11-17-06 Letting

2A

CONSTRUCTION PLANS

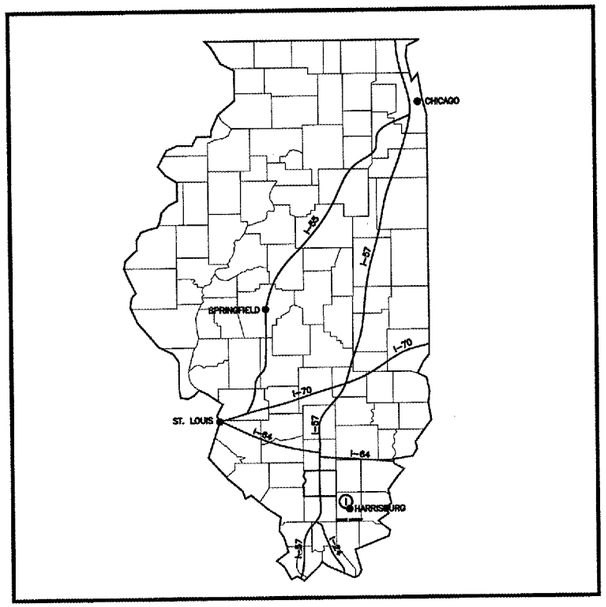
HA022
TOTAL SHEETS: 10

FOR

HARRISBURG RALEIGH AIRPORT

INSTALL REIL'S AND PAPI'S ON RUNWAY 6/24

PROJECT SCOPE:
CONSTRUCTION OF TWO 4-BOX PAPI SYSTEMS, TWO REIL SYSTEMS,
REMOVAL OF TWO VASI SYSTEMS, AND ASSOCIATED WIRING.

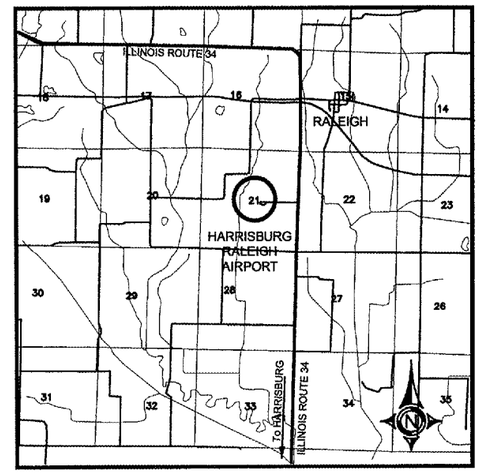


LOCATION MAP

ILLINOIS PROJECT NUMBER: HSB-3614
AIP PROJECT NUMBER: 3-17-0050-B9

HARRISBURG, ILLINOIS
SALINE COUNTY

DATE: OCTOBER 11, 2006



VICINITY MAP

REGISTERED PROFESSIONAL CORPORATION
J.W. BROWN
PRESIDENT
184-002518
ILLINOIS ENGINEER

BROWN AND ROBERTS, INC.
CONSULTING ENGINEER
PRESIDENT
SUBMITTED BY: Jim W Brown
JIM W. BROWN
DATE SUBMITTED: 10/11/2006
LISC. NUMBER: 184-002518
LISC. EXP. DATE: APRIL 30, 2007

PLANS PREPARED BY:
BROWN AND ROBERTS, INC.
1 WESTRIDGE ROAD
HARRISBURG, IL. 62946
(618) 252-8111

HARRISBURG-RALEIGH AIRPORT AUTHORITY

B.R.I. JOB NO. 05-195

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HARRISBURG-RALEIGH AIRPORT
IL PROJECT NO. HSB-3614
AIP NO. 3-17-0050-B9
INDEX AND SUMMARY OF QUANTITIES
SHEET 2 OF 10

HA022

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
AR108654	3/C #4 600 V UG CABLE IN UD	L.F.	1,000
AR108656	3/C #6 600 V UG CABLE IN UD	L.F.	6,000
AR108658	3/C #8 600 V UG CABLE IN UD	L.F.	4,800
AR109410	VAULT WIRING	L.S.	1
AR110312	2" STEEL DUCT, JACKED	L.F.	80
AR110314	4" STEEL DUCT, JACKED	L.F.	70
AR110610	ELECTRICAL HANDHOLE	EA.	1
AR125565	SPLICE CAN	EA.	1
AR125610	REILS	PAIR	2
AR125615	PAPI (L-880 SYSTEM)	EA.	2
AR125909	REMOVE VASI	EA.	2
AR801251	ACCESS ROAD	L.S.	1
AR901525	SEEDING	L.S.	1

INDEX TO SHEETS

HARRISBURG-RALEIGH AIRPORT
IL PROJECT NO. HSB-3614
AIP NO. 3-17-0050-B9
RUNWAY SAFETY PLAN
SHEET 3 OF 10
HA022

SCOPE OF WORK

THE PROJECT SCOPE CONSISTS OF CONSTRUCTION OF TWO 4-BOX PAPI SYSTEMS, TWO REIL SYSTEMS, REMOVAL OF TWO VASI SYSTEMS, AND ASSOCIATED WIRING.

PROPOSED SAFETY PLAN

GENERAL- THE HARRISBURG-RALEIGH AIRPORT AUTHORITY CURRENTLY HAS A PAVED RUNWAY 6-24 WHICH IS 5013 FT. x 75 FT. AND A PAVED RUNWAY 14-32 WHICH IS 2820 FT. x 75 FT.

CONTRACTOR'S RESPONSIBILITIES

IDENTIFICATION- THE CONTRACTOR'S VEHICLES AND EQUIPMENT SHALL BE PROPERLY MARKED WITH 3-FOOT SQUARE INTERNATIONAL ORANGE AND WHITE CHECKERED FLAGS ANYTIME THEY ARE ON AIRPORT PROPERTY.

THE CONTRACTOR AND HIS EMPLOYEES SHALL BE RESTRICTED TO THE WORK AREA.

EQUIPMENT PARKING AND STORAGE- THE CONTRACTOR'S EQUIPMENT PARKING, STORAGE, AND EMPLOYEE PARKING WILL BE AT THE LOCATION SHOWN ON THIS SHEET. ONLY CONTRACTOR VEHICLES AND EQUIPMENT REQUIRED FOR CONSTRUCTION WILL BE ALLOWED OUTSIDE THIS AREA.

BARRICADES AND TRAFFIC CONES- IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO PLACE AND MAINTAIN BARRICADES AND TRAFFIC CONES AS REQUIRED AND AS DIRECTED BY THE RESIDENT ENGINEER. BARRICADES, THEIR MAINTENANCE, PLACEMENT, AND REMOVAL WILL BE CONSIDERED AS AN INCIDENTAL ITEM TO THE CONTRACT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

THE CONTRACTOR WILL NOT BE ALLOWED ON ANY AIRPORT PAVEMENT. THE CONTRACTOR WILL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO EXISTING PAVEMENTS CAUSED BY HIS PERSONNEL OR EQUIPMENT.

HAUL ROUTE AND EQUIPMENT PARKING

THE CONTRACTOR WILL USE THE DESIGNATED HAUL ROUTE AND EQUIPMENT PARKING AREA SHOWN ON THIS SAFETY PLAN. THE PROPOSED EQUIPMENT PARKING AREA WILL BE APPROXIMATELY 100-FT BY 50-FT. THE CONTRACTOR WILL BE REQUIRED TO MAINTAIN THE PROPOSED HAUL ROUTE AND PARKING AREA THROUGHOUT THE COURSE OF THE PROJECT. AT THE CONCLUSION OF THE PROJECT, ALL AREAS DISTURBED WILL BE RESTORED AS NEEDED TO ITS ORIGINAL STATE. RESTORATION OF THE HAUL ROUTE AND EQUIPMENT PARKING AREA WILL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

UTILITY NOTE

THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES AND ORGANIZATIONS THAT 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 SHALL CALL JULIE (1-800-892-0123) TO ACCOMPLISH THESE REQUIREMENTS. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING ALL NON-JULIE UTILITIES LOCATED WITHIN THE PROPOSED CONSTRUCTION LIMITS. THESE UTILITIES ARE TO BE LOCATED PRIOR TO THE START OF CONSTRUCTION.

J.U.L.I.E. INFORMATION

COUNTY.....SALINE
CITY.....HARRISBURG (5MI NORTH)
TOWNSHIP.....RALEIGH
SECTION NO.....21
NEAREST MAJOR ROAD INTERSECTION...ILLINOIS RT. 34 & AIRPORT DRIVE
AIRPORT ADDRESS....HARRISBURG-RALEIGH AIRPORT
PO BOX 33
HARRISBURG, IL 62946

NOTE:

THE 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 RESIDENT ENGINEER. THE CROSSES WILL BE PLACED AT THE ENDS OF THE RUNWAY AND SECURED IN A MANNER APPROVED BY THE RESIDENT ENGINEER. THE PROPOSED CROSSES WILL BE PLACED WHEN 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 AT NO ADDITIONAL COST TO THE CONTRACT.

HEIGHT OF CONSTRUCTION EQUIPMENT

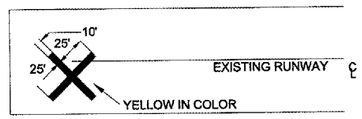
THE MAXIMUM ANTICIPATED HEIGHT OF THE CONSTRUCTION EQUIPMENT IS 20 FEET.

AIRPORT SECURITY

AIRPORT SECURITY WILL BE MAINTAINED AT ALL TIMES. THE PROPOSED HAUL ROUTE SHOWN ON THIS SAFETY PLAN IS THE ONLY ACCESS CONTRACTOR EQUIPMENT AND PERSONNEL WILL BE ALLOWED TO USE. THE CONTRACTOR SHALL PROVIDE BARRICADES AT THIS ACCESS AND ENSURE THE BARRICADES ARE IN PLACE AT THE END OF EACH WORKING DAY.

AIRCRAFT OPERATIONAL AREA

THE CONTRACTOR, HIS EMPLOYEES, OR ANY EQUIPMENT WILL NOT PROCEED WITH ANY WORK WITHIN THE AIRCRAFT OPERATIONAL AREA WITHOUT FIRST CLOSING THE RUNWAY.



DETAIL OF CROSS FOR CLOSED RUNWAY
"NOT TO SCALE"

RUNWAY CLOSURE PROCEDURES:
* CONTACT THE AIRPORT MANAGER OR HIS ASSIGNED REPRESENTATIVE.
* ISSUANCE OF NOTAM BY THE AIRPORT MANAGER OR HIS ASSIGNED REPRESENTATIVE.
* PLACEMENT OF CROSSES (SEE DETAIL THIS SHEET).
* PLACEMENT OF LIGHTED BARRICADES. ONLY AT THE TIME THAT ALL OF THE ABOVE ARE COMPLETED MAY ANY CONSTRUCTION OPERATIONS WITHIN 200' OF THE RUNWAY CENTERLINE BEGIN.
* RUNWAY LIGHTS SHALL BE DISABLED

RUNWAY RE-OPENING PROCEDURES:
* REMOVE CROSSES.
* REMOVE LIGHTED BARRICADES.
* NOTIFY THE AIRPORT MANAGER OR HIS REPRESENTATIVE TO CANCEL THE NOTAM.
* CANCELLATION OF THE NOTAM. A CLOSED RUNWAY WILL NOT BE RE-OPENED UNTIL ALL EQUIPMENT AND WORK ARE NOT WITHIN 200' OF THE RUNWAY CENTERLINE.
* RUNWAY LIGHTS SHALL BE REACTIVATED.

NOTES: 1. THE PROJECT SCOPE CONSISTS OF CONSTRUCTION OF TWO 4-BOX PAPI SYSTEMS, TWO REIL SYSTEMS, REMOVAL OF TWO VASI SYSTEMS, AND ASSOCIATED WIRING.

COORDINATE DATA				
NO	DESCRIPTION	NORTHING	EASTING	ELEV.
1	NGS HB1805	418145.487	923354.429	393.85
2	NGS HB1806	417452.191	922019.287	387.97

LEGEND

LIMITS OF CONSTRUCTION

HARRISBURG-RALEIGH AIRPORT
IL PROJECT NO. HSB-3614
AIP NO. 3-17-0050-B9
EXISTING SITE AND CONSTRUCTION PLAN
SHEET 4 OF 10

HA022

0 250 500

CLOSED RUNWAY MARKER

EXISTING 5013'X75'

MONUMENT EL 393.85 (FLUSH)

KORNARCUND

RUNWAY VISIBILITY ZONE

MONUMENT EL 387.97 (FLUSH)

WIND TEE

TAXILANE

HANGAR

ENTRANCE LANE

WIND CONE EL 425

RUNWAY VISIBILITY ZONE

PARKING

ROTATING BEACON EL 444

NDB TOWERS

"Proposed Contractor Vehicle & Equipment Parking Area and Airport Access Point"

Existing Airport Reference Point
Latitude 37°48'41" N
Longitude 88°32'57" W

GENERAL AVIATION

FUEL

APRON

HANGARS

HANGARS

HANGARS

WIND SOCK

TAXILANE

CLOSED RUNWAY MARKER

EXISTING 5013'X75'

RUNWAY VISIBILITY ZONE

EXISTING 2850'X75'

EXISTING 2850'X75'

AIRPORT REFERENCE POINT:
LATITUDE: 37° 48' 41"N
LONGITUDE: 88° 32' 57"W
ELEVATION: 398 MSL

LUNGE RIDGE RD

LONE OAK ROAD

Lone Oak Road

LONE OAK ROAD

To Illinois Route 34

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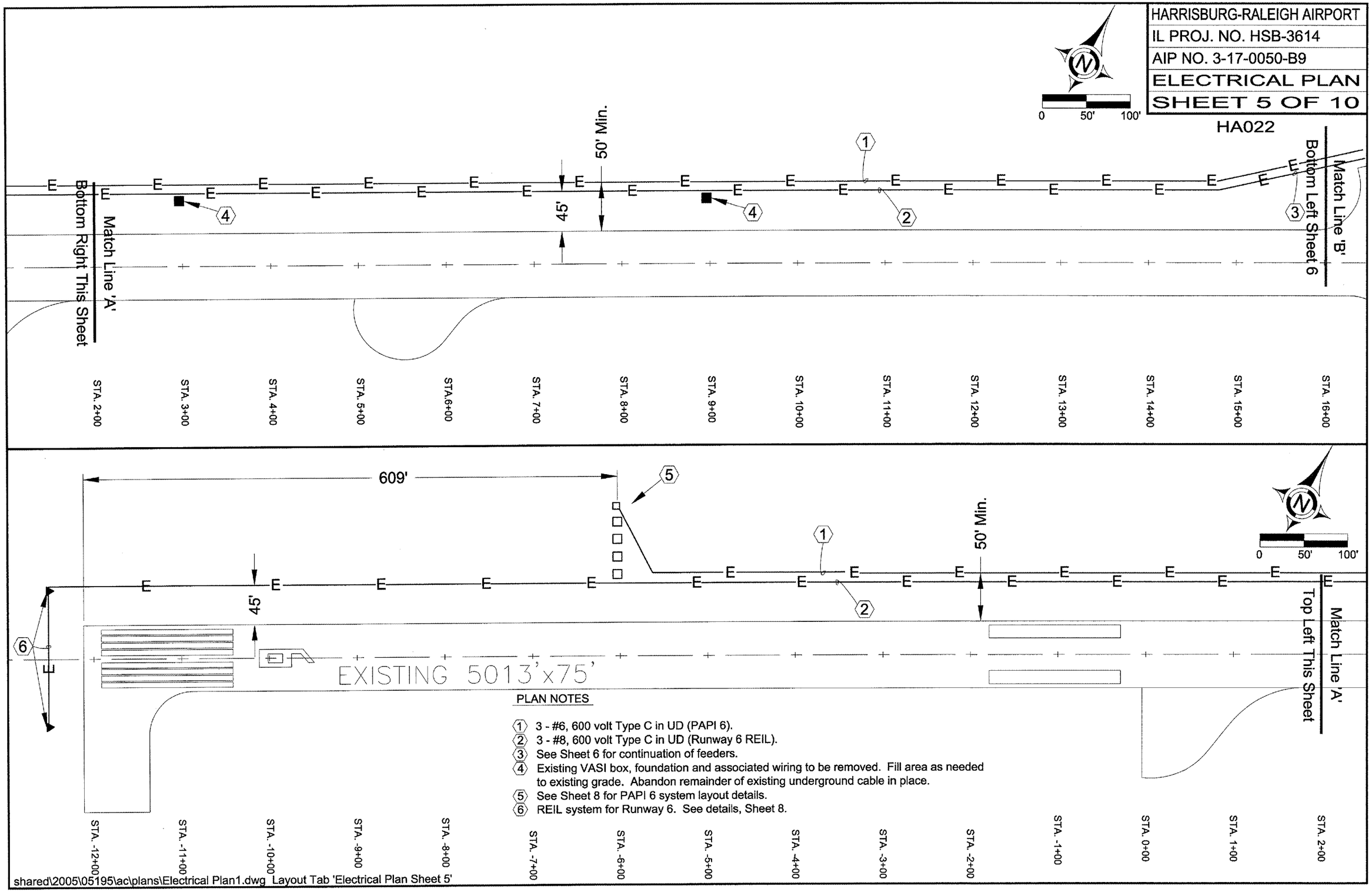
HARRISBURG-RALEIGH AIRPORT
IL PROJ. NO. HSB-3614
AIP NO. 3-17-0050-B9

ELECTRICAL PLAN

SHEET 5 OF 10

HA022



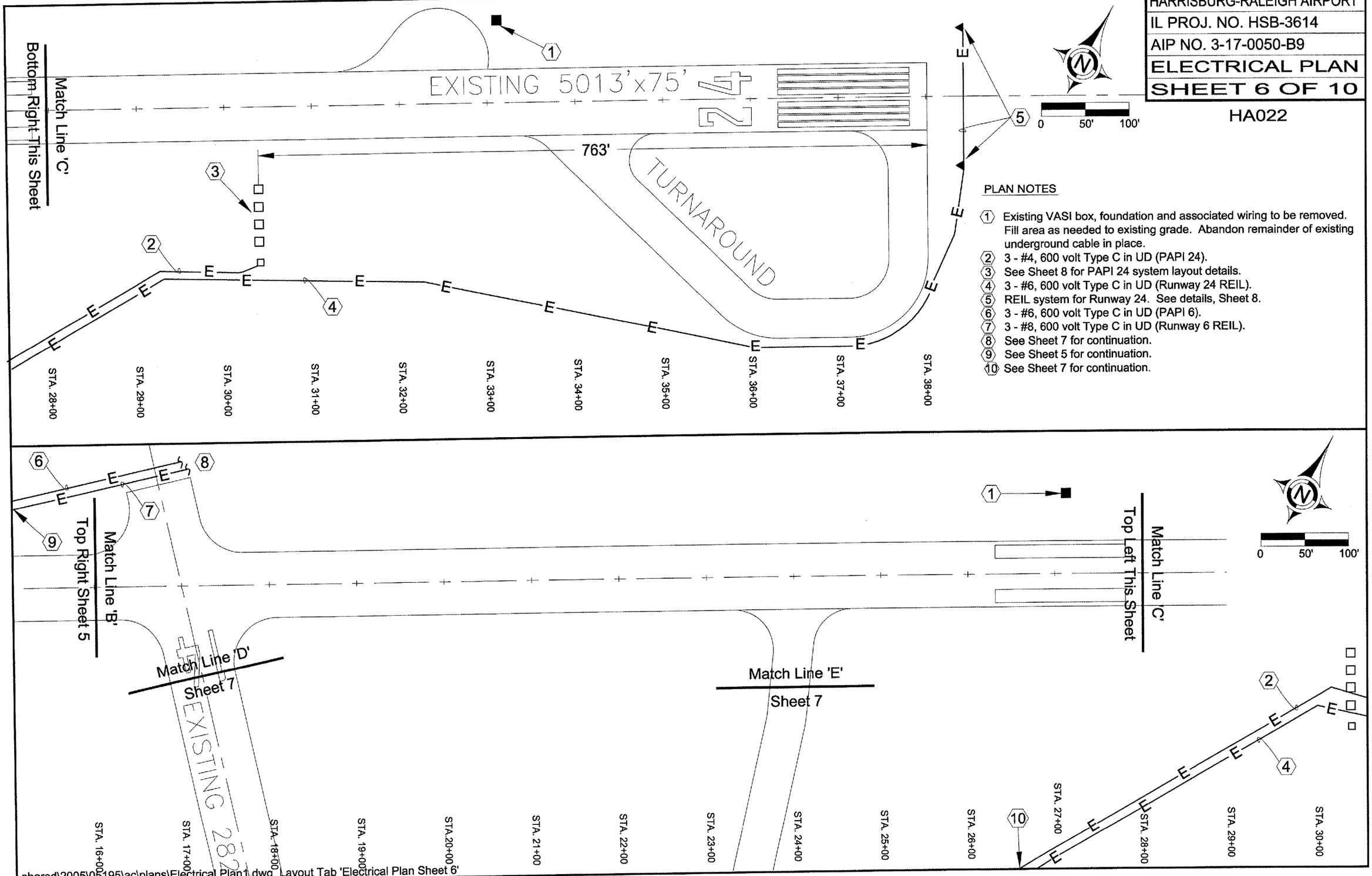
PLAN NOTES

1. 3 - #6, 600 volt Type C in UD (PAPI 6).
2. 3 - #8, 600 volt Type C in UD (Runway 6 REIL).
3. See Sheet 6 for continuation of feeders.
4. Existing VASI box, foundation and associated wiring to be removed. Fill area as needed to existing grade. Abandon remainder of existing underground cable in place.
5. See Sheet 8 for PAPI 6 system layout details.
6. REIL system for Runway 6. See details, Sheet 8.

HARRISBURG-RALEIGH AIRPORT
IL PROJ. NO. HSB-3614
AIP NO. 3-17-0050-B9

ELECTRICAL PLAN
SHEET 6 OF 10

HA022



PLAN NOTES

1. Existing VASI box, foundation and associated wiring to be removed. Fill area as needed to existing grade. Abandon remainder of existing underground cable in place.
2. 3 - #4, 600 volt Type C in UD (PAPI 24).
3. See Sheet 8 for PAPI 24 system layout details.
4. 3 - #6, 600 volt Type C in UD (Runway 24 REIL).
5. REIL system for Runway 24. See details, Sheet 8.
6. 3 - #6, 600 volt Type C in UD (PAPI 6).
7. 3 - #8, 600 volt Type C in UD (Runway 6 REIL).
8. See Sheet 7 for continuation.
9. See Sheet 5 for continuation.
10. See Sheet 7 for continuation.

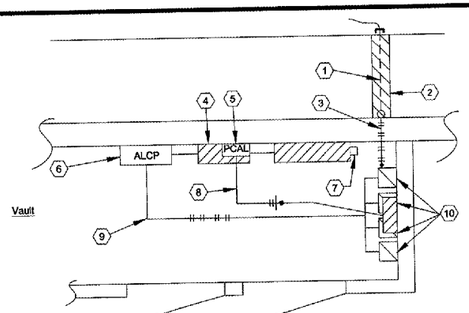
HARRISBURG-RALEIGH AIRPORT
IL PROJ. NO. HSB-3614
AIP NO. 3-17-0050-B9
ELECTRICAL PLAN
SHEET 7 OF 10
HA022

HANGAR
TERMINAL
FUEL
APRON
TAXILANE
TAXILANE
17'
WT
Bottom Sheet 6
Match Line 'E'
Match Line 'D'
Bottom Left Sheet 6
EXISTING 2820' x 75'
0 50' 100'

PLAN NOTES

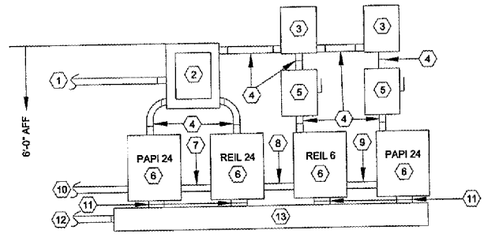
1. 3 - #4, 600 volt Type C in UD (PAPI 24).
2. 3 - #6, 600 volt Type C in UD (Runway 24 REIL).
3. Locate and avoid existing taxiway lighting cables this area.
4. See Sheet 8 for vault wiring details.
5. Locate and avoid existing underground field light wiring in this area. Hand excavate as required around these cables where tail trenches are needed.
6. Wiring in trench to consist of the following circuits:
   - 3 - #6, 600 volt Type C in UD (PAPI 6, 480 volt feed).
   - 3 - #8, 600 volt Type C in UD (Runway 6 REIL, 480 volt feed).
   - 3 - #4, 600 volt Type C in UD (PAPI 24, 240 volt feed).
   - 3 - #6, 600 volt Type C in UD (240 volt feed to Runway 24 REIL).
7. 70 L.F. - one-way 4" steel duct pushed or bored under existing pavement. Unit duct outer jacket shall be removed for wire installation in this duct.
8. Typical concrete handhole. Locate clear of existing underground conductors.
9. 3 - #6, 600 volt Type C in UD.
10. 3 - #8, 600 volt Type C in UD.
11. Locate and avoid existing feed to wind tee.
12. 80 L.F. - one-way 2" steel duct pushed or bored under existing pavement. Unit duct outer jacket shall be removed for wire installation in this duct.
13. Typical L-867 Type D concrete encased splice can with blank cover, located 15 ft from edge of pavement.
14. See Sheet 6 for continuation.

HARRISBURG-RALEIGH AIRPORT
IL PROJECT NO. HSB-3614
AIP NO. 3-17-0050-B9
REIL & PAPI DETAILS
SHEET 8 OF 10
HA022



DETAIL - AIRPORT LIGHTING VAULT MODIFICATIONS
NO SCALE

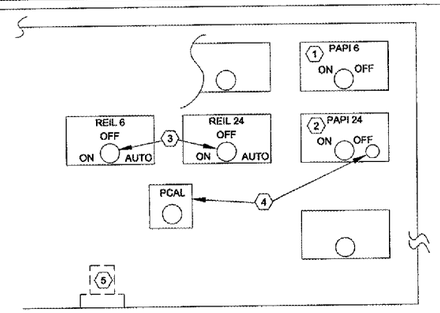
DETAIL NOTES:
1. Conductors in 3" RMC shall consist of the following. These shall be Unit Duct conductors with the outer jacket removed.
   - 3 - #6 (480 volt to Runway 6 PAPI)
   - 3 - #4 (240 volt to Runway 24 PAPI)
   - 3 - #8 (480 volt to Runway 6 REIL)
   - 3 - #6 (240 volt to Runway 24 REIL)
2. Saw-cut, remove and replace existing concrete sidewalk as necessary to place conduit 18" below grade.
3. Seal penetration through existing concrete block wall watertight with non-shrink grout.
4. Existing load center; remove one 2-pole circuit breaker feeding the existing VASI system and replace with a 2-pole, 30 amp circuit breaker of the same brand to feed the proposed PAPI/REIL load center. Disconnect and abandon in place one existing VASI contactor located below this load center.
5. Existing Pilot Control Airfield Lighting (PCAL) system shall remain in place with proposed REILS connected to operate in the automatic mode from the 100% brightness relay in this panel. See typical control schematic, this Sheet. Existing field lighting control scheme shall remain undisturbed.
6. Existing Airport Lighting Control Panel. See detail, this Sheet for toggle switch additions for PAPI & REIL control.
7. Surge arrestor for 120/240 volt single-phase application. Arrestor shall have LED indication for alarm and normal operation, with individually fused suppression modes, ½ nanosecond response, and shall be UL 1449, Second Edition Listed. Surge capacity shall be 80 kA/phase - APT #TE/1XF, or equal. Connect to the line side of this existing panelboard.
8. 2 - #10, 1 - #10 neutral, and 1 - #10 equip ground in ½" C.
9. 7 - #14 in ½" C.
10. See detail this Sheet for REIL and PAPI lighting control component arrangement.



DETAIL - PAPI & REIL SYSTEM CONTACTOR ARRANGEMENT
NO SCALE

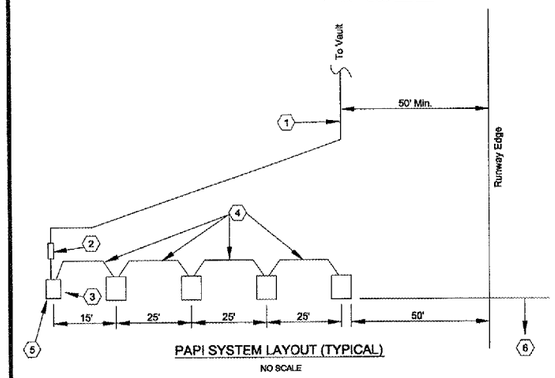
DETAIL NOTES:
1. 2 - #10, 1 - #10 neutral, and 1 - #10 equip ground in ½" C from proposed 30 amp, 2-pole circuit breaker in existing load center.
2. 100 amp, 120/240 volt, main-lug only, single-phase, 3-wire S/N, 8-circuit load center in NEMA 1 surface mount enclosure with separate ground bus - Square D #QO816L100DS/PK7GTA, or equal. Provide with two 15 amp, 2-pole circuit breakers for PAPI systems, and two 15 amp, 2-pole circuit breakers for REIL systems.
3. 3 kVA, 240 volt to 480 volt, single-phase stepup transformer - Square D, #3S1F, or equal.
4. 2 - #12, 1 - #12 neutral, and 1 - #12 equip ground in ½" C.
5. 30 amp, 3-pole, 600 volt, fusible safety switch in NEMA 1 enclosure with ground bus - Square D, #H361, or equal. Fuse two poles at 8 amps with Bussman #FRSR8, or equal. Provide one set of spare fuses.
6. 30 amp, 2-pole, 600 volt, electrically held lighting contactor with 120 VAC coil, in a NEMA 1 surface mounted enclosure - Square D, Class 8903, #SMG1V02, or equal. Provide plastic laminated engraved adhesive-backed labels for front of enclosure to read as shown. Lettering shall be ½" high, black on a white background.
7. 4 - #14 in ½" C.
8. 3- #14 in ½" C.
9. 2- #14 in ½" C.
10. 7 - #14 (2 spares) in ½" C, 120 volts from ALCP control switches.
11. 2 - #12, and 1 - #12 equip ground in ½" C.
12. Conductors in 3" RMC shall consist of the following. These shall be Unit Duct conductors with the outer jacket removed.
    - 3 - #6 (480 volt to Runway 6 PAPI)
    - 3 - #4 (240 volt to Runway 24 PAPI)
    - 3 - #8 (480 volt to Runway 6 REIL)
    - 3 - #6 (240 volt to Runway 24 REIL)

    Provide grounding type insulating bushing on conduit termination and bond to other equipment ground wires with #6 AWG.
13. NEMA 1, 6" x 6" x 36" screw-cover wireway for splicing field conductors to #12's.



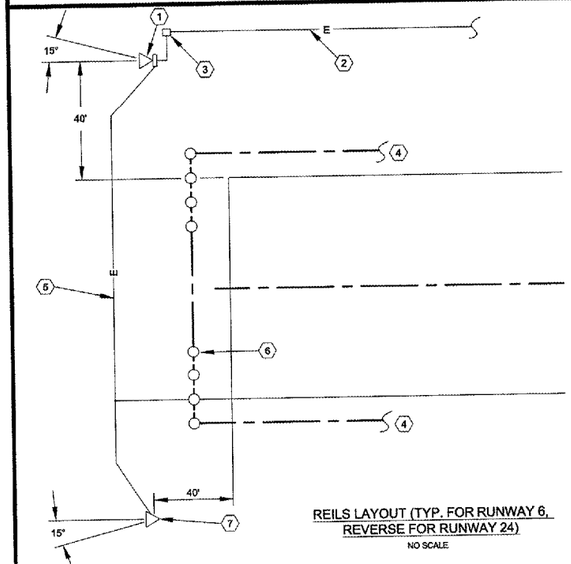
ALCP MODIFICATIONS
NO SCALE

DETAIL NOTES:
1. Remove existing control wiring for the VASI system. Provide new control wiring to terminal board in this ALCP to reuse this switch to control PAPI 6 contactor coil. Remove existing legend plate and provide one new plastic laminated engraved legend plate to match existing size and style, with legend as shown.
2. Provide one new 2-pole, single-throw, maintained contact, bat-handle 20 amp toggle switch to match existing style. Provide one new plastic laminated engraved legend plate to match existing size and style, with legend as shown.
3. Provide one new 2-pole, double-throw, center-off, maintained contact, bat-handle 20 amp toggle switch to match existing style. Provide one new plastic laminated engraved legend plate to match existing size and style, with legend as shown.
4. Remove one existing red miniature pilot light and relocate to lower center of the ALCP as shown. Provide new legend plate to match existing with legend as shown.
5. Mounted in the bottom of the ALCP, provide one plug-in style, 1/3 hp rated, double-pole, double-throw relay with 120 VAC coil, coil power indicator and push-to-test button - Dayton #5YP82/5X852, or equal. Connect per schematic, this Sheet, to control REIL systems.



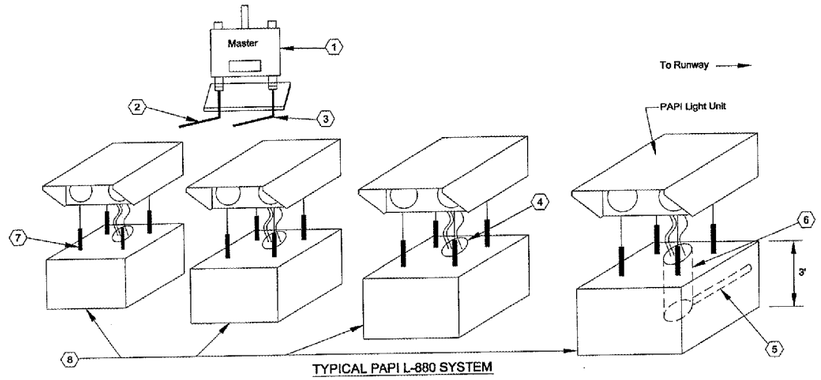
PAPI SYSTEM LAYOUT (TYPICAL)
NO SCALE

DETAIL NOTES:
1. See Site Plans for circuit routing to vault and conductor sizes.
2. Stepdown transformer assembly. See detail, Sheet 9.
3. Master Unit. See detail, this Sheet.
4. Interconnect wiring in trench as required by system manufacturer.
5. Typical four-box layout. See chart, Sheet 9 for exact elevation to light beam center for each box.
6. See Site Plans for exact dimensions from runway threshold.



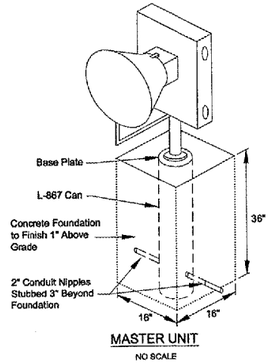
REILS LAYOUT (TYP. FOR RUNWAY 6, REVERSE FOR RUNWAY 24)
NO SCALE

DETAIL NOTES
1. REIL master unit. For master and slave units, the vertical aiming angle shall be 10 degrees above horizontal, and angled away from the runway centerline as shown.
2. See Site Plans and 1-Line Diagram for wire feeds.
3. Stepdown transformer assembly. See detail, Sheet 9.
4. Existing runway lighting circuit. Locate and avoid damaging.
5. Interconnect wiring between master and slave units shall be per system manufacturer's requirements, and shall be considered incidental to this item. All power wiring shall be 600 volt rated, Type C for direct burial installations. Provide a minimum of two spare conductors between units.
6. Existing threshold lights. Locate and avoid underground wiring.
7. REIL slave unit.

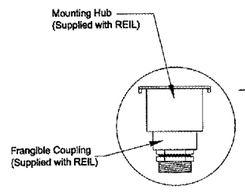


TYPICAL PAPI L-880 SYSTEM
NO SCALE

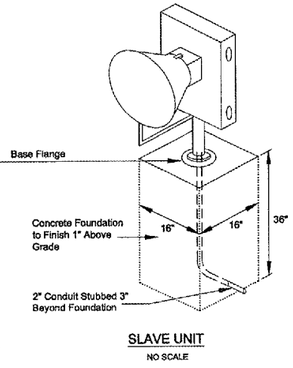
DETAIL NOTES:
1. Master power and control unit. Concrete foundation requirements shall be same as Note 8.
2. 240 volt AC power wiring in trench from local stepdown transformer. See Sheet 9.
3. Power and control wiring in trench as required by manufacturer.
4. Provide frangible couplings and L-823 connectors for all wire entrances into base plate hubs.
5. Typical 2" conduit stubbed 3" beyond outside edge of foundation for wiring.
6. Typical L-867, style D can with base plate; location per manufacturer's requirements.
7. Base flanges shall be fastened to the foundation with ½" x 6" galvanized anchor bolts, washers and nuts; quantity per flange shall be per manufacturer's requirements.
8. Concrete foundations shall extend 1 ft beyond edge of light box units, and shall finish 1" above the highest surrounding grade with edges beveled or chamfered. Center the unit on the foundation.



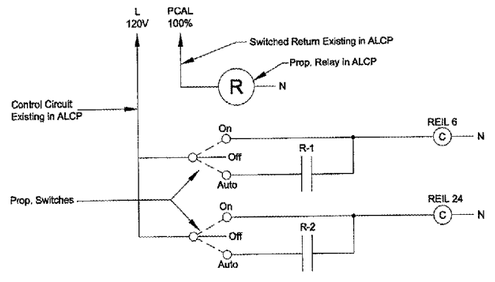
MASTER UNIT
NO SCALE



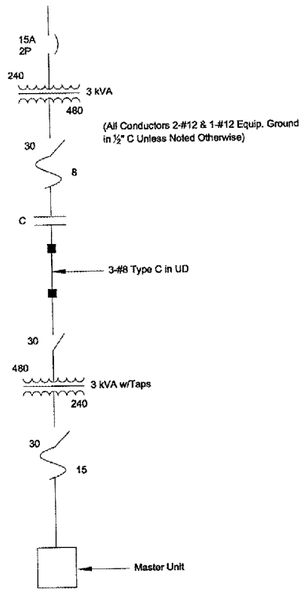
TYPICAL FOR MASTER & SLAVE UNITS
NO SCALE



SLAVE UNIT
NO SCALE

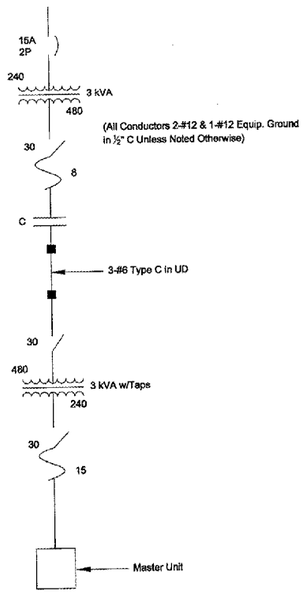


TYPICAL REIL CONTROL SCHEMATIC
NO SCALE



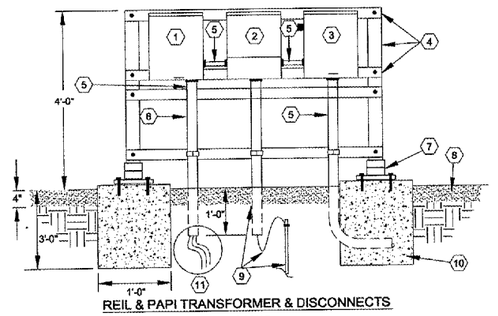
REIL 6 1-LINE DIAGRAM

NO SCALE



PAPI 6 1-LINE DIAGRAM

NO SCALE



REIL & PAPI TRANSFORMER & DISCONNECTS

NO SCALE

DETAIL NOTES

1. 30 amp, 600 volt, 3-pole, non-fused disconnect in NEMA 3R enclosure - Square D, #HU361RB, or equal.
2. 3 kVA, 480 volt to 120/240 volt stepdown transformer with 2 - 2.5% FCAN, and 2 - 2.5% FCBN taps, in weatherproof enclosure - Acme Electric #T-2-53013-4S, or equal. Tap as required to yield 120/240 volts on the secondary side with full PAPI or REIL load applied.
3. 30 amp, 2-pole, 240 volt, fusible safety switch in NEMA 3R enclosure - Square D, #H221NRB, or equal. Fuse at 15 amps with Bussman #FRNR15, or equal. Provide one set of spare fuses. Provide lightning arrestor for single-phase service - Square D, #SDSA1175, or equal. Cut leads as short as possible and connect to line-side of switch.
4. Mounting structure shall consist of two 2" galvanized heavy wall Schedule 40 steel posts with galvanized 12 ga. strut cross-members in sufficient quantity to provide top and bottom support for all mounted enclosures and conduit fastening as shown. Provide watertight caps on top of risers. Fasten structure together with 3/8" plated bolts, nuts and lockwashers.
5. See 1-Line Diagrams, this Sheet.
6. Incoming 480 volt, single-phase feed from vault contactor, in 1 ¼" PVC conduit.
7. 2" frangible coupling and flange. Fasten flange to concrete base with a minimum of four 3/8" x 4" concrete anchors.
8. Provide rock backfill to thickness shown, to extend 2 ft. beyond edges of foundations and mounted enclosures.
9. 1 - #10 grounding electrode conductor in ½" PVC to a 5/8" x 8' ground rod driven 1 ft to the top below grade.
10. Typical for two concrete bases required; dimensions as shown. Concrete shall be poured against undisturbed soil. Top shall finish 1" above surrounding grade.
11. Provide fill sand around wire entrances in conduit. Provide 1 ft of slack in wire and neatly coil in an 'S' curve at conduit entrance.

PAPI - RUNWAY 06			
STATION	OFFSET	AIMING ANGLE	BEAM CENTER ELEVATION
-6+01.22	87.5' LT	3° 30'	391.56
-6+01.22	112.5' LT	3° 10'	391.56
-6+01.22	137.5' LT	2° 50'	391.56
-6+01.22	162.5' LT	2° 30'	391.56

REIL - RUNWAY 06	
STATION	OFFSET
-12+50	77.5' LT
-12+50	77.5' RT

PAPI - RUNWAY 24			
STATION	OFFSET	AIMING ANGLE	BEAM CENTER ELEVATION
30+41.66	87.5' RT	3° 30'	393.51
30+41.66	112.5' RT	3° 10'	393.51
30+41.66	137.5' RT	2° 50'	393.51
30+41.66	162.5' RT	2° 30'	393.51

REIL - RUNWAY 24	
STATION	OFFSET
38+45.1	77.5' LT
38+45.1	77.5' RT

PAPI & REIL LOCATION AND ELEVATION CHART

HARRISBURG-RALEIGH AIRPORT

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REIL & PAPI DETAILS

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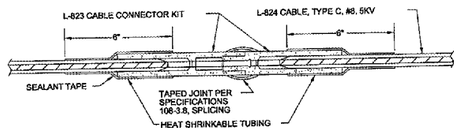


DETAIL - CABLE SPLICING

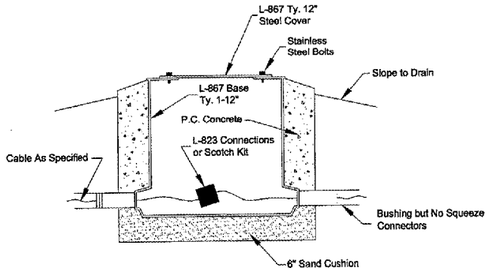
NO SCALE

CABLE SPLICING NOTES:

1. HEAT-SHRINKABLE TUBING WILL NOT BE REQUIRED FOR ISOLATION TRANSFORMER PRIMARY CONNECTORS WHICH ARE MOLDED ON TO THE CABLE LEADS AT THE FACTORY.
2. THE SEALANT TAPE AROUND THE CONNECTOR SHALL BE WATER INSOLUBLE, MAINTAINING ELASTICITY OVER A WIDE RANGE OF TEMPERATURE, AND SHALL BE RAYCHEM NO. S-1011 OR APPROVED EQUAL.
3. HEAT-SHRINKABLE TUBING SHALL HAVE MINIMUM EXPANDED ID. OF 1.200", MAXIMUM RECOVERED ID. OF .300", MINIMUM EXPANDED WALL THICKNESS OF .04", NOMINAL RECOVERY WALL THICKNESS OF 0.17", A MASTIC WATER SEALANT COATING APPLIED ON THE INSIDE, AND SHALL BE RAYCHEM NO. WCS-300-6-S OR APPROVED EQUAL.
4. MINIMUM LENGTH OF THE HEAT-SHRINKABLE TUBING SHALL BE 6".
5. CLEAN THE CABLE INSULATION BEFORE APPLYING THE TUBING WITH A SOLVENT SPECIFIED BY THE TUBING MANUFACTURER.
6. TO HEAT THE TUBING, USE PROPANE TORCH, OR ELECTRIC HEATER RECOMMENDED BY THE TUBING MANUFACTURER.
7. BEGIN HEATING THE TUBING AT THE CENTER, GO COMPLETELY AROUND, THEN MOVE TOWARD THE ENDS.
8. CONTINUE HEATING THE TUBING UNTIL IT SHRINKS COMPLETELY AND THE SEALANT IS BEING SQUEEZED OUT AT BOTH ENDS.
9. IF THERE IS ANY NOTICEABLE HEAT DAMAGE TO THE CABLE OR THE TUBING, THE CONNECTION, INCLUDING THE DAMAGED PORTION, WILL BE REMOVED AND ANOTHER CONNECTION MADE.
10. ALLOW THE CONNECTION TO COOL BEFORE HANDLING.
11. INSTALL THE CONNECTIONS WITHOUT BENDING THEM.
12. THE CONTRACTOR SHALL TRAIN THE AIRPORT MAINTENANCE PERSONNEL IN THE EMPLOYMENT OF CABLE CONNECTION WITH HEAT-SHRINKABLE TUBING. THE INSTRUCTION SHALL INCLUDE AT LEAST TWO ASSEMBLIES AND DISASSEMBLIES FOR SUCH CONNECTIONS.
13. AFTER COMPLETION OF THE CONSTRUCTION, THE CONTRACTOR SHALL TRANSFER ONE OF THE HEATER UNITS TO THE AIRPORT MANAGER. IT SHALL BECOME THE PROPERTY OF THE AIRPORT.

ELECTRICAL PLAN LEGEND

□	PROPOSED PAPI SYSTEM COMPONENT
▶	PROPOSED REIL MASTER OR SLAVE UNIT
—E—	PROPOSED UNDERGROUND ELECTRICAL
— — —	EXISTING UNDERGROUND ELECTRICAL
■	EXISTING VASI COMPONENT
WT ●	EXISTING WIND TEE
H	PROPOSED HANDHOLE
S	PROPOSED SPLICE CAN
RMC	RIGID METAL CONDUIT, SCHEDULE 40 STEEL

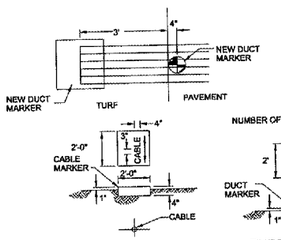


SPLICE BOX DETAILS

NO SCALE

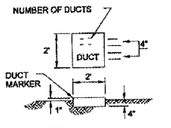
GENERAL ELECTRICAL NOTES

1. The electrical installation as a minimum shall meet the National Electric Code and local regulations.
2. In lieu of stenciling, Contractor shall furnish and install plastic laminated engraved legend plates securely fastened to equipment with tapping or machine screws. Legend plates shall be ½" high black letters on white background.
3. 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 conductor size No. 2 AWG or smaller shall be identified by a continuous white outer finish along its entire length. Neutral conductors size larger than No 2 shall be identified either by a continuous white outer finish along its entire length or by the use of white tape at its terminations and inside accessible wireways.
4. 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.
5. Neatly lace wiring in distribution panels, switches, and junction/pull boxes.
6. Ground all noncurrent-carrying metal parts of electrical equipment by using insulated copper wire to be run inside cabinets and in conduits together with other wires.
7. All ground connections to busses, panel, etc., shall be made with pressure type solderless lug clamps. Soldered or bolt & washer type connections are not acceptable. Clean all metal surfaces before making ground connections. Connections to ground rods shall be made with exothermic welding process.
8. Rigid steel conduit shall be used throughout the installation unless otherwise specified.
9. All steel conduits, fittings, nuts, bolts, etc., shall be galvanized.
10. Use insulated conduit bushing at each conduit termination.
11. Use double lock nuts at each conduit termination.
12. Unless otherwise shown, all exposed conduits shall be run parallel to or at right angles with the lines of the structure.
13. Label both ends of all control conductors to identify terminal number and circuit. Such labeling shall be done at all terminals and splices.
14. Unless otherwise noted, all single control conductors shall be No. 12 AWG, THHN, stranded copper. Extensions to existing control conductors shall be the same color as existing.
15. Both ends of each control conductor shall be terminated at a terminal block. The terminal blocks shall be of proper rating and size and they shall be located in equipment enclosures or special terminal cabinets.
16. Both ends of all control conductors shall be identified as to the circuit terminal block, and terminal number. Only shrinkable permanent labels shall be used.
17. A separate and continuous neutral conductor shall be installed and connected for each circuit in the power panel(s) from the neutral bar to each 120 volt power/control circuit.
18. Except where noted otherwise for equipment grounding conductors, splices and junction points shall be permitted only in junction boxes, ducts equipped with removable covers and at easily accessible locations.
19. Unless otherwise noted, all underground field power multiple and series circuit conductors shall be FAA approved L-824, type, insulation, voltage and size shall be as specified.
20. The joint of the L-823 connectors shall be wrapped in at least one layer of rubber or synthetic rubber tape and one layer of plastic tape, one-half lapped extending at least 1½ inches on each side of the joint. Heat-shrink tubing shall be applied where cable enters back of connector, see Detail Drawing.
21. The ID of the L-823 field-attached connectors shall match the cable OD to provide a watertight cable entrance.
22. All power and control circuit conductors shall be copper. Aluminum shall not be accepted. This includes wire, cable, busses, terminals, switch/panel components, etc.
23. Cable/splice/duct markers shall be precast concrete of size shown. Letter/numbers for the legend to be impressed into tops of the markers shall be pre assembled and secured in mold before concrete is poured. Legend inscribed by hand in wet concrete shall not be acceptable.
24. 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 remainder of the new/existing system. Any incompatible 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 of different manufacturer) that is compatible with the remainder of the airport lighting system.
25. In case the Contractor selects to furnish and install airport lighting equipment requiring additional wiring, transformers, adapters, mountings, etc., to those shown on the Drawings and/or listed in the specifications, any cost for these items shall be incidental to the equipment cost.
26. The Contractor-installed equipment (including FAA approved) shall not generate any electromagnetic interference in the existing and/or new communications, weather, and air traffic control equipment. Any equipment generating such interference shall be replaced by the Contractor, at no additional cost, by equipment meeting the applicable specifications and not generating any interference.



TURF CABLE MARKERS

NO SCALE



TURF DUCT MARKER

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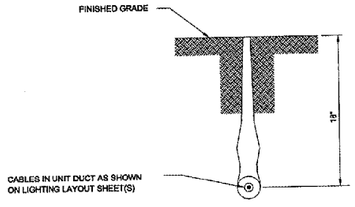
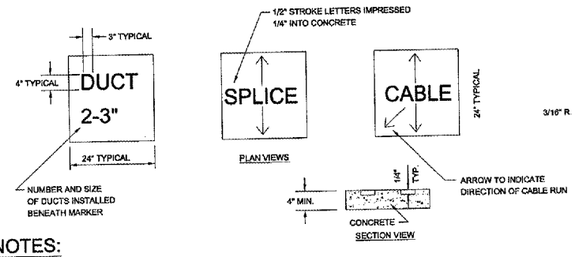


PLOWED CABLE

NO SCALE

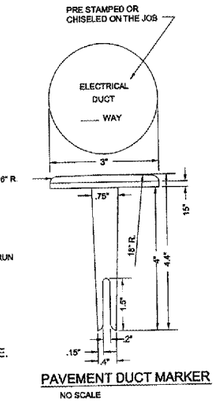


NOTES:

1. MARKERS SHALL BE PLACED AS SPECIFIED IN ITEMS 108, 109 & 125 OF THE SPECIFICATIONS.
2. COST OF CONCRETE MARKERS IS INCIDENTAL TO THE ASSOCIATED ITEMS OF DUCT OR CABLE.
3. EDGE EXPOSED CONCRETE WITH A 1/2" RADIUS TOOL.
4. WHERE ADDITIONAL SPACE TO FIT THE LEGEND IS REQUIRED, SOME OF THE FOLLOWING METHODS SHALL BE EMPLOYED:
   A. REDUCE LETTER SIZE TO 3" HIGH, 2" WIDE
   B. INCREASE THE MARKER SIZE TO 30" x 30" MAX.
   C. PROVIDE ADDITIONAL MARKERS PLACED SIDE BY SIDE.

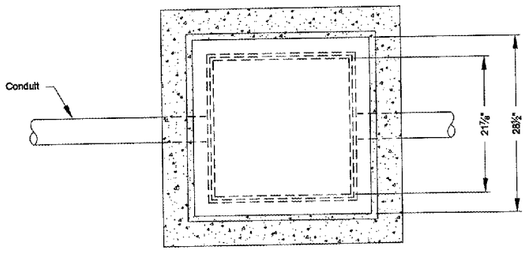
CABLE AND DUCT MARKERS

NO SCALE

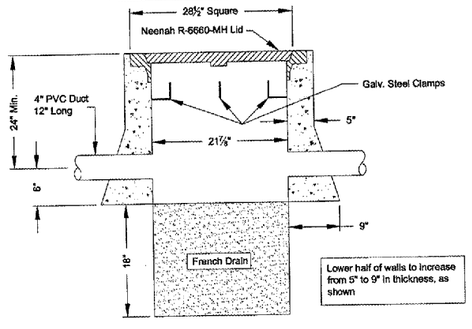


PAVEMENT DUCT MARKER

NO SCALE



6' of each cable to be looped in handhold and suspended from hooks.



HANDHOLE DETAILS

NO SCALE

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