IDOT LETTING: APRIL 25, 2014

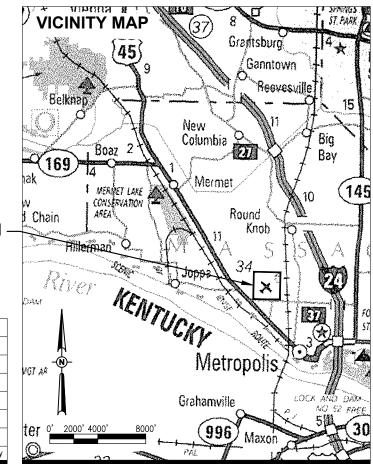
MP007 TOTAL SHEETS = 35

CONSTRUCTION PLANS

CONSTRUCT PARTIAL PARALLEL TAXIWAY TO RUNWAY END 36, PHASE 2 - PAVING

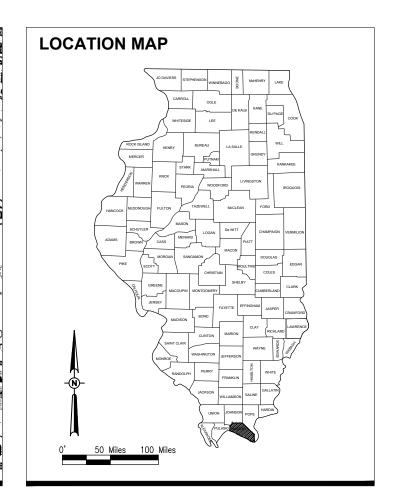
METROPOLIS MUNICIPAL AIRPORT METROPOLIS, MASSAC COUNTY, ILLINOIS

SBG PROJECT NO. 3-17-SBGP-TBD IDA PROJECT NO. M30-4398

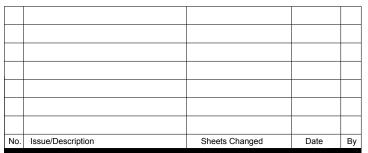


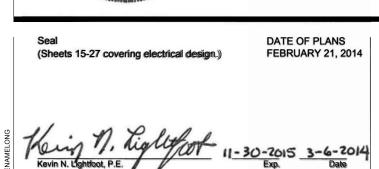
NOTICE TO CONTRACTORS AND BIDDERS

THESE CONSTRUCTION PLANS RELY UPON THE SPECIAL PROVISIONS AND THE SPECIFICATIONS TO PROVIDE FOR A COMPLETE DESCRIPTION OF THE WORK AND CONSTRUCTION REQUIREMENTS. THE PLANS SHALL ONLY BE USED IN COMBINATION WITH ALL CONTRACT DOCUMENTS.



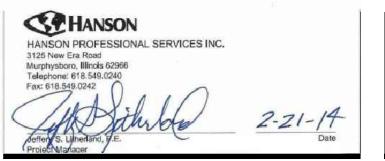
PROJECT LOCATION





062-047643





METROPOLIS MUNICIPAL AIRPORT 751 Airport Road Metropolis, Illinois 62960 Telephone: 618.524.4016 Fax: 618.524.2582



	SUMMARY OF QUANTITIES			<u> </u>
ITEM NO.	DESCRIPTION	UNIT	TOTAL QUANTITIES	AS BUILT QUANTITIES
AR108158	1/C#8 5KV UG CABLE IN UD	L.F.	5,269	
AR110013	3" DIRECTIONAL BORE	L.F.	210	
AR125410	MITL—STAKE MOUNTED	EACH	42	
AR125415	MITL-BASE MOUNTED	EACH	8	
AR125444	TAXI GUIDANCE SIGN, 4 CHARACTER	EACH	1	
AR125447	TAXI GUIDANCE SIGN, 7 CHARACTER	EACH	1	
AR125540	MI THRESHOLD LIGHT STAKE MTD	EACH	6	
AR125901	REMOVE STAKE MOUNTED LIGHT	EACH	6	
AR125961	RELOCATE STAKE MOUNTED LIGHT	EACH	3	
AR150510	ENGINEER'S FIELD OFFICE	L.S.	1	
AR150520	MOBILIZATION	L.S.	1	
AR150540	HAUL ROUTE	L.S.	1	
AR152411	UNCLASSIFIED EXCAVATION	L.S.	1	
AR155540	BY-PRODUCT LIME	TON	208	
AR155612	SOIL PROCESSING-12"	S.Y.	7,960	
AR209606	CRUSHED AGG. BASE COURSE - 6"	S.Y.	7,756	
AR401613	BIT. SURF. CSE.—METHOD I, SUPERPAVE	TON	651	
AR401655	BUTT JOINT CONSTRUCTION	S.Y.	70	
AR401900	REMOVE BITUMINOUS PAVEMENT	S.Y.	548	
AR403613	BIT. BASE CSEMETHOD I, SUPERPAVE	TON	1,100	
AR602510	BITUMINOUS PRIME COAT	GAL.	2,715	
AR603510	BITUMINOUS TACK COAT	GAL.	1,148	
AR620520	PAVEMENT MARKING-WATERBORNE	S.F.	3,315	
AR620525	PAVEMENT MARKING-BLACK BORDER	S.F.	424	
AR620900	PAVEMENT MARKING REMOVAL	S.F.	258	
AR901510	SEEDING	ACRE	1.3	
AR908510	MULCHING	ACRE	1.3	

	INDEX TO SHEETS
SHEET NO.	DESCRIPTION
1	COVER SHEET
2	SUMMARY OF QUANTITIES AND INDEX TO SHEETS
3	PROPOSED SAFETY PLAN
4	PROPOSED CONSTRUCTION PLAN STA. 93+96 TO STA. 104+00
5	PROPOSED CONSTRUCTION PLAN STA. 104+00 TO STA. 111+34
6	PROPOSED CONSTRUCTION PLAN NOTES
7	PROPOSED STAKING PLAN STA. 93+96 TO STA. 104+00
8	PROPOSED STAKING PLAN STA. 104+00 TO STA. 111+34
9	PROPOSED PLAN AND PROFILE TWY A-SHEET 1
10	PROPOSED PLAN AND PROFILE TWY A-SHEET 2
11	PROPOSED MARKING PLAN STA. 93+96 TO STA. 104+00
12	PROPOSED MARKING PLAN STA. 104+00 TO STA. 111+34
13	PROPOSED ELECTRICAL PLAN STA. 93+96 TO STA. 104+00
14	PROPOSED ELECTRICAL PLAN STA. 104+00 TO STA. 111+34
15	AIRFIELD LIGHTING NOTES AND SCHEDULE
16	ELECTRICAL DETAILS SHEET 1
17	ELECTRICAL DETAILS SHEET 2
18	ELECTRICAL DETAILS SHEET 3
19	ELECTRICAL AND DUCT DETAILS
20	ELECTRICAL NOTES SHEET 1
21	ELECTRICAL NOTES SHEET 2
22	ELECTRICAL LEGEND, ABBREVIATIONS & NOTES
23	EXISTING ELECTRICAL ONE LINE DIAGRAM FOR VAULT
24	AIRFIELD LIGHTING WIRING SCHEMATIC
25	HIGH VOLTAGE WIRING SCHEMATIC
26	GROUNDING DETAILS
27	GROUNDING NOTES
28	PROPOSED TAXIWAY A CROSS-SECTIONS STA. 92+68 TO STA. 95+00
29	PROPOSED TAXIWAY A CROSS-SECTIONS STA. 95+25 TO STA. 97+50
30	PROPOSED TAXIWAY A CROSS-SECTIONS STA. 98+00 TO STA. 100+50
31	PROPOSED TAXIWAY A CROSS-SECTIONS STA. 101+00 TO STA. 104+00
32	PROPOSED TAXIWAY A CROSS-SECTIONS STA. 104+50 TO STA. 106+00
33	PROPOSED TAXIWAY A CROSS-SECTIONS STA. 106+50 TO STA. 109+00
34	PROPOSED TAXIWAY A CROSS-SECTIONS STA. 109+50 TO STA. 111+50
35	PROPOSED TAXIWAY A-4 CROSS-SECTIONS

- SURVEY LINE AND CONSTRUCTION CENTERLINE 80' (SAFETY AREA=79') 80' 17.5 17.5 22.5 12.5 1.50% SLOPE 1.50% SLOPE 1-1/2" TYP. 2 (5) · VARIES - EXISTING PROFILE GRADE 6 PROPOSED EARTH FILLET TYPICAL SECTION — TAXIWAY "A" NOT TO SCALE

<u>LEGEND FOR TYPICAL SECTION - TAXIWAY "A"</u>

① 401 - BITUMINOUS SURFACE COURSE (1-1/2" LIFT)

② 403 - BITUMINOUS BASE COURSE (2-1/2" LIFT)

3 603 - BITUMINOUS TACK COAT (0..05 TO 0.15 GAL./S.Y.)

4 602 - BITUMINOUS PRIME COAT (0.35 GAL./S.Y.)

5 209 - CRUSHED AGGREGATE BASE COURSE (6" DEPTH)

6 155 - SOIL PROCESSING (12" DEPTH)

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Illinois Licensed Professional Service Corporation #184-001084

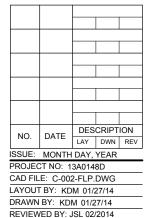
METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

Contract No: MP007



SUMMARY OF QUANTITIES AND INDEX TO SHEETS

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 115'. 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 THEM TO THEIR ORIGINAL STATE. THIS RESTORATION WILL BE CONSIDERED PART OF THE HAUL ROUTE ITEM 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 MAINTAIN CONTINUOUS TAXIWAY ACCESS TO ALL HANGARS AND ADMINISTRATIVE AREAS. THE RUNWAY WILL BE CLOSED ANY TIME THE CONTRACTOR IS WORKING WITHIN 200' OF THE RUNWAY CENTERLINE. THE RUNWAY WILL BE CLOSED AS SHOWN ON THE "DETAIL OF CROSS FOR CLOSED RUNWAY."

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

NO TRENCHES OR HOLES WILL REMAIN OPEN OVERNIGHT, UNLESS LIGHTED BARRICADES ARE ERECTED.

BARRICADES AND TRAFFIC CONES

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

AIRCRAFT OPERATION LINE (AOA)

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 THIS LATHE LINE FOR THE RUNWAY THROUGHOUT THE PROJECT.

SCOPE OF WORK

THIS PROJECT CONSISTS OF THE CONSTRUCTION OF A PARTIAL PARALLEL TAXIWAY AND A CONNECTOR TAXIWAY TO RUNWAY 18-36. ASSOCIATED ITEMS INCLUDE UNCLASSIFIED EXCAVATION, PAVEMENT REMOVAL, LIGHTING, MARKING AND LANDSCAPING.

HEIGHT OF CONSTRUCTION EQUIPMENT

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

CERTIFIED PAYROLLS

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

MATERIAL CERTIFICATION

MATERIALS TO BE INCORPORATED INTO THE PROJECT CANNOT BE USED WITHOUT PRIOR APPROVAL. ALL MATERIALS TO BE USED IN THE PROJECT MUST BE SUBMITTED TO THE RESIDENT ENGINEER FOR APPROVAL. USE OF MATERIALS WITHOUT PRIOR APPROVAL AND ULTIMATELY DETERMINED TO BE UNACCEPTABLE BY THE ILLINOIS DIVISION OF AERONAUTICS ARE SUBJECT TO REMOVAL AND/OR NON-PAYMENT.

NOTE

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

ALL CONSTRUCTION EQUIPMENT ON THE AIRPORT SHALL BE MARKED, LIGHTED AND/OR FLAGGED IN ACCORDANCE WITH AC 150/5210-5D AND 70/7460-1K, OR THE LATEST EDITION.

PROPOSED SAFETY PLAN

GENERAL – THE METROPOLIS MUNICIPAL AIRPORT IS COMPRISED OF ONE RUNWAY. THE PROPOSED CONSTRUCTION WILL NECESSITATE CLOSING OF THE RUNWAY TO COMPLETE WORK WITHIN THE AIRCRAFT OPERATION AREA (AOA). ANY TIME THE CONTRACTOR IS WORKING WITHIN 125' OF THE RUNWAY CENTERLINE, THE RUNWAY WILL BE CLOSED. THE RUNWAY WILL BE CLOSED ONLY WHEN NECESSARY TO COMPLETE THE WORK ITEMS. THE CONTRACTOR WILL HAVE SEVEN (7) CALENDAR DAYS TO COMPLETE THE WORK ITEMS WITHIN THE AIRCRAFT OPERATION AREA (AOA). AT NO TIME WILL THE RUNWAY BE CLOSED OVERNIGHT UNLESS AUTHORIZED BY THE AIRPORT MANAGER. 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. ALL WORK INCLUDED IN OPENING AND CLOSING THE RUNWAY WILL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

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

RADIO CONTROL - THE CONTRACTOR WILL BE REQUIRED TO BE ON A TWO-WAY RADIO CONTACT (122.80 MHZ.) WITH THE AIRPORT UNICOM. THIS WILL KEEP THE CONTRACTOR IN CONSTANT CONTACT WITH THE METROPOLIS MUNICIPAL AIRPORT AND ENABLE THE AIRPORT TO IMMEDIATELY CONTACT THE CONTRACTOR IN CASE OF AN AERONAUTICAL EMERGENCY THAT WOULD REQUIRE ACTION BY THE CONTRACTOR AND/OR HIS PERSONNEL.

150-ENGINEER'S FIELD OFFICE NOTES

THE PROPOSED ENGINEER'S FIELD OFFICE WILL BE FURNISHED, MAINTAINED, AND REMOVED IN ACCORDANCE WITH ITEM AR150510 "ENGINEER'S FIELD OFFICE" AS STATED ON PAGE 53 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS APRIL 1, 2012 OR SUPERCEDED BY THE SPECIAL PROVISION FOR THIS PROJECT.

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

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

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

EROSION CONTROL

THIS PROJECT WILL DISTURB MORE THAN 1 ACRE OF LAND, THEREFORE A N.P.D.E.S. PERMIT WILL BE REQUIRED.

\bigcap	CONTROL DATA	
NO.	DESCRIPTION	ELEV.
1	MAG NAIL W/WASHER END OF RWY 36	372.20
2	MAG NAIL W/WASHER TAXIWAY "A"	380.00
$\sqrt{3}$	CHISELED " " ON SOUTH END OF TAXI GUIDANCE SIGN 36-18	381.39

<u>LEGEND</u>

EXISTING IMPROVEMENTS

FUTURE TAXIWAY

EXISTING BUILDINGS

PROPOSED HAUL ROUTE AND EQUIPMENT PARKING AREA

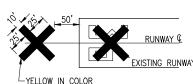
① CONTROL POINTS

PROPOSED BARRICADES OR TRAFFIC CONES

J.U.L.I.E. INFORMATION

COUNTY MASSAC
CITY METROPOLIS
TOWNSHIP 15S-R4E
SECTION NO. 27
ADDRESS METROPOLIS N

__METROPOLIS MUNICIPAL AIRPORT 751 AIRPORT ROAD METROPOLIS, ILLINOIS 62960



DETAIL OF CROSS FOR CLOSED RUNWAY

"NOT TO SCALE"

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.

NOTE:



Hanson Professional Services Inc. 1525 S. 6th Street Springfield, IL 62568 phone: 217-788-2450

fax: 217-788-2503

PLACE AND MAINTAIN

0

AIRCRAFT

LINE

TWY "A4"

OPFRATION

BARRICADES (WHEN RUNWAY CLOSED)

PLACE AND MAINTAIN

PLACE AND MAINTAIN

BARRICADES

BARRICADES

- CP #3

CP #2

Illinois Licensed Professional Service Corporation #184-001084

METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

-PROPOSED HAUL ROUTE.

FOLIPMENT PARKING AREA

AND EMPLOYEE PARKING

NEIHOFF LN

-PROPOSED PIPE

CULVERT IN DITCH

TO ACCESS SITE

0' 100' 200'

FULL SIZE SCALE: 1"=

1"= 400'

Contract No: MP007

NO. DATE DESCRIPTION
LAY DWN REV

ISSUE: MONTH DAY, YEAR

PROJECT NO: 13A0148D

CAD FILE: C-003-SFY.DWG

LAYOUT BY: KDM 01/16/2014

DRAWN BY: BAK 01/16/2014

REVIEWED BY: JSL 02/2014

PROPOSED SAFETY PLAN

SHEET TITLE

3

HANSON

Engineering | Architecture | Planning | Allied Se
Offices Nationwide

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Illinois Licensed Professional Service Corporation #184-001084

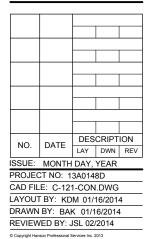
METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

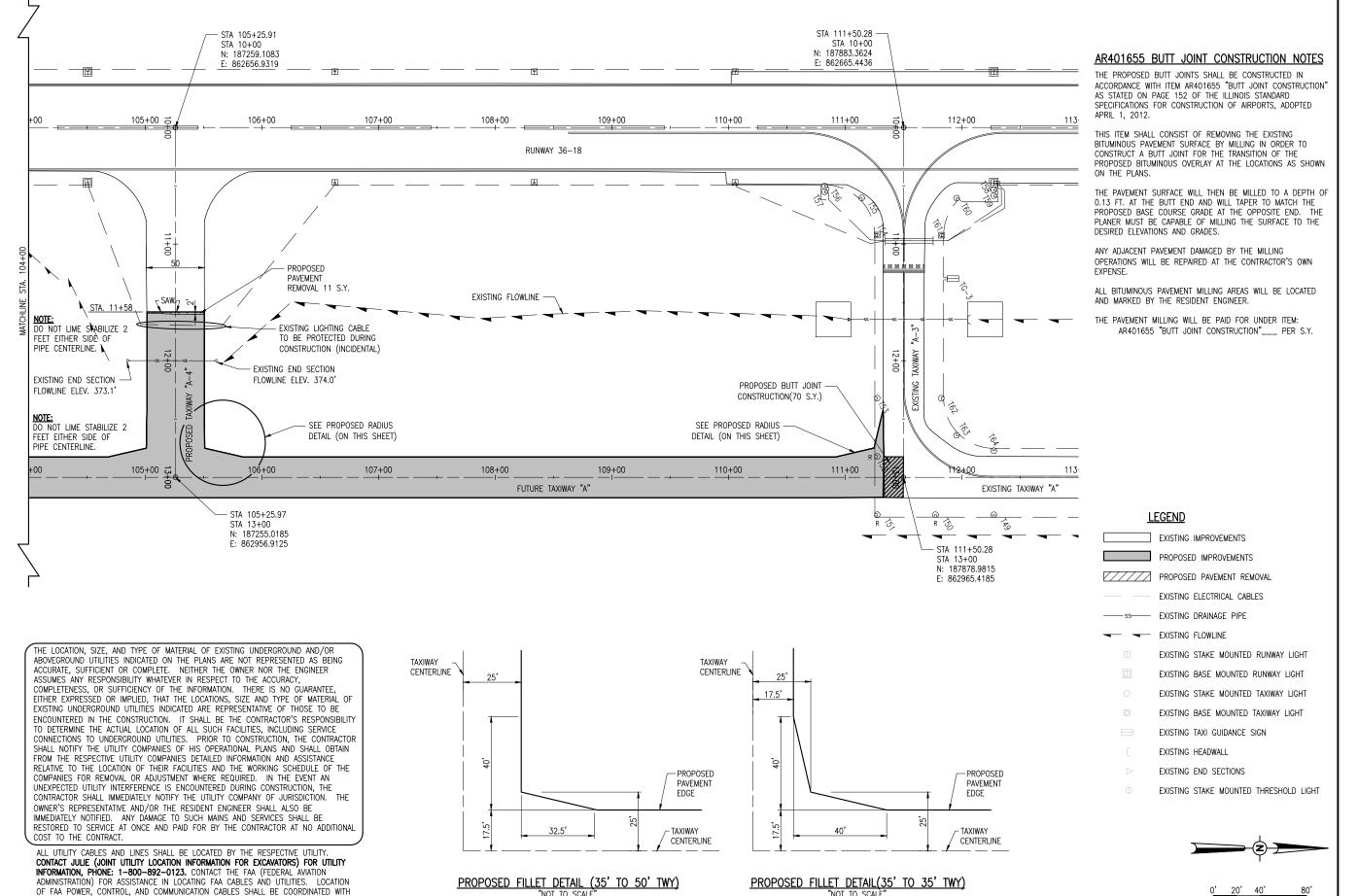
Contract No: MP007



PROPOSED CONSTRUCTION PLAN STA. 93+96 TO STA. 104+00

AND/OR LOCATED BY THE FAA. ALSO CONTACT AIRPORT DIRECTOR/MANAGER AND

AIRPORT PERSONNEL FOR ASSISTANCE IN LOCATING UNDERGROUND AIRPORT CABLES AND/OR UTILITIES. ALSO COORDINATE WORK WITH ALL ABOVEGROUND UTILITIES.



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Illinois Licensed Professional Service Corporation #184-001084

METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

Contract No: MP007

NO. DATE DESCRIPTION
LAY DWN REV
ISSUE: MONTH DAY, YEAR
PROJECT NO: 13A0148D
CAD FILE: C-121-CON.DWG
LAYOUT BY: KDM 01/16/2014
DRAWN BY: BAK 01/16/2014
REVIEWED BY: JSL 02/2014

PROPOSED CONSTRUCTION PLAN STA. 104+00 TO STA. 111+34

SHEET TITLE

HALF SIZE SCALE: 1"= 80 FULL SIZE SCALE: 1"= 40

155-LIME-MODIFIED SUBGRADE NOTES:

THE PROPOSED LIME-MODIFIED SUBGRADE SHALL BE COMPLETED IN ACCORDANCE WITH ITEM 155 "LIME TREATED SUBGRADE" AS STATED ON PAGE 69 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS, ADOPTED APRIL 1, 2012.

THIS ITEM OF WORK SHALL CONSIST OF CONSTRUCTING A 12" DEEP COURSE OF A MIXTURE OF SOIL, LIME AND WATER IN ACCORDANCE WITH THE RATES AND METHODS DESIGNED IN THE SPECIFICATIONS (EITHER THE WET OR DRY METHODS IS ACCEPTABLE).

THE SUBGRADE WILL BE CUT PRIOR TO LIME-MODIFICATION.

ANY SWELL WILL BE REMOVED BY THE CONTRACTOR AND DISPOSED OF ON THE AIRPORT SITE AS DIRECTED BY THE RESIDENT ENGINEER. NO ADDITIONAL PAYMENT WILL BE MADE FOR REMOVAL OF SWELL.

THE LIME-MODIFIED SUBGRADE SHALL BE CUT TO FINISHED ELEVATION UPON COMPLETION (0.05'+) IN ACCORDANCE TO SECTION 155-6.5 OF THE SPECIFICATIONS. THE LIME-MODIFIED SUBGRADE WILL BE WET CURED FOR 2 DAYS.

THE CONTRACTOR WILL LIME-MODIFY THE SUBGRADE FROM THE CENTERLINE TO 1' OUTSIDE OF THE PROPOSED PAVEMENT SURFACE ON BOTH SIDES.

THE LIME-MODIFIED SUBGRADE WILL BE COMPACTED IN ACCORDANCE WITH PROCEDURES FOR AIRCRAFT WEIGHING LESS THAN 60.000 POUNDS.

THE ENTIRE THICKNESS OF THE TREATED SUBGRADE SHALL BE COMPACTED TO A DENSITY OF NOT LESS THAN 95 PERCENT OF THE STANDARD DRY DENSITY (92 PERCENT OF THE MODIFIED DRY DENSITY). THIS MODIFIED DRY DENSITY PROCTOR WILL BE SUPPLIED BY THE CONTRACTOR AND THE COST INCLUDED IN THE SOIL PROCESSING

THE LIME, BY-PRODUCT LIME (CODE L), WAS CALCULATED AT 5% OF THE DRY SOIL WEIGHT AT MAXIMUM DENSITY. THE ACTUAL AMOUNT WILL BE DETERMINED PRIOR TO THE START OF CONSTRUCTION, BUT SHALL NOT EXCEED 5% BY WEIGHT. THE COST OF LIME WILL BE PAID FOR UNDER ITEM AR155540.

THE MAXIMUM TONNAGE OF LIME TO BE PAID WILL BE THE PLAN QUANTITY.

THE PROPOSED LIME-MODIFIED SUBGRADE WILL BE PAID FOR UNDER ITEMS:

AR155612 SOIL PROCESSING-12"_______PER S.Y.

AR155540 BY-PRODUCT LIME_______PER TONS

AR209-CRUSHED AGGREGATE BASE COURSE NOTES

THE CRUSHED AGGREGATE BASE COURSE (209) SHALL BE PLACED IN ACCORDANCE WITH ITEM 209 "CRUSHED AGGREGATE BASE COURSE" AS STATED ON PAGE 93 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS. ADOPTED APRIL 1, 2012.

THE CRUSHED AGGREGATE BASE COURSE MATERIAL (CA-6) WILL BE USED TO CONSTRUCT A BASE COURSE FOR THE PROPOSED BITUMINOUS BASE COURSE (403). THE CRUSHED AGGREGATE BASE COURSE MATERIAL WILL BE 6" IN DEPTH AND COMPACTED TO NOT LESS THAN 95 PERCENT DENSITY.

THE PROPOSED AGGREGATE FOR THE BASE COURSE MATERIAL SHALL MEET THE REQUIREMENTS OF GRADATION "B" IN TABLE 1 OF THE STANDARD SPECIFICATIONS.

<u>209-3.2 EQUIPMENT.</u> ADD THE FOLLOWING PARAGRAPHS TO THIS SECTION:

"PROVISIONS SHALL BE MADE BY THE CONTRACTOR FOR FURNISHING WATER AT THE PLANT AND AT THE SITE OF THE WORK BY EQUIPMENT OF AMPLE CAPACITY AND OF SUCH DESIGN AS TO ASSURE UNIFORM MIXING AND APPLICATION."

THE CONTRACTOR WILL PROVIDE THE RESIDENT ENGINEER A PROCTOR CURVE SHOWING OPTIMUM DENSITY AND MOISTURE FOR THE SUPPLIED BASE COURSE MATERIAL.

THE COMPACTION CONTROL TEST TO BE USED SHALL BE FAA COMPACTION CONTROL TEST T-611 FOR AIRCRAFT WEIGHING LESS THAN 60,000 LBS(STANDARD PROCTOR).

209-5.1 ADD THE FOLLOWING TO THIS SECTION

AR209510 CRUSHED AGGREGATE BASE COURSE___ PER S.Y.

THE 209 CRUSHED AGGREGATE BASE COURSE WILL BE PLACED WITH A PAVING MACHINE SETUP TO INSTALL THE AGGREGATE TO THE PROPOSED AGGREGATE GRADE. THE PAVING MACHINE AND GRADE ACCEPTANCE WILL COMPLY WITH 401 AND 403 SPECIFICATIONS.

AR401613 BITUMINOUS SURFACE COURSE-METHOD 1, SUPERPAVE

THE BITUMINOUS SURFACE COURSE (401) SHALL BE PLACED IN ACCORDANCE WITH ITEM AR401003 "BITUMINOUS SURFACE COURSE—METHOD 1, SUPERPAVE" AS STATED ON PAGE 129 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS, ADOPTED APRIL 1, 2012.

THIS ITEM OF WORK SHALL CONSIST OF CONSTRUCTING ONE LIFT OF BITUMINOUS SURFACE COURSE-METHOD 1, SUPERPAVE (1-1/2) INCH DEPTH) ON THE BITUMINOUS BASE COURSE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE QUALITY CONTROL IN THE PRODUCTION AND CONSTRUCTION OF THE BITUMINOUS SURFACE COURSE METHOD 1. SUPERPAVE.

PRIOR TO STARTING THE BITUMINOUS SURFACE COURSE—METHOD 1, SUPERPAVE OPERATION, THE CONTRACTOR SHALL SUBMIT TO THE RESIDENT ENGINEER A DETAILED OUTLINE SHOWING AREAS AND ORDER OF PAVING WIDTHS OF PAVING LANES, AND REQUIRED OFFSETS FOR ELECTRONIC GRADE.

THE PROPOSED BITUMINOUS SURFACE COURSE METHOD 1, SUPERPAVE WILL BE DESIGNED TO A SUPERPAVE DESIGN OF LESS THAN 60,000 POUNDS.

401-4.9 ADD THE FOLLOWING TO THIS SECTION:

WHEN HAND SPREADING IS PERMITTED, THE MIXTURE WILL BE DISTRIBUTED AND SPREAD USING HAND TOOLS. WHEN THE WORK IS COMPLETED, THE LAYER WILL HAVE THE REQUIRED THICKNESS AND CONFORM TO THE GRADE AND SURFACE CONTOUR SHOWN ON THE PLANS.

401-4.12 ADD THE FOLLOWING TO THIS PARAGRAPH:

ALL PAVEMENT EDGES (LONGITUDINAL, RADIUS, AND PAVEMENT ENDS) MUST BE LEFT IN PROPER ALIGNMENT AS SHOWN ON THE PLANS. THIS MAY BE ACCOMPLISHED BY THE TRIMMING METHOD OUTLINED ABOVE OR AT THE CONTRACTOR'S OPTION BY SAWING AFTER THE PAVING HAS BEEN COMPLETED. NO ADDITIONAL COMPENSATION WILL BE MADE IF THE SAWING METHOD IS USED.

401-6.1 ADD THE FOLLOWING TO THIS SECTION
AR401613 BIT. SURF. CSE-METHOD I, SUPERPAVE ____ PER TON

AR403-BITUMINOUS BASE COURSE-METHOD I, SUPERPAVE NOTES

THE BITUMINOUS BASE COURSE (403) SHALL BE PLACED IN ACCORDANCE WITH ITEM AR403613 "BITUMINOUS BASE COURSE—METHOD I, SUPERPAVE" AS STATED ON PAGE 188 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS, ADOPTED APRIL 1, 2012.

THIS ITEM OF WORK SHALL CONSIST OF CONSTRUCTING ONE LIFT OF BITUMINOUS BASE COURSE (2-1/2 INCH DEPTH) ON THE PROPOSED CRUSHED AGGREGATE BASE COURSE.

THE PROPOSED BITUMINOUS BASE COURSE WILL BE DESIGNED TO A SUPERPAVE DESIGN OF LESS THAN 60,000 POUNDS FOR RUNWAY/TAXIWAY PAVEMENTS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE QUALITY CONTROL IN THE PRODUCTION AND CONSTRUCTION OF THE BITUMINOUS BASE COURSE METHOD 1. SUPERPAVE.

403-4.9 ADD THE FOLLOWING TO THIS SECTION:

WHEN HAND SPREADING IS PERMITTED, THE MIXTURE WILL BE DISTRIBUTED AND SPREAD USING HAND TOOLS. WHEN THE WORK IS COMPLETED, THE LAYER WILL HAVE THE REQUIRED THICKNESS AND CONFORM TO THE GRADE AND SURFACE CONTOUR SHOWN ON THE PLANS.

403-4.11 ADD THE FOLLOWING TO THIS PARAGRAPH:

ALL PAVEMENT EDGES (LONGITUDINAL, RADIUS, AND PAVEMENT ENDS) MUST BE LEFT IN PROPER ALIGNMENT AS SHOWN ON THE PLANS. THIS MAY BE ACCOMPLISHED BY THE TRIMMING METHOD OUTLINED ABOVE OR AT THE CONTRACTOR'S OPTION BY SAWING AFTER THE PAVING HAS BEEN COMPLETED. NO ADDITIONAL COMPENSATION WILL BE MADE IF THE SAWING METHOD IS USED.

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METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

Contract No: MP007

NO.	DATE	DES	CRIPT	ION
NO.	DATE	LAY	DWN	REV
ISSUE:	MONTH	DAY,	YEAR	
PROJEC	CT NO: 1	3A014	8D	
CAD FIL	E: C-122	2CON.	DWG	

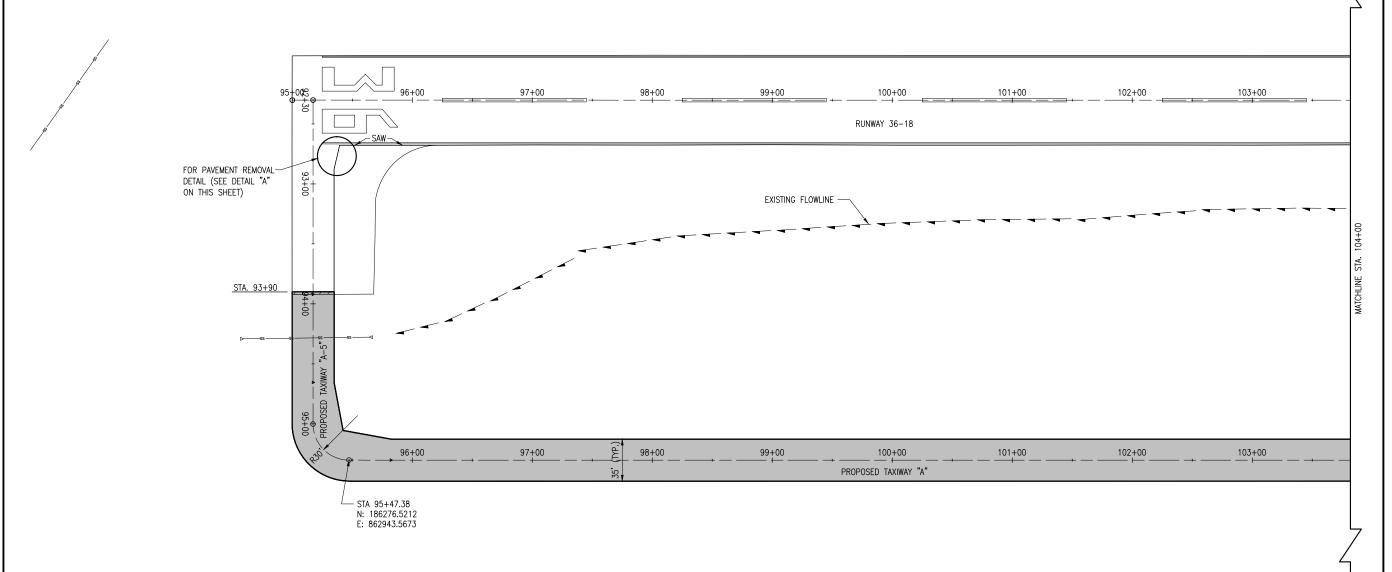
PROPOSED CONSTRUCTION PLAN NOTES

SHEET TITLE

LAYOUT BY: KDM 01/21/2014

DRAWN BY: KDM 01/21/2014

REVIEWED BY: JSL 02/2014



901 SEEDING NOTES

THE PROPOSED SEEDING SHALL BE ACCOMPLISHED IN ACCORDANCE WITH ITEM 901 "SEEDING" AS STATED ON PAGE 319 OF THE STANDARD SPECIFICATIONS FOR, CONSTRUCTION OF AIRPORTS, ADOPTED APRIL 1, 2012.

ALL DISTURBED AREAS LOCATED WITHIN THE PROPOSED GRADING AND SEEDING LIMITS WILL BE SEEDED IN ACCORDANCE WITH THE ABOVE NOTED SPECIFICATION. ALL AREAS OUTSIDE THE DESIGNATED GRADING AND SEEDING LIMITS WILL ALSO BE SEEDED BUT AT THE CONTRACTOR'S OWN EXPENSE.

ALL MATERIALS AND/OR DEBRIS RESULTING FROM THE SEEDING OPERATIONS WILL BE REMOVED FROM THE PAVEMENTS AND MISCELLANEOUS STRUCTURES PRIOR TO OPENING

901-3.4 MAINTENANCE OF SEEDED AREAS. DELETE THE SECOND PARAGRAPH OF THIS SECTION AND ADD THE FOLLOWING:

"THE CONTRACTOR WILL BE REQUIRED TO ESTABLISH A GOOD STAND OF GRASS OF UNIFORM COLOR AND DENSITY TO THE SATISFACTION OF THE RESIDENT ENGINEER. IF AT THE TIME WHEN THE CONTRACT HAS BEEN OTHERWISE COMPLETED, IT IS NOT POSSIBLE TO MAKE AN ADEQUATE DETERMINATION OF COLOR, DENSITY, AND UNIFORMITY OF SUCH STAND OF GRASS, THE ITEM OF WORK WILL BE REVIEWED AT A LATER DATE DETERMINED BY THE ILLINOIS DIVISION OF AERONAUTICS."

DATE SEEDING COMPLETED___

THE PROPOSED SEEDING WILL BE PAID FOR UNDER ITEMS: AR901510 SEEDING ____ PER ACRES

908 MULCHING NOTES

THE PROPOSED MULCHING SHALL BE ACCOMPLISHED IN ACCORDANCE WITH ITEM 908 "MULCHING" AS STATED ON PAGE 330 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS, ADOPTED APRIL 1, 2012.

THIS ITEM SHALL CONSIST OF THE FURNISHING, TRANSPORTING, AND PLACING MULCH OVER THE SEEDED AREA. DISTURBED AREAS OUTSIDE THE GRADING LIMITS SHALL ALSO BE MULCHED AND PARTICIPATION WILL BE THE SAME AS FOR SEEDED AREAS.

908-2.1 MULCH MATERIAL: THE CONTRACTOR MAY EITHER FURNISH STRAW OR HYDROMULCH AS THE TYPE OF MULCH MATERIAL TO BE USED ON THIS PROJECT.

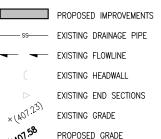
908-3.1 MULCHING: THE HYDRAULIC MULCH SHALL BE APPLIED AS A SLURRY OF 2,500 POUNDS OF MULCH AND NOT LESS THAN 2,500 GALLONS OF WATER PER ACRE.

908-3.4 STRUCTURE CLEANING: AFTER THE PROPOSED MULCH HAS BEEN APPLIED, THE CONTRACTOR WILL CLEAN THE MULCH OFF ALL STRUCTURES (DRAINAGE, ELECTRICAL, LIGHTS, ETC.).

DATE MULCHING COMPLETED___

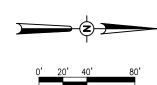
THE PROPOSED MULCHING WILL BE PAID FOR UNDER ITEMS: AR908510 MULCHING ____ PER ACRES

LEGEND



EXISTING IMPROVEMENTS

---- PROPOSED SEEDING AND MULCHING LIMITS



HALF SIZE SCALE: 1"= 80' FULL SIZE SCALE: 1"= 40'

PROPOSED STAKING PLAN STA. 93+96 TO STA. 104+00

REVIEWED BY: JSL 02/2014

SHEET TITLE

IDA No: M3O-4398

CONSTRUCT PARTIAL PARALLEL TAXIWAY

Contract No: MP007

Offices Nationwide

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Hanson Professional Services Inc.

Professional Service Corporation #184-001084

METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

DESCRIPTION NO. DATE LAY DWN REV ISSUE: MONTH DAY, YEAR PROJECT NO: 13A0148D CAD FILE: C-191-STK.DWG LAYOUT BY: KDM 01/16/2014 DRAWN BY: BAK 01/16/2014

Hanson Professional Services Inc. 1525 S. 6th Street Springfield, IL 62568 phone: 217-788-2450 fax: 217-788-2503

Illinois Licensed Professional Service Corporation #184-001084

METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

Contract No: MP007



LAYOUT BY: KDM 01/16/2014 DRAWN BY: BAK 01/16/2014 REVIEWED BY: JSL 02/2014

SHEET TITLE

PROPOSED STAKING PLAN STA. 104+00 TO STA. 111+34



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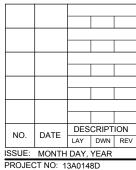
METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

Contract No: MP007



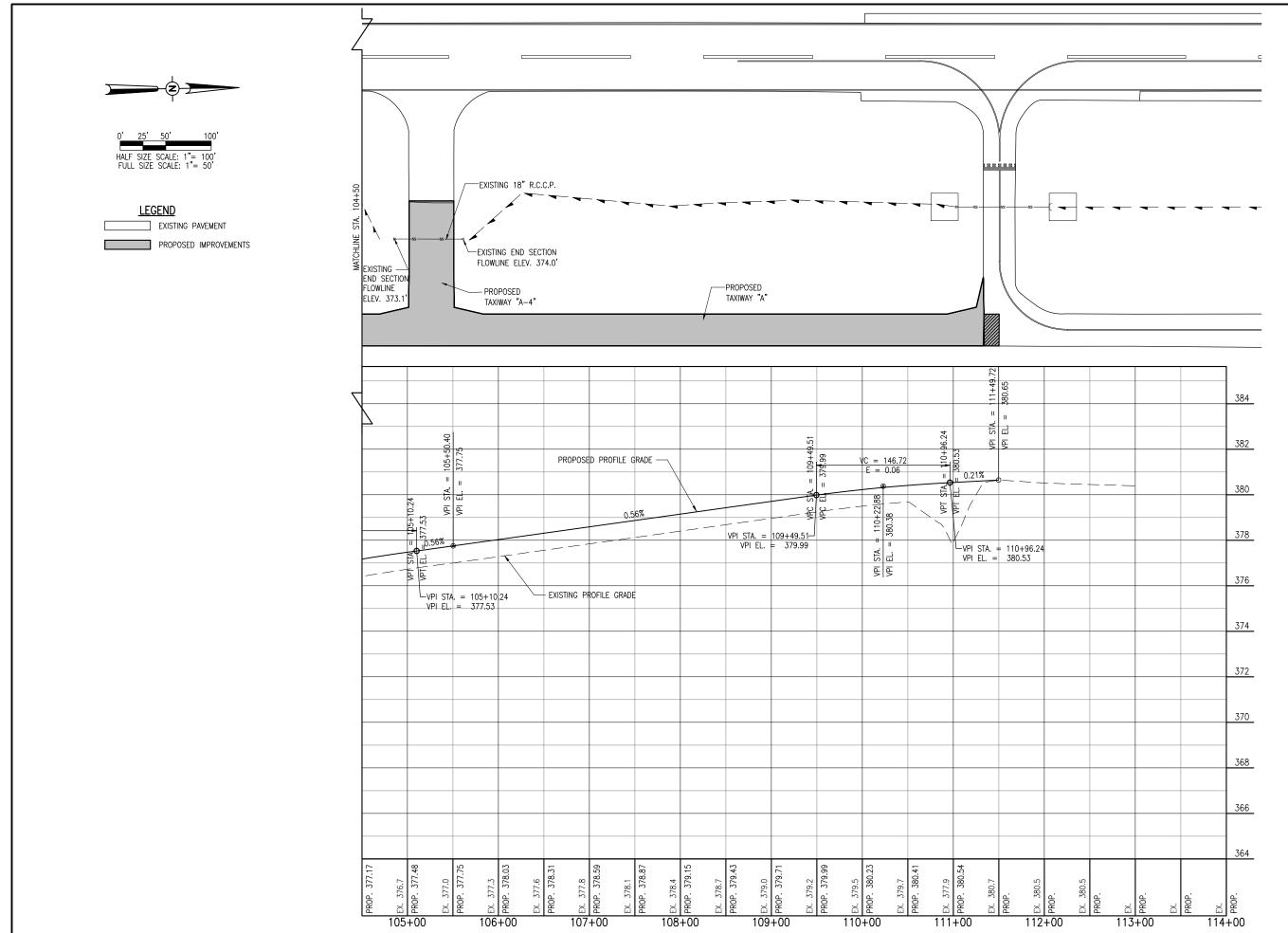
PROJECT NO: 13A0148D
CAD FILE: C-702-PNP.DWG
LAYOUT BY: KDM 01/16/2014

DRAWN BY: BAK 01/16/2014 REVIEWED BY: JSL 02/2014

yright Hanson Professional Services Inc. 2013

SHEET TITLE

PROPOSED PLAN AND PROFILE TWY A-SHEET 1





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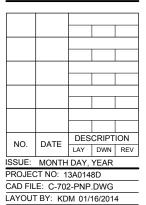
METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

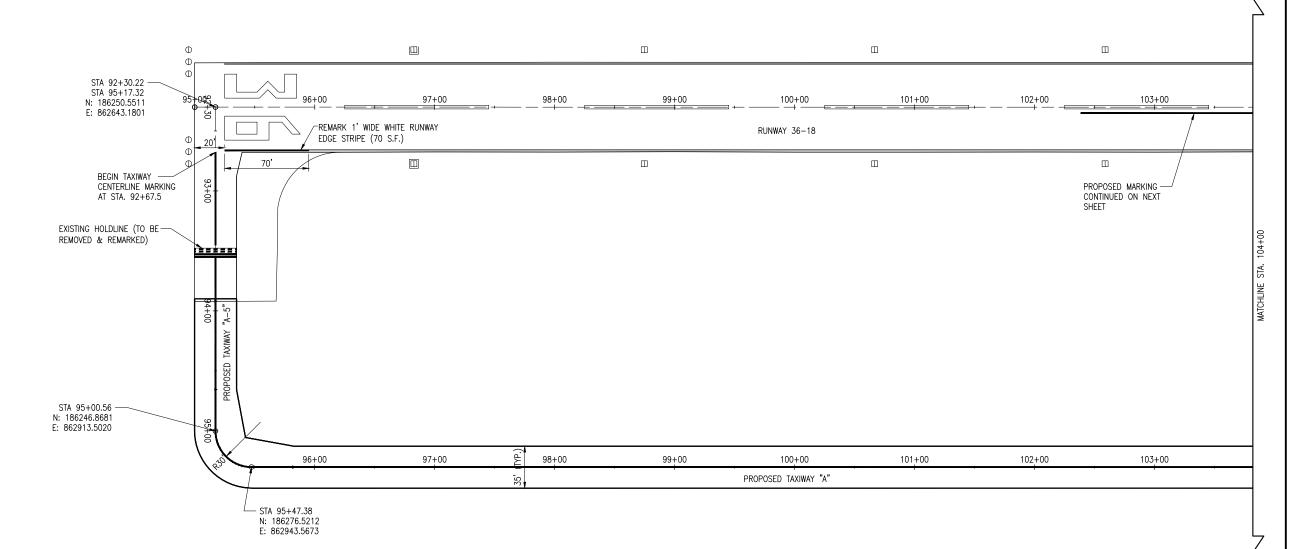
IDA No: M3O-4398

Contract No: MP007



PROPOSED PLAN AND PROFILE TWY A-SHEET 2

DRAWN BY: BAK 01/16/2014 REVIEWED BY: JSL 02/2014



620-PAVEMENT MARKING-WATERBORNE NOTES

THE PAVEMENT MARKING-WATERBORNE (620) SHALL BE PLACED IN ACCORDANCE WITH ITEM 620 "PAVEMENT MARKING" AS STATED ON PAGE 272 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF AIRPORTS, ADOPTED APRIL 1 2012.

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

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

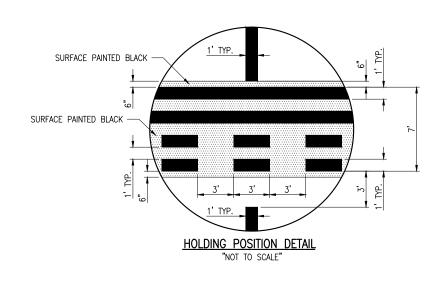
ALL MARKING WILL BE 1' IN WIDTH UNLESS SHOWN OTHERWISE.

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

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

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

THE PROPOSED MARKING WILL BE PAID FOR UNDER ITEM:
AR620520 PAVEMENT MARKING-WATERBORNE ____ PER S.F.
AR620525 PAVEMENT MARKING-BLACK BORDER ____ PER S.F.



EXISTING IMPROVEMENTS

PROPOSED IMPROVEMENTS

EXISTING MARKING

PROPOSED MARKING REMOVAL

PROPOSED MARKING

EXISTING ELECTRICAL DUCT

EXISTING STAKE MOUNTED RUNWAY LIGHT

EXISTING BASE MOUNTED RUNWAY LIGHT

EXISTING BASE MOUNTED TAXIWAY LIGHT

EXISTING STAKE MOUNTED TAXIWAY LIGHT

EXISTING STAKE MOUNTED TAXIWAY LIGHT

EXISTING STAKE MOUNTED THRESHOLD LIGHT

LEGEND





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METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

Contract No: MP007

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NO.	DATE	DESCRIPTION		
NO.	DATE	LAY	DWN	REV
SSUE:	MONTH	DAY,	YEAR	
PROJEC	CT NO: 1	3A014	8D	
CAD FIL	E: C-15	1-MRK	.DWG	
LAYOU	BY: KD	M 01/	16/201	4
DRAWN	BY: BAI	K 01/1	6/2014	1
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© Copyright Har	son Professional S	Services Inc. 2	2013	
SHEET				
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PLAN STA. 93+96 TO STA. 104+00

PROPOSED MARKING



HOLDLINE MARKING TXY. A4

HOLDLINE MARKING TXY. A5

248

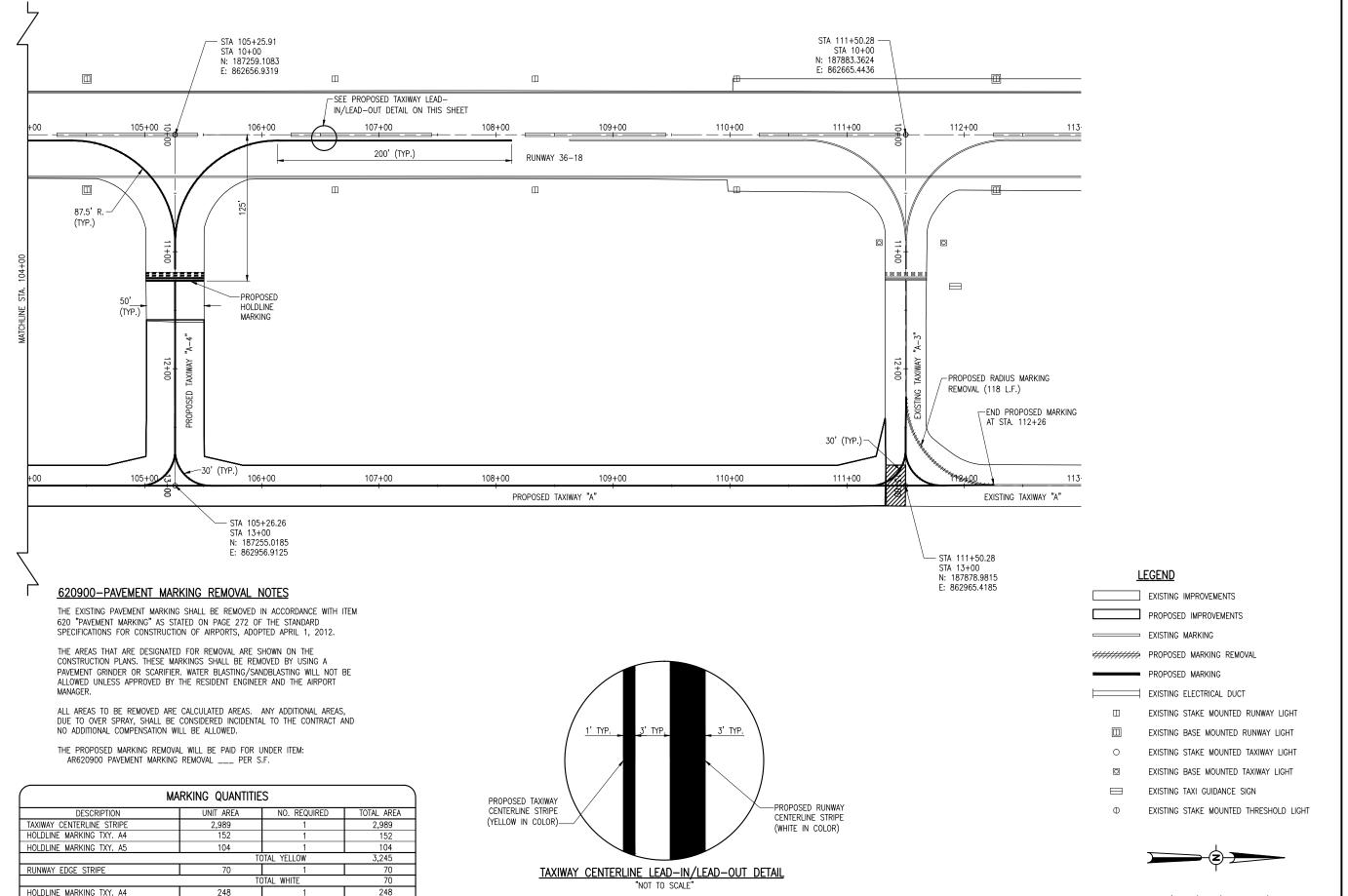
TOTAL BLACK

TOTAL MARKING

176

424

3,739



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METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

Contract No: MP007

NO.	DATE	DESCRIPTION		
NO.	DATE	LAY	DWN	REV
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REVIEW	/ED BY: J	ISL 02/	/2014	

PROPOSED MARKING PLAN STA. 104+00 TO STA. 111+34

SHEET TITLE

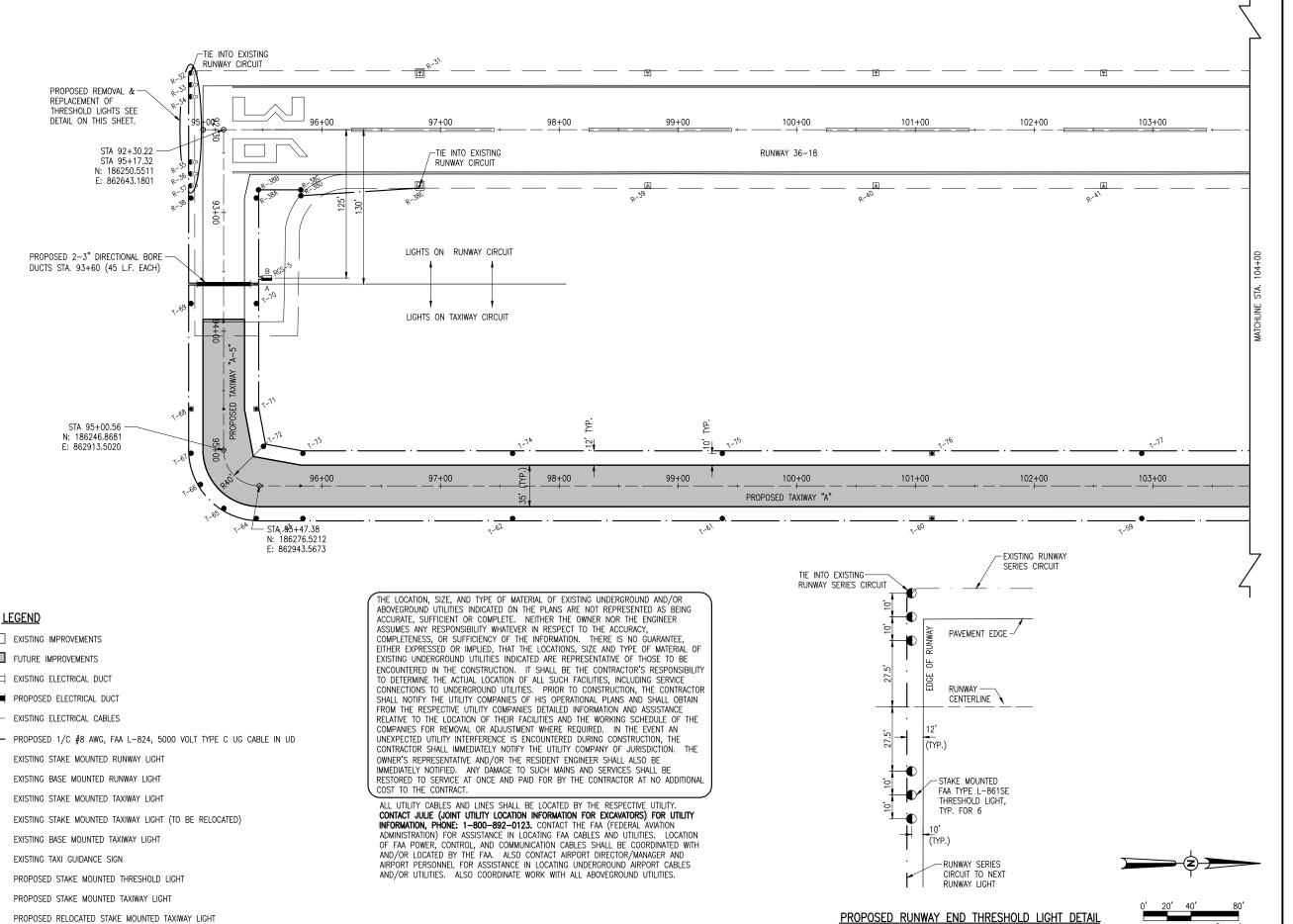
HALF SIZE SCALE: 1"= 80' FULL SIZE SCALE: 1"= 40'



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PROPOSED BASE MOUNTED TAXIWAY LIGHT



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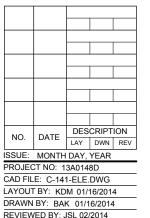
METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

Contract No: MP007



PROPOSED ELECTRICAL PLAN STA. 93+96 TO STA.104+00

SHEET TITLE

HALF SIZE SCALE: 1"= 80' FULL SIZE SCALE: 1"= 40'

NOT TO SCALE



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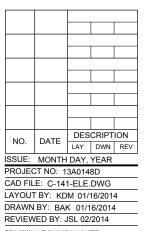
METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

Contract No: MP007



PROPOSED ELECTRICAL PLAN STA. 104+00 TO STA. 111+34

SHEET TITLE

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EXISTING BASE MOUNTED TAXIWAY LIGHT

PROPOSED STAKE MOUNTED THRESHOLD LIGHT

PROPOSED RELOCATED STAKE MOUNTED TAXIWAY LIGHT

PROPOSED STAKE MOUNTED TAXIWAY LIGHT

PROPOSED BASE MOUNTED TAXIWAY LIGHT

EXISTING TAXI GUIDANCE SIGN

2. CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL FIELD VERIFY RESPECTIVE CIRCUITS AND POWER SOURCES PRIOR TO REMOVING OR DISCONNECTING THE RESPECTIVE AIRFIELD LIGHTING, NAVAID, OR OTHER

3. THE CONTRACTOR IS ENCOURAGED TO INSPECT EACH EXISTING LIGHT PRIOR TO RELOCATION AND IDENTIFY TO THE RESIDENT PROJECT REPRESENTATIVE/RESIDENT ENGINEER ANY DAMAGED OR INOPERATING PARTS. ONCE THE EXISTING LIGHT IS REMOVED. THE CONTRACTOR IS RESPONSIBLE FOR ALL FIXTURES DAMAGED DURING THE RELOCATION. ALL LIGHTS WILL BE REINSTALLED IN THE PROPER WORKING ORDER, OR REPLACED AT THE CONTRACTOR'S EXPENSE. ALL EXISTING TAXIWAY LIGHTS THAT ARE DESIGNATED FOR RELOCATION SHALL BE DISCONNECTED AND CAREFULLY REMOVED BY THE CONTRACTOR AS NOT TO DAMAGE THE LIGHT. THE LIGHT ASSEMBLY AND ISOLATION TRANSFORMER SHALL BE RELOCATED AND INSTALLED IN THE LOCATIONS SHOWN. FURNISH AND INSTALL NEW GROUND RODS WITH RELOCATED LIGHTS.

4. PROPOSED RUNWAY, THRESHOLD, AND TAXIWAY LIGHTS SHALL BE PLACED 10' (FT.) FROM THE PAVEMENT EDGE UNLESS SHOWN OTHERWISE ON THESE CONSTRUCTION DRAWINGS. PROPOSED TAXI GUIDANCE SIGNS SHALL BE LOCATED SUCH THAT THE CLOSEST SIDE OF THE SIGN IS 15' FROM THE PAVEMENT EDGE, UNLESS SHOWN OTHERWISE.

PROPOSED RUNWAY LIGHTS, THRESHOLD LIGHTS, TAXIWAY LIGHTS, GUIDANCE SIGNS, OTHER AIRFIELD LIGHTING, SPLICE CANS, HANDHOLES, MANHOLES, ELECTRICAL DUCTS, AND CABLE SHALL BE INSTALLED AT THE LOCATIONS SHOWN AND IN COMPLIANCE WITH THE SPECIFICATIONS, SPECIAL PROVISIONS, RESPECTIVE DETAILS, AND MANUFACTURER'S

6. PROPOSED CABLE FOR RUNWAY AND TAXIWAY LIGHTING SHALL BE INSTALLED APPROXIMATELY 10' FROM THE PAVEMENT EDGE. CABLES SHALL BE PLACED A MINIMUM OF 18" BELOW FINISHED GRADE.

7. THE PROPOSED RUNWAY AND TAXIWAY LIGHTING CABLE SHALL BE 1/C, #8 AWG, FAA L-824, 5000 VOLT, TYPE C UNDERGROUND CABLE IN UNIT DUCT.

8. IN AREAS WHERE THERE IS A CONGESTION OF CABLES OR WHERE THE PROPOSED CABLE CROSSES AN EXISTING CABLE, THE CONTRACTOR IS REQUIRED TO HAND DIG THE TRENCH NECESSARY FOR THE PROPOSED CABLE. AT OTHER LOCATIONS, THE PROPOSED CABLE MAY BE TRENCHED OR PLOWED INTO PLACE. HAND DIGGING, TRENCHING AND/OR PLOWING WILL BE CONSIDERED INCIDENTAL TO THE PROPOSED CABLES AND NO ADDITIONAL COMPENSATION WILL BE

9. PROPOSED RUNWAY THRESHOLD LIGHTS SHALL BE FITTED WITH LENSES IN ACCORDANCE WITH THE "LIGHT LENS SCHEDULE". ALL PROPOSED TAXIWAY LIGHTS WILL BE FITTED WITH 360° BLUE LENSES.

10. ALL RUNWAY, THRESHOLD, AND TAXIWAY LIGHTS SHALL BE TAGGED BY THE CONTRACTOR IN ACCORDANCE WITH THE LIGHT NUMBERS SHOWN ON THESE CONSTRUCTION DRAWINGS. TAGS FOR THE PROPOSED LIGHTS AND EXISTING LIGHTS SHALL BE INCIDENTAL TO THE AIRFIELD LIGHTING WORK AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

11. SEE "TAXI GUIDANCE SIGN SCHEDULE" FOR INFO ON SIGN LEGENDS.

12. THE CONTRACTOR SHALL SECURE, IDENTIFY AND PLACE ALL TEMPORARY EXPOSED WIRING IN CONDUIT, DUCT OR UNIT DUCT TO PREVENT ELECTROCUTION AND FIRE IGNITION SOURCES AS PER THE REQUIREMENTS OF FAA AC 150/5370-2F, PART 218, PARAGRAPH C. ALL LABOR, MATERIALS, AND TIME NECESSARY TO COMPLY WITH THIS REQUIREMENT SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

13. HOMERUN CABLES FOR A RESPECTIVE CIRCUIT THAT ARE INSTALLED IN CONDUIT OR DUCT SHALL BE RUN TOGETHER IN THE SAME RACEWAY OR DUCT.

14. EXISTING AIRFIELD LIGHTING CABLES (SCHEDULED FOR REPLACEMENT) IN AREAS OF NEW WORK SHALL BE DISCONNECTED & REMOVED WHERE IN CONFLICT WITH NEW CONSTRUCTION. IN OTHÉR AREAS CABLES MAY BE ABANDONED IN PLACE.

15. THE CONTRACTOR IS REQUIRED TO FILL IN ALL HOLES AND DEPRESSIONS RESULTING FROM THE NEW WORK, WITH EARTH MATERIAL. THE AREAS SHALL BE COMPACTED TO PREVENT FUTURE SETTLEMENT AND FERTILIZED, SEEDED, AND MULCHED IN ACCORDANCE WITH ITEMS 901 AND 908 RESPECTIVELY.

16. IN THE EVENT THAT OTHER CONSTRUCTION PROJECTS ARE IN PROGRESS AT THE AIRPORT AT THE SAME TIME AS THIS PROJECT, THE CONTRACTOR WILL BE REQUIRED TO COOPERATE WITH ALL OTHER CONTRACTORS AND THE AIRPORT MANAGER IN THE COORDINATION OF THE WORK.

17. NO CONNECTION TO AN ACTIVE LIGHTING CIRCUIT WILL BE BROKEN UNTIL THE CIRCUIT HAS BEEN TURNED OFF IN ACCORDANCE WITH NOTE 1

TAXI GUIDANCE SIGN NOTES

1. THE PROPOSED TAXI GUIDANCE SIGNS SHALL CONFORM TO ADVISORY CIRCULAR 150/5345 44J (OR LATEST ISSUE IN FORCE) AND BE FAA-APPROVED FOR TYPE L-858Y OR L-858Y(L) DIRECTION, DESTINATION, AND BOUNDARY SIGNS (BLACK LEGEND ON YELLOW BACKGROUND); TYPE L-858R OR L-858R(L) MANDATORY INSTRUCTION SIGN (BLACK OUTLINE ON OUTSIDE EDGE OF WHITE LEGEND ON RED BACKGROUND); AND/OR TYPE L-858L OR L-858L(L) LOCATION SIGN (YELLOW LEGEND AND BORDER ON BLACK BACKGROUND).

THE SIGNS SHALL BE SIZE 1, 18-IN. SIGN FACE WITH A 12-IN. LEGEND; STYLE 2, POWERED FROM A 4.8 TO 6.6 AMP SERIES LIGHTING CIRCUIT; CLASS 2, FOR OPERATION FROM -40 DEGREES F TO 131 DEGREES F; MODE 2, TO WITHSTAND WIND LOADS OF 200 M.P.H., BASE-MOUNTED, DOUBLE-SIDED, AS SPECIFIED ON THE PLANS.

THE PROPOSED TAXI GUIDANCE SIGNS SHALL BE LOCATED SUCH THAT THE CLOSEST SIDE OF THE SIGN IS 15' FROM THE PAVEMENT EDGE OR RESPECTIVE RUNWAY SURFACE EDGE.

ALL PROPOSED TAXI GUIDANCE SIGNS SHALL BE TAGGED BY THE CONTRACTOR IN ACCORDANCE WITH THE SIGN NUMBERS SHOWN ON THESE CONSTRUCTION DRAWINGS.

THE PROPOSED LIGHTED TAXI GUIDANCE SIGNS WILL BE PAID FOR UNDER THE FOLLOWING ITEMS: AR125444 TAXI GUIDANCE SIGN, 4 CHARACTER_____ PER EACH.
AR125447 TAXI GUIDANCE SIGN, 7 CHARACTER_____ PER EACH.

	LIGHT LOCATION TABLE						
LIGHT NO.	NORTHING	EASTING	STATION	OFFSET (FT.)	ALIGNMENT	GND RES	
R-32	186223.6616	862595.0045	94+90.00	-47.500'	RWY. 18-36		
R-33	186223.5253	862605.0036	94+90.00	-37.500'	RWY. 18-36		
R-34	186223.3890	862615.0026	94+90.00	-27.500'	RWY. 18-36		
R-35	186222.6395	862669.9975	94+90.00	27.500'	RWY. 18-36		
R-36	186222.5033	862679.9966	94+90.00	37.500'	RWY. 18-36		
R-37	186222.3670	862689.9957	94+90.00	47.500'	RWY. 18-36		
R-38	186222.2150	862700.2991	92+87.72	27.500'	TAXIWAY A		
R-38A	186277.2646	862701.0497	92+87.72	-27.500'	TAXIWAY A		
R-38B	186279.2104	862694.1890	95+46.67	50.500'	RWY. 18-36		
R-38C	186314.8550	862694.6750	95+82.32	50.500'	RWY. 18-36		
R-38D	186314.7868	862699.6745	95+82.32	55.500'	RWY. 18-36		
R-42A	187191.0261	862711.3827	104+58.64	55.500'	RWY. 18-36		
R-42B	187191.0942	862706.3832	104+58.64	50.500'	RWY. 18-36		
R-42C	187211.4543	862715.9668	104+79.13	59.679	RWY. 18-36		
R-42D	187222.9998	862736.7118	10+80.54	27.500'	TAXIWAY A-4		
R-42E	187292.8184	862737.8731	10+80.54	-27.500'	TAXIWAY A-4		
R-42F	187302.6747	862719.5407	105+70.39	62.009'	RWY. 18-36		
R-42G	187321.3770	862708.4599	105+88.94	50.500'	RWY. 18-36		
R-42H	187321.3089	862713.4594	105+88.94	55.500'	RWY. 18-36		

		SIGN	LOCATION T	ABLE		
SIGN NO.	NORTHING	EASTING	STATION	OFFSET (FT.)	ALIGNMENT	GND RES
RGS-4	187301.2029	862782.5175	11+25.00	-40.000'	TAXIWAY A	
RGS-5	186285.3437	862768.6662	93+55.22	-32.500'	TAXIWAY A	

LIGHT NO.	NORTHING	EASTING	STATION	OFFSET (FT.)	ALIGNMENT	GND RES
T-50	187910.6361	862993.3525	111+82.02	27.500'	TAXIWAY A	
T-51	187865.1845	862992.7327	111+36.57	27.500'	TAXIWAY A	
T-52	187819.7329	862992.1130	110+91.11	27.500'	TAXIWAY A	
T-53	187650.9155	862989.7172	109+22.28	27.500'	TAXIWAY A	
T-54	187482.0956	862987.5091	107+53.44	27.500'	TAXIWAY A	
T-55	187313.2770	862985.2071	105+84.61	27.500'	TAXIWAY A	
T-56	187274.1881	862984.6741	105+45.51	27.500'	TAXIWAY A	
T-57	187235.0992	862984.1411	105+06.42	27.500'	TAXIWAY A	
T-58	187196.0103	862983.6081	104+67.33	27.500'	TAXIWAY A	
T-59	187019.3695	862981.1491	102+90.67	27.500'	TAXIWAY A	
T-60	186842.7273	862978.7909	101+14.01	27.500'	TAXIWAY A	
T-61	186666.0858	862976.3823	99+37.56	27.500'	TAXIWAY A	
T-62	186489.4443	862973.9737	97+60.70	27.500'	TAXIWAY A	
T-63	186312.8064	862971.5625	95+84.04	27.500'	TAXIWAY A	
T-64	186273.5844	862970.9531	95+46.04	27.500'	TAXIWAY A	
T-65	186246.4559	862962.1550	95+30.97	27.500'	TAXIWAY A	
T-66	186226.9433	862941.7433	95+16.03	27.500'	TAXIWAY A	
T-67	186219.4057	862915.2867	95+01.50	27.500'	TAXIWAY A	
T-68	186219.8657	862878.0553	94+65.49	27.500'	TAXIWAY A	
T-69	186221.0400	862789.2001	93+76.63	27.500'	TAXIWAY A	
T-70	186276.0527	862789.9271	93+76.60	-27.500'	TAXIWAY A	
T-71	186274.8409	862878.8045	94+65.49	-27.500'	TAXIWAY A	
T-72	186280.4715	862910.2908	95+50.87	-34.842'	TAXIWAY A	
T-73	186313.5503	862916.7288	95+84.04	-27.500'	TAXIWAY A	
T-74	186490.1882	862919.1471	97+60.70	-27.500'	TAXIWAY A	
T-75	186666.8296	862921.5628	99+37.56	-27.500'	TAXIWAY A	
T-76	186843.4709	862923.9786	101+14.01	-27.500'	TAXIWAY A	
T-77	187020.1130	862926.3439	102+90.67	-27.500'	TAXIWAY A	
T-78	187196.7582	862928.7476	104+67.33	-27.500'	TAXIWAY A	
T-79	187220.5716	862923.4615	12+67.04	35.000'	TAXIWAY A-4	
T-80	187221.2875	862897.8502	12+41.41	35.000'	TAXIWAY A-4	
T-81	187222.1436	862817.2810	11+60.90	35.000'	TAXIWAY A-4	
T-82	187291.7082	862818.2902	11+60.90	-35.000'	TAXIWAY A-4	
T-83	187290.5979	862898.7073	12+41.41	-35.000'	TAXIWAY A-4	
T-84	187290.4116	862924.4246	12+67.04	-35.000'	TAXIWAY A-4	
T-85	187314.0249	862930.3434	105+84.61	-27.500'	TAXIWAY A	
T-86	187482.8389	862932.7230	107+53.44	-27.500'	TAXIWAY A	
T-87	187651.6587	862934.9379	109+22.28	-27.500'	TAXIWAY A	
T-88	187820.4826	862937.1181	110+91.11	-27.500°	TAXIWAY A	
T-89	187845.9646	862931.5078	111+16.51	-33.458'	TAXIWAY A	

LIGHT LOCATION TABLE

			LIGHT LENG COHEDNIE		
			LIGHT LENS SCHEDULE		
LIGHT N	NUMBERS	LENS	ORIENTATION		FIXTURE TYPE
T-50 - T-	-89	BLUE			L-861T
R-32 - R-	-37	RED/GREEN GREEN SIDE FACING SOUTH (TOWARDS RUNWAY 36 APPROACH)			L-861SE
R-38 - R-	- R-38D BLUE			L-861T	
R-42A - R-42H BLUE		BLUE		L-861T	
			TAXI GUIDANCE SIGN SCHEDULE		
SIGN NUMBERS	LOCATION			SIDE A	SIDE B
RGS-4	TAXIWAY A4	INTERSECTION WITH RUNV	WAY 36-18 AT HOLD LINE	A4 36-18	← RAMP
RGS-5	TAXIWAY A5	INTERSECTION WITH RUNV	WAY 36 AT HOLD LINE	A5 36	BLANK

TYPE L-858L LOCATION SIGN - YELLOW LEGEND AND BORDER ON A BLACK BACKGROUND

9-27 TYPE L-858R MANDATORY INSTRUCTION SIGN - BLACK OUTLINE ON OUTSIDE EDGE OF WHITE LEGEND ON A RED BACKGROUND

RAMP 1 TYPE L-858Y DIRECTION, DESTINATION, AND BOUNDARY SIGN - BLACK LEGEND ON A YELLOW BACKGROUND

BLANK BLANK - BLACK BACKGROUND

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METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

Contract No: MP007

NO.	DATE	DES	CRIPT	ION
NO.	DATE	LAY	DWN	REV
SSUE:	MONTH	DAY,	YEAR	
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RAWN	BY: BA	< 01/2	3/2014	

AIRFIELD LIGHTING **NOTES AND** SCHEDULE

REVIEWED BY: JSL 02/2014

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DRAWN BY: KDM 01/21/2014
REVIEWED BY: JSL 02/2014

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SHEET 1

ELECTRICAL DETAILS

<u>1</u>6

MEDIUM/HIGH INTENSITY LIGHT - BASE MOUNTED

(NOT TO SCALE)

NOTES

- SEE PROPOSED ELECTRICAL PLANS FOR LOCATIONS OF BASE MOUNTED LIGHTS WITH 2" DUCT INTERFACE AND LOCATIONS WITH CABLE IN UNIT DUCT INTERFACE.
- 2. HOMERUN LIGHT BASE CANS WILL REQUIRE ADDITIONAL CONDUIT HUB OPENINGS. HOME RUN LIGHT BASE CANS SHALL HAVE 2" HUBS AT 0 DEGREES AND 180 DEGREES AND A 3" HUB AT 90 DEGREES.

NOTE:

- GROUNDING FOR RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS SHALL BE AS DETAILED ON THE PLANS AND AS SPECIFIED HEREIN. PER FAA AC 150/5340-30G DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, CHAPTER 12, PART 12.6; A GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. THE PURPOSE OF THE LIGHT BASE GROUND IS TO PROVIDE A DEGREE OF PROTECTION FOR MAINTENANCE PERSONNEL FROM POSSIBLE CONTACT WITH AN ENERGIZED LIGHT BASE OR MOUNTING STAKE THAT MAY RESULT FROM A SHORTED POWER CABLE OR ISOLATION TRANSFORMER. LIGHT BASE GROUND SHALL BE INSTALLED AT EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. A LIGHT BASE GROUND SHALL ALSO BE INSTALLED AT EACH STAKE MOUNTED LIGHT FIXTURE. A LIGHT BASE GROUND SHALL BE INSTALLED AND CONNECTED TO THE METAL FRAME OF EACH TAXI GUIDANCE SIGN AS DETAILED ON THE PLANS AND IN ACCORDANCE WITH THE RESPECTIVE TAXI GUIDANCE SIGN MANUFACTURER RECOMMENDATIONS. THE LIGHT BASE GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR BONDED TO THE GROUND LUG ON THE RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND A 3/4-INCH DIAMETER BY 10-FEET 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 CONNECTÓR SUITABLE FOR DIRECT BURIAL IN EARTH OR CONCRETE. CONNECTIONS TO GROUND RODS SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY ERICO PRODUCTS, INC., SOLON, OHIO, (PHONE: 800-248-9353), THERMOWELD BY CONTINENTAL INDUSTRIES, INC., TULSA, OKLAHOMA (PHONE: 918-663-1440), ULTRAWELD BY HARGER, GRAYSLAKE, ILLINOIS (PHONE: 800-842-7437), OR APPROVED EQUAL. EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS. TOP OF GROUND RODS SHALL BE BURIED 12 INCHES MINIMUM BELOW GRADE, UNLESS SPECIFIED OTHERWISE HEREIN, FOR RESPECTIVE APPLICATIONS
- 2. FOR BASE MOUNTED LIGHT FIXTURES THE LIGHT FIXTURE MUST BE BONDED TO THE LIGHT BASE INTERNAL GROUND LUG VIA A #6 AWG STRANDED COPPER WIRE RATED FOR 600 VOLTS WITH GREEN XHHW INSULATION OR A BRAIDED GROUND STRAP OF EQUIVALENT CURRENT RATING. THE GROUND WIRE LENGTH MUST BE SUFFICIENT TO ALLOW THE REMOVAL OF THE LIGHT FIXTURE FROM THE LIGHT BASE FOR ROUTINE MAINTENANCE. SEE THE LIGHT FIXTURE MANUFACTURER'S INSTRUCTIONS FOR PROPER METHODS OF ATTACHING A BONDING WIRE
- FOR TAXIWAY LIGHTS THAT ARE SPACED WITH LESS THAN 10 FEET OF SEPARATION BETWEEN
 THEM PROVIDE ONE 5/8-INCH DIAMETER BY 8-FOOT LONG GROUND ROD PER TWO
 ADJACENT TAXIWAY LIGHTS.
- 4. STEEL USED TO MANUFACTURE GROUND RODS SHALL BE 100% DOMESTIC STEEL.
- 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 2014 NATIONAL ELECTRICAL CODE ARTICLE 250—12.
- 6. PER FAA 150/5430-30G THE RESISTANCE TO THE GROUND OF THE RESPECTIVE MOUNTING STAKE OR LIGHT BASE (WITH GROUND ROD CONNECTED) MUST BE 25 OHMS OR LESS.
- 7. FOR EACH GROUNDING ELECTRODE SYSTEM THE CONTRACTOR SHALL TEST THE MADE ELECTRODE GROUND SYSTEM WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUNDING SYSTEMS. TEST RESULTS SHALL BE RECORDED FOR EACH GROUNDING ELECTRODE SYSTEM. IF GROUND RESISTANCE EXCEEDS 25 OHMS, CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION. COPIES OF THE GROUND SYSTEM TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER/RESIDENT PROJECT REPRESENTATIVE.

L-861T OR L-861T(L) TAXIWAY
LIGHT AS SHOWN ON PROPOSED
LIGHTING LAYOUT SHEET(S), TYP.

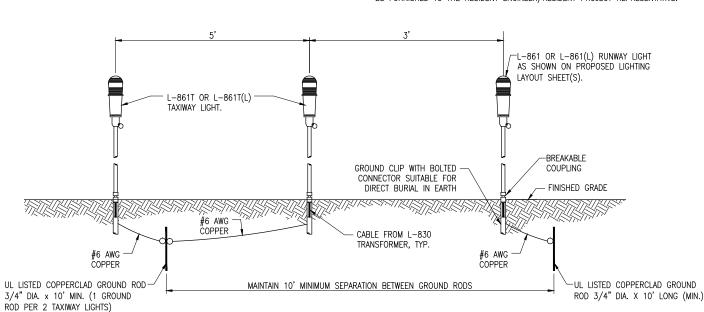
GROUND CLIP WITH BOLTED
CONNECTOR SUITABLE FOR
DIRECT BURIAL IN EARTH

#6 AWG
COPPER
GROUND ROD 3/4" DIA. x 10'
MIN. (1 GROUND ROD PER 2
TAXIWAY LIGHTS)

GROUNDING DETAIL FOR ADJACENT

TAXIWAY LIGHTS

(NOT TO SCALE)



GROUNDING DETAIL FOR ADJACENT RUNWAY AND TAXIWAY LIGHTS

(NOT TO SCALE)

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METROPOLIS, ILLINOIS

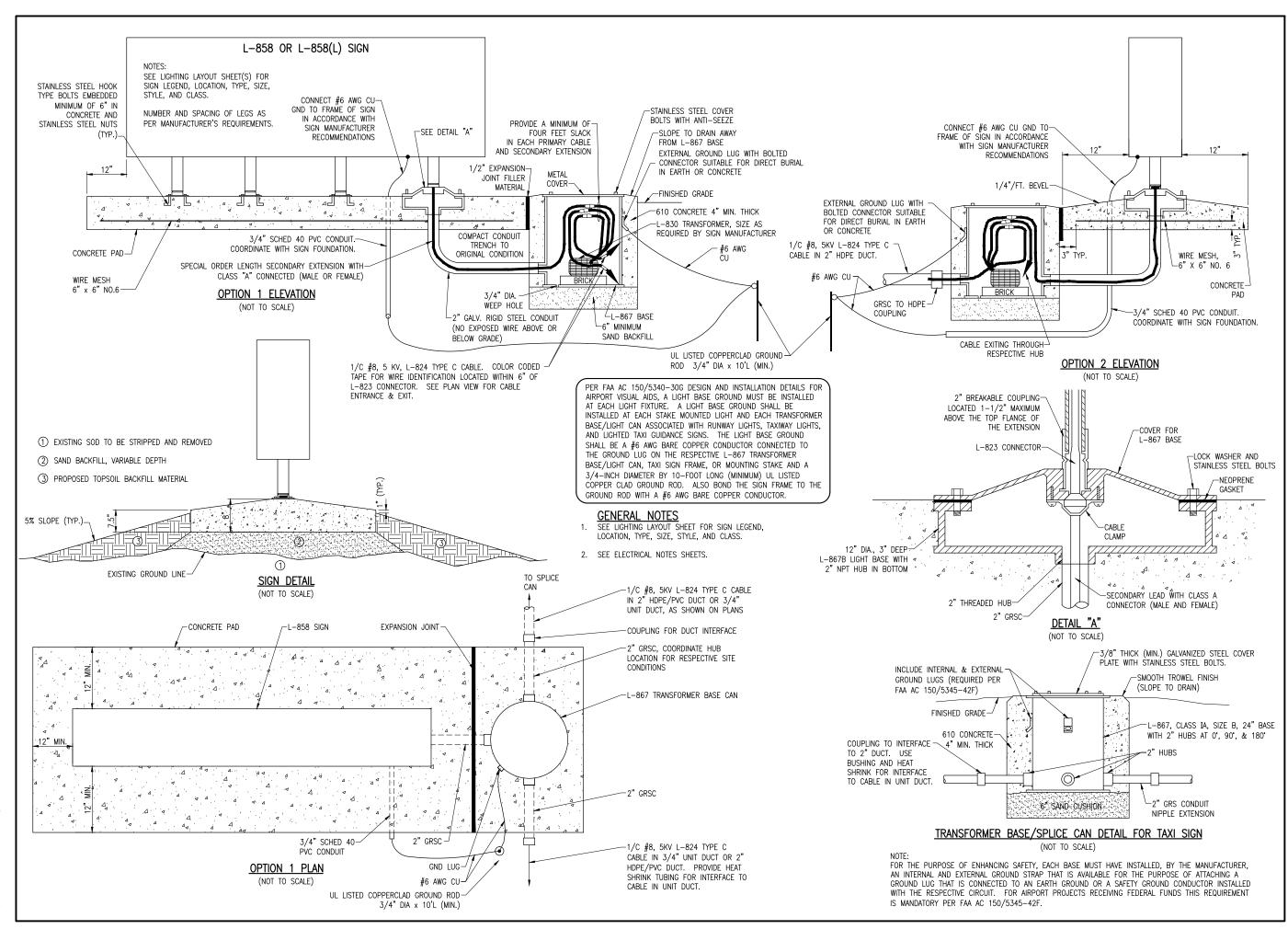
CONSTRUCT PARTIAL PARALLEL TAXIWAY

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ELECTRICAL DETAILS SHEET 2



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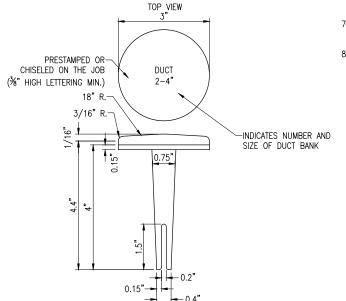
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ELECTRICAL DETAILS SHEET 3



4-DUCT BANK

(NOT TO SCALE)

4" I.D. CONDUIT

BITUMINOUS PAVEMENT DUCT MARKERS "NOT TO SCALE"

NOTES:

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

DUCT BANK NOTES:

- DIMENSIONS FOR CONCRETE COVERAGE AND SEPARATION BETWEEN DUCTS ARE MINIMUM.
- 2. INCLUDE DUCT SPACERS AS MANUFACTURED BY UNDERGROUND DEVICES INC., OR APPROVED EQUAL TO MAINTAIN PROPER SEPARATION OF CONDUITS.
- 3. PROVIDE 3' LONG NO. 4 REBAR AT EACH CORNER OF THE DUCT BANK WHERE APPLICABLE TO ACCOMMODATE INTERFACE OF CONCRETE ENCASED DUCT BANKS TERMINATING IN HANDHOLE. PROVIDE REBAR WHERE APPLICABLE TO EXTEND AN EXISTING CONCRETE ENCASED DUCT BANK. REBAR SHALL BE NO. 4 (1/2" DIA.) AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM A706, GRADE 60.
- 4. CONDUITS FOR CONCRETE ENCASED DUCT SHALL BE SCHEDULE 40 PVC CONFORMING TO ITEM 110.
- 5. MINIMUM DEPTH OF TOP OF DUCT ENCASEMENT SHALL BE 18" BELOW FINISHED GRADE.
- 6. HIGH VOLTAGE AND LOW VOLTAGE CIRCUITS SHALL NOT BE INSTALLED IN THE SAME RACEWAY, CONDUIT, DUCT, HANDHOLE. OR MANHOLE.
- 7. HOMERUN CABLES FOR A RESPECTIVE CIRCUIT SHALL BE INSTALLED IN THE SAME RACEWAY OR DUCT.

CABLE & DUCT MARKER NOTES:

- THE COST OF ALL TURF AND PAVEMENT DUCT MARKERS
 SHALL BE INCIDENTAL TO THE DUCT. THE COST OF ALL
 CABLE MARKERS SHALL BE INCIDENTAL TO THE CABLE.
- 2. BITUMINOUS PAVEMENT DUCT MARKER AND CONCRETE DUCT MARKER TO BE PROVIDED AT EACH END OF EACH DUCT AS SHOWN ON THE LOCATION PLAN. FOR CONCRETE PAVEMENT, THE LETTER "D" SHALL BE IMPRESSED IN THE PAVEMENT INSTEAD OF THE MARKER. THE LETTER SHALL BE FORMED AS DESCRIBED IN NOTE 4.
- CABLE MARKERS SHALL BE PLACED AT CHANGES OF DIRECTION AND APPROXIMATELY EVERY 200' ALONG CABLE RUNS.
- 4. CONCRETE CABLE MARKERS AND DUCT MARKERS SHALL HAVE LETTERS 4" HIGH, 3" WIDE WITH WIDTH OF STROKE ½" AND ¼" DEEP. ALL LETTERS, NUMBERS AND ARROWS TO BE IMPRESSED.
- 5. EMPLOY THE FOLLOWING METHODS WHERE ADDITIONAL SPACE TO FIT THE LEGEND IS REQUIRED:
 - A. REDUCE LETTER SIZE TO 3" HIGH, 2" WIDE.
 B. INCREASE THE MARKER SIZE TO 30" X 30".
- C. PROVIDE ADDITIONAL MARKERS PLACED SIDE BY SIDE.

8. DUCT INTERFACE TO HANDHOLES OR MANHOLES WILL BE ADJUST FOR RESPECTIVE CONSIDERED INCIDENTAL TO THE RESPECTIVE DUCT PAY LOCATION OF DUCT TERMINATION ITEM.

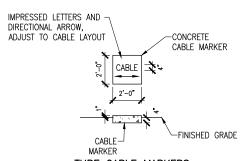
110

PAVEMENT EDGE

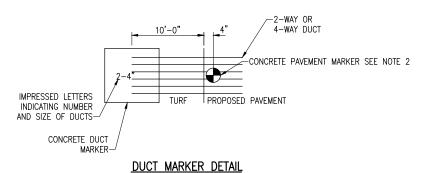
#10 PULL WIRE COIL A MINIMUM OF 3' AT DUCT ENDS. INSTALL APPROVED PLUGS IN END OF DUCTS NOT USED.

UNDERGROUND ELECTRICAL DUCT

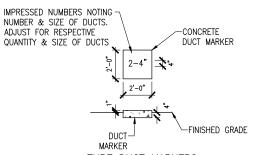
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TURF CABLE MARKERS
"NOT TO SCALE"



NOT TO SCALE



TURF DUCT MARKERS
"NOT TO SCALE"

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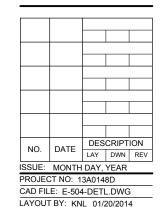
METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

Contract No: MP007



ELECTRICAL AND DUCT DETAILS

DRAWN BY: BAK 01/22/2014

REVIEWED BY: JSL 02/2014

- CONTRACTOR SHALL KEEP A COPY OF THE LATEST NEC IN FORCE ON SITE AT ALL TIMES DURING CONSTRUCTION FOR USE AS A REFERENCE.
- 3. CONTRACTOR SHALL COORDINATE WORK AND ANY POWER OUTAGES AND/OR SHUT DOWN OF SYSTEMS WITH THE RESPECTIVE FACILITY OWNER PERSONNEL AND THE AIRPORT MANAGER/DIRECTOR. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- 4. THE CONTRACTOR SHALL ASCERTAIN THAT ALL LIGHTING SYSTEM COMPONENTS FURNISHED BY HIM, INCLUDING FAA APPROVED EQUIPMENT, ARE COMPATIBLE IN ALL RESPECTS WITH EACH OTHER AND THE REMAINDER OF THE NEW/EXISTING SYSTEM. ANY NONCOMPATIBLE COMPONENTS FURNISHED BY THIS CONTRACTOR SHALL BE REPLACED BY HIM AT NO ADDITIONAL COST TO THE AIRPORT SPONSOR WITH A SIMILAR UNIT, APPROVED BY THE ENGINEER (DIFFERENT MODEL OR DIFFERENT MANUFACTURER) THAT IS COMPATIBLE WITH THE REMAINDER OF THE AIRPORT LIGHTING SYSTEM.
- 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.
- WHEN A SPECIFIC TYPE, STYLE, CLASS, ETC. OF FAA APPROVED EQUIPMENT IS SPECIFIED ONLY THAT TYPE, STYLE, CLASS, WILL BE ACCEPTABLE, EVEN THOUGH EQUIPMENT OF OTHER TYPES STYLES, CLASSES, ETC. MAY BE APPROVED.
- 8. ANY AND ALL INSTRUCTIONS FROM THE RESIDENT ENGINEER/RESIDENT PROJECT REPRESENTATIVE TO THE CONTRACTOR REGARDING CHANGES IN OR DEVIATIONS FROM THE PLANS AND SPECIFICATIONS SHALL BE IN WRITING WITH COPIES SENT TO THE AIRPORT SPONSOR AND THE ILLINOIS DEPARTMENT OF TRANSPORTATION DIVISION OF AERONAUTICS). THE CONTRACTOR SHALL NOT ACCEPT ANY VERBAL INSTRUCTIONS FROM THE RESIDENT ENCINEER/RESIDENT PROJECT REPRESENTATIVE REGARDING ANY CHANGES FROM THE PLANS AND SPECIFICATIONS.
- 9. A MINIMUM OF THREE COPIES OF THE INSTRUCTION BOOK SHALL BE SUPPLIED WITH EACH DIFFERENT TYPE OF EQUIPMENT. THE BOOKS DESCRIBING A MORE SOPHISTICATED TYPE OF EQUIPMENT, SUCH AS REGULATORS, PAPI, REIL, ETC. AS A MINIMUM SHALL CONTAIN THE FOLLOWING:
 - A 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. SAFFTY INSTRUCTIONS.

POWER AND CONTROL NOTES

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

- 15. CONDUITS FOR ELECTRIC SERVICE ENTRANCE AND FEEDERS SHALL BE AS DETAILED HEREIN ON THE PLANS. WHERE GALVANIZED RIGID STEEL CONDUIT IS SPECIFIED IT SHALL HAVE THREADED FITTINGS. SET SCREW TYPE FITTINGS WILL NOT BE ACCEPTABLE. CONDUITS FOR UNDERGROUND APPLICATIONS SHALL BE AS DETAILED HEREIN. CONDUITS FOR GROUNDING ELECTRODE CONDUCTORS OR INDIVIDUAL GROUNDING CONDUCTORS SHALL BE SCHEDULE 40 OR SCHEDULE 80 PVC.
- 16. PROVIDE LIQUID TIGHT FLEXIBLE METAL CONDUIT AT CONNECTIONS TO EQUIPMENT SUBJECT TO VIBRATION OR WHERE FLEXIBILITY IS REQUIRED. LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE U.L. LISTED TO MEET THE REQUIREMENTS OF NEC 350.6, SUITABLE FOR GROUNDING, SUNLIGHT RESISTANT, AND RESISTANT TO OIL, GASOLINE, AND GREASE. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO MOTORS, TRANSFORMERS, & CONSTANT CURRENT REGULATORS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. DO NOT INSTALL LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS NOT UL. LISTED. CONFIRM LIQUID—TIGHT FLEXIBLE METAL CONDUIT BEARS THE UL LABEL PRIOR TO INSTALLING IT.
- 17. UNLESS OTHERWISE SHOWN, ALL EXPOSED CONDUITS SHALL BE RUN PARALLEL TO OR AT RIGHT ANGLES WITH THE LINES OF THE STRUCTURE.
- 18. ALL STEEL CONDUITS, FITTINGS, NUTS, BOLTS, ETC. SHALL BE GALVANIZED.
- 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 13OC 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 MINUMUM.
- 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, CUTOUT, PANELBOARD, & CONTROL PANEL TO WARN PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS, PER THE REQUIREMENTS OF NEC 110.16 "FLASH PROTECTION".

DRAWN BY: BAK 01/22/2014

REVIEWED BY: JSL 02/2014

- NO COMPONENTS OF PRIMARY CIRCUIT SUCH AS CABLE, CONNECTORS AND TRANSFORMERS SHALL BE BROUGHT ABOVE GROUND AT EDGE LIGHTS, SIGNS, REIL, PAPI FTC.
- THERE SHALL BE NO EXPOSED POWER/CONTROL CABLES BETWEEN THE POINT WHERE THEY LEAVE THE UNDERGROUND (DEB OR L-867 BASES) AND WHERE THEY ENTER THE EQUIPMENT (SUCH AS TAXIWAY SIGNS, PAPI, REIL, ETC.) ENCLOSURES. THESE CABLES SHALL BE ENCLOSED IN RIGID CONDUIT OR IN FLEXIBLE, WATERTIGHT CONDUIT WITH BREAKABLE COUPLING(S) AT THE GRADE OR THE HOUSING COVER, AS SHOWN IN APPLICABLE DETAILS.
- 4. THE JOINTS OF THE L-823 PRIMARY CONNECTORS SHALL BE WRAPPED WITH AT LEAST ONE LAYER OF RUBBER OR SYNTHETIC RUBBER TAPE AND ONE LAYER OF PLASTIC TAPE, ONE-HALF LAPPED, EXTENDING AT LEAST 1-1/2 INCHES ON EACH SIDE OF THE JOINT, AS SHOWN ON ELECTRICAL DETAILS SHEET 1.
- THE CABLE ENTRANCE INTO THE FIELD-ATTACHED L-823 CONNECTORS SHALL BE ENCLOSED BY A HEAT-SHRINKABLE TUBING WITH CONTINUOUS INTERNAL ADHESIVE, AS SHOWN ON ELECTRICAL DETAILS SHEET 1.
- L-823 TYPE II, TWO-CONDUCTOR SECONDARY CONNECTORS SHALL BE CLASS 'A' (FACTORY MOI DED).
- 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.
- 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 SFAI.
- 16. TOPS OF THE STAKES SUPPORTING LIGHT FIXTURES SHALL BE FLUSH WITH THE SURROUNDING GRADE.
- 17. PLASTIC LIGHTING FIXTURE COMPONENTS, SUCH AS LAMP HEADS, STEMS, BREAKABLE COUPLINGS, BASE COVERS, BRACKETS, STAKES, SHALL NOT BE ACCEPTABLE.
- 18. THE TOLERANCE FOR THE HEIGHT OF RUNWAY/TAXIWAY EDGE LIGHTS SHALL BE: ONE
 (1) INCH. IN CASE OF STAKE MOUNTED LIGHTS, THE SPECIFIED LIGHTING FIXTURE
 HEIGHT SHALL BE MEASURED BETWEEN THE TOP OF THE STAKE AND THE TOP OF THE
 LENS. IN CASE OF BASE MOUNTED LIGHTS, THE SPECIFIED LIGHTING FIXTURE HEIGHT
 SHALL BE MEASURED BETWEEN THE TOP OF THE BASE FLANGE AND THE TOP OF THE
 LENS, THUS INCLUDING THE BASE COVER, THE FRANGIBLE COUPLING, THE STEM, THE
 LAMP HOUSING AND THE LENS.
- 19. THE TOLERANCE FOR THE LATERAL SPACING (LIGHT LANE TO RUNWAY/TAXIWAY CENTERLINE) OF RUNWAY/TAXIWAY EDGE LIGHTS SHALL BE ONE (1) INCH. THIS ALSO APPLIES AT INTERSECTIONS TO LATERAL SPACING BETWEEN LIGHTS OF A RUNWAY/TAXIWAY AND THE INTERSECTING RUNWAY/TAXIWAY.

- 20. ENTRANCES INTO L-867 BASES SHALL HAVE CONDUIT COUPLINGS OR REDUCERS TO INTERFACE UNIT DUCT/CONDUIT TO L-867 BASE HUBS, OR SHALL BE SEALED WITH HEAT SHRINK AS SHOWN IN DETAIL "B" ON ELECTRICAL DETAILS SHEET 1.
- 21. GALVANIZED/PAINTED EQUIPMENT/COMPONENT SURFACES SHALL NOT BE DAMAGED BY DRILLING, FILING, ETC. DRAIN HOLES IN METAL TRANSFORMER HOUSINGS SHALL BE MADE BEFORE GALVANIZING.
- 22. EDGE LIGHT NUMBERING TAGS SHALL BE FACING THE PAVEMENT.
- 23. CABLE/SPLICE/DUCT MARKERS SHALL BE PRECAST CONCRETE OF THE SIZE SHOWN.

 LETTERS/NUMBERS/ARROWS FOR THE LEGEND TO BE IMPRESSED INTO THE TOPS OF
 THE MARKERS SHALL BE PRE—ASSEMBLED AND SECURED IN THE MOLD BEFORE THE
 CONCRETE IS POURED. LEGEND INSCRIBED BY HAND IN WET CONCRETE SHALL NOT BE
 ACCEPTABLE.
- 24. ALL UNDERGROUND CABLE RUNS SHALL BE IDENTIFIED BY CABLE MARKERS AT 200 FEET MAXIMUM SPACING, WITH AN ADDITIONAL MARKER AT EACH CHANGE OF DIRECTION OF THE CABLE RUN. CABLE MARKERS SHALL BE INSTALLED IMMEDIATELY ABOVE THE CABLES.
- 25. THERE SHALL BE NO SPLICES BETWEEN THE ISOLATION TRANSFORMERS. L-823 CONNECTORS ARE ALLOWED AT TRANSFORMER CONNECTIONS ONLY, UNLESS OTHERWISE SHOWN.
- 26. APPLY AN OXIDE INHIBITING, ANTI-SEIZING COMPOUND TO ALL SCREWS, NUTS AND BREAKAGE COUPLING THREADS
- LOCATIONS OF ENDS OF ALL UNDERGROUND DUCTS SHALL BE IDENTIFIED BY DUCT MARKERS.
- WHERE A PARALLEL, CONSTANT VOLTAGE PAPI SYSTEM IS PROVIDED, THE "T" SPLICES SHALL BE OF THE CAST TYPE.
- CONCRETE USED FOR SLABS, FOOTINGS, BACKFILL AROUND TRANSFORMER HOUSINGS, MARKINGS, ETC. SHALL BE 3500 PSI, AIR-ENTRAINED.
- 30. ALL POWER AND CONTROL CABLES IN MAN/HAND HOLES SHALL BE TAGGED. USE EMBOSSED COPPER STRIPS TO BE ATTACHED AT BOTH ENDS TO THE CABLE BY THE USE OF PLASTIC STRAPS. MINIMUM OF TWO TAGS SHALL BE PROVIDED ON EACH CABLE IN A MAN/HAND HOLE—ONE AT THE CABLE ENTRANCE AND ONE AT THE CABLE EXIT.
- 31. THE LOCATION, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND AND/OR ABOVEGROUND UTILITIES INDICATED ON THE PLANS IS NOT REPRESENTED AS BEING ACCURATE. SUFFICIENT OR COMPLETE. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY WHATEVER IN RESPECT TO ACCURACY, COMPLETENESS, OR SUFFICIENCY OF THE INFORMATION. THERE IS NO GUARANTEE EITHER EXPRESSED OR IMPLIED, THAT THE LOCATIONS, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ARE REPRESENTATIVE OF THOSE TO BE ENCOUNTERED IN THE CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES OF HIS OPERATIONAL PLANS AND SHALL OBTAIN FROM THE RESPECTIVE UTILITY COMPANIES DETAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF THEIR FACILITIES AND THE WORKING SCHEDULE OF THE COMPANIES FOR REMOVAL OR ADJUSTMENT WHERE REQUIRED. IN THE EVENT AN UNEXPECTED UTILITY INTERFERENCE IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY COMPANY OF JURISDICTION. THE OWNER'S REPRESENTATIVE AND/OR THE RESIDENT ENGINEER/RESIDENT PROJECT REPRESENTATIVE SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY DAMAGE TO SUCH MAINS AND SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT. ALL UTILITY CABLES AND LINES SHALL BE LOCATED BY THE RESPECTIVE UTILITY. CONTACT J.U.L.I.E. FOR UTILITY INFORMATION AT 1-800-892-0123. ALSO CONTACT AIRPORT DIRECTOR/MANAGER AND AIRPORT PERSONNEL FOR ASSISTANCE IN LOCATING UNDERGROUND AIRPORT CABLES AND/OR UTILITIES. ALSO COORDINATE WORK WITH ALL ABOVEGROUND UTILITIES.
- 32. WHEN PREPARING CABLE FOR SPLICES, THE CONTRACTOR SHALL USE A CABLE STRIPPER/PENCILLER WHENEVER CABLE CONNECTIONS ARE MADE.

GROUNDING NOTES FOR AIRFIELD LIGHTING

- GROUNDING FOR RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS SHALL BE AS DETAILED ON THE PLANS AND AS SPECIFIED HEREIN. PER FAA AC 150/5340-30G DESIGN AND INSTALLATION DETAILS FOR AIRPORT VISUAL AIDS, CHAPTER 12, PART 12.6; A GROUND MUST BE INSTALLED AT EACH LIGHT FIXTURE. THE PURPOSE OF THE LIGHT BASE GROUND IS TO PROVIDE A DEGREE OF PROTECTION FOR MAINTENANCE PERSONNEL FROM POSSIBLE CONTACT WITH AN ENERGIZED LIGHT BASE OR MOUNTING STAKE THAT MAY RESULT FROM A SHORTED POWER CABLE OR ISOLATION TRANSFORMER. A LIGHT BASE GROUND SHALL BE INSTALLED AT EACH TRANSFORMER BASE/LIGHT CAN ASSOCIATED WITH RUNWAY LIGHTS, TAXIWAY LIGHTS, AND LIGHTED TAXI GUIDANCE SIGNS. A LIGHT BASE GROUND SHALL ALSO BE INSTALLED AT EACH STAKE MOUNTED LIGHT FIXTURE. A LIGHT BASE GROUND SHALL BE INSTALLED AND CONNECTED TO THE METAL FRAME OF EACH TAXI GUIDANCE SIGN AS DETAILED ON THE PLANS AND IN ACCORDANCE WITH THE RESPECTIVE TAXI GUIDANCE SIGN MANUFACTURER RECOMMENDATIONS. THE LIGHT BASE GROUND SHALL BE A #6 AWG BARE COPPER CONDUCTOR BONDED TO THE GROUND LUG ON THE RESPECTIVE L-867 TRANSFORMER BASE/LIGHT CAN OR MOUNTING STAKE AND A 3/4-INCH DIAMETER BY 10-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 SUITABLE FOR DIRECT BURY IN EARTH OR CONCRETE. CONNECTIONS TO GROUND RODS SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY ERICO PRODUCTS, INC., SOLON, OHIO, (PHONE: 800-248-9353), THERMOWELD BY CONTINENTAL INDUSTRIES, INC., TULSA, OKLAHOMA (PHONE: 918-663-1440), ULTRAWELD BY HARGER, GRAYSLAKE, ILLINOIS (PHONE: 800-842-7437), OR APPROVED EQUAL. EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS. TOP OF GROUND RODS SHALL BE BURIED 12 INCHES MINIMUM BELOW GRADE, UNLESS SPECIFIED OTHERWISE HEREIN, FOR RESPECTIVE APPLICATIONS.
- . FOR BASE MOUNTED LIGHT FIXTURES THE LIGHT FIXTURE MUST BE BONDED TO THE LIGHT BASE INTERNAL GROUND LUG VIA A #6 AWG STRANDED COPPER WIRE RATED FOR 600 VOLTS WITH GREEN XHHW INSULATION OR A BRAIDED GROUNDING STRAP OF EQUIVALENT CURRENT RATING. THE GROUND WIRE LENGTH MUST BE SUFFICIENT TO ALLOW THE REMOVAL OF THE LIGHT FIXTURE FROM THE LIGHT BASE FOR ROUTINE MAINTENANCE. SEE THE LIGHT FIXTURE MANUFACTURER'S INSTRUCTIONS FOR PROPER METHODS OF ATTACHING A BONDING WIRE.
- 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 2014 NATIONAL ELECTRICAL CODE ARTICLE 250-12.
- PER FAA 150/5340-30G THE RESISTANCE TO GROUND OF THE RESPECTIVE MOUNTING STAKE OR LIGHT BASE (WITH GROUND ROD CONNECTED) MUST BE 25 OHMS OR LESS.
- 5. FOR EACH AIRFIELD LIGHT FIXTURE, TAXI GUIDANCE SIGN, AND NAVAID THE CONTRACTOR SHALL TEST THE MADE ELECTRODE GROUND SYSTEM WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUNDING SYSTEMS. TEST RESULTS SHALL BE RECORDED FOR EACH GROUNDING ELECTRODE SYSTEM. IF GROUND RESISTANCE EXCEEDS 25 OHMS CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION. COPIES OF THE GROUND SYSTEM TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER/RESIDENT PROJECT REPRESENTATIVE.

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Illinois Licensed
Professional Service Corporation
#184-001084

METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

LAYOUT BY: KNL 01/20/2014

DRAWN BY: BAK 01/22/2014

REVIEWED BY: JSL 02/2014

ELEC	CTRICAL 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			
a	INDICATING LIGHT			
W	MOTOR			
#	LOAD, MOTOR, # = HORSEPOWER			
	ELECTRIC UTILITY METER BASE			
•	JUNCTION BOX WITH SPLICE			
XXX	EQUIPMENT, XXX = DEVICE DESCRIPTION			
GND	GROUND BUS OR TERMINAL			
S/N	NEUTRAL BUS			
#	PANELBOARD WITH MAIN LUGS			
1	PANELBOARD WITH MAIN BREAKER			
- ₩□≫#	FUSE PANEL WITH MAIN FUSE PULLOUT			
	DUPLEX RECEPTACLE 120V SINGLE PHASE GROUNDING TYPE			
	CONTROL STATION			
N EM	TRANSFER SWTICH			
G	ENGINE GENERATOR SET			

	ELECTRICAL LEGEND — SCHEMATIC				
⊣⊢					
- ₩-	NORMALLY CLOSED (N.C.) CONTACT				
(\$*)	STARTER COIL, * = STARTER NUMBER				
OL OL	OVERLOAD RELAY CONTACT				
(CR*)	CONTROL RELAY, * = CONTROL RELAY NUMBER				
R*	RELAY, * = RELAY NUMBER				
· ~	TOGGLE SWITCH / 2 POSITION SWITCH				
OFF AUTO	2-POSITION SELECTOR SWITCH				
HAND FAUTO XOO OOX	3-POSITION SELECTOR SWITCH (H-O-A SHOWN)				
	2 POLE DISCONNECT SWITCH				
1111	3 POLE DISCONNECT SWITCH				
<u>~</u>	PHOTOCELL				
	TERMINAL BLOCK, * = TERMINAL NUMBER				
	DEVICE TERMINAL, * = DEVICE TERMINAL NUMBER				
	INTERNAL PANEL WIRING				
	FIELD WIRING				
	FUSE				
GND	GROUND BUS OR TERMINAL				
S/N	NEUTRAL BUS				
#	GROUND, GROUND ROD, GROUND BUS				
0 0	INDUSTRIAL CONTROL RELAY OR LIGHTING CONTACTOR				
	S1 CUTOUT HANDLE REMOVED				
S1 CUTOUT HANDLE INSERTED					
%	N.O. THERMAL SWITCH				
्रु	N.C. THERMAL SWITCH				
(W)	L-830 SERIES ISOLATION TRANSFORMER				

	ELECTRICAL ABBREVIATIONS		
A.F.F.	ABOVE FINSHED FLOOR		
A, AMP	AMPERES		
ATS	AUTOMATIC TRANSFER SWITCH		
AWG	AMERICAN WIRE GAUGE		
BKR	BREAKER		
С	CONDUIT		
СВ	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		
НОА	HAND OFF AUTOMATIC		
HP	HORSEPOWER		
HPS	HIGH PRESSURE SODIUM		
J	JUNCTION BOX		
KVA	KILOVOLT AMPERE(S)		
KW	KILOWATTS		
LC	LIGHTING CONTACTOR		
LTFMC	LIQUID TIGHT FLEXIBLE METAL CONDUIT (UL LISTED)		
LTG	LIGHTING		
LP	LIGHTING PANEL		
MAX	MAXIMUM		
мсв	MAIN CIRCUIT BREAKER		
мсм	THOUSAND CIRCLUAR 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		
01	OVERLOAD		

OVERLOAD

ELE	ECTRICAL 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
٧	VOLTS
W/	WITH
W /0	WITHOUT
WP	WEATHER PROOF
XFER	TRANSFER
XFMR	TRANSFORMER

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

NOTES:

- (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 VAULT WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- INSULATION OR COLORED MARKING TAPE FOR PHASE AND NEUTRAL CONDUCTORS FOR NO. 4 AWG AND LARGER. INSULATED GROUND CONDUCTORS SHALL HAVE GREEN COLORED INSULATION FOR ALL CONDUCTOR AWG AND/OR KCMIL TO COMPLY WITH NEC 250.119. NEUTRAL NEC 200.6. STANDARD COLORS FOR POWER WIRING AND BRANCH CIRCUITS SHALL BE AS FOLLOWS:
- 5. SEE RESPECTIVE SITE PLANS FOR SITE LEGEND INFORMATION.
 - LTFMC DENOTES LIQUID TIGHT FLEXIBLE METAL CONDUIT UL LISTED, SUNLIGHT RESISTANT, & SUITABLE FOR GROUNDING. LIQUID TIGHT FLEXIBLE METAL CONDUIT AND ASSOCIATED FITTINGS SHALL BE U.L. LISTED TO MEET THE REQUIREMENTS OF NEC 350.6. LIQUID TIGHT FLEXIBLE METAL CONDUIT THAT IS USED FOR FLEXIBILITY (INCLUDING CONNECTIONS TO CCR'S & TRANSFORMERS) SHALL REQUIRE AN EXTERNAL BONDING JUMPER OR INTERNAL EQUIPMENT GROUNDING CONDUCTOR PER NEC 350.60. EXTERNAL BONDING JUMPERS USED WITH CCR INSTALLATIONS SHALL BE #6 AWG COPPER (MINIMUM).
 DO NOT INSTALL LTFMC THAT IS NOT UL LISTED. CONFIRM
 LTFMC BEARS THE UL LABEL PRIOR TO INSTALLATION.
- ALL ENCLOSURES RATED NEMA 4, 4X SHALL HAVE 4, 4X FOR THE RESPECTIVE ENCLOSURE, TO MAINTAIN THE NEMA 4, 4X RATING.
- HIGH VOLTAGE & LOW VOLTAGE CIRCUITS SHALL NOT BE INSTALLED IN THE SAME WIREWAY, CONDUIT, DUCT, OR



- CONTRACTOR SHALL EXAMINE THE SITE AND VAULT TO DETERMINE EXISTING SITE CONDITIONS.
- ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 70 NATIONAL ELECTRICAL CODE

COLOR CODE PHASE AND NEUTRAL CONDUCTOR INSULATION FOR NO. 6 AWG OR SMALLER. PROVIDE COLORED CONDUCTORS SHALL HAVE WHITE COLORED INSULATION FOR NO. 6 AWG AND SMALLER TO MEET THE REQUIREMENTS OF

120/240 VAC. 1 PHASE. 3 WIRE PHASE A BLACK PHASE B RED GREEN

- WATERTIGHT HUBS AT CONDUIT ENTRANCES U.L. LISTED NEMA
- HANDHOLE.

METROPOLIS MUNICIPAL AIRPORT
METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL

PARALLEL TAXIWAY

IDA No: M3O-4398

Contract No: MP007

Offices Nationwide

www.hanson-inc.com

1525 S. 6th Street Springfield, IL 62568

phone: 217-788-2450 fax: 217-788-2503

Illinois Licensed

Hanson Professional Services Inc.

Professional Service Corporation #184-001084

DESCRIPTION NO. DATE LAY DWN REV

PROJECT NO: 13A0148D CAD FILE: E-003-NOTE.DWG LAYOUT BY: KNL 01/20/2014

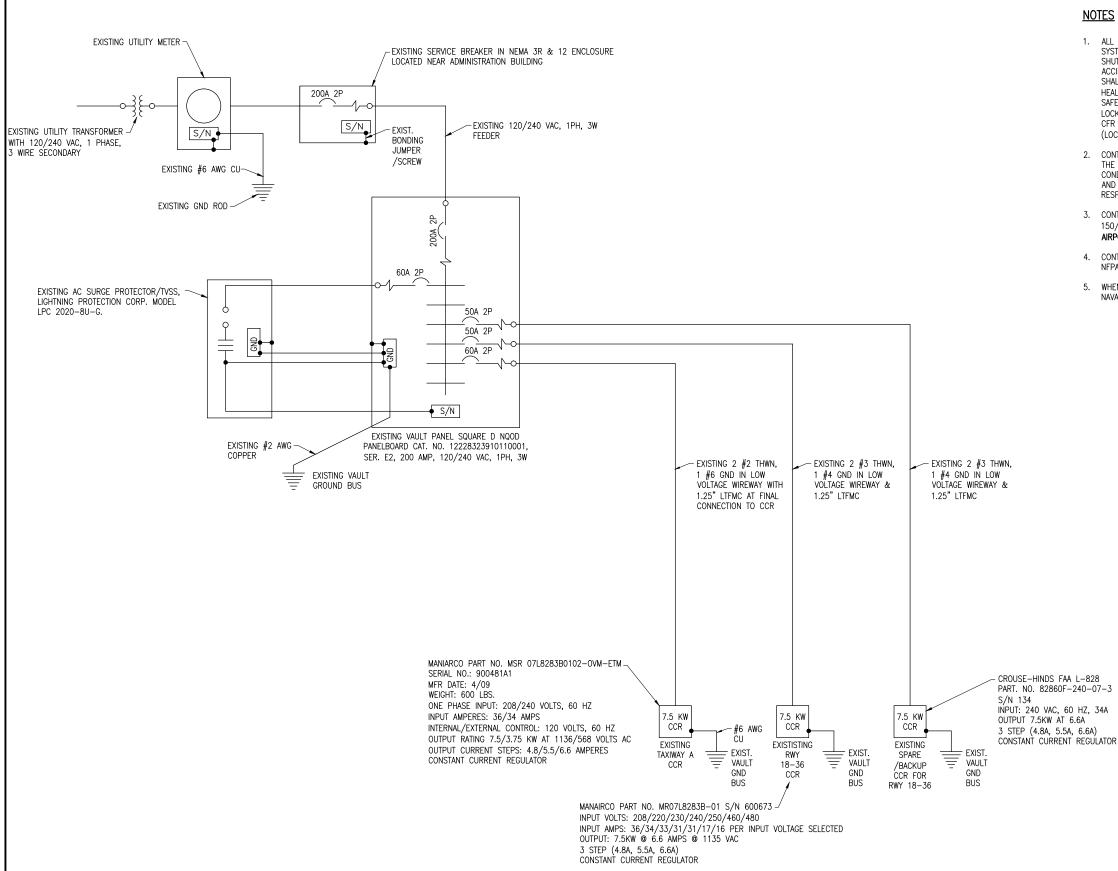
ISSUE: MONTH DAY, YEAR

DRAWN BY: BAK 01/22/2014 REVIEWED BY: JSL 02/2014

SHEET TITLE

NOTES

ELECTRICAL LEGEND, **ABBREVIATIONS &**



- 1. ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT MANAGER. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- 2. CONTRACTOR SHALL EXAMINE THE SITE TO DETERMINE THE EXTENT OF THE WORK. CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS. CONTRACTOR SHALL FIELD VERIFY RESPECTIVE CIRCUITS AND POWER SOURCES PRIOR TO REMOVING OR DISCONNECTING THE RESPECTIVE AIRFIELD LIGHTING, TAXI SIGN, NAVAID, OR OTHER DEVICE.
- 3. CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF FAA AC NO. 150/5370-2F (OR MOST CURRENT ISSUE) "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION".
- 4. CONTRACTOR SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF NFPA 70E - STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE.
- 5. WHEN THE RUNWAY IS SHUT DOWN THE RUNWAY LIGHTING AND AIRFIELD NAVAIDS SHALL BE SHUT OFF.

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METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

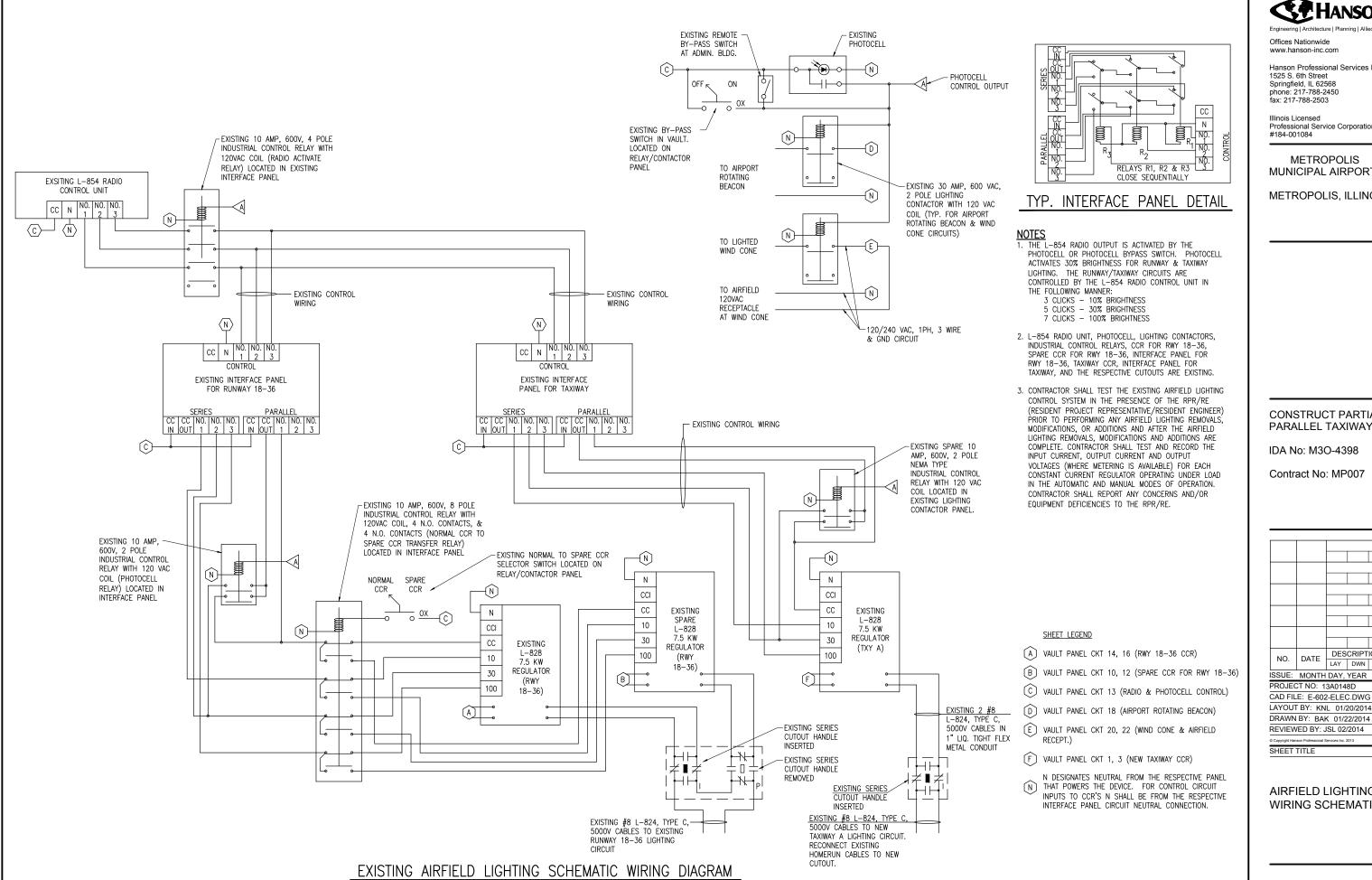
IDA No: M3O-4398

Contract No: MP007

DESCRIPTION NO. DATE LAY DWN REV ISSUE: MONTH DAY, YEAR PROJECT NO: 13A0148D CAD FILE: E-601-ELEC.DWG LAYOUT BY: KNL 01/20/2014 DRAWN BY: BAK 01/22/2014

EXISTING ELECTRICAL ONE LINE DIAGRAM FOR VAULT

REVIEWED BY: JSL 02/2014



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METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

Contract No: MP007

DESCRIPTION NO. DATE LAY DWN REV ISSUE: MONTH DAY, YEAR PROJECT NO: 13A0148D CAD FILE: E-602-ELEC.DWG LAYOUT BY: KNL 01/20/2014

REVIEWED BY: JSL 02/2014 SHEET TITLE

AIRFIELD LIGHTING WIRING SCHEMATIC

NOTES:

- 1. ALL WORK, POWER OUTAGES, AND/OR SHUT DOWN OF EXISTING SYSTEMS SHALL BE COORDINATED WITH THE AIRPORT DIRECTOR AND THE RESPECTIVE FAA ATCT PERSONNEL. ONCE SHUT DOWN, THE CIRCUITS SHALL BE LABELED AS SUCH TO PREVENT ACCIDENTAL ENERGIZING OF THE RESPECTIVE CIRCUITS. ALL PERSONNEL SHALL FOLLOW U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) 29 CFR PART 1910 OCCUPATIONAL SAFETY & HEALTH STANDARDS FOR ELECTRICAL SAFETY AND LOCKOUT/TAGOUT PROCEDURES INCLUDING, BUT NOT LIMITED TO, 29 CFR SECTION 1910.147 THE CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT).
- 2. CONTRACTOR SHALL EXAMINE THE SITE TO CONFIRM AND FIELD VERIFY EXISTING SITE CONDITIONS.
- . MEGGER TEST AND RECORD EXISTING SERIES CIRCUITS PRIOR TO CABLE WORK. ALSO TEST AND RECORD SERIES CIRCUIT LOOP RESISTANCE.
- 4. RUNWAY 18-36 CCR, BACKUP CCR FOR RUNWAY 18-36, TAXIWAY CCR, AND THE ASSOCIATED CUTOUTS ARE EXISTING.
- ALL CCR'S SHALL BE TESTED FOR PROPER OPERATION BEFORE REMOVAL WORK, MODIFICATIONS, AND/OR ADDITIONS AND AFTER THE NEW CABLES AND LIGHTING SYSTEM MODIFICATIONS AND ADDITIONS HAVE BEEN COMPLETED. CONTRACTOR SHALL TEST AND RECORD THE INPUT CURRENT, OUTPUT CURRENT AND OUTPUT VOLTAGES (WHERE METERING IS AVAILABLE) FOR EACH CONSTANT CURRENT REGULATOR IN THE AUTOMATIC AND MANUAL MODES OF OPERATIONS. CONTRACTOR SHALL REPORT CONCERNS AND/OR DEFICIENCIES TO THE RESIDENT PROJECT REPRESNITATIVE/RESIDENT ENGINEER.

LEGEND

- "I" DENOTES PLUG CUTOUT WITH PLUG INSERTED
- P" DENOTES PLUG CUTOUT WITH PLUG PULLED

"CCR" DENOTES CONSTANT CURRENT REGULATOR

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METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

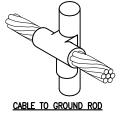
IDA No: M3O-4398

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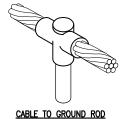
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AYOUT BY: KNL 01/20/2014				
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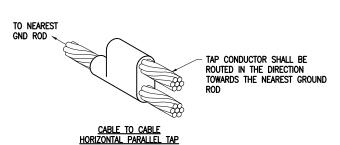
HIGH VOLTAGE WIRING SCHEMATIC

REVIEWED BY: JSL 02/2014



CABLE TO GROUND ROD



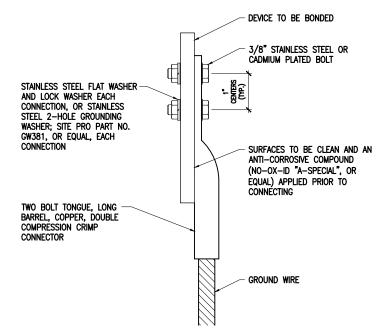


CABLES TO GROUND ROD

DETAIL NOTES

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

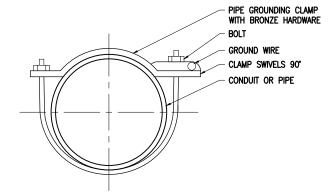
EXOTHERMIC WELD DETAILS

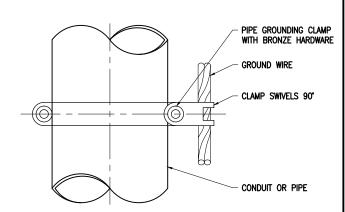


2 HOLE LONG BARREL COMPRESSION LUG TABLE				
WIRE SIZE	BURNDY CAT. NO.	THOMAS & BETTS CAT. NO.	PENN-UNION CAT. NO.	
#8 AWG STRANDED	YA8C-2TC38	256-30695-1157	BBLU-8D-2TC38	
#6 AWG SOLID	YA8C-2TC38 OR YGA6C-2TC38E2G1			
#6 AWG STRANDED	YA6C-2TC38	256-30695-1158	BBLU-6D-2TC38	
#4 AWG STRANDED	YA4C-2TC38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

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

GROUNDING LUG CONNECTION DETAIL





PIPE GROUNDING CLAMP TABLE			
BURNDY CAT. NO.	PIPE SIZE		
OA1. 140.			
GAR3902-BU	1/2" - 1"		
GAR3903-BU	1 1/4" - 2"		
GAR3904-BU	2 1/2" - 3 1/2"		
GAR3905-BU	4" - 5"		
GAR3906-BU	6"		

NOTES

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

PIPE/CONDUIT GROUNDING CLAMP DETAIL

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METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

Contract No: MP007

DESCRIPTION NO. DATE LAY DWN REV ISSUE: MONTH DAY, YEAR PROJECT NO: 13A0148D CAD FILE: E-505-DETL.DWG

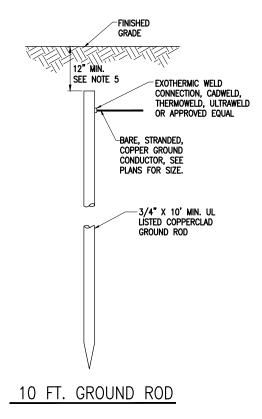
LAYOUT BY: KNL 01/20/2014 DRAWN BY: BAK 01/22/2014 REVIEWED BY: JSL 02/2014

SHEET TITLE

GROUNDING DETAILS

- 2. FURNISH AND INSTALL GROUND RODS AS DETAILED HEREIN. GROUND RODS FOR AIRFIELD LIGHTING (RUNWAY LIGHTING, TAXIWAY LIGHTING, TAXI GUIDANCE SIGNS, & DISTANCE REMAINING SIGNS) SHALL BE MINIMUM 3/4—IN. DIAMETER BY 10—FT LONG, UL—LISTED COPPER CLAD WITH 10—MIL MINIMUM COPPER COATING. GROUND RODS FOR OTHER APPLICATIONS SHALL BE MINIMUM 3/4—IN. DIAMETER BY 10—FT LONG, UL—LISTED, COPPER CLAD WITH 10—MIL MINIMUM COPPER COATING. GROUND RODS SHALL BE SPACED OR AS DETAILED ON THE RESPECTIVE PLANS, AND IN NO CASE SPACED LESS THAN ONE ROD LENGTH APART. ALL CONNECTIONS TO GROUND RODS AND THE GROUND RING SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELD BY ERICO PRODUCTS, INC., SOLON, OHIO, (PHONE 1—800—248—9353), THERMOWELD BY CONTINENTAL INDUSTRIES, INC., TULSA, OKLAHOMA (PHONE 918—663—1440) OR ULTRAWELD BY HARGER, GRAYSLAKE, ILLINOIS (PHONE 1—800—842—7437) OR APPROVED EQUAL. EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS OR AT BURIED GROUNDING ELECTRODE CONDUCTORS.
- 3. CONTRACTOR SHALL TEST EACH MADE ELECTRODE GROUND ROD/GROUND FIELD/GROUND RING WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUND FIELD SYSTEMS. IF GROUND RESISTANCE EXCEEDS 25 OHMS, CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION. COPIES OF GROUND ROD TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER/RESIDENT PROJECT REPRESENTATIVE.
- 4. ALL PRODUCTS ASSOCIATED WITH THE GROUNDING SYSTEM SHALL BE UL-LISTED AND LABELED.
- ALL BOLTED OR MECHANICAL CONNECTIONS SHALL BE COATED WITH A CORROSION PREVENTATIVE COMPOUND BEFORE JOINING, SANCHEM INC. "NO-OX-ID "A-SPECIAL" COMPOUND, BURNDY PENETROX E, OR EQUAL.
- METALLIC SURFACES TO BE JOINED SHALL BE PREPARED BY THE REMOVAL OF ALL NON-CONDUCTIVE MATERIAL, PER 2014 NATIONAL ELECTRICAL CODE ARTICLE 250-12. ALL COPPER BUS BARS MUST BE CLEANED PRIOR TO MAKING CONNECTIONS TO REMOVE SURFACE OXIDATION.
- 7. METALLIC RACEWAY FITTINGS SHALL BE MADE UP TIGHT TO PROVIDE A PERMANENT LOW IMPEDANCE PATH FOR ALL CIRCUITS. METAL CONDUIT TERMINATIONS IN ENCLOSURES SHALL BE BONDED TO THE ENCLOSURE WITH UL-LISTED FITTINGS SUITABLE FOR GROUNDING. PROVIDE GROUNDING BUSHINGS WITH BONDING JUMPERS FOR ALL METAL CONDUITS ENTERING SERVICE EQUIPMENT (METER BASE, CT CABINET, MAIN SERVICE BREAKER ENCLOSURE, ETC.). PROVIDE GROUNDING BUSHINGS WITH BONDING JUMPERS FOR ALL METAL CONDUITS ENTERING AN ENCLOSURE THROUGH CONCENTRIC OR ECCENTRIC KNOCKOUTS THAT ARE PUNCHED OR OTHERWISE FORMED SO AS TO IMPAIR THE ELECTRICAL CONNECTION TO GROUND. STANDARD LOCKNUTS OR BUSHINGS SHALL NOT BE THE SOLE MEANS FOR BONDING WHERE A CONDUIT ENTERS AN ENCLOSURE THROUGH A CONCENTRIC OR ECCENTRIC KNOCKOUT
- 8. ALL CONNECTIONS, LOCATED ABOVE GRADE, BETWEEN THE DIFFERENT TYPES OF GROUNDING CONDUCTORS SHALL BE MADE USING UL—LISTED DOUBLE COMPRESSION CRIMP TYPE CONNECTORS OR UL—LISTED BOLTED GROUND CONNECTORS. FOR GROUND CONNECTIONS TO ENCLOSURES, CASES AND FRAMES OF ELECTRICAL EQUIPMENT NOT SUPPLIED WITH GROUND LUGS THE CONTRACTOR SHALL DRILL REQUIRED HOLES FOR MOUNTING A BOLTED GROUND CONNECTOR. ALL BOLTED GROUND CONNECTORS SHALL BE BURNDY, THOMAS AND BETTS, OR EQUAL. TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUES IN UL STANDARD 486A TO ASSURE PERMANENT AND EFFECTIVE GROUNDING.
- ALL METAL EQUIPMENT ENCLOSURES, CONDUITS, CABINETS, BOXES, RECEPTACLES, MOTORS, ETC. SHALL BE BONDED TO THE RESPECTIVE GROUNDING SYSTEM.
- 10. PROVIDE ALL BOXES FOR PROPOSED OUTLETS, SWITCHES, CIRCUIT BREAKERS, ETC. WITH GROUNDING SCREWS. PROVIDE ALL PANELBOARD, SWITCHGEAR, ETC., ENCLOSURES WITH GROUNDING BARS WITH INDIVIDUAL SCREWS, LLGS, CLAMPS, ETC., FOR EACH OF THE GROUNDING CONDUCTORS THAT ENTER THEIR RESPECTIVE ENCLOSURES.
- 11. EACH NEW FEEDER CIRCUIT AND/OR BRANCH CIRCUIT SHALL INCLUDE AN EQUIPMENT GROUND WIRE. METAL RACEWAY OR CONDUIT SHALL NOT MEET THIS REQUIPMENT. THE EQUIPMENT GROUND WIRE FROM EQUIPMENT SHALL NOT BE SMALLER THAN ALLOWED BY 2014 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, THEY SHALL BE IDENTIFIED BY THE COLOR GREEN, AND SHALL BE THE SAME INSULATION TYPE AS THE PHASE CONDUCTORS.

- 12. ALL EXTERIOR METAL CONDUIT, WHERE NOT ELECTRICALLY CONTINUOUS BECAUSE OF MANHOLES, HANDHOLES, NON-METALLIC JUNCTION BOXES, ETC., SHALL BE BONDED TO ALL OTHER METAL CONDUIT IN THE RESPECTIVE DUCT RUN, AND AT EACH END, WITH A COPPER-BONDING JUMPER SIZED IN CONFORMANCE WITH 2014 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 FNCLOSURE GROUND BUS TO THE CONDUIT SIZED PER 2014 NEC 250-102.
- 13. IT IS THE INTENT OF THIS SPECIFICATION THAT ALL MOTOR FRAMES, PUMP BASES ELECTRICAL EQUIPMENT ENCLOSURES, PANEL HOUSINGS, CONDUITS, BOXES, ETC. HAVE A CONTINUOUS COPPER WIRE GROUND CONNECTION AND SHALL BE POSITIVELY BONDED TO THE RESPECTIVE GROUNDING SYSTEM. CONDUIT CONNECTORS <u>WILL NOT</u> BE CONSIDERED AS ADEQUATE GROUNDING.
- 14. PROVIDE A POSITIVE GROUND BOND FOR ALL OUTLET BOXES, ELECTRICAL EQUIPMENT ENCLOSURES, GROUNDING RECEPTACLES, TOGGLE SWITCHES, ETC. INSTALL A GROUNDING CONDUCTOR TO HAVE 600-VOLT INSULATION AND BE IDENTIFIED BY A CONTINUOUS GREEN COLOR COATING. THEY SHALL BE USED SOLELY FOR GROUNDING PURPOSES AND BE ENTIRELY SEPARATE FROM WHITE GROUNDED NEUTRAL CONDUCTOR, EXCEPT AT SUPPLY SIDE OF SERVICE DISCONNECTING MEANS, WHERE GROUNDING AND NEUTRAL SYSTEMS ARE TO BE CONNECTED TO SERVICE GROUND.
- 15. EACH AND ALL GROUNDED CASED AND METAL PARTS ASSOCIATED WITH ELECTRICAL EQUIPMENT SHALL BE TESTED FOR CONTINUITY OF CONNECTION WITH GROUND BUS SYSTEM BY CONTRACTOR IN PRESENCE OF OWNER'S REPRESENTATIVE.
- 16. ALL CONNECTIONS BETWEEN THE DIFFERENT TYPES OF GROUNDING CONDUCTORS ABOVE GRADE SHALL BE MADE USING BOLTED GROUND CONNECTORS. GROUND LUGS SHALL BE PROVIDED IN ALL ENCLOSURES AND WIRING TERMINATION JUNCTION BOXES. EQUIPMENT GROUNDS AND GROUNDING CONDUCTOR SHALL BE CONNECTED TO THESE GROUND LUGS. FOR GROUND CONNECTIONS TO ENCLOSURES, CASES AND FRAMES OF ELECTRICAL EQUIPMENT NOT SUPPLIED WITH GROUND LUGS THE CONTRACTOR SHALL DRILL REQUIRED HOLES FOR MOUNTING A BOLTED GROUND CONNECTOR. ALL BOLTED GROUND CONNECTORS SHALL BE BURNDY. OR APPROVED EQUAL.
- 7. BOND ALL NONCURRENT-CARRYING PARTS OF METAL EQUIPMENT TO GROUND SYSTEM.
- 18. BUILDING STRUCTURAL STEEL SYSTEM SHALL BE BONDED TO ELECTRICAL GROUND SYSTEM.
- INSTALL GROUNDING ELECTRODE CONDUCTORS, LIGHTNING PROTECTION DOWN CONDUCTORS AND SEPARATE GROUND CONDUCTORS IN SCHEDULE 40 OR SCHEDULE 80 PVC CONDUIT OR EXPOSED WHERE ACCEPTABLE TO LOCAL CODES. WHERE GROUNDING ELECTRODE CONDUCTORS, LIGHTNING PROTECTION DOWN CONDUCTORS OR INDIVIDUAL GROUND CONDUCTORS ARE RUN IN PVC CONDUIT, <u>DO NOT</u> COMPLETELY ENCIRCLE CONDUIT WITH FERROUS AND/OR MAGNETIC MATERIALS. USE NON-METALLIC REINFORCED FIBERGLASS STRUT SUPPORT. WHERE METAL CONDUIT CLAMPS ARE INSTALLED, USE NYLON BOLTS, NUTS, WASHERS AND SPACERS TO INTERRUPT A COMPLETE METALLIC PATH FROM ENCIRCLING THE CONDUIT. THIS IS REQUIRED TO AVOID GIRDLING OF GROUND CONDUCTORS. GIRDLING OF A GROUND CONDUCTOR IS THE RESULT OF PLACING THE CONDUCTOR IN A RING OF MAGNETIC MATERIAL. THIS RING COULD BE A METALLIC CONDUIT, U-BOLT OR STRUT SUPPORT PIPE CLAMP, OR OTHER SUPPORT HARDWARE. THE RESULT OF GIRDLING GROUND CONDUCTORS SIGNIFICANTLY INCREASES. THE INDUCTIVE IMPEDANCE OF THE GROUND CONDUCTOR. INDUCTIVE AND CAPACITIVE IMPEDANCE IS A TYPE OF RESISTANCE THAT OPPOSES THE FLOW OF ALTERNATING CURRENT. ANY INCREASE IN THE IMPEDANCE OF A GROUND CONDUCTOR REDUCES ITS ABILITY TO EFFECTIVELY MITIGATE RADIO FREQUENCY NOISE IN THE GROUND SYSTEM. THE CONDITION WHERE A GROUND CONDUCTOR IS GIRDLED DURING A LIGHTNING STRIKE RESULTS IN PHENOMENA KNOWN AS SURGE IMPEDANCE LOADING. SURGE IMPEDANCE LOADING IS A RESULT OF VOLTAGE AND CURRENT REACHING 500,000 VOLTS AND 10,000 AMPS FOR A SHORT DURATION. GIRDLING FURTHER INCREASES THE IMPEDANCE AT LIGHTNING FREQUENCIES OF 100 KILOHERTZ TO 100 MEGAHERTZ. AT THESE POWER AND FREQUENCY LEVELS ANY INCREASE IN THE IMPEDANCE OF THE GROUND CONDUCTOR MUST BE CONTROLLED. DURING LIGHTNING DISCHARGE CONDITIONS A LOW INDUCTIVE IMPEDANCE PATH IS MORE IMPORTANT THAN A LOW DC RESISTANCE PATH.
- 20. IF LOCAL CODES DICTATE THAT INDIVIDUAL GROUNDING CONDUCTORS MUST BE RUN IN METAL CONDUIT OR RACEWAY, THEN THE CONDUIT OR RACEWAY MUST BE BONDED AT EACH END OF THE RUN WITH A BONDING JUMPER SIZED EQUAL TO THE INDIVIDUAL GROUNDING CONDUCTOR OR AS REQUIRED BY 2014 NEC 250-102. NOTE THIS DOES NOT APPLY TO AC EQUIPMENT GROUNDING CONDUCTORS RUN WITH AC CIRCUITS.
- 21. WHERE A CONFLICT IS DETERMINED WITH RESPECT TO GROUNDING REQUIREMENTS PER MANUFACTURER INSTALLATION INSTRUCTIONS, NEC, AND/OR THE CONTRACT DOCUMENTS, CONTACT THE RESIDENT ENGINEER OR PROJECT ENGINEER FOR FURTHER DIRECTIONS.
- 22. GROUND RODS SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN REQUIREMENTS. STEEL USED TO MANUFACTURER GROUND RODS SHALL BE 100 PERCENT DOMESTIC



<u>NOTES</u>

- 1. TYPE AND MINIMUM NUMBER OF GROUND RODS SHALL BE AS SPECIFIED ON THE PLAN.
- 2. THE RESISTANCE TO GROUND OF THE GROUNDING SYSTEM SHALL NOT EXCEED 25 OHMS.
- COST OF GROUND RODS IS INCIDENTAL TO THE ASSOCIATED ITEMS REQUIRING GROUNDING UNLESS OTHERWISE SPECIFIED.
- GROUND RODS SHALL BE SPACED AS DETAILED ON THE PLANS AND SHALL NOT BE SPACED LESS THAN ONE ROD LENGTH APART.
- 5. TOP OF GROUND RODS SHALL BE 12" MINIMUM BELOW GRADE UNLESS DETAILED OTHERWISE HEREIN
- GROUND RODS FOR RUNWAY LIGHTING, TAXIWAY LIGHTING, AND TAXI GUIDANCE SIGNS SHALL BE A MINIMUM 3/4-INCH DIAMETER BY 10-FT LONG UL LISTED COPPER CLAD.

GROUND RODS
(NOT TO SCALE)

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METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

Contract No: MP007

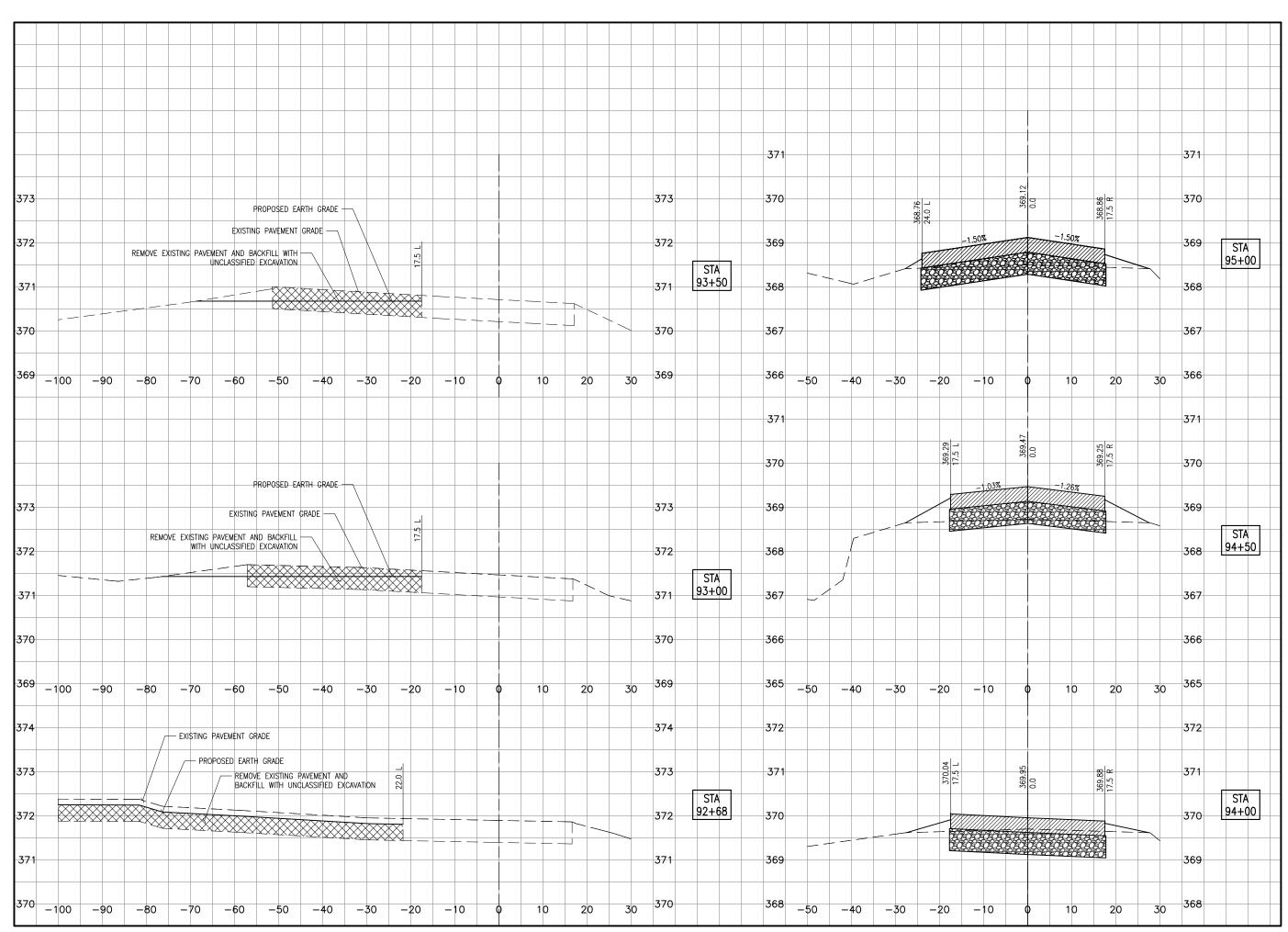
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ISSUE: MONTH DAY, YEAR				
PROJECT NO: 13A0148D				
CAD FILE: F-004-NOTE DWG				

GROUNDING NOTES

LAYOUT BY: KNL 01/20/2014

DRAWN BY: BAK 01/22/2014

REVIEWED BY: JSL 02/2014





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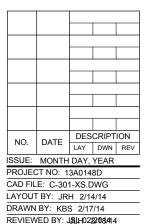
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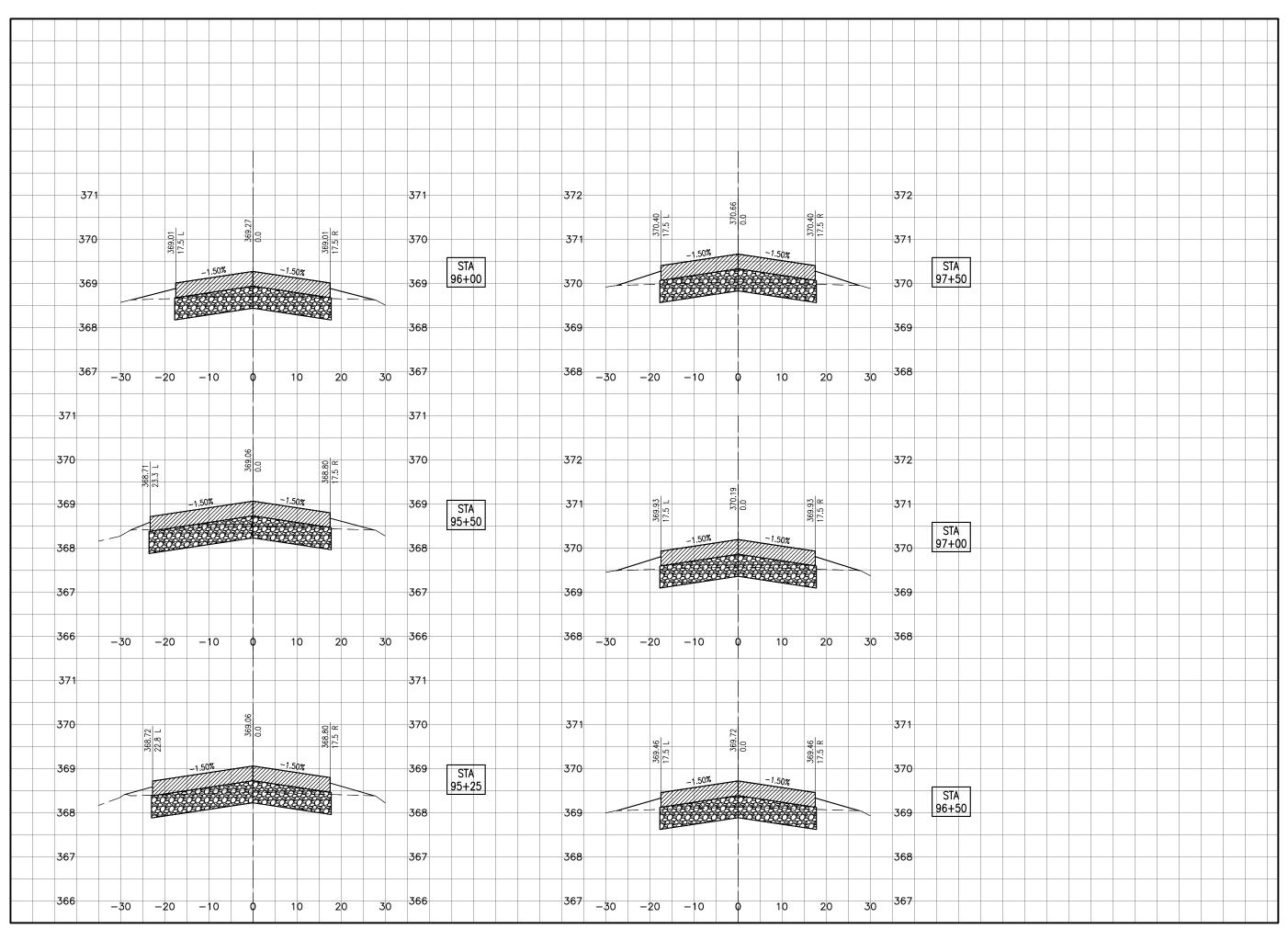
CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

Contract No: MP007



TAXIWAY A CROSS SECTIONS STA. 92+68 TO 95+00



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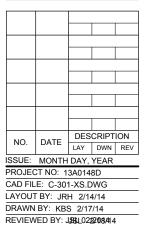
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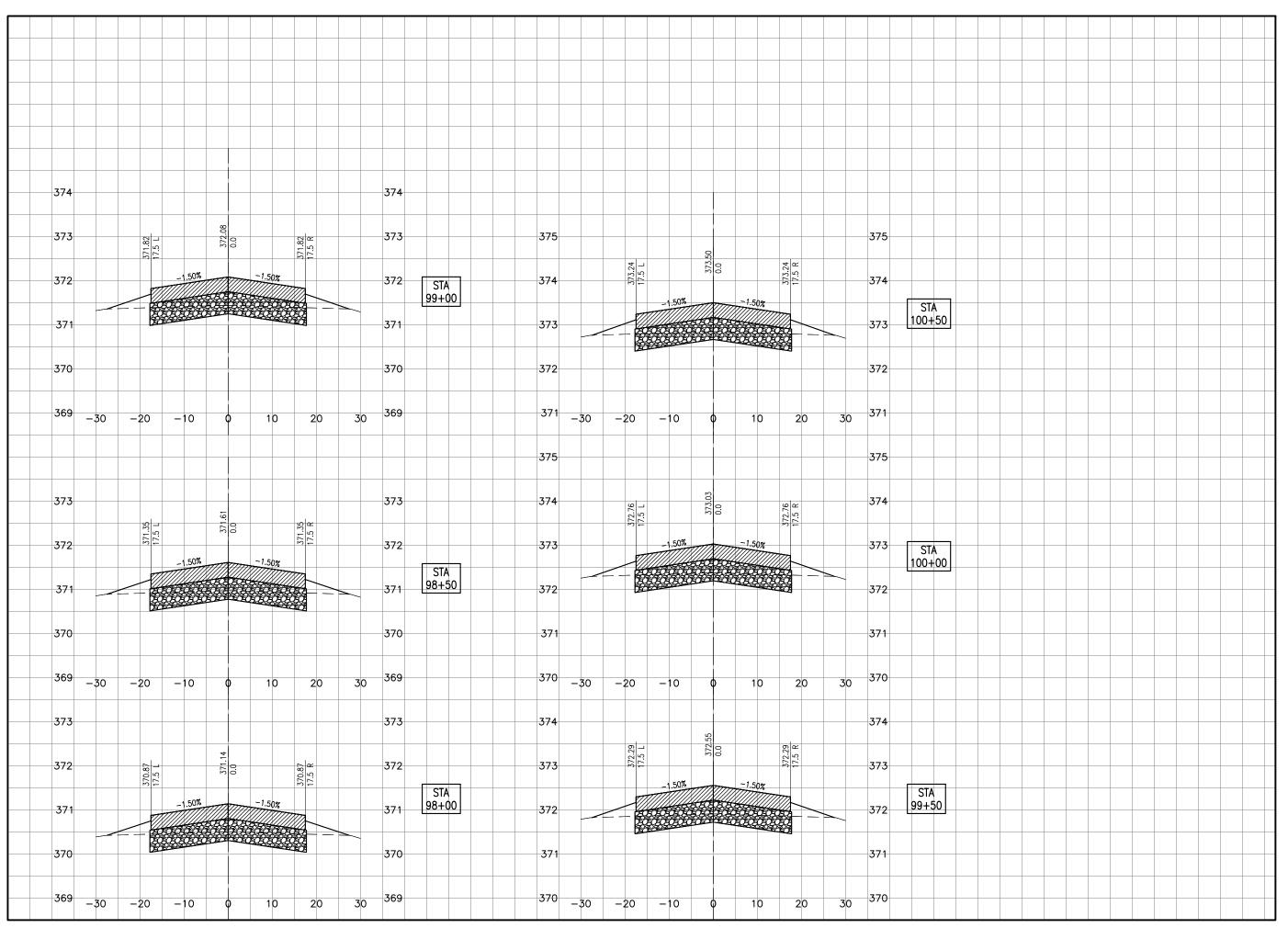
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IDA No: M3O-4398

Contract No: MP007



TAXIWAY A CROSS SECTIONS STA. 95+25 TO 97+50



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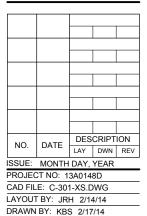
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METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

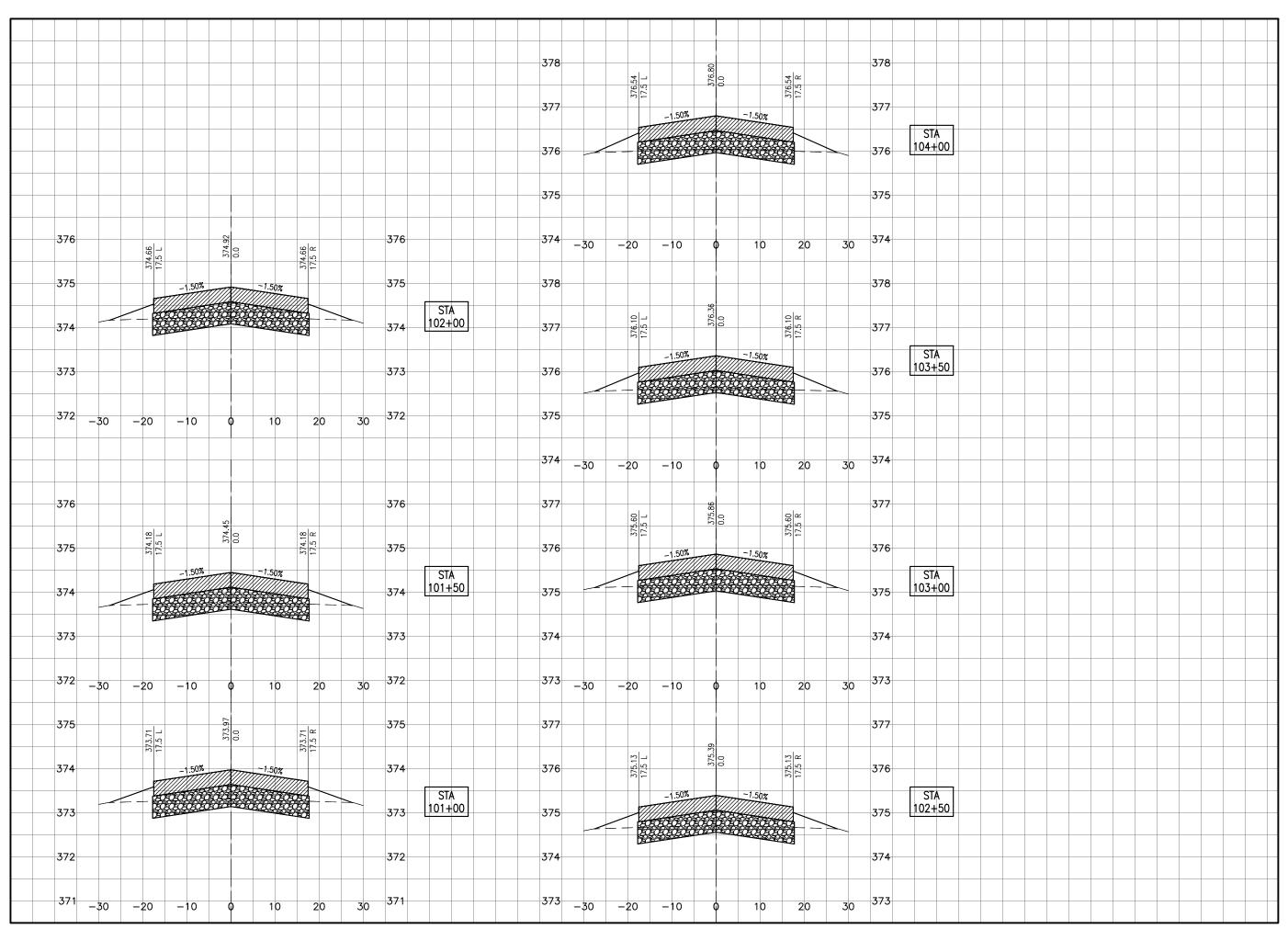
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Contract No: MP007



TAXIWAY A CROSS SECTIONS STA. 98+00 TO 100+50

REVIEWED BY: J\$\$L022208/44





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METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

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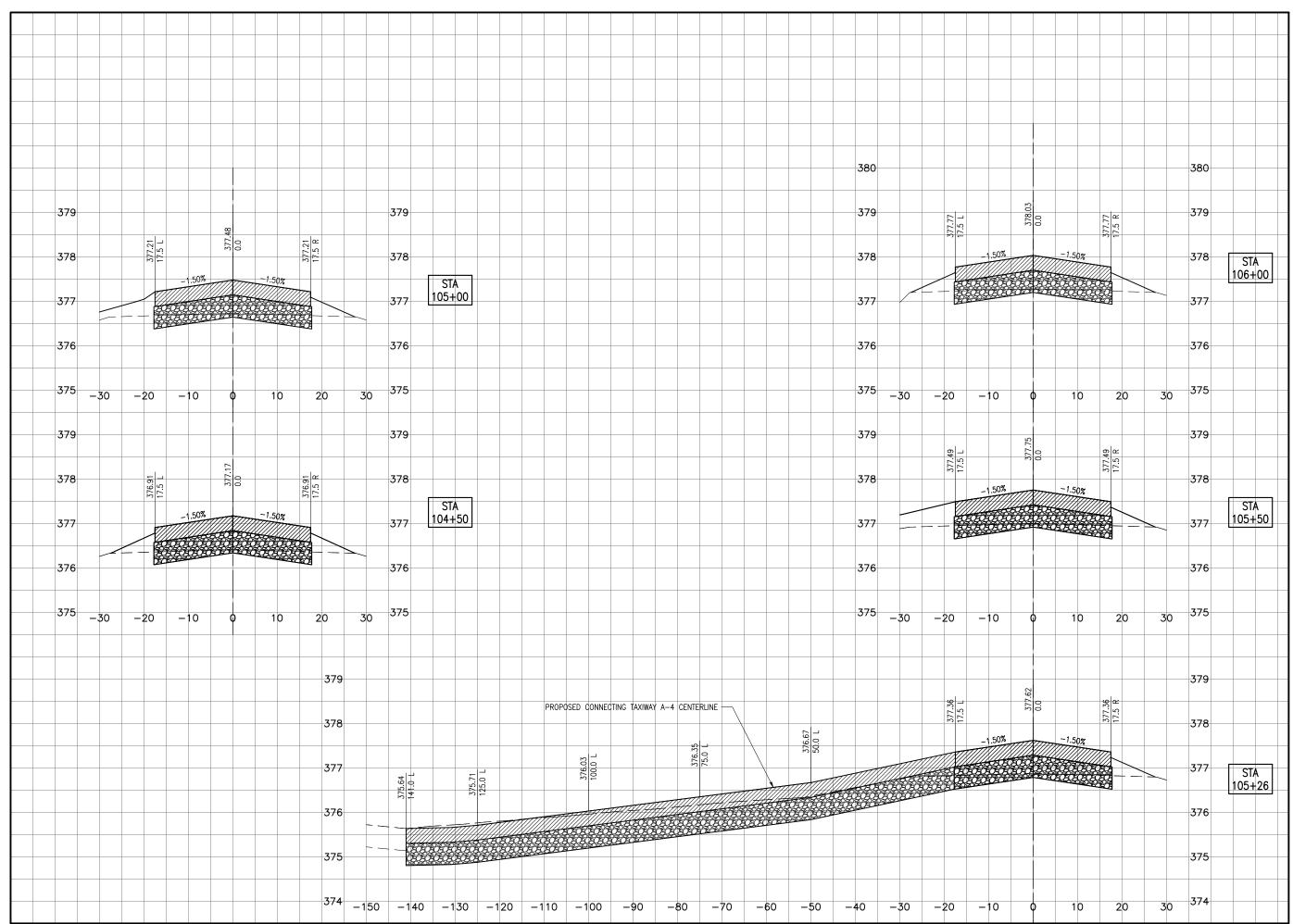


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LAYOUT BY: JRH 2/14/14
DRAWN BY: KBS 2/17/14
REVIEWED BY: J\$\frac{3}{2}\frac{1}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}

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TAXIWAY A CROSS SECTIONS STA. 101+00 TO 104+00





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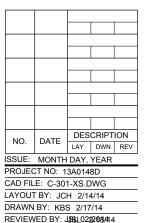
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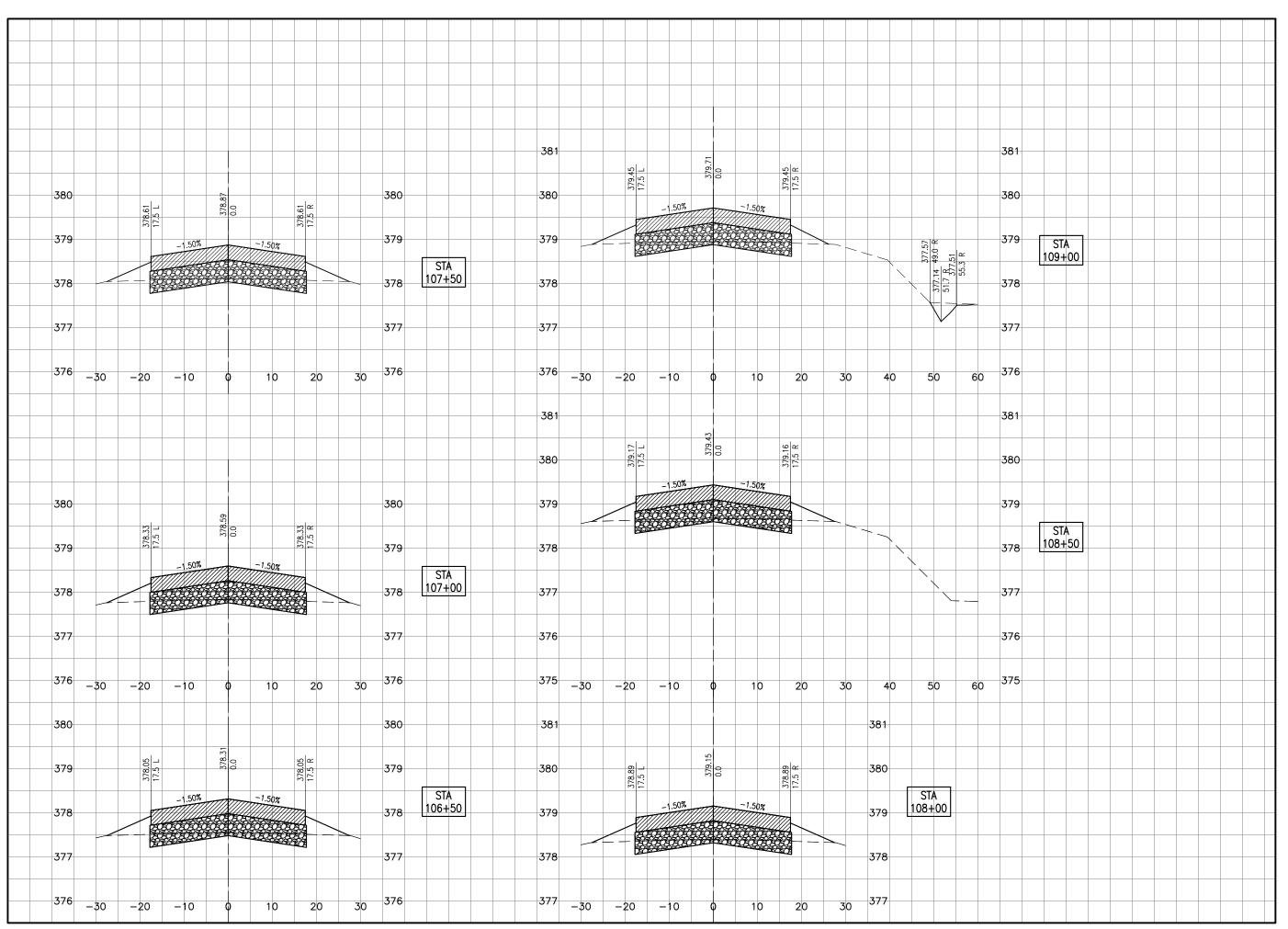
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IDA No: M3O-4398

Contract No: MP007



TAXIWAY A CROSS SECTIONS STA. 104+50 TO 106+00



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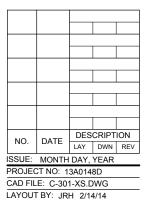
METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

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Contract No: MP007

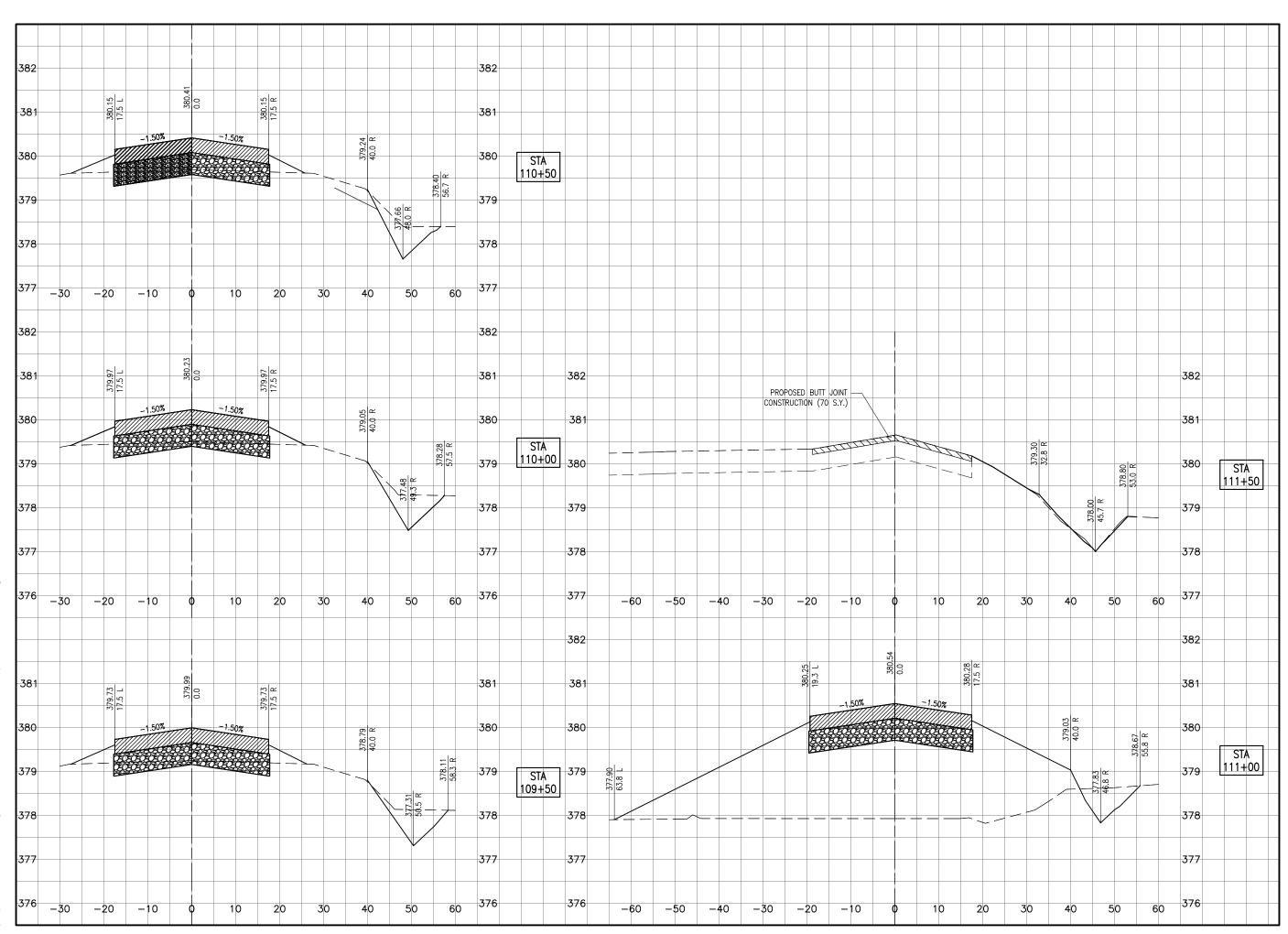


TAXIWAY A CROSS SECTIONS STA. 106+50 TO 109+00

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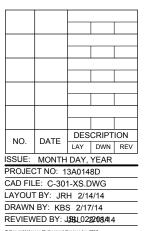
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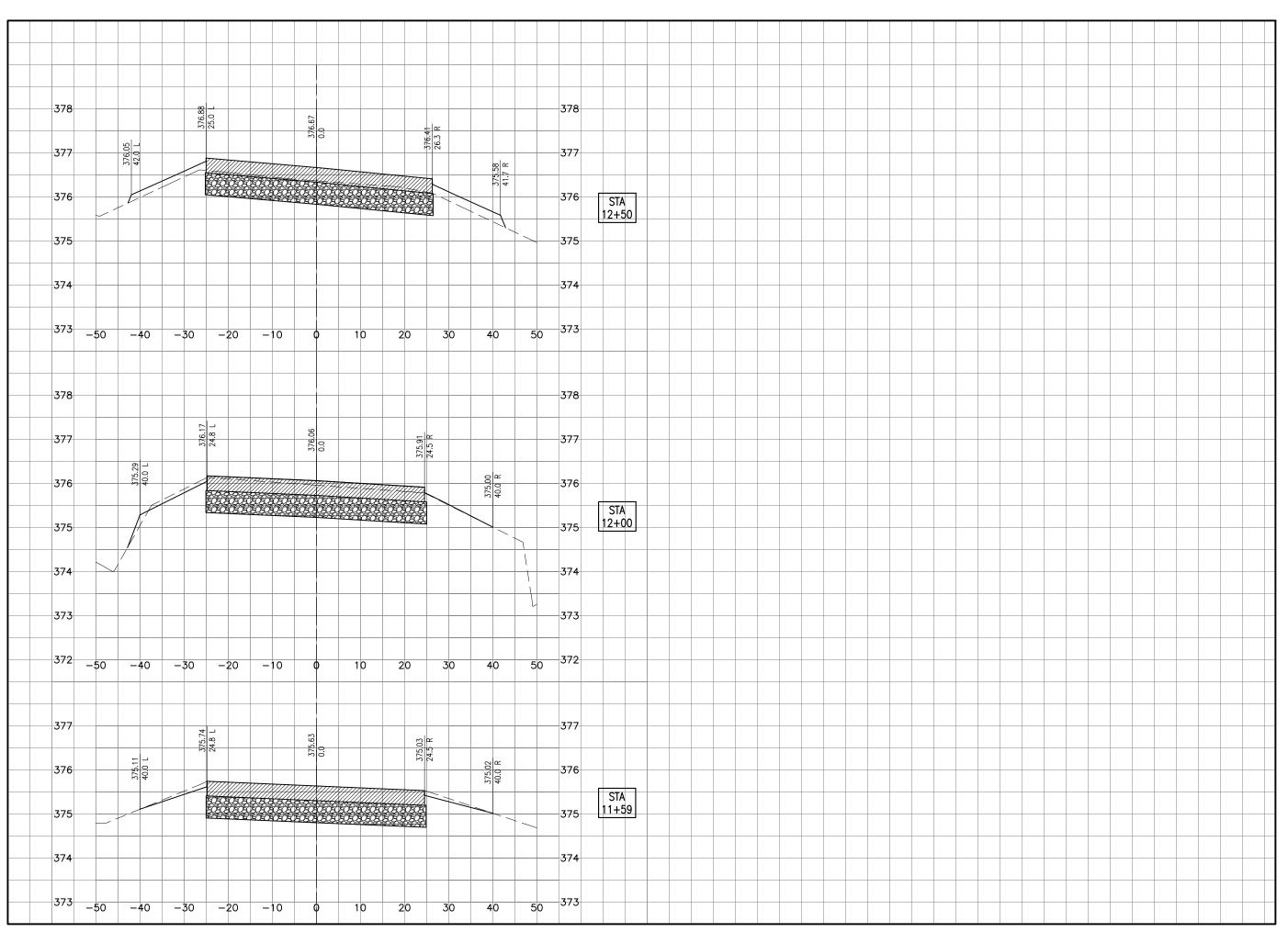
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Contract No: MP007



TAXIWAY A CROSS SECTIONS STA. 109+50 TO 111+50



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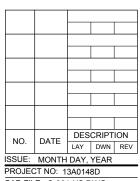
METROPOLIS MUNICIPAL AIRPORT

METROPOLIS, ILLINOIS

CONSTRUCT PARTIAL PARALLEL TAXIWAY

IDA No: M3O-4398

Contract No: MP007



PROJECT NO: 13A0148D

CAD FILE: C-301-XS.DWG

LAYOUT BY: XXX XX/XX/XXXX

DRAWN BY: XXX XX/XX/XXXX

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