



1 PHOTO - EXISTING PANEL BOARDS

LEGEND

ABBREVIATIONS:

- ACH ABOVE CABINET HEIGHT
- AFF ABOVE FINISHED FLOOR
- C.O. CONDUIT ONLY
- EMT ELECTRICAL METALLIC TUBING
- GFI GROUND FAULT INTERRUPTED
- GFR GROUND FAULT RELAY
- HDG HOT-DIPPED GALVANIZED
- HR HOME RUN
- N.C. NORMALLY CLOSED
- N.O. NORMALLY OPEN
- OC ON CENTER
- PVC POLYVINYL CHLORIDE CONDUIT
- RSC RIGID STEEL CONDUIT
- UON UNLESS OTHERWISE NOTED
- XFMR TRANSFORMER

SHEET NOTE SYMBOLS:

- (E) EXISTING TO REMAIN
- (N) NEW
- (R) RELOCATE EXISTING
- (X) REMOVE EXISTING

POWER:

- DUPLEX RECEPTACLE
- DISCONNECT

SERVICE EQUIPMENT:

- TRANSFORMER
- PANELBOARD
- MAIN DISTRIBUTION PANEL

DIAGRAM SYMBOLS:

- AUTOMATIC TRANSFER SWITCH
- CIRCUIT BREAKER
- DISCONNECT OR SWITCH
- GENERATOR
- GROUND BUS
- GROUND ROD
- METER
- TRANSIENT VOLTAGE SURGE SUPPRESSOR
- CURRENT TRANSFORMER
- TRANSFORMER

NOTES:

1. SEQUENCE OF CONSTRUCTION: OPERATION OF THE AIRPORT SHALL BE MAINTAINED DURING THE REMOVAL AND REPLACEMENT OF EQUIPMENT. PROVIDE A SEQUENCE OF WORK TO THE AIRPORT ARCHITECT. DETERMINE AND SCHEDULE WORK FOR MINIMAL POWER INTERRUPTION PER ACCEPTANCE BY THE AIRPORT ARCHITECT.
2. FOR FUTURE GATE 2 JETBRIDGE WORK COORDINATE WITH OWNER AND DESIGN ENGINEER.



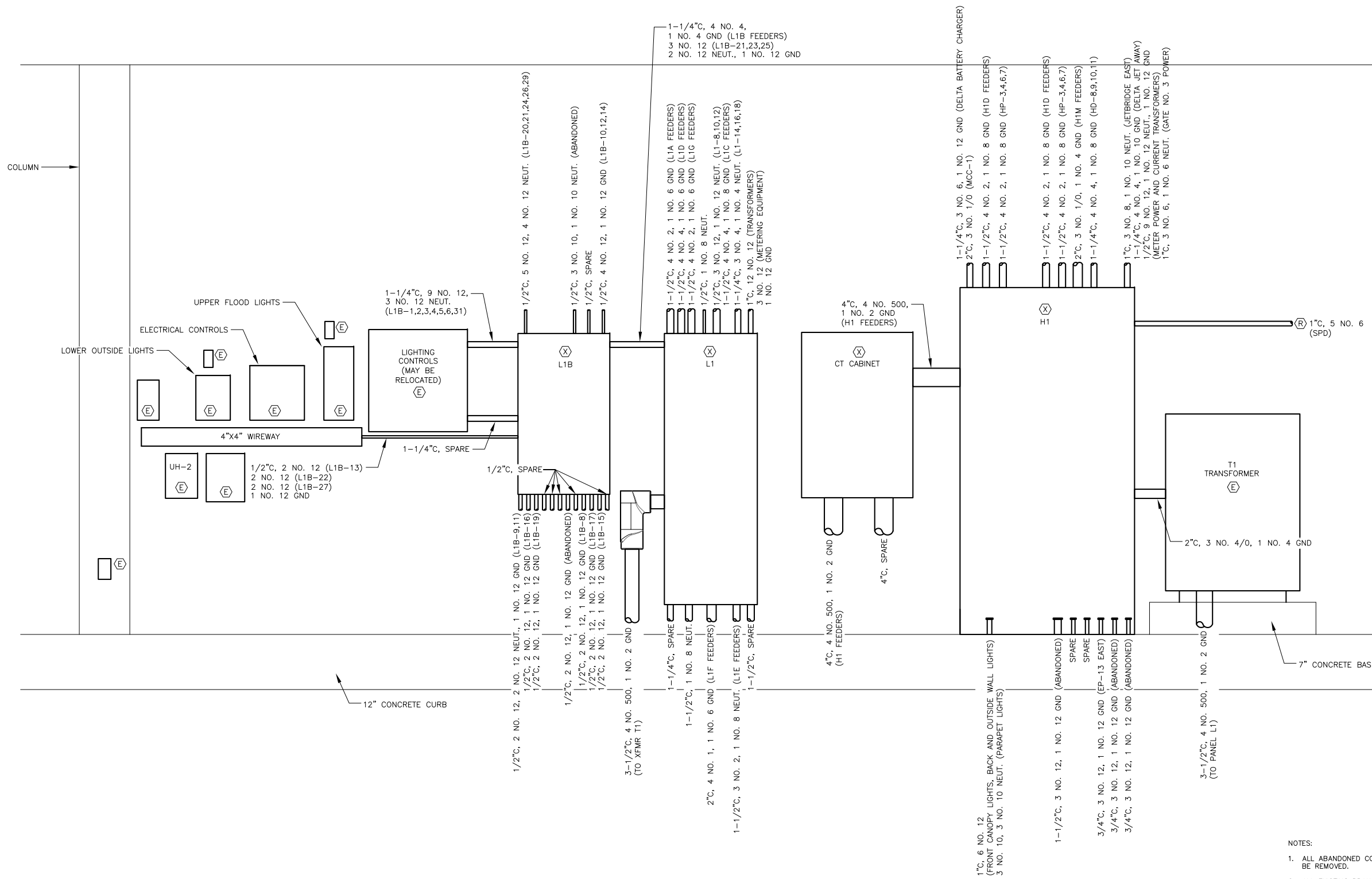
Juneau International Airport
City and Borough of Juneau
JNU ELECTRICAL PANEL UPGRADES
Contract No. BE17-196

REVISION	DESCRIPTION	DATE

SHEET NUMBER

E100

SCALE:
DATE: January 2017



1 ELEVATION OF BAG WELL ELECTRICAL PANELS - EXISTING LAYOUT w/ MODIFICATIONS NOTED

SCALE: 0 6" 1' 2'

- NOTES:
- ALL ABANDONED CONDUCTORS DISCOVERED DURING CONSTRUCTION SHALL BE REMOVED.
 - ALL EXISTING BRANCH CIRCUIT AND FEEDER CONDUCTORS AND CONDUITS SHALL REMAIN, UNLESS NOTED OTHERWISE.
 - CONTRACTOR OPTION TO RELOCATE EXISTING LIGHTING CONTROL PANEL, COORDINATE WITH OWNER AND DESIGN ENGINEER.



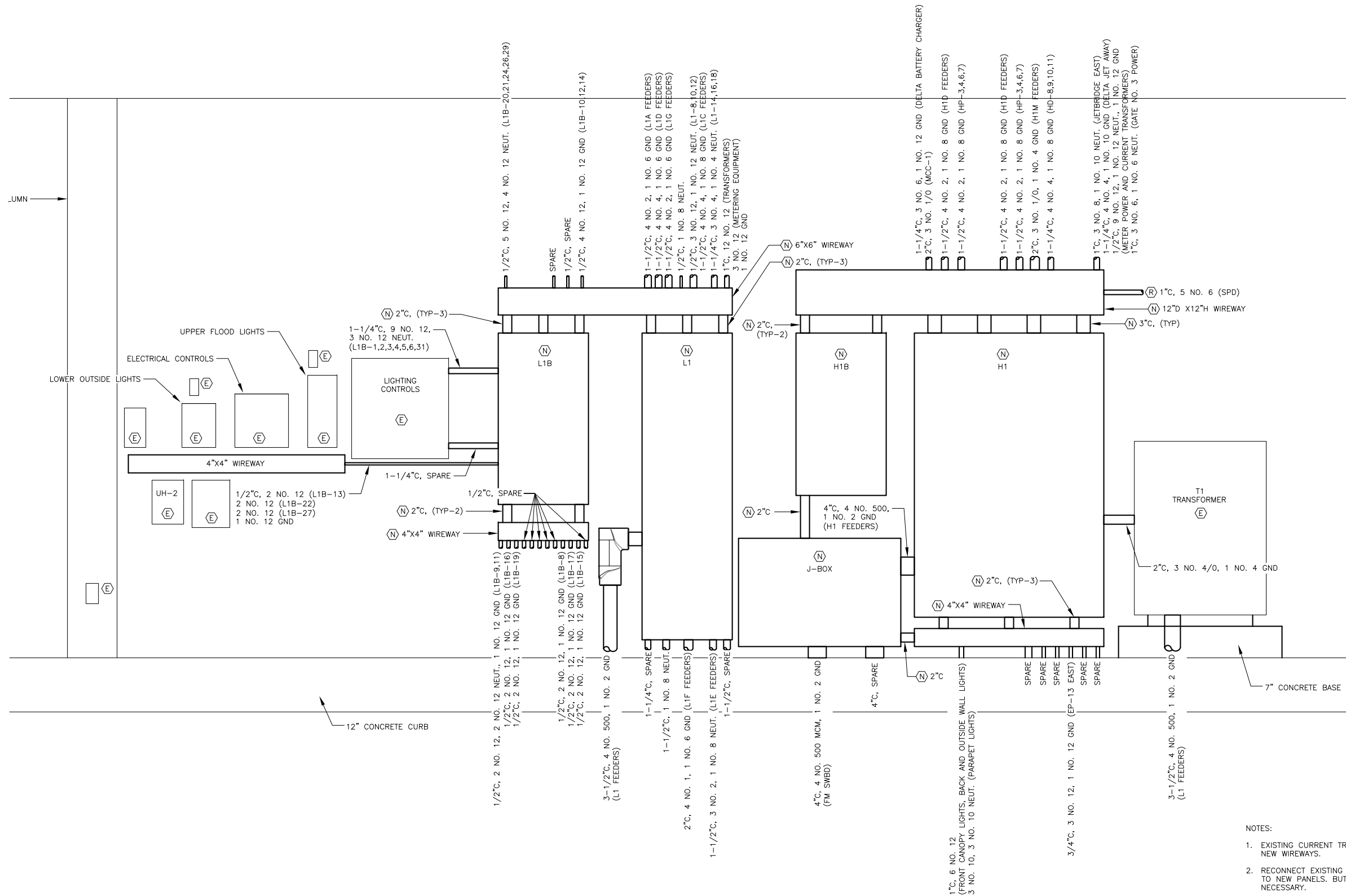
HAIGHT & ASSOCIATES
 CONSULTING ELECTRICAL ENGINEERS
 526 Main Street, Juneau, AK 99801
 (907) 586-9788



Juneau International Airport
 City and Borough of Juneau
JNU ELECTRICAL PANEL UPGRADES
 Contract No. BE17-196

REVISION	DESCRIPTION	DATE

SHEET NUMBER
E101
 SCALE:
 DATE: January 2017



- NOTES:
- EXISTING CURRENT TRANSFORMERS FOR METERS SHALL HOUSED IN NEW WIREWAYS.
 - RECONNECT EXISTING BRANCH CIRCUIT AND FEEDER CONDUCTORS TO NEW PANELS. BUTT SPLICE AND EXTEND CONDUCTORS WHERE NECESSARY.

1 ELEVATION OF BAG WELL ELECTRICAL PANELS - NEW LAYOUT w/ MODIFICATIONS NOTED

SCALE: 0 6" 1' 2'



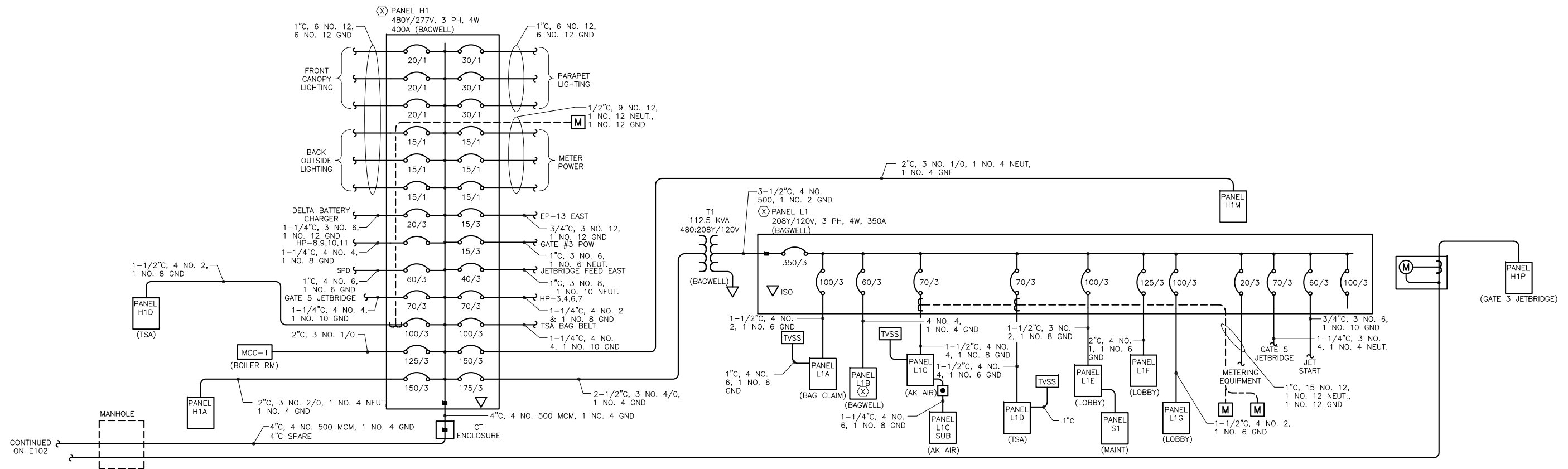
HAIGHT & ASSOCIATES
CONSULTING ELECTRICAL ENGINEERS
526 Main Street, Juneau, AK 99801
(907) 586-9788



Juneau International Airport
City and Borough of Juneau
JNU ELECTRICAL PANEL UPGRADES
Contract No. BE17-196

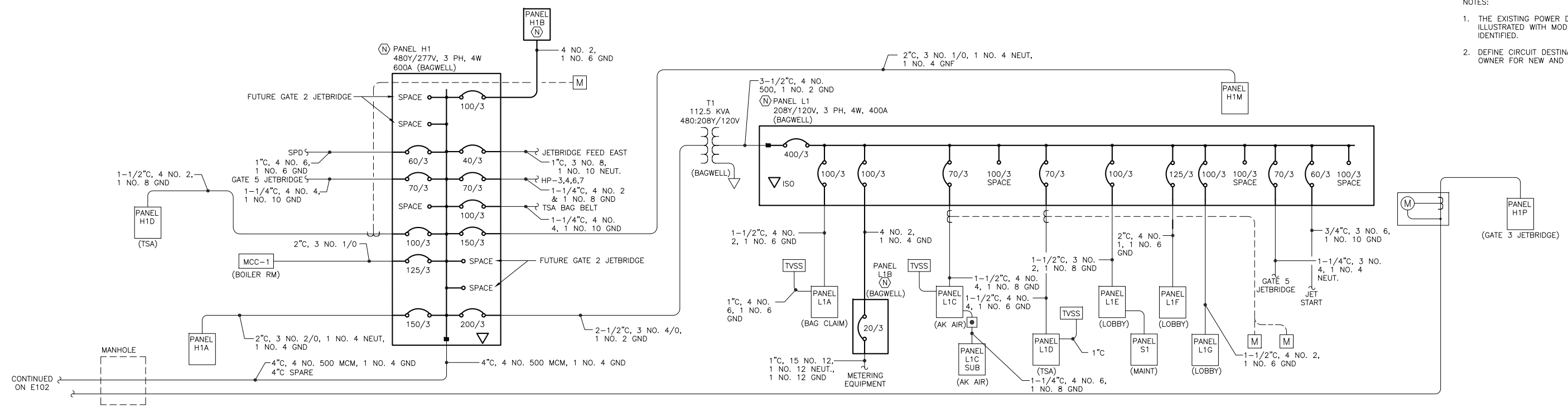
REVISION DESCRIPTION	DATE

SHEET NUMBER
E200
SCALE:
DATE: January 2017



1 SINGLE LINE DIAGRAM - EXISTING POWER DISTRIBUTION SYSTEM (EXISTING TO REMAIN UNLESS NOTED)

- NOTES:
1. THE EXISTING POWER DISTRIBUTION SYSTEM IS ILLUSTRATED WITH MODIFICATION AND ADDITIONS IDENTIFIED.
 2. DEFINE CIRCUIT DESTINATIONS AS REQUIRED BY OWNER FOR NEW AND EXISTING.



1 SINGLE LINE DIAGRAM - NEW POWER DISTRIBUTION SYSTEM

EXISTING TO REMAIN, SHOWN LIGHTER.



Juneau International Airport
 City and Borough of Juneau
JNU ELECTRICAL PANEL UPGRADES
 Contract No. BE17-196

REVISION DESCRIPTION	DATE

SHEET NUMBER
E201
 SCALE:
 DATE: January 2017

PANEL L1B		SIZE	VOLTS/PHASE				MAIN	LOCATION	MOUNT	
		225 AMPS	208Y/120V, 3 PH				MLO	BAGWELL	SURFACE	
C K T NO	DESCRIPTION	BREAKER AMP/ POLE	KVA				BREAKER AMP/ POLE	DESCRIPTION	C K T NO	
			CKT	AØ	BØ	CØ				
1	WEST HALF LIGHTING	20/1	0.0	0.0		0.0	20/1	EAST HALF LIGHTING	2	
3	WEST HALF	20/1	0.0		0.0	0.0	20/1	EAST HALF	4	
5	WEST HALF	20/1	0.0			0.0	20/1	EAST HALF	6	
7	SPARE	20/1	0.0	0.0		0.0	20/1	JETWAY FLOOD LIGHTS	8	
9	EAST WALL	20/1	0.0		0.0	0.0			10	
11	CO2 DETECTOR, WEST WALL	20/1	0.0			0.0	20/1	WEST GARAGE DOOR	12	
13			0.0	0.0		0.0	20/1	CENTER GARAGE DOOR	14	
15			0.0		0.0	0.0	20/1	EAST GARAGE DOOR	16	
17	WEST UNIT HEATER	20/1	0.0			0.0	20/1	WEST COIL-UP DOOR	18	
19	EAST UNIT HEATER	20/1	0.0	0.0		0.0	20/1	CENTER COIL-UP DOOR	20	
21	MIDDLE UNIT HEATER	20/1	0.0		0.0	0.0	20/1	CENTER LARGE ROLL UP DOOR	22	
23	GATE 6 STAIRWELL	20/1	0.0			0.0	0.0		24	
25	DEPARTURE AREA PODIUMS	20/1	0.0	0.0		0.0			26	
27	BAGWELL OFFICE	20/1	0.0		0.0	0.0	20/1	EAST JETWAY	28	
29	BAGWELL OFFICE	20/1	0.0			0.0	0.0	20/1	EAST JETWAY LEAD-IN LIGHT	30
31	CONTROL TIME CLOCKS, EXTERIOR GFI	20/1	0.0	0.0		0.0	20/1	WEST JETWAY LEAD-IN OUTSIDE	32	
33	LOW VOLT TRANSFORMER PANEL R1B	20/1	0.0		0.0	0.0	20/1	SPARE	34	
35	SPARE	20/1	0.0			0.0	0.0		36	
37			0.0	0.0		0.0			38	
39			0.0		0.0	0.0			40	
41			0.0			0.0	0.0		42	
43			0.0	0.0		0.0			44	
45			0.0		0.0	0.0			46	
47			0.0			0.0	0.0		48	
49			0.0	0.0		0.0			50	
51			0.0		0.0	0.0			52	
53			0.0			0.0	0.0		54	
55			0.0	0.0		0.0	15/3	METERING EQUIPMENT	56	
57			0.0		0.0	0.0	--	----	58	
59			0.0			0.0	--	----	60	
BALANCED CONNECTED LOAD: 0.0 KVA / 0.0 AMPS			0.0	0.0	0.0					
MAXIMUM PHASE LOAD: 0.0 KVA / 0.0 AMPS										

* GFCI CIRCUIT BREAKER

PANEL H1B		SIZE	VOLTS/PHASE				MAIN	LOCATION	MOUNT	
		100 AMPS	480/277V, 3 PH				MLO	BAGWELL	SURFACE	
C K T NO	DESCRIPTION	BREAKER AMP/ POLE	KVA				BREAKER AMP/ POLE	DESCRIPTION	C K T NO	
			CKT	AØ	BØ	CØ				
1	FRONT CANOPY LIGHTING	20/1	0.0	0.0		0.0	30/1	PARAPET LIGHTING	2	
3	FRONT CANOPY LIGHTING	20/1	0.0		0.0	0.0	30/1	PARAPET LIGHTING	4	
5	FRONT CANOPY LIGHTING	20/1	0.0			0.0	30/1	PARAPET LIGHTING	6	
7	BACK OUTSIDE LIGHTING	15/1	0.0	0.0		0.0			8	
9	BACK OUTSIDE LIGHTING	15/1	0.0		0.0	0.0			10	
11	BACK OUTSIDE LIGHTING	15/1	0.0			0.0	0.0		12	
13	DELTA BATTERY CHARGER	20/3	0.0	0.0		0.0	15/3	EP-13 EAST	14	
15	----	--	0.0		0.0	0.0	--	----	16	
17	----	--	0.0			0.0	0.0	----	18	
19	HP-8,9,10,11	20/1	0.0	0.0		0.0	15/3	GATE #3 POWER	20	
21			0.0		0.0	0.0	--	----	22	
23			0.0			0.0	0.0	--	----	24
25			0.0	0.0		0.0			26	
27			0.0		0.0	0.0			28	
29			0.0			0.0	0.0		30	
31			0.0	0.0		0.0			32	
33			0.0		0.0	0.0			34	
35			0.0			0.0	0.0		36	
37			0.0	0.0		0.0	15/1	METER POWER	38	
39			0.0		0.0	0.0	15/1	METER POWER	40	
41			0.0			0.0	15/1	METER POWER	42	
BALANCED CONNECTED LOAD: 0.0 KVA / 0.0 AMPS			0.0	0.0	0.0					
MAXIMUM PHASE LOAD: 0.0 KVA / 0.0 AMPS										



Juneau International Airport
 City and Borough of Juneau

JNU ELECTRICAL PANEL UPGRADES

 Contract No. BE17-196

REVISION	DESCRIPTION	DATE

SHEET NUMBER

E202

SCALE:
DATE: January 2017

SPECIFICATIONS

1. GENERAL

1.1 DEFINITIONS

- A. EMT: ELECTRICAL METALLIC TUBING.
- B. GFCI: GROUND-FAULT CIRCUIT INTERRUPTER.
- C. IMC: INTERMEDIATE METAL CONDUIT.
- D. RSC: RIGID STEEL CONDUIT.
- E. TVSS: TRANSIENT VOLTAGE SURGE SUPPRESSOR.
- F. UTP: UNSHIELDED TWISTED PAIR.

1.2 SUBMITTALS

- A. PRODUCT DATA:
 - 1. CONDUITS, RACEWAYS, AND BOXES.
 - 2. SWITCHBOARDS, PANELBOARDS AND OVERCURRENT PROTECTIVE DEVICES.
- B. SHOP DRAWINGS:
 - 1. SWITCHBOARDS, PANELBOARDS AND OVERCURRENT PROTECTIVE DEVICES.
- C. FIELD TEST REPORTS: SUBMIT WRITTEN TEST REPORTS TO INCLUDE THE FOLLOWING:
 - 1. TEST PROCEDURES USED.
 - 2. TEST RESULTS THAT COMPLY WITH REQUIREMENTS.
 - 3. RESULTS OF FAILED TESTS AND CORRECTIVE ACTION TAKEN TO ACHIEVE TEST RESULTS THAT COMPLY WITH REQUIREMENTS.

1.3 QUALITY ASSURANCE

- A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.
- B. COMPLY WITH NFPA 70.

1.4 COORDINATION

- A. SEQUENCE, COORDINATE, AND INTEGRATE INSTALLING ELECTRICAL MATERIALS AND EQUIPMENT FOR EFFICIENT FLOW OF THE WORK.
- B. WHERE ELECTRICAL IDENTIFICATION DEVICES ARE APPLIED TO FIELD-FINISHED SURFACES, COORDINATE INSTALLATION OF IDENTIFICATION DEVICES WITH COMPLETION OF FINISHED SURFACE.

1.5 FIELD QUALITY CONTROL

- A. INSPECT INSTALLED COMPONENTS FOR DAMAGE AND FAULTY WORK, INCLUDING THE FOLLOWING:
 - 1. SUPPORTING DEVICES FOR ELECTRICAL COMPONENTS.
 - 2. ELECTRICAL IDENTIFICATION.
 - 3. ELECTRICAL DEMOLITION.
 - 4. TOUCHUP PAINTING.
- B. CONDUCTOR AND CABLE TESTS:
 - 1. AFTER INSTALLING CONDUCTORS AND CABLES AND BEFORE ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, TEST FEEDER CONDUCTOR INSULATION FOR COMPLIANCE WITH REQUIREMENTS.

1.6 REFINISHING AND TOUCHUP PAINTING

- A. REFINISH AND TOUCHUP PAINT.
 - 1. CLEAN DAMAGED AND DISTURBED AREAS AND APPLY PRIMER, INTERMEDIATE, AND FINISH COATS TO SUIT THE DEGREE OF DAMAGE AT EACH LOCATION.
 - 2. FOLLOW PAINT MANUFACTURER'S WRITTEN INSTRUCTIONS FOR SURFACE PREPARATION AND FOR TIMING AND APPLICATION OF SUCCESSIVE COATS.
 - 3. REPAIR DAMAGE TO GALVANIZED FINISHES WITH ZINC-RICH PAINT RECOMMENDED BY MANUFACTURER.
 - 4. REPAIR DAMAGE TO PAINT FINISHES WITH MATCHING TOUCHUP COATING RECOMMENDED BY MANUFACTURER.

1.7 CLEANING AND PROTECTION

- A. ON COMPLETION OF INSTALLATION, INCLUDING OUTLETS, FITTINGS, AND DEVICES, INSPECT EXPOSED FINISH. REMOVE BURRS, DIRT, PAINT SPOTS, AND CONSTRUCTION DEBRIS.
- B. PROTECT EQUIPMENT AND INSTALLATIONS AND MAINTAIN CONDITIONS TO ENSURE THAT COATINGS, FINISHES, AND CABINETS ARE WITHOUT DAMAGE OR DETERIORATION AT TIME OF SUBSTANTIAL COMPLETION.

2. BASIC MATERIALS AND METHODS

2.1 SUPPORTING DEVICES

- A. MATERIAL: COLD-FORMED STEEL, WITH CORROSION-RESISTANT COATING ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.
- B. METAL ITEMS FOR USE OUTDOORS, IN DAMP LOCATIONS, OR IN CORROSIVE ENVIRONMENTS: HOT-DIP GALVANIZED STEEL, OR STAINLESS STEEL.
- C. SLOTTED-STEEL CHANNEL SUPPORTS: FLANGE EDGES TURNED TOWARD WEB, AND 9/16-INCH-DIAMETER SLOTTED HOLES AT A MAXIMUM OF 2 INCHES O.C., IN WEBS.
 - 1. CHANNEL THICKNESS: SELECTED TO SUIT STRUCTURAL LOADING.
 - 2. FITTINGS AND ACCESSORIES: PRODUCTS OF THE SAME MANUFACTURER AS CHANNEL SUPPORTS.
- D. RACEWAY AND CABLE SUPPORTS: MANUFACTURED CLEVIS HANGERS, RISER CLAMPS, STRAPS, THREADED C-CLAMPS WITH RETAINERS, CEILING TRAPEZE HANGERS, WALL BRACKETS, AND SPRING-STEEL OR CLICK-TYPE HANGERS.
- E. EXPANSION ANCHORS: CARBON-STEEL WEDGE OR SLEEVE TYPE.
- F. POWDER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL.
- G. ELECTRICAL EQUIPMENT INSTALLATION:
 - 1. HEADROOM MAINTENANCE: IF MOUNTING HEIGHTS OR OTHER LOCATION CRITERIA ARE NOT INDICATED, ARRANGE AND INSTALL COMPONENTS AND EQUIPMENT TO PROVIDE THE MAXIMUM POSSIBLE HEADROOM.
 - 2. MATERIALS AND COMPONENTS: INSTALL LEVEL, PLUMB, AND PARALLEL AND PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS, UNLESS OTHERWISE INDICATED.
 - 3. EQUIPMENT: INSTALL TO FACILITATE SERVICE, MAINTENANCE, AND REPAIR OR REPLACEMENT OF COMPONENTS. CONNECT FOR EASE OF DISCONNECTING, WITH MINIMUM INTERFERENCE WITH OTHER INSTALLATIONS.
 - 4. RIGHT OF WAY: GIVE TO RACEWAYS AND PIPING SYSTEMS INSTALLED AT A REQUIRED SLOPE.
 - 5. MEET APPLICABLE UL, NEMA, NFPA REQUIREMENTS FOR ALL MATERIALS, DEVICES, AND EQUIPMENT.

H. ELECTRICAL SUPPORTING DEVICE APPLICATION:

- 1. DAMP LOCATIONS AND OUTDOORS: HOT-DIP GALVANIZED MATERIALS, STAINLESS STEEL MATERIALS, OR NONMETALLIC, U-CHANNEL SYSTEM COMPONENTS.
- 2. DRY LOCATIONS: STEEL MATERIALS.
- 3. SELECTION OF SUPPORTS: COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.
- 4. STRENGTH OF SUPPORTS: ADEQUATE TO CARRY PRESENT AND FUTURE LOADS, TIME A SAFETY FACTOR OF AT LEAST FOUR; MINIMUM OF 200-LB DESIGN LOAD.
- I. SUPPORT INSTALLATION:
 - 1. INSTALL SUPPORT DEVICES TO SECURELY AND PERMANENTLY FASTEN AND SUPPORT ELECTRICAL COMPONENTS.
 - 2. INSTALL INDIVIDUAL AND MULTIPLE RACEWAY HANGERS AND RISER CLAMPS TO SUPPORT RACEWAYS. PROVIDE U-BOLTS, CLAMPS, ATTACHMENTS, AND OTHER HARDWARE NECESSARY FOR HANGER ASSEMBLIES AND FOR SECURING HANGER RODS AND CONDUITS.
 - 3. SUPPORT PARALLEL RUNS OF HORIZONTAL RACEWAYS TOGETHER ON TRAPEZE- OR BRACKET-TYPE HANGERS.
 - 4. SIZE SUPPORTS FOR MULTIPLE RACEWAY INSTALLATIONS SO CAPACITY CAN BE INCREASED BY A 25 PERCENT MINIMUM IN THE FUTURE.
 - 5. SUPPORT INDIVIDUAL HORIZONTAL RACEWAYS SEPARATE, MALLEABLE-IRON PIPE HANGERS OR CLAMPS.
 - 6. INSTALL 1/4-INCH DIAMETER OR LARGER THREADED STEEL HANGER RODS, UNLESS OTHERWISE INDICATED.
 - 7. SPRING-STEEL FASTENERS SPECIFICALLY DESIGNED FOR SUPPORTING SINGLE CONDUITS OR TUBING MAY BE USED INSTEAD OF MALLEABLE-IRON HANGERS FOR 1-INCH AND SMALLER RACEWAYS SERVING LIGHTING AND RECEPTACLE BRANCH CIRCUITS ABOVE SUSPENDED CEILINGS FOR FASTENING RACEWAYS TO SLOTTED CHANNEL AND ANGLE SUPPORTS.
 - 8. ARRANGE SUPPORTS IN VERTICAL RUNS SO THE WEIGHT OF RACEWAYS AND ENCLOSED CONDUCTORS IS CARRIED ENTIRELY BY RACEWAY SUPPORTS, WITH NO WEIGHT LOAD ON RACEWAY TERMINALS.
 - 9. SIMULTANEOUSLY INSTALL VERTICAL CONDUCTOR SUPPORTS WITH CONDUCTORS.
 - 10. SEPARATELY SUPPORT CAST BOXES THAT ARE THREADED TO RACEWAYS AND USED FOR FIXTURE SUPPORT. SUPPORT SHEET-METAL BOXES DIRECTLY FROM THE BUILDING STRUCTURE OR BY BAR HANGERS. IF BAR HANGERS ARE USED, ATTACH BAR TO RACEWAYS ON OPPOSITE SIDES OF THE BOX AND SUPPORT THE RACEWAY WITH AN APPROVED FASTENER NOT MORE THAN 24 INCHES FROM THE BOX.
 - 11. INSTALL METAL CHANNEL RACKS FOR MOUNTING CABINETS, PANELBOARDS, DISCONNECT SWITCHES, CONTROL ENCLOSURES, PULL AND JUNCTION BOXES, TRANSFORMERS, AND OTHER DEVICES, UNLESS COMPONENTS ARE MOUNTED DIRECTLY TO STRUCTURAL ELEMENTS OF ADEQUATE STRENGTH.
 - 12. SECURELY FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTS TO THE BUILDING STRUCTURE, UNLESS OTHERWISE INDICATED. PERFORM FASTENING ACCORDING TO THE FOLLOWING UNLESS OTHER FASTENING METHODS ARE INDICATED:
 - a. EXISTING CONCRETE: EXPANSION BOLTS.
 - b. INSTEAD OF EXPANSION BOLTS, THREADED STUDS DRIVEN BY A POWDER CHARGE AND PROVIDED WITH LOCK WASHERS MAY BE USED IN EXISTING CONCRETE.

1.2 IDENTIFICATION

- A. IDENTIFICATION DEVICES: A SINGLE TYPE OF IDENTIFICATION PRODUCT FOR EACH APPLICATION CATEGORY. USE COLORS PRESCRIBED BY ANSI A13.1, NFPA 70, AND THESE SPECIFICATIONS.
- B. TAPE MARKERS FOR WIRE: VINYL OR VINYL-CLOTH, SELF-ADHESIVE, WRAPAROUND TYPE WITH PREPRINTED NUMBERS AND LETTERS.
- C. ENGRAVED-PLASTIC LABELS, SIGNS, AND INSTRUCTION PLATES: ENGRAVING STOCK, MELAMINE PLASTIC LAMINATE PUNCHED OR DRILLED FOR MECHANICAL FASTENERS 1/16-INCH MINIMUM THICKNESS FOR SIGNS UP TO 20 SQ.IN. AND 1/8-INCH MINIMUM THICKNESS FOR LARGER SIZES. ENGRAVED LEGEND IN WHITE LETTERS ON BLACK BACKGROUND.
- D. FASTENERS FOR NAMEPLATES AND SIGNS: SELF-TAPPING, STAINLESS-STEEL SCREWS OR NO. 10/32 STAINLESS-STEEL MACHINE SCREWS WITH NUTS AND FLAT AND LOCK WASHERS.
- E. INSTALLATION:
 - 1. INSTALL AT LOCATIONS FOR MOST CONVENIENT VIEWING WITHOUT INTERFERENCE WITH OPERATION AND MAINTENANCE OF EQUIPMENT.
 - 2. COORDINATE NAMES, ABBREVIATIONS, COLORS, AND OTHER DESIGNATIONS USED FOR ELECTRICAL IDENTIFICATION WITH CORRESPONDING DESIGNATIONS INDICATED IN THE CONTRACT DOCUMENTS OR REQUIRED BY CODES AND STANDARDS. USE CONSISTENT DESIGNATIONS THROUGHOUT PROJECT.
 - 3. SELF-ADHESIVE IDENTIFICATION PRODUCTS: CLEAN SURFACES BEFORE APPLYING.
 - 4. COLOR-CODE 208/120-V SYSTEM SECONDARY SERVICE, FEEDER, AND BRANCH-CIRCUIT CONDUCTORS THROUGHOUT THE SECONDARY ELECTRICAL SYSTEM AS FOLLOWS:
 - a. PHASE A: BLACK
 - b. PHASE B: RED
 - c. PHASE C: BLUE
 - 5. COLOR-CODE 480/277-V SYSTEM SECONDARY SERVICE, FEEDER, AND BRANCH-CIRCUIT CONDUCTORS THROUGHOUT THE SECONDARY ELECTRICAL SYSTEM AS FOLLOWS:
 - a. PHASE A: BROWN
 - b. PHASE B: ORANGE
 - c. PHASE C: YELLOW
 - 6. WORKSPACE INDICATION: INSTALL FLOOR MARKING TAPE TO SHOW WORKING CLEARANCES IN THE DIRECTION OF ACCESS TO LIVE PARTS. WORKSPACE SHALL BE AS REQUIRED BY NFPA 70 AND 29 CFR 1926.403 UNLESS OTHERWISE INDICATED. DO NOT INSTALL AT FLUSH-MOUNTED PANELBOARDS AND SIMILAR EQUIPMENT IN FINISHED SPACES.

1.3 DEMOLITION

- A. PROTECT EXISTING ELECTRICAL EQUIPMENT AND INSTALLATIONS INDICATED TO REMAIN. IF DAMAGED OR DISTURBED IN THE COURSE OF THE WORK, REMOVE DAMAGED PORTIONS AND INSTALL NEW PRODUCTS OF EQUAL CAPACITY, QUALITY, AND FUNCTIONALITY.
- B. ACCESSIBLE WORK: REMOVE EXPOSED ELECTRICAL EQUIPMENT AND INSTALLATIONS, INDICATED TO BE DEMOLISHED, IN THEIR ENTIRETY.
- C. ABANDONED WORK: CUT AND REMOVE BURIED RACEWAY AND WIRING, INDICATED TO BE ABANDONED IN PLACE, 2 INCHES BELOW THE SURFACE OF ADJACENT CONSTRUCTION. CAP RACEWAYS AND PATCH SURFACE TO MATCH EXITING FINISH.
- D. REMOVE DEMOLISHED MATERIAL FROM PROJECT SITE.
- E. REMOVE, STORE, CLEAN, REINSTALL, RECONNECT, AND MAKE OPERATIONAL COMPONENTS INDICATED FOR RELOCATION.

1.4 CUTTING AND PATCHING

- A. CUT, CHANNEL, CHASE, AND DRILL FLOORS, WALLS, PARTITIONS, CEILINGS, AND OTHER SURFACES REQUIRED TO PERMIT ELECTRICAL INSTALLATIONS. PERFORM CUTTING BY SKILLED MECHANICS OF TRADES INVOLVED.
- B. REPAIR AND REFINISH DISTURBED FINISH MATERIALS AND OTHER SURFACES TO MATCH ADJACENT UNDISTURBED SURFACES. INSTALL NEW FIREPROOFING WHERE EXISTING FIRESTOPPING HAS BEEN DISTURBED. REPAIR AND REFINISH MATERIALS AND OTHER SURFACES BY SKILLED MECHANICS OF TRADES INVOLVED.



Juneau International Airport
 City and Borough of Juneau

JNU ELECTRICAL PANEL UPGRADES

 Contract No. BE17-196

REVISION DESCRIPTION	DATE

SHEET NUMBER

E900

SCALE:
DATE: January 2017

3. CONDUCTORS AND CABLES

- 1.1 CONDUCTOR AND CABLE MATERIAL
 - A. COPPER COMPLYING WITH NEMA WC 5 OR 7; STRANDED FOR NO. 8 AWG AND LARGER.
 - B. INSULATION TYPES: TYPE THW, THHN-THWN, XHHW, USE, AND SO COMPLYING WITH NEMA WC 5 OR 7.
 - C. CABLE: ARMORED CABLE, TYPE AC; METAL-CLAD CABLE, TYPE MC; NONMETALLIC-SHEATHED CABLE, TYPE NM; AND TYPE SO: WITH GROUND WIRE.
 - 1. MC METAL-CLAD CABLE: PROVIDE INTERLOCKED STEEL OR ALUMINUM METAL CLAD CABLE WITH THHN, COLOR CODED, COPPER CONDUCTORS. THE METAL SHEATH MAY SERVE AS A SAFETY GROUND. PROVIDE THE CABLE WITH A GROUND CONDUCTOR FOR ISOLATED OR SEPARATE SAFETY GROUND. PROVIDE AN OVERALL WRAP OF MOISTURE RESISTANT COVERING MADE WITH THE INTERLOCKING METAL SHEATH. PROVIDE CONNECTORS AND SUPPORT CLAMPS SPECIFICALLY MADE FOR THIS CABLE.
- 1.2 CONDUCTOR AND INSULATION APPLICATIONS
 - A. TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 486A AND UL 486B.
 - B. MAKE SPLICES AND TAPS THAT ARE COMPATIBLE WITH CONDUCTOR MATERIAL AND THAT POSSESS EQUIVALENT OR BETTER MECHANICAL STRENGTH AND INSULATION RATINGS THAN UNSPLICED CONDUCTORS.
 - 1. USE OXIDE INHIBITOR IN EACH SPLICE AND TAP CONDUCTOR FOR ALL CONDUCTORS LOCATED IN MOIST OR CORROSIVE ENVIRONMENTS.

4. RACEWAYS

- 1.1 CONDUIT AND TUBING
 - A. RIGID STEEL CONDUIT: ANSI C80.1
 - B. IMC: ANSI C80.6
 - C. EMT AND FITTINGS: ANSI C80.3
 - 1. FITTINGS: SET-SCREW OR COMPRESSION TYPE.
 - D. FITTINGS: NEMA FB 1; COMPATIBLE WITH CONDUIT AND TUBING MATERIALS.
- 1.2 WIREWAYS:
 - A. SHEET METAL SIZED AND SHAPED AS INDICATED, NEMA 1; SCREW-COVER TYPE. INCLUDE COUPLINGS, OFFSETS, ELBOWS, EXPANSION JOINTS, ADAPTERS, HOLD-DOWN STRAPS, END CAPS, AND OTHER FITTINGS TO MATCH AND MATE WITH WIREWAYS AS REQUIRED FOR COMPLETE SYSTEM.
- 1.3 INSTALLATION
 - A. INDOORS:
 - 1. EXPOSED: EMT.
 - 2. CONCEALED: EMT.
 - 3. DAMP OR WET LOCATIONS: RIGID STEEL CONDUIT.
 - 4. BOXES AND ENCLOSURES: NEMA 250, TYPE 1.
 - B. MINIMUM RACEWAY SIZE: 1/2-INCH TRADE SIZE.
 - C. RACEWAY FITTINGS: COMPATIBLE WITH RACEWAYS AND SUITABLE FOR USE AND LOCATION.
 - 1. RIGID AND INTERMEDIATE STEEL CONDUIT: USE THREADED RIGID STEEL CONDUIT FITTINGS, UNLESS OTHERWISE INDICATED.
 - D. INSTALL EXPOSED RACEWAYS, AND RACEWAYS WITHIN ACCESSIBLE SPACES, PARALLEL OR AT RIGHT ANGLES TO NEARBY SURFACES OR STRUCTURAL MEMBERS AND FOLLOW SURFACE CONTOURS AS MUCH AS POSSIBLE.
 - 1. RUN PARALLEL OR BANKED RACEWAYS TOGETHER ON COMMON SUPPORTS.
 - 2. MAKE PARALLEL BENDS IN PARALLEL OR BANKED RUNS. USE FACTORY ELBOWS ONLY WHERE ELBOWS CAN BE INSTALLED PARALLEL; OTHERWISE, PROVIDE FIELD BENDS FOR PARALLEL RACEWAYS.
 - E. JOIN RACEWAYS WITH FITTINGS DESIGNED AND APPROVED FOR THAT PURPOSE AND MAKE JOINTS TIGHT.
 - 1. USE INSULATING BUSHINGS TO PROTECT CONDUCTORS.
 - F. TIGHTEN SET SCREWS OF THREADLESS FITTINGS WITH SUITABLE TOOLS.
 - G. TERMINATIONS:
 - 1. WHERE RACEWAYS ARE TERMINATED WITH LOCKNUTS AND BUSHINGS, ALIGN RACEWAYS TO ENTER SQUARELY AND INSTALL LOCKNUTS WITH DISHED PART AGAINST BOX. USE TWO LOCKNUTS, ONE INSIDE AND ONE OUTSIDE BOX.
 - 2. WHERE RACEWAYS ARE TERMINATED WITH THREADED HUBS, SCREW RACEWAYS OR FITTINGS TIGHTLY INTO HUB SO END BEARS AGAINST WIRE PROTECTION SHOULDER. WHERE CHASE NIPPLES ARE USED, ALIGN RACEWAYS SO COUPLING IS SQUARE TO BOX; TIGHTEN CHASE NIPPLE SO NO THREADS ARE EXPOSED.

5. BOXES, ENCLOSURES, AND CABINETS

- 1.1 SMALL SHEET METAL PULL AND JUNCTION BOXES: NEMA OS 1.
- 1.2 CAST-METAL PULL AND JUNCTION BOXES: NEMA FB 1, CAST ALUMINUM WITH GASKETED COVER.
- 1.3 HINGED-COVER ENCLOSURES: NEMA 250, TYPE 1, WITH CONTINUOUS HINGE COVER AND FLUSH LATCH.
 - A. METAL ENCLOSURES: STEEL, FINISHED INSIDE AND OUT WITH MANUFACTURER'S STANDARD ENAMEL.
- 1.4 CABINETS: NEMA 250, TYPE 1, GALVANIZED STEEL BOX WITH REMOVABLE INTERIOR PANEL AND REMOVABLE FRONT, FINISHED INSIDE AND OUT WITH MANUFACTURER'S STANDARD ENAMEL. HINGED DOOR IN FRONT COVER WITH FLUSH LATCH AND CONCEALED HINGE. KEY LATCH TO MATCH PANELBOARDS. INCLUDE METAL BARRIERS TO SEPARATE WIRING OF DIFFERENT SYSTEMS AND VOLTAGE AND INCLUDE ACCESSORY FEET WHERE REQUIRED FOR FREESTANDING EQUIPMENT.

6. PANELBOARDS

- A. PANELBOARDS (LOADCENTERS) SHALL BE SIZED AND RATED IN ACCORDANCE TO THE PANEL SCHEDULES IN THE DRAWINGS. THE BUS BARS MAY BE COPPER OR ALUMINUM. PROVIDE WITH MULTIPLE LUGS AS REQUIRED. PROVIDE A NEUTRAL TERMINAL BAR. PROVIDE A GROUND TERMINAL BAR IF GROUND CONDUCTORS ARE TERMINATED IN THE PANELBOARD. BRACE FOR 10,000 SYMMETRICAL RMS AMPERES, UNLESS OTHERWISE NOTED.
- B. SIZE THE ENCLOSURE TO ALLOW FOR ADEQUATE WIRE GUTTER SPACE. THE FRONT SHALL BE A SINGLE ELEMENT WITH A LOCKABLE DOOR. THE FRONT SHALL BE REMOVABLE ONLY WITH THE DOOR OPEN. A TYPED CIRCUIT DIRECTORY SHALL BE LOCATED INSIDE THE DOOR. PROVIDE KEYS. THE INTERIOR ASSEMBLY SHALL BE DEADFRONT WITH THE FRONT COVER REMOVED.
- C. MOUNT WITH THE TOP OF THE ENCLOSURE AT 72 INCHES ABOVE FINISHED FLOOR, UNLESS OTHERWISE NOTED. INSTALL THE PANELBOARD INTERIORS AFTER THE ENCLOSURE HAS BEEN INSTALLED.
- D. INSTALL CIRCUIT BREAKERS IN THE ORDER SPECIFIED IN THE DRAWING PANELBOARD SCHEDULES, UNLESS APPROVAL OTHERWISE IS GRANTED. TYPE THE CIRCUIT DIRECTORY WITH CIRCUIT DESCRIPTIONS AS THEY ARE SHOWN IN THE DRAWING PANELBOARD SCHEDULES. THE DIRECTORY SHALL BE CONFIGURED IDENTICALLY WITH THE CIRCUIT BREAKER CONFIGURATION.
- E. INFRARED SCANNING: AFTER SUBSTANTIAL COMPLETION, BUT NOT MORE THAN 30 DAYS AFTER FINAL ACCEPTANCE, PERFORM AN INFRARED SCAN OF EACH SWITCH. REMOVE ALL ACCESS PANELS SO JOINTS AND CONNECTIONS ARE ACCESSIBLE TO PORTABLE SCANNER:
 - 1. INSTRUMENT: USE AN INFRARED SCANNING DEVICE DESIGNED TO MEASURE TEMPERATURE OR TO DETECT SIGNIFICANT DEVIATIONS FROM NORMAL VALUES. PROVIDE CALIBRATION RECORD FOR DEVICE.
 - 2. RECORD OF INFRARED SCANNING: PREPARE A REPORT THAT IDENTIFIES SWITCHES CHECKED AND THAT DESCRIBES SCANNING RESULTS. INCLUDE NOTATION OF DEFICIENCIES DETECTED, REMEDIAL ACTION TAKEN, AND OBSERVATIONS AFTER REMEDIAL ACTION

7. SWITCHBOARD

- 1.1 MANUFACTURED UNIT
 - A. SWITCHBOARD SHALL BE FRONT-CONNECTED, FRONT-ACCESSIBLE WITH INDIVIDUALLY FIXED MAIN DEVICES, UTILITY METERING, AND ATS. BRACE FOR 10,000 SYMMETRICAL RMS AMPERES, UNLESS OTHERWISE NOTED.
 - B. THE ENCLOSURE SHALL BE NEMA 3R RATED WITH A DRIP SHIELD OVER THE DOORS. FACTORY FINISH WITH THE MANUFACTURER'S STANDARD COLOR. TREAT THE UNDERSIDE WITH CORROSION-RESISTANT COATING.
 - C. PROVIDE BARRIERS BETWEEN ADJACENT SWITCHBOARD SECTIONS.
 - D. PROVIDE INSULATION ON MAIN AND VERTICAL BUSES.
 - E. BUSES AND CONNECTIONS: THREE PHASE, FOUR WIRE.
 - 1. PHASE- AND NEUTRAL-BUS MATERIAL: TIN-PLATED, HIGH-STRENGTH, ELECTRICAL-GRADE ALUMINUM ALLOY WITH TIN-PLATED ALUMINUM CIRCUIT-BREAKER LINE CONNECTIONS.
 - 2. LOAD TERMINALS: INSULATED, RIGIDLY BRACED, RUNBACK BUS EXTENSIONS, OF SAME MATERIAL AS THROUGH BUSES, EQUIPPED WITH MECHANICAL CONNECTORS FOR OUTGOING CIRCUIT CONDUCTORS.
 - 3. GROUND BUS: MINIMUM-SIZE REQUIRED BY UL 891, HARD-DRAWN COPPER OF 98 PERCENT CONDUCTIVITY, EQUIPPED WITH MECHANICAL CONNECTORS FOR FEEDER-CIRCUIT GROUND CONDUCTORS.
 - 4. MAIN PHASE BUSES AND EQUIPMENT GROUND BUSES: UNIFORM CAPACITY FOR ENTIRE LENGTH OF SWITCHBOARD'S MAIN AND DISTRIBUTION SECTIONS.
 - 5. NEUTRAL BUSES: 50 PERCENT OF THE AMPACITY OF PHASE BUSES UNLESS OTHERWISE INDICATED, EQUIPPED WITH MECHANICAL CONNECTORS FOR OUTGOING CIRCUIT NEUTRAL CABLES.
 - F. BUS-BAR INSULATION: FACTORY-APPLIED, FLAME-RETARDANT, TAPE WRAPPING OF INDIVIDUAL BUS BARS OR FLAME-RETARDANT, SPRAY-APPLIED INSULATION. MINIMUM INSULATION TEMPERATURE RATING OF 105 DEG C.
- 1.2 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES
 - A. MOLDED-CASE CIRCUIT BREAKER (MCCB): COMPLY WITH UL 489, WITH INTERRUPTING CAPACITY TO MEET AVAILABLE FAULT CURRENTS:
 - 1. THERMAL-MAGNETIC CIRCUIT BREAKERS: INVERSE TIME-CURRENT ELEMENT FOR LOW-LEVEL OVERLOADS, AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS. ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT-BREAKER FRAME SIZES 250 A AND LARGER.
 - 2. ADJUSTABLE INSTANTANEOUS-TRIP CIRCUIT BREAKERS: MAGNETIC TRIP ELEMENT WITH FRONT-MOUNTED, FIELD-ADJUSTABLE TRIP SETTING.
 - 3. ELECTRONIC TRIP CIRCUIT BREAKERS WITH RMS SENSING; FIELD-REPLACEABLE RATING PLUG OR FIELD-REPLICABLE ELECTRONIC TRIP; AND THE FOLLOWING FIELD-ADJUSTABLE SETTINGS.
 - a. INSTANTANEOUS TRIP.
 - 4. FEATURES AND ACCESSORIES:
 - a. STANDARD FRAME SIZES, TRIP RATINGS, AND NUMBER OF POLES.
 - b. LUGS: MECHANICAL STYLE, SUITABLE FOR NUMBER, SIZE, TRIP RATINGS, AND CONDUCTOR MATERIAL.
- 1.3 INSTALLATION
 - A. INSTALL SWITCHBOARDS AND ACCESSORIES ACCORDING TO NECA 400.
 - B. ADJUST MOVING PARTS AND OPERABLE COMPONENTS TO FUNCTION SMOOTHLY, AND LUBRICATE AS RECOMMENDED BY MANUFACTURER.
 - C. SET FIELD-ADJUSTABLE CIRCUIT-BREAKER TRIP RANGES AS INDICATED.
 - D. INFRARED SCANNING: AFTER SUBSTANTIAL COMPLETION, BUT NOT MORE THAN 60 DAYS AFTER FINAL ACCEPTANCE, PERFORM AN INFRARED SCAN OF EACH SWITCH. REMOVE ALL ACCESS PANELS SO JOINTS AND CONNECTIONS ARE ACCESSIBLE TO PORTABLE SCANNER:
 - 1. INSTRUMENT: USE AN INFRARED SCANNING DEVICE DESIGNED TO MEASURE TEMPERATURE OR TO DETECT SIGNIFICANT DEVIATIONS FROM NORMAL VALUES. PROVIDE CALIBRATION RECORD FOR DEVICE.
 - 2. RECORD OF INFRARED SCANNING: PREPARE A REPORT THAT IDENTIFIES SWITCHES CHECKED AND THAT DESCRIBES SCANNING RESULTS. INCLUDE NOTATION OF DEFICIENCIES DETECTED, REMEDIAL ACTION TAKEN, AND OBSERVATIONS AFTER REMEDIAL ACTION.



Juneau International Airport
 City and Borough of Juneau

JNU ELECTRICAL PANEL UPGRADES

 Contract No. BE17-196

REVISION DESCRIPTION	DATE

SHEET NUMBER

E901

SCALE:
DATE: January 2017