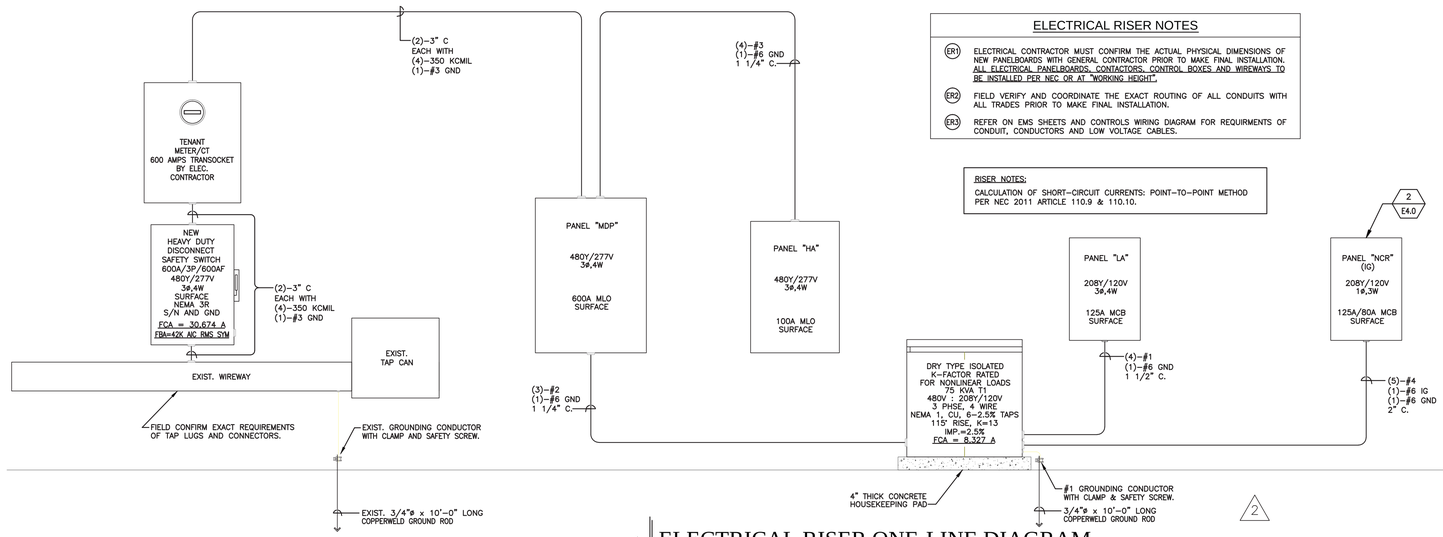


ELECTRICAL RISER NOTES

ER1 ELECTRICAL CONTRACTOR MUST CONFIRM THE ACTUAL PHYSICAL DIMENSIONS OF NEW PANELBOARDS WITH GENERAL CONTRACTOR PRIOR TO MAKE FINAL INSTALLATION. ALL ELECTRICAL PANELBOARDS, CONTACTORS, CONTROL BOXES AND WIREWAYS TO BE INSTALLED PER NEC OR AT "WORKING HEIGHT".

ER2 FIELD VERIFY AND COORDINATE THE EXACT ROUTING OF ALL CONDUITS WITH ALL TRADES PRIOR TO MAKE FINAL INSTALLATION.

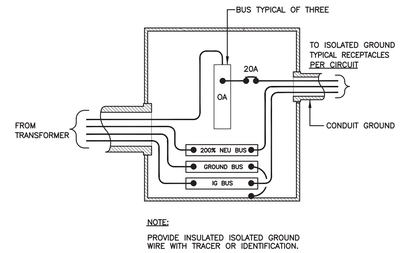
ER3 REFER ON EMS SHEETS AND CONTROLS WIRING DIAGRAM FOR REQUIRMENTS OF CONDUIT, CONDUCTORS AND LOW VOLTAGE CABLES.

RISER NOTES:

CALCULATION OF SHORT-CIRCUIT CURRENTS: POINT-TO-POINT METHOD PER NEC 2011 ARTICLE 110.9 & 110.10.

1 ELECTRICAL RISER ONE-LINE DIAGRAM

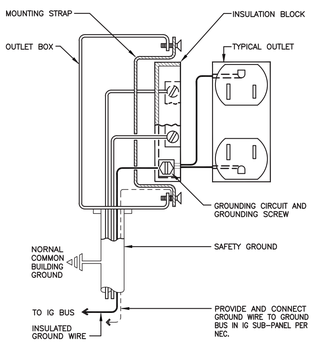
E4.0 SCALE: NOT TO SCALE



NOTE:

PROVIDE INSULATED ISOLATED GROUND WIRE WITH TRACER OR IDENTIFICATION.

ISOLATED GROUND PANEL



ISOLATED GROUND RECEPTACLE

2 ISOLATED GROUND REQUIREMENTS

E4.0 SCALE: NOT TO SCALE

PANEL "MDP" SCHEDULE

MOUNTING: SURFACE | TYPE: G.E. SPECTRA SERIES | FAULT CURRENT: 28,214 A | MAIN: MLO BUS: 600 A

VOLTS: 480Y/277 Vac BOLT-On | ENCLOSURE: NEMA 1 WITH GROUND BAR | FAULT BRACING: 42k AIC RMS. SYM. | MAIN SIZE BREAKER: NONE

PHASE: 3 WIRE: 4 Hz.: 60 | ISOLATED GROUND: NONE | TVSS/SPD: YES | LOCATION: ELECTRICAL ROOM

DESCRIPTION	WIRE & CONDUIT SIZE	LOAD (kVA)	BREAKER	CIRCUIT	CIRCUIT	BREAKER	LOAD (kVA)	WIRE & CONDUIT SIZE	DESCRIPTION
AC-1, ON ROOF (GAS HEAT)	(3)#8, 3/4"C	6.097	25/3	1	2	25/3	6.097	(3)#8, 3/4"C	AC-2, ON ROOF (GAS HEAT)
"	–	6.097	–	3	4	–	6.097	–	"
"	–	6.097	–	5	6	–	6.097	–	"
AC-3, ON ROOF (GAS HEAT)	(3)#6, 1"C	10.808	45/3	7	8	45/3	10.808	(3)#6, 1"C	AC-4, ON ROOF (GAS HEAT)
"	–	10.808	–	9	10	–	10.808	–	"
"	–	10.808	–	11	12	–	10.808	–	"
AC-5, ON ROOF (GAS HEAT)	(3)#4, 1 1/4"C	14.965	60/3	13	14	60/3	14.965	(3)#4, 1 1/4"C	AC-6, ON ROOF (GAS HEAT)
"	–	14.965	–	15	16	–	14.965	–	"
"	–	14.965	–	17	18	–	14.965	–	"
AC-7, ON ROOF (GAS HEAT)	(3)#4, 1 1/4"C	14.965	60/3	19	20	100/3	15.259	(3)#3, 1 1/4"C	75 KVA TRANSFORMER "T1"
"	–	14.965	–	21	22	–	15.259	–	"
"	–	14.965	–	23	24	–	15.259	–	"
PANEL "HA"	(4)#3, 1 1/4"C	11.502	100/3	25	26	30/3	5.820	(3)#8, 3/4"C	COMPACTOR
"	–	11.502	–	27	28	–	5.820	–	
"	–	11.502	–	29	30	–	5.820	–	
TENANT PULSE DEMAND METER "DM"	(3)#12, 3/4"C	0.100	15/3	13	14	30/3			SPACE
"		0.100	–	15	16	–			"
"		0.100	–	17	18	–			"
SPACE			30/3	19	20	30/3			SPACE
"			–	21	22	–			"
"			–	23	24	–			"
SPACE			60/3	25	26	60/3			SPACE
"			–	27	28	–			"
"			–	29	30	–			"

TOTAL kVA ØA = 111,386 | TOTAL kVA ØB = 111,386 | TOTAL kVA ØC = 111,386

TOTAL CONNECTED LOAD = 334,158 kVA

402 AMPS

TOTAL DEMAND LOAD = 294.405 kVA

354.1 AMPS

2011 NEC ARTICLE 215.3 ARTICLE 220 II & III ARTICLE 440.33

NOTES:

1. PROVIDE AND SIZE GROUND CONDUCTORS PER 2011 NEC. FOR ALL CIRCUITS NOT SHOWN AND INDICATED ON THIS PANEL SCHEDULE & ON PLANS UNLESS OTHERWISE NOTED.
2. PROVIDE INTEGRAL TVSS/SPD WITH 160kA MAX. SURGE CURRENT PER PHASE
3. NEW PANEL CIRCUIT SCHEDULES TO BE TYPED, NOT HANDWRITTEN, ON PANEL MANUFACTURERS SUPPLIED TEMPLATE.
4. ALL PANELS TO BE IDENTIFIED WITH ENGRAVED PHENOLIC RESIN PLACARDS.

PANEL "NCR" SCHEDULE

MOUNTING: SURFACE | TYPE: G.E. A SERIES TYPE AQ | FAULT CURRENT: 7,765 A | MAIN: MCB BUS: 125 A

VOLTS: 208Y/120 Vac BOLT-On | ENCLOSURE: NEMA 1 WITH GROUND BAR | FAULT BRACING: 10K AIC | MAIN SIZE BREAKER: 80 A

PHASE: 3 WIRE: 4 Hz.: 60 | ISOLATED GROUND: YES | TVSS/SPD: NONE | LOCATION: ELECTRICAL ROOM

DESCRIPTION	WIRE & CONDUIT SIZE	LOAD (kVA)	BREAKER	CIRCUIT	CIRCUIT	BREAKER	LOAD (kVA)	WIRE & CONDUIT SIZE	DESCRIPTION
SENSORMATIC EQUIPMENT	(3)#10, 3/4"C	0.350	20/1	1	2	20/1	0.380	(3)#10, 3/4"C	SENSORMATIC EQUIPMENT
CASH OFFICE RECEPTACLES	(3)#12, 3/4"C	0.540	20/1	3	4	20/1	0.720	(3)#12, 3/4"C	MANAGER'S OFFICE RECEPTACLES
MANAGER'S OFFICE RECEPTACLES	(3)#12, 3/4"C	0.720	20/1	5	6	20/1	0.540	(3)#12, 3/4"C	MANAGER'S OFFICE RECEPTACLES
EQUIPMENT CLOSET RECEPTACLES	(3)#12, 3/4"C	0.900	20/1	7	8	20/1	1.100	(3)#12, 3/4"C	EQUIPMENT CLOSET RECEPTACLE
CHECKOUT REGISTERS	(3)#10, 3/4"C	0.628	20/1	9	10	20/1	0.628	(3)#10, 3/4"C	CHECKOUT REGISTERS
CHECKOUT REGISTERS	(3)#10, 3/4"C	0.628	20/1	11	12	20/1	0.628	(3)#10, 3/4"C	CHECKOUT REGISTERS
DATA CIRCUIT POWER, ELECT. RM.	(3)#12, 3/4"C	0.180	20/1	13	14	20/1	0.628	(3)#10, 3/4"C	CHECKOUT REGISTERS
LOCKER ROOM RECEPTACLES	(3)#12, 3/4"C	0.180	20/1	15	16	20/1	0.720	(2)#12, 3/4"C	EQUIPMENT CLOSET RECEPTACLES
LOCKER ROOM RECEPTACLES	(3)#12, 3/4"C	0.180	20/1	17	18	20/1	0.720	(2)#12, 3/4"C	EQUIPMENT CLOSET RECEPTACLES
LOCKER ROOM RECEPTACLES	(3)#12, 3/4"C	0.180	20/1	19	20	20/1	0.360	(3)#12, 3/4"C	MANAGER'S OFFICE RECEPTACLES
MANAGER'S OFFICE RECEPTACLES	(3)#12, 3/4"C	0.360	20/1	21	22	20/1	0.360	(3)#12, 3/4"C	MANAGER'S OFFICE RECEPTACLES
SPARE			20/1	23	24	20/1			SPARE
SPARE			20/1	25	26	20/1			SPARE
SPARE			20/1	27	28	20/1			SPARE
SPARE			20/1	29	30	20/1			SPARE
SPARE			20/1	31	32	20/1			SPARE
SPARE			20/1	33	34	20/1			SPARE
SPARE			20/1	35	36	20/1			SPARE
SPARE			20/1	37	38	20/1			SPARE
SPARE			20/1	39	40	20/1			SPARE
SPARE			20/1	41	42	20/1			SPARE

TOTAL kVA ØA = 3.910 | TOTAL kVA ØB = 3.860 | TOTAL kVA ØC = 3.860

TOTAL CONNECTED LOAD = 11.630 kVA

32.3 AMPS

TOTAL DEMAND LOAD = 10.815 kVA

30.0 AMPS

2011 NEC ARTICLE 215.3 ARTICLE 220 II & III

NOTES:

1. PROVIDE AND SIZE GROUND CONDUCTORS PER 2011 NEC. FOR ALL CIRCUITS NOT SHOWN AND INDICATED ON THIS PANEL SCHEDULE & ON PLANS UNLESS OTHERWISE NOTED.
2. NEW PANEL CIRCUIT SCHEDULES TO BE TYPED, NOT HANDWRITTEN, ON PANEL MANUFACTURERS SUPPLIED TEMPLATE.
3. ALL PANELS TO BE IDENTIFIED WITH ENGRAVED PHENOLIC RESIN PLACARDS.

PANEL "LA" SCHEDULE

MOUNTING: SURFACE | TYPE: G.E. A SERIES TYPE AQ | FAULT CURRENT: 7,871 A | MAIN: MCB BUS: 125 A

VOLTS: 208Y/120 Vac BOLT-On | ENCLOSURE: NEMA 1 WITH GROUND BAR | FAULT BRACING: 10K AIC | MAIN SIZE BREAKER: 125 A

PHASE: 3 WIRE: 4 Hz.: 60 | ISOLATED GROUND: YES WITH 200% RATED NEUTRAL | TVSS/SPD: NONE | LOCATION: ELECTRICAL ROOM

BMS DO	DESCRIPTION	WIRE & CONDUIT SIZE	LOAD (kVA)	BREAKER	CIRCUIT	CIRCUIT	BREAKER	LOAD (kVA)	WIRE & CONDUIT SIZE	DESCRIPTION	BMS DO
3	SIGNAGE	(2)#8, 3/4"C	1.200	20/1	1	2	20/1	0.600	(2)#12, 3/4"C	EF-1, MEN/WOMEN RESTROOMS	1
3	SIGNAGE	(2)#8, 3/4"C	1.200	20/1	3	4	20/1	0.600	(2)#12, 3/4"C	EF-2, LOCKER RM./JAN. CLOSET/EQUIP. CLOSET	1
3	SIGNAGE	(2)#8, 3/4"C	1.200	20/1	5	6	20/1	0.200	(2)#12, 3/4"C	EF-3, ELECTRICAL ROOM	
	LCP-1	(2)#12, 3/4"C	1.200	20/1	7	8	20/1			SPARE	
	EMCP-1	(2)#12, 3/4"C	0.800	20/1	9	10	20/1	0.210	(2)#12, 3/4"C	ELECTRIC DOOR STRIKE, RECEPTACLE, FITTING ROOM	
	SOLAR FILM SHADE	(2)#12, 3/4"C	0.800	20/1	11	12	20/1	0.360	(2)#10, 3/4"C	SALES FLOOR RECEPTACLE	
	RTUs RECEPTACLES	(2)#8, 3/4"C	1.440	20/1	13	14	20/1	0.360	(2)#10, 3/4"C	SALES FLOOR RECEPTACLE	
6	WH-1, JAN. CLOSET	(2)#10, 3/4"C	2.000	30/2	15	16	20/1	0.360	(2)#10, 3/4"C	SALES FLOOR RECEPTACLE	
	"	–	2.000	–	17	18	20/1	0.360	(2)#10, 3/4"C	SALES FLOOR RECEPTACLE	
1	DF-1H	(2)#12, 3/4"C	1.200	20/1	19	20	20/1	0.900	(2)#12, 3/4"C	CCTV OUTLET	
4	NEON NICHE	(2)#8, 3/4"C	1.600	20/1	21	22	20/1	1.200	(2)#8, 3/4"C	ENTRY DOORS	
	SUMP PUMP ((2)-1 HP), LOADING DOCK ③	(2)#10, 3/4"C	1.920	30/1	23	24	20/1	1.200	(2)#12, 3/4"C	FIRE ALARM CONTROL PANEL ②	
	FRONT END GENERAL	(2)#10, 3/4"C	0.540	20/1	25	26	20/1	1.200	(2)#12, 3/4"C	SECURITY CONTROL PANEL ②	
	FRONT END GENERAL	(2)#10, 3/4"C	0.540	20/1	27	28	20/1	0.540	(2)#12, 3/4"C	HAND DRYER, MEN'S RESTROOM	1
	SPARE			20/1	29	30	20/1	0.540	(2)#12, 3/4"C	HAND DRYER, WOMEN'S RESTROOM	1
	SPARE			20/1	31	32	20/1	0.780	(2)#12, 3/4"C	REFRIGERATOR, LOCKER ROOM	
	FRONT END GENERAL	(2)#10, 3/4"C	0.540	20/1	33	34	20/1	0.540	(2)#10, 3/4"C	FRONT END GENERAL	
	FRONT END GENERAL	(2)#10, 3/4"C	0.540	20/1	35	36	20/1	0.180	(2)#12, 3/4"C	FUTURE EXPANSION "A"	
2	JEWELRY CASE LIGHTING	(2)#10, 3/4"C	0.800	20/1	37	38	20/1	0.180	(2)#12, 3/4"C	FUTURE EXPANSION "A"	
1	VENDING MACHINE, LOCKER ROOM	(2)#12, 3/4"C	0.900	20/1	39	40	20/1	0.180	(2)#12, 3/4"C	FUTURE EXPANSION "A"	
	VENDING MACHINE, LOCKER ROOM	(2)#12, 3/4"C	0.900	20/1	41	42	20/1	0.180	(2)#12, 3/4"C	FUTURE EXPANSION "A"	
	RECEPTACLES, ELEC., LOCKER, OFFICE HALL	(2)#12, 3/4"C	0.720	20/1	43	44	20/1	0.180	(2)#12, 3/4"C	FUTURE EXPANSION "A"	
	SPARE			20/1	45	46	20/1	0.080	(2)#12, 3/4"C	TRANSFORMER (120/24VAC – EXIT DEVICE	
6	RECIRCULATING PUMP "RP-1", JAN. CLOSET	(2)#12, 3/4"C	1.176	20/1	47	48	20/1			SPARE	
	SPARE			20/1	49	50	20/1			SPARE	
	SPARE			20/1	51	52	20/1			SPARE	
	SPARE			20/1	53	54	20/1			SPARE	

TOTAL kVA ØA = 11.300 | TOTAL kVA ØB = 11.290 | TOTAL kVA ØC = 11.556

TOTAL CONNECTED LOAD = 34.146 kVA

94.8 AMPS

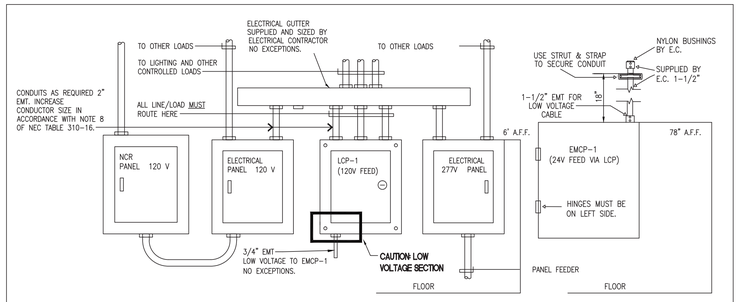
TOTAL DEMAND LOAD = 22.073 kVA

61.3 AMPS

2011 NEC ARTICLE 220 II & III

NOTES:

1. PROVIDE AND SIZE GROUND CONDUCTORS PER 2011 NEC. FOR ALL CIRCUITS NOT SHOWN AND INDICATED ON THIS PANEL SCHEDULE & ON PLANS UNLESS OTHERWISE NOTED.
2. PROVIDE LOCKABLE CIRCUIT BREAKER FOR CIRCUIT 24 & 26.
3. INSTALL GFCI CIRCUIT BREAKER.
4. NEW PANEL CIRCUIT SCHEDULES TO BE TYPED, NOT HANDWRITTEN, ON PANEL MANUFACTURERS SUPPLIED TEMPLATE.
5. ALL PANELS TO BE IDENTIFIED WITH ENGRAVED PHENOLIC RESIN PLACARDS.



3 TYPICAL PANEL MOUNTING

E4.0 SCALE: NOT TO SCALE

LOAD ANALYSIS – MARSHALLS

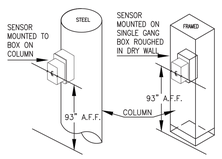
LOADS: VOLT-AMPERES (VA)	VA
LIGHTING LOADS (NEC 2011 ARTICLE 215/220) 1.) LIGHTING LOADS: ARTICLE 220.12 A.) INTERIOR LIGHTING = 32,505 VA B.) EXTERIOR LIGHTING = 2,000 VA 2.) DEMAND LIGHTING LOADS: ARTICLE 215.3 TOTAL DEMAND LIGHTING LOADS = (32,505 VA + 2.000) = 34,505 VA	34,505
RECEPTACLE LOADS (NEC 2011 ARTICLE 220 II & III) A.) PANEL "LA" & "NCR" = 32,888 VA TOTAL DEMAND RECEPTACLE LOADS = 32,888 VA	32,888
MOTOR AND HVAC LOADS (NEC 2011 ARTICLE 440.33) A.) HVAC = 225,306 VA B.) 25% OF THE HIGHEST MOTOR (7.5 HP-480Y/3ø) = 7,145 VA x .25 = 1,706 VA TOTAL HVAC LOAD = 225,306 VA + 1,706 VA = 227,012 VA	227,012
TOTAL DEMAND LOAD	294,405

REMARKS:

TOTAL CALCULATED DEMAND LOAD IN AMPS (SERVICE VOLTAGE IS 480Y/277VAC 3P/4W) = 294,405/(480 x 1.732) = 354 AMPS. THEREFORE, 600 AMPS ELECTRICAL SERVICE IS SELECTED.

ROSS DRESS FOR LESS STANDARD TEMPERATURE SENSOR REQUIREMENTS
ELECTRICAL CONTRACTOR MUST LOCATE TEMPERATURE SENSORS PER THE EMS DRAWINGS.

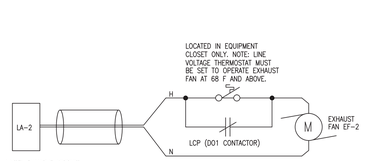
Zone Location	Mounting Surface Type: Sheet-rock/ Dryw all	Sheet-rock/ Concrete Filled	Concrete	Mounting Height: +54"	+93"	Vertical Mounted Device: 4" Square shallow box w ith single gang flat ring vertical	"Wirenext" single gang ivory shallow box vertical	Single gang plaster ring vertical	Double gang sw itch or mud ring	Wire Type	Notes:
Sales Floor - Column	X				X		X			2 x #18Ga. TSP	Do not locate w ithin 10' of supply diffusers except on opposite side of column.
		X			X			X		2 x #18Ga. TSP	
			X		X		X			2 x #18Ga. TSP	
Stockroom - Wall		X			X			X		2 x #18Ga. TSP	Mount next to interior door
				X		X				2 x #18Ga. TSP	Mount next to interior door
Women's Fitting Room - Wall		X			X			X		2 x #18Ga. TSP	Mount in demising w all at end of hallw ay
Manager's Office - Wall		X		X				X		2 x #18Ga. TSP	Mount next to interior door
Override Panel		X		X					X	10 x #18Ga.	Mount next to interior door
Cash Office		X		X				X		2 x #18Ga. TSP	Mount next to interior door



LENNOX TEMPERATURE SENSOR, CCBAC; ROUGH-IN, PIPE & WIRE BY ELEC. FINAL MOUNTING & TERMINATION BY C&C BUILDING AUTOMATION CO. W.T.S. MOUNTING HEIGHTS: (MOUNT SINGLE GANG RING VERTICALLY)

4 TEMPERATURE SENSOR ROUGH-IN INSTRUCTIONS

E4.0 SCALE: NOT TO SCALE



NOTE: EXAMPLE CIRCUIT NUMBERING PER PANEL SCHEDULE LA

5 EF-2 EXHAUST FAN

E4.0 SCALE: NOT TO SCALE

2 ADDENDUM #3 7-29-14
3 ADDENDUM #3 10-27-14

ISSUED FOR CONSTRUCTION
MARCH 3, 2015

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ROSS BUILD-OUT #1663
CROSSROADS MALL
GREENVILLE, TEXAS

GREENVILLE PROPERTIES LTD.
GREENVILLE, TEXAS

DATE: 05/02/2014
PROJECT NO. 08-12-02
DRAWN BY LLL

ELECTRICAL RISER DIAGRAM, PANEL SCHEDULES, NOTES & DETAILS

E4.0

STATE OF TEXAS
BASSAM G. JABORI
89863
REGISTERED PROFESSIONAL ENGINEER
11/7/14

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