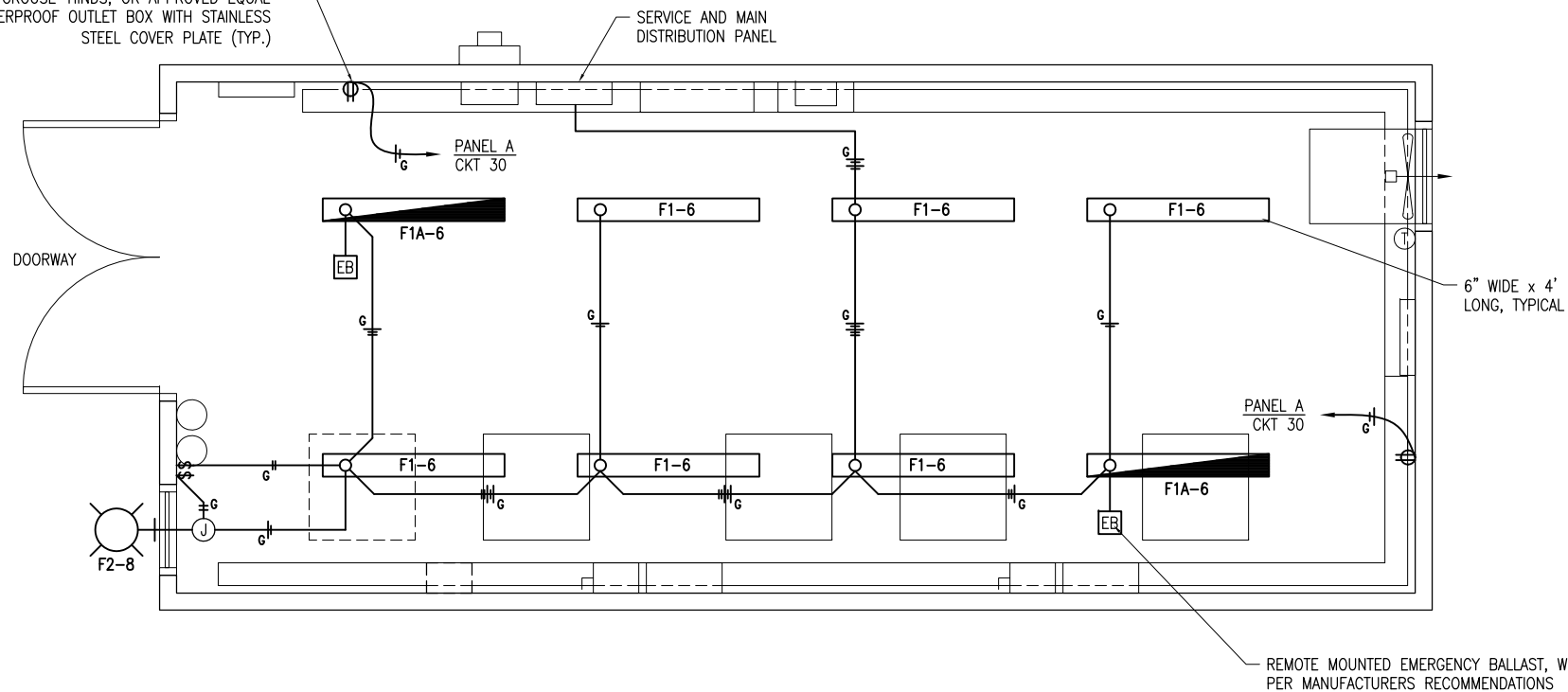
REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

PROPOSED VAULT ELECTRICAL EQUIPMENT PLAN

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120 VAC, 20 AMP SPEC GRADE, NEMA 5-20R, DUPLEX CONVENIENCE RECEPTACLE IN A DIE CAST CONSTRUCTION HUBBELL/RACO/BELL, APPLETON, CROUSE-HINDS, OR APPROVED EQUAL WEATHERPROOF OUTLET BOX WITH STAINLESS STEEL COVER PLATE (TYP.)



NOTES

- 15 AMP & 20 AMP BRANCH CIRCUITS FOR LIGHTING & RECEPTACLES SHALL USE #12 AWG THWN (MIN.). EMT MAY BE USED FOR LIGHTING AND RECEPTACLE BRANCH CIRCUITS.
- LIGHT FIXTURES SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN REQUIREMENTS. PROVIDE CERTIFICATION OF MANUFACTURE IN THE UNITED STATES WITH SHOP DRAWINGS SUBMITTAL.
- ADJUST RECEPTACLE LOCATIONS WHERE NECESSARY TO ACCOMMODATE EQUIPMENT LAYOUT.
- TEST EMERGENCY LIGHTING AND CONFIRM PROPER OPERATION.
- "USPOM" SUFFIX ON LITHONIA LIGHT FIXTURE CATALOG NUMBERS INDICATES UNITED STATES POINT OF MANUFACTURE.



Vault Lighting and Receptacle Plan

SCALE 1/2" = 1'-0"  
 1 0 2 4 FEET

LIGHTING FIXTURE SCHEDULE						
FIXT. TYPE	DESCRIPTION	MANUFACTURER & CATALOG NO.	LAMPS/WATTS	VOLTS	MOUNTING	REMARKS
F1	4 FT. WET LOCATION LISTED ENCLOSED AND GASKETED INDUSTRIAL FLUORESCENT LIGHT FIXTURE, IMPACT RESISTANT, UV RESISTANT REINFORCED POLYESTER FIBERGLASS HOUSING, HIGH IMPACT ACRYLIC DIFFUSER, RAPID START COLD WEATHER 0 DEG. F. ELECTRONIC BALLAST WITH LESS THAN OR EQUAL TO 10% THD.	LITHONIA: DMW-2-32-AR-120-CW-GEB10RS-WLF-USPOM	2-32W T8 4100K 59 TOTAL INPUT WATTS	120	SURFACE TO HARD CEILING	PROVIDE WET LOCATION FITTINGS INSTALLED IN TOP OF FIXTURE.
F1A	SAME AS F1 EXCEPT PROVIDE AN EMERGENCY BALLAST CAPABLE OF OPERATING 2 LAMPS FOR 90 MINUTES AT 1100-1400 TOTAL LUMENS, BODINE #B50ST. NOTE BALLAST MIGHT REQUIRE TO BE REMOTE MOUNTED NEAR FIXTURE AS INDICATED ON THE PLANS.	LITHONIA: DMW-2-32-AR-120-CW-GEB10RS-WLF-USPOM	2-32W T8 4100K 59 TOTAL INPUT WATTS	120	SURFACE TO HARD CEILING	PROVIDE WET LOCATION FITTINGS INSTALLED IN TOP OF FIXTURE.
F2	COMPACT FLUORESCENT WALL-PAK, ONE PIECE INJECTION MOLDED UV STABILIZED POLYCARBONATE HOUSING, HIGH PERFORMANCE SPECULAR ANODIZED SEGMENTED REFLECTOR, ONE PIECE HIGH TEMPERATURE SILICONE GASKET, MEDIUM BRONZE FINISH, HIGH POWERFACTOR ELECTRONIC BALLAST WITH LESS THAN OR EQUAL TO 10% THD, UL LISTED FOR WET LOCATIONS, FUSED.	LITHONIA: TWA-42TRT-120-SF-CR-DMB-LPI-USPOM	1-42W TRT 4100K 47 TOTAL INPUT WATTS	120	SURFACE TO WALL ABOVE AND TO THE LEFT OF EXTERIOR DOOR APPROXIMATELY 4 INCHES ABOVE TOP OF DOOR FRAME. ADJUST LOCATION TO ACCOMMODATE DOORWAY OVERHANG.	CONNECT TO WALL SWITCH LOCATED ON THE INSIDE OF THE BUILDING.

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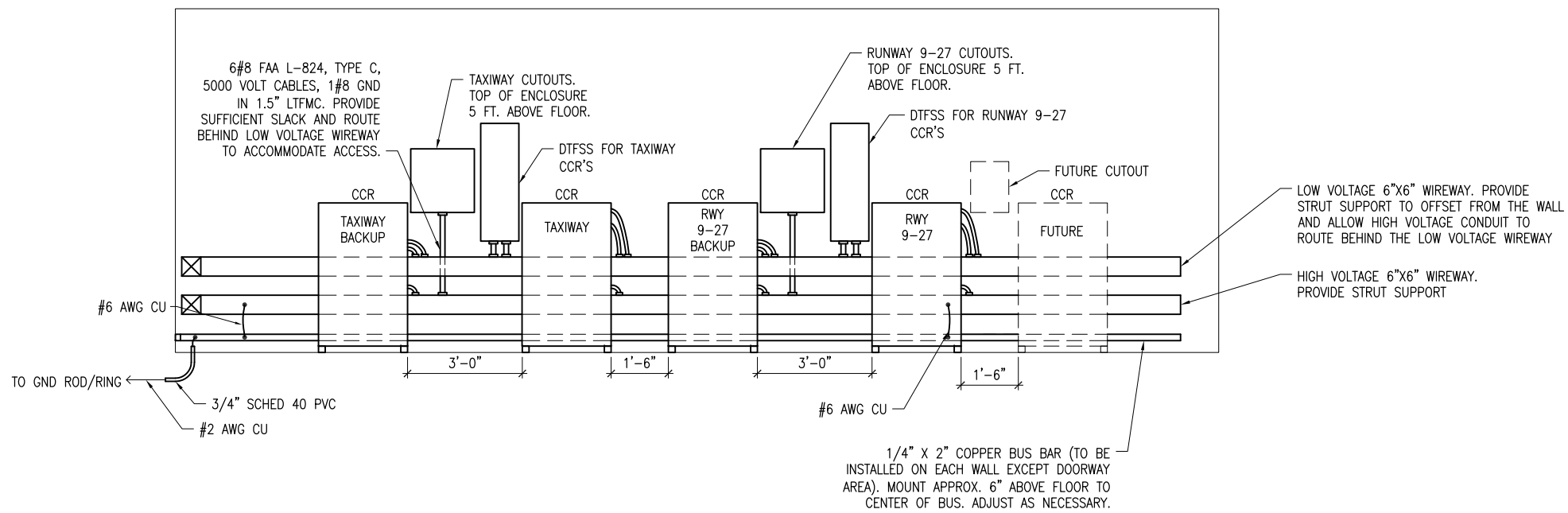


REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

PROPOSED VAULT LIGHTING AND RECEPTACLE PLAN

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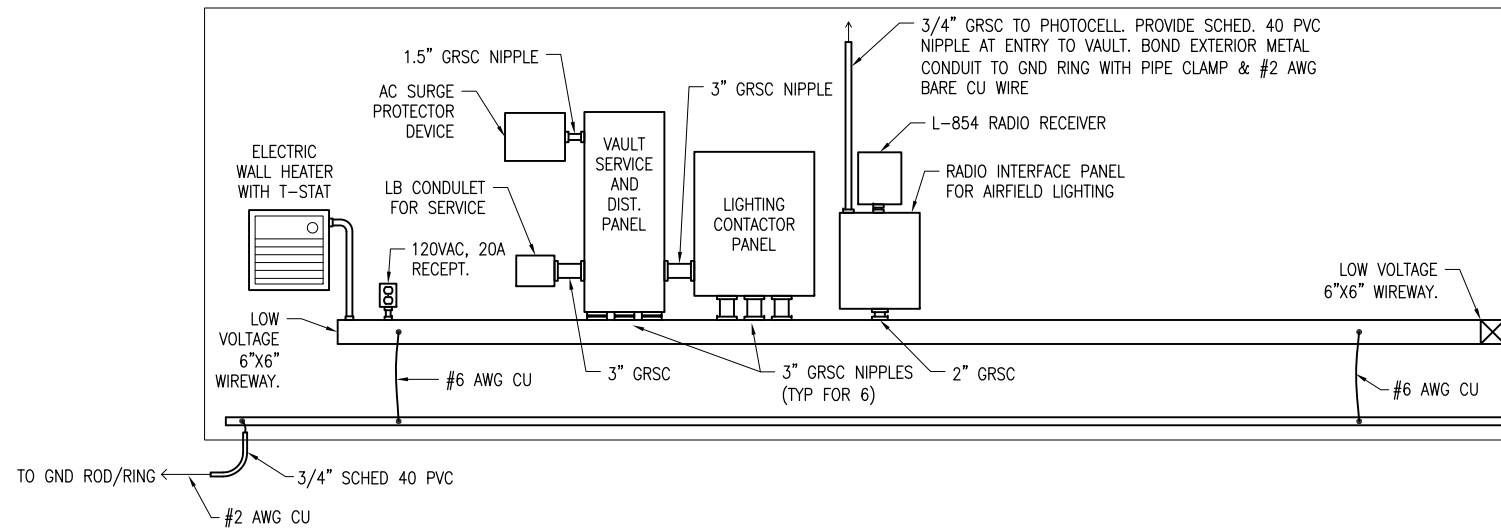




**VAULT EAST WALL ELEVATION**

SCALE 1/2"=1'-0"

1 0 2 4 FEET



**VAULT WEST WALL ELEVATION**

SCALE 1/2"=1'-0"

1 0 2 4 FEET

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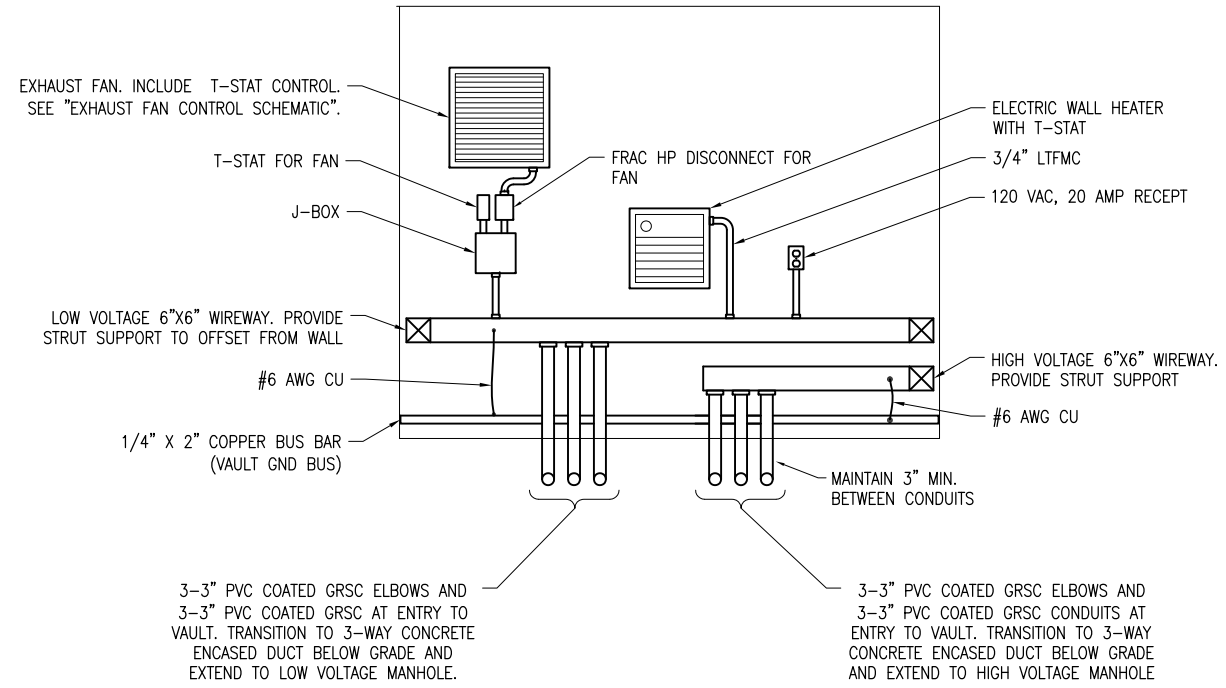
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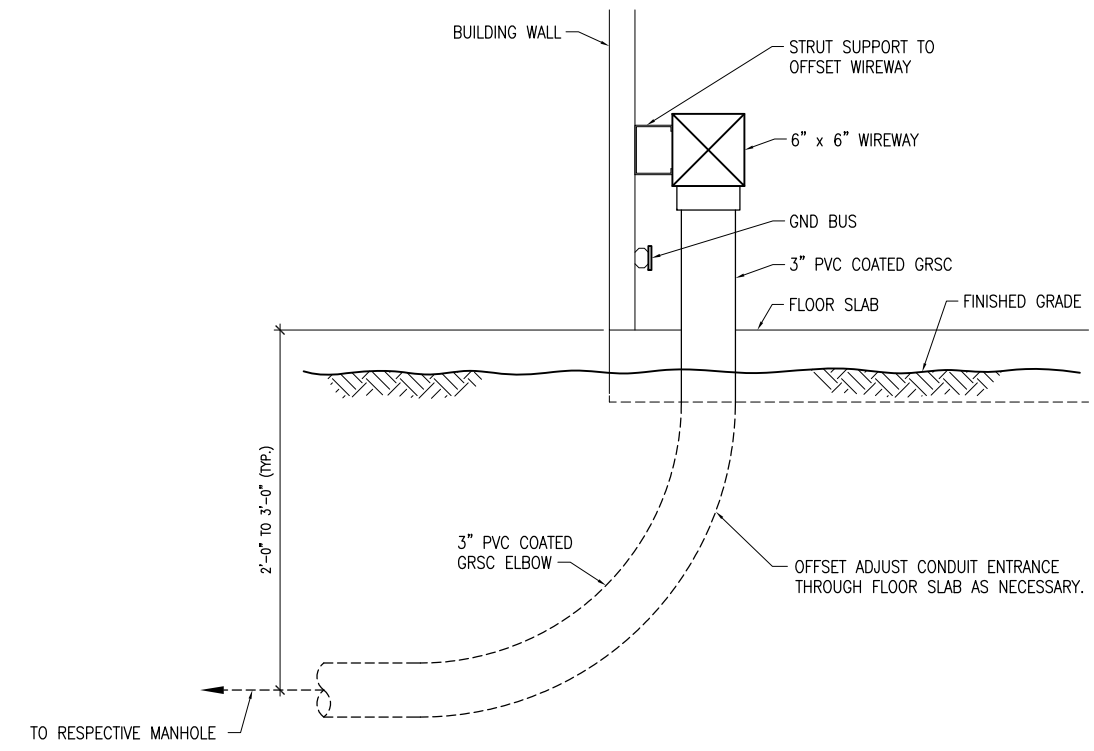
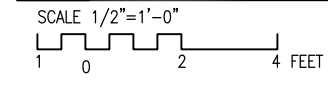
REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

PROPOSED AIRPORT VAULT WALL ELEVATIONS (SHEET 1)

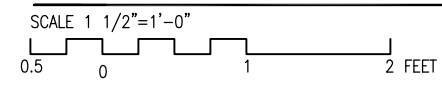
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VAULT NORTH WALL ELEVATION



CONDUIT ENTRANCE DETAIL



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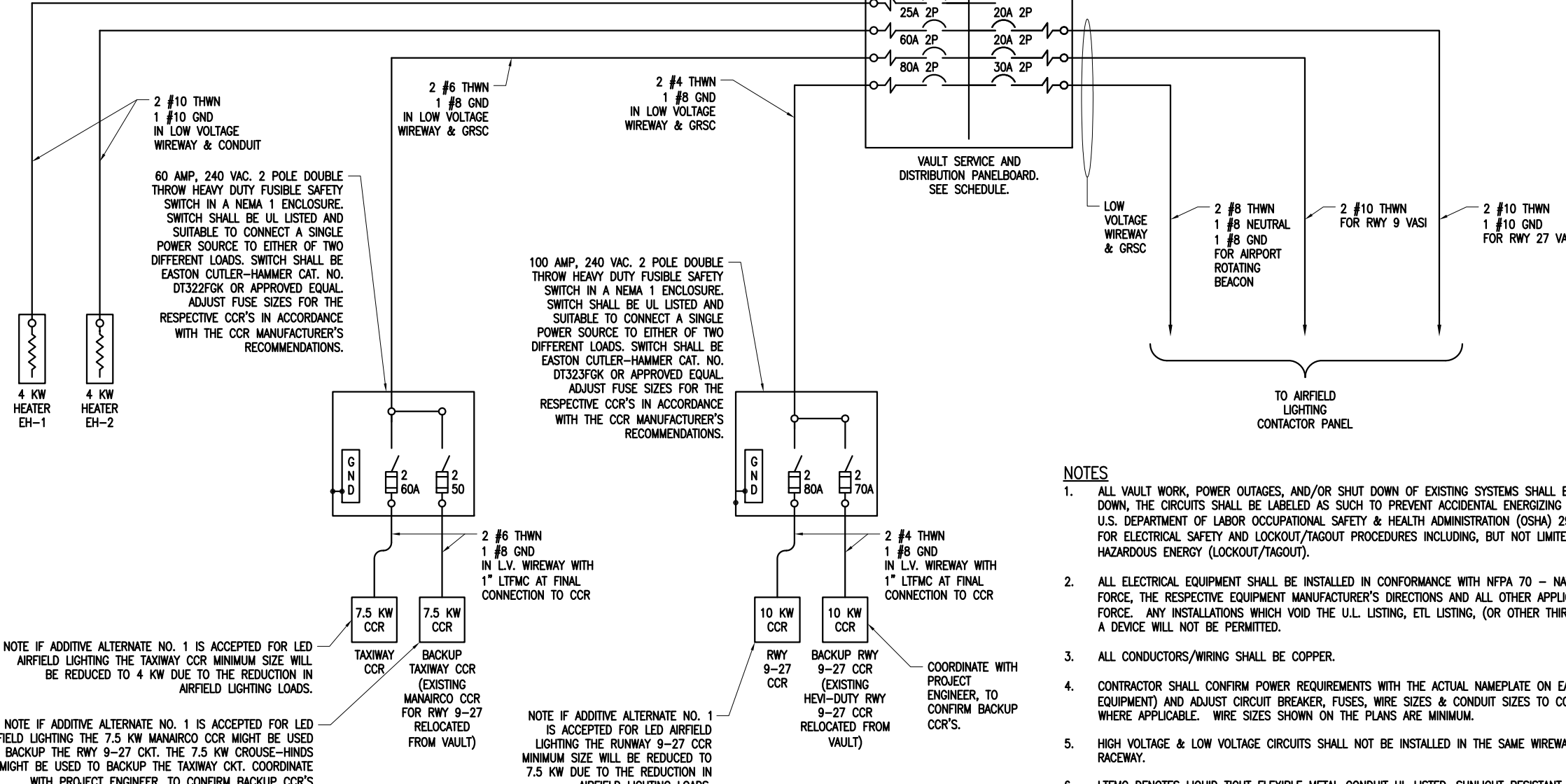
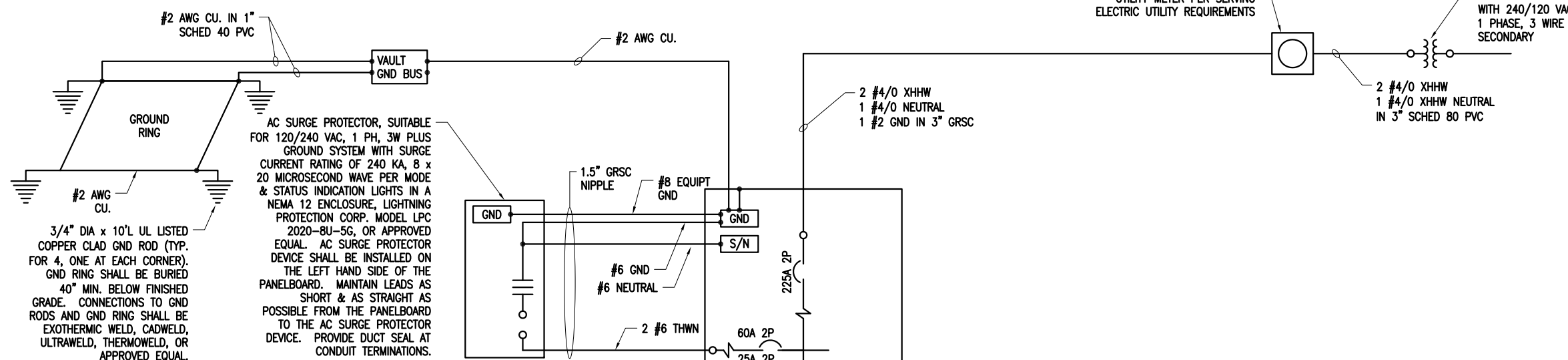
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REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

PROPOSED AIRPORT VAULT WALL ELEVATIONS (SHEET 2)



- NOTES**
1. ALL VAULT WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
  2. ALL ELECTRICAL EQUIPMENT 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.
  3. ALL CONDUCTORS/WIRING SHALL BE COPPER.
  4. CONTRACTOR SHALL CONFIRM POWER REQUIREMENTS WITH THE ACTUAL NAMEPLATE ON EACH CONSTANT CURRENT REGULATOR (OR OTHER RESPECTIVE EQUIPMENT) AND ADJUST CIRCUIT BREAKER, FUSES, WIRE SIZES & CONDUIT SIZES TO CONFORM WITH NEC & MANUFACTURER'S RECOMMENDATIONS WHERE APPLICABLE. WIRE SIZES SHOWN ON THE PLANS ARE MINIMUM.
  5. HIGH VOLTAGE & LOW VOLTAGE CIRCUITS SHALL NOT BE INSTALLED IN THE SAME WIREWAY, CONDUIT, HANDHOLE, MANHOLES, JUNCTION BOX, OR RACEWAY.
  6. 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.
  7. CONTRACTOR SHALL COORDINATE NEW ELECTRICAL SERVICE WITH THE SERVING ELECTRIC UTILITY AND THE AIRPORT MANAGER. CONTRACTOR SHALL CONFIRM REQUIREMENTS WITH SERVING ELECTRIC UTILITY COMPANY. THE SERVING ELECTRIC UTILITY IS AMEREN.
  8. ALL WORK SHOWN ON THIS SHEET SHALL BE PAID FOR UNDER ITEM AR109200 INSTALL ELECTRICAL EQUIPMENT PER LUMP SUM.

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

NOTE IF ADDITIVE ALTERNATE NO. 1 IS ACCEPTED FOR LED AIRFIELD LIGHTING THE TAXIWAY CCR MINIMUM SIZE WILL BE REDUCED TO 4 KW DUE TO THE REDUCTION IN AIRFIELD LIGHTING LOADS.

NOTE IF ADDITIVE ALTERNATE NO. 1 IS ACCEPTED FOR LED AIRFIELD LIGHTING THE 7.5 KW MANARCO CCR MIGHT BE USED TO BACKUP THE RWY 9-27 CKT. THE 7.5 KW CROUSE-HINDS CCR MIGHT BE USED TO BACKUP THE TAXIWAY CKT. COORDINATE WITH PROJECT ENGINEER, TO CONFIRM BACKUP CCR'S

NOTE IF ADDITIVE ALTERNATE NO. 1 IS ACCEPTED FOR LED AIRFIELD LIGHTING THE RUNWAY 9-27 CCR MINIMUM SIZE WILL BE REDUCED TO 7.5 KW DUE TO THE REDUCTION IN AIRFIELD LIGHTING LOADS.

COORDINATE WITH PROJECT ENGINEER, TO CONFIRM BACKUP CCR'S.

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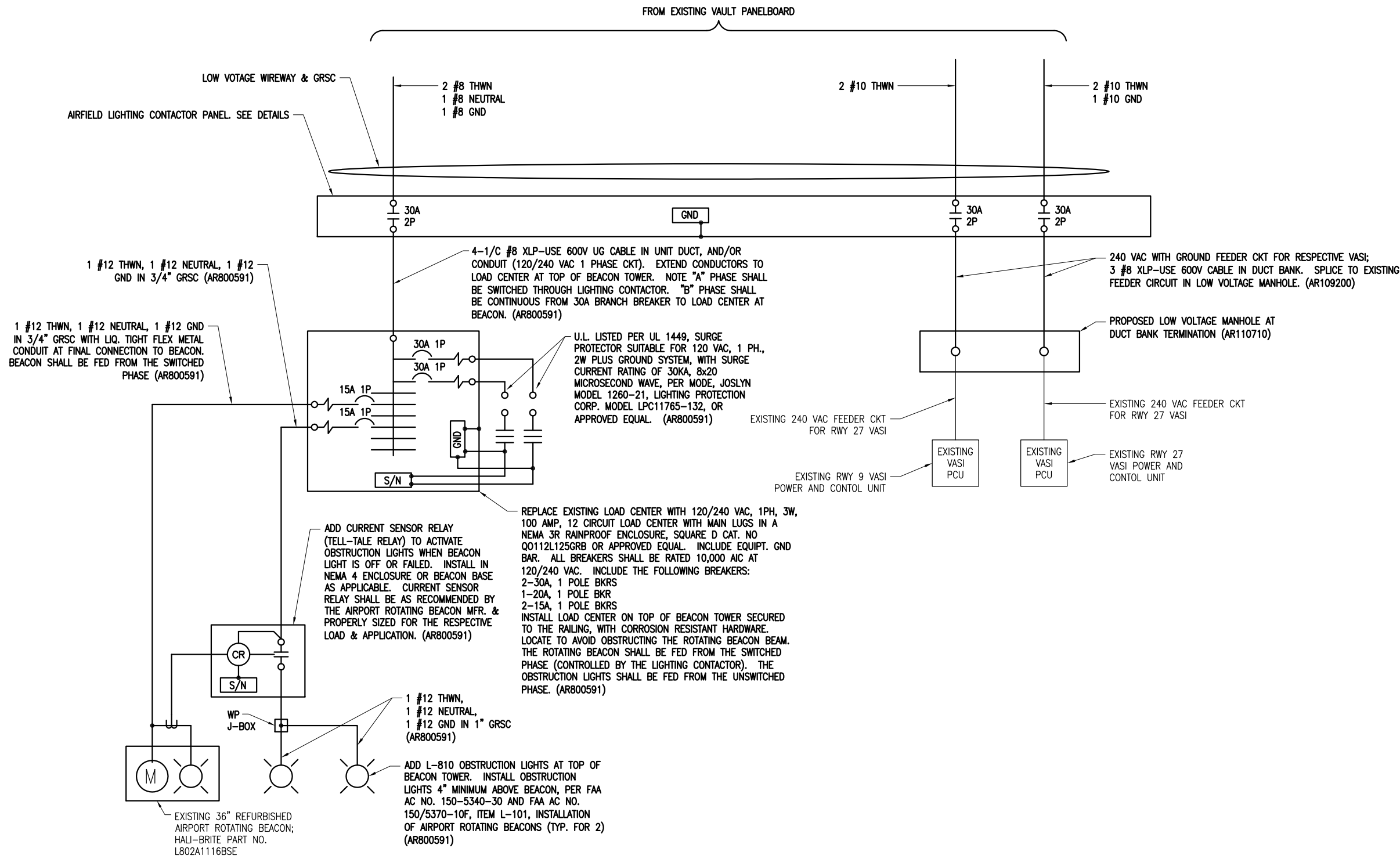
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PROPOSED ELECTRICAL ONE-LINE DIAGRAM FOR VAULT & AIRFIELD SHEET 1

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PROPOSED ELECTRICAL ONE-LINE DIAGRAM FOR  
VAULT AND AIRFIELD (CONTINUED)

NOTE:

1. PROVIDE BOOST TRANSFORMER FOR EACH VASI CIRCUIT WHERE VOLTAGE DROP FROM VAULT TO VASI PCU EXCEEDS 5%. BOOST TRANSFORMER SHALL BE INSTALLED IN THE VAULT. EXISTING BOOST TRANSFORMERS MAY BE RELOCATED TO NEW VAULT WHERE DETERMINED SUITABLE FOR USE.

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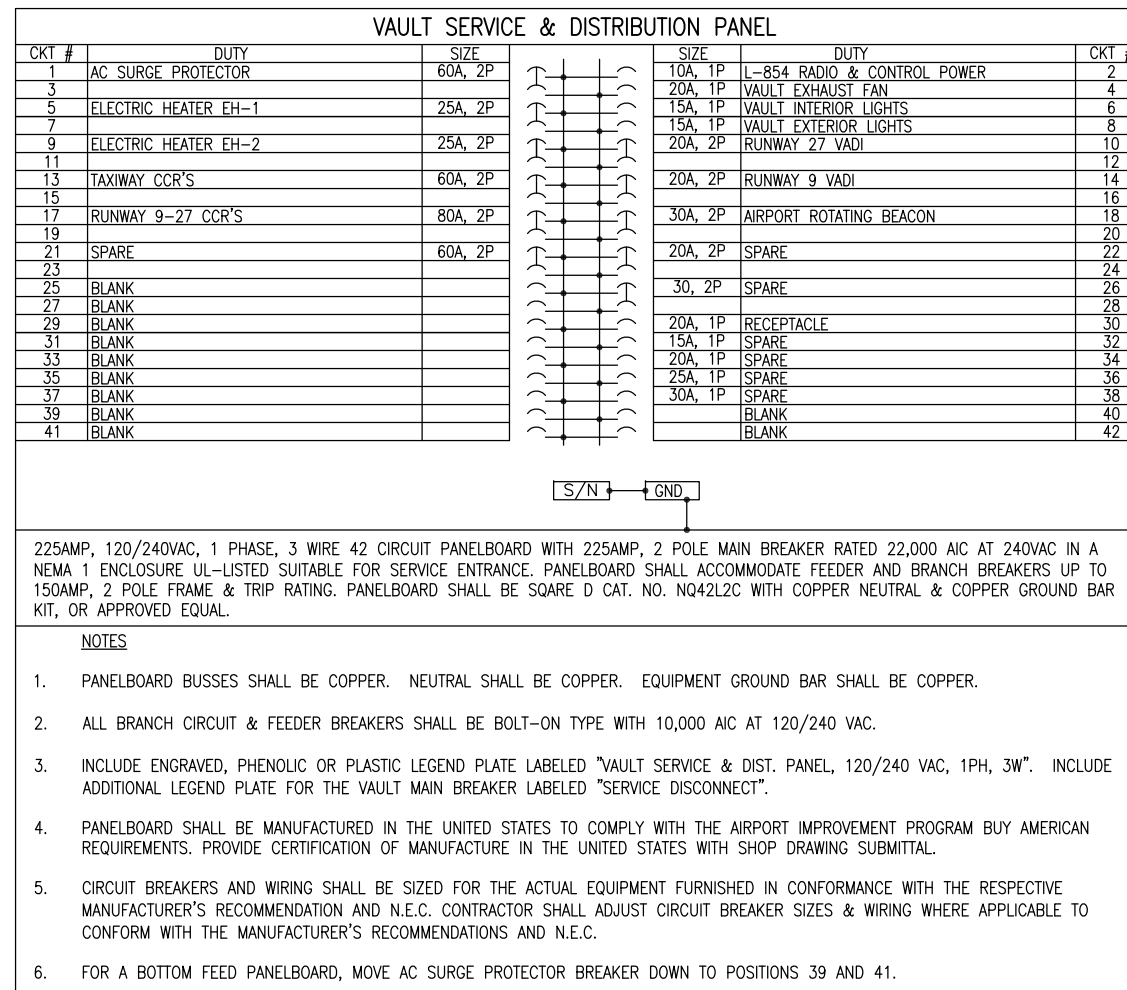
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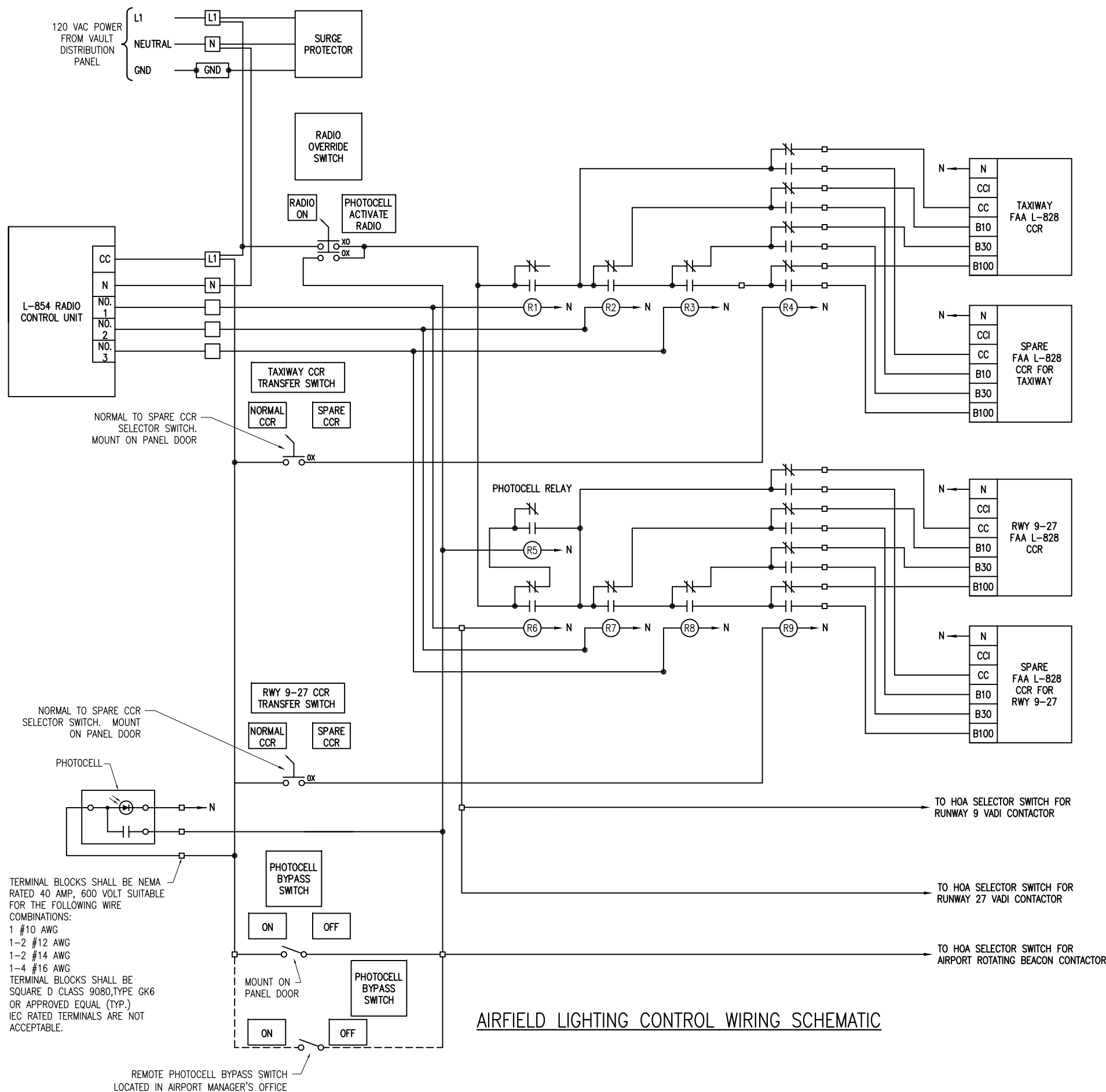
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Hanson Proj. No. 12A0053 Filename E-608-SCHD.dwg Scale NOT TO SCALE Date 06/17/13	
LAYOUT	KNL 01/17/13
DRAWN	TRR 01/21/13
REVIEWED	KNL/CAH 02/04/13



REPLACE VAULT, AIRFIELD  
 LIGHTING AND GUIDANCE SIGNS

VAULT PANELBOARD  
 SCHEDULE



AIRFIELD LIGHTING CONTROL WIRING SCHEMATIC

TERMINAL BLOCKS SHALL BE NEMA RATED 40 AMP, 600 VOLT SUITABLE FOR THE FOLLOWING WIRE COMBINATIONS:  
 1 #10 AWG  
 1-2 #12 AWG  
 1-2 #14 AWG  
 1-4 #16 AWG  
 TERMINAL BLOCKS SHALL BE SQUARE D CLASS 9080, TYPE GK6 OR APPROVED EQUAL (TYP.) IEC RATED TERMINALS ARE NOT ACCEPTABLE.

REMOTE PHOTOCELL BYPASS SWITCH LOCATED IN AIRPORT MANAGER'S OFFICE

NOTES:

- RELAY INTERFACE CONTROL PANEL SHALL BE MANUFACTURED BY AN FAA APPROVED L-821 PANEL BUILDER OR A UL 508 INDUSTRIAL CONTROL PANEL BUILDER, AND SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN REQUIREMENT AND THE "BUY AMERICAN ACT". RELAY INTERFACE CONTROL PANEL SHALL BE A SEPARATE PANEL. DO NOT COMBINE WITH LIGHTING CONTACTOR PANEL.
- PANEL SHALL BE IN A NEMA 12 ENCLOSURE WITH HINGED COVER. DRILL HOLE IN BOTTOM OF ENCLOSURE TO ALLOW CONDENSATION TO ESCAPE.
- EXTERNAL CONTROL CABLE SHALL BE NO. 12 AWG COPPER, 600 VOLT CABLE. ALL PANEL INTERIOR CONTROL CABLE SHALL BE MINIMUM 16 AWG, COPPER, 600 VOLT CABLE.
- IN THE AUTOMATIC MODE OF OPERATION THE RUNWAY 9-27 CONSTANT CURRENT REGULATORS (PRIMARY UNIT & SPARE UNIT) SHALL BE CONTROLLED BY THE PHOTOCELL & THE L-854 RADIO CONTROL UNIT IN THE FOLLOWING MANNER:  
 PHOTOCELL - 10% BRIGHTNESS & ACTIVATE RADIO CONTROL  
 5 CLICKS - 30% BRIGHTNESS  
 7 CLICKS - 100% BRIGHTNESS
- IN THE AUTOMATIC MODE OF OPERATION THE TAXIWAY CONSTANT CURRENT REGULATOR SHALL BE CONTROLLED BY THE PHOTOCELL & THE L-854 RADIO CONTROL UNIT IN THE FOLLOWING MANNER:  
 PHOTOCELL -ACTIVATE RADIO CONTROL  
 3 CLICKS -10% BRIGHTNESS  
 5 CLICKS -30% BRIGHTNESS  
 7 CLICKS -100% BRIGHTNESS
- THE RUNWAY 9-27 VADI CIRCUITS WILL BE CONTROLLED IN THE AUTOMATIC MODE BY THE L-854 RADIO CONTROL UNIT IN THE FOLLOWING MANNER.  
 CONFIRM CONTROL WITH AIRPORT MANAGER.  
 3 CLICKS - ON  
 5 CLICKS - REMAIN ON  
 7 CLICKS - REMAIN ON
- THE RADIO OVERRIDE SWITCH WILL ACTIVATE L-854 RADIO CONTROL 24 HOURS PER DAY IN THE "RADIO ON" POSITION. THE PHOTOCELL WILL ACTIVATE RADIO CONTROL IN THE "PHOTOCELL ACTIVATE RADIO" POSITION.
- IN THE AUTOMATIC MODE OF OPERATION THE AIRPORT ROTATING BEACON SHALL BE ACTIVATED BY THE PHOTOCELL OR PHOTOCELL BYPASS SWITCH.
- EQUIPMENT GROUND WIRES SHALL BE INCLUDED WITH EACH BRANCH CIRCUIT & EACH CONTROL CIRCUIT.
- INCLUDE PHOTOCELL BYPASS SWITCH, AND REMOTE PHOTOCELL BYPASS SWITCH TO BE LOCATED IN THE ADMINISTRATION BLDG.
- SURGE PROTECTOR SHALL BE UL LISTED PER UL 1449, SUITABLE FOR 120 VAC, 1 PH, 2 WIRE PLUS GROUND SYSTEM WITH SURGE CURRENT RATING OF 40 KA (MIN.), 8x20 MICROSECOND WAVE, AND STATUS INDICATION LIGHTS IN A WEATHERPROOF HOUSING, JOSLYN MODEL 1260-21, OR APPROVED EQUAL. MAINTAIN LEADS AS SHORT & AS STRAIGHT AS POSSIBLE. INCLUDE MOUNTING BRACKET.
- INCLUDE EQUIPMENT GROUND BAR, ILSCO D167-12 OR EQUAL
- CONTROL RELAYS SHALL HAVE 10 AMP CONTACT RATINGS AT 240 VAC WITH 120 VAC COILS. PROVIDE 3 SPARE RELAYS FOR EACH TYPE USED IN THE RELAY INTERFACE PANEL.
- COLOR CODING FOR THE CONTROL WIRING TO EACH CONSTANT CURRENT REGULATOR SHALL BE CONSISTENT FOR ALL REGULATORS. COLOR CODING SHALL BE AS FOLLOWS:  
 CC -RED  
 10% -ORANGE  
 30% -YELLOW  
 100% -BLUE  
 NEUTRAL -WHITE  
 EQUIPT. GND -GREEN  
 ALSO TAG THE CONTROL WIRES WITH THE RESPECTIVE DESIGNATION (CC, 10%, 30%, 100%)
- "N" DESIGNATES NEUTRAL CONNECTION OR NEUTRAL CONDUCTOR.

REVISION	DATE	DESCRIPTION
06/12/13		REMOVED PAPER/SASIS TO REMAIN

MACOMB MUNICIPAL AIRPORT  
 MACOMB, ILLINOIS  
 BLOCK GRANT PROJ.: 3-17-0064-B21  
 IL PROJ.: MGB-4206

Hanson Proj. No. 12A0053	Revision	01/13/13
Filename E-602-SCM.dwg	Scale	NOT TO SCALE
Drawn	TRR	11/14/12
Reviewed	KNL/CAH	02/04/13

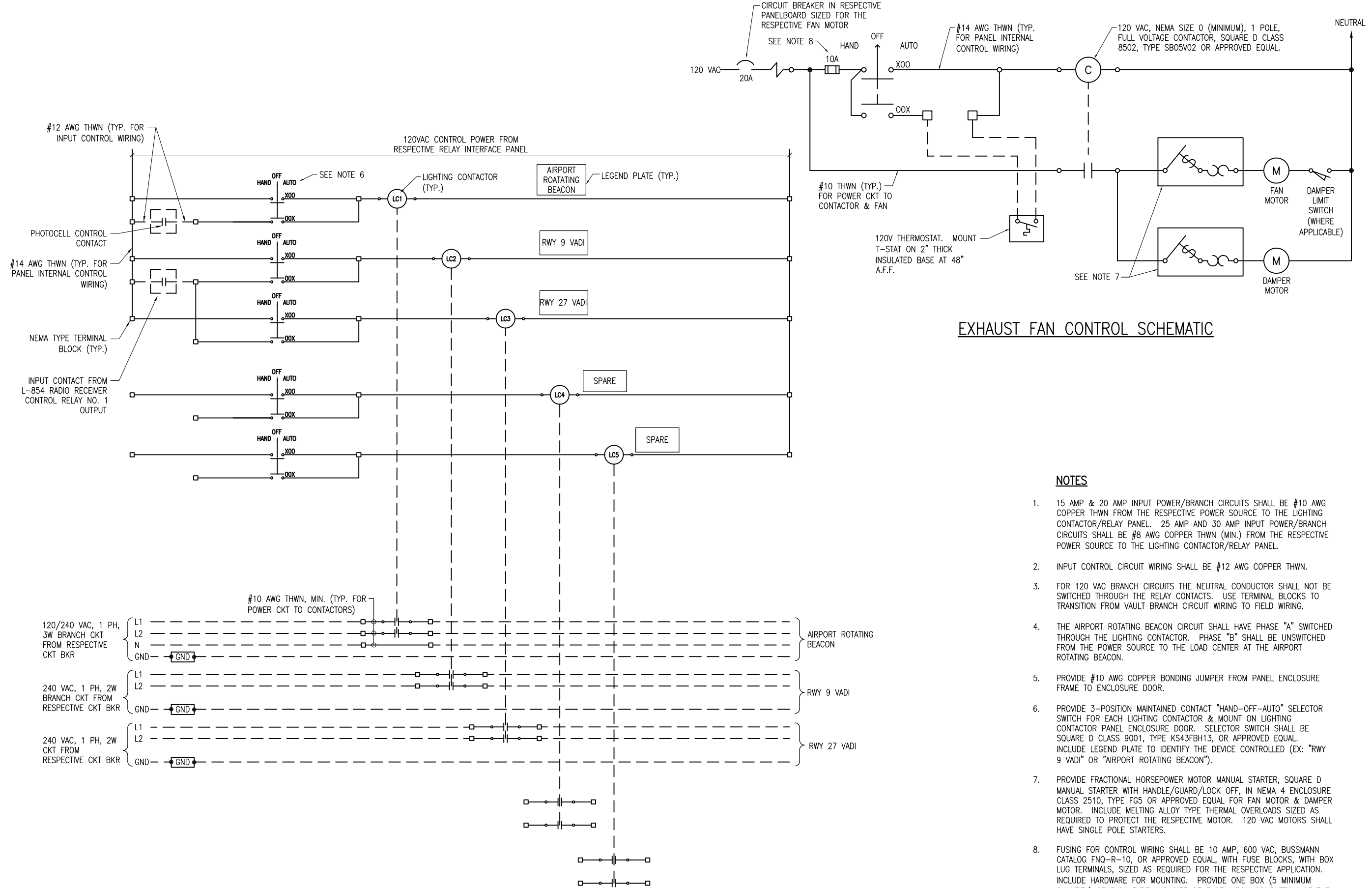


REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS  
 AIRFIELD LIGHTING CONTROL WIRING SCHEMATIC

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EXHAUST FAN CONTROL SCHEMATIC

CONTROL PANEL FOR AIRFIELD NAVAIDS SCHEMATIC

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. 25 AMP AND 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 CIRCUIT WIRING 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 KS43FB13, OR APPROVED EQUAL. INCLUDE LEGEND PLATE TO IDENTIFY THE DEVICE CONTROLLED (EX: "RWY 9 VADI" OR "AIRPORT ROTATING BEACON").
- PROVIDE FRACTIONAL HORSEPOWER MOTOR MANUAL STARTER, SQUARE D MANUAL STARTER WITH HANDLE/GUARD/LOCK OFF, IN NEMA 4 ENCLOSURE CLASS 2510, TYPE FG5 OR APPROVED EQUAL FOR FAN MOTOR & DAMPER MOTOR. INCLUDE MELTING ALLOY TYPE THERMAL OVERLOADS SIZED AS REQUIRED TO PROTECT THE RESPECTIVE MOTOR. 120 VAC MOTORS SHALL HAVE SINGLE POLE STARTERS.
- FUSING FOR CONTROL WIRING SHALL BE 10 AMP, 600 VAC, BUSSMANN CATALOG FNQ-R-10, OR APPROVED EQUAL, WITH FUSE BLOCKS, WITH BOX LUG TERMINALS, SIZED AS REQUIRED FOR THE RESPECTIVE APPLICATION. INCLUDE HARDWARE FOR MOUNTING. PROVIDE ONE BOX (5 MINIMUM QUANTITY) OF EACH TYPE AND SIZE OF FUSE, UPON COMPLETION OF THE JOB FOR USE AS SPARES.

REVISION	DATE	REMOVED PARTS/VASIS TO REMAIN
06/12/13		

MACOMB MUNICIPAL AIRPORT  
 MACOMB, ILLINOIS  
 BLOCK GRANT PROJ.: 3-17-0064-B21  
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Hanson Proj. No. 1200053	File Name E-603-SCM.dwg	Scale AS SHOWN	Date 06/17/13
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REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS  
 LIGHTING CONTACTOR PANEL SCHEMATIC

REVISION	DATE	DESCRIPTION
06/12/13		REMOVED PAPER/SASIS TO REMAIN

MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS

IL PROJ.: MOB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21

Hanson Proj. No. 12A0053	Scale AS SHOWN	Date 06/17/13
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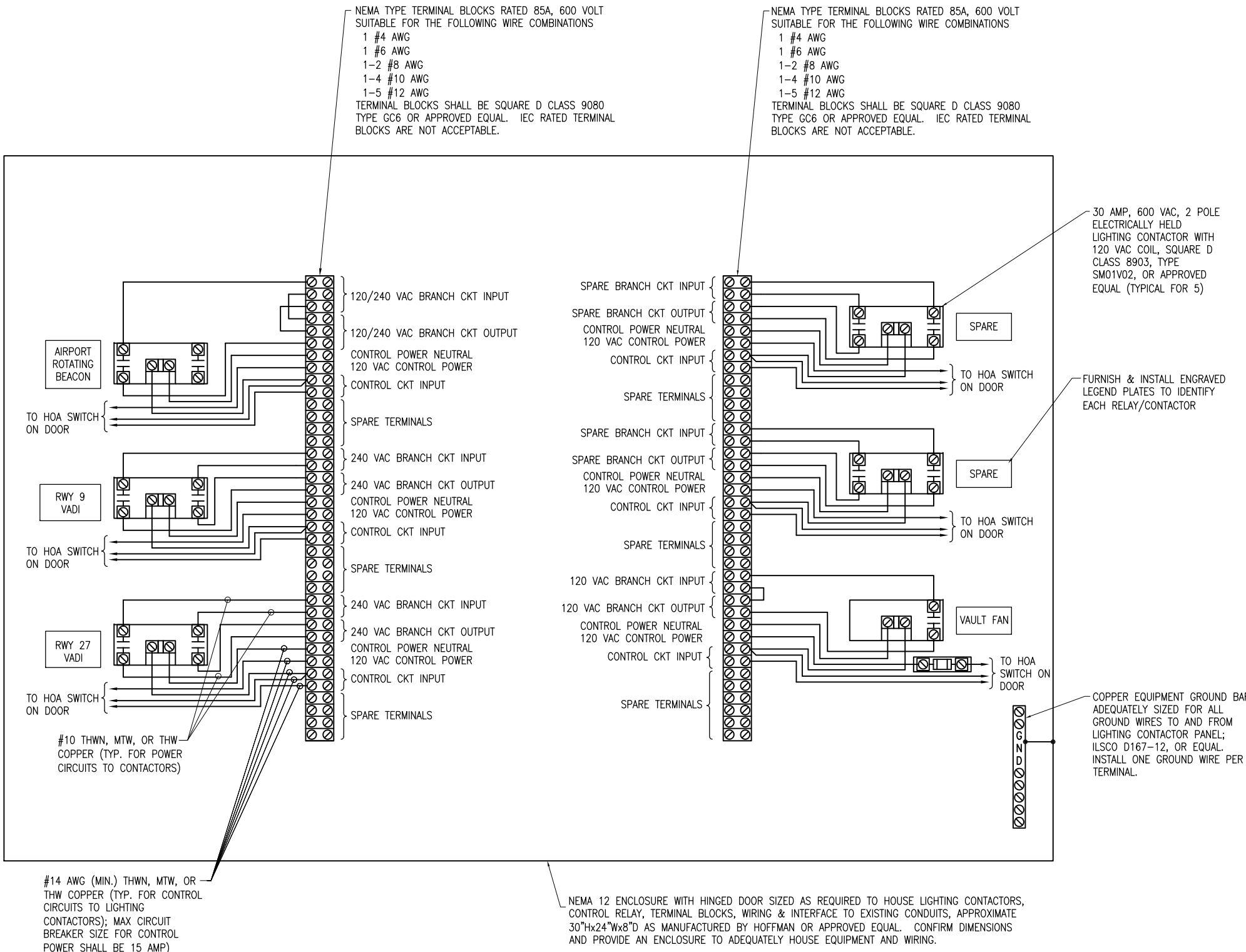


REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

LIGHTING CONTACTOR PANEL DETAIL

**NOTES**

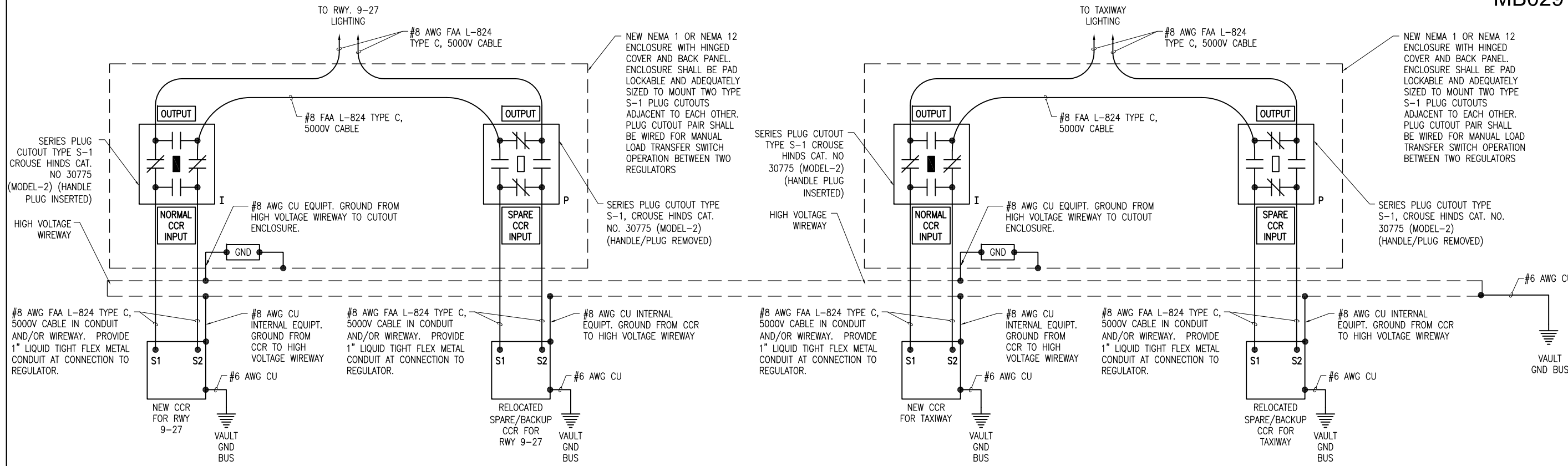
- 15 AMP & 20 AMP INPUT POWER/BRANCH CIRCUITS SHALL BE #10 AWG COPPER THWN FROM THE RESPECTIVE POWER SOURCE TO THE LIGHTING CONTACTOR PANEL. 30 AMP INPUT POWER/BRANCH CIRCUITS SHALL BE #8 AWG COPPER THWN (MIN.) FROM THE RESPECTIVE POWER SOURCE TO THE LIGHTING CONTACTOR PANEL.
- INPUT CONTROL CIRCUITS 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: "RWY 9 VADI" OR "AIRPORT ROTATING BEACON").
- SEE "LIGHTING CONTACTOR SCHEMATIC" AND "EXHAUST FAN CONTROL SCHEMATIC" FOR ADDITIONAL INFORMATION ON WIRING.
- FUSING FOR FAN CIRCUIT CONTROL WIRING SHALL BE 10 AMP, 600 VAC, BUSSMANN CATALOG FNQ-R-10, OR APPROVED EQUAL, WITH FUSE BLOCKS, WITH BOX LUG TERMINALS, SIZED AS REQUIRED FOR THE RESPECTIVE APPLICATION. INCLUDE HARDWARE FOR MOUNTING. PROVIDE ONE BOX (5 MINIMUM QUANTITY) OF EACH TYPE AND SIZE OF FUSE, UPON COMPLETION OF THE JOB FOR USE AS SPARES.
- INCLUDE LEGEND PLATE ON CONTROL PANEL ENCLOSURE OUTER DOOR LABELED "NOTICE: CONTACTORS HAVE REMOTE LOCATED CONTROLS AND MAY ACTIVATE AT ANY TIME".
- 120/240 VAC PHASE "A" CONDUCTORS SHALL HAVE BLACK COLORED INSULATION. 120/240 VAC PHASE "B" CONDUCTORS SHALL HAVE RED COLORED INSULATION. NEUTRAL CONDUCTORS SHALL HAVE WHITE COLORED INSULATION. INSULATED EQUIPMENT GROUND WIRES SHALL HAVE GREEN COLORED INSULATION.
- CONTROL PANEL FOR AIRFIELD NAVAIDS & VAULT FAN SHALL BE MANUFACTURED BY A UL 508 INDUSTRIAL CONTROL PANEL BUILDER OR AN FAA APPROVED L-821 PANEL BUILDER, AND SHALL BE MANUFACTURED IN THE UNITED STATES TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCES REQUIREMENT. WHERE THE PANEL IS MANUFACTURED BY AN L-821 PANEL BUILDER IT SHALL BE LABELED AS AN L-821 PANEL.
- CONTROL PANEL FOR AIRFIELD NAVAIDS & VAULT FAN SHALL BE SEPARATE FROM THE RELAY INTERFACE CONTROL PANEL.



**CONTROL PANEL FOR AIRFIELD NAVAIDS**

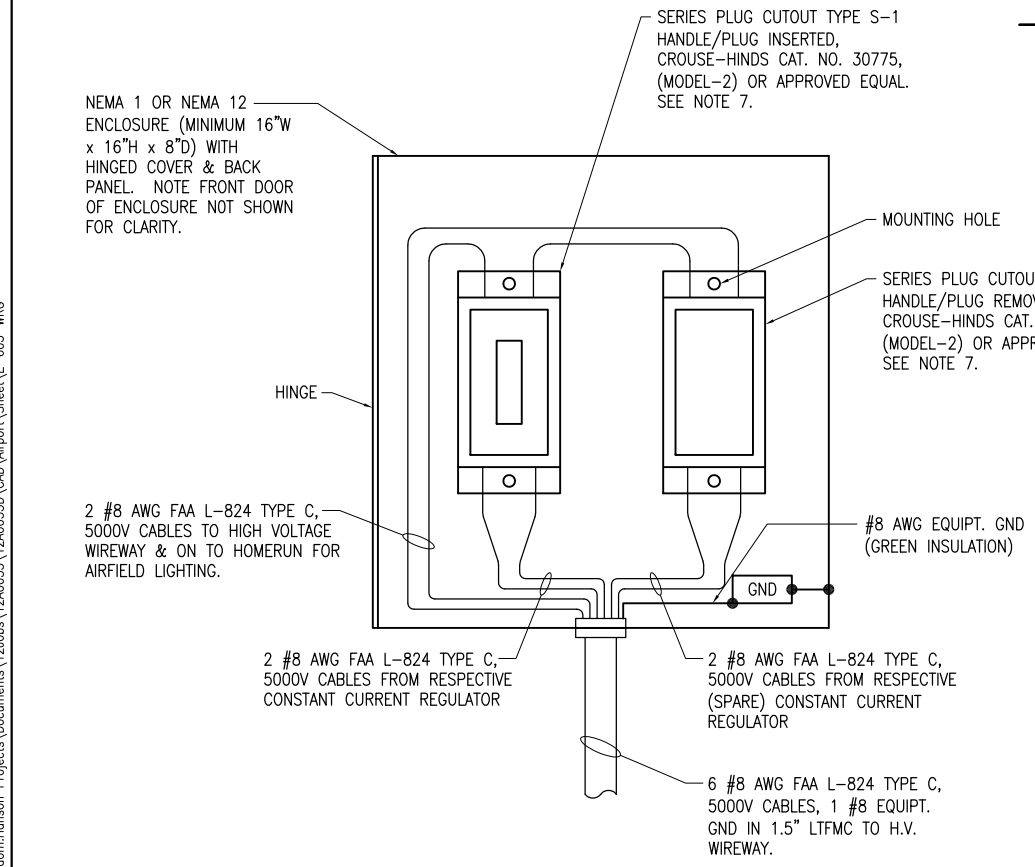
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HIGH VOLTAGE WIRING SCHEMATIC FOR RUNWAY 9-27 & TAXIWAY

NOT TO SCALE



SERIES PLUG CUTOUT MOUNTING DETAIL

(TYPICAL FOR 2)

NOT TO SCALE

LEGEND

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

NOTES

1. PROVIDE PHENOLIC ENGRAVED LEGEND PLATES FOR EACH CONSTANT CURRENT REGULATOR (EXISTING & NEW) NOTING THE RUNWAY AND/OR TAXIWAY SERVED.
2. EACH PLUG CUTOUT CABINET SHALL BE FURNISHED WITH A PHENOLIC ENGRAVED LEGEND PLATE THAT IDENTIFIES THE RESPECTIVE RUNWAY OR TAXIWAY CIRCUIT OR REGULATOR. INCLUDE AN ADDITIONAL LEGEND PLATE LABELED "CAUTION OPERATE CUTOUTS WITH CCR SHUT OFF".
3. PROVIDE PHENOLIC ENGRAVED LEGEND PLATES FOR THE CUTOUTS TO IDENTIFY THE RESPECTIVE REGULATOR OUTPUT CONNECTION AND THE RESPECTIVE CIRCUIT LOAD CONNECTION.
4. BOND EACH REGULATOR FRAME TO VAULT GROUND BUS WITH A DEDICATED #6 AWG COPPER BONDING JUMPER.
5. PROVIDE ADEQUATE WORKING SPACE IN FRONT OF EACH CUTOUT ENCLOSURE TO MEET NEC CLEARANCE REQUIREMENTS.
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 INSTALLING IT.
7. SERIES PLUG CUTOUTS SHALL BE TYPE S-1, RATED 5000 VOLTS, 20-AMP, AND SHALL COMPLY WITH FAA AC 150/5340-4C, SERIES PLUG CUTOUTS SHALL BE RATED SUITABLE FOR NORMAL OPERATION WITH HANDLE REMOVED OR HANDLE INSERTED. CUTOUTS SHALL DISCONNECT THE INPUT FROM THE OUTPUT, SHORT THE INPUT TERMINALS, AND SHORT THE OUTPUT TERMINALS WHEN THE HANDLE/PLUG IS REMOVED. CUTOUTS SHALL BE SUITABLE FOR MANUAL TRANSFER OPERATION (ONE SERIES CIRCUIT LOOP WITH THE CAPABILITY OF BEING POWERED FROM EITHER OF TWO CONSTANT CURRENT REGULATOR POWER SOURCES). SERIES PLUG CUTOUTS SHALL BE CROUSE-HINDS CAT. NO. 30775, OR APPROVED EQUAL THE RESPECTIVE MANUFACTURER SHALL CERTIFY IN WRITING THAT THEIR CUTOUT IS SUITABLE AND RATED FOR THE RESPECTIVE APPLICATION.
8. HIGH VOLTAGE & LOW VOLTAGE CIRCUITS SHALL NOT BE INSTALLED IN THE SAME WIREWAY, CONDUIT, HANDHOLE, JUNCTION BOX, OR RACEWAY.

REVISION	DATE

MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS  
BLOCK GRANT PROJ.: 3-17-0064-B21  
IL PROJ.: MGB-4206

Hanson Proj. No. 12A0053	Filename E-605-WRG.dwg	Scale NOT TO SCALE	Date 06/17/13
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REVIEWED	KNL/CAH	02/04/13	



REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS  
HIGH VOLTAGE WIRING SCHEMATIC FOR RUNWAY 9-27 & TAXIWAY

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LEGEND PLATE SCHEDULE	
DEVICE	LABEL
VAULT SERVICE DISTRIBUTION PANELBOARD	VAULT SERVICE & DISTRIBUTION PANEL 120/240 VAC, 1 PH, 3W
MAIN BREAKER IN VAULT PANEL	SERVICE DISCONNECT
RUNWAY 9-27 CCR	RUNWAY 9-27
BACKUP/SPARE CCR FOR RUNWAY 9-27	SPARE FOR RUNWAY 9-27
TAXIWAY CCR	TAXIWAY
BACKUP/SPARE CCR FOR TAXIWAY	SPARE FOR TAXIWAY
CUTOUT ENCLOSURE FOR RUNWAY 9-27	RUNWAY 9-27 CUTOUTS
NORMAL CUTOUT INPUT SIDE CONNECTION FOR RUNWAY 9-27	NORMAL CCR INPUT
SPARE CUTOUT INPUT SIDE CONNECTION	SPARE CCR INPUT
EACH CUOUT (TAXIWAY) OUTPUT SIDE CONNECTION (2 LEGEND PLATES)	OUTPUT
CUTOUT ENCLOSURE FOR TAXIWAY	TAXIWAY CUTOUTS
NORMAL CUTOUT INPUT SIDE CONNECTION FOR TAXIWAY	NORMAL CCR INPUT
SPARE CUTOUT INPUT SIDE CONNECTION FOR TAXIWAY	SPARE CCR INPUT
EACH CUTOUT (TAXIWAY) OUTPUT SIDE CONNECTION (2 LEGEND PLATES)	OUTPUT
EACH CUTOUT ENCLOSURE (2 LEGEND PLATES)	CAUTION OPERATE CUTOUTS WITH CCR'S SHUT OFF
RADIO RELAY INTERFACE PANEL	RADIO RELAY INTERFACE PANEL
MANUAL TRANSFER SWITCH FOR RUNWAY 9-27 NORMAL CCR AND SPARE/BACKUP CCR	TRANSFER SWITCH FOR RUNWAY 9-27 CONSTANT CURRENT REGULATORS
MANUAL TRANSFER SWITCH FOR RUNWAY 9-27 NORMAL CCR AND SPARE/BACKUP CCR - NORMAL SWITCH POSITION	NORMAL CCR
MANUAL TRANSFER SWITCH FOR RUNWAY 9-27 NORMAL CCR AND SPARE/BACKUP CCR - BACKUP SWITCH POSITION	SPARE/BACKUP CCR

LEGEND PLATE SCHEDULE CONTINUED	
DEVICE	LABEL
MANUAL TRANSFER SWITCH FOR TAXIWAY NORMAL CCR AND SPARE/BACKUP CCR	TRANSFER SWITCH FOR TAXIWAY CONSTANT CURRENT REGULATORS
MANUAL TRANSFER SWITCH FOR TAXIWAY NORMAL CCR AND SPARE/BACKUP CCR - NORMAL SWITCH POSITION	NORMAL CCR
MANUAL TRANSFER SWITCH FOR TAXIWAY NORMAL CCR AND SPARE/BACKUP CCR - BACKUP SWITCH POSITION	SPARE/BACKUP CCR
CONTROL PANEL FOR AIRFIELD NAVAIDS AND VAULT FAN	CONTACTOR PANEL FOR AIRFIELD NAVAIDS, & VAULT FAN
CONTROL PANEL FOR AIRFIELD NAVAIDS AND VAULT FAN	NOTICE CONTACTORS HAVE REMOTE LOCATED CONTROLS AND MAY ACTIVATE AT ANY TIME
LOW VOLTAGE WIREWAY (PROVIDE 9 LEGEND PLATES 1/2" HIGH BLACK LETTERS WHITE BACKGROUND)	LOW VOLTAGE
HIGH VOLTAGE WIREWAY (PROVIDE 6 LEGEND PLATES 1/2" HIGH BLACK LETTERS WHITE BACKGROUND)	HIGH VOLTAGE
VAULT GROUND BUS (PROVIDE 4 LEGEND PLATES 1/2" HIGH WHITE LETTERS GREEN BACKGROUND; INSTALL ABOVE OR BELOW GROUND BUS)	VAULT GROUND BUS
GROUNDING ELECTRODE CONDUCTORS TERMINATED ON VAULT GROUND BUS. (PROVIDE 3 LEGEND PLATES & SECURE TO CONDUCTORS WITH NYLON STRING OR CABLE TIES)	DO NOT DISCONNECT
RWY 9 VASI PCU	RWY 9 VASI PCU 240 VAC, 1 PH FED FROM VAULT
RWY 27 VASI PCU	RWY 27 VASI PCU 240VAC, 1PH FED FROM VAULT
BEACON LOAD CENTER	BEACON LOAD CTR 120/240 VAC, 1PH, 3W FED FROM VAULT

- DIRECTIONS TO TRANSFER RUNWAY 9-27 LIGHTING FROM NORMAL CCR TO SPARE/BACKUP CCR.
- SHUT OFF INPUT POWER (CIRCUIT BREAKER) TO BOTH RWY 9-27 CCR'S & TURN CCR SELECTOR SWITCHES TO OFF.
  - OPERATE MANUAL TRANSFER SWITCH FOR RWY 9-27 AND MOVE HANDLE FROM "NORMAL" POSITION TO "SPARE/BACKUP" POSITION.
  - PULL CUTOUT HANDLE FROM NORMAL CCR UNIT & INSERT INTO SPARE CCR CUTOUT.
  - GO TO RADIO RELAY INTERFACE PANEL & TURN "RWY 9-27 CCR TRANSFER" SELECTOR SWITCH FROM "NORMAL" TO "SPARE" POSITION.
  - TURN ON INPUT POWER (CIRCUIT BREAKER) TO SPARE RWY 9-27 CCR.
  - 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 OR ADJACENT TO CUTOUT ENCLOSURE FOR RESPECTIVE RUNWAY.

**RUNWAY 9-27 CCR TRANSFER PROCEDURE  
PLACARD DETAIL**



"DANGER - HIGH VOLTAGE KEEP OUT" SIGN

PROVIDE WARNING SIGN ON VAULT EXTERIOR DOORS LABELED "DANGER - HIGH VOLTAGE - KEEP OUT" PER THE REQUIREMENTS OF NEC 110.34 (C). PROVIDE MINIMUM OF 2 SIGNS (ONE ON EACH DOOR TO THE VAULT). SIGNS SHALL BE APPROXIMATELY 10"H X 14"W.

- DIRECTIONS TO TRANSFER TAXIWAY LIGHTING FROM NORMAL CCR TO SPARE/BACKUP CCR.
- SHUT OFF INPUT POWER (CIRCUIT BREAKER) TO BOTH TAXIWAY CCR'S & TURN CCR SELECTOR SWITCHES TO OFF.
  - OPERATE MANUAL TRANSFER SWITCH FOR TAXIWAY AND MOVE HANDLE FROM "NORMAL" POSITION TO "SPARE/BACKUP" POSITION.
  - PULL CUTOUT HANDLE FROM NORMAL CCR UNIT (CUTOUT #1) & INSERT INTO SPARE CCR CUTOUT (CUTOUT #2).
  - GO TO RADIO RELAY INTERFACE PANEL & TURN "TAXIWAY CCR TRANSFER" SELECTOR SWITCH FROM "NORMAL" TO "SPARE" POSITION.
  - TURN ON INPUT POWER (CIRCUIT BREAKER) TO SPARE TAXIWAY CCR.
  - 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 OR ADJACENT TO CUTOUT ENCLOSURE FOR RESPECTIVE RUNWAY.

**TAXIWAY CCR TRANSFER PROCEDURE PLACARD  
DETAIL**

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

FURNISH & INSTALL A WEATHERPROOF WARNING LABEL FOR EACH SAFETY SWITCH, 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.



"DANGER - HIGH VOLTAGE" SIGN

FURNISH AND INSTALL "DANGER - HIGH VOLTAGE" LABELS/SIGNS FOR EACH CUTOUT ENCLOSURE, EACH CONSTANT CURRENT REGULATOR, AND THE HIGH VOLTAGE WIREWAY, TO COMPLY WITH FAA AC 150/5340-26B "MAINTENANCE OF AIRPORT VISUAL AID FACILITIES". LABELS SHALL BE APPROXIMATELY 4" X 6" OR 5" X 7".

REVISION  
DATE 06/12/13  
REMOVED PARTS/VASIS TO REMAIN

MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS

ILL. PROJ.: MOB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21

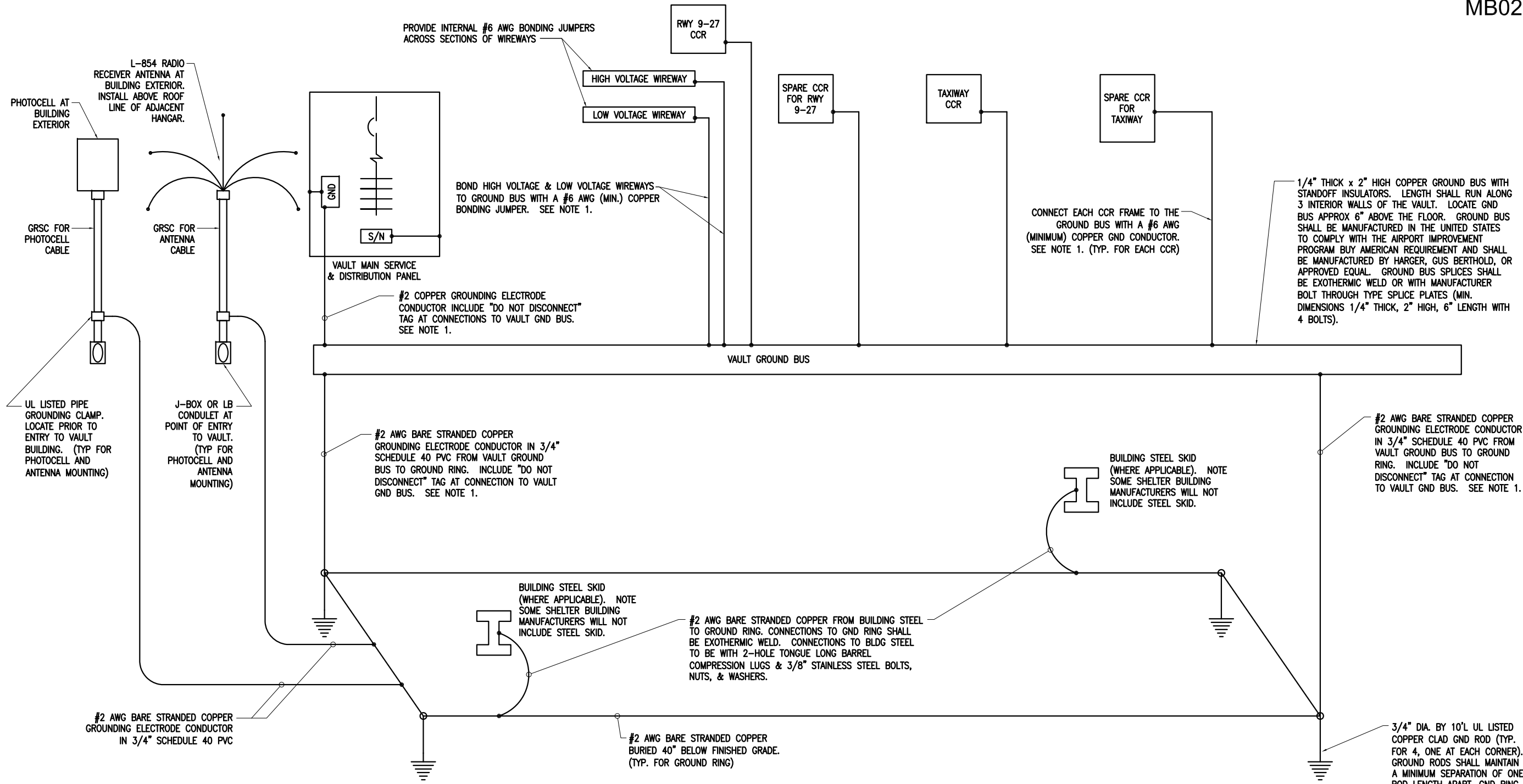
Hanson Proj. No. 1240053 Filename E-609-SCHD.dwg Scale NOT TO SCALE Date 06/17/13	LAYOUT DRAWN REVIEWED	KNL TRR KNL/CAH	01/17/13 01/21/13 02/04/13
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REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

LEGEND PLATE SCHEDULES



**VAULT GROUND BUS RISER**

- NOTES**
1. CONNECTIONS TO GROUND BUS BAR SHALL BE WITH 2-HOLE TONGUE LONG BARREL COMPRESSION LUGS BOLTED TO THE BUS BAR.
  2. ALL CONNECTIONS TO THE GROUND RING AND GROUND RODS SHALL BE EXOTHERMIC WELD.
  3. ALL INSULATED GROUND WIRES SHALL HAVE GREEN COLORED INSULATION FOR ALL CONDUCTOR AWG AND KCMIL.
  4. ALL WORK SHOWN ON THIS SHEET SHALL BE PAID FOR UNDER ITEM AR109200 "INSTALL ELECTRICAL EQUIPMENT" PER LUMP SUM.
  5. TEST GROUND RING AND RECORD RESULTS. WHERE GROUND RESISTANCE TEST RESULTS EXCEED 25 OHMS CONTACT PROJECT ENGINEER FOR FURTHER DIRECTION.

REVISION	DATE

MACOMB MUNICIPAL AIRPORT  
MACOMB, ILLINOIS

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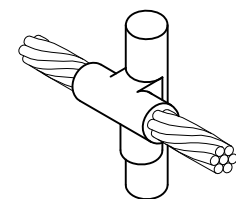
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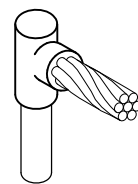
REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

CCR GROUND BUS RISER

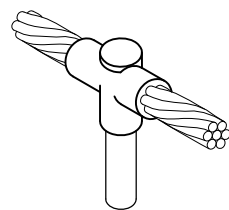
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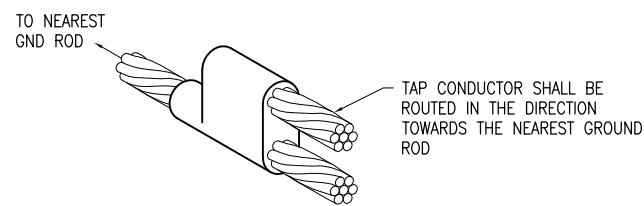
CABLE TO GROUND ROD



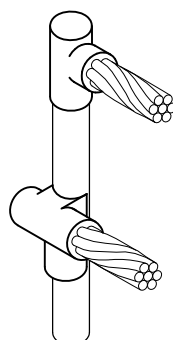
CABLE TO GROUND ROD



CABLE TO GROUND ROD



CABLE TO CABLE  
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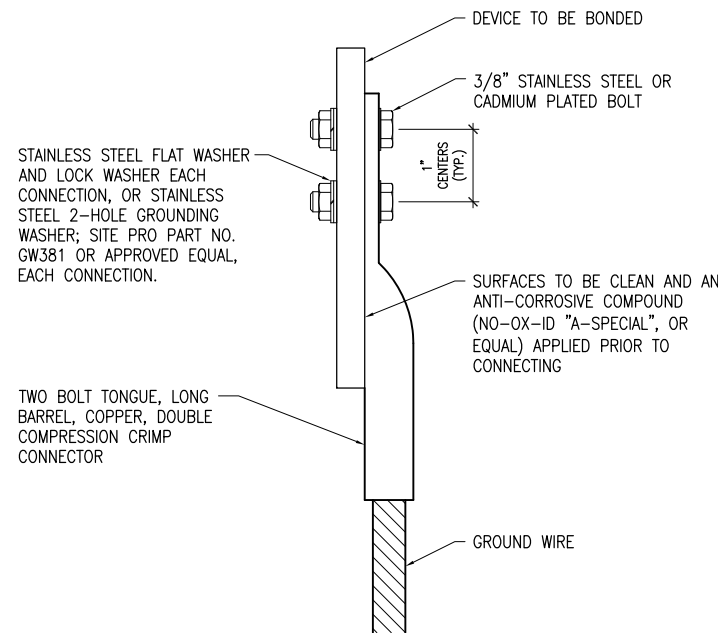


CABLES TO GROUND ROD

**DETAIL NOTES**

- ALL BELOW GRADE CONNECTIONS TO GROUND RODS & GROUND RING CONDUCTORS SHALL BE EXOTHERMIC WELD TYPE CONNECTIONS. EXOTHERMIC WELDS SHALL BE CADWELDED AS MANUFACTURED BY ERICO PRODUCTS, SOLON, OHIO, ULTRAWELDED 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.
- INDIVIDUAL GROUNDING ELECTRODE CONDUCTORS SHALL NOT BE INSTALLED IN METAL CONDUIT. INSTALL GROUNDING ELECTRODE CONDUCTORS IN SCHED 40 PVC CONDUIT AS REQUIRED IN FOUNDATIONS, FOR PROTECTION, WHERE ENTERING ENCLOSURES, ETC. WHERE PLASTIC CONDUIT IS USED FOR INDIVIDUAL GROUND WIRES, DO NOT COMPLETELY ENCIRCLE THE CONDUIT WITH FERROUS AND/OR MAGNETIC MATERIALS. WHERE METAL CLAMPS ARE INSTALLED USE NYLON BOLTS, NUTS, WASHERS, & SPACERS TO INTERRUPT A COMPLETE METALLIC PATH FROM ENCIRCLING THE CONDUIT.

**EXOTHERMIC WELD DETAILS**

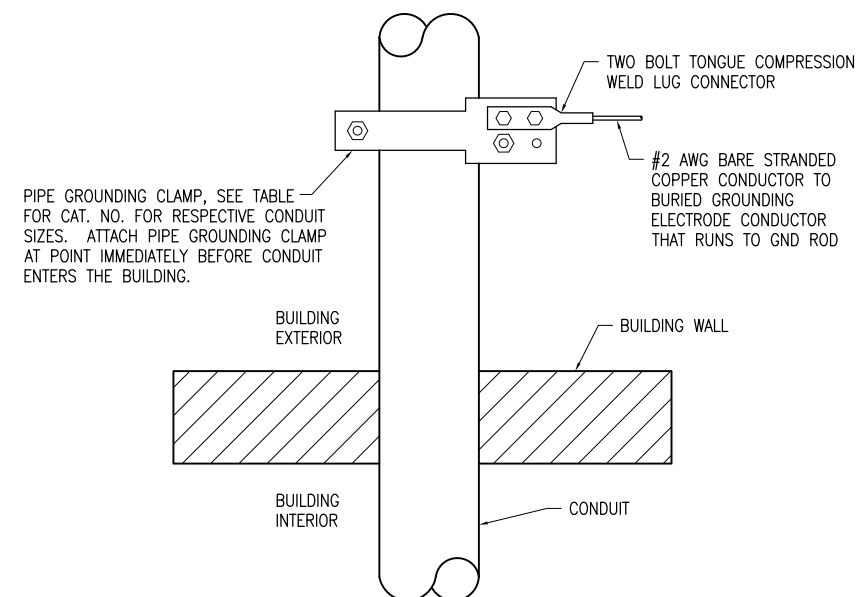


2 HOLE LONG BARREL COMPRESSION LUG TABLE			
WIRE SIZE	BURNDY CAT. NO.	THOMAS & BETTS CAT. NO.	PENN-UNION CAT. NO.
#8 AWG STRANDED	YA8C-2TC38	256-30695-1157	BBLU-8D-2TC38
#6 AWG SOLID	YA8C-2TC38 OR YGA6C-2TC38E2G1		
#6 AWG STRANDED	YA6C-2TC38	256-30695-1158	BBLU-6D-2TC38
#4 AWG STRANDED	YA4C-2TC38	256-30695-1159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

**NOTES**

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

**GROUNDING LUG CONNECTION DETAIL**



PIPE GROUNDING CLAMP TABLE	
BURNDY CAT. NO.	CONDUIT SIZE
GAR3902TC	1/2" - 1"
GAR3903TC	1 1/4" - 2"
GAR3904TC	2 1/2" - 3 1/2"
GAR3905TC	4" - 5"
GAR3906TC	6"
GAR3907TC	8"

**NOTES**

- EXTERIOR CONDUIT GROUNDING IS REQUIRED FOR THE PHOTOCELL CONDUIT, RADIO ANTENNA CONDUIT, & OTHER CONDUITS EXTENDING TO THE ROOF LEVEL.
- CONNECTIONS TO BURIED GROUNDING ELECTRODE CONDUCTOR SHALL BE EXOTHERMIC WELD.

**EXTERIOR CONDUIT GROUNDING DETAIL**

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IL PROJ.: MGB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21

Hanson Proj. No. 12A0053	1/13/13
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Date 06/17/13	01/15/13
LAYOUT	02/04/13
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REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS

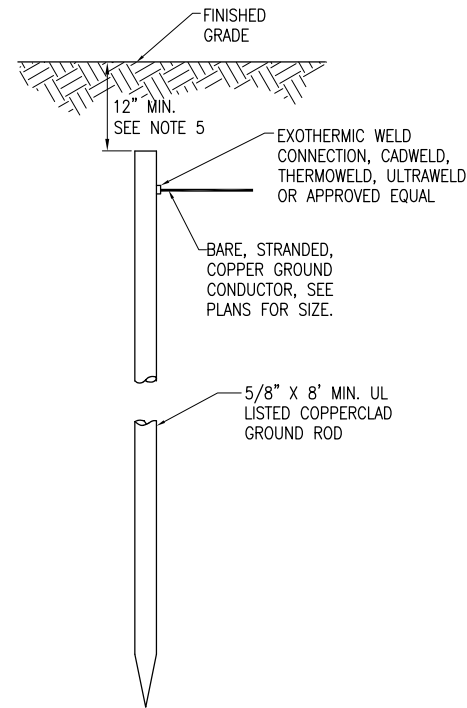
GROUNDING DETAILS

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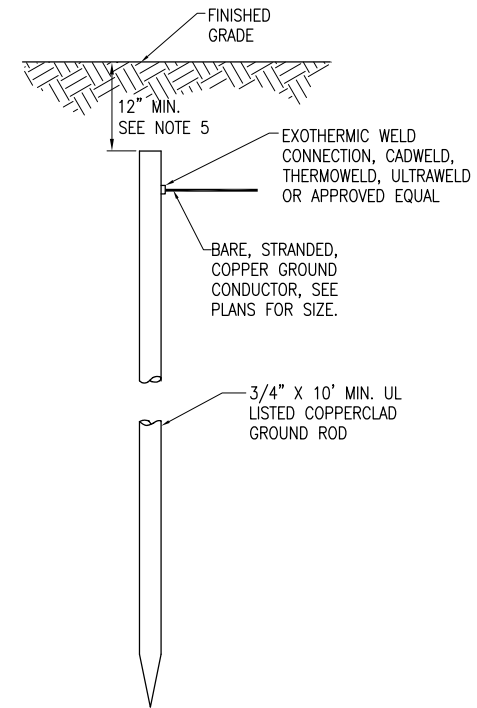
**GROUNDING NOTES**

- THE CONTRACTOR SHALL FURNISH AND INSTALL ALL GROUNDING AS MAY BE NECESSARY OR REQUIRED TO MAKE A COMPLETE GROUNDING SYSTEM AS REQUIRED BY THE LATEST NATIONAL ELECTRICAL CODE (NFPA 70) IN FORCE AND FAA-STD-019e (LIGHTNING AND SURGE PROTECTION, GROUNDING, BONDING, AND SHIELDING REQUIREMENTS FOR FACILITIES AND ELECTRONIC EQUIPMENT). THE RELIABILITY OF THE GROUNDING SYSTEM IS DEPENDENT ON CAREFUL, PROPER INSTALLATION AND CHOICE OF MATERIALS. IMPROPER PREPARATION OF SURFACES TO BE JOINED TO MAKE AN ELECTRICAL PATH, LOOSE JOINTS OR CORROSION CAN INTRODUCE IMPEDANCE THAT WILL SERIOUSLY IMPAIR THE ABILITY OF THE GROUND PATH TO PROTECT PERSONNEL AND EQUIPMENT AND TO ABSORB TRANSIENTS THAT CAN CAUSE NOISE IN COMMUNICATIONS CIRCUITS. THE FOLLOWING FUNCTIONS ARE PARTICULARLY IMPORTANT TO ENSURE A RELIABLE GROUND SYSTEM:
- 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) OR APPROVED EQUAL. EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS OR AT BURIED GROUNDING ELECTRODE CONDUCTORS.
- CONTRACTOR SHALL TEST EACH MADE ELECTRODE GROUND ROD/GROUND FIELD/GROUND RING WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUND FIELD SYSTEMS. IF GROUND RESISTANCE EXCEEDS 25 OHMS, CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION. COPIES OF GROUND ROD TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER/RESIDENT PROJECT REPRESENTATIVE.
- ALL PRODUCTS ASSOCIATED WITH THE GROUNDING SYSTEM SHALL BE UL-LISTED AND LABELED.
- 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.
- METALLIC SURFACES TO BE JOINED SHALL BE PREPARED BY THE REMOVAL OF ALL NON-CONDUCTIVE MATERIAL, PER 2011 NATIONAL ELECTRICAL CODE ARTICLE 250-12. ALL COPPER BUS BARS MUST BE CLEANED PRIOR TO MAKING CONNECTIONS TO REMOVE SURFACE OXIDATION.
- 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
- 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.
- ALL METAL EQUIPMENT ENCLOSURES, CONDUITS, CABINETS, BOXES, RECEPTACLES, MOTORS, ETC. SHALL BE BONDED TO THE RESPECTIVE GROUNDING SYSTEM.
- 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.
- EACH NEW FEEDER CIRCUIT AND/OR BRANCH CIRCUIT SHALL INCLUDE AN EQUIPMENT GROUND WIRE. METAL RACEWAY OR CONDUIT SHALL NOT MEET THIS REQUIREMENT. THE EQUIPMENT GROUND WIRE FROM EQUIPMENT SHALL NOT BE SMALLER THAN ALLOWED BY 2011 NEC TABLE 250-122 "MINIMUM SIZE CONDUCTORS OR GROUNDING RACEWAY AND EQUIPMENT." WHEN CONDUCTORS ARE ADJUSTED IN SIZE TO COMPENSATE FOR VOLTAGE DROP, EQUIPMENT-GROUNDING CONDUCTORS SHALL BE ADJUSTED PROPORTIONATELY ACCORDING TO CIRCULAR MIL AREA. ALL EQUIPMENT GROUND WIRES SHALL BE COPPER, EITHER BARE OR INSULATED GREEN IN COLOR. WHERE THE EQUIPMENT GROUNDING CONDUCTORS ARE INSULATED, THEY SHALL BE IDENTIFIED BY THE COLOR GREEN, AND SHALL BE THE SAME INSULATION TYPE AS THE PHASE CONDUCTORS.

- ALL EXTERIOR METAL CONDUIT, WHERE NOT ELECTRICALLY CONTINUOUS BECAUSE OF MANHOLES, HANDHOLES, NON-METALLIC JUNCTION BOXES, ETC., SHALL BE BONDED TO ALL OTHER METAL CONDUIT IN THE RESPECTIVE DUCT RUN, AND AT EACH END, WITH A COPPER-BONDING JUMPER SIZED IN CONFORMANCE WITH 2011 NEC 250-102. WHERE METAL CONDUITS TERMINATE IN AN ENCLOSURE (SUCH AS A MOTOR CONTROL CENTER, SWITCHBOARD, ETC) WHERE THERE IS NOT ELECTRICAL CONTINUITY WITH THE CONDUIT AND THE RESPECTIVE ENCLOSURE, PROVIDE A BONDING JUMPER FROM THE RESPECTIVE ENCLOSURE GROUND BUS TO THE CONDUIT SIZED PER 2011 NEC 250-102.
- 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.
- PROVIDE A POSITIVE GROUND BOND FOR ALL OUTLET BOXES, ELECTRICAL EQUIPMENT ENCLOSURES, GROUNDING RECEPTACLES, TOGGLE SWITCHES, ETC. INSTALL A GROUNDING CONDUCTOR IN ALL WIRE AND CABLE RACEWAYS. GROUND CONDUCTOR TO HAVE 600-VOLT INSULATION AND BE IDENTIFIED BY A CONTINUOUS GREEN COLOR COATING. THEY SHALL BE USED SOLELY FOR GROUNDING PURPOSES AND BE ENTIRELY SEPARATE FROM WHITE GROUNDED NEUTRAL CONDUCTOR, EXCEPT AT SUPPLY SIDE OF SERVICE DISCONNECTING MEANS, WHERE GROUNDING AND NEUTRAL SYSTEMS ARE TO BE CONNECTED TO SERVICE GROUND.
- EACH AND ALL GROUNDED CASED AND METAL PARTS ASSOCIATED WITH ELECTRICAL EQUIPMENT SHALL BE TESTED FOR CONTINUITY OF CONNECTION WITH GROUND BUS SYSTEM BY CONTRACTOR IN PRESENCE OF OWNER'S REPRESENTATIVE.
- 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 APPROVED EQUAL.
- BOND ALL NONCURRENT-CARRYING PARTS OF METAL EQUIPMENT TO GROUND SYSTEM.
- BUILDING STRUCTURAL STEEL SYSTEM SHALL BE BONDED TO ELECTRICAL GROUND SYSTEM.
- 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.
- IF LOCAL CODES DICTATE THAT INDIVIDUAL GROUNDING CONDUCTORS MUST BE RUN IN METAL CONDUIT OR RACEWAY, THEN THE CONDUIT OR RACEWAY MUST BE BONDED AT EACH END OF THE RUN WITH A BONDING JUMPER SIZED EQUAL TO THE INDIVIDUAL GROUNDING CONDUCTOR OR AS REQUIRED BY 2011 NEC 250-102. NOTE THIS DOES NOT APPLY TO AC EQUIPMENT GROUNDING CONDUCTORS RUN WITH AC CIRCUITS.
- 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.
- GROUND RODS SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN REQUIREMENTS. STEEL USED TO MANUFACTURER GROUND RODS SHALL BE 100 PERCENT DOMESTIC STEEL.



**8 FT. GROUND ROD**




**10 FT. GROUND ROD**

**NOTES**

- TYPE AND MINIMUM NUMBER OF GROUND RODS SHALL BE AS SPECIFIED ON THE PLAN.
- THE RESISTANCE TO GROUND OF THE GROUNDING SYSTEM SHALL NOT EXCEED 25 OHMS.
- COST OF GROUND RODS IS INCIDENTAL TO THE ASSOCIATED ITEMS REQUIRING GROUNDING UNLESS OTHERWISE SPECIFIED. GROUND RODS FOR VAULT WILL BE CONSIDERED INCIDENTAL TO ITEM AR109200.
- GROUND RODS SHALL BE SPACED AS DETAILED ON THE PLANS AND SHALL NOT BE SPACED LESS THAN ONE ROD LENGTH APART.
- TOP OF GROUND RODS SHALL BE 12" MINIMUM BELOW GRADE UNLESS DETAILED OTHERWISE HEREIN. TOP OF GROUND RODS FOR VAULT SHALL BE 30" MIN. BELOW GRADE. GROUND RING CONDUCTORS SHALL BE 40" MINIMUM BELOW GRADE TO BE BELOW FROST LINE (FOR MCDONOUGH COUNTY, ILLINOIS).
- GROUND RODS FOR RUNWAY LIGHTING, TAXIWAY LIGHTING, AND TAXI GUIDANCE SIGNS SHALL BE A MINIMUM 5/8-INCH DIAMETER BY 8-FT LONG UL LISTED COPPER CLAD.
- GROUND RODS FOR VAULT, WIND CONES, BEACON TOWER, AND OTHER NAVAIDS SHALL BE A MINIMUM 3/4-INCH DIAMETER BY 10-FT LONG UL LISTED COPPER CLAD.

**GROUND RODS**

(NOT TO SCALE)

REVISION					
DATE					
<p><b>MACOMB MUNICIPAL AIRPORT MACOMB, ILLINOIS</b></p>					
<p>ILL. PROJ.: MGB-4206 BLOCK GRANT PROJ.: 3-17-0064-B21</p>					
Hanson Proj. No. 12A0053	Filename E-004-NOTE.dwg	Scale NONE	Date 06/17/13	LAYOUT KNL	01/13/13
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<p>REPLACE VAULT, AIRFIELD LIGHTING AND GUIDANCE SIGNS</p>			<p>GROUNDING NOTES</p>		
<p><b>53</b></p> <p>53 of 53 sheets</p>					

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