

CONSTRUCTION PLANS FOR ST. LOUIS DOWNTOWN AIRPORT CAHOKIA, ST. CLAIR COUNTY, ILLINOIS AIR TRAFFIC CONTROL TOWER INTERFACE TO VAULT

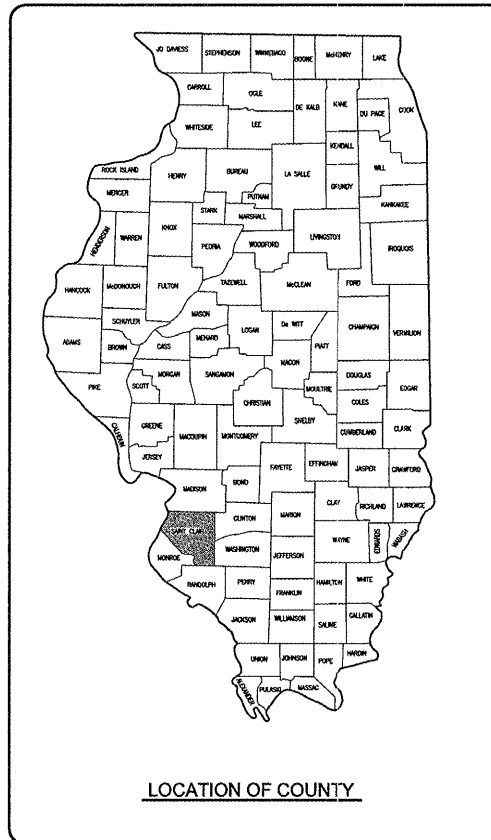
SCOPE OF WORK

THIS PROJECT CONSISTS OF INSTALLING AN L-821 CONTROL PANEL AT THE NEW ATCT (AIR TRAFFIC CONTROL TOWER) AND CABLING, DUCTS HANDHOLES BETWEEN THE ATCT AND THE EXISTING AIRPORT ELECTRICAL VAULT, ASSOCIATED VAULT WORK, AND RE-CABLING TO THE AIRPORT ROTATING BEACON AND WIND-TEE.

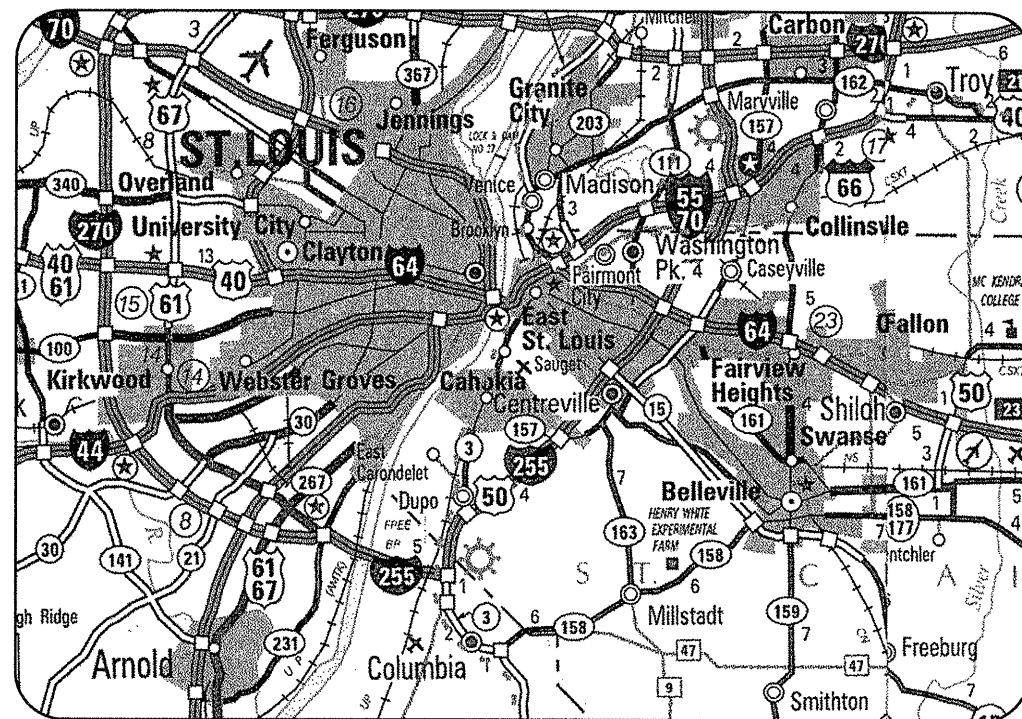
ADDITIVE ALTERNATE NO. 1: INCLUDES THE INSTALLATION OF TWO L-806 SUPPLEMENTAL LIGHTED WIND CONES ON RUNWAY 12R-30L WITH ASSOCIATED CABLING.

ADDITIVE ALTERNATE NO. 2: INCLUDES THE REMOVAL OF THE EXISTING UNLIT WIND CONE & THE REPLACEMENT INSTALLATION OF AN L-807 LIGHTED WIND CONE WITH ASSOCIATED CABLING.

ILL. PROJ.: CPS-3708
A.I.P. PROJ.: 3-17-0039-B19
LATITUDE: 38° 34' 14"
LONGITUDE: 90° 09' 22"
ELEVATION: 413' M.S.L.
DATE: JULY 23, 2008



LOCATION OF COUNTY



LOCATION



HANSON
Hanson Professional Services Inc.
Submitted by: *Kevin N. Lightfoot* ENG'R
Date Submitted: 7/25/2008
Lic. Exp. Date: 11/30/2009

BI-STATE DEVELOPMENT AGENCY
Approved: *Robert M. Daniel* DIRECTOR OF THE AIRPORT
Date: July 23, 2008

REVISION	DATE

SAINT LOUIS DOWNTOWN AIRPORT
A Division of Bi-State Development Agency
A.I.P. PROJ.: 3-17-0039-B19

Hanson Project No. 84507ELECD_0900	
Electronic R-001CVR.DWG	
Scale NOT TO SCALE	
Date 07/16/07	
LAYOUT KNL 05/11/07	
DRAWN BAK 05/11/07	
REVIEWED CAH 07/13/07	

HANSON
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4227 Earth City Expressway, Suite 130
St. Louis, MO 63045-1308
Offices Nationwide

ATCT INTERFACE TO VAULT
COVER SHEET

JUL 25 2008 9:40 AM V00R00805
I:\AIRPORTS\ST. LOUIS DOWNTOWN\84507ELECD\AIRPORT\SHEETS\R-001CVR.DWG - COVER

SCOPE OF WORK

THIS PROJECT CONSISTS OF INSTALLING AN L-821 CONTROL PANEL AT THE NEW ATCT (AIR TRAFFIC CONTROL TOWER) AND CABLING, DUCTS HANDHOLES BETWEEN THE ATCT AND THE EXISTING AIRPORT ELECTRICAL VAULT, AND ASSOCIATED VAULT WORK, AND RECALLING TO THE AIRPORT ROTATING BEACON AND WIND-TEE. ADDITIVE ALTERNATE NO. 1 INCLUDES THE INSTALLATION OF TWO L-806 SUPPLEMENTAL LIGHTED WIND CONES ON RUNWAY 12R-30L WITH ASSOCIATED CABLING. ADDITIVE ALTERNATE NO. 2 INCLUDES THE REMOVAL OF THE EXISTING UNLIT WIND CONE & THE REPLACEMENT INSTALLATION OF AN L-807 LIGHTED WIND CONE WITH ASSOCIATED CABLING.

AIRPORT SECURITY NOTE

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

UTILITY NOTE

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

HEIGHT OF CONSTRUCTION EQUIPMENT

THE MAXIMUM ANTICIPATED HEIGHT OF THE CONSTRUCTION EQUIPMENT WILL BE 60 FEET. THE TALLEST EQUIPMENT IS EXPECTED TO BE A BUCKET TRUCK TO WORK ON THE AIRPORT ROTATING BEACON.

HAUL ROUTE AND VEHICLE PARKING

THE CONTRACTOR WILL USE THE DESIGNATED HAUL ROUTE AND PARKING AREA AS SHOWN ON THIS SHEET. THE PROPOSED PARKING AREA WILL BE 200' X 200'. THE CONTRACTOR WILL BE REQUIRED TO MAINTAIN THE PROPOSED HAUL ROUTE AND PARKING AREA THROUGHOUT THE COURSE OF THE PROJECT. ANY AREAS DAMAGED OUTSIDE OF THESE AREAS WILL BE REPAIRED BY THE CONTRACTOR AND AT THE CONTRACTOR'S OWN EXPENSE. AT THE CONCLUSION OF THE PROJECT THE CONTRACTOR WILL GRADE, FERTILIZE, SEED AND MULCH THE HAUL ROUTE AND PARKING AREA AS NEEDED TO RESTORE IT TO ITS ORIGINAL STATE. RESTORATION OF THE HAUL ROUTE AND PARKING AREA WILL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

CONTRACTOR RESPONSIBILITIES

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

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

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

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

NO TRENCHES OR HOLES WILL REMAIN OPEN OVERNIGHT.

NO RUNWAY SHALL BE CLOSED OVERNIGHT.

BARRICADES AND TRAFFIC CONES

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

LEGEND

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

THE LOCATION, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ON THE PLANS IS NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES OF HIS OPERATIONAL PLANS AND SHALL OBTAIN FROM THE RESPECTIVE UTILITY COMPANIES DETAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF THEIR FACILITIES AND THE WORKING SCHEDULE OF THE COMPANIES FOR REMOVAL OR ADJUSTMENT WHERE REQUIRED. IN THE EVENT AN UNEXPECTED UTILITY INTERFERENCE IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY COMPANY OF JURISDICTION. THE ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT.

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

AIRCRAFT OPERATION LINE

THE CONTRACTOR WILL LOCATE THIS LINE AT THE START OF CONSTRUCTION AND WILL PLACE FLAGGED LATHE EVERY 150' ALONG IT. THIS LINE WILL BE THE LIMITS THAT ALL CONTRACTOR PERSONNEL MAY VENTURE WHEN A RUNWAY IS NOT CLOSED. THE CONTRACTOR WILL MAINTAIN THE LATHE LINE FOR RUNWAYS.

CERTIFIED PAYROLLS

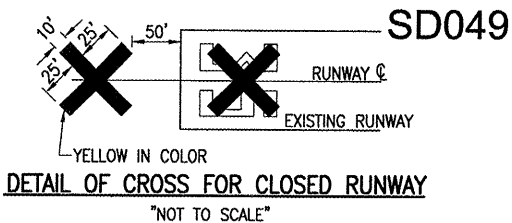
THE RESIDENT ENGINEER CANNOT FORWARD CONSTRUCTION REPORTS TO THE ILLINOIS DIVISION OF AERONAUTICS FOR PROCESSING UNTIL ALL CERTIFIED PAYROLLS FOR THE PERIOD HAVE BEEN RECEIVED.

MATERIAL CERTIFICATION

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

RUNWAY 12R-30L CLOSURE

THIS PROJECT WILL NECESSITATE TWO CLOSURES OF RUNWAY 12R-30L FOR BASE BID WORK. ADDITIONAL CLOSURES WILL BE DURING THE INSTALLATION OF THE CABLING TO THE L-806 SUPPLEMENTAL LIGHTED WIND CONES UNDER THE WORK FOR ADDITIVE ALTERNATE NO. 1. WHENEVER THE CONTRACTOR IS WITHIN 200' OF THE RUNWAY CENTERLINE THE RUNWAY WILL BE CLOSED. THE CONTRACTOR WILL HAVE FOUR HOURS IN WHICH TO CLOSE THE RUNWAY, INSTALL THE PROPOSED CABLE AND RE-OPEN THE RUNWAY. THE PROPOSED CABLE WILL BE PLOWED INTO PLACE TO MINIMIZE THE AMOUNT OF TIME THE RUNWAY WILL BE CLOSED.



NOTE:

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

J.U.L.I.E. INFORMATION

COUNTY ST. CLAIR
 CITY CAHOKIA
 TOWNSHIP CENTERVILLE
 SECTION NO. T.1N. - R.10W.
 ADDRESS BI-STATE DEVELOPMENT AGENCY
 707 NORTH FIRST STREET
 ST. LOUIS, MISSOURI 63102

CRITICAL POINT DATA

LATITUDE: 38° 34' 25.42136"
 LONGITUDE: 90° 09' 56.97879"
 ELEVATION: 412.03 M.S.L.

PROPOSED SAFETY PLAN

GENERAL - THE ST. LOUIS DOWNTOWN AIRPORT IS COMPRISED OF THREE RUNWAYS. THE PROPOSED CONSTRUCTION WILL NECESSITATE CLOSING RUNWAY 5-23 AND 12R-30L. ALSO TAXIWAYS C, B1, B2, B4, B5, B6, AND B7 WILL BE CLOSED. WHEN CONSTRUCTION ACTIVITIES ARE WITHIN 200' OF A RUNWAY CENTERLINE OR 85' OF A TAXIWAY CENTERLINE, THAT RUNWAY OR TAXIWAY MUST BE CLOSED. CLOSURE OF A RUNWAY IS BY ISSUANCE OF A NOTAM AND PLACEMENT OF CROSSES OVER THE NUMERALS. A TAXIWAY IS CLOSED BY THE PLACEMENT OF BARRICADES AND/OR TRAFFIC CONES ACROSS THE TAXIWAY TO DISALLOW USE OF THE TAXIWAY BY AIRCRAFT. THE RUNWAY/TAXIWAY WILL BE CLOSED ONLY DURING THE CONSTRUCTION DAY. AT THE END OF EACH CONSTRUCTION DAY THE CONTRACTOR WILL SMOOTH GRADE ALL AREAS WITHIN THE SAFETY AREA TO THE SATISFACTION OF THE RESIDENT ENGINEER AND RE-OPEN THE RUNWAY/TAXIWAY. ALL WORK INCLUDED IN OPENING AND CLOSING THE RUNWAY/TAXIWAY WILL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

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

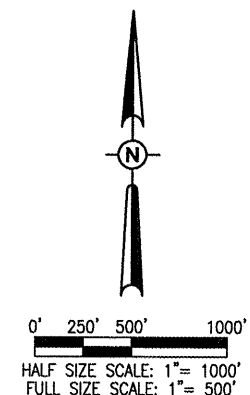
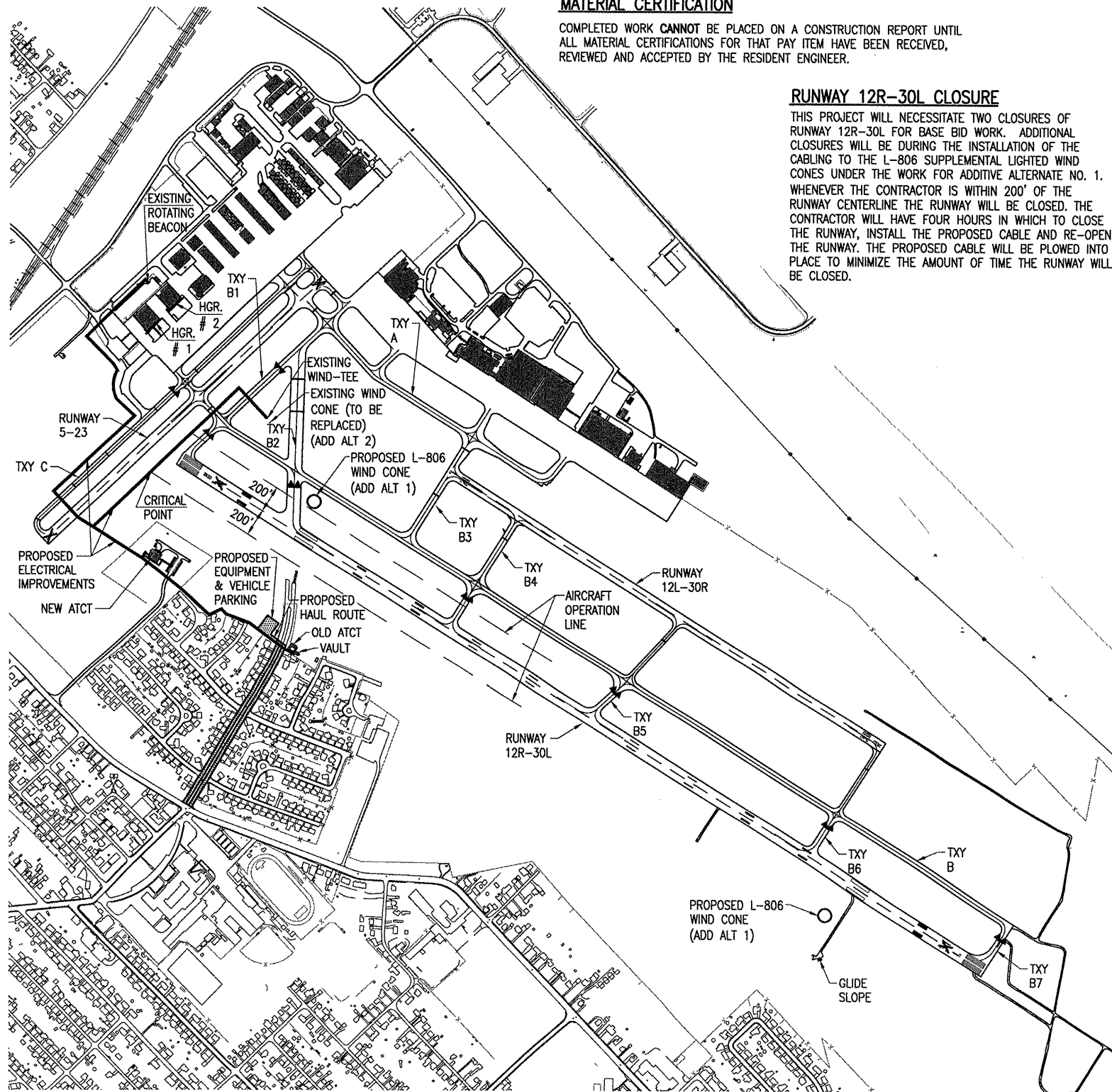
RADIO CONTROL - THE CONTRACTOR WILL BE REQUIRED TO BE IN TWO-WAY RADIO CONTACT (121.80 MHz.) WITH THE AIRPORT UNICOM. THIS WILL KEEP THE CONTRACTOR IN CONSTANT CONTACT WITH THE ST. LOUIS DOWNTOWN AIRPORT AND ENABLE THE AIRPORT TO IMMEDIATELY CONTACT THE CONTRACTOR IN CASE OF AN AERONAUTIC EMERGENCY THAT WOULD REQUIRE ACTION BY THE CONTRACTOR AND/OR HIS PERSONNEL.

EROSION CONTROL

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

CRITICAL POINT DATA

LATITUDE - 38° 34' 25.42"
 LONGITUDE - 90° 09' 56.98"
 ELEVATION - 409.0



BY	
REVISION	
DATE	
SAINT LOUIS DOWNTOWN AIRPORT A Division of Bi-State Development Agency A.I.P. PROJ. 3-17-0039-B19	
Hanson Project No. 8450TELED.0900	05/11/07
Filename R-003SEY.DWG	05/11/07
Scale SCALE	07/16/07
Date 07/16/07	
LAYOUT CAH	05/11/07
DRAWN BAK	05/11/07
REVIEWED KNL	07/12/07
Hanson Professional Services Inc. 4227 Earth City Expressway, Suite 130 St. Louis, MO 63045-1308 Offices Nationwide	
ATCT INTERFACE TO VAULT	PROPOSED SAFETY PLAN
3	
3 of 26 sheets	

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)
LTS	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
MTL	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 (MOST CURRENT ISSUE IN FORCE), THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES, AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE U.L. LISTING, ETL LISTING (OR OTHER THIRD PARTY LISTING) AND/OR THE MANUFACTURER'S WARRANTY OF A DEVICE WILL NOT BE PERMITTED.
- CONTRACTOR SHALL COORDINATE WORK AND ANY POWER OUTAGES WITH THE RESPECTIVE FACILITY OWNER PERSONNEL AND THE AIRPORT DIRECTOR.
- 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. 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.

SD049

BY	REVISION	DATE

SAINT LOUIS DOWNTOWN AIRPORT
 A Division of Bi-State Development Agency
 A.I.P. PROJ: 3-17-0039-B18

Hanson Project No.	8450TELECD_0900
Filename	E-001.DWG
Scale	NONE
Date	07/16/07
LAYOUT	KNL 05/03/07
DRAWN	CCC 05/18/07
REVIEWED	CAH 07/13/07

HANSON
 Hanson Professional Services, Inc.
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 St. Louis, MO 63045-1308
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ATCT INTERFACE TO VAULT
 ELECTRICAL LEGEND AND ABBREVIATIONS

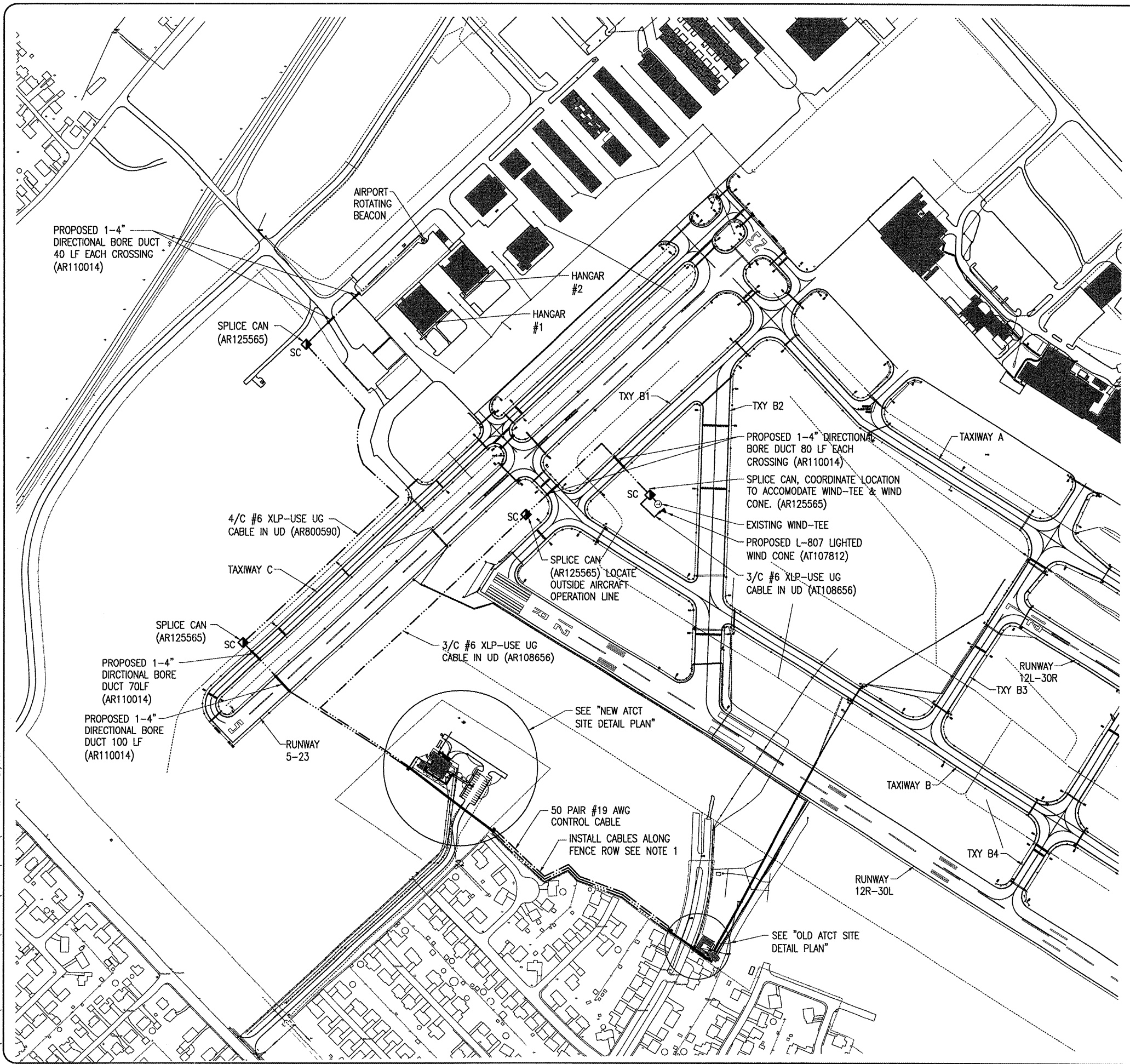
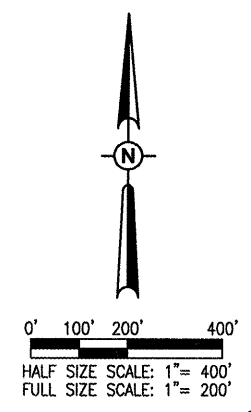
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CALL J.U.L.I.E. FOR UTILITY INFORMATION AT 1-800-892-0123. CONTACT FAA FOR ASSISTANCE IN LOCATING FAA CABLES AND UTILITIES.

LEGEND

	EXISTING PAVEMENT		EXISTING ROTATING BEACON
	EXISTING BUILDINGS		EXISTING ELECTRICAL HANDHOLE
	EXISTING ELECTRICAL CABLES		EXISTING ELECTRICAL MANHOLE
	EXISTING ELECTRICAL		PROPOSED L-807 WIND CONE
	EXISTING GAS LINE		EXISTING WIND TEE
	EXISTING WATER LINE		EXISTING ELECTRICAL TRANSFORMER
	EXISTING FENCE		EXISTING ELECTRIC UTILITY POLE
	EXISTING TELEPHONE LINE		PROPOSED ELECTRICAL HANDHOLE
	EXISTING FIBER OPTIC		PROPOSED SPLICE CAN
	EXISTING STORM SEWER		
	EXISTING SANITARY SEWER		
	PROPOSED ELECTRICAL DUCT		
	PROPOSED 50 PAIR #19 AWG CONTROL CABLE		
	PROPOSED 3/C #6 XLP-USE 600V UG CABLE IN UD		
	PROPOSED 4/C #6 XLP-USE 600V UG CABLE IN UD		

- NOTES**
- CONFIRM WITH THE AIRPORT THE AREA ALONG THE FENCE LINE THAT IS NOT SUBJECT TO FARMING. CABLES SHALL NOT BE INSTALLED IN THE AREAS SUBJECT TO FARMING.
 - SEE PROPOSED SAFETY PLAN FOR RUNWAY & TAXIWAY CLOSURE REQUIREMENTS. ALL RUNWAY & TAXIWAY CLOSURES MUST BE COORDINATED WITH AND APPROVED BY THE AIRPORT DIRECTOR.
 - PROPOSED L-807 LIGHTED WIND CONE TO BE INSTALLED IN SAME LOCATION AS EXISTING UNLIT WIND CONE TO BE REMOVED.



DATE	REVISION	BY

SAINT LOUIS DOWNTOWN AIRPORT
 A Division of Bi-State Development Agency
 ILL. PROJ. 3-17-0039-819
 ILL. PROJ. CPS-3708

Hanson Project No. 84507ELEC.D.0800	Revision R-101SIT.DWG	Scale 07/16/07	Date 07/16/07
LAYOUT	KNL	05/11/07	05/11/07
DRAWN	BAK	05/11/07	05/11/07
REVIEWED	CAH	07/13/07	07/13/07

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ATCT INTERFACE TO VAULT
 PROPOSED ELECTRICAL SITE PLAN
5
 5 of 26 sheets

JUL 25, 2008 9:42 AM VOORHOEDS
 I:\AIRPORTS\ST. LOUIS DOWNTOWN\8450TELEC\AIRPORT\SHETS\R-102SIT.DWG - Layout1

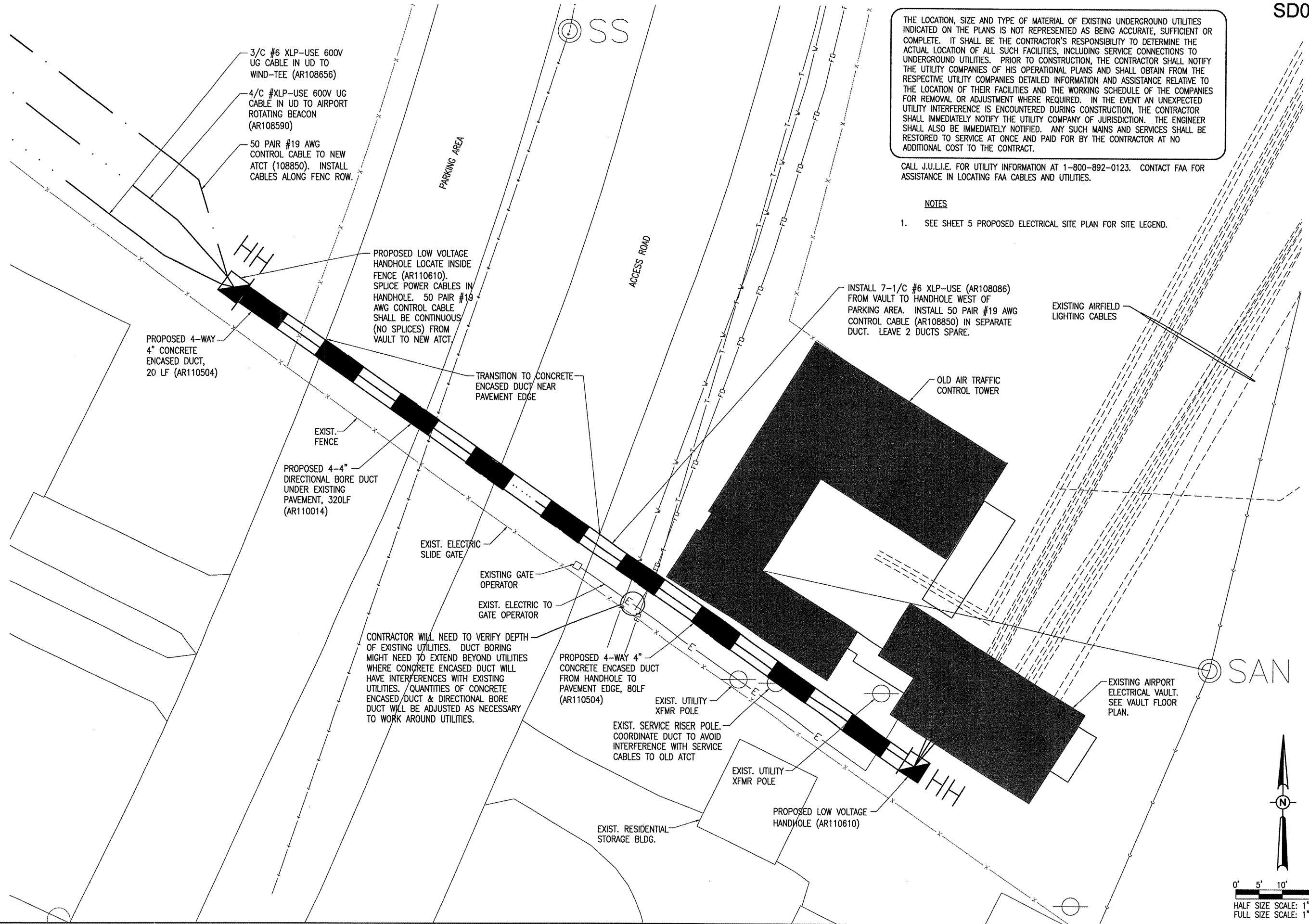
SD049

THE LOCATION, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ON THE PLANS IS NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES OF HIS OPERATIONAL PLANS AND SHALL OBTAIN FROM THE RESPECTIVE UTILITY COMPANIES DETAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF THEIR FACILITIES AND THE WORKING SCHEDULE OF THE COMPANIES FOR REMOVAL OR ADJUSTMENT WHERE REQUIRED. IN THE EVENT AN UNEXPECTED UTILITY INTERFERENCE IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY COMPANY OF JURISDICTION. THE ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT.

CALL J.U.L.I.E. FOR UTILITY INFORMATION AT 1-800-892-0123. CONTACT FAA FOR ASSISTANCE IN LOCATING FAA CABLES AND UTILITIES.

NOTES

1. SEE SHEET 5 PROPOSED ELECTRICAL SITE PLAN FOR SITE LEGEND.

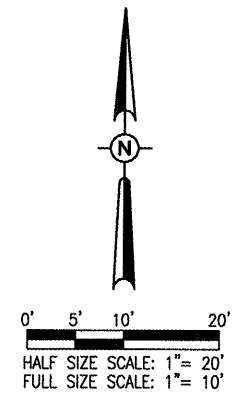


3/C #6 XLP-USE 600V UG CABLE IN UD TO WIND-TEE (AR108656)
 4/C #XLP-USE 600V UG CABLE IN UD TO AIRPORT ROTATING BEACON (AR108590)
 50 PAIR #19 AWG CONTROL CABLE TO NEW ATCT (108850). INSTALL CABLES ALONG FENC ROW.

PROPOSED LOW VOLTAGE HANDHOLE LOCATE INSIDE FENCE (AR110610). SPLICE POWER CABLES IN HANDHOLE. 50 PAIR #19 AWG CONTROL CABLE SHALL BE CONTINUOUS (NO SPLICES) FROM VAULT TO NEW ATCT.

INSTALL 7-1/C #6 XLP-USE (AR108086) FROM VAULT TO HANDHOLE WEST OF PARKING AREA. INSTALL 50 PAIR #19 AWG CONTROL CABLE (AR108850) IN SEPARATE DUCT. LEAVE 2 DUCTS SPARE.

CONTRACTOR WILL NEED TO VERIFY DEPTH OF EXISTING UTILITIES. DUCT BORING MIGHT NEED TO EXTEND BEYOND UTILITIES WHERE CONCRETE ENCASED DUCT WILL HAVE INTERFERENCES WITH EXISTING UTILITIES. QUANTITIES OF CONCRETE ENCASED DUCT & DIRECTIONAL BORE DUCT WILL BE ADJUSTED AS NECESSARY TO WORK AROUND UTILITIES.



DATE	REVISION	BY

SAINT LOUIS DOWNTOWN AIRPORT
 A Division of Bi-State Development Agency
 I.L. PROJ.: OPS-3708
 I.L. PROJ.: 3-17-0039-B19

Hanson Project No. 8450TELEC.DWG	FILENAME: R-102SIT.DWG	Scale: 1" = 10'	Date: 07/16/07
LAYOUT	KNL	05/22/07	
DRAWN	BAK	05/22/07	
REVIEWED	CAH	07/13/07	

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ATCT INTERFACE TO VAULT
 OLD ATCT SITE DETAIL
 PLAN

DATE	REVISION	BY

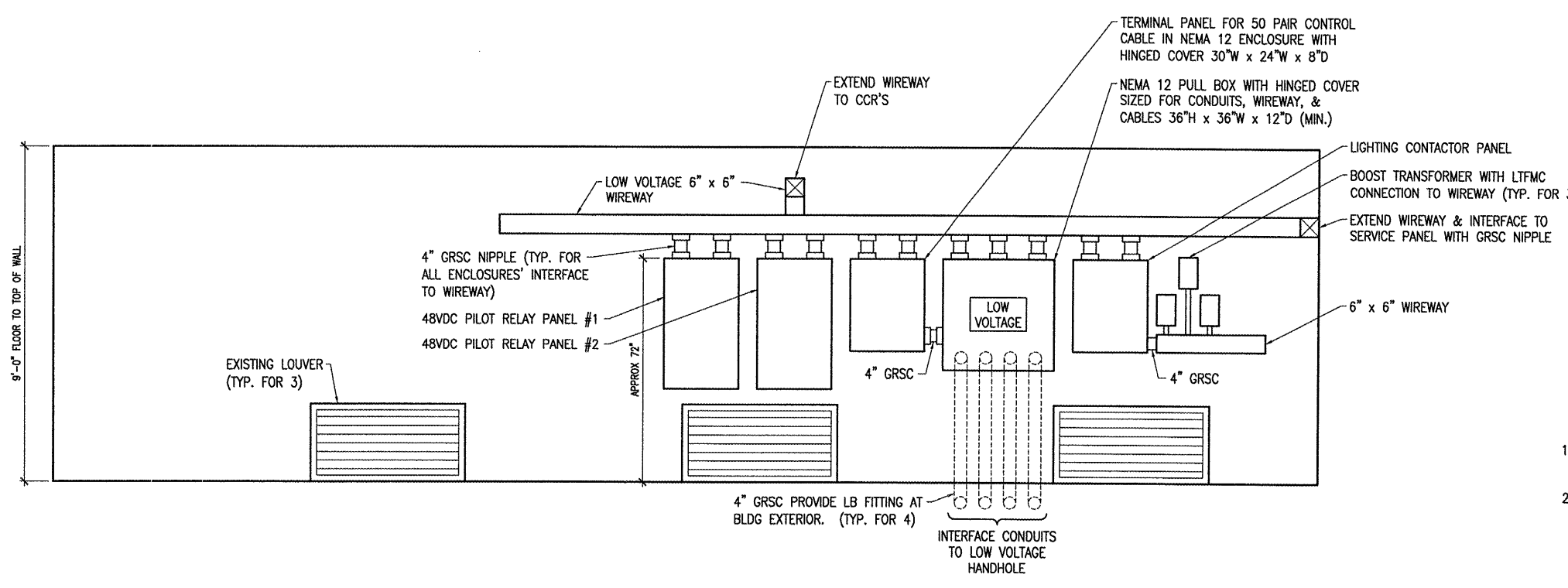
SAINT LOUIS DOWNTOWN AIRPORT
 A Division of Bi-State Development Agency
 A.I.P. PROJ.: 3-17-0039-B18

IL PROJ.: CPS-3708

Hanson Project No.	8450TELECD_0900
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Date	07/16/07
LAYOUT	KNL 06/25/07
DRAWN	CCC 06/28/07
REVIEWED	CAH 07/13/07

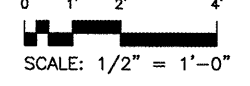
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ATCT INTERFACE TO VAULT
 VAULT SOUTH WALL ELEVATION

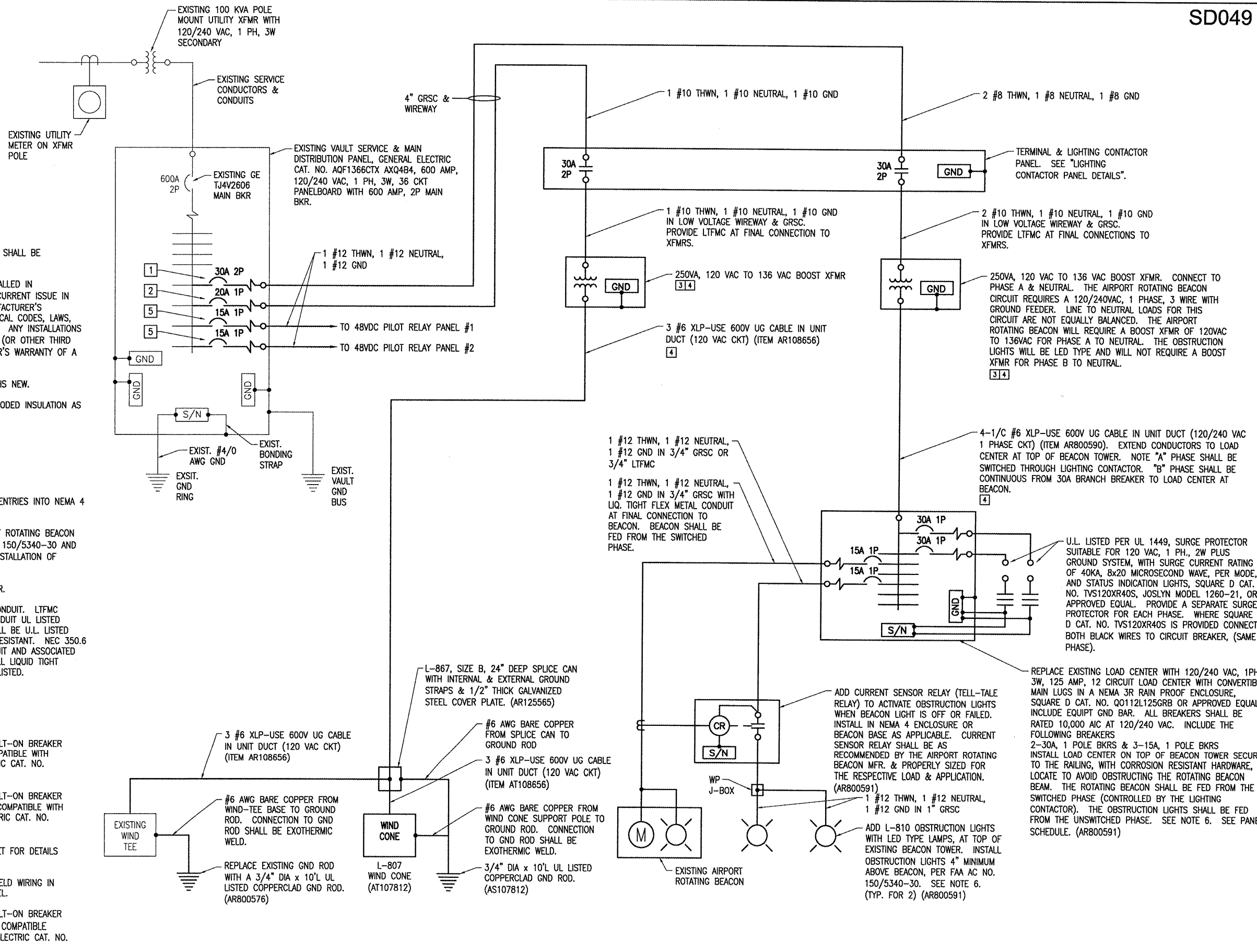


- NOTES**
- COORDINATE INSTALLATION OF NEW EQUIPMENT TO AVOID INTERFERENCES WITH EXISTING LOUVERS AND EXISTING EQUIPMENT.
 - PROVIDE APPROXIMATELY 6" OF SEPARATION BETWEEN PILOT RELAY PANELS, TERMINAL PANEL, PULL BOX, & LIGHTING CONTACTOR PANEL. ADJUST TO AVOID INTERFERENCES.

VAULT SOUTH WALL ELEVATION



NOTE
 SCALE SHOWN IS FOR FULL SIZE PLANS



NOTES

1. ALL VAULT WORK AND/OR POWER OUTAGES SHALL BE COORDINATED WITH THE AIRPORT MANAGER.
2. ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 (NEC MOST CURRENT ISSUE IN FORCE), THE RESPECTIVE EQUIPMENT MANUFACTURER'S DIRECTIONS AND ALL OTHER APPLICABLE LOCAL CODES, LAWS, ORDINANCES AND REQUIREMENTS IN FORCE. ANY INSTALLATIONS WHICH VOID THE 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 EQUIPMENT NOT LABELED AS EXISTING IS NEW.
4. CABLE IN UNIT DUCT SHALL HAVE COLOR CODED INSULATION AS FOLLOWS:
120/240 VAC CIRCUITS
PHASE A BLACK
PHASE B RED
NEUTRAL WHITE
GROUND GREEN
5. PROVIDE NEMA 4 HUBS FOR ALL CONDUIT ENTRIES INTO NEMA 4 RATED ENCLOSURES.
6. INSTALL OBSTRUCTION LIGHTING ON AIRPORT ROTATING BEACON TOWER IN CONFORMANCE WITH FAA AC NO. 150/5340-30 AND FAA AC NO. 150/5370-10, ITEM L-101, INSTALLATION OF AIRPORT ROTATING BEACONS.
7. ALL CONDUCTORS/WIRING SHALL BE COPPER.
8. GRSC DENOTES GALVANIZED RIGID STEEL CONDUIT. LTFMC DENOTES LIQUID TIGHT FLEXIBLE METAL CONDUIT UL LISTED LIQUID TIGHT FLEXIBLE METAL CONDUIT SHALL BE U.L. LISTED SUITABLE FOR GROUNDING AND SUNLIGHT RESISTANT. NEC 350.6 NOTES LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE LISTED. DO NOT INSTALL LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS NOT UL LISTED.

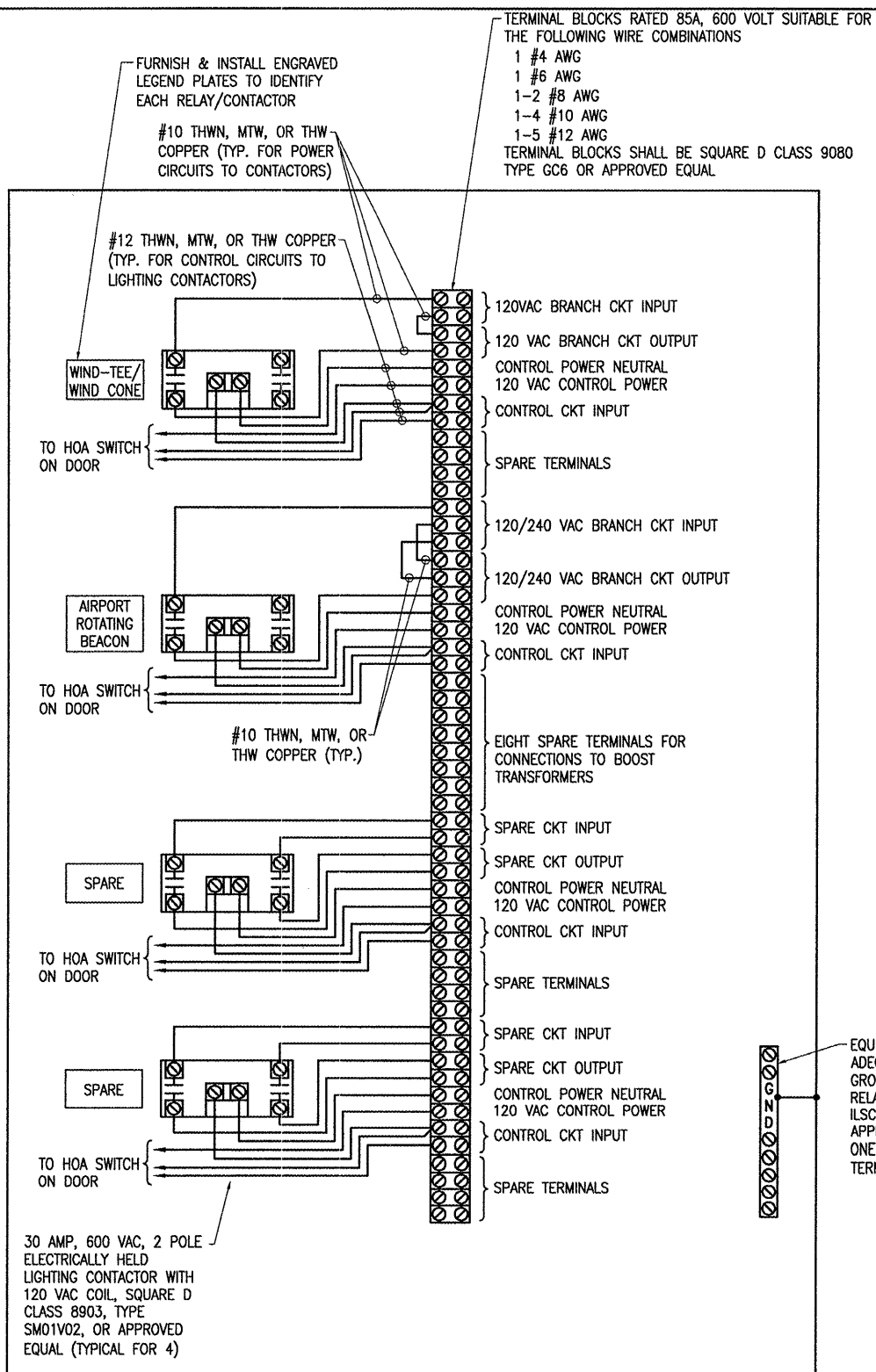
KEYED NOTES

- 1 FURNISH & INSTALL A 30 AMP, 2 POLE BOLT-ON BREAKER WITH 22,000 AIC AT 240 VAC THAT IS COMPATIBLE WITH THE EXISTING PANELBOARD, GENERAL ELECTRIC CAT. NO. THHQB22030.
- 2 FURNISH & INSTALL A 20 AMP, 1 POLE BOLT-ON BREAKER WITH 22,000 AIC AT 120/240 VAC THAT IS COMPATIBLE WITH THE EXISTING PANELBOARD, GENERAL ELECTRIC CAT. NO. THHQB1120.
- 3 SEE "TRANSFORMER WIRING DIAGRAMS" SHEET FOR DETAILS ON BOOST TRANSFORMER CONNECTIONS.
- 4 PERFORM SPLICES FOR VAULT WIRING TO FIELD WIRING IN THE TERMINAL & LIGHTING CONTACTOR PANEL.
- 5 FURNISH & INSTALL A 15 AMP, 1 POLE BOLT-ON BREAKER WITH 22,000 AIC AT 120/240 VAC THAT IS COMPATIBLE WITH THE EXISTING PANELBOARD GENERAL ELECTRIC CAT. NO. THHQB1115.

VAULT ELECTRICAL ONE-LINE DIAGRAM

BY	
REVISION	
DATE	
SAINT LOUIS DOWNTOWN AIRPORT A Division of Missouri State Development Agency A.L.P. PROJ.: 3-17-0039-B19	
Project No. 84507ELECD_0900 E-601.DWG Scale NONE Date 07/16/07	
LAYOUT	05/18/07
DRAWN	05/22/07
REVIEWED	07/13/07
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ATCT INTERFACE TO VAULT	VAULT ELECTRICAL ONE-LINE DIAGRAM
10 10 of 28 sheets	

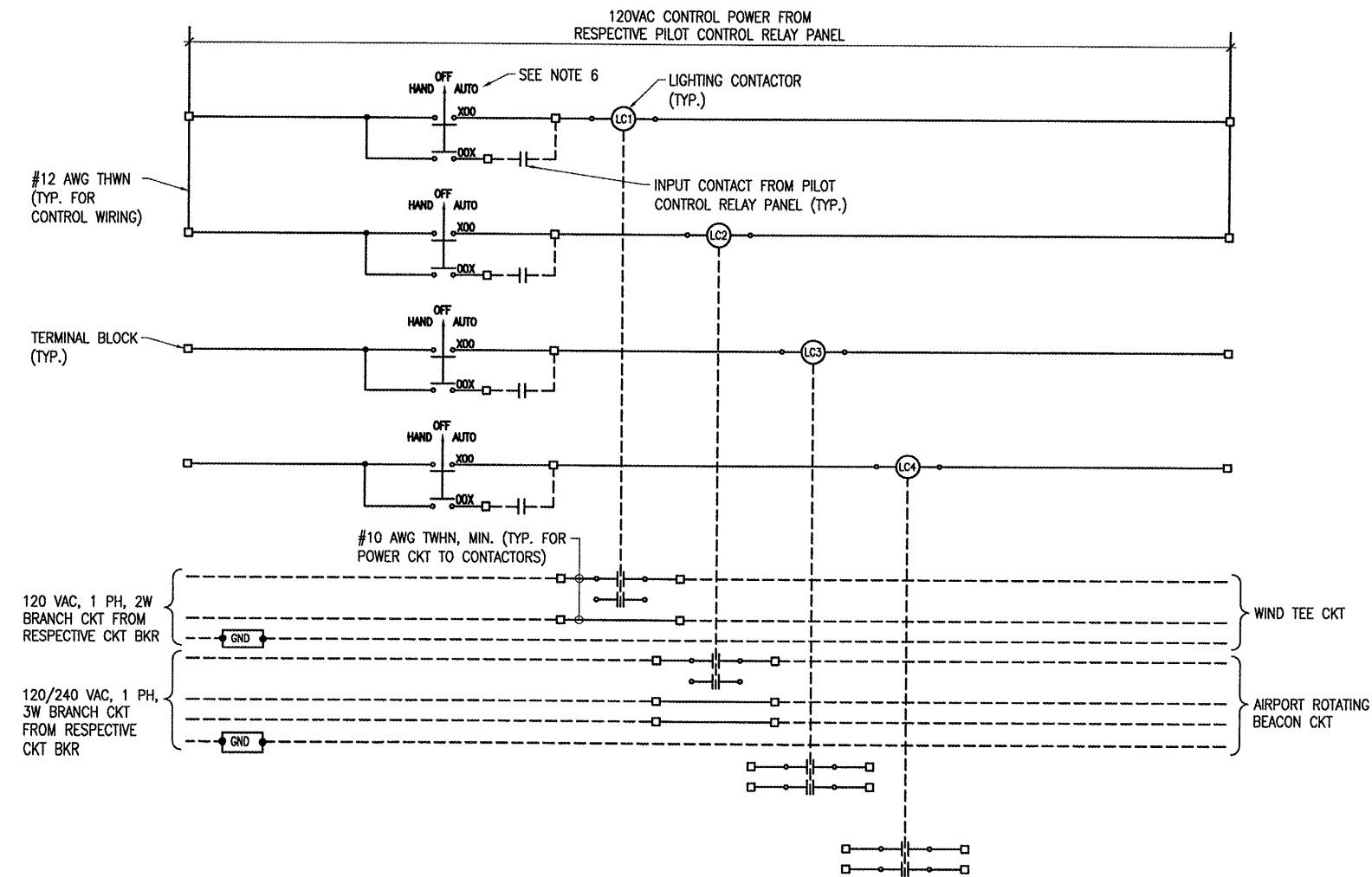
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CONTROL PANEL FOR BEACON & WIND TEE

NOTES

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



SCHEMATIC

DATE	REVISION	BY

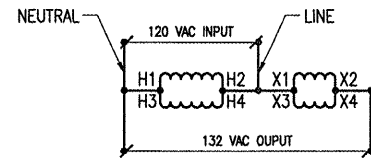
SAINT LOUIS DOWNTOWN AIRPORT
 A Division of Bi-State Development Agency
 A.I.P. PROJ.: 3-17-0039-B1B

IL PROJ.: OPS-3708

Hanson Project No.	B450TELECD_0900
Filename	E-602.DWG
Scale	NONE
Date	07/16/07
LAYOUT	KNL 05/18/07
DRAWN	MV 05/22/07
REVIEWED	CAH 07/13/07

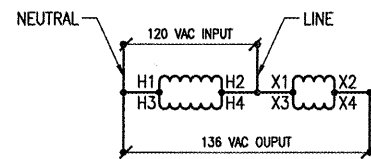
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ATCT INTERFACE TO VAULT
 LIGHTING CONTACTOR PANEL DETAIL



NOTE:
CONFIRM WIRING WITH RESPECTIVE
TRANSFORMER MFR.

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



NOTE:
CONFIRM WIRING WITH RESPECTIVE
TRANSFORMER MFR.

120 VAC TO 136 VAC BOOST TRANSFORMER
CONNECTION DIAGRAM FOR SQUARE D
CAT. NO. 250SV46B OR CAT. NO. 500SV46B TRANSFORMER

LEGEND PLATE SCHEDULE	
DEVICE	LEGEND PLATE LABEL
LOW VOLTAGE PULL BOX (PROVIDE LEGEND PLATE WITH 1/2" HIGH BLACK LETTERS WHITE BACKGROUND)	LOW VOLTAGE
LOW VOLTAGE WIREWAY (PROVIDE 10 LEGEND PLATES 1/2" HIGH BLACK LETTERS WHITE BACKGROUND)	LOW VOLTAGE
LIGHTING CONTACTOR PANEL (SEE LIGHTING CONTACTOR PANEL DETAIL FOR ADDITIONAL LEGEND PLATES)	LIGHTING CONTACTOR PANEL FOR AIRFIELD LIGHTING EQUIPMENT
BOOST TRANSFORMER FOR WIND-TEE	WIND-TEE
BOOST TRANSFORMER FOR AIRPORT ROTATING BEACON - PHASE A	BEACON - PHASE A
TERMINAL PANEL FOR 50 PAIR CONTROL CABLE LOCATED IN VAULT	TERMINAL PANEL VAULT INTERFACE TO ATCT
TERMINAL PANEL FOR 50 PAIR CONTROL CABLE LOCATED IN NEW ATCT	TERMINAL PANEL ATCT INTERFACE TO VAULT
48VDC PILOT CONTROL RELAY PANEL #1	PILOT CONTROL RELAY PANEL #1 48VDC
48VDC PILOT CONTROL RELAY PANEL #2	PILOT CONTROL RELAY PANEL #2 48VDC

NOTES

- 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/OR MACHINE SCREWS. FURNISH ADDITIONAL LEGEND PLATES WHERE REQUIRED BY CODE, FOR ADDITIONAL EQUIPMENT, AS DETAILED HEREIN IN THE PLANS, AND AS NOTED IN THE SPECIAL PROVISION SPECIFICATIONS. WHERE EQUIPMENT/DEVICE DOES NOT HAVE SUFFICIENT SPACE FOR THE RESPECTIVE LEGEND PLATES INSTALL LEGEND PLATES ABOVE OR ADJACENT TO RESPECTIVE DEVICE.

REVISION	BY

DATE

SAINT LOUIS DOWNTOWN AIRPORT
 A Division of Bi-State Development Agency
 A.I.P. PROJ.: 3-17-0039-B19

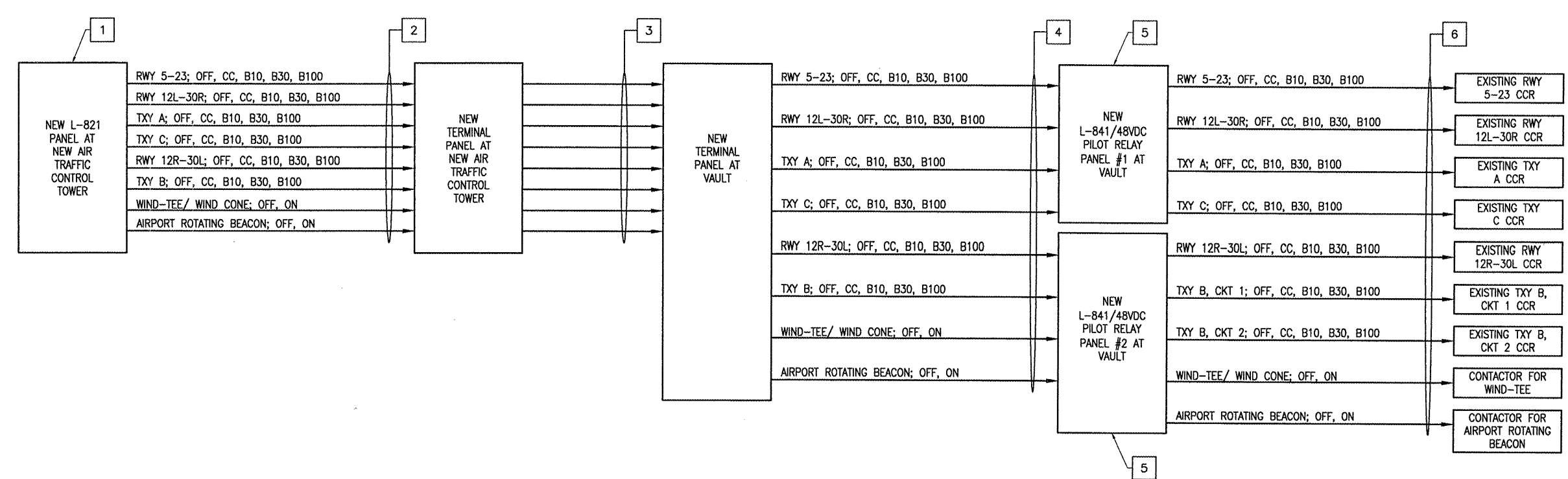
IL PROJ.: CPS-3708

Hanson Project No. 84507ELEC.D.0900	Revision	05/18/07
Filename E-603.DWG	Drawn	05/18/07
Size NONE	Checked	07/13/07
Date 07/16/07	Reviewed	
LAYOUT	KNL	
DRAWN	CCC	
REVIEWED	CAH	

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ATCT INTERFACE TO VAULT



TRANSFORMER WIRING DIAGRAMS AND LEGEND PLATE SCHEDULE

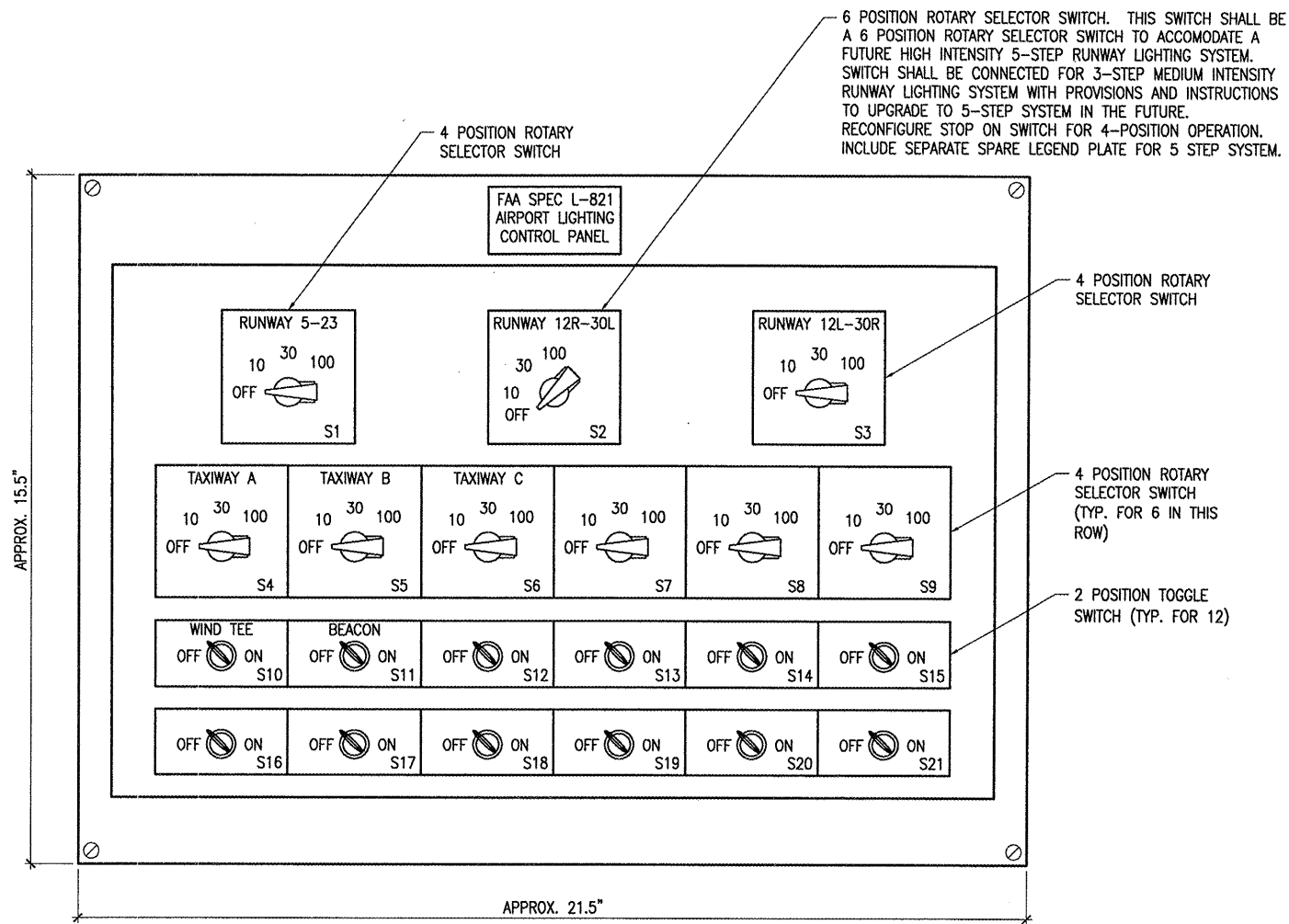


CONTROL BLOCK DIAGRAM FOR AIRFIELD LIGHTING

KEYED NOTES:

- 1 COORDINATE LOCATION OF NEW L-821 CONTROL PANEL WITH FAA AIR TRAFFIC CONTROL TOWER PERSONNEL. SEE "L-821 CONTROL PANEL DETAILS" SHEET, FOR PANEL LAYOUT & REQUIREMENTS.
- 2 CONTROL WIRING FROM L-821 PANEL TO TERMINAL PANEL AT NEW AIR TRAFFIC CONTROL TOWER SHALL BE 2 SETS OF 37/C #12 AWG, 600 VOLT TYPE TC CONTROL CABLE. PROVIDE CABLE SUPPORTS AND SLEEVES THROUGH WALL & FLOOR PENETRATIONS. TERMINAL PANEL AT ATCT SHALL BE LOCATED WITHIN 50' OF THE POINT OF CABLE ENTRY INTO THE BUILDING. 50 PAIR CABLE SHALL TRANSITION TO 2 SETS OF 37/C #14 AWG 600 VOLT TYPE TC CONTROL CABLE AT ATCT TERMINAL PANEL. SEE SPECIAL PROVISION SPECS.
- 3 FURNISH AND INSTALL 50-PAIR #19 AWG COMMUNICATION CABLE DIRECT BURY FROM THE VAULT TO THE NEW ATCT. CABLE SHALL COMPLY WITH ANSI/ICEA S-84-608-2002 AND RUS 7 CFR 1755.390 (PE-39). CABLE SHALL BE 50-PAIR, #19 AWG SOLID ANNEALED COPPER TELEPHONE COMMUNICATIONS CABLE, GOPHER RESISTANT, JELLY FILLED TO RESIST MOISTURE ENTRY AND TO INHIBIT CORROSION, SUITABLE FOR DIRECT BURIAL (BY PLOWING METHOD OR TRENCHING METHOD), AND FOR USE IN DUCT, SUPERIOR ESSEX GOPIC-F SERIES, PART NUMBER 04-034-27, OR APPROVED EQUAL. PROVIDE A TERMINAL BLOCK ENCLOSURE AT EACH LOCATION TO TERMINATE THE CONTROL WIRING CONDUCTORS. TERMINAL BLOCKS SHALL BE RATED 600 VOLT, 30 AMP, SUITABLE FOR THE RESPECTIVE WIRE SIZES, SQUARE D CLASS 9080, TYPE GK6 OR APPROVED EQUAL, HOUSED IN A NEMA 12 ENCLOSURE WITH HINGED COVER SIZED AS REQUIRED FOR THE CABLE AND TERMINATIONS. TERMINALS SHALL BE LABELED AND NUMBERED 1 THROUGH 100. PROVIDE GALVANIZED RIGID STEEL CONDUIT WHERE CABLE EMERGES FROM GRADE.
- 4 CONTROL WIRING FROM TERMINAL PANEL AT VAULT TO PILOT RELAY PANELS SHALL BE #12 AWG THWN COPPER IN WIREWAY & GRSC. DO NOT USE INSULATION COLORS THAT ARE WHITE OR GREEN FOR CONTROL WIRING. WHITE INSULATED CONDUCTORS SHALL BE FOR NEUTRAL CONDUCTORS. GREEN INSULATED CONDUCTORS SHALL BE FOR GROUND WIRES.
- 5 NEW PILOT RELAY PANEL 48 VDC FURNISHED BY AIRPORT, INSTALLED BY CONTRACTOR. SEE "PILOT RELAY PANEL 48 VDC" SHEET FOR DETAILS.
- 6 CONTROL WIRING FROM RESPECTIVE PILOT RELAY PANEL TO EACH RESPECTIVE CCR SHALL BE 4 #12 THWN, 1 #12 NEUTRAL, 1 #12 GND IN LOW VOLTAGE WIREWAY AND GRSC. PROVIDE LTFMC AT FINAL CONNECTIONS TO CCR'S. EXISTING CONTROL WIRING CONDUITS TO CCR'S MAY BE INTERCEPTED AND REUSED. SEE "LIGHTING CONTACTOR PANEL DETAIL" FOR WIRING REQUIREMENTS BETWEEN RESPECTIVE PILOT RELAY PANEL AND LIGHTING CONTACTORS.

DATE	BY				
REVISION					
 <p style="text-align: center;">SAINT LOUIS DOWNTOWN AIRPORT A Division of Bi-State Development Agency</p>					
ILL. PROJ.: CPS-3708 ALP. PROJ.: J-17-0039-B19					
Hanson Project No. 84507ELECD.0900	E-604.DWG	NONE	07/16/07	KML 06/25/07	CAH 07/13/07
Filename	Scale	Date	LAYOUT	DRAWN	REVIEWED
 <p style="text-align: center; font-size: x-small;">Hanson Professional Services Inc. 4227 St. Louis, MO 63045-3208 Offices Nationwide</p>					
ATCT INTERFACE TO VAULT			CONTROL BLOCK DIAGRAM FOR AIRFIELD LIGHTING		
13					
13 of 26 sheets					



NEW L-821 CONTROL PANEL

NOTES

1. THE NEW L-821 CONTROL PANEL SHALL BE COMPATIBLE WITH THE CONSOLE AT THE NEW AIR TRAFFIC CONTROL TOWER. THE DIMENSIONS SHOWN ARE BASED ON THE DIMENSIONS OF THE EXISTING L-821 PANEL LOCATED AT THE EXISTING (OLD) AIR TRAFFIC CONTROL TOWER. CONTRACTOR SHALL COORDINATE DIMENSIONS OF THE NEW L-821 CONTROL PANEL TO BE COMPATIBLE WITH THE RESPECTIVE CONSOLE. THE NEW L-821 CONTROL PANEL SHALL BE TYPE I, CLASS F, STYLE 1, MODE 1 CONFORMING TO FAA A/C 150/5345-3E, AS DETAILED ON THIS SHEET, AND PER THE SPECIAL PROVISION SPECIFICATIONS. THE NEW L-821 CONTROL PANEL SHALL BE MANUFACTURED BY AN FAA-APPROVED L-821 CONTROL PANEL MANUFACTURER; RURAL ELECTRIC INC., CONNECTICUT CONTROL SOLUTIONS, 9502 EAST MAIN STREET, MESA, ARIZONA 85207, PHONE: (480)-986-1488 OR (888)-964-1488, FAX (480)-984-0319, OR AN EQUIVALENT FAA APPROVED L-821 CONTROL PANEL MANUFACTURER.
2. L-821 CONTROL PANEL WILL BE PAID FOR UNDER ITEM AR109600 L-821 CONTROL PANEL PER EACH.
3. CONTROL WIRING AND ASSOCIATED CONDUITS, RACEWAYS, SUPPORTS, TERMINAL PANEL(S), JUNCTION BOXES, PULL BOXES, LABOR, TOOLS, COORDINATION AND INCIDENTALS REQUIRED TO COMPLETE THE WORK IN THE AIR TRAFFIC CONTROL TOWER WILL BE PAID FOR UNDER ITEM AR109430 POWER AND CONTROL WIRING PER LUMP SUM.

BY	
REVISION	
DATE	

SAINT LOUIS DOWNTOWN AIRPORT
A Division of Ill-State Development Agency
A.I.P. PROJ.: 3-17-03B-818

IL PROJ.: OPS-3708

Hanson Project No.	8450TELECD 0900
Filename	E-503.DWG
Scale	NONE
Date	07/16/07

LAYOUT	KNL	06/07/07
DRAWN	MY	06/07/07
REVIEWED	CAH	07/13/07

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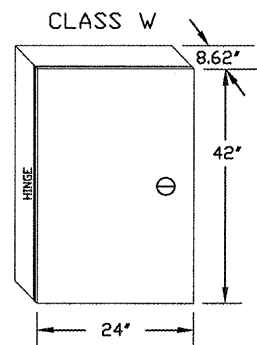
ATCT INTERFACE TO VAULT
L-821 CONTROL PANEL DETAILS

14
14 of 26 sheets

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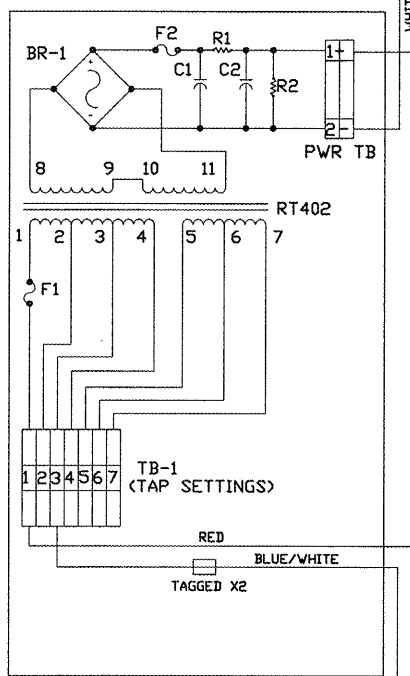
PARTS LIST

PART	DESCRIPTION
PANEL BOX	A-42N24B NEMA 1 W/PANEL
RYA-RYT	MK2P-S DMRON
TRANS.	RT402 STANCOR
BR-1	3A-5A 200PIV
F1	3A
F2	2A
R1	15ohm 20/25W
R2	200ohm 40/50W
20 RES.	100ohm 2W
C1,C2	2900uF 75V
20 CAPS.	.47uF 100V
40 VARIS.	VP130
TERM BLK	9080-GK6 SQ D
WIRE	MIL-P16878D-B16



CONTROL INPUT

1	A+
2	A-
3	B+
4	B-
5	C+
6	C-
7	D+
8	D-
9	E+
10	E-
11	F+
12	F-
13	G+
14	G-
15	H+
16	H-
17	I+
18	I-
19	J+
20	J-
21	K+
22	K-
23	L+
24	L-
25	M+
26	M-
27	N+
28	N-
29	O+
30	O-
31	P+
32	P-
33	Q+
34	Q-
35	R+
36	R-
37	S+
38	S-
39	T+
40	T-

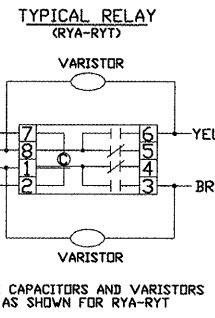
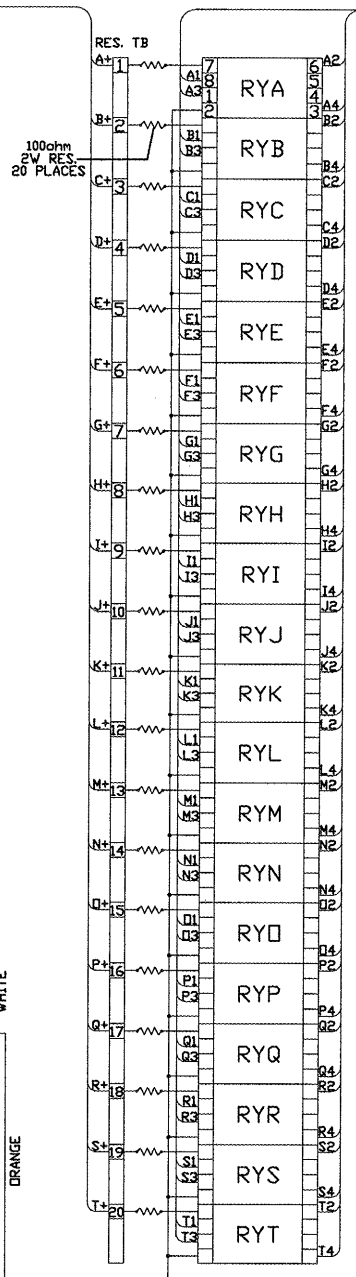


INPUT CONNECTIONS FOR VARIOUS CONTROL DISTANCES (TBL)

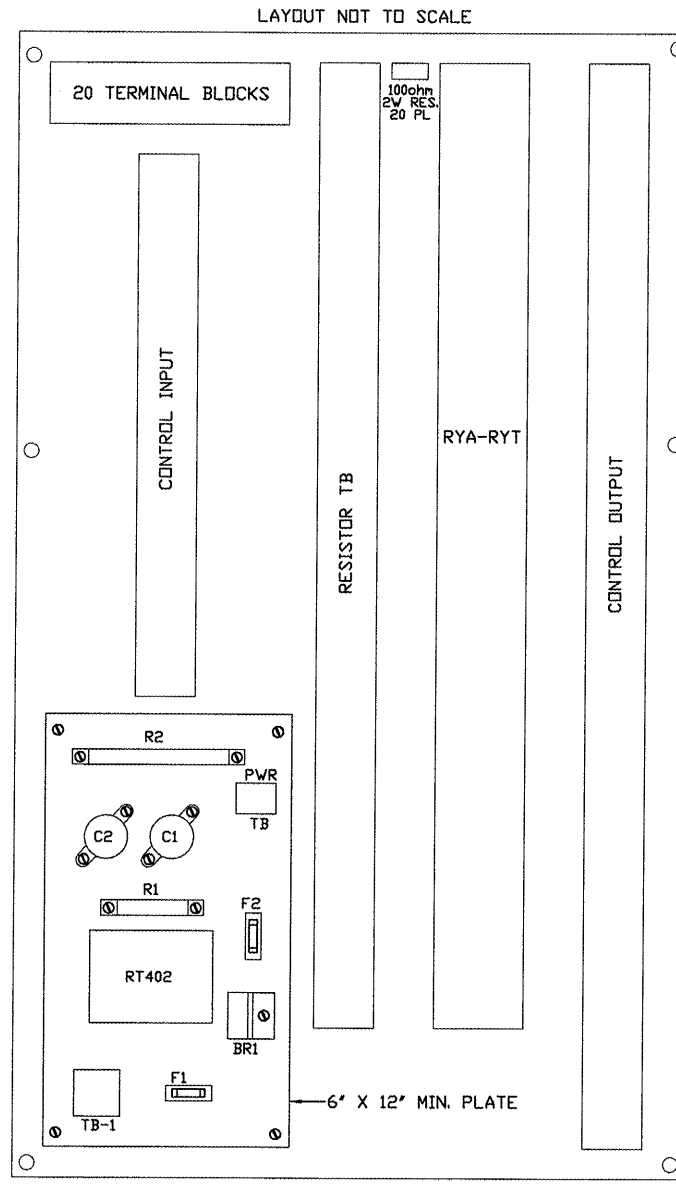
INPUT X &	CONNECT TOGETHER	DISTANCE TO CONTROL
3	NONE	TO 1000ft
7	2 & 5	1000 TO 15000ft
7	2 & 6	15000ft & UP

CONTROL OUTPUT

A1	1
A2	2
A3	3
A4	4
B1	5
B2	6
B3	7
B4	8
C1	9
C2	10
C3	11
C4	12
D1	13
D2	14
D3	15
D4	16
E1	17
E2	18
E3	19
E4	20
F1	21
F2	22
F3	23
F4	24
G1	25
G2	26
G3	27
G4	28
H1	29
H2	30
H3	31
H4	32
I1	33
I2	34
I3	35
I4	36
J1	37
J2	38
J3	39
J4	40
K1	41
K2	42
K3	43
K4	44
L1	45
L2	46
L3	47
L4	48
M1	49
M2	50
M3	51
M4	52
N1	53
N2	54
N3	55
N4	56
O1	57
O2	58
O3	59
O4	60
P1	61
P2	62
P3	63
P4	64
Q1	65
Q2	66
Q3	67
Q4	68
R1	69
R2	70
R3	71
R4	72
S1	73
S2	74
S3	75
S4	76
T1	77
T2	78
T3	79
T4	80
X1	120VAC
X2	82



SD049



38" X 22.5" NEMA 1

- NOTES
- 48 VDC PILOT RELAY PANEL IS SIMILAR TO AN L-841 AUXILIARY RELAY PANEL.
 - TWO 48 VDC PILOT RELAY PANELS MANUFACTURED BY UNIVERSE, INC. WILL BE FURNISHED BY THE AIRPORT AND SHALL BE INSTALLED BY THE CONTRACTOR AT THE VAULT.
 - INSTALLATION OF 48 VDC PILOT RELAY PANELS WILL BE PAID FOR & INCLUDED WITH ITEM AR109200 INSTALL ELECTRICAL EQUIPMENT PER LUMP SUM.

DATE	REVISION	BY

SAINT LOUIS DOWNTOWN AIRPORT
 A Division of St. Louis Development Agency
 ALP PROJ: 3-17-0039-B18
 I.L. PROJ: CPS-3708

Hanson Project No.	8450TELECD.0800
Estimate	E-606.DWG
Scale	NONE
Date	07/16/07
LAYOUT	KNL 06/25/07
DRAWN	MY 06/28/07
REVIEWED	CAH 07/13/07

HANSON
 Hanson Professional Services Inc.
 4227 Earth City Expressway, Suite 130
 St. Louis, MO. 63045-1308
 Offices Nationwide

ATCT INTERFACE TO VAULT
 PILOT RELAY PANEL
 48 VDC

**48VDC PILOT RELAY PANEL #1
RELAY ASSIGNMENT**



CCR CONTROL INPUT	RELAY
RWY 5-23 CCR CC	RELAY A, A2
RWY 5-23 CCR B10	RELAY B, B2
RWY 5-23 CCR B30	RELAY C, C2
RWY 5-23 CCR B100	RELAY D, D2
RWY 12L-30R CCR CC	RELAY E, E2
RWY 12L-30R CCR B10	RELAY F, F2
RWY 12L-30R CCR B30	RELAY G, G2
RWY 12L-30R CCR B100	RELAY H, H2
TXY A CCR CC	RELAY I, I2
TXY A CCR B10	RELAY J, J2
TXY A CCR B30	RELAY K, K2
TXY A CCR B100	RELAY L, L2
TXY C CCR CC	RELAY M, M2
TXY C CCR B10	RELAY N, N2
TXY C CCR B30	RELAY O, O2
TXY C CCR B100	RELAY P, P2
SPARE	RELAY Q
SPARE	RELAY R
SPARE	RELAY S
SPARE	RELAY T

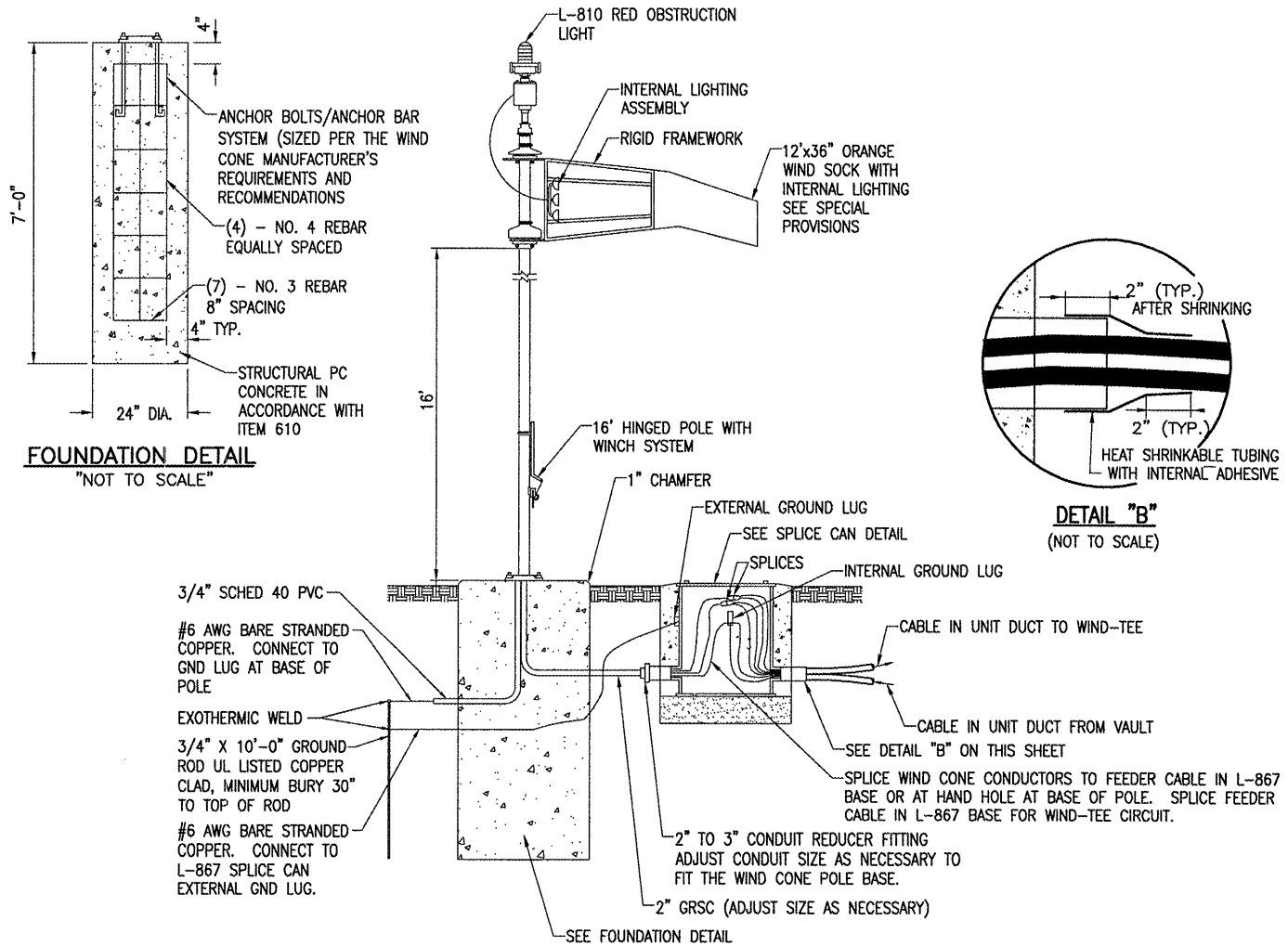
**48VDC PILOT RELAY PANEL #2
RELAY ASSIGNMENT**

CCR/CONTACTOR CONTROL INPUT	RELAY
RWY 12R-30L CCR CC	RELAY A, A2
RWY 12R-30L CCR B10	RELAY B, B2
RWY 12R-30L CCR B30	RELAY C, C2
RWY 12R-30L CCR B100	RELAY D, D2
RESERVE FOR FUTURE RWY 12R-30L CCR B4	RELAY E, E2
RESERVE FOR FUTURE RWY 12R-30L CCR B5	RELAY F, F2
TXY B, CKT 1 CCR CC	RELAY G, G2
TXY B, CKT 1 CCR B10	RELAY H, H2
TXY B, CKT 1 CCR B30	RELAY I, I2
TXY B, CKT 1 CCR B100	RELAY J, J2
TXY B, CKY 2 CCR CC	RELAY G, G4
TXY B, CKY 2 CCR B10	RELAY H, H4
TXY B, CKY 2 CCR B30	RELAY I, I4
TXY B, CKY 2 CCR B100	RELAY J, J4
WIND-TEE CONTACTOR - AUTO	RELAY K, K1 & K2
AIRPIORT ROTATING BEACON - AUTO	RELAY L, L1 & L2
SPARE	RELAY M
SPARE	RELAY N
SPARE	RELAY O
SPARE	RELAY P
SPARE	RELAY Q
SPARE	RELAY R
SPARE	RELAY S
SPARE	RELAY T

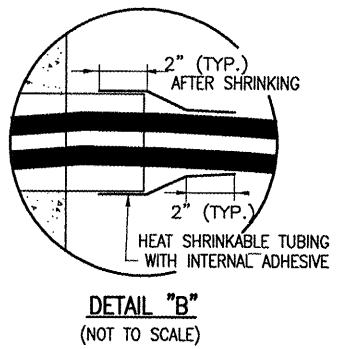
NOTES

1. EACH 48 VDC PILOT CONTROL RELAY PANEL SHALL BE FED FROM A DEDICATED 10 AMP OR 15 AMP, 1 POLE, 120 VAC BRANCH CIRCUIT BREAKER OUT OF THE VAULT SERVICE PANELBOARD.
2. 120 VAC CONTROL POWER FOR CONSTANT CURRENT REGULATORS SHALL BE FROM THE RESPECTIVE PILOT CONTROL RELAY PANEL CONTROLLING THAT CONSTANT CURRENT REGULATOR. CONNECT 120 VAC POWER TO THE CORRESPONDING RELAY INPUT CONTACT TERMINALS (EXAMPLE A1, B1, C1, D1, E1, F1, G1, H1, I1, ETC. FOR CORRESPONDING RELAY OUTPUT TERMINALS A1, B2, C2, D2, E2, F2, G2, H2, I2, ETC.).
3. 120 VAC CONTROL POWER FOR THE LIGHTING CONTACTOR CONTROL PANEL SHALL BE FROM THE RESPECTIVE PILOT CONTROL RELAY PANEL CONTROLLING THE LIGHTING CONTACTORS.
4. ESTABLISH A COLOR CODING FOR THE CONTROL WIRING TO EACH CONSTANT CURRENT REGULATOR AND BE CONSISTENT FOR ALL REGULATORS.
EXAMPLE:
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%)

	BY								
	REVISION								
	DATE								
 <p style="font-size: small; text-align: center;">A Division of Missouri State Development Agency A.L.P. PROJ.: 3-17-0038-B19 IL PROJ.: CFS-3708</p>									
Hanson Project No. 84507ELEC0_0900 Elevation E-605.DWG Scale NONE Date 07/16/07		LAYOUT KNL 06/25/07 DRAWN MV 06/28/07 REVIEWED CAH 07/13/07		 <p style="font-size: x-small; text-align: center;">Hanson Professional Services, Inc. 4227 Earth City Expressway, Suite 130 St. Louis, MO 63045-1308 Offices Nationwide</p>					
ATCT INTERFACE TO VAULT					RELAY ASSIGNMENTS FOR PILOT RELAY PANELS				
16									
16 of 26 sheets									



FOUNDATION DETAIL
"NOT TO SCALE"



DETAIL "B"
(NOT TO SCALE)

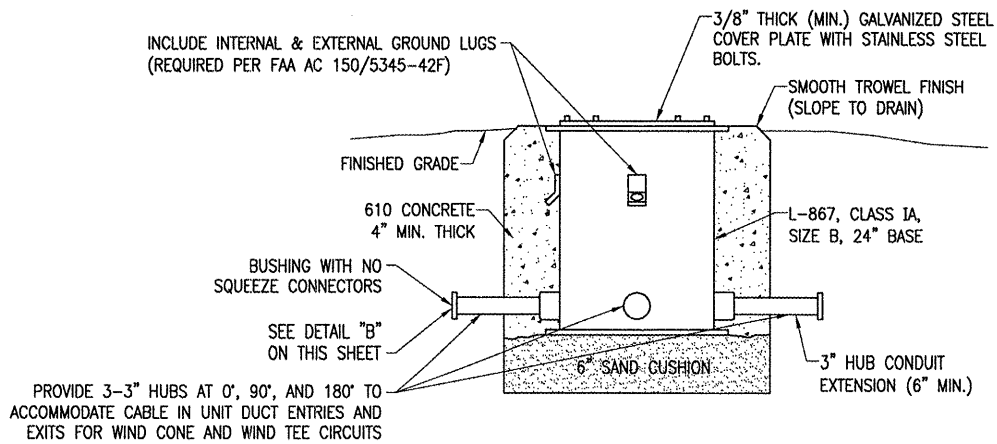
INTERNALLY LIGHTED L-807 WIND CONE
"NOT TO SCALE"

- NOTES**
1. WIND CONE SHALL BE FAA APPROVED L-807, STYLE 1B INTERNALLY LIGHTED, SIZE 2 WITH ORANGE WIND SOCK, 120 VAC, & WITH L-810 OBSTRUCTION LIGHT, SEE SPECIAL PROVISION SPECS.
 2. L-807 WIND CONE 12' INTERNALLY LIT WILL BE PAID FOR UNDER ITEM AT107812.
 3. THE WIND CONE IS AN ADDITIVE ALTERNATE. IN THE EVENT THE WIND CONE IS NOT AWARDED LOCATE THE SPLICE CAN NEAR THE WIND-TEE.
 4. SPLICE CAN WILL BE PAID FOR SEPARATELY UNDER ITEM AR125565.

WIND CONE REMOVAL NOTES

1. EXISTING UNLIT WIND CONE LOCATED NEAR THE WIND-TEE SHALL BE REMOVED. THE CONTRACTOR SHALL COORDINATE THE REMOVAL OF EXISTING UNLIT WIND CONE WITH THE INSTALLATION OF THE NEW L-807 LIGHTED WIND CONE TO MINIMIZE THE TIME WHEN THE AIRPORT IS WITHOUT A MAIN WIND CONE. THE CONTRACTOR SHALL ALSO COORDINATE WITH AND NOTIFY THE AIRPORT DIRECTOR AND THE RESIDENT ENGINEER AND PROVIDE A SCHEDULE FOR WIND CONE REMOVAL AND THE INSTALLATION OF THE NEW L-807 LIGHTED WIND CONE. THE CONTRACTOR SHALL TURN EACH WIND CONE AND SUPPORT POLE OVER TO THE AIRPORT DIRECTOR AND/OR AIRPORT MAINTENANCE STAFF. THE CONCRETE BASE/FOUNDATION WILL BE DISPOSED OF OFF THE AIRPORT SITE, IN A LEGAL MANNER, AT THE EXPENSE OF THE CONTRACTOR.
2. THE HOLES LEFT FROM THE BASE/FOUNDATION REMOVAL SHALL BE FILLED WITH EARTH MATERIAL. THE EARTH MATERIAL WILL BE COMPACTED TO PREVENT ANY FUTURE SETTLEMENT. THE EARTH MATERIAL WILL BE OBTAINED FROM OFF THE AIRPORT SITE. THE DISTURBED AREA WILL BE RESTORED, GRADED, AND SEEDED TO THE SATISFACTION OF THE ENGINEER AND IS CONSIDERED INCIDENTAL TO THE REMOVAL OF THE WIND CONE.
3. REMOVAL OF EXISTING UNLIT WIND CONE WILL BE PAID FOR UNDER ITEM AT107900 REMOVE WIND CONE - PER EACH.

WORK FOR L-807 WIND CONE SHOWN ON THIS SHEET IS FOR ADDITIVE ALTERNATE NO. 2



SPLICE CAN DETAIL FOR WIND CONE/WIND-TEE
(NOT TO SCALE)

DATE	REVISION	BY

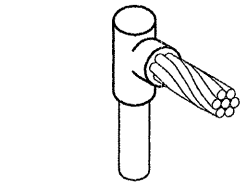
SAINT LOUIS DOWNTOWN AIRPORT
A Division of Bi-State Development Agency
A.I.P. PROJ.: 3-17-0039-B19
I.L. PROJ.: 0FS-3708

Hanson Project No.	84507ELECD_0900
Filename	E-505.DWG
Scale	NONE
Date	07/16/07
LAYOUT	KNL 06/25/07
DRAWN	MV 06/26/07
REVIEWED	CAH 07/13/07

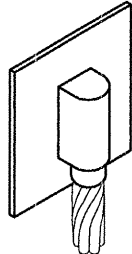
HANSON
Hanson Professional Services, Inc.
4227 Earth City Expressway, Suite 130
St. Louis, MO 63045-1308
Offices Nationwide

ATCT INTERFACE TO VAULT
L-807 WIND CONE DETAIL

JUL 25, 2008 9:39 AM V00RH00805
I:\AIRPORTS\ST. LOUIS DOWNTOWN\84507ELECD\AIRPORT_SHEETS\E-505.DWG - Work



CABLE TO GROUND ROD

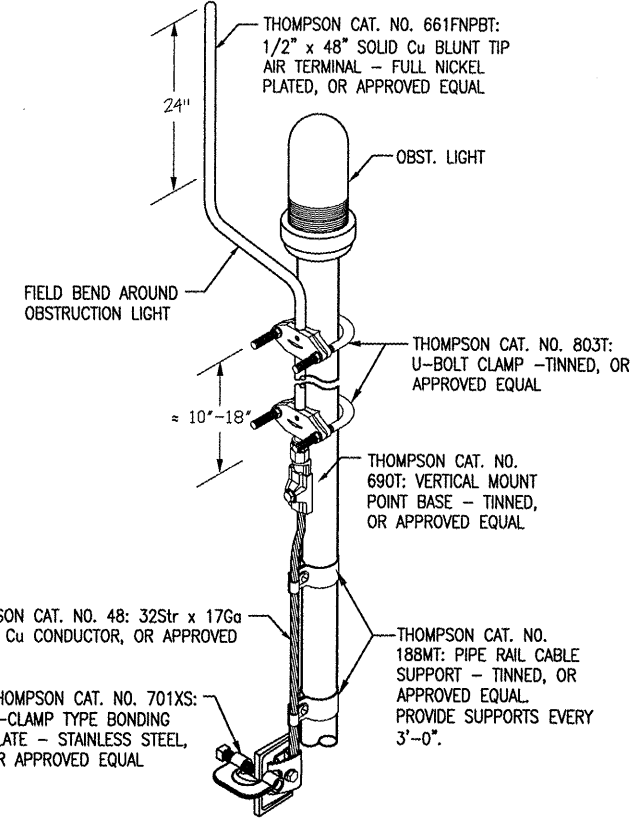


CABLE TO SURFACE

DETAIL NOTES

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

EXOTHERMIC WELD DETAILS

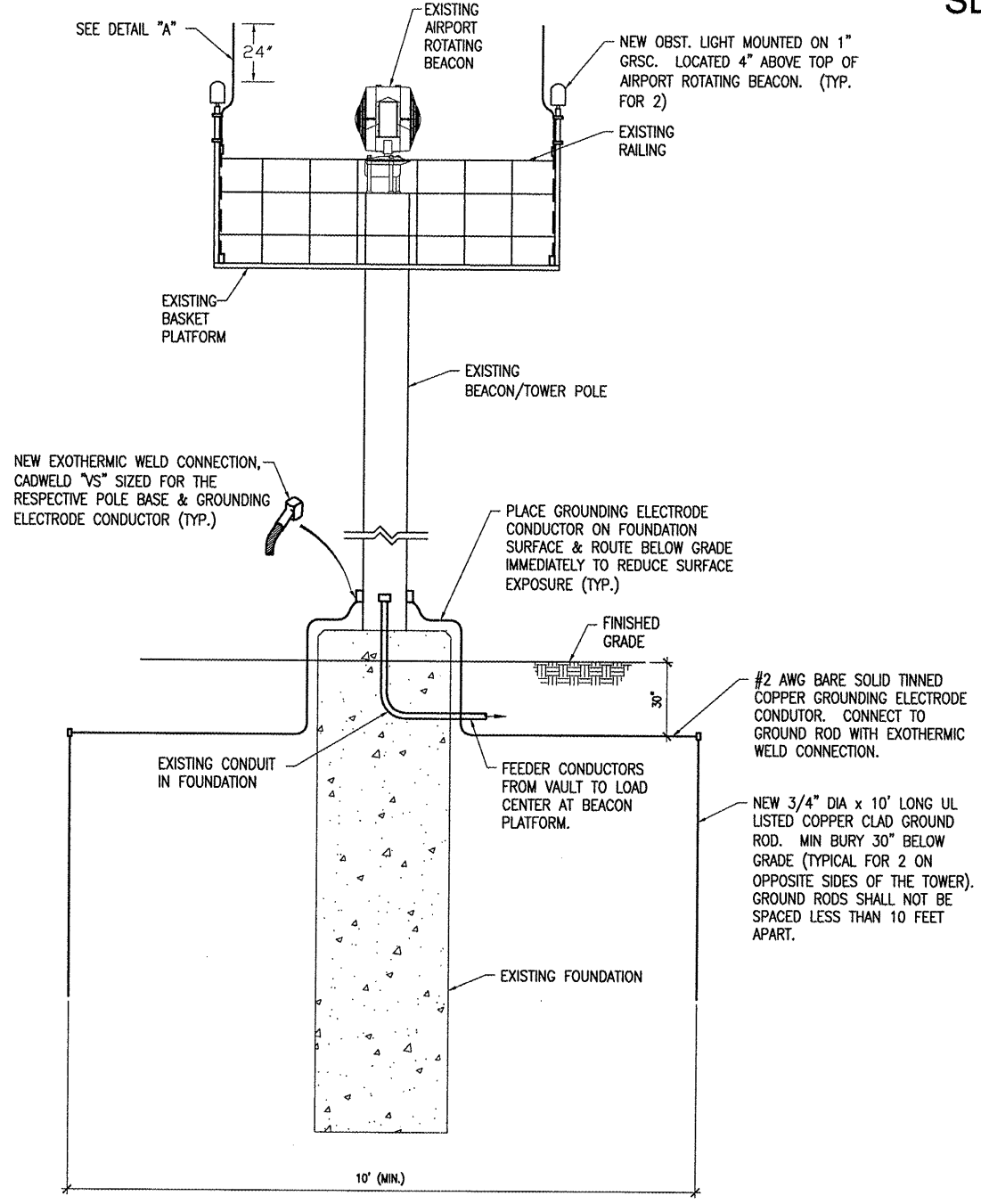


DETAIL A

NTS

NOTES

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



LIGHTNING PROTECTION DETAIL FOR AIRPORT ROTATING BEACON

NTS

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

AIRPORT ROTATING BEACON PANEL						
CKT #	DUTY	SIZE		SIZE	DUTY	CKT #
1	AIRPORT ROTATING BEACON	15A 1P		30A 1P	SURGE PROTECTOR (PHASE A)	2
3	OBSTRUCTION LIGHTS	15A 1P		30A 1P	SURGE PROTECTOR (PHASE B)	4
5	BLANK				BLANK	6
7	SPARE	15A 1P			BLANK	8
9	BLANK				BLANK	10
11	BLANK				BLANK	12

125 AMP, 120/240 VAC, 1 PHASE, 3 WIRE, 12 CIRCUIT LOAD CENTER WITH CONVERTIBLE MAIN LUGS IN A NEMA 3R RAIN PROOF ENCLOSURE, SQUARE D CAT. NO. Q0112L125GRB OR APPROVED EQUAL.

NOTES

- INCLUDE EQUIPT GROUND BAR KIT.
- ALL BREAKERS SHALL HAVE 10,000 AIC RATING AT 120/240 VAC.
- PHASE "A" SHALL BE SWITCHED THROUGH A LIGHTING CONTACTOR AT THE VAULT. PHASE "B" SHALL BE UNSWITCHED.
- INCLUDE ENGRAVED PHENOLIC LEGEND PLATE LABELED ARB PANEL, 120/240 VAC, 1PH, 3W, FED FROM VAULT.
- SURGE PROTECTORS SHALL BE SUITABLE FOR 120VAC, 1PH, 2W PLUS GROUND, 40KA SURGE CURRENT RATING, & STATUS INDICATION LIGHTS, JOSLYN MODEL 1260-21 OR SQUARE D TVS120XR40S, OR APPROVED EQUAL. FURNISH & INSTALL TWO SURGE PROTECTORS (ONE FOR EACH PHASE). WHERE SQUARE D TVS120XR40S IS PROVIDED CONNECT BOTH BLACK WIRES TO 1-POLE CIRCUIT BREAKER (SAME PHASE).

REVISION	DATE	BY

SAINT LOUIS DOWNTOWN AIRPORT



Hanson Project No.	8450TELECD_0900
Estimate	E-504.DWG
Scale	NONE
Date	05/18/07
LAYOUT	KNL 06/25/07
DRAWN	MY 06/28/07
REVIEWED	CAH 07/13/07

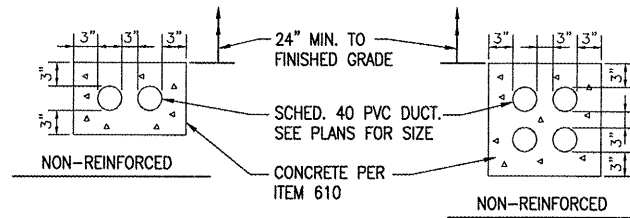
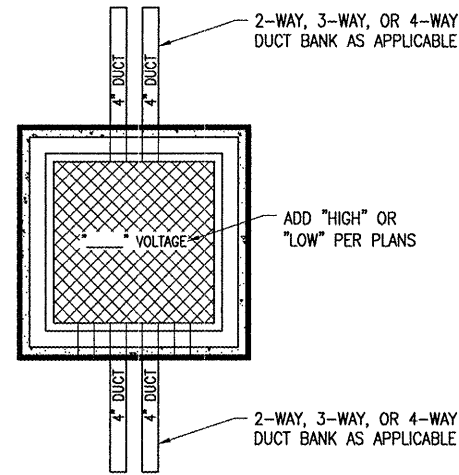
HANSON

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St. Louis, MO 63045-1308
Offices Nationwide

ATCT INTERFACE TO VAULT

LIGHTNING PROTECTION DETAILS FOR BEACON

JUL 25, 2008 9:39 AM V00RH00805
E:\AIRPORTS\ST. LOUIS DOWNTOWN\8450TELECD\AIRPORT\SHEETS\E-504.DWG - Work



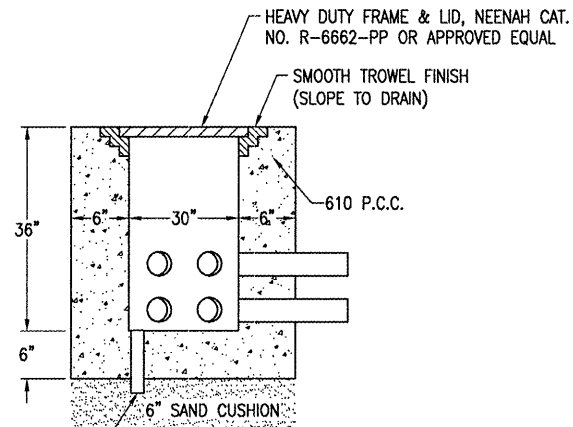
NOTES:

1. ALL DIMENSIONS ARE MINIMUM.
2. INCLUDE DUCT SPACERS AS MANUFACTURED BY UNDERGROUND DEVICES INC., TO MAINTAIN PROPER SEPARATION OF CONDUITS.

CONCRETE ENCASED DUCT DETAIL

(2-WAY & 4-WAY SHOWN)

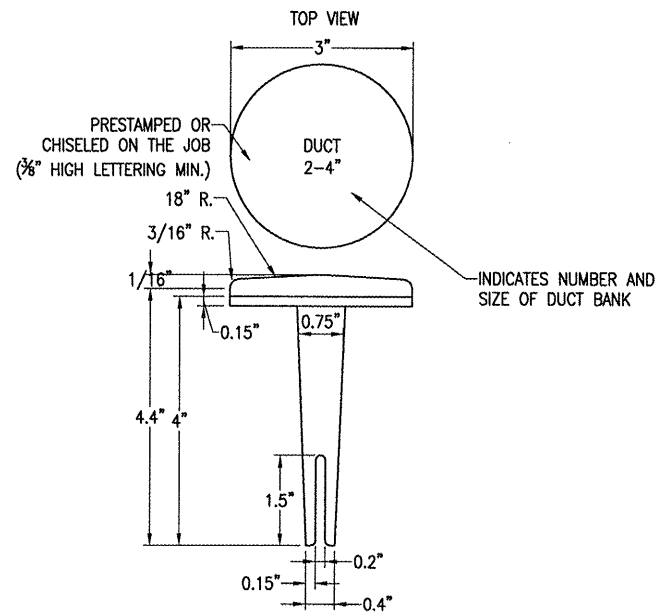
THE LOCATION OF UNDERGROUND UTILITIES AS INDICATED ON THE PLANS HAS BEEN OBTAINED FROM EXISTING RECORDS. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY WHATSOEVER, IN RESPECT TO THE ACCURACY OR SUFFICIENCY OF THE INFORMATION AND THERE IS NO GUARANTEE, EITHER EXPRESSED OR IMPLIED, THAT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



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

NOTE:

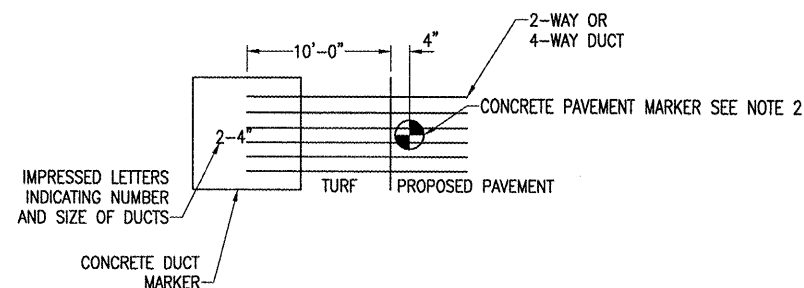
1. LIDS FOR LOW VOLTAGE HANDHOLES SHALL BE LABELED "LOW VOLTAGE". LIDS FOR HIGH VOLTAGE HANDHOLES SHALL BE LABELED "HIGH VOLTAGE". COORDINATE LETTERING WITH MFR.
2. HANDHOLE MAY BE CAST IN PLACE OR PRECAST.
3. SEE SPECIAL PROVISIONS.



BITUMINOUS PAVEMENT DUCT MARKERS

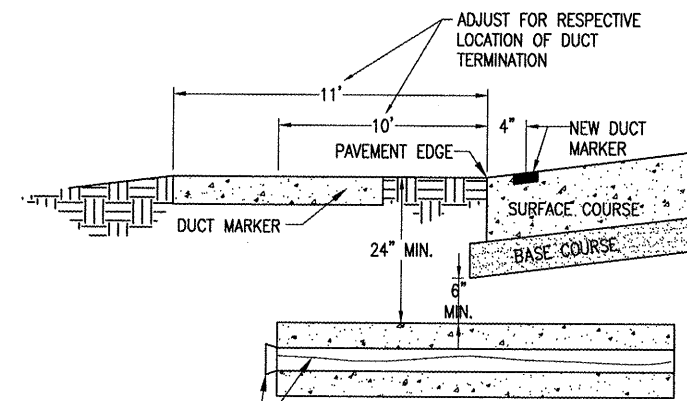
"NOT TO SCALE"

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



DUCT MARKER DETAIL

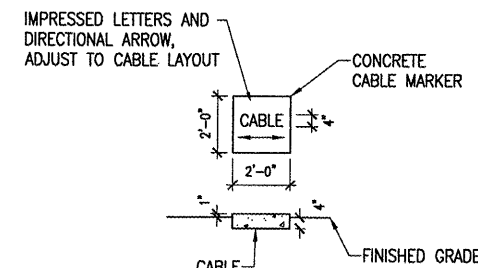
"NOT TO SCALE"



#10 PULL WIRE COIL A MINIMUM OF 3' AT DUCT ENDS. INSTALL APPROVED PLUGS IN END OF DUCTS NOT USED.

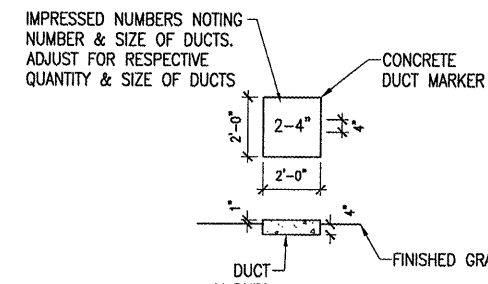
UNDERGROUND ELECTRICAL DUCT

"NOT TO SCALE"



TURF CABLE MARKERS

"NOT TO SCALE"



TURF DUCT MARKERS

"NOT TO SCALE"

DATE	REVISION	BY

SAINT LOUIS DOWNTOWN AIRPORT
A Division of Bi-State Development Agency

ALP PROJ: 3-17-03B-819

IL PROJ: CPS-3708

Hanson Project No.	84507ELEC.0900
Drawn	E-501.DWG
Scale	NONE
Date	07/16/07
LAYOUT	05/03/07
DRAWN	CCC
REVIEWED	CAH
	05/18/07

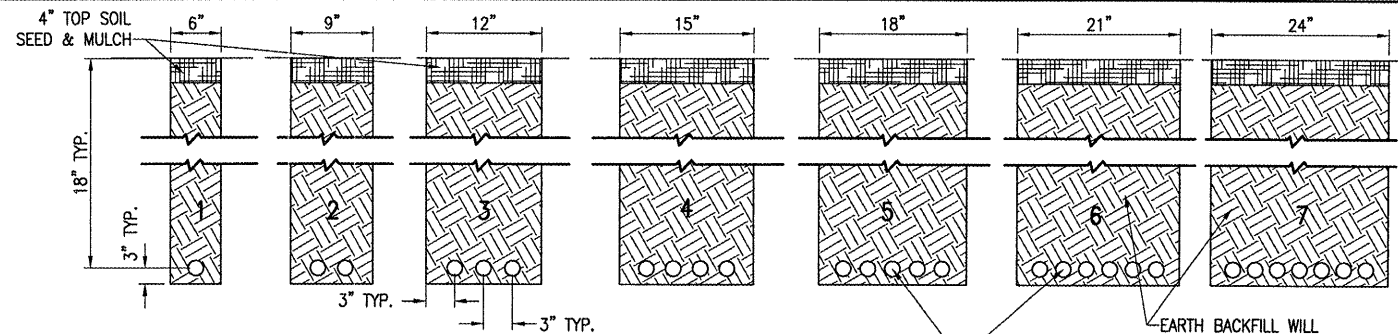
HANSON

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4227 Earth City Expressway, Suite 130
St. Louis, MO 63045-1308
Offices Nationwide

ATCT INTERFACE TO VAULT

ELECTRICAL DETAILS

SHEET 1



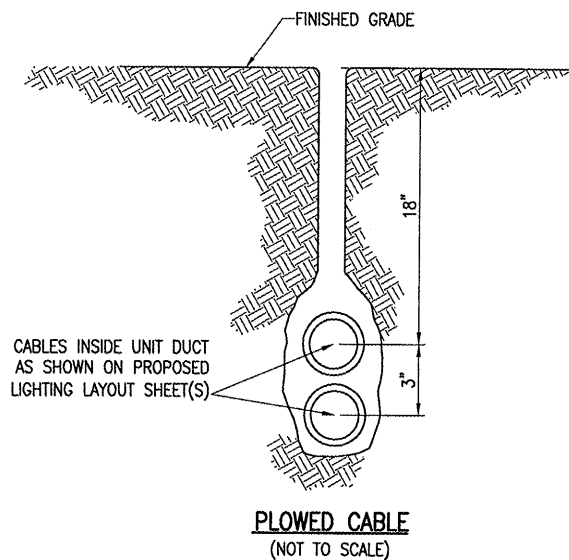
NOTES:
 DETAIL NUMBERS INDICATE NO. OF CABLES.

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.

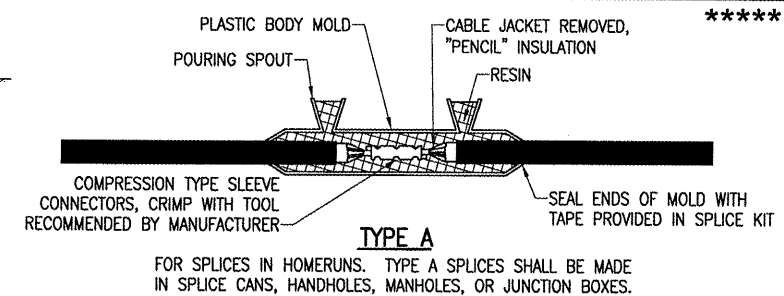
DEPTH OF TRENCHES SHALL BE AS SHOWN ABOVE UNLESS OTHERWISE SPECIFIED ON THE PLANS.

ALL DISTURBED SURFACES SHALL BE RESTORED TO THEIR ORIGINAL CONDITION. COST IS INCIDENTAL TO TRENCH.

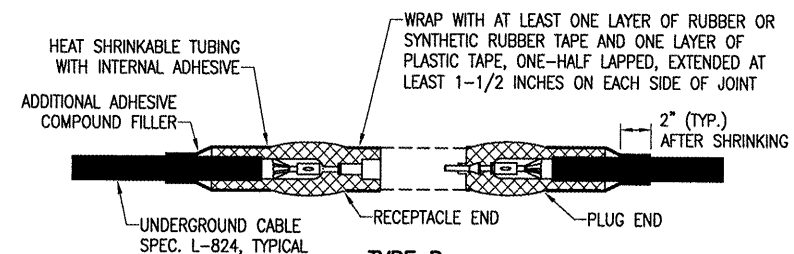
CABLE TRENCHES
 (NOT TO SCALE)



PLOWED CABLE
 (NOT TO SCALE)

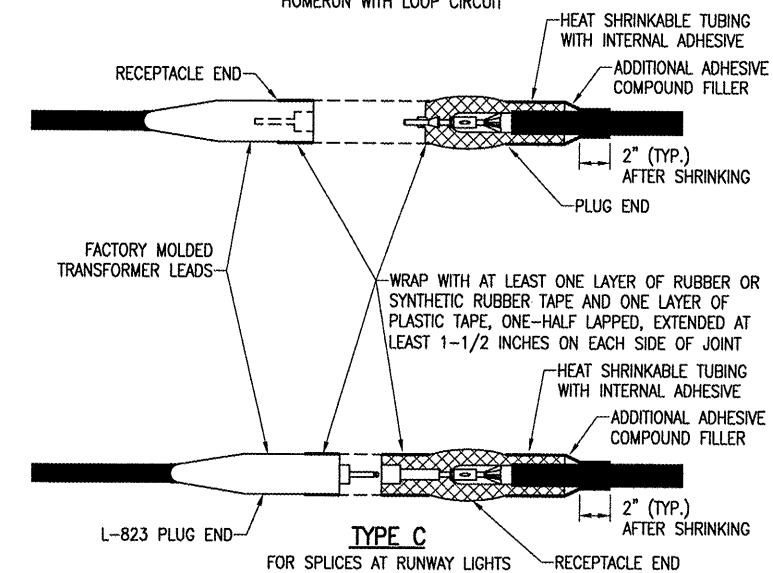


FOR SPLICES IN HOMERUNS. TYPE A SPLICES SHALL BE MADE IN SPLICE CANS, HANDHOLES, MANHOLES, OR JUNCTION BOXES.



TYPE B

FOR SPLICES AT JUNCTION OF HOMERUN WITH LOOP CIRCUIT



TYPE C

FOR SPLICES AT RUNWAY LIGHTS

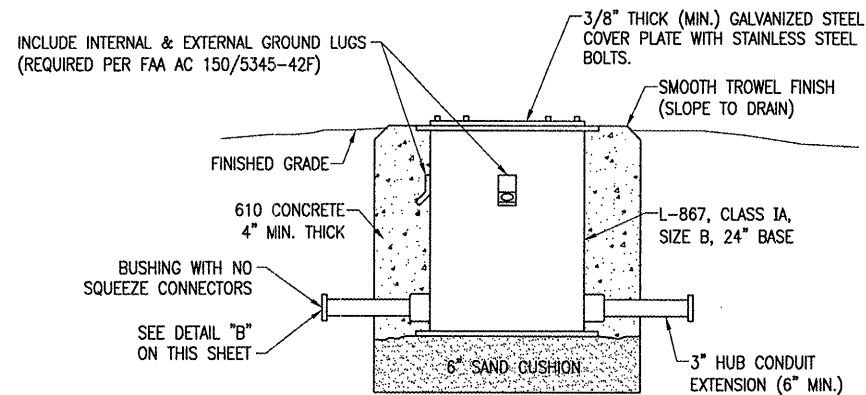
NOTES:
 SEE PROPOSED LIGHTING LAYOUT SHEET(S) FOR SPLICE TYPE.

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

CABLE SPLICES
 (NOT TO SCALE)

THE LOCATION, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ON THE PLANS IS NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES OF HIS OPERATIONAL PLANS AND SHALL OBTAIN FROM THE RESPECTIVE UTILITY COMPANIES DETAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF THEIR FACILITIES AND THE WORKING SCHEDULE OF THE COMPANIES FOR REMOVAL OR ADJUSTMENT WHERE REQUIRED. IN THE EVENT AN UNEXPECTED UTILITY INTERFERENCE IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY COMPANY OF JURISDICTION. THE ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT.

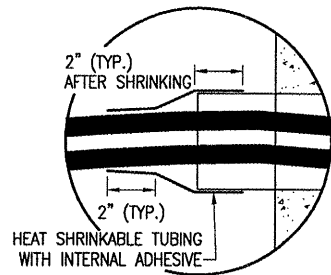
CALL J.U.L.I.E. FOR UTILITY INFORMATION AT 1-800-892-0123. CONTACT AIRPORT PERSONNEL FOR ASSISTANCE IN LOCATING AIRPORT CABLES. CONTACT FAA FOR ASSISTANCE IN LOCATING FAA CABLES



SPLICE CAN DETAIL
 (NOT TO SCALE)

NOTES:

- SPLICE CANS SHALL BE LOCATED AS DETAILED ON THE PLANS.
- ADDITIONAL SPLICE CANS REQUIRED FOR EXISTING CABLES CUT AND REPAIRED OR TO ACCOMMODATE CABLE RESPECTIVE INSTALLATION SHALL BE INCIDENTAL TO THAT RESPECTIVE PAY ITEM OR REPAIR WORK.



DETAIL "B"
 (NOT TO SCALE)

BY	REVISION	DATE

TRI-TOWNSHIP AIRPORT
 SAVANNA, CARROLL COUNTY
 ILLINOIS

Hanson Project No.	826-		
Element	E-502.DWG		
Scale	NONE		
Date	01/02/08		
LAYOUT	KNL	01/02/08	
DRAWN	MOR	01/02/08	
REVIEWED	CAH	07/13/07	

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

ATCT INTERFACE
 TO VAULT

ELECTRICAL DETAILS
 SHEET 3

GENERAL NOTES

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

POWER AND CONTROL NOTES

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

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

BY	
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DATE	

SAINT LOUIS DOWNTOWN AIRPORT
A Division of St. Louis Development Agency
A.I.P. PROJ.: 3-17-0039-B19

I.L. PROJ.: GPS-3708

Hanson Project No.	84507ELECD 0900
Estimate	E-002.DWG
Scale	NONE
Date	07/16/07
LAYOUT	KNL 05/03/07
DRAWN	CCC 05/18/07
REVIEWED	CAH 07/13/07

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ATCT INTERFACE TO VAULT
ELECTRICAL NOTES
SHEET 1

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AIRFIELD LIGHTING NOTES

1. UNLESS OTHERWISE NOTED, ALL UNDERGROUND AIRFIELD LIGHTING SERIES CIRCUIT CONDUCTORS WHETHER DEB OR IN DUCT/CONDUIT SHALL BE FAA APPROVED 5000 VOLT L-824 TYPE. ALL UNDERGROUND FIELD POWER LOW VOLTAGE (600 VOLT & BELOW) CIRCUIT CONDUCTORS WHETHER DEB OR IN DUCT/CONDUIT SHALL BE UL LISTED 600 VOLT, TYPE XLP-USE-2 COPPER CONDUCTORS. CONDUCTOR SIZES SHALL BE AS SPECIFIED, HEREIN.
2. NO COMPONENTS OF PRIMARY CIRCUIT SUCH AS CABLE, CONNECTORS AND TRANSFORMERS SHALL BE BROUGHT ABOVE GROUND AT EDGE LIGHTS, SIGNS, REIL, PAPI, ETC.
3. THERE SHALL BE NO EXPOSED POWER/CONTROL CABLES BETWEEN THE POINT WHERE THEY LEAVE THE UNDERGROUND (DEB OR L-867 BASES) AND WHERE THEY ENTER THE EQUIPMENT (SUCH AS TAXIWAY SIGNS, PAPI, REIL, ETC.) ENCLOSURES. THESE CABLES SHALL BE ENCLOSED IN RIGID CONDUIT OR IN FLEXIBLE, WATERTIGHT CONDUIT WITH BREAKABLE COUPLING(S) AT THE GRADE OR THE HOUSING COVER, AS SHOWN IN APPLICABLE DETAILS.
4. THE JOINTS OF THE L-823 PRIMARY CONNECTORS SHALL BE WRAPPED WITH AT LEAST ONE LAYER OF RUBBER OR SYNTHETIC RUBBER TAPE AND ONE LAYER OF PLASTIC TAPE, ONE-HALF LAPPED, EXTENDING AT LEAST 1-1/2 INCHES ON EACH SIDE OF THE JOINT, AS SHOWN ON SHEET NO. 20.
5. THE CABLE ENTRANCE INTO THE FIELD-ATTACHED L-823 CONNECTORS SHALL BE ENCLOSED BY A HEAT-SHRINKABLE TUBING WITH CONTINUOUS INTERNAL ADHESIVE, AS SHOWN ON SHEET NO. 20.
6. L-823 TYPE II, TWO-CONDUCTOR SECONDARY CONNECTORS SHALL BE CLASS 'A' (FACTORY MOLDED).
7. THERE SHALL BE NO SPLICES IN THE SECONDARY CABLE(S) WITHIN THE STEMS OF A RUNWAY/TAXIWAY EDGE/THRESHOLD LIGHTING FIXTURE AND THE WIREWAYS LEADING TO TAXIWAY SIGNS AND PAPI/REIL EQUIPMENT.
8. ELECTRICAL INSULATING GREASE SHALL BE APPLIED WITHIN THE L-823, SECONDARY, TWO CONDUCTOR CONNECTORS TO PREVENT WATER ENTRANCE. THESE CONNECTORS SHALL NOT BE TAPED.
9. DEB ISOLATION TRANSFORMERS SHALL BE BURIED AT A DEPTH OF TEN (10") INCHES ON A LINE CROSSING THE LIGHT AND PERPENDICULAR TO THE RUNWAY/TAXIWAY CENTERLINE AT A LOCATION TWELVE (12") INCHES FROM THE LIGHT OPPOSITE FROM THE RUNWAY/TAXIWAY.
10. A SLACK OF THREE (3') FEET, MINIMUM, SHALL BE PROVIDED IN THE PRIMARY CABLE AT EACH TRANSFORMER/CONNECTOR TERMINATION. AT STAKE-MOUNTED LIGHTS, THE SLACK SHALL BE LOOSELY COILED IMMEDIATELY BELOW THE ISOLATION TRANSFORMER.
11. DIRECTION OF PRIMARY CABLES SHALL BE IDENTIFIED BY COLOR CODING AS FOLLOWS: WHEN FACING LIGHT WITH BACK TO PAVEMENT, CABLE TO THE LEFT IS CODED RED AND CABLE TO RIGHT IS CODED BLUE. THIS APPLIES TO STAKE MOUNTED LIGHTS AND BASE MOUNTED LIGHTS WHERE THE BASE HAS ONLY ONE ENTRANCE.
12. L-867 BASES SHALL BE SIZE B, 24" DEEP, CLASS I, UNLESS OTHERWISE NOTED.
13. BASE MOUNTED BREAKABLE COUPLINGS SHALL NOT HAVE WEEP HOLES TO THE OUTSIDE. PLUGGED UP HOLES SHALL NOT BE ACCEPTABLE. IT SHALL BE A 1/4" DIAMETER, MINIMUM, OR EQUIVALENT OPENING FOR DRAINAGE FROM THE SPACE AROUND THE SECONDARY CONNECTOR INTO THE L-867 BASE.
14. THE ELEVATION OF THE BREAKABLE COUPLING GROOVE SHALL NOT EXCEED 1-1/2" ABOVE THE EDGE OF THE COVER IN CASE OF BASE MOUNTED COUPLINGS, OR THE TOP OF THE STAKE IN CASE OF STAKE MOUNTED COUPLINGS.
15. WHERE THE BREAKABLE COUPLING IS NOT AN INTEGRAL PART OF THE LIGHT FIXTURE STEM OR MOUNTING LEG, A BEAD OF SILICON SEAL SHALL BE APPLIED COMPLETELY AROUND LIGHT STEM OR WIREWAY AT BREAKABLE COUPLING TO PROVIDE A WATERTIGHT SEAL.
16. TOPS OF THE STAKES SUPPORTING LIGHT FIXTURES SHALL BE FLUSH WITH THE SURROUNDING GRADE.
17. PLASTIC LIGHTING FIXTURE COMPONENTS, SUCH AS LAMP HEADS, STEMS, BREAKABLE COUPLINGS, BASE COVERS, BRACKETS, STAKES, SHALL NOT BE ACCEPTABLE.
18. THE TOLERANCE FOR THE HEIGHT OF RUNWAY/TAXIWAY EDGE LIGHTS SHALL BE: ONE (1) INCH. IN CASE OF STAKE MOUNTED LIGHTS, THE SPECIFIED LIGHTING FIXTURE HEIGHT SHALL BE MEASURED BETWEEN THE TOP OF THE STAKE AND THE TOP OF THE LENS. IN CASE OF BASE MOUNTED LIGHTS, THE SPECIFIED LIGHTING FIXTURE HEIGHT SHALL BE MEASURED BETWEEN THE TOP OF THE BASE FLANGE AND THE TOP OF THE LENS, THUS INCLUDING THE BASE COVER, THE FRANGIBLE COUPLING, THE STEM, THE LAMP HOUSING AND THE LENS.


GROUNDING NOTES FOR AIRFIELD LIGHTING

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 ON SHEET NO. 20.
21. GALVANIZED/PAINTED EQUIPMENT/COMPONENT SURFACES SHALL NOT BE DAMAGED BY DRILLING, FILING, ETC. DRAIN HOLES IN METAL TRANSFORMER HOUSINGS SHALL BE MADE BEFORE GALVANIZING.
22. EDGE LIGHT NUMBERING TAGS SHALL BE FACING THE PAVEMENT.
23. CABLE/SPLICE/DUCT MARKERS SHALL BE PRECAST CONCRETE OF THE SIZE SHOWN. LETTERS/NUMBERS/ARROWS FOR THE LEGEND TO BE IMPRESSED INTO THE TOPS OF THE MARKERS SHALL BE PRE-ASSEMBLED AND SECURED IN THE MOLD BEFORE THE CONCRETE IS POURED. LEGEND INSCRIBED BY HAND IN WET CONCRETE SHALL NOT BE ACCEPTABLE.
24. ALL UNDERGROUND CABLE RUNS SHALL BE IDENTIFIED BY CABLE MARKERS AT 200 FEET MAXIMUM SPACING, WITH AN ADDITIONAL MARKER AT EACH CHANGE OF DIRECTION OF THE CABLE RUN. CABLE MARKERS SHALL BE INSTALLED IMMEDIATELY ABOVE THE CABLES.
25. THERE SHALL BE NO SPLICES BETWEEN THE ISOLATION TRANSFORMERS. L-823 CONNECTORS ARE ALLOWED AT TRANSFORMER CONNECTIONS ONLY, UNLESS OTHERWISE SHOWN.
26. APPLY AN OXIDE INHIBITING, ANTI-SEIZING COMPOUND TO ALL SCREWS, NUTS AND BREAKAGE COUPLING THREADS.
27. LOCATIONS OF ENDS OF ALL UNDERGROUND DUCTS SHALL BE IDENTIFIED BY DUCT MARKERS.
28. WHERE A PARALLEL, CONSTANT VOLTAGE PAPI SYSTEM IS PROVIDED, THE "T" SPLICES SHALL BE OF THE CAST TYPE.
29. CONCRETE USED FOR SLABS, FOOTINGS, BACKFILL AROUND TRANSFORMER HOUSINGS, MARKINGS, ETC. SHALL BE 3000 PSI, AIR-ENTRAINED.
30. ALL POWER AND CONTROL CABLES IN MAN/HAND HOLES SHALL BE TAGGED. USE EMBOSSED COPPER STRIPS TO BE ATTACHED AT BOTH ENDS TO THE CABLE BY THE USE OF PLASTIC STRAPS. MINIMUM OF TWO TAGS SHALL BE PROVIDED ON EACH CABLE IN A MAN/HAND HOLE-ONE AT THE CABLE ENTRANCE AND ONE AT THE CABLE EXIT.
31. THE LOCATION, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ON THE PLANS IS NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES OF HIS OPERATIONAL PLANS AND SHALL OBTAIN FROM THE RESPECTIVE UTILITY COMPANIES DETAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF THEIR FACILITIES AND THE WORKING SCHEDULE OF THE COMPANIES FOR REMOVAL OR ADJUSTMENT WHERE REQUIRED. IN THE EVENT AN UNEXPECTED UTILITY INTERFERENCE IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY COMPANY OF JURISDICTION. THE ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT. CALL J.U.L.I.E. FOR UTILITY INFORMATION AT 1-800-892-0123. ALSO CONTACT AIRPORT MANAGER AND/OR RESPECTIVE AIRPORT PERSONNEL FOR ASSISTANCE IN LOCATING UNDERGROUND AIRPORT CABLES AND/OR UTILITIES. CONTACT FAA FOR ASSISTANCE IN LOCATING THEIR CABLES.
32. WHEN PREPARING CABLE FOR SPLICES, THE CONTRACTOR SHALL USE A CABLE STRIPPER/PENCILLER WHENEVER CABLE CONNECTIONS ARE MADE.

1. GROUNDING FOR RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS SHALL BE AS DETAILED ON THE PLANS AND AS SPECIFIED HEREIN. PER FAA AC 150/5340-30C DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, CHAPTER 12, PART 12.6; A SAFETY GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. THE PURPOSE OF THE SAFETY GROUND IS TO PROTECT PERSONNEL FROM POSSIBLE CONTACT WITH AN ENERGIZED LIGHT BASE OR MOUNTING STAKE AS THE RESULT OF A SHORTED CABLE OR ISOLATION TRANSFORMER. A SAFETY GROUND SHALL BE INSTALLED AT EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. A SAFETY GROUND SHALL ALSO BE INSTALLED AT EACH STAKE MOUNTED LIGHT FIXTURE. THE SAFETY GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR CONNECTED TO THE GROUND LUG ON THE RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND A 5/8-INCH DIAMETER BY 8-FOOT LONG (MINIMUM) UL LISTED COPPER CLAD GROUND ROD. CONNECTIONS TO GROUND LUGS ON THE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE SHALL BE WITH A UL LISTED GROUNDING CONNECTOR. CONNECTIONS TO GROUND RODS SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY ERICO PRODUCTS, INC., SOLON, OHIO, (PHONE: 800-248-9353), THERMOWELD BY CONTINENTAL INDUSTRIES, INC., OKLAHOMA (PHONE: 918-663-1440) OR ULTRAWELD BY HARGER, GRAYSLAKE, ILLINOIS (PHONE: 800-842-7437). EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS. TOP OF GROUND RODS SHALL BE BURIED 12 INCHES MINIMUM BELOW GRADE, UNLESS SPECIFIED OTHERWISE HEREIN, FOR RESPECTIVE APPLICATIONS.
2. CLEAN ALL METAL SURFACES BEFORE MAKING GROUND CONNECTIONS. METALLIC SURFACES TO BE JOINED SHALL BE PREPARED BY THE REMOVAL OF ALL NON-CONDUCTIVE MATERIAL PER 2008 NATIONAL ELECTRICAL CODE ARTICLE 250-12.
3. PER FAA 150/5340-30C THE RESISTANCE TO GROUND OF THE RESPECTIVE MOUNTING STAKE OR LIGHT BASE (WITH GROUND ROD CONNECTED) MUST BE 25 OHMS OR LESS.

BY	
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DATE	

SAINT LOUIS DOWNTOWN AIRPORT
 A Division of Missouri State Development Agency
 A.L.P. PROJ.: 3-17-0039-819



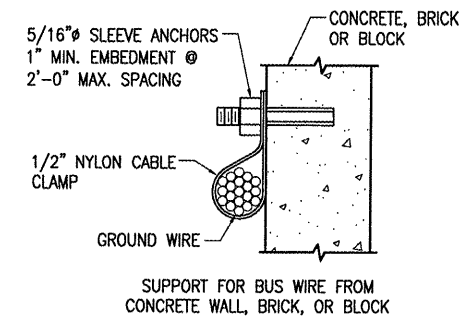
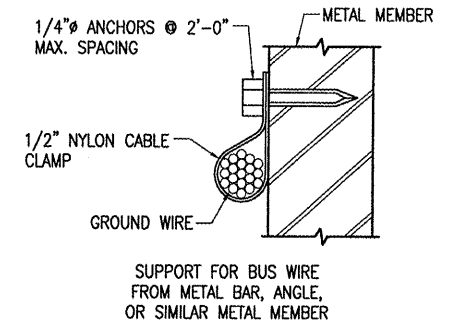
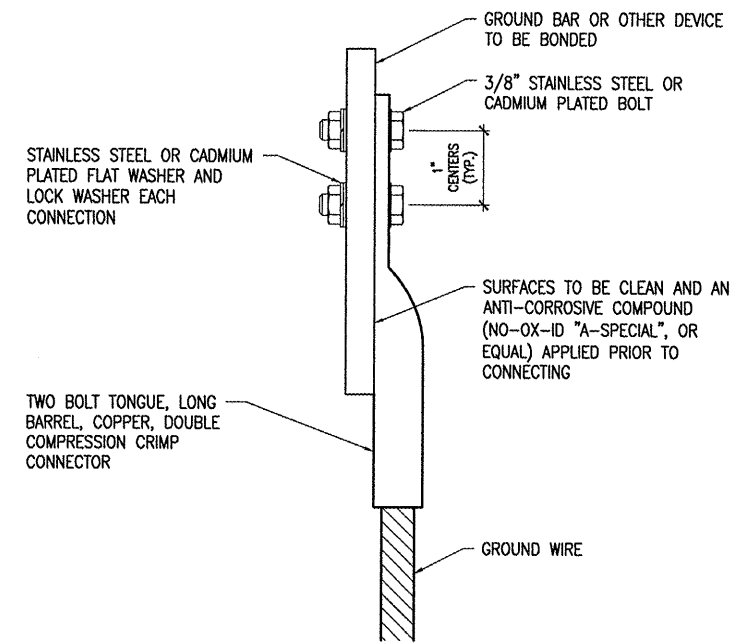
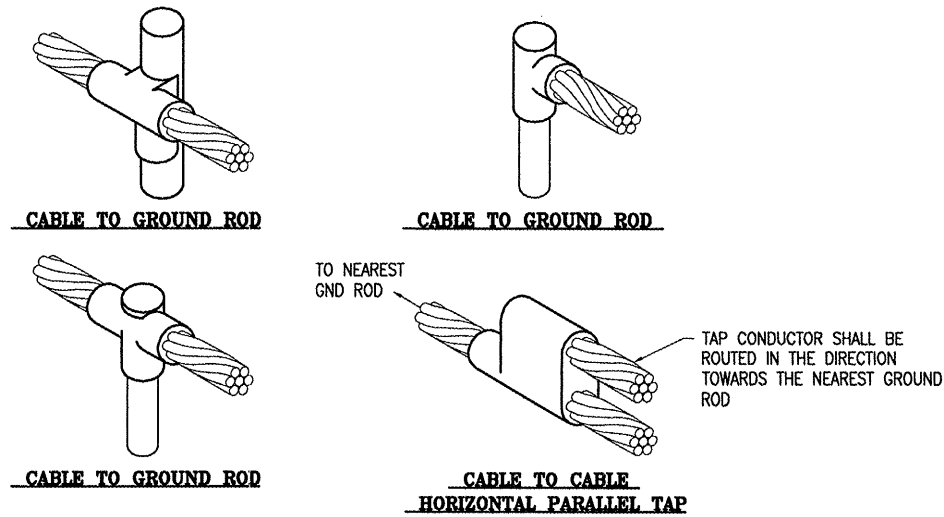
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Hanson Project No.	84507ELECD_0900
Filename	E-003.DWG
State	NONE
Date	07/16/07
LAYOUT	KNL 05/03/07
DRAWN	CCC 05/19/07
REVIEWED	CAH 07/13/07

HANSON
 Hanson Professional Services, Inc.
 4227 Earth City Place, Suite 130
 St. Louis, MO 63046-1308
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ATCT INTERFACE TO VAULT
 ELECTRICAL NOTES
 SHEET 2

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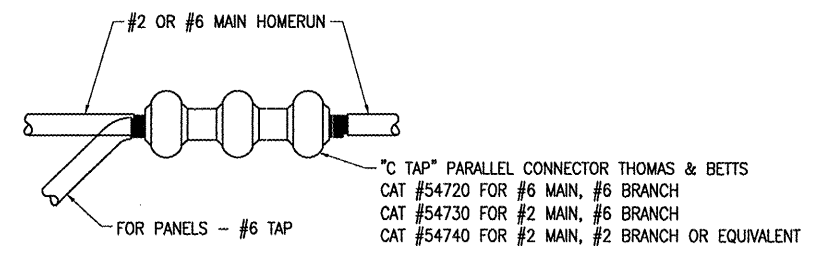
NOTE: WHERE NOTED ON THE PLANS GROUND WIRES SHALL BE RUN IN SCHED 40 PVC CONDUIT (SIZE AS DETAILED). PVC CONDUIT CONTAINING GROUND CONDUCTORS SHALL NOT HAVE METAL SUPPORTS THAT COMPLETELY ENCIRCLE THE CONDUIT. USE NYLON BOLTS, NUTS, WASHERS, AND/OR REINFORCED FIBERGLASS STRUT SUPPORT. DO NOT USE CABLE TIES OR TIE WRAPS.

TYPICAL GROUND WIRE SUPPORT DETAIL

DETAIL NOTES

- ALL BELOW GRADE CONNECTIONS TO GROUND RODS & GROUND RING CONDUCTORS SHALL BE EXOTHERMIC WELD TYPE CONNECTIONS. EXOTHERMIC WELDS SHALL BE CADWELD AS MANUFACTURED BY ERICO PRODUCTS, SOLON, OHIO, ULTRAWELD AS MANUFACTURED BY HARGER LIGHTNING PROTECTION & GROUNDING EQUIPMENT, GRAYSLAKE, IL, 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



NOTES

- COMPRESSION CONNECTORS SHALL BE THOMAS & BETTS 600 VOLT, C TAPS OR H TAPS, BURNDY COPPER CRIMPIT TYPE YC-C, OR EQUIVALENT, SIZED & SUITABLE FOR THE RESPECTIVE CONDUCTORS. INSTALL PER MANUFACTURER'S DIRECTIONS.
- COMPRESSION CONNECTORS SHALL BE FOR INDOOR APPLICATIONS. OUTDOOR APPLICATIONS SHALL REQUIRE EXOTHERMIC WELD.

GROUND DOUBLE COMPRESSION CONNECTOR DETAIL

2 HOLE LONG BARREL COMPRESSION LUG TABLE

WIRE SIZE	BURNDY CAT. NO.	THOMAS & BETTS CAT. NO.
#6 AWG STRANDED	YA6C-2TC38	256-30695-1158
#4 AWG STRANDED	YA4C-2TC38	256-30695-1159
#2 AWG STRANDED	YA2C-2TC38	256-30695-1160
#2 AWG SOLID	YA3C-2TC38	256-30695-1160
#1/0 AWG STRANDED	YA25-2TC38	256-30695-1162
#2/0 AWG STRANDED	YA26-2TC38	256-30695-1116
#3/0 AWG STRANDED	YA27-2TC38	54816BE

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.
- 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

BY	
REVISION	
DATE	

SAINT LOUIS DOWNTOWN AIRPORT
 A Division of Bi-State Development Agency
 A.I.P. PROJ.: 3-17-0039-B19

IL PROJ.: CPS-3708

Hanson Project No.	84507ELED.0900
Electronic	E-506.DWG
Scale	NONE
Date	07/16/07
LAYOUT	KNL 05/03/07
DRAWN	CCC 05/18/07
REVIEWED	CAH 07/13/07

HANSON
 Hanson Professional Services, Inc.
 4227 Earth City Expressway, Suite 130
 St. Louis, MO 63045-1308
 Offices Nationwide

ATCT INTERFACE TO VAULT	GROUNDING DETAILS
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GROUNDING NOTES

1. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL GROUNDING AS MAY BE NECESSARY OR REQUIRED TO MAKE A COMPLETE GROUNDING SYSTEM AS REQUIRED BY THE LATEST NATIONAL ELECTRICAL CODE (NFPA 70) IN FORCE AND FAA-STD-019e (LIGHTNING AND SURGE PROTECTION, GROUNDING, BONDING, AND SHIELDING REQUIREMENTS FOR FACILITIES AND ELECTRONIC EQUIPMENT). THE RELIABILITY OF THE GROUNDING SYSTEM IS DEPENDENT ON CAREFUL, PROPER INSTALLATION AND CHOICE OF MATERIALS. IMPROPER PREPARATION OF SURFACES TO BE JOINED TO MAKE AN ELECTRICAL PATH, LOOSE JOINTS OR CORROSION CAN INTRODUCE IMPEDANCE THAT WILL SERIOUSLY IMPAIR THE ABILITY OF THE GROUND PATH TO PROTECT PERSONNEL AND EQUIPMENT AND TO ABSORB TRANSIENTS THAT CAN CAUSE NOISE IN COMMUNICATIONS CIRCUITS. THE FOLLOWING FUNCTIONS ARE PARTICULARLY IMPORTANT TO ENSURE A RELIABLE GROUND SYSTEM:
2. FURNISH AND INSTALL GROUND RODS AS DETAILED HEREIN. GROUND RODS SHALL BE 3/4-IN. DIAMETER BY 10-FT LONG, UL-LISTED, COPPER CLAD WITH 10-MIL MINIMUM COPPER COATING. GROUND RODS SHALL IN NO CASE BE SPACED LESS THAN ONE ROD LENGTH APART. ALL CONNECTIONS TO GROUND RODS AND GROUNDING ELECTRODE CONDUCTORS LOCATED BELOW GRADE SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY ERICO PRODUCTS, INC., SOLON, OHIO, (PHONE 1-800-248-9353), THERMOWELD BY CONTINENTAL INDUSTRIES, INC., TULSA, OKLAHOMA (PHONE 918-663-1440) OR ULTRAWELD BY HARGER, GRAYSLAKE, ILLINOIS (PHONE 1-800-842-7437). EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS OR AT BURIED GROUNDING ELECTRODE CONDUCTORS.
3. ALL PRODUCTS ASSOCIATED WITH THE GROUNDING SYSTEM SHALL BE UL-LISTED AND LABELED.
4. ALL BOLTED OR MECHANICAL CONNECTIONS SHALL BE COATED WITH A CORROSION PREVENTATIVE COMPOUND BEFORE JOINING, SANCHEM INC. "NO-OX-ID "A-SPECIAL" COMPOUND, OR EQUAL.
5. METALLIC SURFACES TO BE JOINED SHALL BE PREPARED BY THE REMOVAL OF ALL NON-CONDUCTIVE MATERIAL, PER 2008 NATIONAL ELECTRICAL CODE ARTICLE 250-12. ALL COPPER BUS BARS MUST BE CLEANED PRIOR TO MAKING CONNECTIONS TO REMOVE SURFACE OXIDATION.
6. METALLIC RACEWAY FITTINGS SHALL BE MADE UP TIGHT TO PROVIDE A PERMANENT LOW IMPEDANCE PATH FOR ALL CIRCUITS. METAL CONDUIT TERMINATIONS IN ENCLOSURES SHALL BE BONDED TO THE ENCLOSURE WITH UL-LISTED FITTINGS SUITABLE FOR GROUNDING. PROVIDE GROUNDING BUSHINGS WITH BONDING JUMPERS FOR ALL METAL CONDUITS ENTERING SERVICE EQUIPMENT (METER BASE, CT CABINET, MAIN SERVICE BREAKER ENCLOSURE, ETC.). PROVIDE GROUNDING BUSHINGS WITH BONDING JUMPERS FOR ALL METAL CONDUITS ENTERING AN ENCLOSURE THROUGH CONCENTRIC OR ECCENTRIC KNOCKOUTS THAT ARE PUNCHED OR OTHERWISE FORMED SO AS TO IMPAIR THE ELECTRICAL CONNECTION TO GROUND. STANDARD LOCKNUTS OR BUSHINGS SHALL NOT BE THE SOLE MEANS FOR BONDING WHERE A CONDUIT ENTERS AN ENCLOSURE THROUGH A CONCENTRIC OR ECCENTRIC KNOCKOUT
7. ALL CONNECTIONS, LOCATED ABOVE GRADE, BETWEEN THE DIFFERENT TYPES OF GROUNDING CONDUCTORS SHALL BE MADE USING UL-LISTED DOUBLE COMPRESSION CRIMP TYPE CONNECTORS OR UL-LISTED BOLTED GROUND CONNECTORS. FOR GROUND CONNECTIONS TO ENCLOSURES, CASES AND FRAMES OF ELECTRICAL EQUIPMENT NOT SUPPLIED WITH GROUND LUGS THE CONTRACTOR SHALL DRILL REQUIRED HOLES FOR MOUNTING A BOLTED GROUND CONNECTOR. ALL BOLTED GROUND CONNECTORS SHALL BE BURNDY, THOMAS AND BETTS, OR EQUAL. TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUES IN UL STANDARD 486A TO ASSURE PERMANENT AND EFFECTIVE GROUNDING.
8. ALL METAL EQUIPMENT ENCLOSURES, CONDUITS, CABINETS, BOXES, RECEPTACLES, MOTORS, ETC. SHALL BE BONDED TO THE RESPECTIVE GROUNDING SYSTEM.
9. PROVIDE ALL BOXES FOR PROPOSED OUTLETS, SWITCHES, CIRCUIT BREAKERS, ETC. WITH GROUNDING SCREWS. PROVIDE ALL PANELBOARD, SWITCHGEAR, ETC., ENCLOSURES WITH GROUNDING BARS WITH INDIVIDUAL SCREWS, LUGS, CLAMPS, ETC., FOR EACH OF THE GROUNDING CONDUCTORS THAT ENTER THEIR RESPECTIVE ENCLOSURES.
10. EACH FEEDER CIRCUIT AND/OR BRANCH CIRCUIT SHALL INCLUDE AN EQUIPMENT GROUND WIRE. METAL RACEWAY OR CONDUIT SHALL NOT MEET THIS REQUIREMENT. THE EQUIPMENT GROUND WIRE FROM EQUIPMENT SHALL NOT BE SMALLER THAN ALLOWED BY 2008 NEC TABLE 250-122 "MINIMUM SIZE CONDUCTORS OR GROUNDING RACEWAY AND EQUIPMENT." WHEN CONDUCTORS ARE ADJUSTED IN SIZE TO COMPENSATE FOR VOLTAGE DROP, EQUIPMENT-GROUNDING CONDUCTORS SHALL BE ADJUSTED PROPORTIONATELY ACCORDING TO CIRCULAR MIL AREA. ALL EQUIPMENT GROUND WIRES SHALL BE COPPER, EITHER BARE OR INSULATED GREEN IN COLOR. WHERE THE EQUIPMENT GROUNDING CONDUCTORS ARE INSULATED, THEY SHALL BE IDENTIFIED BY THE COLOR GREEN, AND SHALL BE THE SAME INSULATION TYPE AS THE PHASE CONDUCTORS.
11. ALL EXTERIOR METAL CONDUIT, WHERE NOT ELECTRICALLY CONTINUOUS BECAUSE OF MANHOLES, HANDHOLES, NON-METALLIC JUNCTION BOXES, ETC., SHALL BE BONDED TO ALL OTHER METAL CONDUIT IN THE RESPECTIVE DUCT RUN, AND AT EACH END, WITH A COPPER-BONDING JUMPER SIZED IN CONFORMANCE WITH 2008 NEC 250-102. WHERE METAL CONDUITS TERMINATE IN AN ENCLOSURE (SUCH AS A MOTOR CONTROL CENTER, SWITCHBOARD, ETC) WHERE THERE IS NOT ELECTRICAL CONTINUITY WITH THE CONDUIT AND THE RESPECTIVE ENCLOSURE, PROVIDE A BONDING JUMPER FROM THE RESPECTIVE ENCLOSURE GROUND BUS TO THE CONDUIT SIZED PER 2008 NEC 250-102.
12. IT IS THE INTENT OF THIS SPECIFICATION THAT ALL MOTOR FRAMES, PUMP BASES ELECTRICAL EQUIPMENT ENCLOSURES, PANEL HOUSINGS, CONDUITS, BOXES, ETC. HAVE A CONTINUOUS COPPER WIRE GROUND CONNECTION AND SHALL BE POSITIVELY BONDED TO THE RESPECTIVE GROUNDING SYSTEM. CONDUIT CONNECTORS WILL NOT BE CONSIDERED AS ADEQUATE GROUNDING.
13. PROVIDE A POSITIVE GROUND BOND FOR ALL OUTLET BOXES, ELECTRICAL EQUIPMENT ENCLOSURES, GROUNDING RECEPTACLES, TOGGLE SWITCHES, ETC. INSTALL A GROUNDING CONDUCTOR IN ALL WIRE AND CABLE RACEWAYS. GROUND CONDUCTOR TO HAVE 600-VOLT INSULATION AND BE IDENTIFIED BY A CONTINUOUS GREEN COLOR COATING. THEY SHALL BE USED SOLELY FOR GROUNDING PURPOSES AND BE ENTIRELY SEPARATE FROM WHITE GROUNDED NEUTRAL CONDUCTOR, EXCEPT AT SUPPLY SIDE OF SERVICE DISCONNECTING MEANS, WHERE GROUNDING AND NEUTRAL SYSTEMS ARE TO BE CONNECTED TO SERVICE GROUND.
14. EACH AND ALL GROUNDED CASED AND METAL PARTS ASSOCIATED WITH ELECTRICAL EQUIPMENT SHALL BE TESTED FOR CONTINUITY OF CONNECTION WITH GROUND BUS SYSTEM BY CONTRACTOR IN PRESENCE OF OWNER'S REPRESENTATIVE.
15. ALL CONNECTIONS BETWEEN THE DIFFERENT TYPES OF GROUNDING CONDUCTORS ABOVE GRADE SHALL BE MADE USING BOLTED GROUND CONNECTORS. GROUND LUGS SHALL BE PROVIDED IN ALL ENCLOSURES AND WIRING TERMINATION JUNCTION BOXES. EQUIPMENT GROUNDS AND GROUNDING CONDUCTOR SHALL BE CONNECTED TO THESE GROUND LUGS. FOR GROUND CONNECTIONS TO ENCLOSURES, CASES AND FRAMES OF ELECTRICAL EQUIPMENT NOT SUPPLIED WITH GROUND LUGS THE CONTRACTOR SHALL DRILL REQUIRED HOLES FOR MOUNTING A BOLTED GROUND CONNECTOR. ALL BOLTED GROUND CONNECTORS SHALL BE BURNDY, OR EQUAL.
16. BOND ALL NONCURRENT-CARRYING PARTS OF METAL EQUIPMENT TO GROUND SYSTEM.
17. 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.
18. IF LOCAL CODES DICTATE THAT INDIVIDUAL GROUNDING CONDUCTORS MUST BE RUN IN METAL CONDUIT OR RACEWAY, THEN THE CONDUIT OR RACEWAY MUST BE BONDED AT EACH END OF THE RUN WITH A BONDING JUMPER SIZED EQUAL TO THE INDIVIDUAL GROUNDING CONDUCTOR OR AS REQUIRED BY 2008 NEC 250-102. NOTE THIS DOES NOT APPLY TO AC EQUIPMENT GROUNDING CONDUCTORS RUN WITH AC CIRCUITS.
19. WHERE A CONFLICT IS DETERMINED WITH RESPECT TO GROUNDING REQUIREMENTS PER MANUFACTURER INSTALLATION INSTRUCTIONS, NEC, AND/OR THE CONTRACT DOCUMENTS, CONTACT THE RESIDENT ENGINEER FOR FURTHER DIRECTIONS.

BY	
REVISION	
DATE	

SAINT LOUIS DOWNTOWN AIRPORT
A Division of St. Louis Development Agency
A.I.P. PROJ.: 3-17-0038-B19
IL PROJ.: 05-3708



Hanson Project No.	84507ELECD_0900
Revision	E-004.RWG
Scale	NONE
Date	07/16/07
LAYOUT	KNL 05/03/07
DRAWN	CCC 05/18/07
REVIEWED	CAH 07/13/07

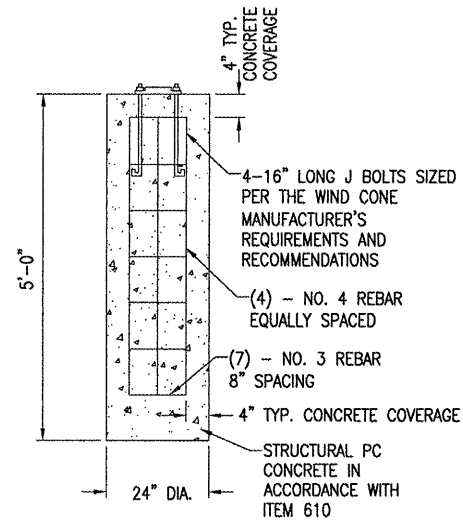
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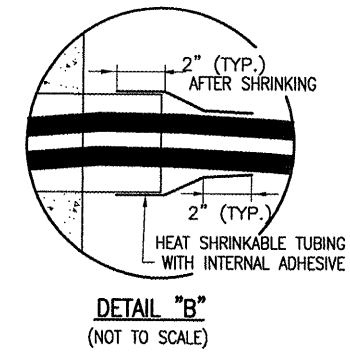
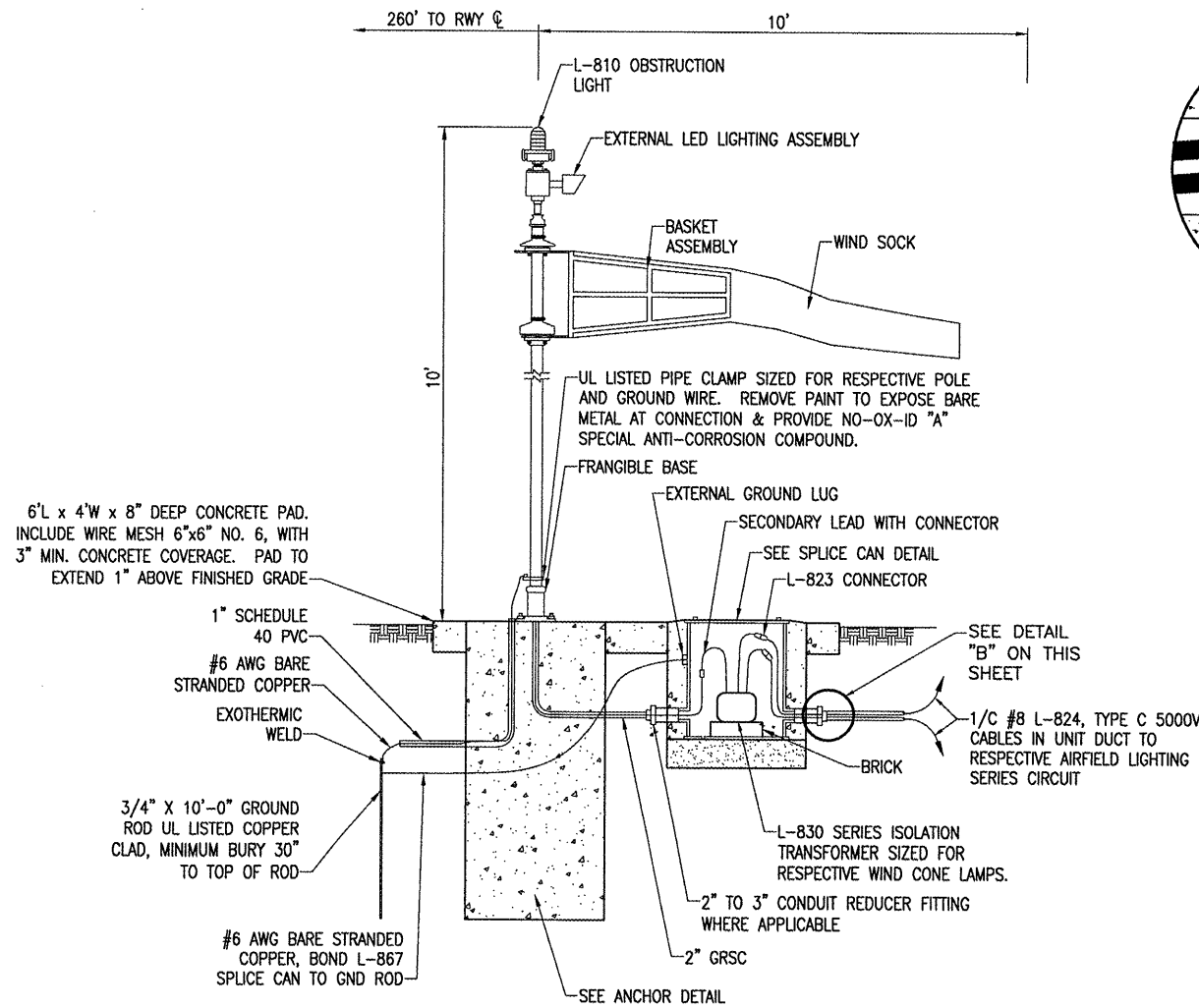
ATCT INTERFACE TO VAULT

GROUNDING NOTES

JUL 25, 2008 9:38 AM V00R000805
E:\AIRPORTS\ST. LOUIS DOWNTOWN\84507ELECD\AIRPORT\ SHEETS\E-004.DWG - Work



ANCHORING DETAIL
"NOT TO SCALE"



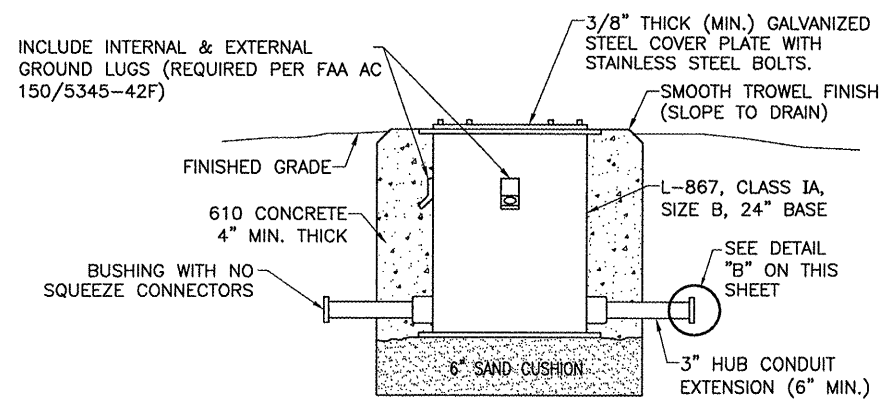
DETAIL "B"
(NOT TO SCALE)

**WORK & DETAILS SHOWN
ON THIS SHEET IS FOR
ADDITIVE ALTERNATE NO. 1**

NOTES

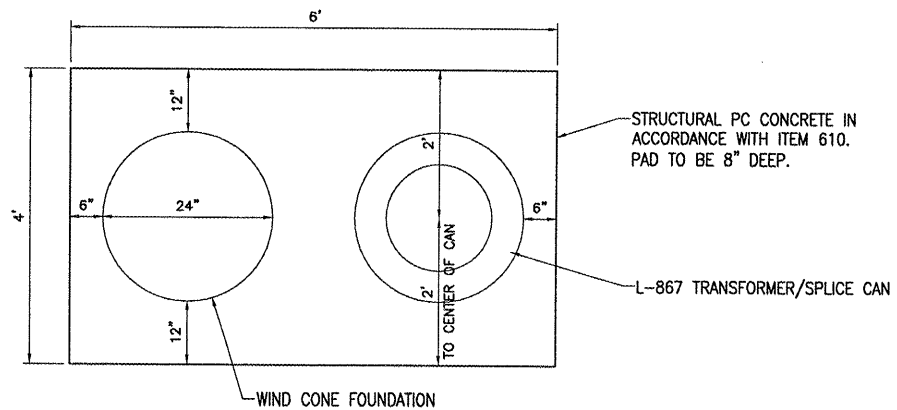
1. WIND CONES SHALL INCLUDE CONSTANT-BRIGHTNESS SERIES CIRCUIT POWER ADAPTER. SEE SPECIAL PROVISION SPECS.
2. WIND CONES WILL BE PAID FOR UNDER ITEM AS107408 L-806 WIND CONE - 8' LIGHTED PER EACH. SPLICE CANS FOR L-806 WIND CONE SERIES CIRCUIT TRANSFORMERS WILL BE INCIDENTAL TO ITEM AS107408.

EXTERNALLY LIGHTED L806 WIND CONE (SERIES CIRCUIT TYPE)
"NOT TO SCALE"



SPLICE CAN DETAIL
(NOT TO SCALE)

INCLUDE INTERNAL AND
EXTERNAL GROUND LUGS



CONCRETE PAD PLAN VIEW
(NOT TO SCALE)

DATE	REVISION	BY

**SAINT LOUIS
DOWNTOWN
AIRPORT**
A Division of Bi-State Development Agency
A.I.P. PROJ.: 3-17-0039-B19
IL PROJ.: 05-3708

Hanson Project No. 84507ELECD.0900			
Filename E-507.DWG			
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Date 07/21/08			
LAYOUT	KNL	07/21/08	
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REVIEWED	CAH	07/22/08	

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ATCT INTERFACE
TO VAULT

L-806 WIND CONE
ELEVATION
DETAIL

JUL 25, 2008 9:39 AM W00R000805
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