



# LANE COMMUNITY COLLEGE DOWNTOWN CAMPUS

## Electrical Basis of Design

PRESENTED TO: Lane Community College

PRESENTED BY: Brett Cournoyer, PE, LEED BC+D



# PRESENTATION OVERVIEW

Building Power  
System

Power Monitoring

Lighting Design  
Strategies





# ELECTRICAL

## *Design Criteria*

	Goals
Lighting power densities (W/sf)	20% below code (0.8W/sf)
Lighting power energy use (kWh/yr)	50% less than a typical building
Plug load power density (W/sf)	~2W/sf
Plug load energy use	70% less than a typical building





# ELECTRICAL BASIS OF DESIGN

## *Power System*





- ① PROVIDED FOR FEEDER EMBEDED
- ② MOTORS (DOWN EXCEPTED) SHALL TO HAVE COORDINATION AND PANEL SCHEDULES FOR FEEDER AND OVERCURRENT PROTECTION INFORMATION
- ③ ELEVATOR OVER TRAVEL LIMITS
- ④ ELEVATOR CONTROL MODULE WITH INTEGRAL SHUNT TRIP AND FEED-BACK INTERFACE, SEE EMB FOR FURTHER INFORMATION. COORDINATE PUMP SCHEDS WITH ELEVATOR INSTALLER.
- ⑤ CONDUIT FOR CONTACT WIRING
- ⑥ IDENTIFY, ENERGY METERING POINT WHERE INDICATED FOR HOUSE PANELS. INTENT IS FOR METERS SERVING A COMMON FLOOR OR HOUSING BUILDING TO BE VERTICALLY AGGREGATED INTO ONE METER PER FLOOR
- ⑦ WIRE MANS JUNCTION SHALL BE SIZED PER MANUFACTURER'S PUBLISHED RECOMMENDATIONS. REFER TO SPECIFICATION SECTION 26013 FOR ADDITIONAL INFORMATION.
- ⑧ BREAKER SHALL BE 100% RATED





# ELECTRICAL BASIS OF DESIGN

## Power System: Academic Infrastructure

### MOTORIZED VENT SYSTEM INSTALLATION REQUIREMENTS:

1. MOTORIZED VENT SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING: COORDINATE ALL INSTALLATION REQUIREMENTS WITH SYSTEM SUPPLIER PRIOR TO COMMENCING WORK. PROVIDE ALL ELECTRICAL WORK FOR A COMPLETE AND OPERATIONAL SYSTEM.
2. MOTORIZED VENT SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING: COORDINATE ALL INSTALLATION REQUIREMENTS WITH SYSTEM SUPPLIER PRIOR TO COMMENCING WORK. PROVIDE ALL ELECTRICAL WORK FOR A COMPLETE AND OPERATIONAL SYSTEM.
3. VENT OPERATOR POWER SUPPLIES ARE FURNISHED IN ANOTHER DIVISION OF WORK. INSTALLED BY DIVISION 26. INSTALL EACH RELAY VENT CONTROLLER AND PROVIDE 240V POWER WIRING TO CORRESPONDING POWER SUPPLY. COORDINATE INSTALLATION REQUIREMENTS WITH SYSTEM SUPPLIER.
4. RELAY VENT CONTROLLER IS FURNISHED IN ANOTHER DIVISION OF WORK. INSTALLED BY DIVISION 26. INSTALL EACH RELAY VENT CONTROLLER AND PROVIDE 240V POWER WIRING TO CORRESPONDING POWER SUPPLY. COORDINATE INSTALLATION REQUIREMENTS WITH SYSTEM SUPPLIER.
5. VENT MOTORS ARE FURNISHED AND INSTALLED IN ANOTHER DIVISION OF WORK. PROVIDE POWER WIRING TO VENT MOTORS IN DIVISION 26. COORDINATE ALL WIRING REQUIREMENTS WITH SYSTEM SUPPLIER. COORDINATE VENT MOTOR QUANTITY WITH SYSTEM SUPPLIER.
6. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS OF ALL VENTS (WINDOWS, TURBINE VENTILATOR OPERATIONAL PANELS) THAT ARE TO BE MOTORIZED.
7. REFER TO PANEL SCHEDULES AND DETAIL SHEETS FOR FURTHER INFORMATION.

### REL NOTES:

1. SEE CONNECTOR TO D TO PANEL SCHEDULES FOR ADDITIONAL INFORMATION.
2. CABLE CONDUITS AND ALL CONTROL FIRE ALARMING SHALL BE GROUPED AND RUN IN DESIGNATED AREAS ONLY. SEE MEP COORDINATION SHEETS FOR ROUTING PATHWAYS. IF PATHWAYS PROVIDE INSUFFICIENT COORDINATE EXCEPTIONS WITH ARCHITECT PRIOR TO INSTALLATION.

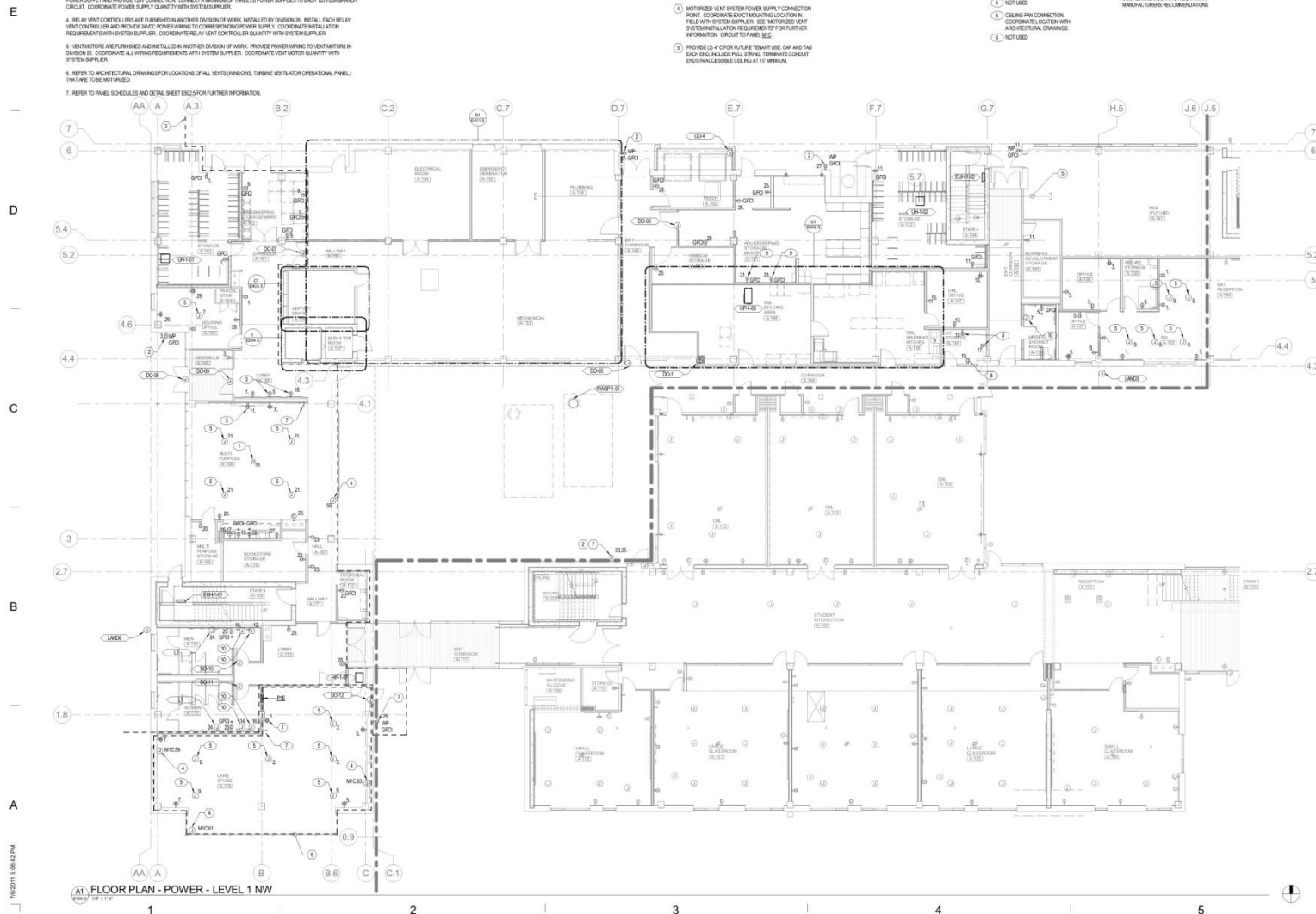
### NOTES:

1. VENT CONNECTION FOR P.O.S. EQUIPMENT.
2. ALL EXTERIOR RECEPTACLES LOCATED ON THE PERIMETER OF THE BUILDING SHALL BE LOCKABLE.
3. CIRCUITS MUST BE GROUND LINE FED FROM 100% UNLESS OTHERWISE NOTED. CIRCUITS MUST BE GROUND LINE FED FROM 100% UNLESS OTHERWISE NOTED.
4. MOTORIZED VENT SYSTEM POWER SUPPLY CONNECTION POINT. COORDINATE EXACT MOUNTING LOCATION IN FIELD WITH SYSTEM SUPPLIER. SEE "MOTORIZED VENT SYSTEM INSTALLATION REQUIREMENTS" FOR FURTHER INFORMATION. CIRCUIT TO PANEL BSC.
5. PROVIDE 1/2" CIP FOR FUTURE TOWN USE. CAP AND TAG EACH END. INCLUDE FILLING. TERMINATE CONDUIT END IN RECESSED CEILING AT 10' MINIMUM.

6. CIRCUITS SHOWN WITH BOUNDARY FED FROM 100% UNLESS OTHERWISE NOTED.
7. 100% SWAMP. WEATHER-PROOF THREE LOCK RECEPTACLES FOR IDENT POWER.

### EQUIPMENT LEGEND:

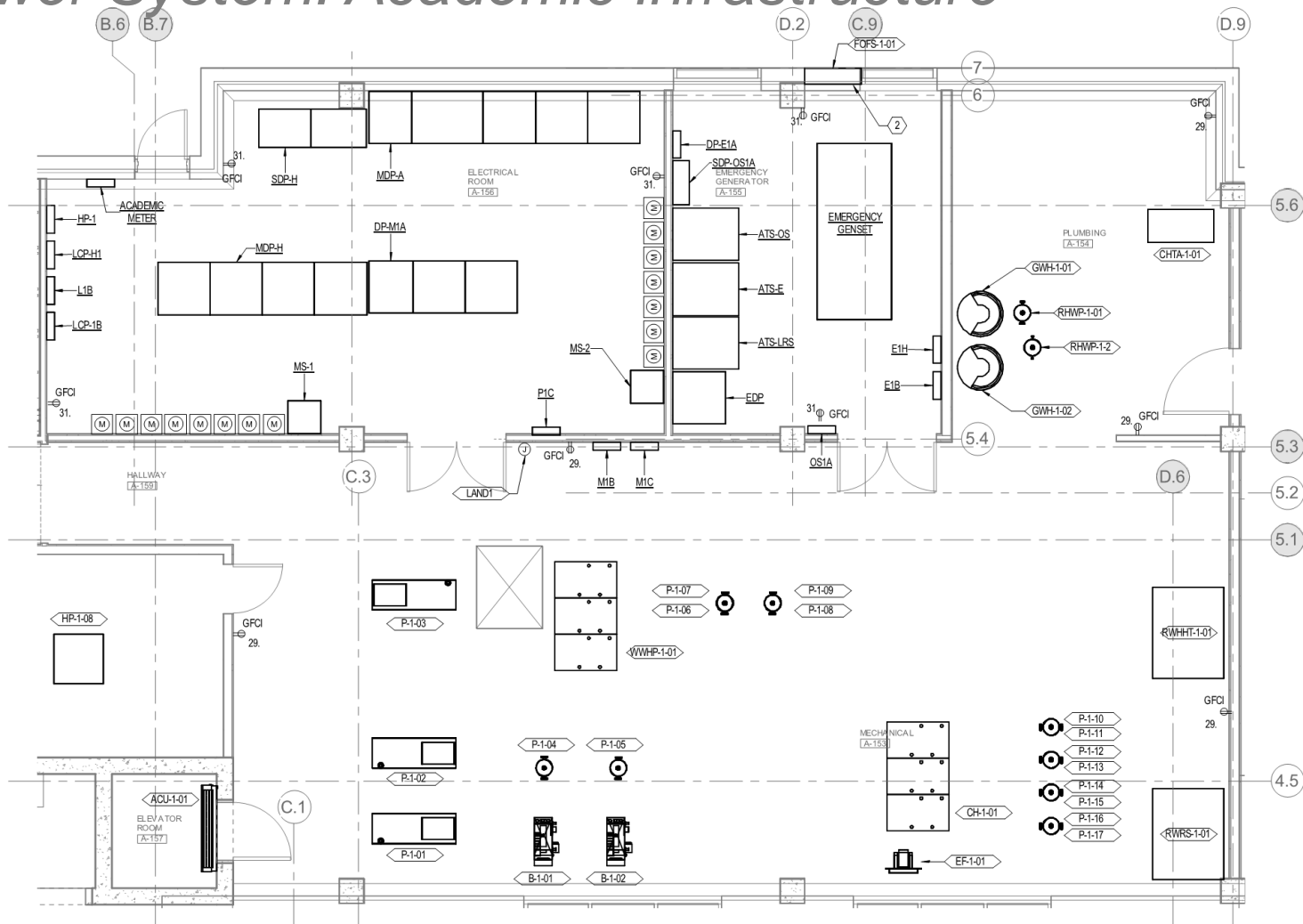
1. CEILING MOUNTED RECEPTACLE FOR PROJECTOR CONNECTION
2. TEACHER'S STATION
3. PLASMA SCREEN CONNECTION
4. NOT USED
5. CEILING FAN CONNECTION. COORDINATE LOCATION WITH ARCHITECTURAL DRAWINGS.
6. NOT USED
7. FAN SPEED CONTROL SWITCH
8. LAPTOP CHARGING STATION
9. HOUSEKEEPING EQUIPMENT CHARGING STATION
10. ELECTRIC HAND DRYER CONNECTION. COORDINATE MOUNTING HEIGHT WITH MANUFACTURER'S RECOMMENDATIONS.



101. FLOOR PLAN - POWER - LEVEL 1 NW

# ELECTRICAL BASIS OF DESIGN

## Power System: Academic Infrastructure







1. MOTORIZED VENT SYSTEM FURNISHED IN ANOTHER DIVISION OF WORK. INSTALLATION OF POWER SUPPLIES AND VENT CONTROLLERS, AND ALL ASSOCIATED SYSTEM POWER WIRING BY DIVISION 26. REFER TO SHEET SSJ 5 FOR TYPICAL WIRING DIAGRAM AND ADDITIONAL REQUIREMENTS.

- [illegible]

1. CLOCKS ARE FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR. ELECTRICAL CONNECTION FOR CLOCKS PROVIDED BY CONTRACTOR AS SHOWN ON PLANS.

2. PROVIDE CONNECTION TO EDC PANEL FROM CIRCUIT IN OPTIONAL STANDBY PANEL. REFER TO PANEL SCHEDULES FOR ADDITIONAL INFORMATION.
3. CABLE CONDUITS AND ALL CONTROL/ALARM ROUTING SHALL BE GROUPED AND RUN IN DESIGNATED AREAS ONLY. SEE MEP COORDINATION SHEETS, G SERIES, FOR ROUTING PATHWAYS. IF PATHWAYS PROVIDE INSUFFICIENT COORDINATE EXCEPTIONS WITH ARCHITECT PRIOR TO INSTALLATION.
4. REFER TO PANEL SCHEDULES FOR TAMPER SWITCH AND FLOW SWITCH CIRCUITING INFORMATION.

1 8 WIRE, 4 CIRCUIT POWERED FURNITURE CONNECTION

- ② PROVIDE CIRCUITRY AS INDICATED. PROVIDE AND INSTALL QUAD RECEPTACLE IN OWNER FURNISHED CASE WORK. SEE A/D DRAWINGS FOR FURTHER DETAIL.
- ③ ALL EXTERIOR RECEPTACLES LOCATED ON THE PERIMETER OF THE BUILDING SHALL BE LOCKABLE.
- ④ 1200WV, 50AMP, WEATHERPROOF TWIST-LOCK RECEPTACLE FOR EVENT POWER.
- ⑤ MOTORIZED VENT SYSTEM POWER SUPPLY CONNECTION POINT. COORDINATE EXACT MOUNTING LOCATION IN FIELD WITH SYSTEM SUPPLIER. SEE "MOTORIZED VENT SYSTEM INSTALLATION REQUIREMENTS" FOR FURTHER INFORMATION. CIRCUIT TO PANEL M/C.

1 CEILING MOUNTED RECEPTACLE FOR

- 2 TEACHER'S STATION

- 7 FAN SPEED CONTROL SWITCH
- 8 ELECTRIC HAND DRIVER CONNECT TO COORDINATE MOUNTING HEIGHT WITH MANUFACTURERS RECOMMENDATION AND ARCHITECTURAL ELEVATIONS
- 9 MOTORIZED PROJECTOR SCREEN

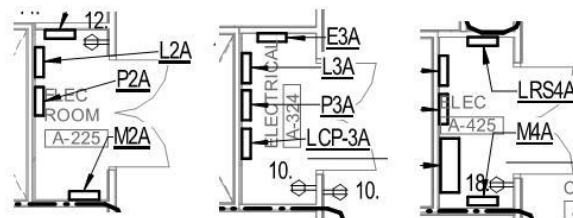
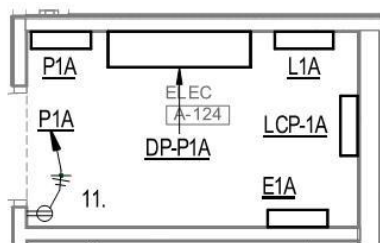






# ELECTRICAL BASIS OF DESIGN

## *Power System: Academic Infrastructure*



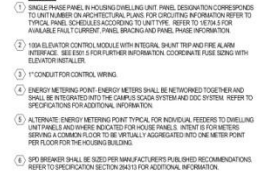
C3  
E401.5

ENLARGED PLAN - LEVEL ONE ELECTRICAL ROOM

1/4" = 1'-0"



A



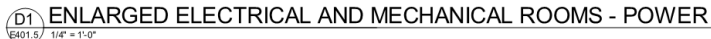


2 ALTERNATE: ENERGY METERING POINT TYPICAL FOR INDIVIDUAL FEEDERS TO DWELLING UNIT PANELS. INTENT IS FOR METERS SERVING A COMMON FLOOR TO BE VIRTUALLY AGGREGATED INTO ONE METER POINT PER FLOOR FOR THE HOUSING BUILDING.



Drawn by  
**ADG**  
Checked by  
**SJT**  
Date  
**July 1, 2011**  
Project No  
**1001**  
Consultant Project No  
Owner Project No  
**SP-5**

## E252.5

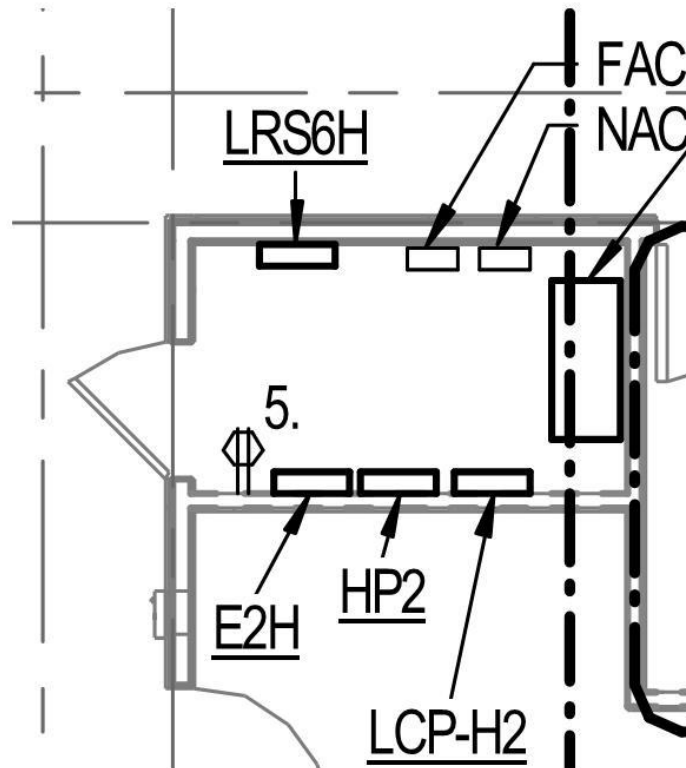






# ELECTRICAL BASIS OF DESIGN

## *Power System: Residential Infrastructure*





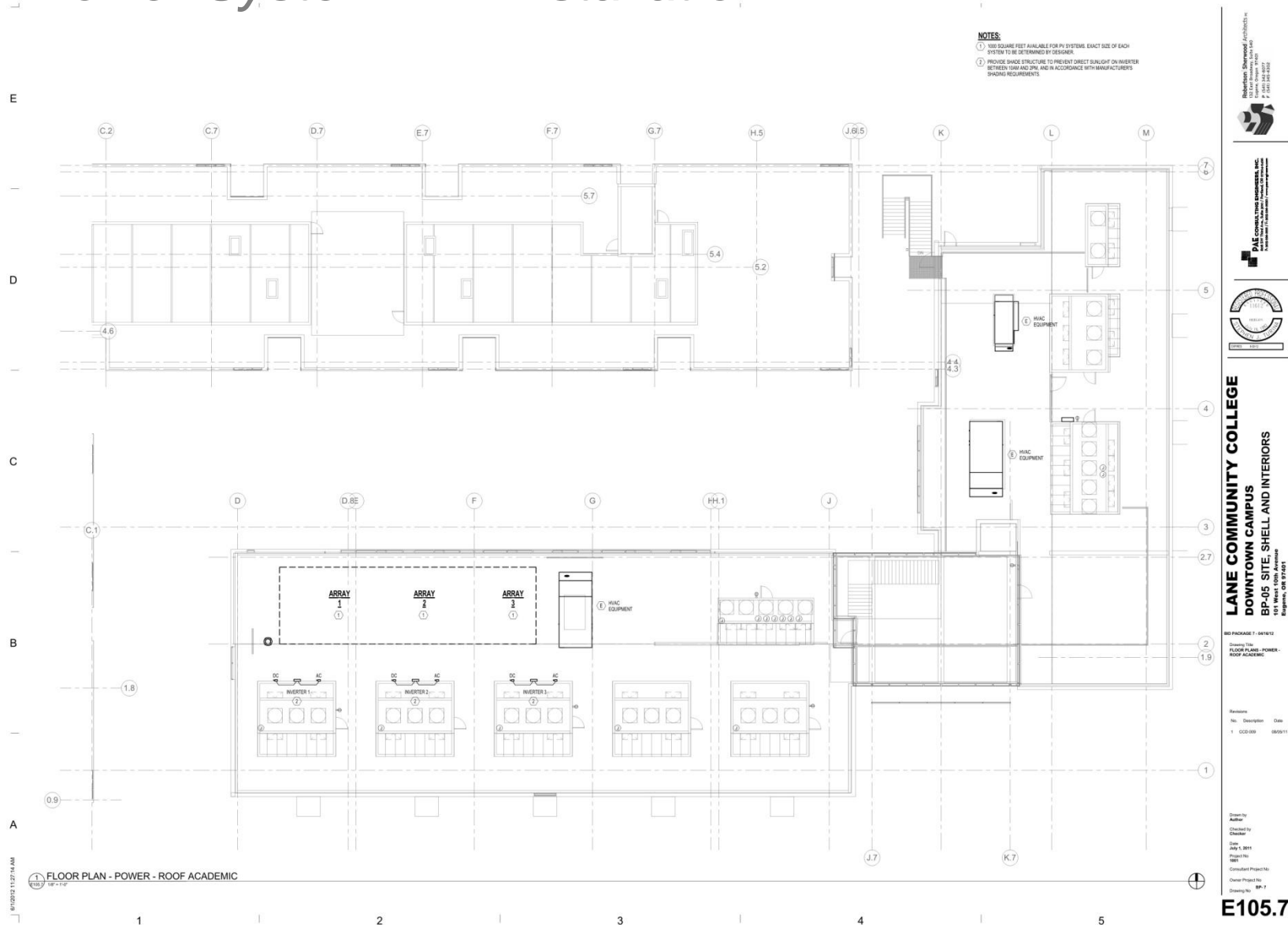
# ELECTRICAL BASIS OF DESIGN

## Power System: PV Installation

THREE PHASE (3-Ø) CABLE				THREE SINGLE (3-Ø) CABLE			
SIZE	AREA	WEIGHT	RESISTANCE	SIZE	AREA	WEIGHT	RESISTANCE
1/2"	0.12	0.12	1.21	1/2"	0.12	0.12	1.21
3/4"	0.18	0.18	0.81	3/4"	0.18	0.18	0.81
1"	0.25	0.25	0.51	1"	0.25	0.25	0.51
1 1/4"	0.42	0.42	0.31	1 1/4"	0.42	0.42	0.31
1 1/2"	0.50	0.50	0.26	1 1/2"	0.50	0.50	0.26
2"	0.71	0.71	0.18	2"	0.71	0.71	0.18
2 1/2"	0.94	0.94	0.14	2 1/2"	0.94	0.94	0.14
3"	1.19	1.19	0.11	3"	1.19	1.19	0.11
3 1/2"	1.44	1.44	0.09	3 1/2"	1.44	1.44	0.09
4"	1.70	1.70	0.07	4"	1.70	1.70	0.07
4 1/2"	1.96	1.96	0.06	4 1/2"	1.96	1.96	0.06
5"	2.23	2.23	0.05	5"	2.23	2.23	0.05
5 1/2"	2.50	2.50	0.04	5 1/2"	2.50	2.50	0.04
6"	2.77	2.77	0.03	6"	2.77	2.77	0.03
6 1/2"	3.04	3.04	0.02	6 1/2"	3.04	3.04	0.02
7"	3.31	3.31	0.02	7"	3.31	3.31	0.02
7 1/2"	3.58	3.58	0.01	7 1/2"	3.58	3.58	0.01
8"	3.85	3.85	0.01	8"	3.85	3.85	0.01
8 1/2"	4.12	4.12	0.01	8 1/2"	4.12	4.12	0.01
9"	4.39	4.39	0.01	9"	4.39	4.39	0.01
9 1/2"	4.66	4.66	0.01	9 1/2"	4.66	4.66	0.01
10"	4.93	4.93	0.01	10"	4.93	4.93	0.01
10 1/2"	5.20	5.20	0.01	10 1/2"	5.20	5.20	0.01
11"	5.47	5.47	0.01	11"	5.47	5.47	0.01
11 1/2"	5.74	5.74	0.01	11 1/2"	5.74	5.74	0.01
12"	6.01	6.01	0.01	12"	6.01	6.01	0.01
12 1/2"	6.28	6.28	0.01	12 1/2"	6.28	6.28	0.01
13"	6.55	6.55	0.01	13"	6.55	6.55	0.01
13 1/2"	6.82	6.82	0.01	13 1/2"	6.82	6.82	0.01
14"	7.09	7.09	0.01	14"	7.09	7.09	0.01
14 1/2"	7.36	7.36	0.01	14 1/2"	7.36	7.36	0.01
15"	7.63	7.63	0.01	15"	7.63	7.63	0.01
15 1/2"	7.90	7.90	0.01	15 1/2"	7.90	7.90	0.01
16"	8.17	8.17	0.01	16"	8.17	8.17	0.01
16 1/2"	8.44	8.44	0.01	16 1/2"	8.44	8.44	0.01
17"	8.71	8.71	0.01	17"	8.71	8.71	0.01
17 1/2"	8.98	8.98	0.01	17 1/2"	8.98	8.98	0.01
18"	9.25	9.25	0.01	18"	9.25	9.25	0.01
18 1/2"	9.52	9.52	0.01	18 1/2"	9.52	9.52	0.01
19"	9.79	9.79	0.01	19"	9.79	9.79	0.01
19 1/2"	10.06	10.06	0.01	19 1/2"	10.06	10.06	0.01
20"	10.33	10.33	0.01	20"	10.33	10.33	0.01
20 1/2"	10.60	10.60	0.01	20 1/2"	10.60	10.60	0.01
21"	10.87	10.87	0.01	21"	10.87	10.87	0.01
21 1/2"	11.14	11.14	0.01	21 1/2"	11.14	11.14	0.01
22"	11.41	11.41	0.01	22"	11.41	11.41	0.01
22 1/2"	11.68	11.68	0.01	22 1/2"	11.68	11.68	0.01
23"	11.95	11.95	0.01	23"	11.95	11.95	0.01
23 1/2"	12.22	12.22	0.01	23 1/2"	12.22	12.22	0.01
24"	12.49	12.49	0.01	24"	12.49	12.49	0.01
24 1/2"	12.76	12.76	0.01	24 1/2"	12.76	12.76	0.01
25"	13.03	13.03	0.01	25"	13.03	13.03	0.01
25 1/2"	13.30	13.30	0.01	25 1/2"	13.30	13.30	0.01
26"	13.57	13.57	0.01	26"	13.57	13.57	0.01
26 1/2"	13.84	13.84	0.01	26 1/2"	13.84	13.84	0.01
27"	14.11	14.11	0.01	27"	14.11	14.11	0.01
27 1/2"	14.38	14.38	0.01	27 1/2"	14.38	14.38	0.01
28"	14.65	14.65	0.01	28"	14.65	14.65	0.01
28 1/2"	14.92	14.92	0.01	28 1/2"	14.92	14.92	0.01
29"	15.19	15.19	0.01	29"	15.19	15.19	0.01
29 1/2"	15.46	15.46	0.01	29 1/2"	15.46	15.46	0.01
30"	15.73	15.73	0.01	30"	15.73	15.73	0.01
30 1/2"	16.00	16.00	0.01	30 1/2"	16.00	16.00	0.01
31"	16.27	16.27	0.01	31"	16.27	16.27	0.01
31 1/2"	16.54	16.54	0.01	31 1/2"	16.54	16.54	0.01
32"	16.81	16.81	0.01	32"	16.81	16.81	0.01
32 1/2"	17.08	17.08	0.01	32 1/2"	17.08	17.08	0.01
33"	17.35	17.35	0.01	33"	17.35	17.35	0.01
33 1/2"	17.62	17.62	0.01	33 1/2"	17.62	17.62	0.01
34"	17.89	17.89	0.01	34"	17.89	17.89	0.01
34 1/2"	18.16	18.16	0.01	34 1/2"	18.16	18.16	0.01
35"	18.43	18.43	0.01	35"	18.43	18.43	0.01
35 1/2"	18.70	18.70	0.01	35 1/2"	18.70	18.70	0.01
36"	18.97	18.97	0.01	36"	18.97	18.97	0.01
36 1/2"	19.24	19.24	0.01	36 1/2"	19.24	19.24	0.01
37"	19.51	19.51	0.01	37"	19.51	19.51	0.01
37 1/2"	19.78	19.78	0.01	37 1/2"	19.78	19.78	0.01
38"	20.05	20.05	0.01	38"	20.05	20.05	0.01
38 1/2"	20.32	20.32	0.01	38 1/2"	20.32	20.32	0.01
39"	20.59	20.59	0.01	39"	20.59	20.59	0.01
39 1/2"	20.86	20.86	0.01	39 1/2"	20.86	20.86	0.01
40"	21.13	21.13	0.01	40"	21.13	21.13	0.01
40 1/2"	21.40	21.40	0.01	40 1/2"	21.40	21.40	0.01
41"	21.67	21.67	0.01	41"	21.67	21.67	0.01
41 1/2"	21.94	21.94	0.01	41 1/2"	21.94	21.94	0.01
42"	22.21	22.21	0.01	42"	22.21	22.21	0.01
42 1/2"	22.48	22.48	0.01	42 1/2"	22.48	22.48	0.01
43"	22.75	22.75	0.01	43"	22.75	22.75	0.01
43 1/2"	23.02	23.02	0.01	43 1/2"	23.02	23.02	0.01
44"	23.29	23.29	0.01	44"	23.29	23.29	0.01
44 1/2"	23.56	23.56	0.01	44 1/2"	23.56	23.56	0.01
45"	23.83	23.83	0.01	45"	23.83	23.83	0.01
45 1/2"	24.10	24.10	0.01	45 1/2"	24.10	24.10	0.01
46"	24.37	24.37	0.01	46"	24.37	24.37	0.01
46 1/2"	24.64	24.64	0.01	46 1/2"	24.64	24.64	0.01
47"	24.91	24.91	0.01	47"	24.91	24.91	0.01
47 1/2"	25.18	25.18	0.01	47 1/2"	25.18	25.18	0.01
48"	25.45	25.45	0.01	48"	25.45	25.45	0.01
48 1/2"	25.72	25.72	0.01	48 1/2"	25.72	25.72	0.01
49"	25.99	25.99	0.01	49"	25.99	25.99	0.01
49 1/2"	26.26	26.26	0.01	49 1/2"	26.26	26.26	0.01
50"	26.53	26.53	0.01	50"	26.53	26.53	0.01
50 1/2"	26.80	26.80	0.01	50 1/2"	26.80	26.80	0.01
51"	27.07	27.07	0.01	51"	27.07	27.07	0.01
51 1/2"	27.34	27.34	0.01	51 1/2"	27.34	27.34	0.01
52"	27.61	27.61	0.01	52"	27.61	27.61	0.01
52 1/2"	27.88	27.88	0.01	52 1/2"	27.88	27.88	0.01
53"	28.15	28.15	0.01	53"	28.15	28.15	0.01
53 1/2"	28.42	28.42	0.01	53 1/2"	28.42	28.42	0.01
54"	28.69	28.69	0.01	54"	28.69	28.69	0.01
54 1/2"	28.96	28.96	0.01	54 1/2"	28.96	28.96	0.01
55"	29.23	29.23	0.01	55"	29.23	29.23	0.01
55 1/2"	29.50	29.50	0.01	55 1/2"	29.50	29.50	0.01
56"	29.77	29.77	0.01	56"	29.77	29.77	0.01
56 1/2"	30.04	30.04	0.01	56 1/2"	30.04	30.04	0.01
57"	30.31	30.31	0.01	57"	30.31	30.31	0.01
57 1/2"	30.58	30.58	0.01	57 1/2"	30.58	30.58	0.01
58"	30.85	30.85	0.01	58"	30.85	30.85	0.01
58 1/2"	31.12	31.12	0.01	58 1/2"	31.12	31.12	0.01
59"	31.39	31.39	0.01	59"	31.39	31.39	0.01
59 1/2"	31.66	31.66	0.01	59 1/2"	31.66	31.66	0.01
60"	31.93	31.93	0.01	60"	31.93	31.93	0.01
60 1/2"	32.20	32.20	0.01	60 1/2"	32.20	32.20	0.01
61"	32.47	32.47	0.01	61"	32.47	32.47	0.01
61 1/2"	32.74	32.74	0.01	61 1/2"	32.74	32.74	0.01
62"	33.01	33.01	0.01	62"	33.01	33.01	0.01
62 1/2"	33.28	33.28	0.01	62 1/2"	33.28	33.28	0.01
63"	33.55	33.55	0.01	63"	33.55	33.55	0.01
63 1/2"	33.82	33.82	0.01	63 1/2"	33.82	33.82	0.01
64"	34.09	34.09	0.01	64"	34.09	34.09	0.01
64 1/2"	34.36	34.36	0.01	64 1/2"	34.36	34.36	0.01
65"	34.63	34.63	0.01	65"	34.63	34.63	0.01
65 1/2"	34.90	34.90	0.01	65 1/2"	34.90	34.90	0.01
66"	35.17	35.17	0.01	66"	35.17	35.17	0.01
66 1/2"	35.44	35.44	0.01	66 1/2"	35.44	35.44	0.01
67"	35.71	35.71	0.01	67"	35.71	35.71	0.01
67 1/2"	35.98	35.98	0.01	67 1/2"	35.98	35.98	0.01
68"	36.25	36.25	0.01	68"	36.25	36.25	0.01
68 1/2"	36.52	36.52	0.01	68 1/2"	36.52	36.52	0.01
69"	36.79	36.79	0.01	69"	36.79	36.79	0.01
69 1/2"	37.06	37.06	0.01	69 1/2"	37.06	37.06	0.01
70"	37.33	37.33	0.01	70"	37.33	37.33	0.01
70 1/2"	37.60	37.60	0.01	70 1/2"	37.60	37.60	0.01
71"	37.87	37.87	0.01	71"	37.87	37.87	0.01
71 1/2"	38.14	38.14	0.01	71 1/2"	38.14	38.14	0.01
72"	38.41	38.41	0.01	72"	38.41	38.41	0.01
72 1/2"	38.68	38.68	0.01	72 1/2"	38.68	38.68	0.01
73"	38.95	38.95	0.01	73"	38.95	38.95	0.01
73 1/2"	39.22	39.22	0.01	73 1/2"	39.22	39.22	0.01
74"	39.49	39.49	0.01	74"	39.49	39.49	0.01
74 1/2"	39.76	39.76	0.01	74 1/2"	39.76	39.76	0.01
75"	40.03	40.03	0.01	75"	40.03	40.03	0.01
75 1/2"	40.30	40.30	0.01	75 1/2"	40.30	40.30	0.01
76"	40.57	40.57	0.0				

# ELECTRICAL BASIS OF DESIGN

## Power System: PV Installation





# ELECTRICAL BASIS OF DESIGN

## *Power System: PV Installation*

Photovoltaic  
Array



Image courtesy of SRG Partnership





# ELECTRICAL BASIS OF DESIGN

## *Metering System*





# ELECTRICAL BASIS OF DESIGN

## Metering System

PHASE 1 WIRE + GROUND				PHASE 2 WIRE + GROUND			
AMP	CONDUIT SIZE	CONDUIT TYPE	CONDUIT SIZE	AMP	CONDUIT SIZE	CONDUIT TYPE	CONDUIT SIZE
100A	1 1/2"	402	1 1/2"	100A	1 1/2"	402	1 1/2"
150A	2"	402	2"	150A	2"	402	2"
200A	2 1/2"	402	2 1/2"	200A	2 1/2"	402	2 1/2"
250A	3"	402	3"	250A	3"	402	3"
300A	3 1/2"	402	3 1/2"	300A	3 1/2"	402	3 1/2"
350A	4"	402	4"	350A	4"	402	4"
400A	4 1/2"	402	4 1/2"	400A	4 1/2"	402	4 1/2"
450A	5"	402	5"	450A	5"	402	5"
500A	5 1/2"	402	5 1/2"	500A	5 1/2"	402	5 1/2"
550A	6"	402	6"	550A	6"	402	6"
600A	6 1/2"	402	6 1/2"	600A	6 1/2"	402	6 1/2"
650A	7"	402	7"	650A	7"	402	7"
700A	7 1/2"	402	7 1/2"	700A	7 1/2"	402	7 1/2"
750A	8"	402	8"	750A	8"	402	8"
800A	8 1/2"	402	8 1/2"	800A	8 1/2"	402	8 1/2"
850A	9"	402	9"	850A	9"	402	9"
900A	9 1/2"	402	9 1/2"	900A	9 1/2"	402	9 1/2"
950A	10"	402	10"	950A	10"	402	10"
1000A	10 1/2"	402	10 1/2"	1000A	10 1/2"	402	10 1/2"

### GENERAL NOTES:

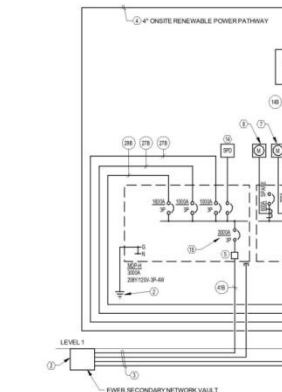
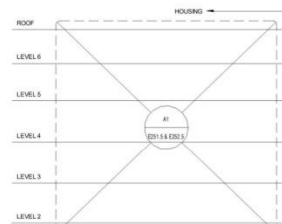
1. REFER TO PANEL SCHEDULES FOR PANEL CAPACITY AND PROVISIONS.
2. REFER TO PANEL SCHEDULES FOR AVAILABLE PANEL CURRENT AT EACH PANEL OR SWITCHBOARD. SCOR MUST MEET OR EXCEED AVAILABLE PANEL.

### NOTES:

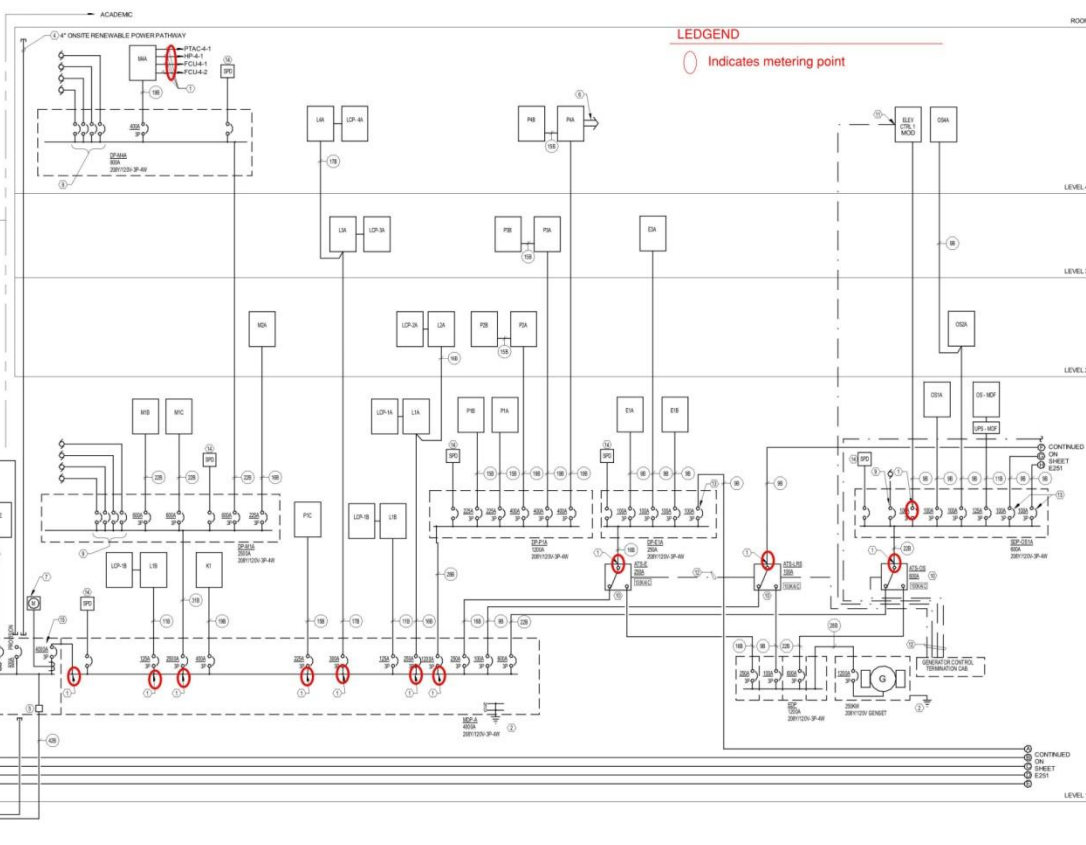
1. ENERGY METERING POINT: ENERGY METERS SHALL BE NETWORKED TOGETHER AND SHALL BE INTEGRATED INTO THE CAMPUS ENERGY AND SCADA SYSTEM. SEE SPECIFICATION FOR FURTHER DETAIL.
2. SEE GRADING, EROSION CONTROL, AND SYSTEM DETAIL ON SHEET E201-02 FOR FURTHER DETAIL.
3. PROVIDE 30" x 4" CONDUIT FORM VOLTAGE TO MAIN DISTRIBUTION GEAR (VDC) CONDUIT TO EACH ENERGY METERING POINT. LATERAL AND RECESSED IN FEEDER RIG. UNLESS CONDUIT SHALL BE TAPPED AS SPARE AND PROVIDED WITH FULL STRING.
4. FEED IN CONDUIT WITHIN ELECTRICAL ROOM AT ACCESSIBLE LOCATION. CAP, LABEL AND PROVIDE FULL STRING.
5. LABEL METERING POINTS BY FEEDER, METERING ELECTRICAL CONTRACTOR, COORDINATE SIZE, AND RECESSED WITH FEEDER PRIOR TO CONSTRUCTION.
6. CIRCUITS SERVING 4-400V SHALL HAVE BRANCH CIRCUIT METERING AND SHALL BE NETWORKED TOGETHER AND INTEGRATED INTO THE CAMPUS SCADA SYSTEM. REFER TO PANEL SCHEDULES AND FLOOR PLANS FOR MONITORED BRANCH CIRCUITS. PROVIDE METERING FOR ADDITIONAL 30" BRANCH CIRCUITS IN ADDITION TO CIRCUITS INDICATED.
7. ENERGY ELECTRICAL UTILITY METER, COORDINATE METER REQUIREMENTS WITH ENERGY.

1. PROVIDED FOR FUTURE ENERGY METER.
2. METERS SHOWN GENERALLY: REFER TO MIE COORDINATION AND PANEL SCHEDULES FOR FEEDER AND OVERCURRENT PROTECTION INFORMATION.
3. 4-PHASE OPEN TRANSFORMERS.
4. 100A ELEVATOR CONTROL MODULE WITH INTEGRAL SHUNT TRIP AND FIRE ALARM INTERFACE. SEE E201-03 FOR FURTHER INFORMATION. COORDINATE FUSE RATING WITH ELEVATOR METALFEEL.
5. 7" CONDUIT FOR CONTROL WIRING.
6. ALTERNATE ENERGY METERING POINT: WHERE INDICATED FOR HOUSE PANELS. INTENT IS FOR METERS SERVING A COMMON FLOOR IN HOUSING BUILDING. REFER TO PANEL SCHEDULES AND FLOOR PLANS FOR FURTHER INFORMATION.
7. 300A BREAKER SHALL BE SIZED PER MANUFACTURER'S PUBLISHED RECOMMENDATIONS. REFER TO SPECIFICATION SECTION 260131 FOR ADDITIONAL INFORMATION.
8. BREAKER SHALL BE 100% RATED.

PHASE 1 WIRE + GROUND				PHASE 2 WIRE + GROUND			
AMP	CONDUIT SIZE	CONDUIT TYPE	CONDUIT SIZE	AMP	CONDUIT SIZE	CONDUIT TYPE	CONDUIT SIZE
100A	1 1/2"	402	1 1/2"	100A	1 1/2"	402	1 1/2"
150A	2"	402	2"	150A	2"	402	2"
200A	2 1/2"	402	2 1/2"	200A	2 1/2"	402	2 1/2"
250A	3"	402	3"	250A	3"	402	3"
300A	3 1/2"	402	3 1/2"	300A	3 1/2"	402	3 1/2"
350A	4"	402	4"	350A	4"	402	4"
400A	4 1/2"	402	4 1/2"	400A	4 1/2"	402	4 1/2"
450A	5"	402	5"	450A	5"	402	5"
500A	5 1/2"	402	5 1/2"	500A	5 1/2"	402	5 1/2"
550A	6"	402	6"	550A	6"	402	6"
600A	6 1/2"	402	6 1/2"	600A	6 1/2"	402	6 1/2"
650A	7"	402	7"	650A	7"	402	7"
700A	7 1/2"	402	7 1/2"	700A	7 1/2"	402	7 1/2"
750A	8"	402	8"	750A	8"	402	8"
800A	8 1/2"	402	8 1/2"	800A	8 1/2"	402	8 1/2"
850A	9"	402	9"	850A	9"	402	9"
900A	9 1/2"	402	9 1/2"	900A	9 1/2"	402	9 1/2"
950A	10"	402	10"	950A	10"	402	10"
1000A	10 1/2"	402	10 1/2"	1000A	10 1/2"	402	10 1/2"



ONE LINE DIAGRAM - ELECTRICAL



LANE COMMUNITY COLLEGE  
DOWNTOWN CAMPUS  
BP-05 SITE, SHELL AND INTERIORS  
Program, 08/17/2017

CONSTRUCTION DOCUMENTS

Revisions  
No. Description Date

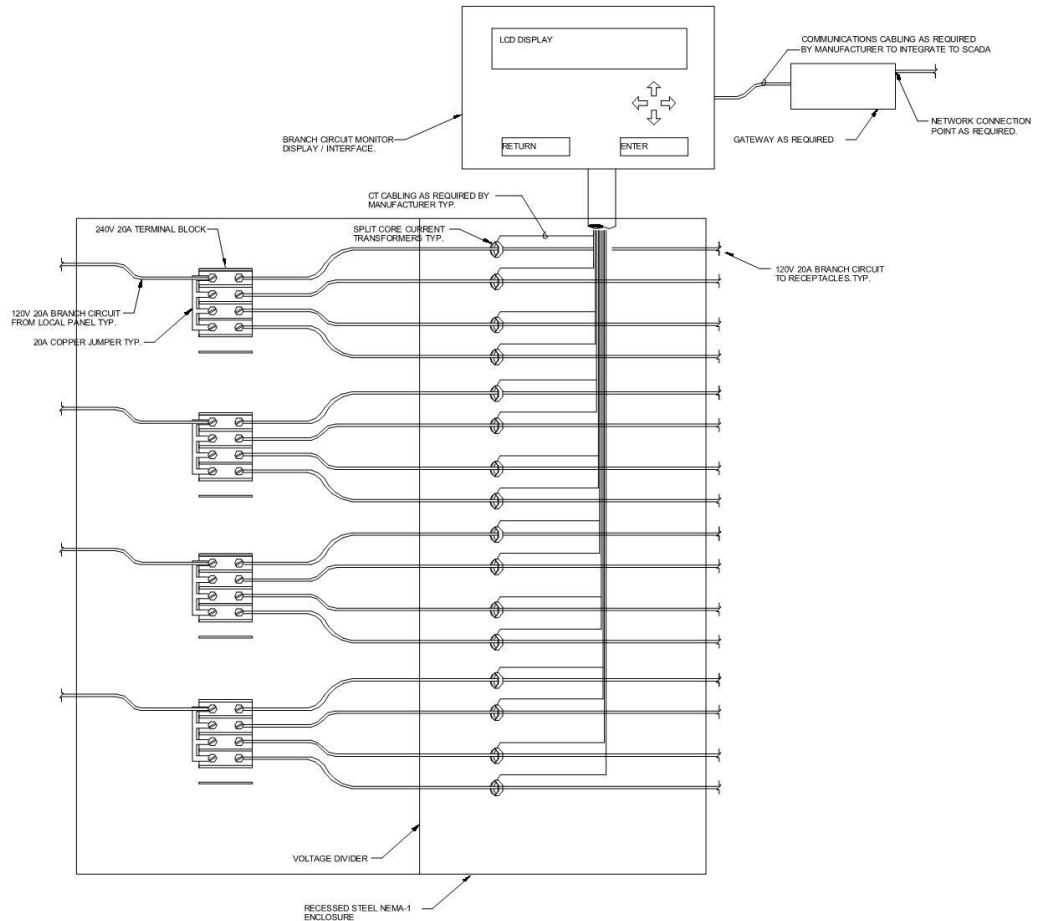
Drawn By  
Checked By  
Date  
Project No.  
Consultant Project No.  
Owner Project No.  
Drawing No. E-1

E201.5



# ELECTRICAL BASIS OF DESIGN

## *Metering System*







# ELECTRICAL BASIS OF DESIGN

## *Lighting System*

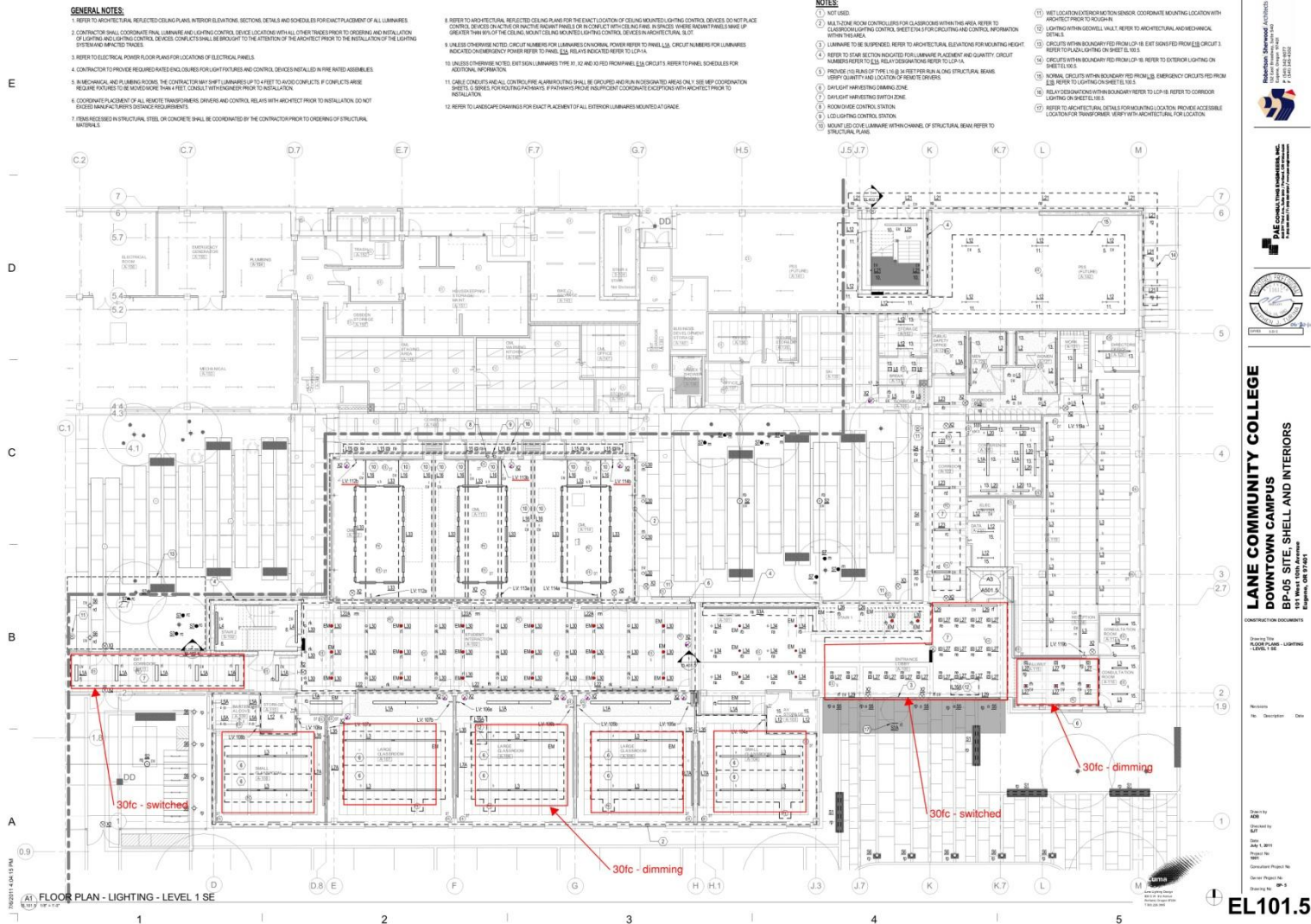






# ELECTRICAL BASIS OF DESIGN

## Academic Strategies and Control





- |    |   |    |  |
|----|---|----|--|
| 1  | NOT USED.   | 11 | WET LOCATION EXTERIOR MOTION SENSOR. COORDINATE MOUNTING LOCATION WITH ARCHITECT PRIOR TO ROUGH-IN.  |
| 2  | MULTI-ZONE ROOM CONTROLLERS FOR CLASSROOMS WITHIN THIS AREA. REFER TO CLASSROOM LIGHTING CONTROL SHEET E04.5 FOR CIRCUITING AND CONTROL INFORMATION WITHIN THIS AREA. | 12 | LIGHTING WITHIN GEOWALL. VERIFY, REFER TO ARCHITECTURAL AND MECHANICAL DETAIL.   |
| 3  | LUMINAIRE TO BE SUSPENDED. REFER TO ARCHITECTURAL ELEVATIONS FOR MOUNTING HEIGHT.   | 13 | GROUTS WITHIN BOUNDARY FEED FROM LCP-1B. EXIST SIGNS FEED FROM <u>E</u> 03. CIRCUIT 3. REFER TO PLAZA LIGHTING ON SHEET E10.0.5.           |
| 4  | REFER TO STAIR SECTION INDICATED FOR LUMINAIRE PLACEMENT AND QUANTITY. CIRCUIT NUMBERS REFER TO <u>E</u> 04. RELAY DISCRETEMENTS RELAY TO LCP-1A.                     | 14 | GROUTS WITHIN BOUNDARY FEED FROM LCP-1B. REFER TO EXTERIOR LIGHTING ON SHEET E10.0.5.  |
| 5  | PROVIDE: (1) RUNS OF THE 1/8" & 3/4" FEET PER RUN ALONG STRUCTURAL BEAMS. VERIFY QUANTITY AND LOCATION OF REMOTE DRIVERS.   | 15 | NORMAL CIRCUITS WITHIN BOUNDARY FEED FROM <u>E</u> 04. EMERGENCY CIRCUITS FEED FROM <u>E</u> 03. REFER TO LIGHTING ON SHEET E10.0.5.       |
| 6  | DAYLIGHT HARVESTING DIMMING ZONE.   | 16 | RELAY DESIGNATIONS WITHIN BOUNDARY FEED TO LCP-1B. REFER TO CORRIDOR LIGHTING ON SHEET E10.0.5.  |
| 7  | DAYLIGHT HARVESTING SWITCH ZONE.  | 17 | REFER TO ARCHITECTURAL DETAILS FOR MOUNTING LOCATION. PROVIDE ACCESSIBLE LOCATION FOR TRANSFORMER. VERIFY WITH ARCHITECTURAL FOR LOCATION. |
| 8  | ROOM DIVIDE CONTROL STATION.  |    |  |
| 9  | LED LIGHTING CONTROL STATION.   |    |  |
| 10 | MOUNT LED COVE LUMINAIRE WITHIN CHANNEL OF STRUCTURAL BEAM. REFER TO STRUCTURAL PLANS.  |    |  |



# ELECTRICAL BASIS OF DESIGN

## *Academic Strategies and Control*

CML LIGHTING CONTROL UNITS																		
SYSTEM CONTROL INPUTS																		
Room/Area	Switch Plate/Input	Switch	Switch Description	Control Unit ID	a	b	c	d	e	ae	be	ce	de	Shade Ctrl	HVAC	Notes		
A-112																		
	Photo Cell	-	PE Cell Daylight Dimming	112	X	X												3.
	Occupancy Sensor	-	Manual On/Auto Off	112	X	X	X							X	X			1.2.5.
	Occupancy Sensor	-	Manual On/Auto Off	112	X	X	X							X	X			1.2.5.
	LV112a	S112aa	Relay a Dim Raise/Lower	112	X													4.
	LV112a	S112ab	Relay b Dim Raise/Lower	112		X												4.
	LV112a	S112ac	Relay c Dim Raise/Lower	112			X											4.
	LV112b	S112ba	Relay a Dim Raise/Lower	112	X													4.
	LV112b	S112bb	Relay b Dim Raise/Lower	112		X												4.
	LV112b	S112bc	Relay c Dim Raise/Lower	112			X											4.
A-113																		
	Photo Cell	-	PE Cell Daylight Dimming	113	X	X												3.
	Occupancy Sensor	-	Manual On/Auto Off	113	X	X	X							X	X			1.2.5.
	Occupancy Sensor	-	Manual On/Auto Off	113	X	X	X							X	X			1.2.5.
	LV113a	S113aa	Relay a Dim Raise/Lower	113	X													4.
	LV113a	S113ab	Relay b Dim Raise/Lower	113		X												4.
	LV113a	S113ac	Relay c Dim Raise/Lower	113			X											4.
	LV113b	S113ba	Relay a Dim Raise/Lower	113	X													4.
	LV113b	S113bb	Relay b Dim Raise/Lower	113		X												4.
	LV113b	S113bc	Relay c Dim Raise/Lower	113			X											4.
A-114																		
	Photo Cell	-	PE Cell Daylight Dimming	114	X	X												3.
	Occupancy Sensor	-	Manual On/Auto Off	114	X	X	X							X	X			1.2.5.
	Occupancy Sensor	-	Manual On/Auto Off	114	X	X	X							X	X			1.2.5.
	LV114a	S114aa	Relay a Dim Raise/Lower	114	X													4.
	LV114a	S114ab	Relay b Dim Raise/Lower	114		X												4.
	LV114a	S114ac	Relay c Dim Raise/Lower	114			X											4.
	LV114b	S114ba	Relay a Dim Raise/Lower	114	X													4.
	LV114b	S114bb	Relay b Dim Raise/Lower	114		X												4.
	LV114b	S114bc	Relay c Dim Raise/Lower	114			X											4.

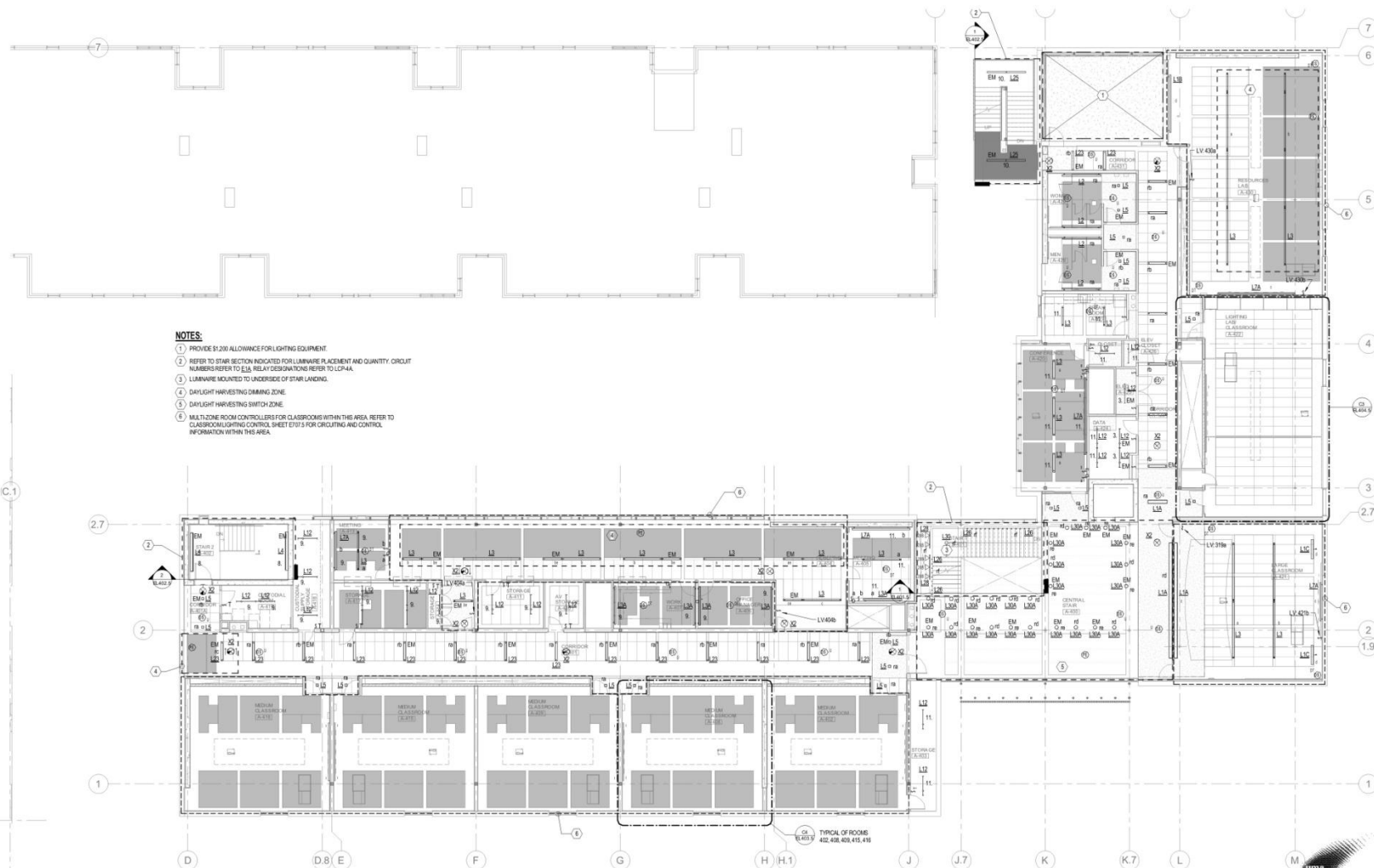
### Notes:

- Occupancy sensor shall control HVAC system with Auto On/Auto Off sequence.
- Occupancy Sensor to turn Off all lights. Presets unaffected.
- Photocell shall Dim or Switch fixtures as indicated on floor plans as fixtures within daylighting zone.
- When rooms divisions are collapsed by room control station shown on EL 101.5 switch shall control relay of same designation in adjoining space. When room dividers are in place, switch shall resume control of local relay only. Provide 5 button present wall station at each switch bank.
- Provide control wiring from relay indicated to shade controller. Coordinate controller location in field with system provider.



# ELECTRICAL BASIS OF DESIGN

## *Academic Strategies and Control*



### NOTES:

1. PROVIDE 5' 0" ALLOWANCE FOR LIGHTING EQUIPMENT.
2. REFER TO START SECTION INDICATED FOR LUMINAIRE PLACEMENT AND QUANTITY. CIRCUIT NUMBERS REFER TO L2, RELAY DESIGNATIONS REFER TO LCP4A.
3. LUMINAIRE MOUNTED TO UNDERSIDE OF STAIR LANDING.
4. DAYLIGHT HARVESTING DIMMING ZONE.
5. DAYLIGHT HARVESTING SWITCH ZONE.
6. MULTIZONE ROOM CONTROLLERS FOR CLASSROOMS WITHIN THIS AREA. REFER TO CLASSROOM LIGHTING SHEET E701.3 FOR CIRCUITING AND CONTROL INFORMATION WITHIN THIS AREA.

1 FLOOR PLAN - LIGHTING - LEVEL 4 ACADEMIC



**LANE COMMUNITY COLLEGE**  
**DOWNTOWN CAMPUS**  
**BP-05 SITE, SHELL AND INTERIORS**  
101 West 10th Avenue  
Eugene, OR 97401

CONSTRUCTION DOCUMENTS

Drawing Title  
FLOOR PLAN - LIGHTING  
LEVEL 4 ACADEMIC

Revisions  
No. Description Date

Drawn by  
ADP  
Checked by  
BTT  
Date  
JAN 1, 2011  
Project No.  
1001  
Consultant Project No.  
Drawing No.  
BP-05

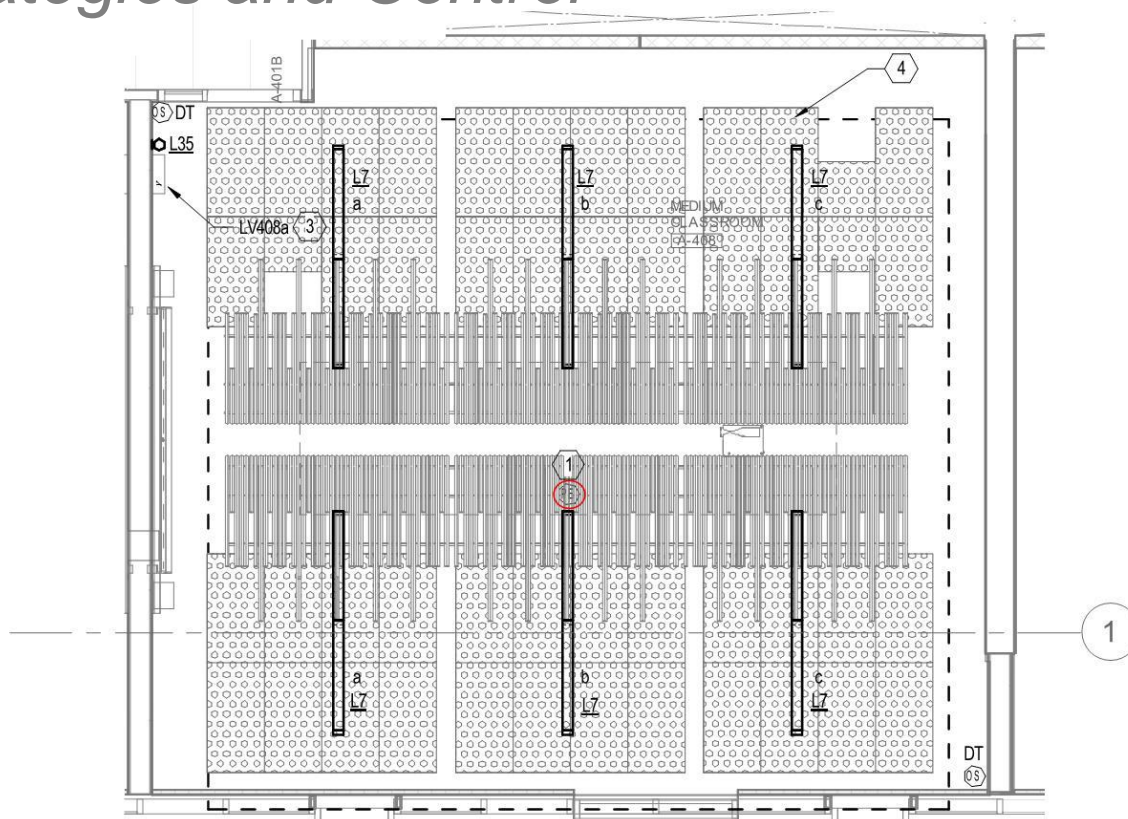


**EL104.5**





- 1 OPEN LOOP PHOTOCELL. MOUNT IN SKYLIGHT WELL.
- 2 MOUNT ABOVE REFLECTOR PER ARCHITECTURAL DETAIL.
- 3 MULTI-ZONE CONTROLLER DIMMER STATION.
- 4 DAYLIGHT HARVEST DIMMING ZONE.





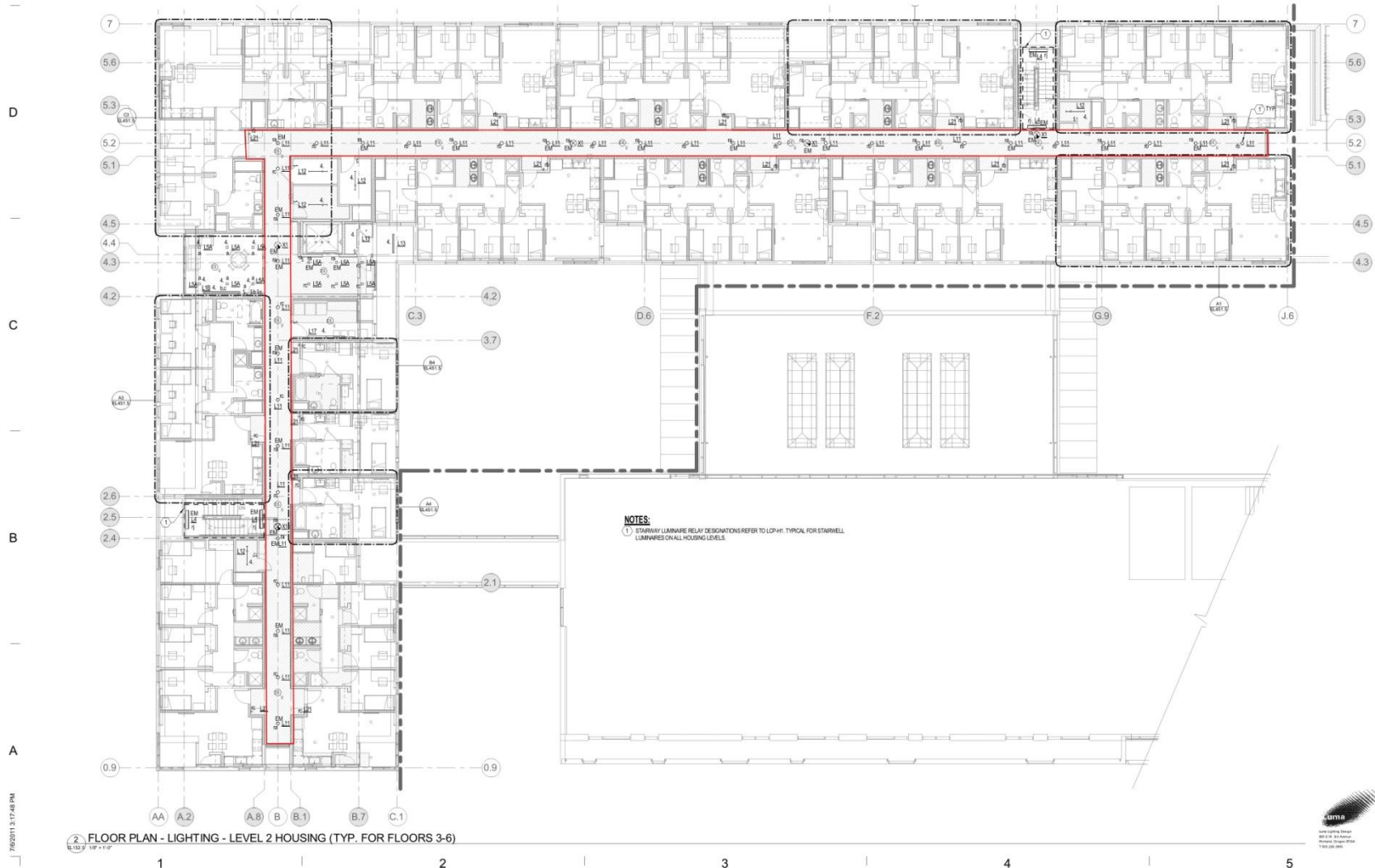
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SLVLLc  
SLVLLd  
SLVLLe  
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SLVLLv  
SLVLLw  
SLVLLx  
SLVLLy  
SLVLLz  
SLVLLaa  
SLVLLbb  
SLVLLcc  
SLVLLdd  
SLVLLee  
SLVLLff

2) EXIT SIGN LUMINAIRES FED FROM PANEL E3A CIRCUIT 13.



# ELECTRICAL BASIS OF DESIGN

## *Residential Strategies and Control*



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**DOWNTOWN CAMPUS**  
**BP-05 SITE, SHELL AND INTERIORS**  
1015 W. WALL ST., SUITE 200  
SACRAMENTO, CA 95811

CONSTRUCTION DOCUMENTS

Drawing Title  
FLOOR PLANS - LIGHTING  
- LEVEL 2 HOUSING

Revisions  
No. Description Date

Drawn by  
ABD  
Checked by  
BUT  
Date  
July 1, 2011  
Project No.  
1001  
Consultant Project No.  
Owner Project No.  
BP-5  
Drawing No.



LUMINA  
Luminaire Design  
and Installation  
Services  
1015 W. WALL ST., SUITE 200  
SACRAMENTO, CA 95811

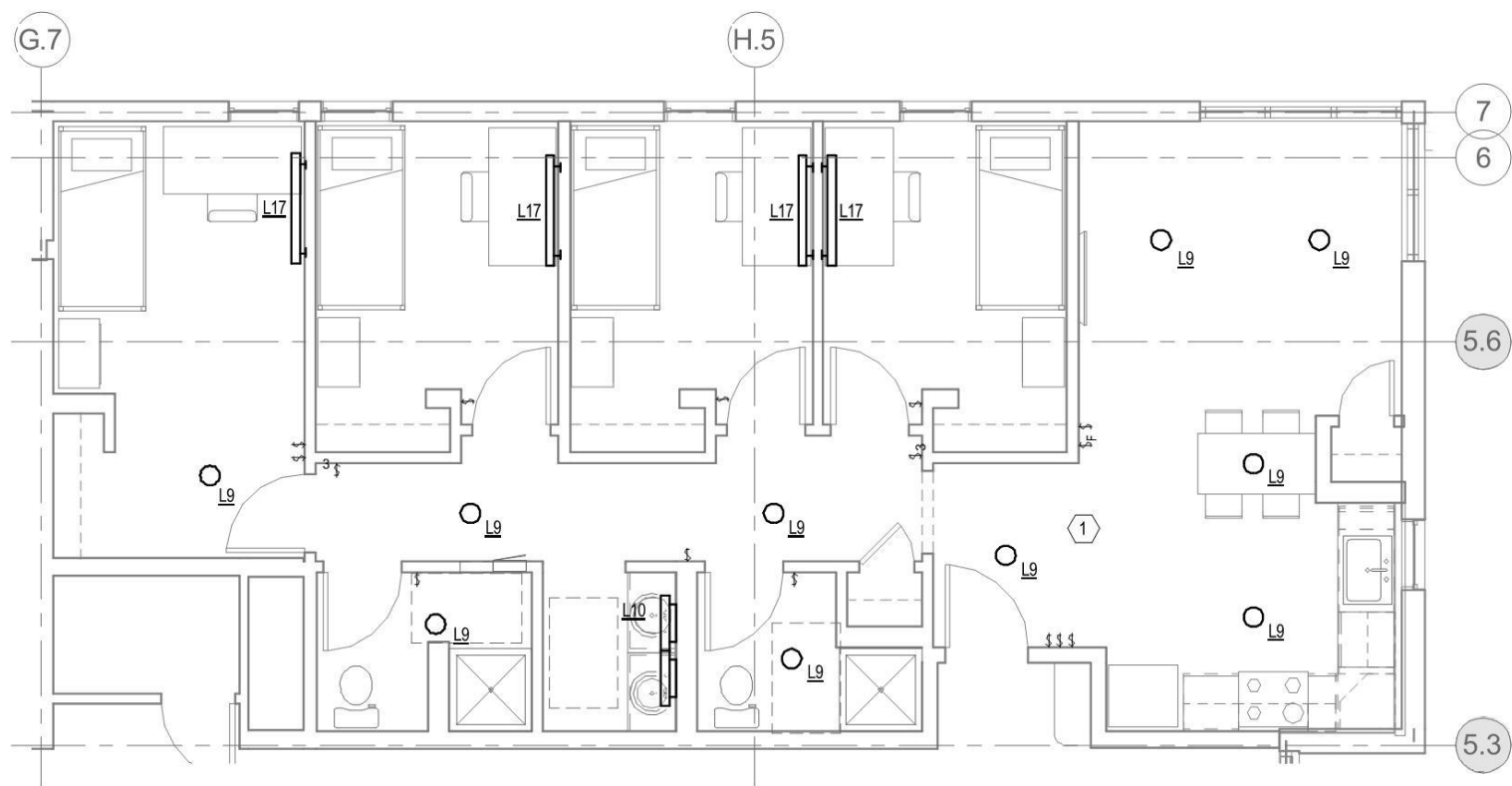


**EL152.5**



# ELECTRICAL BASIS OF DESIGN

## *Residential Strategies and Control*



**B1 PARTIAL PLAN - UNIT TYPE A1 - LIGHTING**

B.451.5 1/4" = 1'-0"





# ELECTRICAL BASIS OF DESIGN

*Any questions?*

