EXISTING PANEL TO BE REUSED — H

LIGHTING PANELBOARD

REMARKS
1. E – EXISTING BRANCH CIRCUIT TO BE REUSED.
2. E.C. TO MAKE FINIAL CONNECTIONS TO OWNER SUPPLIED EQUIPMENT
3. ALL LIGHTING CONTROLLED BY MOTION SWITCHES
4. HVAC EQUIPMENT TO BE PROTECTED W/ HACR TYPE CIRCUIT BREAKERS
5. VERIFY ALL CIRCUIT BREAKERS SIZES REQUIRED FOR OWNERS EQUIPMENT

NEW 200 AMP MCB — 100 AMP BUS
480 VOLT P–P — NEMA 1
277 VOLT P–N — CU. BUS
3 PHASE — GRND BAR
4 WIRE — SURFACE MTD
22000 AIC SYMMETRICAL — 22 K RATED CBS

C PH (AMP)	B PH (AMP)	A PH (AMP)	N (AMP)	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CKT BKR AMP /P	NO	NO	CKT BKR AMP /P	WIRE	DESCRIPTION	TYPE	LOAD (VA)	N (AMP)	A PH (AMP)	B PH (AMP)	C PH (AMP)
		21.2	0.0	17654	AC	E – RTU	#8	40 /3	1	2	50 /3	#6	E – TRANSFORMER	SF	30000	0.0	36.1		
	21.2		0.0	0	AC		---		3	4		---		SF	0	0.0		36.1	
21.2		0.0	0.0	0	AC		---		5	6		---		SF	0	0.0	0.0		36.1
	0.0	17.8	0.0	14798	AC	NEW RTU–1	#12	20 /3	7	8	/1	---	SPACE ONLY		0	0.0	0.0	0.0	
	17.8	0.0	0.0	0	AC		---		9	10	/1	---	SPACE ONLY		0	0.0	0.0	0.0	
17.8	0.0		0.0	0	AC		---		11	12	/1	---	SPACE ONLY		0	0.0		0.0	0.0
		0.0	0.0	0		SPACE ONLY	---	/1	13	14	/1	---	SPACE ONLY		0	0.0	0.0		
	0.0		0.0	0		SPACE ONLY	---	/1	15	16	/1	---	SPACE ONLY		0	0.0		0.0	
0.0		0.0	0.0	0		SPACE ONLY	---	/1	17	18	/1	---	SPACE ONLY		0	0.0	0.0		0.0
	0.0	0.0	0.0	0		SPACE ONLY	---	/1	19	20	/1	---	SPACE ONLY		0	0.0	0.0	0.0	
	0.0	0.0	0.0	0		SPACE ONLY	---	/1	21	22	/1	---	SPACE ONLY		0	0.0	0.0	0.0	
0.0	0.0		0.0	0		SPACE ONLY	---	/1	23	24	/1	---	SPACE ONLY		0	0.0		0.0	0.0
		0.0	0.0	0			---					---			0	0.0	0.0		
	0.0		0.0	0			---					---			0	0.0		0.0	
0.0		0.0	0.0	0			---					---			0	0.0	0.0		0.0
	0.0	0.0	0.0	0			---					---			0	0.0	0.0	0.0	
	0.0	0.0	0.0	0			---					---			0	0.0	0.0	0.0	
0.0	0.0		0.0	0			---					---			0	0.0		0.0	0.0
		0.0	0.0	0			---					---			0	0.0	0.0		
	0.0		0.0	0			---					---			0	0.0		0.0	
0.0		0.0	0.0	0			---					---			0	0.0	0.0		0.0

CONNECTED LOADS

C PH (AMP)	B PH (AMP)	A PH (AMP)	N (AMP)	LOAD (VA)	TYPE	DESCRIPTION
0.0	0.0	0.0	0.0	0	HT	ELECTRIC HEAT
39.0	39.0	39.0	0.0	32453	AC	A/C REFRIGERATION
0.0	0.0	0.0	0.0	0	MM	MISC. MOTORS
0.0	0.0	0.0	0.0	0	WH	WATER HEATING
0.0	0.0	0.0	0.0	0	OL	OUTDOOR LIGHTING
0.0	0.0	0.0	0.0	0	LT	INDOOR LIGHTING
0.0	0.0	0.0	0.0	0	RP	RECEPTACLES
0.0	0.0	0.0	0.0	0	EX	EXISTING DEMAND
0.0	0.0	0.0	0.0	0	MC	MISC. CONTINUOUS
0.0	0.0	0.0	0.0	0	MN	MISC. NON–CONTINU'S
0.0	0.0	0.0	0.0	0	KT	KITCHEN EQUIPMENT
36.1	36.1	36.1	0.0	30000	SF	SUB–FEED
75.1	75.1	75.1	0.0	62453		*** TOTAL ***
21.2	21.2	21.2		17654		LARGEST MOTOR

NEC COMPUTED LOADS

0

NEC FCTR	DESCRIPTION	TYPE	LOAD (VA)	N (AMP)	A PH (AMP)	B PH (AMP)	C PH (AMP)
	0	0					
0.00	ELECTRIC HEAT	HT	0	0.0	0.0	0.0	0.0
1.00	A/C REFRIGERATION	AC	32453	0.0	39.0	39.0	39.0
1.00	MISC. MOTORS	MM	0	0.0	0.0	0.0	0.0
1.00	WATER HEATING	WH	0	0.0	0.0	0.0	0.0
1.25	OUTDOOR LIGHTING	OL	0	0.0	0.0	0.0	0.0
1.25	INDOOR LIGHTING	LT	0	0.0	0.0	0.0	0.0
220–13	RECEPTACLES	RP	0	0.0	0.0	0.0	0.0
1.25	EXISTING DEMAND	EX	0	0.0	0.0	0.0	0.0
1.25	MISC. CONTINUOUS	MC	0	0.0	0.0	0.0	0.0
1.00	MISC. NON–CONTINU'S	MN	0	0.0	0.0	0.0	0.0
0.65	KITCHEN EQUIPMENT	KT	0	0.0	0.0	0.0	0.0
1.00	SUB–FEED	SF	30000	0.0	36.1	36.1	36.1
	FEED–THRU		0	0.0	0.0	0.0	0.0
0.25	LARGEST MOTOR	0	4414	0.0	5.3	5.3	5.3
	*** TOTAL ***		66866	0.0	80.4	80.4	80.4

EXISTING PANEL TO REMAIN – REUSE — L

LIGHTING PANELBOARD

REMARKS
1. EXISTING PANEL – REUSE EXISTING BRNAHC CIRCUITS INDICATED W/ "E"
2. LABLE ALL BRANCH CIRCUITS AND PANEL BOARD
3. "NEW" NEW BRANCH CIRCUITS AND CIRCUIT BREAKER TO BE INSTALLED
4. VERIFY ALL EQUIPMENT CONNECTION WITH MECHANICAL CONTRACTOR
5. HVAC EQUIPMENT TO BE PROTECTED W/ HACR TYPE CIRCUIT BREAKERS

100 AMP MCB — 100 AMP BUS
208 VOLT P–P — CU BUSS
120 VOLT P–N — GRND BUS
3 PHASE — NEMA 1
4 WIRE — SURFACE
22000 AIC SYMMETRICAL — MOUNTED

C PH (AMP)	B PH (AMP)	A PH (AMP)	N (AMP)	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CKT BKR AMP /P	NO	NO	CKT BKR AMP /P	WIRE	DESCRIPTION	TYPE	LOAD (VA)	N (AMP)	A PH (AMP)	B PH (AMP)	C PH (AMP)
		5.2	5.2	625	LT	E – LIGHTS	#12	20 /1	1	2	20 /1	#12	E – RECPT.	RP	900	7.5	7.5		
	11.2		11.2	1350	LT	E – LIGHTS	#12	20 /1	3	4	20 /1	#12	E – RECPT.	RP	1080	9.0		9.0	
5.4			5.4	650	LT	E – LIGHTS	#12	20 /1	5	6	20 /1	#12	E – RECPT.	RP	900	7.5	0.0		7.5
		9.4	9.4	1125	LT	E – LIGHTS	#12	20 /1	7	8	20 /1	#12	E – RECPT.	RP	1260	10.5	10.5	0.0	
	9.4	0.0	9.4	1125	LT	E – LIGHTS	#12	20 /1	9	10	20 /1	#12	E – RECPT.	RP	1260	10.5	0.0	10.5	
7.5			7.5	900	LT	E – LIGHTS	#12	20 /1	11	12	20 /1	#12	E – RECPT.	RP	1260	10.5		0.0	10.5
		2.5	2.5	300	LT	E – LIGHTS	#12	20 /1	13	14	20 /1	#12	E – RECPT.	RP	1080	9.0	9.0		
	8.2		8.2	988	LT	NEW LIGHTS	#12	20 /1	15	16	20 /1	#12	E – RECPT.	RP	1260	10.5		10.5	
6.2		0.0	6.2	750	LT	NEW LIGHTS	#12	20 /1	17	18	20 /1	#12	E – TTB RECPT.	MC	1260	10.5	0.0		10.5
		6.2	6.2	750	LT	NEW LIGHTS	#12	20 /1	19	20	20 /1	#12	E – ROOF GFI RECPT.	RP	1260	10.5	10.5	0.0	
	6.0		6.0	720	LT	NEW LIGHTS	#12	20 /1	21	22	30 /2	#10	E – WATER HEATER	WH	2250	0.0	0.0	10.8	
5.0			5.0	600	LT	NEW LIGHTS	#12	20 /1	23	24		---		WH	0	0.0		0.0	10.8
		3.7	3.7	444	LT	NEW LIGHTS	#12	20 /1	25	26	20 /1	#12	NEW OFFICE RECPT.	RP	720	6.0	6.0		
	3.0		3.0	360	MC	NEW EGRESS LIGHTS	#12	20 /1	27	28	20 /1	#12	NEW STUDIO RECPT.	RP	540	4.5		4.5	
1.5		0.0	1.5	180	RP	NEW ROOF GFI RECPT.	#12	20 /1	29	30	20 /1	#12	NEW STORAGE RM RECPT.	RP	720	6.0	0.0		6.0
	0.0		0.0	0		SPACE	---	/1	31	32	20 /1	#12	NEW STORAGE RM RECPT.	RP	720	6.0	6.0	0.0	
0.0		0.0	0.0	0		SPACE	---	/1	33	34	20 /1	#12	NEW SALES RECPT.	RP	540	4.5	0.0	4.5	
	0.0		0.0	0		SPACE	---	/1	35	36	20 /1	#12	NEW SALES RECPT.	RP	180	1.5		0.0	1.5
0.0		0.0	0.0	0		SPACE	---	/1	37	38	20 /1	#12	NEW SALES RECPT.	RP	720	6.0	6.0		
	4.2		4.2	500	RP	E – STORE SYSTEMS	#12	20 /1	39	40	/1	---	SPACE ONLY		0	0.0		0.0	
12.5		0.0	12.5	1500	OL	E – EXT. LOGHTING	#12	20 /1	41	42	20 /1	#12	E – EGRESS LIGHTING	MC	300	2.5	0.0		2.5

CONNECTED LOADS

C PH (AMP)	B PH (AMP)	A PH (AMP)	N (AMP)	LOAD (VA)	TYPE	DESCRIPTION
0.0	0.0	0.0	0.0	0	HT	ELECTRIC HEAT
0.0	0.0	0.0	0.0	0	AC	A/C REFRIGERATION
0.0	0.0	0.0	0.0	0	MM	MISC. MOTORS
10.8	10.8	0.0	0.0	2250	WH	WATER HEATING
12.5	0.0	0.0	12.5	1500	OL	OUTDOOR LIGHTING
24.1	34.8	27.0	34.8	10327	LT	INDOOR LIGHTING
27.0	43.1	55.5	55.5	15080	RP	RECEPTACLES
0.0	0.0	0.0	0.0	0	EX	EXISTING DEMAND
13.0	3.0	0.0	13.0	1920	MC	MISC. CONTINUOUS
0.0	0.0	0.0	0.0	0	MN	MISC. NON–CONTINU'S
0.0	0.0	0.0	0.0	0	KT	KITCHEN EQUIPMENT
0.0	0.0	0.0	0.0	0	SF	SUB–FEED
87.4	91.8	82.5	82.5	31077		*** TOTAL ***
0.0	0.0	0.0		0		LARGEST MOTOR

NEC COMPUTED LOADS

0

NEC FCTR	DESCRIPTION	TYPE	LOAD (VA)	N (AMP)	A PH (AMP)	B PH (AMP)	C PH (AMP)
	0	0					
0.00	ELECTRIC HEAT	HT	0	0.0	0.0	0.0	0.0
1.00	A/C REFRIGERATION	AC	0	0.0	0.0	0.0	0.0
1.00	MISC. MOTORS	MM	0	0.0	0.0	0.0	0.0
1.00	WATER HEATING	WH	2250	0.0	0.0	10.8	10.8
1.25	OUTDOOR LIGHTING	OL	1875	15.6	0.0	0.0	15.6
1.25	INDOOR LIGHTING	LT	12909	43.5	33.8	43.5	30.2
220–13	RECEPTACLES	RP	12540	46.2	46.2	35.9	22.5
1.25	EXISTING DEMAND	EX	0	0.0	0.0	0.0	0.0
1.25	MISC. CONTINUOUS	MC	2400	16.2	0.0	3.7	16.2
1.00	MISC. NON–CONTINU'S	MN	0	0.0	0.0	0.0	0.0
0.65	KITCHEN EQUIPMENT	KT	0	0.0	0.0	0.0	0.0
1.00	SUB–FEED	SF	0	0.0	0.0	0.0	0.0
	FEED–THRU		0	0.0	0.0	0.0	0.0
0.25	LARGEST MOTOR	0	0	0.0	0.0	0.0	0.0
	*** TOTAL ***		31974	84.5	79.9	94.0	95.3

2 PANEL SCHEDULES

ELECTRICAL SPECIFICATIONS

PART I. GENERAL PROVISIONS

1. SCOPE: PROVIDE ALL LABOR, MATERIAL AND EQUIPMENT IN ACCORDANCE WITH THESE SPECIFICATIONS, AND THE ACCOMPANYING DRAWING TO PROVIDE A COMPLETE AND PROPERLY AND PROPERLY OPERATING ELECTRICAL SYSTEM FOR THE BUILDING.

   A. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL OF THE FOLLOWING MATERIAL AND EQUIPMENT UNDER THIS DIVISION OF THE SPECIFICATIONS, UNLESS NOTED OTHERWISE: PANELBOARDS; LIGHTING FIXTURES; LAMPS; RACEWAYS; 600 VOLT WIRE AND CABLE; WIRING DEVICES; DEVICE PLATES; DEVICE, PULL AND JUNCTION BOXES; SAFETY SWITCHES; MOTOR STARTERS; LIGHTING CONTROLS; CIRCUIT BREAKERS; FUSES; TIME CLOCKS; EQUIPMENT IDENTIFICATIONS (NAMEPLATES AND DIRECTORIES); WIRE AND CABLE TERMINATIONS.

   B. THE FOLLOWING MATERIAL AND EQUIPMENT WILL BE FURNISHED AND/OR INSTALLED BY OTHERS, OR UNDER OTHER DIVISIONS OF THE SPECIFICATIONS, UNLESS NOTED OTHERWISE: COMMUNICATION DEVICES, SECURITY COMMUNICATION DEVICES, SECURITY EQUIPMENT, POINT OF SCALE (POS) EQUIPMENT.

2. GENERAL REQUIREMENTS; ALL WORK SHALL PERFORMED BY SKILLED LICENSED ELECTRICIANS IN ACCORDANCE WITH THE BEST PRACTICES OF THE TRADE, MEETING THE REQUIREMENTS OF THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, APPLICABLE FEDERAL, STATE AND LOCAL CODES AND THE REQUIREMENTS OF THE ELECTRICAL UTILITY COMPANY FURNISHING THE SERVICES. ALL NECESSARY CONSTRUCTION PERMITS AND CERTIFICATES OF INSPECTION SHALL BE PURCHASED AND OBTAINED UNDER THIS CONTRACT.

   A. COORDINATION: ALL OUTLETS MUST BE ACCURATELY LOCATED, REVIEW THE ARCHITECTURAL, PLUMBING AND HEATING AND VENTILATING PLANS IN ORDER TO COORDINATE THIS WORK WITH OTHER TRADES, AND COOPERATE WITH THEM IN THE ENTIRE INSTALLATION.

PART II. MATERIALS

1. MATERIALS; ALL MATERIALS SHALL BE NEW AND OF THE QUALITY INDICATED BY THE SPECIFIED BRAND NAMES. SUBSTITUTIONS OF MATERIAL OF EQUAL QUALITY BY OTHER MAJOR MANUFACTURERS OF COMMERCIAL EQUIPMENT MAY BE ACCEPTABLE PROVIDED A LIST OF SUCH SUBSTITUTIONS IS APPROVED IN WRITING BY THE ARCHITECT AND ENGINEER. THE CONTRACTOR SHALL SUBMIT A SUBSTITUTION LIST FOR APPROVAL.

   A. PANEL BOARDS: PANEL BOARDS SHALL BE BOLT–IN CIRCUIT BREAKER TYPE, AS SHOWN ON THE PLANS. PANELS SHALL BE OF PANEL BOARD CONSTRUCTION, 20 INCHES WIDE (MINIMUM), 5–3/4" TO 6–1/2" DEEP, UL LISTED, AND MEET UL 67, UL 50, AND FEDERAL SPECIFICATION W–P–115B AS TYPE 1, CLASS 1, WITH BOLT–ON CIRCUIT BREAKERS, COPPER OR TIN–PLATED ALUMINUM BUS BARS, NEUTRAL BUS, GROUND BUS AND A HINGED LOCKABLE DOOR. CABINETS SHALL BE CODE GAUGE, GALVANIZED STEEL, MOUNTED AS SHOWN. PROVIDE TYPEWRITTEN CIRCUIT DIRECTORIES WITH CLEAR PLASTIC PROTECTORS IN ALL PANELS, ALL WIRES SHALL BE TAGGED WITH PANEL AND CIRCUIT NUMBERS. APPROVED MANUFACTURERS PANELS ARE SQUARE D/TELEMECHANIQUE, CUTLER–HAMMER, GENERAL ELECTRIC, AND SIEMENS (1–T–E).

   B. LIGHTING FIXTURES: ALL LIGHTING FIXTURES SHALL BE UL LISTED, COMMERCIAL QUALITY. FLUORESCENT LIGHTING FIXTURES SHALL BE METALUX, DAYBRITE, COLUMBIA, LIGHTOLIER OR EQUAL. INCANDESCENT LIGHTING FIXTURES SHALL BE HALO, OMEGA, CAPRI, PRESCOLITE, LIGHTOLIER, MARCO, OR EQUAL. HID LIGHTING FIXTURES SHALL BE, EMCO, GENERAL ELECTRIC, HADCO, HUBBELL OR EQUAL. EXIT/EMERGENCY LIGHTING FIXTURES SHALL BE SURE–LITES, CHLORIDE, LIGHTOLIER, DUAL–LITE, EMERGINCY–LITE, HUBBELL, OR EQUAL.

   C. LAMPS: ALL NEW FLUORESCENT LAMPS (F32T8) SHALL BE 3500 DEGREE K COLOR TEMPERATURE, 2950 MIN INITIAL LUMENS, 20,000 HOURS RATED LIFE, AND 78 MIN CRI, UNLESS NOTED OTHERWISE.

   D. WIRING DEVICES: ALL WIRING DEVICES SHALL BE UL LISTED, COMMERCIAL SPECIFICATION GRADE, SWITCHES SHALL BE RATED 20 AMPS AT 120/277 VOLTS, AC. STANDARD RECEPTACLES SHALL BE 15 AMP, DUPLEX, GROUNDING TYP, IN NEMA CONFIGURATIONS, UNLESS NOTED OTHERWISE. SWITCHES IN THE SAME LOCATION SHALL BE STAINLESS STEEL. APPROVED MANUFACTURERS OF SWITCHES AND RECEPTACLES ARE HUBBELL, ARROW HART, BRYANT, LEVITON, PASS & SEYMOUR. GENERAL ELECTRIC, SLATER, OR EQUAL.

   1. SWITCHES RE; SCHEDULE
      a. SINGLE POLE: BRYANT 4521–I, OR EQUAL.
      b. THREE WAY: HUBBELL CS320–I, OR EQUAL.
   2. RECEPTACLES RE; SCHEDULE
      a. NEMA 5–15R: ARROW HART CR151, OR EQUAL.
      b. NEMA 5–15R–IG: HUBBELL IG–5262–I, OR EQUAL.
      c. NEMA 5–15R–IG/SS: PASS & SEYMOUR IG–6262–OSP, OR EQUAL.
      d. NEMA 5–15R–GFCI: LEVITON 6598–I, OR EQUAL.
      e. NEMA 6–20R: BRYANT 5451–I, OR EQUAL.
      f. SAFETY (TAMPER RESISTANT): ARROW HART 63521, OR EQUAL.
      g. OTHERS: COMMERCIAL OR INDUSTRIAL GRADE, UL LISTED.

3. WP PLATES: WEATHERPROOF OUTLET COVERS THAT ARE WEATHERPROOF ONLY WHEN A SELF–CLOSING COVER IS CLOSED ARE PERMITTED UNDER NEC ARTICLE 410.

E. MOTOR STARTERS: ALL NEW MOTOR CONTROLLERS SHALL BE UNDERWRITERS LABORATORIES (UL) LISTENED AND LABELED, AND CONFORM WITH APPLICABLE STANDARDS OF UL (PUBLICATION #508), ANSI/NEMA ICS1, ANSI/NEMA ICS2, IEEE, NFPA, FEDERAL SPECIFICATIONS, AND OTHER APPLICABLE INDUSTRY STANDARDS. MOTOR STARTERS SHALL BE COMBINATION, AC, MAGNETIC, FULL VOLTAGE, NON–REVERSING (FNVR), RATED IN ACCORDANCE WITH NEMA (NOT IEC) STANDARDS IN THE SIZES REQUIRED. EACH STARTER SHALL BE SUPPLIED IN A NEMA 1 ENCLOSURE, WITH A LOCKABLE DISCONNECT HANDLE. EACH STARTER SHALL HAVE EITHER A MOTOR CIRCUIT PROTECTOR (MCP), OR A FUSIBLE DISCONNECT WITH DUAL ELEMENT CURRENT LIMITING FUSES. OVERLOAD RELAYS SHALL BE MANUAL RESET, MELTING ALLOY TYPE WITH THERMAL UNITS SIZED FOR THE ACTUAL MOTOR NAMEPLATE FULL LOAD AMPS. EACH STARTER SHALL BE CAPABLE OF ACCEPTING UP TO FOUR ADDITIONAL EXTERNAL NUMBER OF AUXILIARY CONTACTS. STARTERS SHALL BE FURNISHED OR AT LEAST TWO AND HORSEPOWER SHOWN ON THE DRAWINGS. CONTROL POWER SHALL BE 120 VOLT AC AND FUSED. ALL CONTROLS FOR THE STARTERS SHALL BE REMOTE, EACH MOTOR STARTER SHALL A UL LISTED WITHSTAND RATING THAT MEETS OR EXCEEDS THAT OF THE UPSTREAM PANEL. CUTLER–HAMMER/EATON, FURNACE ELECTRIC, GENERAL ELECTRIC, SIEME/SITE, SQUARE D/TELEMECHINIQUE, WESTINGHOUSE ELECTRIC, OR EQUAL.

F. MOTOR CONTROL DEVICES: CONTROL DEVICES SHALL BE HEAVY DUTY, OIL–TIGHT, WATERTIGHT, 60 AMPS MAKE, 6 AMPS BREAK, 600 VOLT AC, I IN A NEMA 4 ENCLOSURE ON THE HOOD. SELECTOR SWITCHES SHALL HAVE MULTIPLE CONTACT BLOCKS AS REQUIRED. CONTROLS SHALL BE SQUARE D CLASS 9001. TYPE K, ALLEN–BRADLEY, FURNACE, CUTLER HAMMER, OR EQUAL.

G. TRANSFORMER TO BE DRY–TYPE WITH NATURAL DRAFT VENTILATION. UNITS TO BE RATED FOR 480 VOLTS, 3 PHASE, 3 WIRE PRIMARY, AND 120/208 VOLTS, 3 PHASE, 4 WIRE SECONDARY, UNLESS OTHERWISE INDICATED. UNITS TO BE DESIGNED FOR 60 HERTZ OPERATION, WITH KVA CAPACITIES AS SHOWN ON DRAWINGS. TRANSFORMERS TO CONFORM WITH APPLICABLE NEMA AND ANSI STANDARDS, AND BE UL LISTED. TRANSFORMERS TO HAVE CLASS H INSULATION, HIGH GRADE SILICONE STEEL CORES, AND BE RATED FOR A MAXIMUM TEMPERATURE RISE OF 115 DEGREES C. UNITS RATED 30 KVA AND LARGER SHALL HAVE FOUR 2–1/2% TAPS BELOW NORMAL AND TWO 2–1/2% TAPS ABOVE NORMAL. UNITS RATED LESS THAN 30 KVA TO TWO 5% TAPS BELOW NORMAL. SOUND LEVELS GENERATED BY TRANSFORMERS ARE NOT TO EXCEED THE FOLLOWING VALUES: 9 KVA AND LESS –40 db, 10 TO 45 KVA –42 db, 50 TO 150 KVA –45 db. ACCEPTABLE MANUFACTURERS

2. CONDUIT AND FITTINGS: CONDUIT Permitted (A) RIGID GALVANIZED, (B) EMT, (C) PVC, AND (D) EMT. TYPES UTILIZED SHALL BE RUN ONLY AS PERMITTED PER CODE, ALL WIRING SHALL BE RUN IN CONDUIT. CONDUIT PLACED IN CONCRETE OR RUN UNDERGROUND SHALL BE RIGID WALLS ABOVE GRADE MAY BE PVC. CONDUIT EXPOSED OR RUN IN MASONRY WALLS ABOVE GRADE MAY BE PVC OR EMT HERE ALLOWED BY LOCAL CODES. IF EMT IS NOT PERMITTED, RIGID SCREWED GALVANIZED PIPE CONDUIT AND FITTINGS SHALL BE USED. OF SHIELDED CABLE IS REQUIRED FOR CONTROL CIRCUITRY, IT SHALL BE TAN, GREY OR ANY NEUTRAL COLOR OTHER THAN THAT AS SPECIFIED FOR POWER DISTRIBUTION. NO CONDUIT SMALLER THAN 3/4" SHALL BE INSTALLED EXCEPT FOR TWO–WIRE SWITCH LEGS. ALL CONDUIT BENDS SHALL BE FREE FROM DENTS AND KINKS. ALL CONDUITS SHALL BE ELECTRICALLY CONTINUOS FROM THE SERVICE EQUIPMENT TO ALL OUTLETS, AND SHALL BE SECURED TO ALL METAL BOXES WITH ONE LOCK NUT OUTSIDE, AND ONE INSIDE THE BOX WITH A REINFORCED BAKELITE BUSHING. IF PVC, OR ENT, IS USED, THEN APPROPRIATE SIZED, ELECTRICALLY CONTINUOS, BOND WIRES SHALL BE RUN FROM THE SERVICE EQUIPMENT TO ALL OUTLETS, AND SHALL BE SECURED TO EACH WIRING DEVICE PER THE NATIONAL ELECTRICAL CODE. WHERE CONNECTIONS ARE TO BE MADE BETWEEN CONDUIT TERMINATION'S AND MOTORS, EQUIPMENT, OR APPARATUS NECESSITATING FLEXIBLE CONNECTIONS, APPROVED FLEXIBLE CONDUIT SHALL BE USED. OUTDOOR CONNECTIONS TO FANS, HVAC UNITS, OR ROTATING EQUIPMENT SHALL BE MADE WITH HELICAL WOUND, LIQUID TIGHT, FLEXIBLE STEEL CONDUIT. EXCEED FIVE (5) FEET. DURING CONSTRUCTION, CONDUIT SHALL BE KEPT FREE OF ALL FOREIGN MATTER BY USE OF CAPPED BUSHINGS ON ALL TURNED UP ENDS. PAPER OR WOOD PLUGS ARE NOT ACCEPTABLE FOR THIS PURPOSE.

3. WIRE AND CABLES: ALL WIRE AND CABLES SHALL BE UNDERWRITERS LABORATORIES LISTED, AND LABELED. AND CONFORM WITH APPLICABLE STANDARDS OF UL (44, AND 83), NEMA (WC–5, AND WC–7), IPCEA (S–61–402, AND S–66–524), FEDERAL SPECIFICATIONS (J–C–30A(1), AND HH–I–595C), ANSI, AND OTHER APPLICABLE INDUSTRY STANDARDS. CONNECTORS AND LUGS SHALL MEET UL PUBLICATIONS 486. ALL BRANCH CIRCUIT WIRING SHALL BE 600 VOLT, COPPER, 60 DEGREE C (MIN), TYPE THHN/THWN WITH A MINIMUM SIZE OF #12 AWG, UNLESS NOTED OTHERWISE. WIRE SIZES OF #6 AWG AND LARGER SHALL BE STRANDED. SERVICE AND FEEDER CABLES SHALL BE 600 VOLT, STRANDED COPPER, 75 DEGREE C (MIN), TYPE XHHW. ALL KITCHEN EQUIPMENT CIRCUITS SHALL HAVE A SEPARATE GROUND CONDUCTORS. PROVIDE BARE OR GREEN–INSULATED GROUND WIRE IN ALL RACEWAYS, CABLE ASSEMBLIES, AND WHERE NOTED. SIZE EQUIPMENT GROUNDS PER TABLE 250–95 OF THE NATIONAL ELECTRICAL CODE. INSULATION COLOR CODES SHALL BE PER N.E.C.

A. ALL WIRING SHALL BE INSTALLED IN CONDUIT, EXCEPT WHERE SPECIFICALLY SHOWN ON THE DRAWINGS. NONMETALLIC (TYPE NM) CABLE IS NOT PERMITTED.

B. ALL BRANCH CIRCUIT COMMUNICATION, SIGNALING, AND CONTROL BE ROUTED ABOVE THE CEILING. VERIFY WHETHER OR NOT THE SPACE WIRING TO THE KITCHEN, FIRE PROTECTION, AND OTHER EQUIPMENT SHALL ABOVE THE CEILING IS USED AS A SPACE FOR RETURN AIR FOR THE ENVIRONMENTAL AIR SYSTEM. IF IT IS USED FOR RETURN AIR, PROVIDE APPROVED RACEWAYS FOR ALL OVERHEAD WIRING PER NEC ARTICLE 300, IF IT IS NOT "OTHER SPACE USED FOR ENVIRONMENTAL OF NEC ARTICLES 725 AND 760 MAY BE RUN WITHOUT RACEWAYS, UNO. ALL SAFETY CONTROL WIRING FOR FIRE PROTECTION SYSTEMS, SHUNT TRIPS, ETC. SHALL BE RUN IN A RACEWAY IN ACCORDANCE WITH NEC ARTICLE 725.

4. SITE Lighting THE G.C. WILL FURNISH THE SITE LIGHTING PACKAGE, AS REQUIRED FOR THE SPECIFIC LOCATION, UNDER THIS SPECIFICATION SECTION, PROVIDE 1" RIGID GALVANIZED STEEL ELECTRICAL CONDUIT, AND THE REQUIRED WIRING FROM THE PANEL TO THE POLE. SET FIXTURES AND POLES ON CONCRETE BASES, AS PROVIDED UNDER SPECIFICATION SECTION 3A: CONCRETE. GROUND/BOND ALL SUIT LIGHTING FIXTURES/POLES FOR PER THE NEC. THE BRANCH CIRCUIT CONDUCTORS SHALL BE INCREASED FROM #10 AWG TO #8 AWG IF THE HORIZONTAL DISTANCE FROM THE PANEL TO THE POLE IS GREATER THAN EIGHTY (80) FEET. ALL SITE LIGHTING SHALL BE CONTROLLED THROUGH THE LIGHTING CONTROL SYSTEM SHOWN ON THE DRAWINGS. REFER TO THE SITE PLAN FOR QUANTITY AND LOCATION OF ALL SITE LIGHTING. SET FIXTURES AS SPECIFIED, AND AIM AFTER DARK FOR UNIFORM LIGHT DISTRIBUTION.

5. EMPTY CONDUIT: LEAVE A #12 AWG PULL WIRE IN ALL EMPTY CONDUITS.

6. BOXES AND WIRE WAYS: ALL JUNCTION BOXES, PULL BOXES, WIRE WAYS, ETC, SHALL BE SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

7. EQUIPMENT IDENTIFICATION: PROVIDE NAMEPLATES FOR ALL PANEL BOARDS, MOTOR STARTERS, CONTROLS, AND OTHER ELECTRICAL EQUIPMENT. EQUIPMENT VISIBLE TO THE PUBLIC SHALL BE IDENTIFIED WITH ENGRAVED LAMINATED NAMEPLATES ATTACHED WITH STAINLESS STEEL FASTENERS, ELECTRICAL EQUIPMENT. EQUIPMENT VISIBLE TO THE PUBLIC SHALL BE IDENTIFIED WITH ENGRAVED LAMINATED NAMEPLATES ATTACHED WITH STAINLESS STEEL FASTENERS. ELECTRICAL EQUIPMENT NOT VISIBLE TO THE PUBLIC MAY BE NEATLY IDENTIFIED WITH BLACK PERMANENT MARKERS TO MATCH EXISTING FACILITY DEVICES (EST). COORDINATE EXACT REQUIREMENTS.

PART III. EXECUTION

1. TESTS: MAKE ALL TEST NECESSARY TO ENSURE THAT THE ENTIRE INSTALLATION IS FREE FROM IMPROPER GROUNDS, AND FROM SHORTED AND/OR OPEN CONDUCTORS. VOLTAGE, CURRENT, AND ROTATION TESTS SHALL BE MADE BEFORE ANY MOTORS ARE PLACE IN OPERATION. ALL LOADS SHALL BE BALANCED ACROSS PHASES. CHECK TO SEE THAT ALL LIGHTS WORK, AND ARE CONTROLLED BY SWITCHES INDICATED ON DRAWINGS, OR CIRCUIT BREAKERS SO INDICATED ON PANEL SCHEDULE.

2. GUARANTEE: FURNISH A GUARANTEE IN WRITING TO THE OWNER THAT ALL MATERIAL SAND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM DATE WORK EXECUTED UNDER THIS SECTION IS FREE FROM DEFECTS OF FINAL ACCEPTANCE. IN ADDITION, DURING THE TERM OF THIS GUARANTEE, THE REPAIR AND/OR REPLACEMENT OF ANY DEFECTIVE WORK, AND ALL RESULTING DAMAGES SHALL BE MADE AT NO ADDITIONAL EXPENSE TO THE OWNER.

3. CLEANUP: LEAVE THE ELECTRICAL PORTION OF THE WORK IN A CLEAN AND FINISHED CONDITION.

4. SHOP DRAWINGS: PROVIDE SHOP DRAWINGS FOR THE FOLLOWINGS ITEMS: PANEL BOARDS, LIGHTING FIXTURES, MOTOR STARTERS, TWO STAGE LIGHTING CONTROL UNIT.

5. AS–BUILT DRAWINGS: MAINTAIN AS–BUILT DRAWINGS, UPDATED DAILY DURING CONSTRUCTION, AND PRESENT THE OWNER WITH ONE SET UPON COMPLETION. PROVIDE THE OWNER'S PERSONNEL WITH ON–SITE INSTRUCTION IN THE OPERATION AND MAINTENANCE OF THE COMPLETED ELECTRICAL SYSTEM. PROVIDE THE OWNER WITH A OPERATION AND MAINTENANCE (O & M) MANUAL COVERING THE FOLLOWING ITEMS OF ELECTRICAL EQUIPMENT: MOTOR STARTERS.

1 ELECTRICAL SPECIFICATIONS

JOB NUMBER: 1130

DATE: 09/08/11

REVISIONS:

A New Expansion for:
TWENTY – TWO FIFTY INTERIORS
Building Q - Sugar Land Town Square
2250 Lone Star Drive Sugar Land, Texas

JIM LAWLESS, AIA
Architects & Planners
4610 Sweetwater Blvd
Suite 200-C
Sugar Land, Texas
77479
(281) 240-6101

STATE OF TEXAS — H.M. McLEOD JR. — REGISTERED PROFESSIONAL ENGINEER

THIS SEAL WAS AUTHORIZED THIS DATE 9/08/11

PROJECT #11-210

H.M. McLEOD, P.E.
4727 MERWIN ST. SUITE B
HOUSTON, TEXAS 77027
OFFICE: (713) 961-2699
FAX: (713) 961-5691
CELL: (713) 806-1646
Firm Registration:
H. M. McLeod, P.E. #F-3679

DRAWING: ELECTRICAL SPECS & SCHEDULE

E-4