

EXISTING		LOCATION:															
PANEL: LP1		CIRCUIT CODE: L - LIGHTING R - KITCHEN															
DATE: 01/11/11		M - RECEPTACLES H - ELECTRIC HEATING															
TIME: 3:49 PM		LM - LARGEST MOTOR O - MISCELLANEOUS															
BUS: 100		MOUNTING: SURFACE															
FULLY RATED AC: 10000		NEMA: 1 ENCL: 1															
NO	LOC	NO	LOC	DESCRIPTION	Q/A	Q/B	Q/C	A/B	C	Q/A	Q/B	Q/C	(NOTE)	DESCRIPTION	TRIP	TRIP	TRIP
1	H	20	1	UNIT HEATERS - S	1502	-	-	-	-	-	-	-	-	SPARE	20	1	2
3	H	20	1	UNIT HEATERS - N	1542	-	-	-	-	720	-	-	-	REC - STORAGE	20	1	4
5	20	1	SPARE											EFF-10	20	1	LM 4
7	20	1	SPARE							1000				HEAT TRACE	20	1	O 8
9	R	20	1	REC - MECHANICAL	900	-	-	-	-	-	-	-	-	SPARE	20	1	10
11	20	1	SPARE											CT CONTROLS	20	1	LM 12
13	O	20	1	MAIN PIPE RACK	1300	-	-	-	-	720				REC - MECH	20	1	R 14
15	O	20	1	MAIN PIPE RACK	1300	-	-	-	-	720				REC - MECH	20	1	R 16
17	O	20	1	MAIN PIPE RACK	1300	-	-	-	-	720				REC - MECH	20	1	R 18
19	20	1	SPARE							540				LTG REC - TOWERS	20	1	L 20
21	20	1	SPARE											SPARE	20	1	22
23	20	1	SPARE											MECH LITS	20	1	L 24
25	20	1	SONOXIDE UNIT CONTROL VALVES	1000	-	-	-	-	-	-				SPARE	20	1	26
27	20	1	SONOXIDE	1000	-	-	-	-	-	-				SPARE	20	1	28
29	20	1	MMA HEAT TRACE	1000	-	-	-	-	-	-				SPARE	20	1	30
31	2													SPARE	20	1	32
33	H	20	1	NEW HEAT TRACE	1800	-	-	-	-	-				SPARE	20	1	34
35	H	20	1	NEW HEAT TRACE	1800	-	-	-	-	-				SPARE	20	1	36
37	H	20	1	NEW HEAT TRACE	1800	-	-	-	-	-				SPARE	20	1	38
39	50	SPARE												SPARE	20	1	40
41	2													SPARE	20	1	42

PANEL LP1 LOAD CALCULATION

LIGHTING	1,400	VOLTAMPS x 1.25	=	1,750	VOLTAMPS
RECEPTACLES - 1ST 10KVA	3,780	VOLTAMPS x 1.00	=	3,780	VOLTAMPS
RECEPTACLES - BALANCE	0	VOLTAMPS x 0.50	=	0	VOLTAMPS
LARGEST MOTOR LOAD	2,368	VOLTAMPS x 1.25	=	2,960	VOLTAMPS
BALANCE OF MOTOR LOADS	0	VOLTAMPS x 1.00	=	0	VOLTAMPS
KITCHEN EQUIPMENT	0	VOLTAMPS x 1.00	=	0	VOLTAMPS
ELECTRIC HEATING EQUIPMENT	8,334	VOLTAMPS x 1.00	=	8,334	VOLTAMPS
MISC LOADS	7,400	VOLTAMPS x 1.00	=	7,400	VOLTAMPS
TOTAL CALCULATED DEMAND LOAD = 24,224 VOLTAMPS					
FULL LOAD AMPS = 67.2					

EXISTING		LOCATION:															
PANEL: MCC-P1		CIRCUIT CODE: L - LIGHTING R - KITCHEN															
DATE: 2/16/10 2:53 PM		M - RECEPTACLES H - ELECTRIC HEATING															
TIME:		LM - LARGEST MOTOR O - MISCELLANEOUS															
BUS: 600		MOUNTING: SURFACE															
FULLY RATED AC: 50		NEMA: 1 ENCL: 1															
NO	LOC	NO	LOC	DESCRIPTION	Q/A	Q/B	Q/C	A/B	C	Q/A	Q/B	Q/C	(NOTE)	DESCRIPTION	TRIP	TRIP	TRIP
1	20	PR-7			2106	-	-	-	-	11085				PR-3	80	2	2
3	3				2106	-	-	-	-	11085							4
5	3									11085							6
7	15	FCU-P2			720	-	-	-	-	498				FCU-P1	15	8	8
9	3				720	-	-	-	-	498							10
13	15	FCU-P2			387	-	-	-	-	9425			1	CT-1	80	14	14
15	3				387	-	-	-	-	9425			1				16
17	3									9425			1				18
19	15	FCU-P1			498	-	-	-	-	14410				CT-2	100	20	20
21	3				498	-	-	-	-	14410							22
23	3									14410							24
25	15	PR-1			1330	-	-	-	-	11085				PR-4	80	3	26
27	3				1330	-	-	-	-	11085							28
29	3									11085							30
31	15	PR-2			720	-	-	-	-	942				EFF-8	15	32	32
33	3				720	-	-	-	-	942							34
35	30	EFF-7			3879	-	-	-	-	498				FCU-P1	15	36	36
39	3				3879	-	-	-	-	498							38
41	3									498				FCU-P2	15	40	40
43	30	NEW UNIT HTR			6000	-	-	-	-	387							44
45	3				6000	-	-	-	-	387							46
47	3									387				PANEL LP1	100	50	50
										6027							52
										6027							54

PANEL MCC-P1 LOAD CALCULATION

LIGHTING	0	VOLTAMPS x 1.25	=	0	VOLTAMPS
RECEPTACLES - 1ST 10KVA	0	VOLTAMPS x 1.00	=	0	VOLTAMPS
RECEPTACLES - BALANCE	0	VOLTAMPS x 0.50	=	0	VOLTAMPS
LARGEST MOTOR LOAD	0	VOLTAMPS x 1.25	=	0	VOLTAMPS
BALANCE OF MOTOR LOADS	0	VOLTAMPS x 1.00	=	0	VOLTAMPS
KITCHEN EQUIPMENT	0	VOLTAMPS x 1.00	=	0	VOLTAMPS
ELECTRIC HEATING EQUIPMENT	0	VOLTAMPS x 1.00	=	0	VOLTAMPS
MISC LOADS	0	VOLTAMPS x 1.00	=	0	VOLTAMPS
TOTAL CALCULATED DEMAND LOAD = 222,598 VOLTAMPS					
FULL LOAD AMPS = 267.8					

GENERAL NOTES

- DO NOT SCALE DRAWINGS. VERIFY DIMENSIONS IN FIELD PRIOR TO COMMENCEMENT OF WORK.
- FINAL CONNECTIONS & ROUGH-IN REQUIREMENTS TO EQUIPMENT SHALL BE PER MANUFACTURER'S APPROVED WIRING DIAGRAMS, DETAILS AND INSTRUCTIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE MATERIALS AND EQUIPMENT COMPATIBLE WITH EQUIPMENT ACTUALLY SUPPLIED.
- CONTRACTOR SHALL REVIEW ARCHITECTURAL, STRUCTURAL, MECHANICAL AND OTHER DRAWINGS PRIOR TO BID.
- CONTRACTOR SHALL VISIT SITE PRIOR TO BID AND VERIFY THAT CONDITIONS ARE AS INDICATED. CONTRACTOR SHALL REPORT DISCREPANCIES TO THE ARCHITECT AND INCLUDE IN HIS BID ALL COSTS REQUIRED TO MAKE HIS WORK MEET EXISTING CONDITIONS.
- PROPOSED SUBSTITUTIONS OF ELECTRICAL EQUIPMENT OR REQUEST FOR "OR EQUAL" OR "APPROVED EQUAL" LISTING SHALL BE SUBMITTED TO ARCHITECT NOT LESS THAN TEN (10) WORKING DAYS PRIOR TO BID.
- WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER TO THE SATISFACTION OF THE ARCHITECT.
- WORK, MATERIALS AND EQUIPMENT SHALL CONFORM TO THE LATEST EDITIONS OF LOCAL, STATE, AND NATIONAL CODES AND ORDINANCES.
- PROVIDE PERMITS AND INSPECTIONS REQUIRED.
- PROVIDE RECORD DRAWINGS TO ARCHITECT. DRAWINGS SHALL INCLUDE ALL ADDENDUM ITEMS, CHANGE ORDERS, ALTERATIONS, REROUTINGS, ETC.
- VERIFY EXACT LOCATION OF EQUIPMENT TO BE FURNISHED BY OTHERS PRIOR TO ROUGH-IN.
- SYSTEMS SHALL BE TESTED FOR PROPER OPERATION. IF TESTS SHOW THAT WORK IS DEFECTIVE, CONTRACTOR SHALL MAKE CORRECTIONS NECESSARY AT NO COST TO OWNER.
- SYSTEM OUTAGES SHALL BE PERMITTED ONLY AT TIMES APPROVED BY OWNER, IN WRITING. WORK WHICH COULD RESULT IN AN ACCIDENTAL OUTAGE (BEYOND BRANCH CIRCUITS) SHALL BE PERFORMED WITH THE OWNER'S MAINTENANCE PERSONNEL ADVISED OF SUCH WORK. ALL OUTAGES REQUIRE A DETAILED "MOP" STATING TIME, DATE AND DURATION. THIS MUST BE PRESENTED AT LEAST FOURTEEN DAYS PRIOR TO OUTAGE FOR REVIEW AND APPROVAL.
- CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING EQUIPMENT WHICH IS DAMAGED DUE TO INCORRECT FIELD WIRING PROVIDED UNDER THIS SECTION OR FACTORY WIRING IN EQUIPMENT PROVIDED UNDER THIS SECTION.
- CONTRACTOR'S FAILURE TO ORDER OR RELEASE ORDER FOR MATERIALS AND/OR EQUIPMENT WILL NOT BE ACCEPTED AS A REASON TO SUBSTITUTE ALTERNATE MATERIALS OR EQUIPMENT.
- SYSTEMS SHALL BE COMPLETE, OPERABLE AND READY FOR CONTINUOUS OPERATION. SWITCHES, RECEPTACLES, MOTORS, ETC., SHALL BE CONNECTED AND OPERABLE.
- PROVIDE MAINTENANCE RECEPTACLE WITHIN 25'-0" OF ALL MECHANICAL OR MOTORIZED EQUIPMENT.
- BE AS DIRECTED BY OWNER. DIRECTORIES SHALL BE TYPED AND INSTALLED UNDER CLEAR PLASTIC COVERS.
- EXISTING ELECTRICAL EQUIPMENT, ETC., BEING REMOVED SHALL BE RETURNED TO THE OWNER, EXCEPT FOR THOSE ITEMS BEING RELOCATED.
- CONTRACTOR SHALL PROVIDE NEW UPDATED PANELBOARD DIRECTORIES FOR EXISTING AND NEW CIRCUITS BEING UTILIZED FOR COMPLETION OF PROJECT. PROVIDE DIRECTORIES TO OWNER FOR APPROVAL. ROOM NAMES AND NUMBERS SHALL BE INCLUDED IN DESCRIPTION.
- ALL WIRING SHALL BE INSTALLED IN LISTED METALLIC RACEWAYS. RACEWAYS IN SLAB-ON-GRADE OR BELOW GRADE SHALL BE SCHEDULE 40 PVC. TRANSITIONS FROM BELOW TO ABOVE GRADE SHALL BE WITH RIGID STEEL ELBOWS WITH P.V.C. JACKET.
- NON-METALLIC AND FLEXIBLE METAL CONDUITS SHALL HAVE A CODE SIZED COPPER GROUNDING CONDUCTOR. INCREASE CONDUIT SIZE AS REQUIRED.
- ALL ELECTRICAL SYSTEMS COMPONENTS SHALL BE LISTED OR LABELED BY U.L.
- WIRE TERMINATION PROVISIONS FOR PANELBOARDS, CIRCUIT BREAKERS, SAFETY SWITCHES, AND ALL OTHER ELECTRICAL APPARATUS SHALL BE LISTED AS SUITABLE FOR 75°C.

SYMBOL LIST

- GRND INDICATES GROUND
- PNL INDICATES PANEL
- WP INDICATES WEATHER-PROOF (NEMA 3R)
- XFMR INDICATES TRANSFORMER
- ⊙ JUNCTION BOX
- ⊞ NON-FUSED DISCONNECT SWITCH - 30A, 3P, UNLESS NOTED OTHERWISE
- SURFACE MOUNTED PANELBOARD
- ▨ MAIN SWITCHBOARD, MOTOR CONTROL CENTER OR DISTRIBUTION BOARD
- ⊞ FUSED NEMA 3R DISCONNECT SWITCH
- T TRANSFORMER
- MOTOR OUTLET
- HOMERUN CONDUIT - STROKES INDICATE QUANTITY OF CONDUCTORS
- CONDUIT AND/OR WIRE CONCEALED IN WALL OR ABOVE CEILING EXCEPT IN EXPOSED STRUCTURE AREAS
- CONDUIT AND/OR WIRE BELOW FLOOR OR GRADE
- EXISTING CONDUIT AND/OR WIRE TO BE REMOVED
- EXISTING CONDUIT AND/OR WIRE TO REMAIN (SHOWN LIGHT LINEWEIGHT)
- CONDUIT STUB-OUT
- 1/2"-2 #12 & 1 #12 GRND THWN UNLESS NOTED
- 1/2"-3 #12 & 1 #12 GRND THWN UNLESS NOTED
- 1/2"-4 #12 & 1 #12 GRND THWN UNLESS NOTED
- CIRCUIT BREAKER
- FUSIBLE SWITCH
- GROUNDING ELECTRODE
- SINGLE METER WITH CT
- SHUNT TRIP DEVICE LOCATED IN METAL ENCLOSURE WITH HINGED AND LOCKABLE COVER
- MECHANICAL EQUIPMENT - SEE HVAC AND PLUMBING DRAWINGS
- GROUND BUS & GROUND ELECTRODES

SHEET INDEX

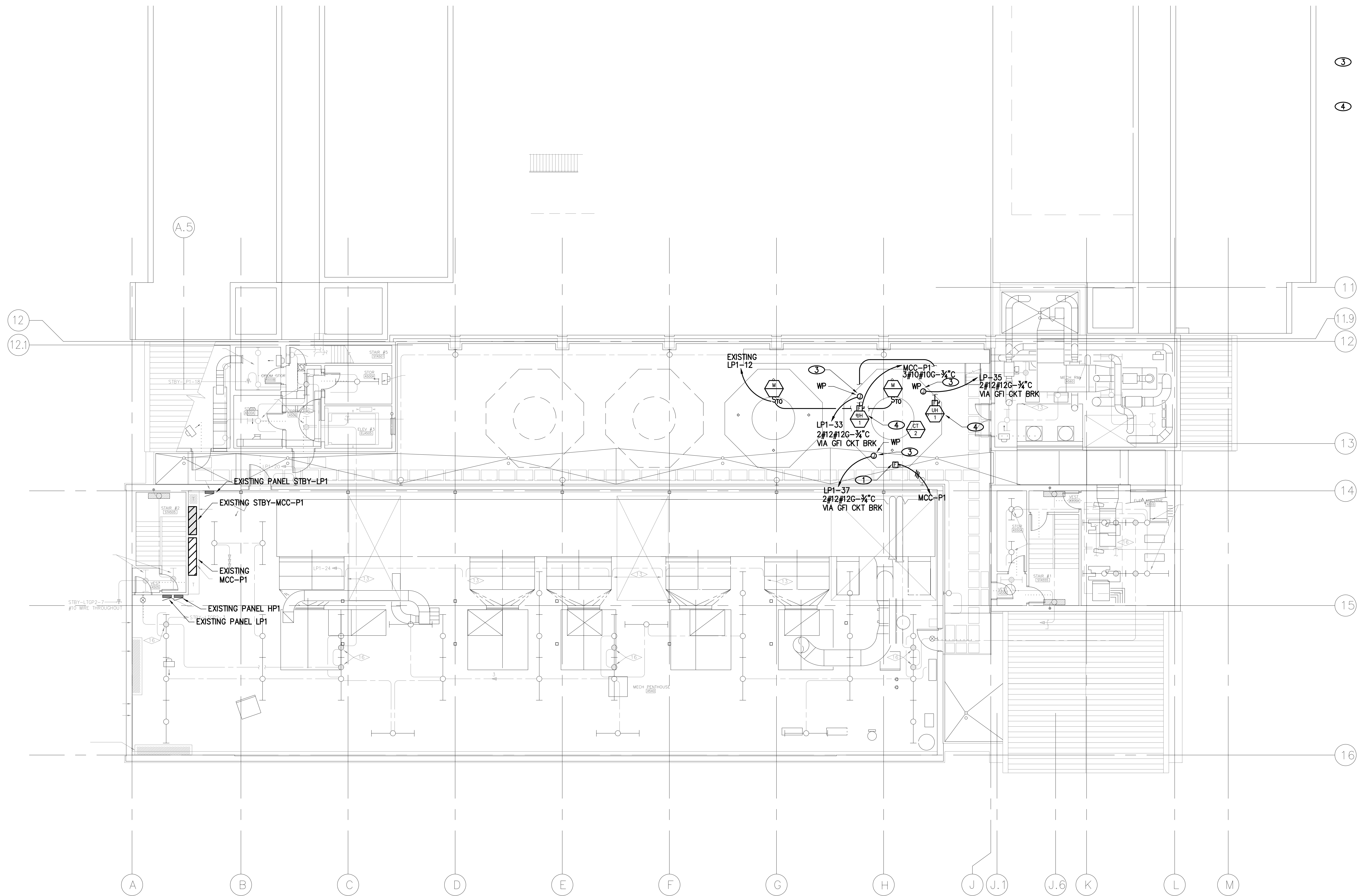
SHEET NUMBER	SHEET DESCRIPTION
E-001	GENERAL NOTES, SYMBOLS LIST, SHEET INDEX & PANEL SCHEDULES
E-101	OVERALL ELECTRICAL PLAN
E-102	ONE-LINE DIAGRAM

CHECKED BY: X
 DATE: 11/22/2010
 DRAWN BY: X
 DATE: 11/22/10
 100% BID DOCUMENTS

JCA
 13772 Denver W Pkwy
 Suite 200
 Lakewood, CO 80401
 p.303.985.3260

MCDB - NORTH COOLING TOWER REPLACEMENT - CU PRO05187

COVER SHEET & PANEL SCHEDULES



- NOTES**
- ① EXISTING 100A 3P NEMA 3R FUSED DISCONNECT FEEDING COOLING TOWER CONNECTION SHALL BE DISCONNECTED TO ALLOW FOR NEW TOWER REPLACEMENT RECONNECT NEW TOWER, PROVIDE NEW 3#1CU, #8 CU GRD-1 1/2" C FROM EXISTING SWITCH TO NEW TOWER LOCATION. FUSE PER MANUFACTURE'S REQUIREMENT.
 - ② EXISTING 110 VOLT CONNECTION FOR SOLENOID, CONTROLS AND CONTROL PANEL SHALL BE DISCONNECTED, TO ALLOW FOR REMOVAL OF EXISTING TOWER, EXISTING CIRCUIT SHALL BE EXTENDED TO NEW TOWER AFTER INSTALL.
 - ③ JUNCTION BOX FOR CONNECTION OF HEAT TAPE, VERIFY EXACT LOCATION WITH M.C. PROVIDE FINAL CONNECTION, HEAT TYPE & CONTROLS BY M.C.
 - ④ ELECTRIC UNIT HEATER 9kw 480V 3P 3#10#10G 3/4" C M3R FUSED DISCONNECT SWITCH FUSED PER MFR REQUIREMENTS

ELECTRICAL - PLAN
SCALE: 1/8" = 1'-0"

CHECKED BY	DATE
REVISION	11-22-2010
100% BID DOCUMENTS	
DRAWN BY	
DATE	11/22/10

JCAA
CONSULTING
ENGINEERS, LLC

13772 Denver W Pkwy
Suite 200
Lakewood, CO 80401
p.303.985.3260

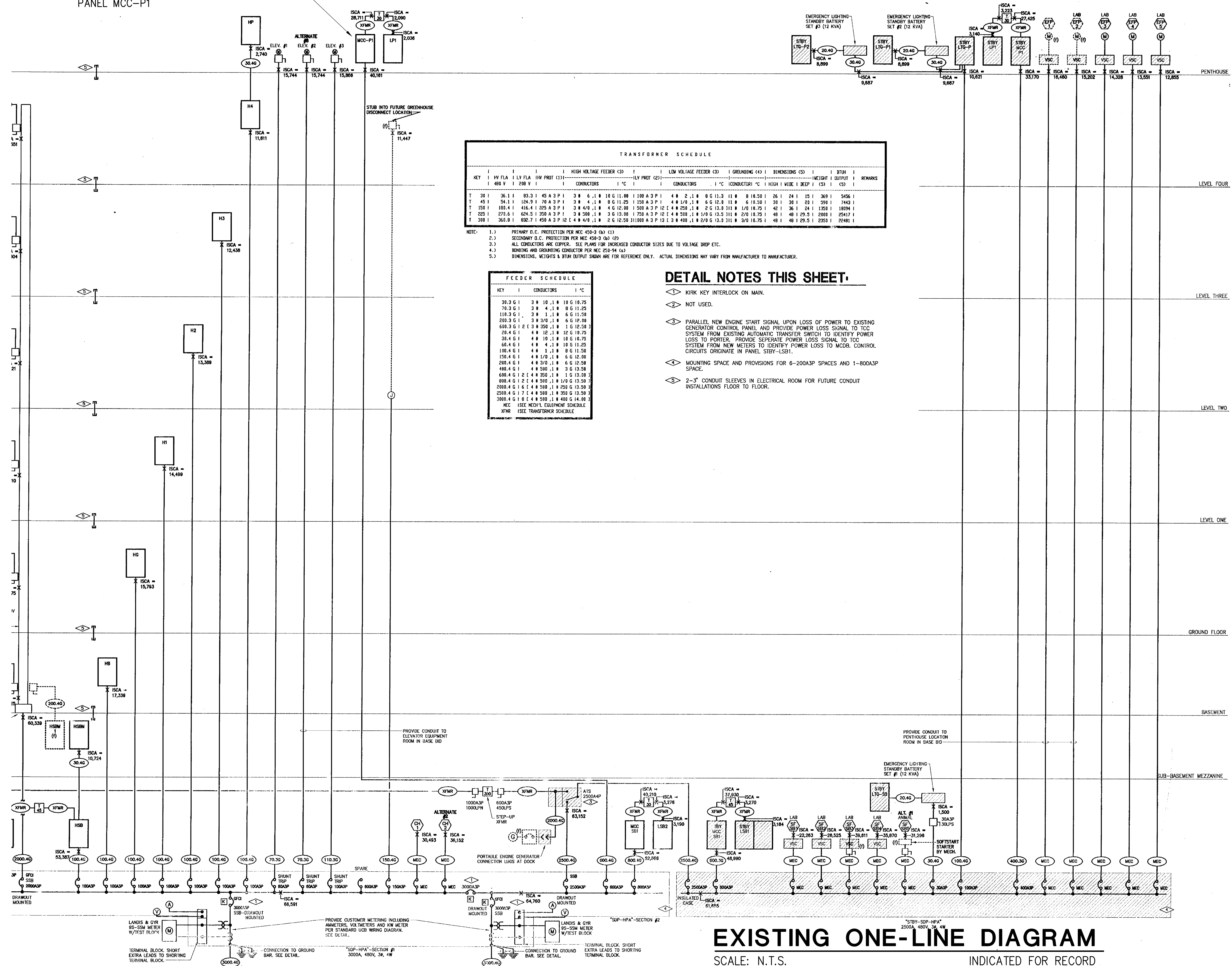
MCDB - NORTH COOLING TOWER REPLACEMENT - CU PR005187

ELECTRICAL PLAN

SHEET NO.

JOB NO. # 09.1131

EXISTING COOLING TOWER TO BE DISCONNECTED AND NEW TOWER SHALL BE RECONNECTED TO PANEL MCC-P1



TRANSFORMER SCHEDULE

KEY	HP	FLA	LV FLA	HP PROF	HIGH VOLTAGE FEEDER (3)	LV PROF (2)	LOW VOLTAGE FEEDER (3)	GROUNDING (4)	DIMENSIONS (3)	STUB	REMARKS			
1	2	3	4	5	6	7	8	9	10	11	12			
T 20	36.1	80.3	145	A 3 P 1	3 # 6, 1 # 10 G 11.80	100 A 3 P 1	4 # 2, 1 # 8 G 11.3	11 # 8	8 1/2 x 50	24	15	369	5456	
T 45	54.1	124.9	20	A 3 P 1	3 # 4, 1 # 8 G 11.25	100 A 3 P 1	4 # 1/0, 1 # 6 G 12.0	11 # 8	6 1/2 x 50	30	23	598	7443	
T 150	183.4	416.4	225	A 3 P 1	3 # 4/0, 1 # 4 G 12.00	1500 A 3 P 1	2 # 2 G 13.3	11 # 8	1/0 18.75	42	36	24	1504	1824
T 225	273.6	624.5	250	A 3 P 1	3 # 500, 1 # 3 G 13.00	1750 A 3 P 1	2 # 2 G 13.3	11 # 8	2/0 18.75	48	40	29.5	2880	2547
T 300	360.8	827.7	450	A 3 P 1	2 # 4/0, 1 # 2 G 12.50	31500 A 3 P 1	2 # 2 G 13.3	11 # 8	3/0 18.75	48	40	29.5	2200	2240

NOTE:
 1.1 PRIMARY O.C. PROTECTION PER NEC 450-3 (b) (1)
 2.2 SECONDARY O.C. PROTECTION PER NEC 450-3 (b) (2)
 3.3 ALL CONDUCTORS ARE COPPER. SEE PLANS FOR INCREASED CONDUCTOR SIZES DUE TO VOLTAGE DROP ETC.
 4.3 BONDING AND GROUNDING CONDUCTOR PER NEC 250-94 (4)
 5.3 DIMENSIONS, WEIGHTS & STUB OUTPUT SHOWN ARE FOR REFERENCE ONLY. ACTUAL DIMENSIONS MAY VARY FROM MANUFACTURER TO MANUFACTURER.

FEEDER SCHEDULE

KEY	CONDUCTORS	1 °C
30.3 G 1	3 # 10, 1 # 10 G 12.75	
70.3 G 1	3 # 4, 1 # 8 G 11.25	
110.3 G 1	3 # 1, 1 # 8 G 11.50	
200.3 G 1	3 # 3/0, 1 # 6 G 12.00	
600.3 G 1	2 # 3 # 550, 1 # 1 G 12.50	
20.4 G 1	4 # 12, 1 # 12 G 12.75	
30.4 G 1	4 # 10, 1 # 10 G 12.75	
60.4 G 1	4 # 4, 1 # 10 G 11.25	
100.4 G 1	4 # 1, 1 # 8 G 11.50	
150.4 G 1	4 # 1/0, 1 # 6 G 12.00	
200.4 G 1	4 # 3/0, 1 # 6 G 12.50	
400.4 G 1	4 # 500, 1 # 3 G 13.50	
600.4 G 1	2 # 4 # 350, 1 # 1 G 13.50	
800.4 G 1	2 # 4 # 500, 1 # 1/0 G 13.50	
2000.4 G 1	6 # 4 # 500, 1 # 250 G 13.50	
2500.4 G 1	7 # 4 # 500, 1 # 350 G 13.50	
3000.4 G 1	8 # 4 # 500, 1 # 400 G 14.00	

DETAIL NOTES THIS SHEET:

- ◊ KIRK KEY INTERLOCK ON MAIN.
- ◊ NOT USED.
- ◊ PARALLEL NEW ENGINE START SIGNAL UPON LOSS OF POWER TO EXISTING GENERATOR CONTROL PANEL AND PROVIDE POWER LOSS SIGNAL TO TCC SYSTEM FROM EXISTING AUTOMATIC TRANSFER SWITCH TO IDENTIFY POWER LOSS TO PORTER. PROVIDE SEPARATE POWER LOSS SIGNAL TO TCC SYSTEM FROM NEW PANELS TO IDENTIFY POWER LOSS TO MCCB. CONTROL CIRCUITS ORIGINATE IN PANEL STBY-LSB1.
- ◊ MOUNTING SPACE AND PROVISIONS FOR 6-200A3P SPACES AND 1-800A3P SPACE.
- ◊ 2"-3" CONDUIT SLEEVES IN ELECTRICAL ROOM FOR FUTURE CONDUIT INSTALLATIONS FLOOR TO FLOOR.

EXISTING ONE-LINE DIAGRAM
 SCALE: N.T.S. INDICATED FOR RECORD

CHECKED BY X DATE 02-01-2011
 REVISIONS
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 DRAWN BY X DATE 02/01/11

JCAA
 CONSULTING
 ENGINEERS
 13772 Denver W Pkwy
 Suite 200
 Lakewood, CO 80401
 p.303.985.3260

MCDB - NORTH COOLING TOWER REPLACEMENT - CU PRO05187
ONE LINE DIAGRAM
 SHEET NO. **E-102**
 JOB NO. # 09.1131