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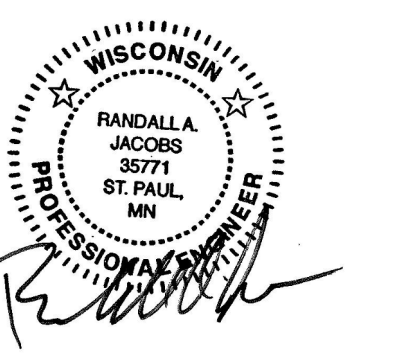
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Olbrich Botanical Gardens Expansion Phase 1

BPW Project #8162
 3330 Atwood Avenue
 Madison, WI 53704

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Signature: _____
 Print Names: Randall A. Jacobs

Date: JUNE 4, 2018 License No. 35771

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PROJECT NO. 2017016

PROJECT PHASE BID DOCUMENTS

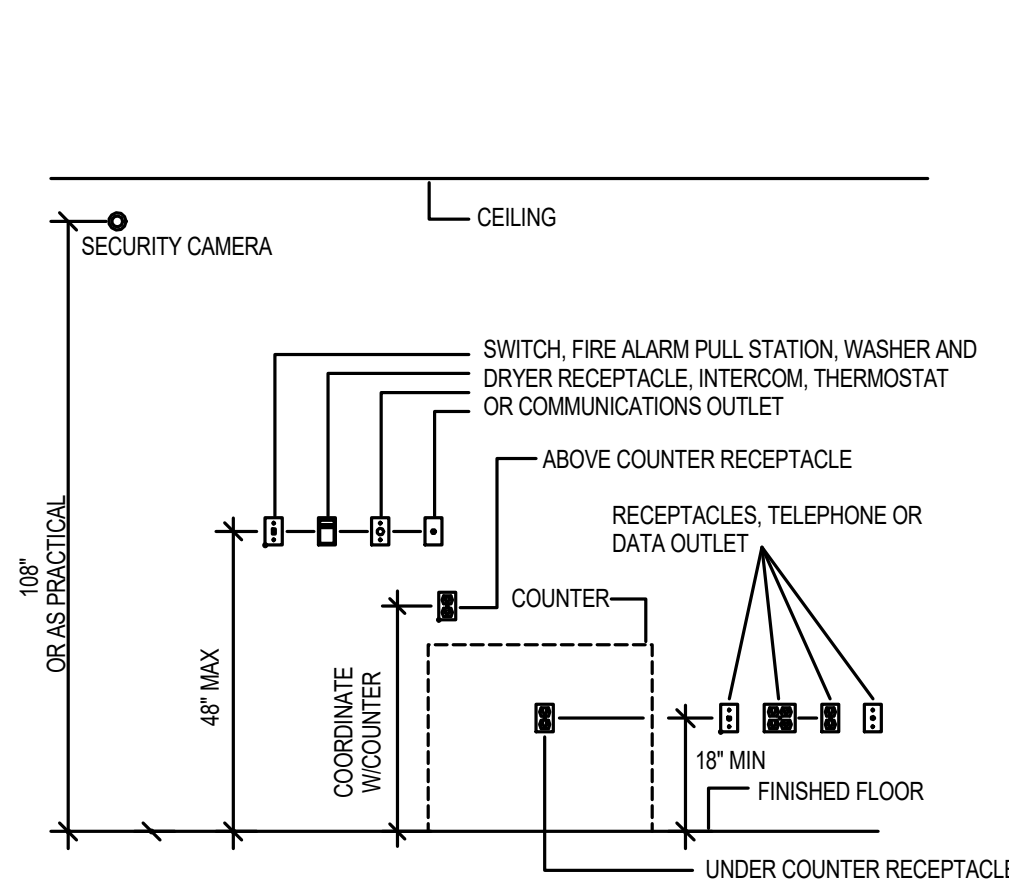
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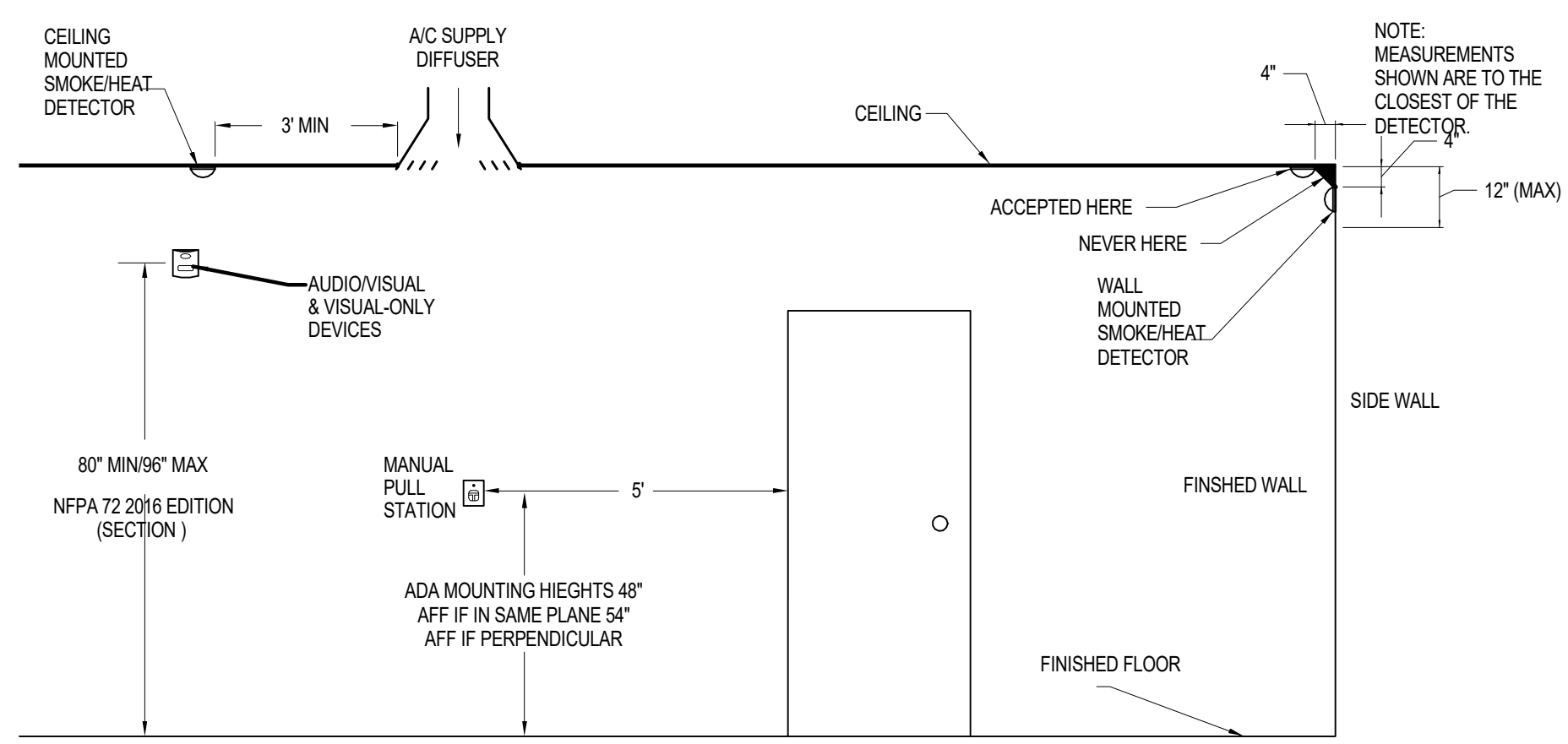
ELECTRICAL TITLE SHEET

EXHIBIT N E000

ELECTRICAL SYMBOLS LEGEND		ELECTRICAL ABBREVIATIONS		
RECEPTACLES 20A 120V 2P 3W GROUNDING DUPLEX RECEPTACLE DUPLICATE RECEPTACLE (1 SWITCHED & 1 UNSWITCHED) SINGLE-POLE RECEPTACLE QUADPLEX RECEPTACLE GFCI RECEPTACLE RECEPTACLE MTD. 6" ABOVE COUNTER OR HGT SHOWN TAMPER RESISTANT RECEPTACLE WEATHER-PROOF GFCI RECEPTACLE QUADPLEX FLOORBOX SPECIAL RECEPTACLE	LIGHTING FIXTURE TYPE PER SCHEDULE - CIRCUIT NUMBER TRIGGER STYLE RECESSED FIXTURE, TYPE AS NOTED SWITCH OR RELAY LEGS FIXTURE ON EMERGENCY POWER STRIP LIGHT / SUSPENDED DIRECT/INDIRECT SURFACE MTD FIXTURE TRACK LIGHTING PENDANT/SURFACE MTD UP/DOWN LIGHT RECESSED/DOWNLIGHT FIXTURE SQUARE RECESSED/DOWNLIGHT FIXTURE ACCENT FIXTURE WALL MOUNTED FIXTURE EXIT SIGN (ARROWS INDICATED AS SHOWN) - (SHADING INDICATES # OF FACES) CLG MTD EMERGENCY FIXTURE EMERGENCY FIXTURE COMBO EMERGENCY EXIT LIGHT - (ARROW INDICATES DIRECTION) - (SHADING INDICATES # OF FACES) BOLLARD/SIDEWALK LIGHT FLOOD LIGHT SINGLE HEAD FIXTURE/POLE TWIN HEAD FIXTURE/POLE	ONE LINE DIAGRAM FUSED SWITCH CIRCUIT BREAKER AUTOMATIC TRANSFER SWITCH TRANSFORMER METER ELECTRICAL EQUIPMENT: PANELBOARD, DISTRIBUTION PANEL, SWITCHBOARD	ABBREVIATIONS A AMPERES AB ABOVE COUNTERTOP ADJ ADJACENT AFF ABOVE FINISH FLOOR AFG ABOVE FINISH GRADE AIC AMPS INTERRUPTING CURRENT ANNC ANNUNCIATOR ARCH ARCHITECT ATS AUTOMATIC TRANSFER SWITCH AUTO AUTOMATIC BATT BATTERY BD BOARD BLDG BUILDING C CONDUIT CB CIRCUIT BREAKER CC CONTRACTOR CONTRACTOR CK CIRCUIT CLG CEILING COMB COMBINATION STARTER CONN CONNECT CPT CONTROL POWER TRANSFORMER CT CURRENT TRANSFORMER DET DETAIL DIST DISTRIBUTION DIV DIVISION DN DOWN DWG DRAWINGS EA EACH EC ELECTRICAL CONTRACTOR EM EMERGENCY EQUIP EQUIPMENT EWC ELECTRIC WATER COOLER EX EXISTING EXP EXPLOSION PROOF EXR EXISTING RELOCATED F FUSE FA FIRE ALARM FAAP FIRE ALARM ANNUNCIATOR PANEL FACP FIRE ALARM CONTROL PANEL FT FEET FUT FUTURE G, GND GROUND GC GENERAL CONTRACTOR GFCI GROUND FAULT CIRCUIT INTERRUPT HORZ HORIZONTAL HORIZ HORIZONTAL HP HORSEPOWER HR HOUR HTG HEATING HZ HERTZ IBC INTERNATIONAL BUILDING CODE IG ISOLATED GROUND IN INCH JB JUNCTION BOX K KILO LTG LIGHTING LV LOW VOLTAGE M MI MAX MAXIMUM MC MECHANICAL CONTRACTOR MCA MINIMUM CIRCUIT AMPS MCB MAIN CIRCUIT BREAKER MCC MOTOR CONTROL CENTER MDP MAIN DISTRIBUTION PANEL MFG MANUFACTURER MH MANHOLE MIC MICROWAVE OVER MIN MINIMUM MISC MISCELLANEOUS MLO MAIN LUG ONLY MTD MOUNTED MT EMPTY MTR MOTOR NC NORMALLY CLOSED NEC NATIONAL ELECTRICAL CODE NF NON-FUSED NL NIGHT LIGHT NO NORMALLY OPENED OCC OCCUPANCY OCH OVERHEAD PB PULL BOX PC PLUMBING CONTRACTOR PF POWER FACTOR PH PHASE PNL PANEL PRI PRIMARY PT POTENTIAL TRANSFORMER PVC POLYVINYL CHLORIDE PWR POWER REC RECEPTACLE REF REFRIGERATOR RM ROOM SC SPACE SEC SECONDARY SHT SHEET SP SPARE SPD SURGE PROTECTIVE DEVICE SPST SINGLE POLE SINGLE THROW SURF SURFACE SW SWITCH TEL TELEPHONE TERM TERMINAL TV TELEVISION TYP TYPICAL UE UNDERGROUND ELECTRICAL UG UNDERGROUND UNO UNLESS NOTED OTHERWISE V VOLTS VA VOLT-AMPERES VAR VOLT-AMPERES REACTIVE VERT VERTICAL VFD VARIABLE FREQUENCY DRIVE W WATTS WP WEATHER PROOF W WITH XFMR TRANSFORMER 20A 20 AMP 3W 3 WIRE 20I 20 AMP, SINGLE PHASE	
COMMUNICATIONS SURFACE MOUNTED RACEWAY WITH DEVICES AS NOTED TELEPHONE TELEPHONE/DATA DATA ONLY COMMUNICATION DEVICE MTD. 6" ABOVE COUNTER OR HGT SHOWN WIRELESS ACCESS POINT	SWITCHING 20A 120/277V SPST SWITCH 20A 120/277V 3-WAY SWITCH 20A 120/277V 4-WAY SWITCH DIMMER SWITCH KEY OPERATED SWITCH CEILING MTD OCC. SENSOR PHOTOCELL	POWER PANEL BOARD DISTRIBUTION PANEL BOARD SEPARATE CIRCUIT BREAKER UTILITY METER DISCONNECT FUSED DISCONNECT SWITCH EMERGENCY FUSED DISCONNECT SWITCH TRANSFORMER MOTOR STARTER/CONTACTOR COMBINATION MOTOR STARTER PUSH BUTTON STATION AS NOTED J-BOX MOTOR CONNECTION CABLE TRAY RUN HOME RUN TO PANEL BOARD	FIRE ALARM MANUAL PULL STATION 48" A.F.F. CENTER WALL MTD. AUDIO/VISUAL NOTIFICATION 82" A.F.F. TO CENTER WALL MTD. AUDIO ONLY NOTIFICATION 82" A.F.F. TO CENTER WALL MTD. VISUAL ONLY NOTIFICATION 82" A.F.F. TO CENTER CEILING MTD. VISUAL NOTIFICATION CEILING MTD. AUDIO NOTIFICATION CEILING MTD. AUDIO/VISUAL NOTIFICATION SMOKE DETECTOR HEAT DETECTOR DUCT DETECTOR FIRE ALARM RELAY SPRINKLER FLOW SWITCH TAMPER FLOW SWITCH MAGNETIC DOOR HOLD FIRE ALARM CONTROL PANEL FIRE ALARM ANNUNCIATOR PANEL	SECURITY CLOSED CIRCUIT CAMERA (CCC) CARD READER ELECTRIC STRIKE ELECTRIC LATCH MAGNETIC LOCK

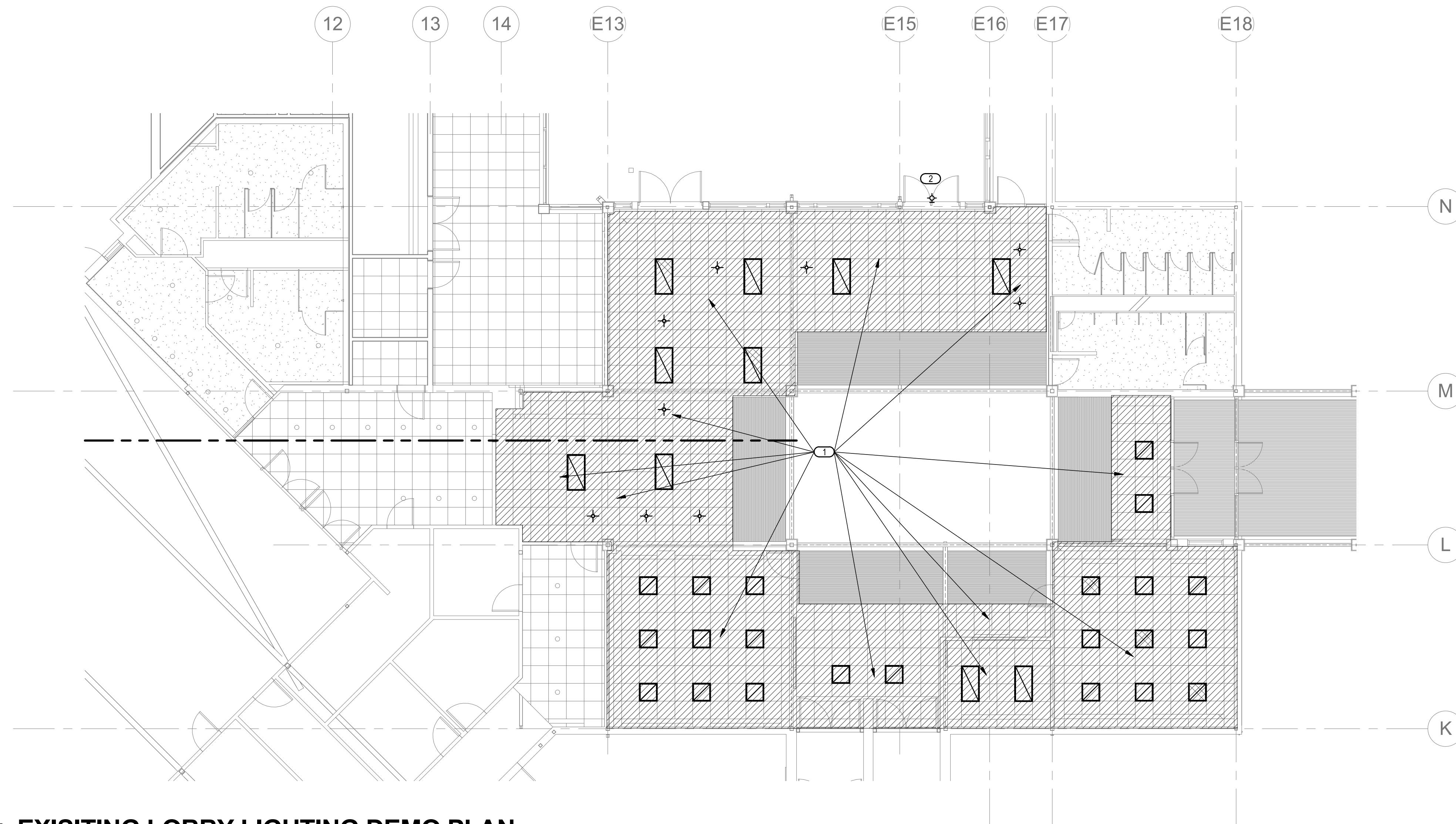


1 TYPICAL MOUNTING DETAILS
 12" = 1'-0"



2 FIRE ALARM MOUNTING DETAILS
 12" = 1'-0"

ELECTRICAL SHEET INDEX	
E000	ELECTRICAL TITLE SHEET
ED100	LOBBY LIGHTING DEMOLITION
ED110	GREENHOUSE ELECTRICAL DEMOLITION PLAN
E001	SITE LANDSCAPE POWER PLAN
E002	SECOND FLOOR EXTERIOR LIGHTING PLAN
E101	LEARNING CENTER LIGHTING PLAN
E102	LEARNING CENTER POWER PLAN
E103	LEARNING CENTER ROOF AND BELOW GRADE POWER PLAN
E104	GREENHOUSE LIGHTING PLAN
E112	GREENHOUSE POWER PLAN
E113	GREENHOUSE FIRE DETECTION PLAN
E400	ONE-LINE DIAGRAM AND SCHEDULES
E410	ELECTRICAL GREENHOUSE SCHEDULES
E500	ELECTRICAL DETAILS



1 EXISTING LOBBY LIGHTING DEMO PLAN
1/8" = 1'-0"

GENERAL DEMOLITION NOTES

A. SEE ARCHITECTURAL SHEETS FOR SYMBOLS, ABBREVIATIONS, AND PROJECT GENERAL NOTES THAT APPLY.

B. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR ADDITIONAL INFORMATION ON CEILING GRID REPLACEMENT.

C. THIS DEMOLITION PLAN HAS BEEN PREPARED TO ASSIST THE CONTRACTOR IN DETERMINING THE SCOPE OF DEMOLITION WORK TO BE INCLUDED IN THIS PROJECT. DUE TO CONDITIONS BEYOND OUR CONTROL, THIS DRAWING IS NOT INTENDED TO BE A COMPLETE INDICATION OF ALL DEMOLITION WORK REQUIRED TO COMPLETE THE PROJECT. THE CONTRACTOR SHOULD REVIEW ALL DRAWING AND SPECIFICATIONS, INCLUDING DEMOLITION SHOWN FOR OTHER TRADES, AND BECOME FAMILIAR WITH EXISTING CONDITIONS, IN ORDER TO DETERMINE THE SCOPE OF DEMOLITION WORK.

D. ALL LIGHTING FIXTURES SHALL BE REMOVED, CLEANED, RELAMPED AS NECESSARY, AND REMOUNTED IN THE SAME LOCATION AND ON THE SAME CIRCUITS. ITEMS DAMAGED OR NOT ACCEPTED BY THE OWNER SHALL BE DISPOSED AND REPLACED WITH A MATCHING FIXTURE.

E. CIRCUITS AND RACEWAY FOR LIGHTING FIXTURES TO REMAIN IN PLACE AND RE-CIRCUITED TO REPLACED FIXTURES.

F. NO ITEM THAT IS INTENDED TO REMAIN SHALL BE LEFT WITH LOSS OF POWER OR COMMUNICATIONS DUE TO REMOVAL OF OTHER ITEMS CONNECTED TO THE SAME CIRCUIT. EXTEND ALL EXISTING CIRCUITS TO EQUIPMENT/DEVICES THAT ARE TO REMAIN.

KEYED NOTES

○ ALL LIGHTING FIXTURES IN INDICATED AREA TO BE REMOVED, CLEANED, RELAMPED AS NECESSARY, AND REPLACED IN THE SAME LOCATION AFTER REPLACEMENT OF ACT CEILING TILES. ALL CIRCUITS AND RACEWAYS TO REMAIN IN PLACE AND BE REUSED.

ⓐ REMOVE EXISTING FIXTURE AND CIRCUIT.

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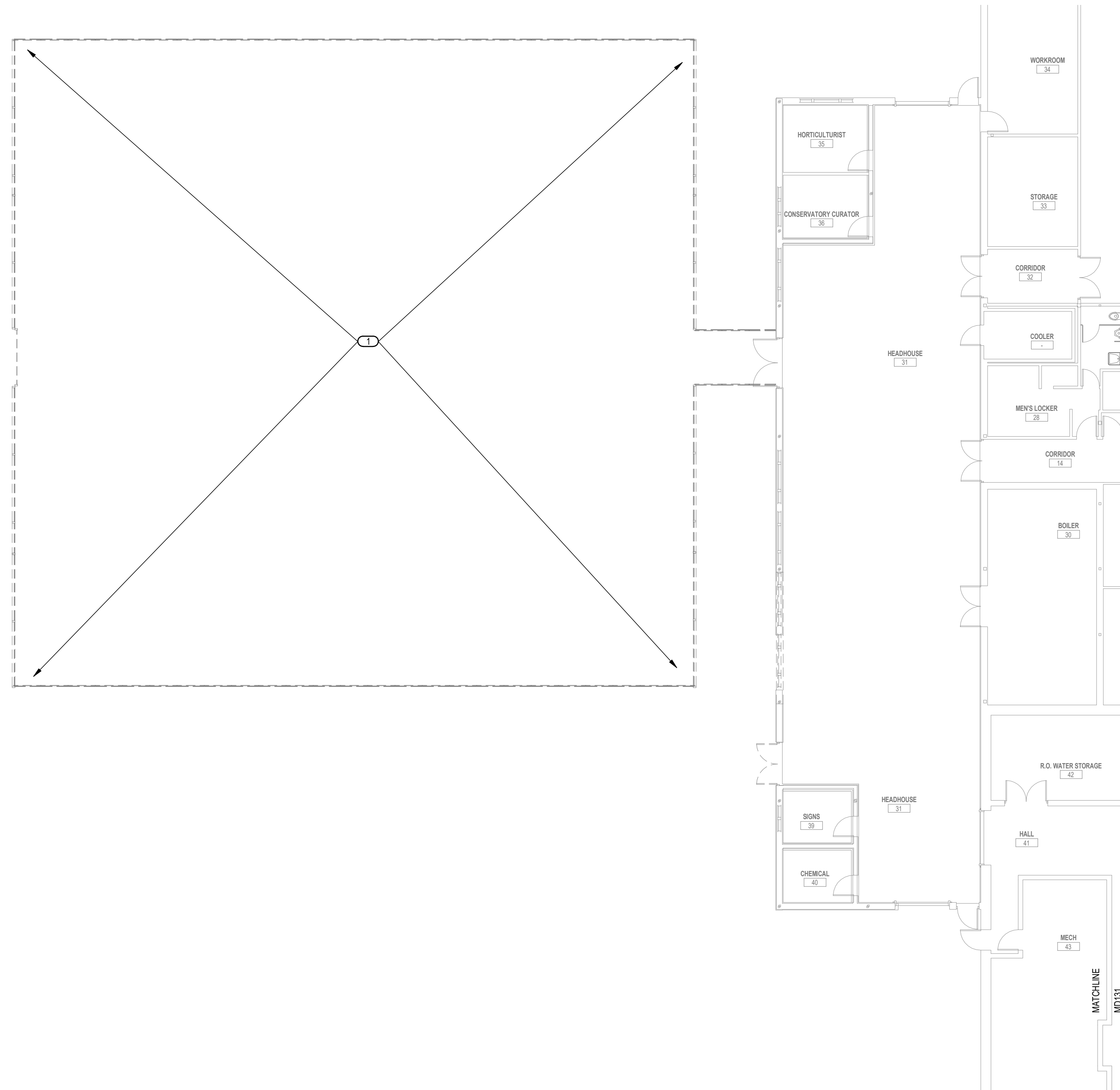
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PROJECT NO. 2017016
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**LOBBY LIGHTING
DEMOLITION**

**EXHIBIT N
ED100**



GENERAL DEMOLITION NOTES

A. SEE SHEET E000 FOR SYMBOLS, ABBREVIATIONS, AND PROJECT GENERAL NOTES THAT APPLY.

B. SEE ARCHITECTURAL, MECHANICAL AND GREENHOUSE DRAWINGS FOR ADDITIONAL INFORMATION ON EXISTING EQUIPMENT LOCATIONS.

C. THIS DEMOLITION PLAN HAS BEEN PREPARED TO ASSIST THE CONTRACTOR IN DETERMINING THE SCOPE OF DEMOLITION WORK TO BE INCLUDED IN THIS PROJECT. DUE TO CONDITIONS BEYOND OUR CONTROL, THIS DRAWING IS NOT INTENDED TO BE A COMPLETE INDICATION OF ALL DEMOLITION WORK REQUIRED TO COMPLETE THE PROJECT. THE CONTRACTOR SHOULD REVIEW ALL DRAWING AND SPECIFICATIONS, INCLUDING DEMOLITION SHOWN FOR OTHER TRADES, AND BECOME FAMILIAR WITH EXISTING CONDITIONS, IN ORDER TO DETERMINE THE SCOPE OF DEMOLITION WORK.

D. ALL ITEMS REMOVED AND NOT RELOCATED SHALL BE OFFERED TO THE OWNER PRIOR TO DISPOSAL. ITEMS ACCEPTED BY THE OWNER SHALL BE CLEANED PRIOR TO THE OWNER TAKING POSSESSION. ITEMS NOT ACCEPTED BY THE OWNER SHALL BE DISPOSED.

E. ALL ITEMS SHOWN AS REMOVED SHALL HAVE THE ITEM AND CIRCUIT REMOVED BACK TO THE PANELBOARD OR THE LAST ACTIVE DEVICE REMAINING.

F. NO ITEM THAT IS INTENDED TO REMAIN SHALL BE LEFT WITH LOSS OF POWER OR COMMUNICATIONS DUE TO REMOVAL OF OTHER ITEMS CONNECTED TO THE SAME CIRCUIT. EXTEND ALL EXISTING CIRCUITS TO EQUIPMENT/DEVICES THAT ARE TO REMAIN.

KEYED NOTES

① GREENHOUSE TO BE DEMOLISHED. DEMOLISH ALL RACEWAYS, CONDUIT, RECEPTACLES, LIGHT FIXTURES, CONTROL WIRING WITH RACEWAY, MOTORS, ETC. REMOVE RACEWAY AND CIRCUIT BACK TO PANEL SOURCE. ALL LIGHT FIXTURES TO BE SALVAGED AND OFFERED TO OWNER. ALL HPS GROW LIGHTS TO BE CLEANED, RELAMPED, AND INSPECTED FOR REUSE.

1 GREENHOUSE ELECTRICAL DEMOLITION PLAN
3/32" = 1'-0"

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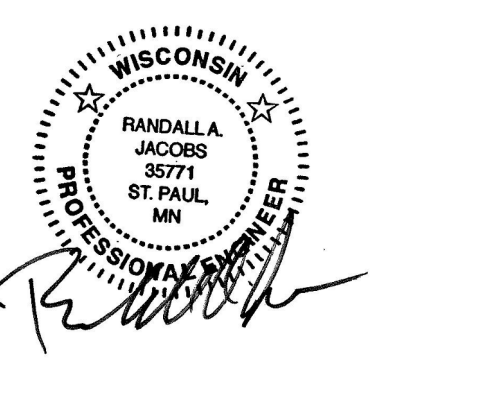
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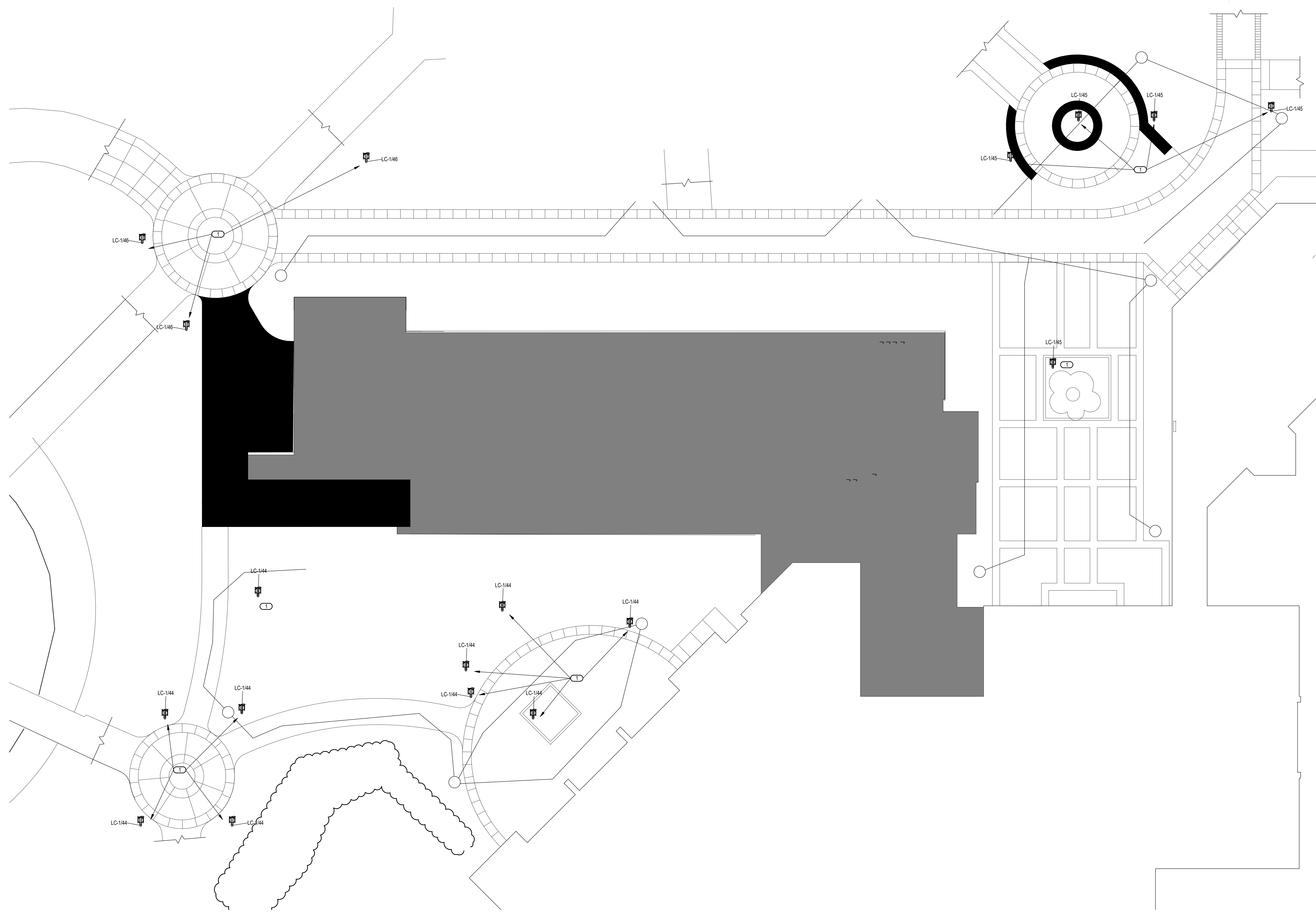


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**GREENHOUSE
ELECTRICAL
DEMOLITION PLAN**
**EXHIBIT N
ED110**



KEYED NOTES

1 INSTALL UNDERGROUND 20 A CONDUIT RUNS TO WEATHERPROOF RECEPTACLES IN LANDSCAPE AREA. SEE ALSO LANDSCAPE HARDSCAPE PLAN.

1 LANDSCAPE SITE POWER
1" = 10'-0"

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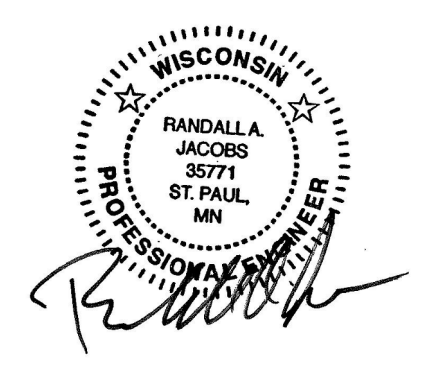
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**SITE LANDSCAPE
POWER PLAN**

**EXHIBIT N
E001**

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**SECOND FLOOR
 EXTERIOR
 LIGHTING PLAN**

**EXHIBIT N
 E002**

KEYED NOTES

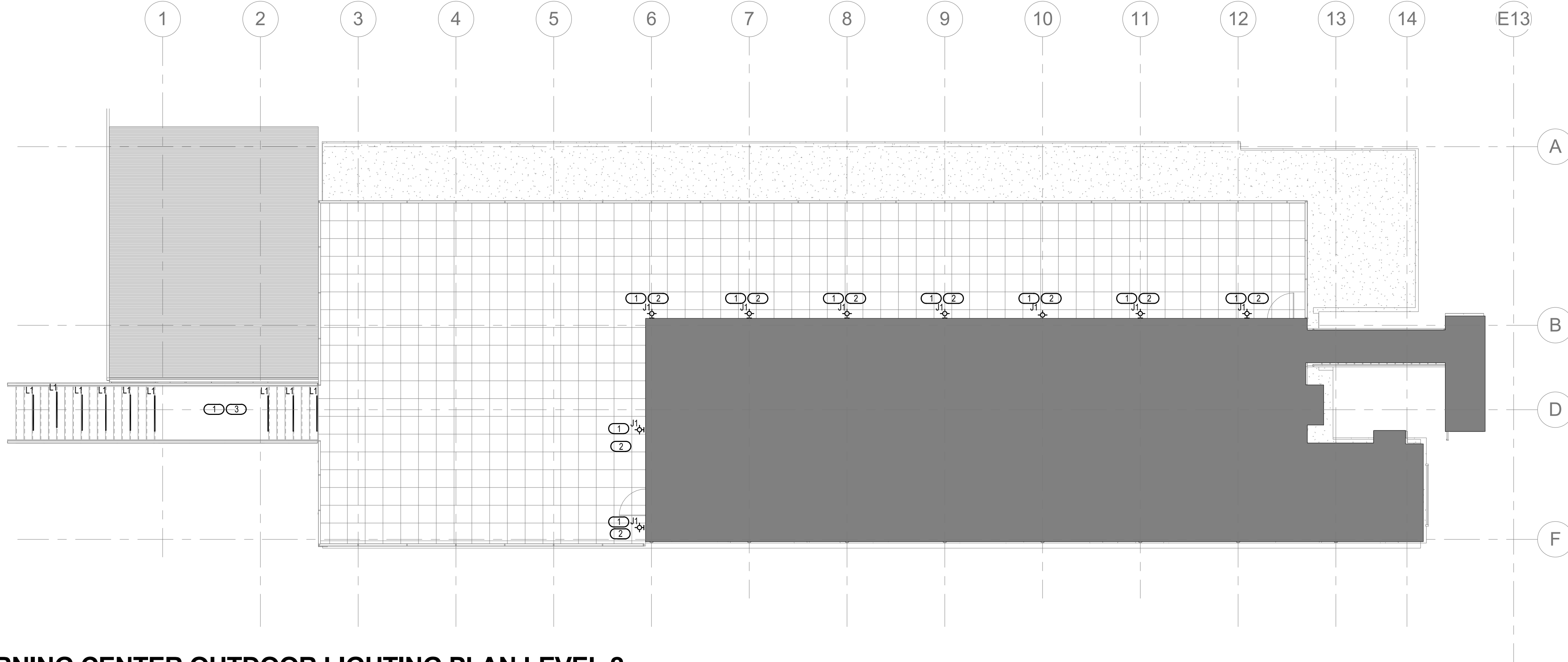
① INDICATED LIGHTS TO BE CONTROLLED BY EXISTING EXTERIOR PHOTOCCELL ON EXISTING BUILDING. FIXTURES SHALL ALSO BE SWITCHED TO TIME CONTROLLER RELAY, LOCATED IN MECHANICAL ROOM, TO SWITCH EXTERIOR LIGHTING TO LOWER LEVEL AFTER OWNER-DESIGNATED TIME. SEE DETAIL ON SHEET E500. ALL LIGHTS SHOWN ON THIS SHEET POWERED FROM SAME CIRCUIT ON PANEL LC-1 - SEE PANEL SCHEDULE.

② MOUNT WALL PACK FIXTURES WITH TOP OF FIXTURE AT 7' 11" AFF.

③ STEP LIGHTS, TYPE L1, TO BE INSTALLED ON UNDERSIDE OF TREADS OF OUTDOOR STAIRWELL. MOUNT FIXTURE ON UNDERSIDE OF STEP, CENTERED, ADJUSTING MOUNT ANGLE TO POINT OUTWARD TOWARD LANDING OF TREAD BELOW. 24 V TRANSFORMER, SUPPLIED WITH LIGHTING FIXTURE(S) TO BE LOCATED IN OUTDOOR STORAGE AREA 125 BELOW STAIRCASE LANDING.

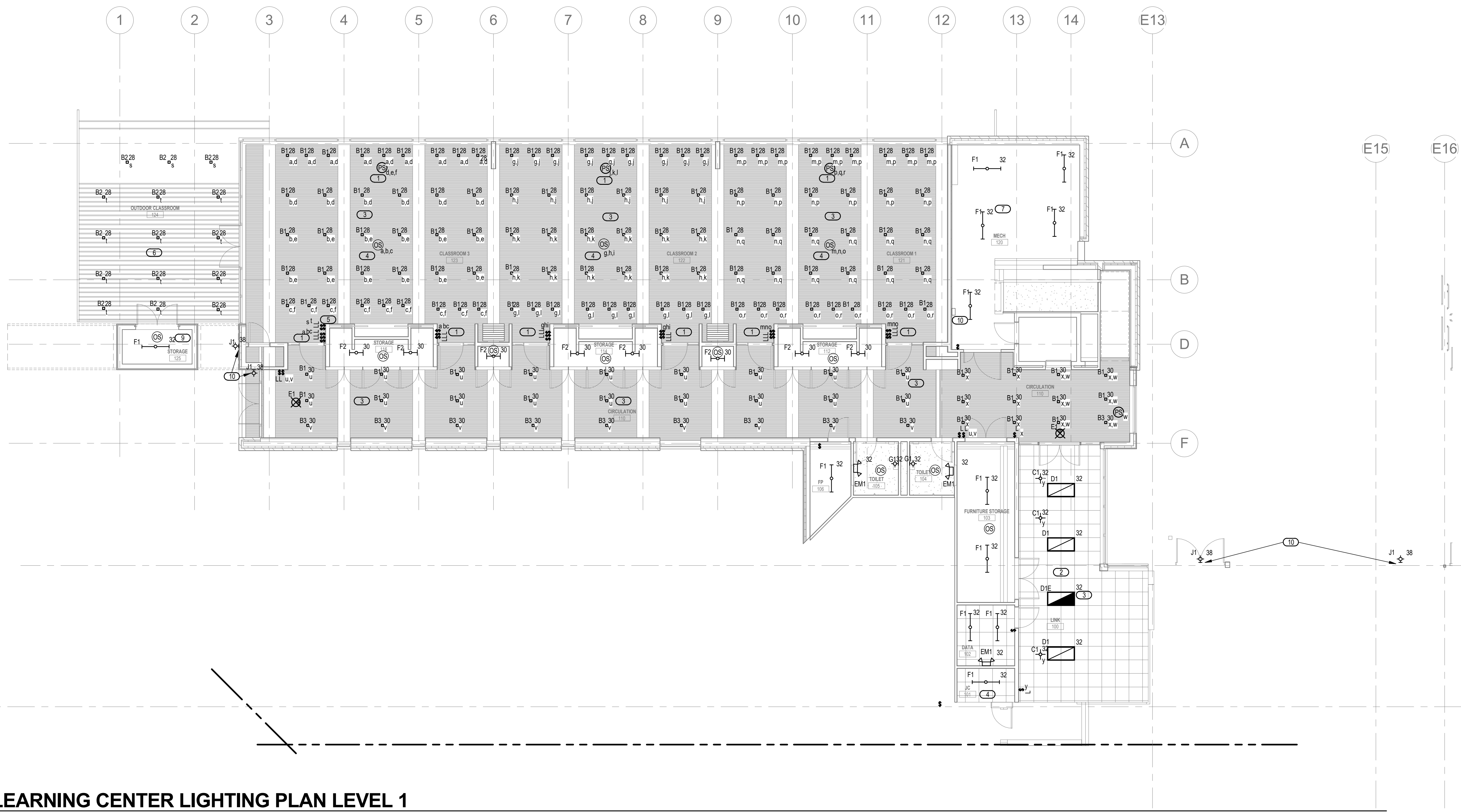
LIGHT FIXTURE SCHEDULE

TYPE	DESCRIPTION	Mounting	MANUFACTURER	MODEL SERIES	LAMP	VOLTS	NOTES
J1	EXTERIOR RECTANGULAR WALL PACK, BLACK	WALL SURFACE	BEGA	24 374	3000k, 85+ CRI	120 V	
L1	LED SURFACE LINEAR, 1/2" LOCATION, 30 DEGREE ADJUSTABLE ANGLE, BLACK FINISH	SURFACE UNDER STAIR RISER	WINONA	WSL105W	3000K, 189 LM/FT	120 V	TRANSFORMER DOWN TO 24 V SUPPLIED WITH LIGHT FIXTURES



1 LEARNING CENTER OUTDOOR LIGHTING PLAN LEVEL 2
 1/8" = 1'-0"

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1 LEARNING CENTER LIGHTING PLAN LEVEL 1

1/8" = 1'-0"

GENERAL LIGHTING NOTES

A. SEE ARCHITECTURE AND GREENHOUSE DRAWINGS FOR ADDITIONAL DETAILS OF STRUCTURE AND LOCATION OF OTHER EQUIPMENT.

B. INSTALL IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS. PROVIDE SUPPORTING DEVICES FOR ADEQUATE SUPPORT OF LUMINAIRES FROM THE STRUCTURE.

C. PROVIDE A SEPARATE NEUTRAL CONDUCTOR FOR EACH CIRCUIT. MULTIWIRE BRANCH CIRCUITS SHALL NOT BE UTILIZED.

D. SWITCHES/LIGHTING CONTROL DEVICES SHOWN ADJACENT TO EACH OTHER SHALL BE MOUNTED UNDER A COMMON FACEPLATE, UNLESS NOTED OTHERWISE.

E. LUMINAIRES THAT DO NOT INCLUDE A SWITCH LEG OR OTHER CONTROL DESIGNATION SHALL BE CONTROLLED FROM THE SWITCH/LIGHTING CONTROL DEVICE SHOWN WITHIN THE ROOM INCLUDING THE LUMINAIRE.

F. COORDINATE ALL MOUNTING HARDWARE FOR LUMINAIRES WITH GREENHOUSE OVERHEAD MOUNTED EQUIPMENT. IN PARTICULAR, LIGHTING AND MOUNTING HARDWARE MUST NOT INTERFERE WITH OPERATION OF SHADES IN THE GREENHOUSE AREA. SEE GREENHOUSE DRAWINGS.

G. ALL LIGHTING CIRCUIT NUMBERS REFER TO PANEL GH-C.

KEYED NOTES

1 INDICATED LIGHTING SHALL BE IN DAYLIGHTING ZONES WITH DIMMABLE CONTROLS ROUTED THROUGH LOW VOLTAGE SWITCH ON WALL - LIGHT FIXTURES IN EACH ZONE AS NOTED BY PHOTOSENSOR SWITCH TAG. LOCATE HUBS AND POWER PACKS FOR CONTROLLING WIRELESS SYSTEM ABOVE WOODEN SLAT CEILING FEATURE (FIRST FLOOR). SEE DETAIL 1 ON SHEET E500.

2 SWITCH FOR D1 FIXTURES IN LINK AREA TO TIE INTO EXISTING SWITCHING IN ADJACENT LOBBY AREA

3 BATTERY BACK-UP POWER EMERGENCY LIGHT FIXTURE.

4 CLASSROOM SENSORS SHALL BE VACANCY TYPE.

5 OUTDOOR CLASSROOM LIGHT SWITCHES LOCATED HERE. CONTROLLING FIXTURES AS INDICATED BY TAGS. MOUNT IN 3-GANG PLATE ABOVE CLASSROOM LIGHT SWITCHES. LABEL: SINK LIGHTS; DOWN LIGHTS.

6 MOUNT OUTDOOR LUMINAIRES TO INDICATED SIDE OF GULUM BEAMS.

7 COORDINATE MOUNTING HEIGHT OF STRIP LIGHT FIXTURES WITH DUCTWORK AND PIPING.

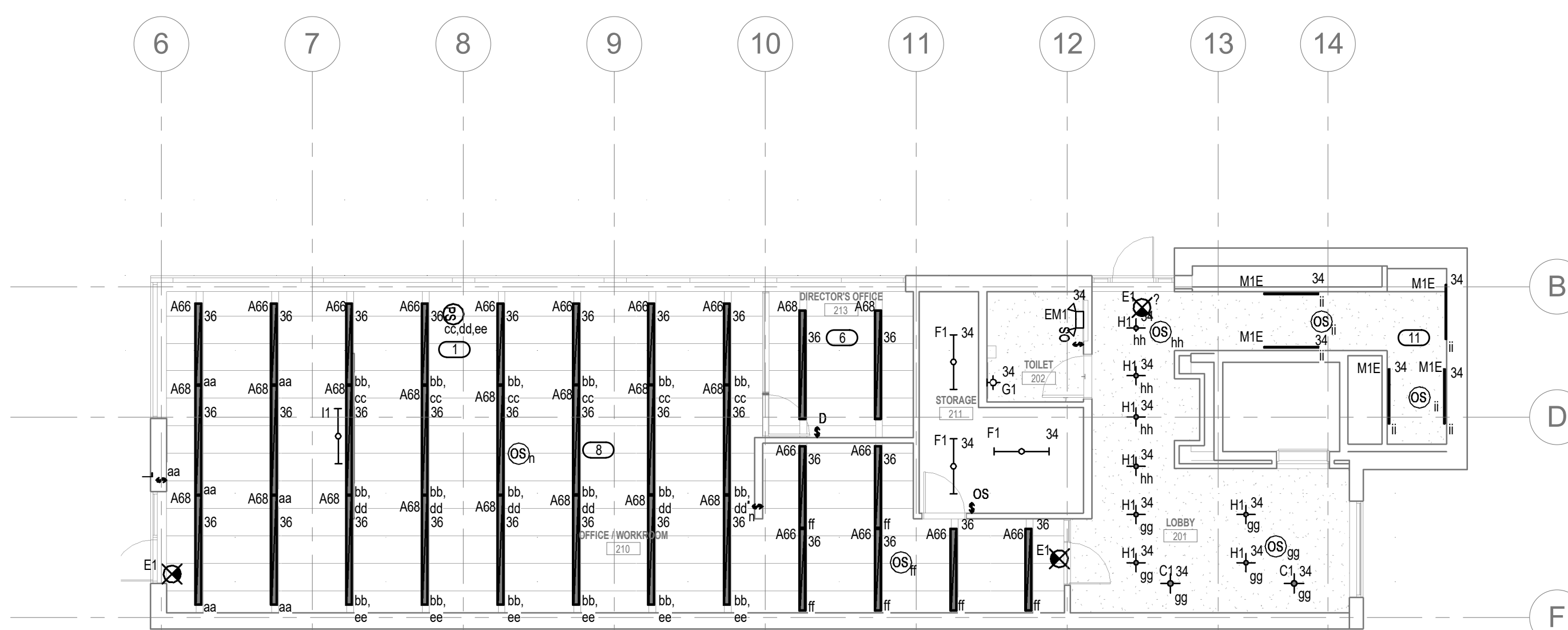
8 INDIVIDUAL TASK LIGHTING, INCORPORATED INTO THE OFFICE FURNITURE, SHALL BE LOCATED AT EACH WORKSTATION.

9 LOCATE 24 V DRIVER FOR STEP LIGHTS SHOWN ON SHEET E002 IN THIS STORAGE ROOM.

10 EXISTING MAIN BUILDING PHOTOCELL SHALL CONTROL SWITCHING FOR EXTERIOR LIGHT FIXTURES. FIXTURES SHALL ALSO BE SWITCHED TO RELAYS. LOCATED IN MECHANICAL ROOM. TO DIM EXTERIOR LIGHTING TO LOWER LEVEL AFTER OWNER-DESIGNATED TIME. SEE DETAIL ON SHEET E500.

11 MOUNT STAIRWELL FIXTURES (M1E) ON WALL NEAR STAIRWELL CEILING WITH ASYMMETRIC THROW AIMED AT OPPOSITE STAIRWELL WALL.

LIGHT FIXTURE SCHEDULE							
TYPE	DESCRIPTION	Mounting	EXAMPLE MFR.	MODEL	LAMP	VOLTS	NOTES
A66	6" LED Recessed Slot 6" Long, Flush Clear Diffuser	RECESSED	Acuity Brands Lighting	SLOT 6	3500K, 90 CRI, 400 LMFT	120 V	
A68	6" LED Recessed Slot 6" Long, Flush Clear Diffuser	RECESSED	Acuity Brands Lighting	SLOT 6	3500K, 90 CRI, 400 LMFT	120 V	
B1	4" Square LED Downlight, Black Housing, Clear Reflector	RECESSED	Indy	SDSQ48BD	3500K, 90 CRI, 2000 LM	120 V	
B2	4" Square LED Downlight, Black Housing, White/Culobor Raked	RECESSED	Indy	SDSQ48BD	3500K, 90 CRI, 1250 LM	120 V	
B3	4" square LED Downlight, Black Housing, Wall Wash, Clear Reflector	RECESSED	Indy	SD45Q	3500K, 90 CRI, 1500 LM	120 V	
C1	3" Gimbal LED Downlight, White Housing, adjustable	RECESSED	Lithonia Lighting	3G	4000K, 90 CRI, 600 LM	120 V	
D1	2' x 4' LED Troffer, Clear Diffuser	RECESSED	Lithonia Lighting	ALL	3500K, 80 CRI, 4000 LM	120 V	
D1E	2' x 4' LED Troffer, Battery Backup, Clear Diffuser	RECESSED	Lithonia Lighting	ALL	3500K, 80 CRI, 4000 LM	120 V	INTEGRAL BATTERY
E1	1-Sided EXIT Light, LED, Battery Backup	RECESSED	Lithonia Lighting	LRP	LED	120 V	INTEGRAL BATTERY
EM1	Emergency Lighting Unit, Battery Backup	WALL SURFACE	Lithonia Lighting	ELM2	LED	120 V	INTEGRAL BATTERY
F1	4" LED Strip Light	SURFACE	Lithonia Lighting	ZL SERIES	3500K, 5000 LM	120 V	
F2	4" LED Surface Basket Light	SURFACE	Lithonia Lighting	LBL4	3500K, 80 CRI, 4000 LM	120 V	
G1	LED Wall-Mounted Rectangular Sconce, Black	WALL SURFACE	BEGA	STUDIO LINE	3500K, 80+ CRI, 120 V		
G2	LED wall-Mounted Vaportight, Aluminum housing	WALL SURFACE	Lithonia Lighting	OLVTWM	4000K, 90 CRI, 600 LM	120 V	
H1	LED Recessed Can Down Light	RECESSED	Lithonia Lighting	LON SERIES	3500K, 80 CRI, 1000 LM	120 V	
I1	4" LED Under Cabinet Strip Light w. Integrated Power Cord	UNDER CABINET SURFACE	Lithonia Lighting	UCLD	3500K, 80+ CRI, 740 LM	120 V	POWER CORD AND INTEGRAL SWITCH
J1	EXTERIOR RECTANGULAR WALL PACK, BLACK	WALL SURFACE	BEGA	24 374	3000K, 85+ CRI, 120 V		
M1E	4" LED LINEAR, ASYMMETRIC, BLACK FINISH	WALL SURFACE	PINNACLE	EDGE EX1-B	3500K, 80 CRI, 1500 LM	120 V	INTEGRAL BATTERY

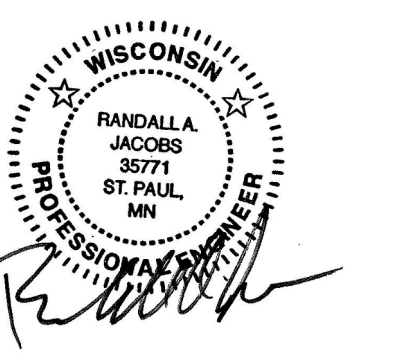


2 LEARNING CENTER LIGHTING PLAN - LEVEL 2

1/8" = 1'-0"

Olbrich Botanical Gardens
Expansion Phase 1
BPW Project #8162
3330 Atwood Avenue
Madison, WI 53704

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Engineer under the Laws of the State of Wisconsin.
ENGINEER SEAL



Signature:
Print Names: Randall A. Jacobs
Date: JUNE 4, 2018 License No. 35771

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		09.09.2017	SCHEMATIC DESIGN SUBMISSION
		12.08.2017	DD PRICING SET
		01.10.2018	DESIGN DEVELOPMENT SUBMISSION
		01.17.2018	UDC SUBMISSION
		03.31.2018	75% CD PRICING ISSUE
		05.04.2018	90% CONSTRUCTION DOCUMENTS
		06.01.2018	BID ISSUE
		06.04.2018	PERMIT ISSUE

PROJECT NO. 2017016

PROJECT PHASE BID DOCUMENTS

DRAWN BY: MSR CHECKED BY: MSR

LEARNING CENTER LIGHTING PLAN

EXHIBIT N E101

**Olbrich Botanical Gardens
 Expansion Phase 1**
 BPW Project #8162
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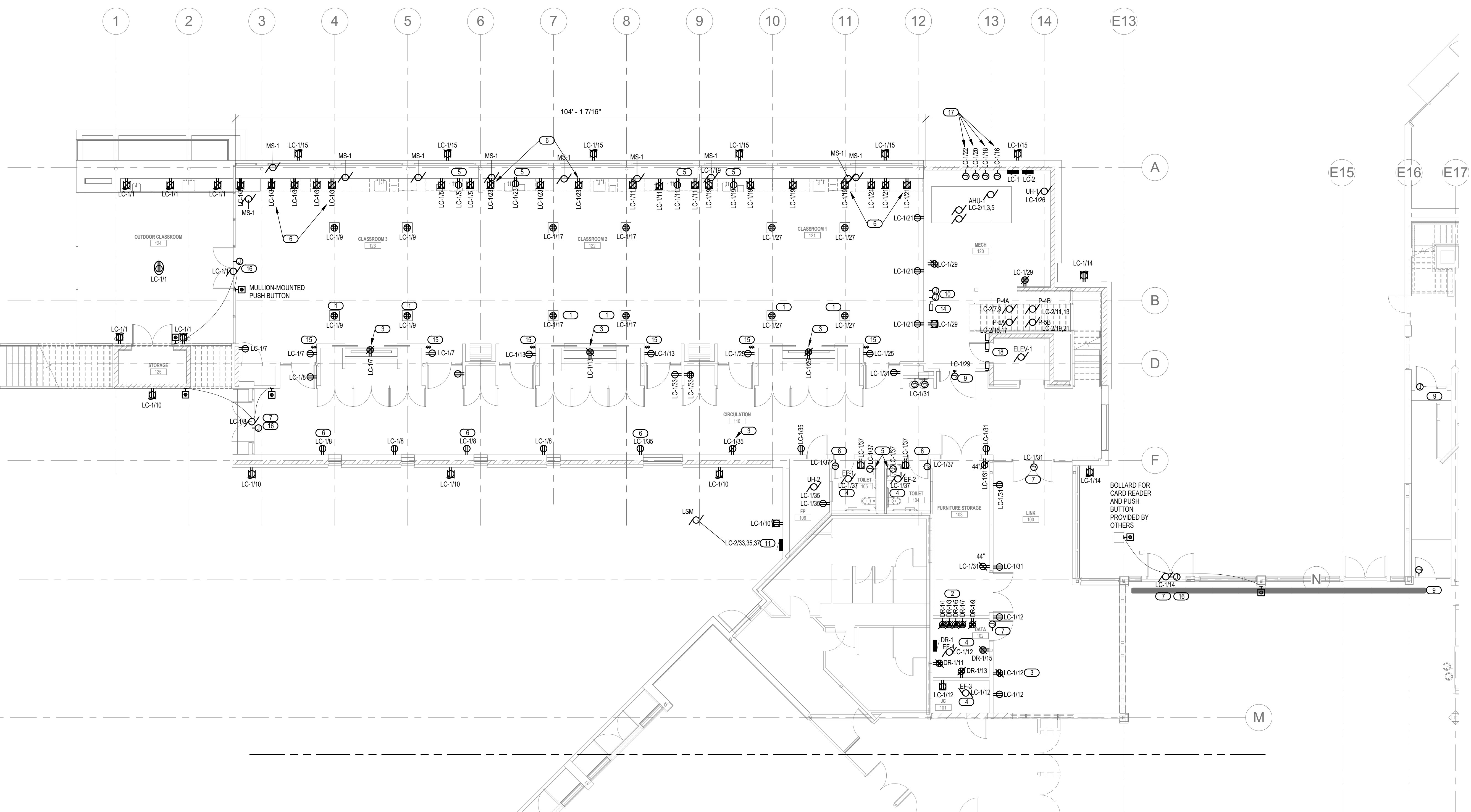
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PROJECT PHASE	BID DOCUMENTS
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**LEARNING CENTER
 POWER PLAN**

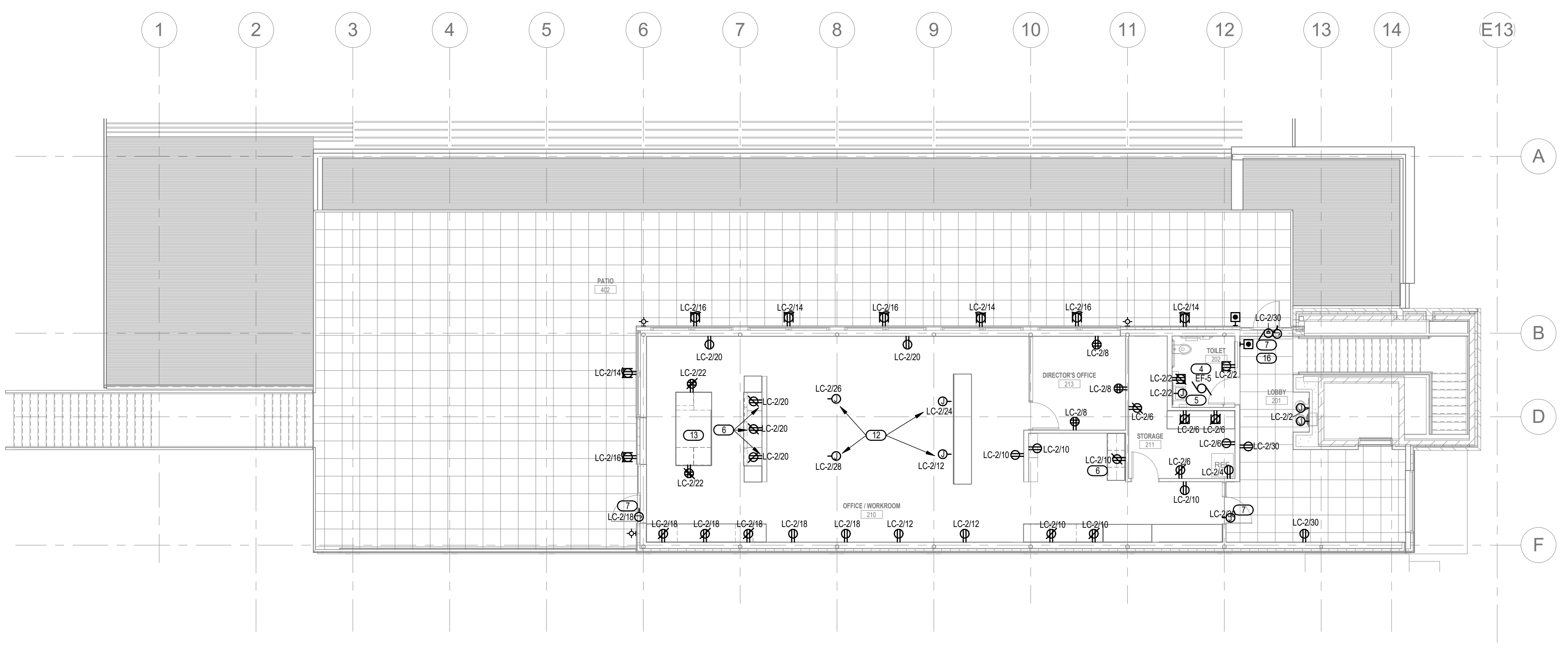
**EXHIBIT N
 E102**

- GENERAL POWER NOTES**
- SEE SHEET E000 FOR SYMBOLS, ABBREVIATIONS, AND PROJECT GENERAL NOTES.
 - SEE ARCHITECTURAL, MECHANICAL AND GREENHOUSE DRAWINGS FOR ADDITIONAL INFORMATION ON EQUIPMENT LOCATIONS.
 - SEE MOTOR AND EQUIPMENT SCHEDULE FOR MOTOR CONNECTION INFORMATION. COORDINATE THE LOCATION OF EQUIPMENT CONNECTIONS AND DISCONNECTING MEANS WITH THE EQUIPMENT SUPPLIER.
 - VERIFY ROUGH-IN REQUIREMENTS OF ALL OWNER FURNISHED EQUIPMENT PRIOR TO INSTALLATION.
 - GFCI PROTECTED RECEPTACLES SHALL BE PROVIDED WHERE THE RECEPTACLE IS LOCATED WITHIN 6' OF A SINK AND IN ANY WET LOCATION.
 - MINIMUM HOME RUN CONDUIT SIZE SHALL BE 3/4".
 - PANEL CIRCUIT DESIGNATIONS PROVIDED FOR DESIGN INTENT. EC SHALL VERIFY AND DOCUMENT EXACT CIRCUIT NUMBERS AS CIRCUITED IN THE FIELD.

- KEYED NOTES**
- PROVIDE INDICATED FLOOR BOX WITH (3) DUPLEX RECEPTACLES AND (1) HDMI CONNECTION.
 - PROVIDE NEMA L5-20R TWIST LOCK RECEPTACLES ON WALL FOR TECHNOLOGY RACKS. SEE T300 FOR RACK DETAILS.
 - MOUNT RECEPTACLES AT 78" FOR AV MONITORS.
 - CONTROL SWITCHING FOR THE EXHAUST FANS THROUGH SWITCHING PROVIDED BY MECHANICAL CONTRACTOR. JANITOR ROOM FAN SHALL BE HARD-WIRED ALWAYS ON.
 - CONNECTION FOR MOTION-SENSOR ACTIVATED FAUCET ROUGHED IN UNDER SINK IN CABINET.
 - INDICATED RECEPTACLES TO INCLUDE DUAL USB CHARGING PORTS.
 - PROVIDE POWER FOR ELECTRONIC LOCK AND DOOR STRIKE FOR ACCESS CONTROLLED DOOR. SEE TECHNOLOGY DRAWING T300 FOR CONTROLLED DOOR DETAIL.
 - PROVIDE JUNCTION BOX FOR POWER FOR DOOR ASSIST MOTOR AT HINGE. SEE DOOR ASSIST MANUFACTURER INSTALLATION INSTRUCTIONS FOR WIRING.
 - PROVIDE JUNCTION BOX FOR POWER FOR ELECTRONIC LATCH AND STRIKE ASSOCIATED WITH DOOR. SEE DOOR HARDWARE ON ARCHITECTURAL SHEETS.
 - PROVIDE JUNCTION BOXES FOR DISCONNECT TO SUMP MOTOR AND SENSOR CONTROLS IN STORMWATER ACCESS HATCH. CONNECT TO CIRCUIT AND CONTROL WIRING RUNS TO SKID IN ROOM 42 - SEE SHEET E112.
 - PROVIDE 40A CIRCUIT TO CONTROL PANEL FOR LIFT STATION MOTOR. MOTOR LOCATED BELOW GRADE FOR LIFT STATION. SEE CIVIL DRAWINGS FOR DETAILS.
 - RACEWAYS TO DESK FURNITURE IN OFFICE AREA TO BE RUN BELOW RAISED FLOOR. COORDINATE JUNCTION BOX PLACEMENT WITH OFFICE MODULAR FURNITURE. WHIPS TO MODULAR FURNITURE SUPPLIED WITH FURNITURE. WIRED BY EC.
 - QUAD RECEPTACLES MOUNTED ON SIDES OF ISLAND CENTER AT 12" BELOW TOP OF ISLAND, OR AS CLOSE AS ALLOWED BY CASEWORK. COORDINATE BOX PLACEMENT AND CONDUIT ROUTING WITH ARCHITECTURAL DETAIL FOR ISLAND.
 - LOCATION OF AC INVERTER FROM PHOTOVOLTAIC ARRAY - SEE SHEET E500 DETAILS. MOUNT ON WALL.
 - SWITCHES FOR MOTORIZED SHADES MS-1 MOTORS. SEE ALSO ARCHITECTURAL SHEETS FOR MOTORIZED SHADE DETAILS.
 - PROVIDE PUSHBUTTON AND ADA DOOR OPERATORS WITH ASSOCIATED HARDWARE. SEE ARCHITECTURAL FOR DOOR HARDWARE LIST AND DETAIL ON SHEET E500.
 - CIRCUITS FOR RECESSED FAN COILS ON LEVEL 1 AND 2. COORDINATE J-BOX LOCATION WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.
 - SEE ELEVATOR INSTALLATION INSTRUCTIONS AND ONE LINE DIAGRAM FOR POWER REQUIREMENTS FOR ELEVATOR PANEL. ELEVATOR SHUNT TRIP DISCONNECT AND DISCONNECTS FOR CAB LIGHTS AND CAB VENTILATION TO BE MOUNTED ON WALL WHERE PRACTICAL NEAR ELEVATOR CONTROLS. SEE DETAIL ON SHEET E500.

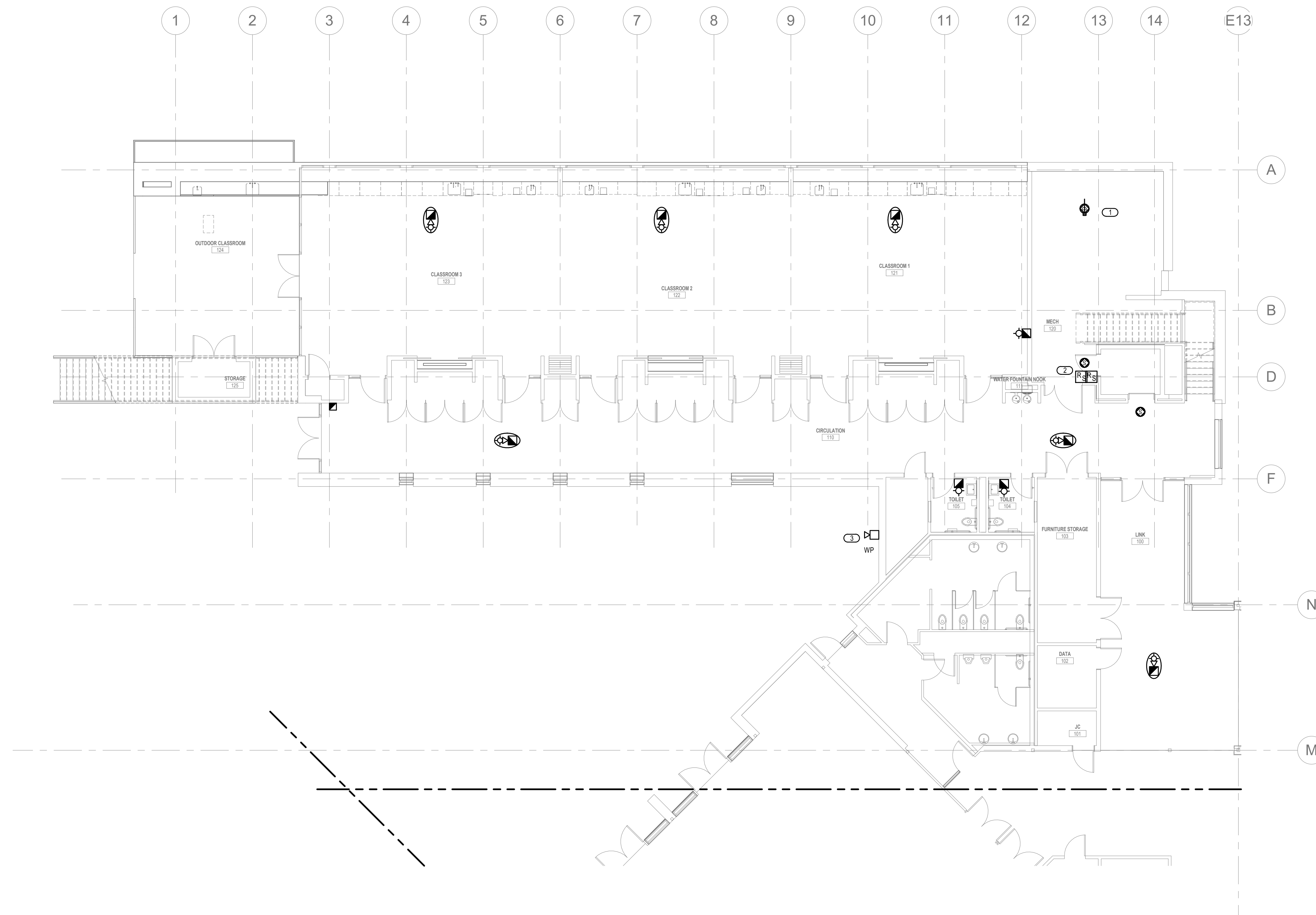


1 LEARNING CENTER POWER PLAN LEVEL 1
 1/8" = 1'-0"



2 LEARNING CENTER POWER PLAN LEVEL 2
 1/8" = 1'-0"

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GENERAL FIRE ALARM NOTES

1. THE EXISTING FIRE ALARM SYSTEM SHALL REMAIN IN OPERATION DURING CONSTRUCTION. ALL NEW DEVICES SHALL BE ADDED INTO THE EXISTING SYSTEM. FIRE ALARM CONTROL PANEL IS LOCATED IN THE VESTIBULE AT THE MAIN ENTRY INTO THE EXISTING LOBBY. ALL DEVICES SHALL BE COMPATIBLE WITH THIS FIRE PANEL.

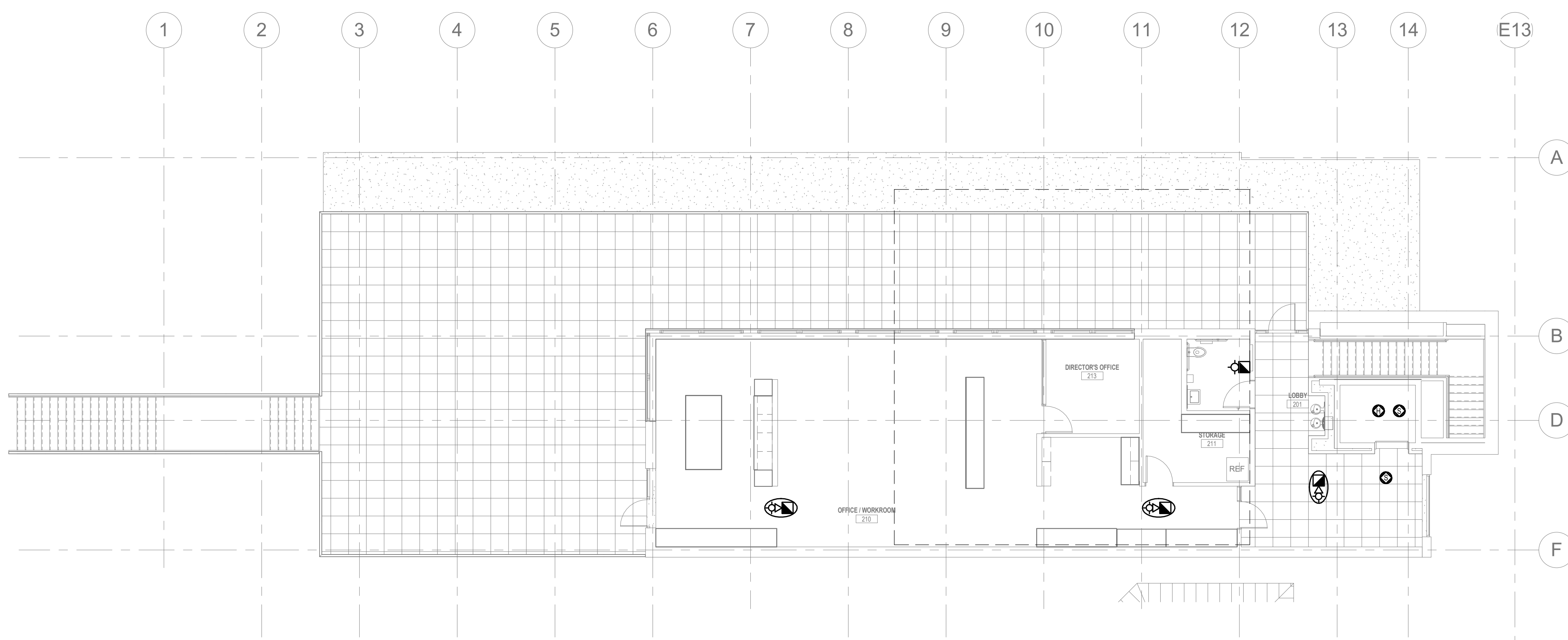
KEYED NOTES

1. PROVIDE DUCT SMOKE DETECTOR MOUNTED IN RETURN DUCTWORK ABOVE AIR HANDLER UNIT. SEE MECHANICAL DUCTWORK PLANS FOR LOCATION. SMOKE DETECTOR SHALL SEND SHUTDOWN SIGNAL TO AHU-1.

2. PROVIDE RELAY SWITCHES FOR ELEVATOR RECALL AND SHUNT TRIP SHUTDOWN WITHIN 3 FEET OF ELEVATOR CONTROL PANEL. SEE ELEVATOR CONTROL PANEL WIRING INSTRUCTIONS FOR CONNECTION OF THESE RELAYS. SEE DETAIL ON SHEET E500.

3. PROVIDE WEATHERPROOF AUDIO NOTIFICATION DEVICE 80" AFF ON WALL OUTSIDE FIRE PROTECTION WATER SERVICE LOCATION.

1 LEARNING CENTER FIRE DETECTION PLAN LEVEL 1
1/8" = 1'-0"



2 LEARNING CENTER FIRE DETECTION PLAN LEVEL 2
1/8" = 1'-0"

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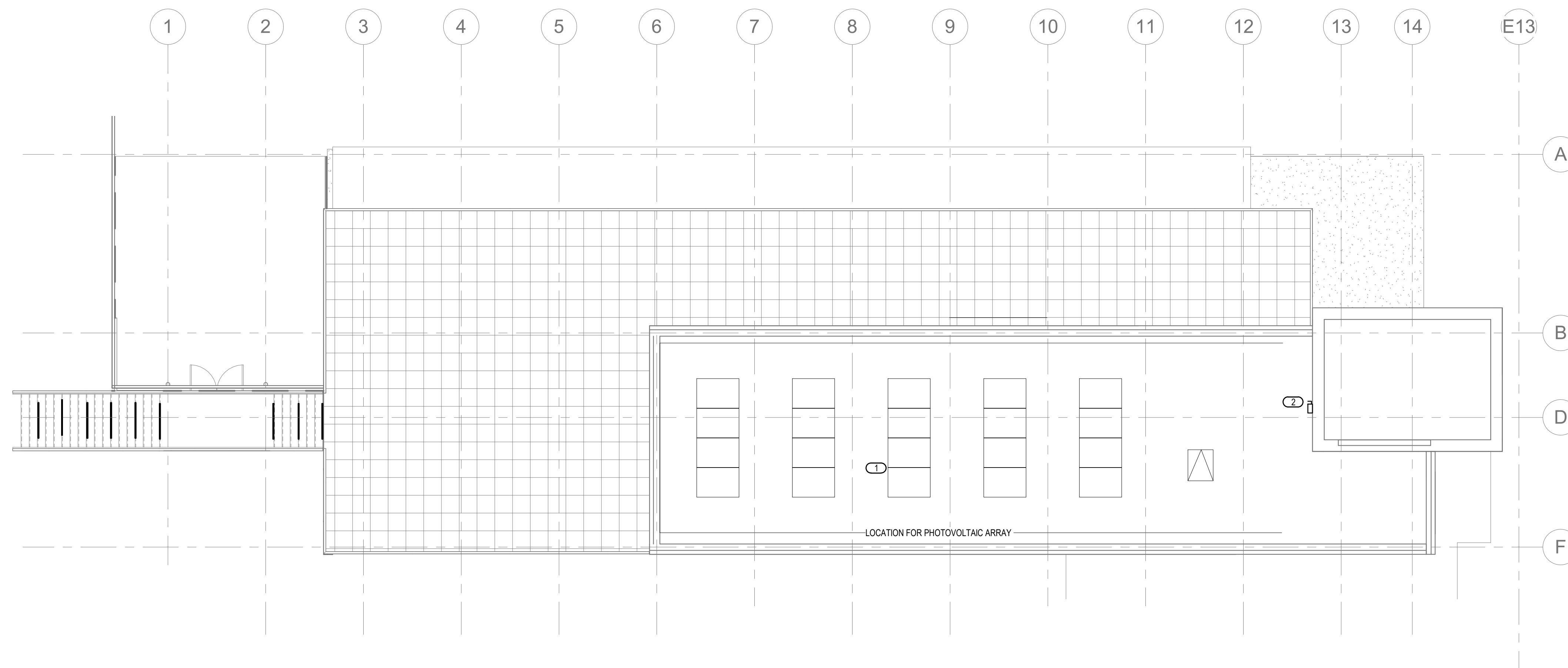
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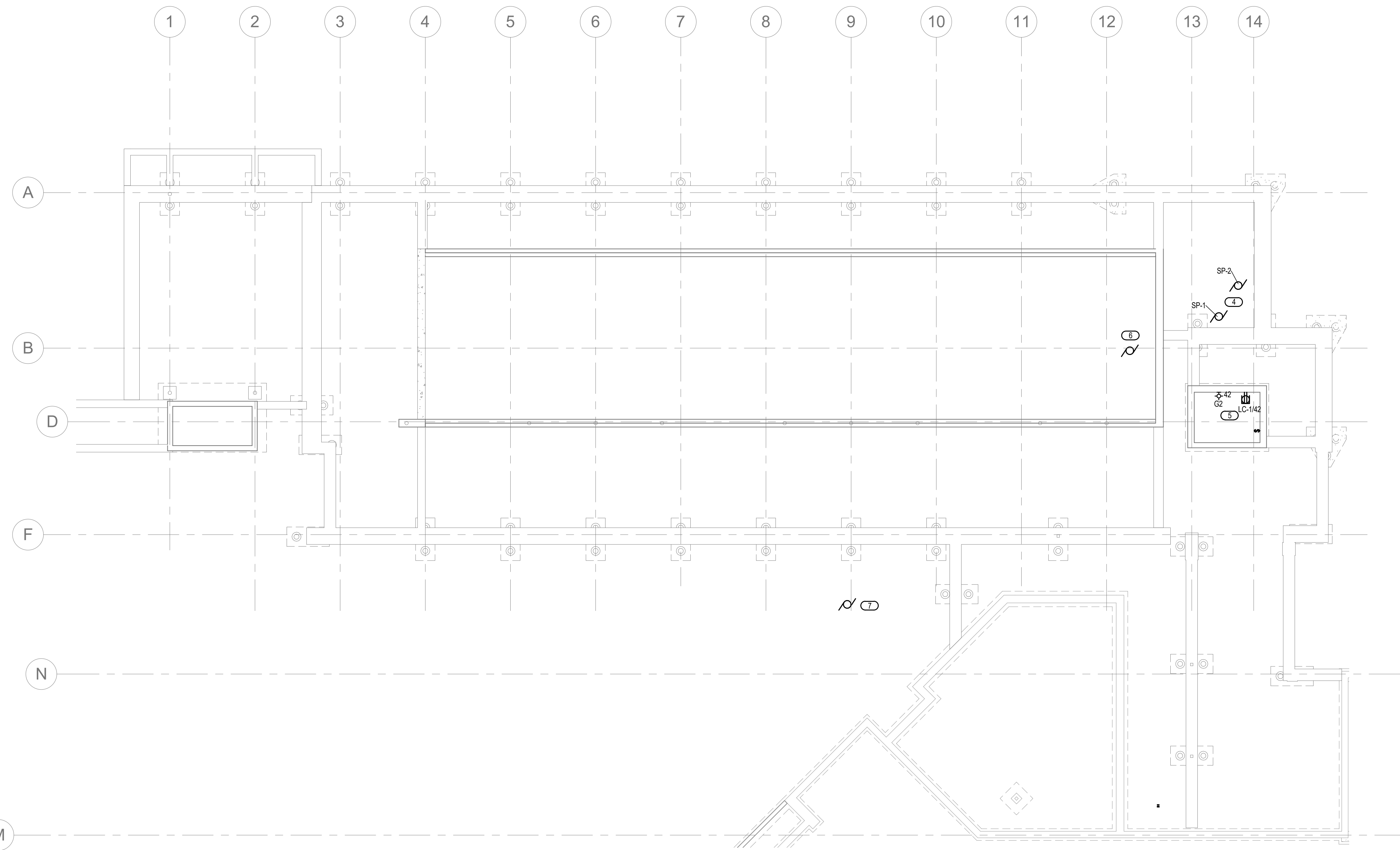
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**LEARNING CENTER
FIRE DETECTION
PLAN**

**EXHIBIT N
E103**



1 LEARNING CENTER ELECTRICAL ROOF PLAN
1/8" = 1'-0"



2 LEARNING CENTER ELECTRICAL PLAN - BELOW GRADE
1/8" = 1'-0"

GENERAL POWER NOTES

- A. SEE SHEET E000 FOR SYMBOLS, ABBREVIATIONS, AND PROJECT GENERAL NOTES.
- B. SEE ARCHITECTURAL, MECHANICAL AND GREENHOUSE DRAWINGS FOR ADDITIONAL INFORMATION ON EQUIPMENT LOCATIONS.
- C. SEE MOTOR AND EQUIPMENT SCHEDULE FOR MOTOR CONNECTION INFORMATION. COORDINATE THE LOCATION OF EQUIPMENT CONNECTIONS AND DISCONNECTING MEANS WITH THE EQUIPMENT SUPPLIER.
- D. VERIFY ROUGH-IN REQUIREMENTS OF ALL OWNER FURNISHED EQUIPMENT PRIOR TO INSTALLATION.
- E. GFCI PROTECTED RECEPTACLES SHALL BE PROVIDED WHERE THE RECEPTACLE IS LOCATED WITHIN 6' OF A SINK AND IN ANY WET LOCATION.
- F. MINIMUM HOME RUN CONDUIT SIZE SHALL BE 3/4".
- G. PANEL CIRCUIT DESIGNATIONS PROVIDED FOR DESIGN INTENT. EC SHALL VERIFY AND DOCUMENT EXACT CIRCUIT NUMBERS AS CIRCUIED IN THE FIELD.

KEYED NOTES

- 1 PHOTOVOLTAIC ARRAY BASIS OF DESIGN: MODULES W. PANEL ARRAYS ON FIXED, NON-BALLASTED RACKING, DC OPTIMIZERS, INVERTERS TO 208 VOLT 3-PHASE. SEE DETAIL ON E500.
- 2 MOUNT DC DISCONNECT TO WALL IN THIS LOCATION. SEE ONE LINE ON SHEET E500.
- 3
- 4 CONTROLS FOR SUMP PUMPS MOUNTED ON WALL IN MECH ROOM 120. SEE SHEET P301 FOR SUMP PUMP DETAIL.
- 5 MOUNT LIGHT FIXTURE AND SWITCH ON WALL AND GFCI RECEPTACLE IN ELEVATOR PIT.
- 6 RAIN WATER CISTERN SUMP PUMP. SEE NOTES ON SHEETS E102 AND E112.
- 7 LIFT STATION MOTOR. SEE NOTE ON SHEET E102.

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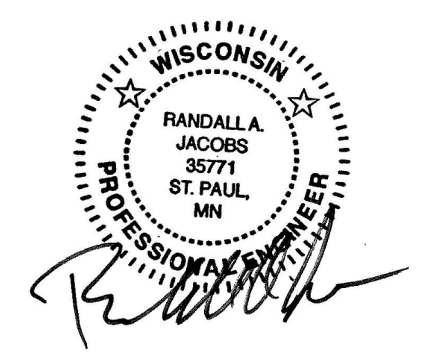
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PROJECT NO. 2017016

PROJECT PHASE BID DOCUMENTS

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**LEARNING CENTER
ROOF AND BELOW
GRADE POWER
PLAN**

**EXHIBIT N
E104**

**Olbrich Botanical Gardens
 Expansion Phase 1**
 BPW Project #8162
 3330 Atwood Avenue
 Madison, WI 53704

GENERAL LIGHTING NOTES

A. SEE ARCHITECTURE AND GREENHOUSE DRAWINGS FOR ADDITIONAL DETAILS OF STRUCTURE AND LOCATION OF OTHER EQUIPMENT.

B. INSTALL IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS. PROVIDE SUPPORTING DEVICES FOR ADEQUATE SUPPORT OF LUMINAIRES FROM THE STRUCTURE.

C. PROVIDE A SEPARATE NEUTRAL CONDUCTOR FOR EACH CIRCUIT. MULTIWIRE BRANCH CIRCUITS SHALL NOT BE UTILIZED.

D. SWITCHES/LIGHTING CONTROL DEVICES SHOWN ADJACENT TO EACH OTHER SHALL BE MOUNTED UNDER A COMMON FACEPLATE, UNLESS NOTED OTHERWISE.

E. LUMINAIRES THAT DO NOT INCLUDE A SWITCH LEG OR OTHER CONTROL DESIGNATION SHALL BE CONTROLLED FROM THE SWITCH/LIGHTING CONTROL DEVICE SHOWN WITHIN THE ROOM INCLUDING THE LUMINAIRE.

F. COORDINATE ALL MOUNTING HARDWARE FOR LUMINAIRES WITH GREENHOUSE OVERHEAD-MOUNTED EQUIPMENT. IN PARTICULAR, LIGHTING AND MOUNTING HARDWARE MUST NOT INTERFERE WITH OPERATION OF SHADES IN THE GREENHOUSE AREA. SEE GREENHOUSE DRAWINGS.

G. ALL LIGHTING CIRCUIT NUMBERS REFER TO PANEL GH-C.

KEYED NOTES

1. GROW LIGHTING IN GREENHOUSE SHALL BE POWERED BY POWER CORDS ON ELEVATED RAILS. CONTROL OF ALL GROW LIGHTING SHALL BE THROUGH GREENHOUSE CONTROL PANELS - SEE GREENHOUSE DRAWINGS FOR DETAIL S. EC SHALL CONNECT ALL CONTROL WIRING AND PROVIDE AND INSTALL ALL ASSOCIATED RACEWAYS.

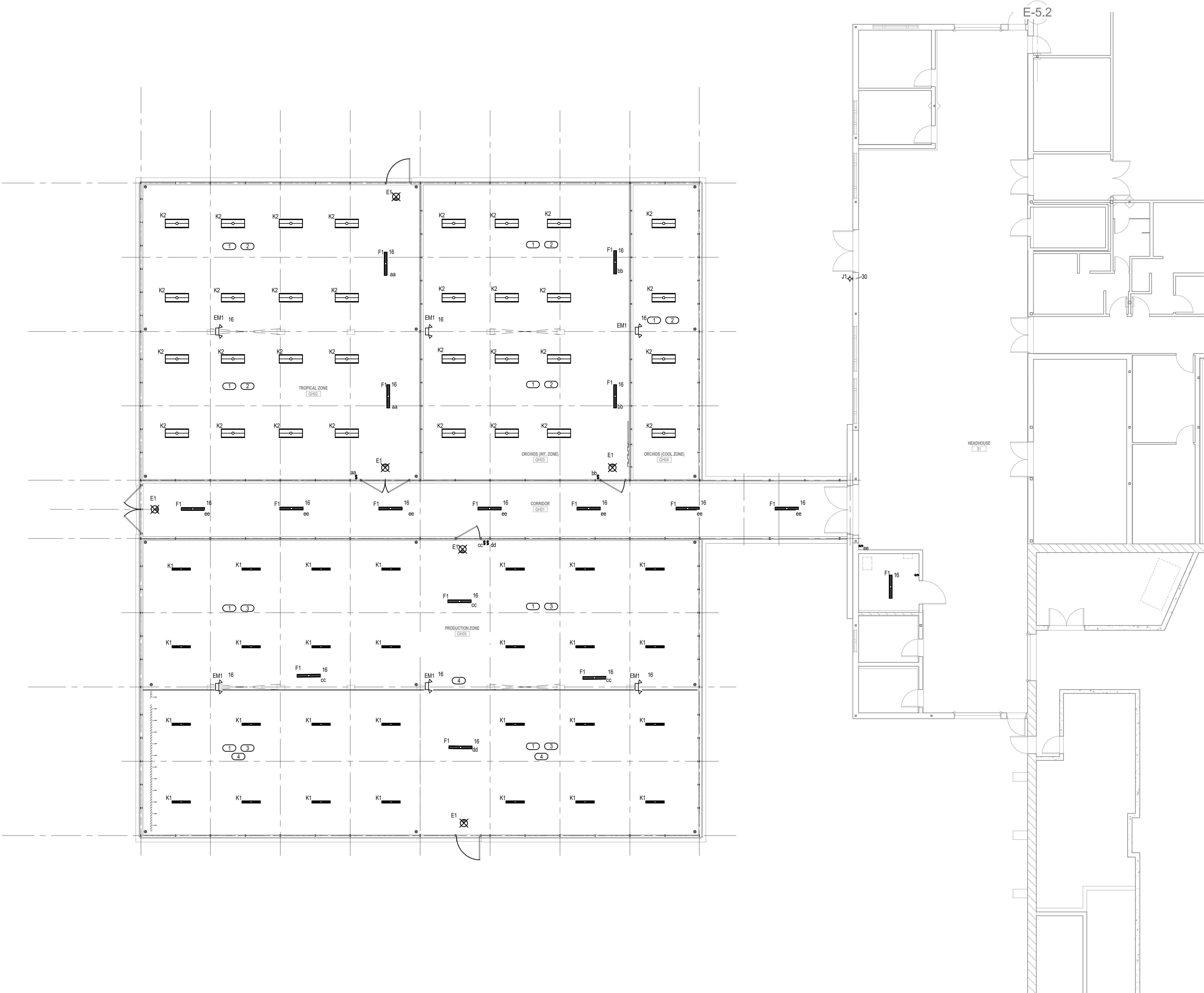
2. GROW LIGHTING IN TROPICAL AND ORCHID AREAS SHALL BE MOUNTED SUSPENDED AT 90" AFF. RE-INSTALL EXISTING HPS LIGHTS SALVAGED FROM GREENHOUSE DEMOLITION. SALVAGED LIGHTS TO BE CLEANED, INSPECTED, AND RELAMPED AS NEEDED. PROVIDE ADDITIONAL NEW HPS TO COMPLETE INSTALLATION.

3. GROW LIGHTING STRIPS IN PRODUCTION AREA SHALL BE TRACK-MOUNTED AT 110" AFF.

4. ALL CONDUIT IN PRODUCTION SOUTH BLACKOUT ZONE SHALL BE ROUTED THROUGH ALUMINUM PANEL BETWEEN GRIDS G E AND G F AT GRID G S. ALL CONDUIT WITHIN PRODUCTION SOUTH BLACKOUT ZONE SHALL RUN BELOW BLACKOUT SHADE HEIGHT AND MUST NOT INTERFERE WITH HORIZONTAL OR VERTICAL TRAVEL OF SHADING. SEE GREENHOUSE DRAWINGS FOR DETAILS.

LIGHT FIXTURE SCHEDULE

TYPE	DESCRIPTION	Mounting	MANUFACTURER	MODEL	LAMP	VOLTS	NOTES
E1	1-Sided EXTL Light, LED, Battery Backup	RECESSED	Lithonia Lighting	LRP	LED	120 V	INTEGRAL BATTERY
EM1	Emergency Lighting Unit, Battery Backup	WALL SURFACE	Lithonia Lighting	ELM2	LED	120 V	INTEGRAL BATTERY
F1	4' LED Strip Light	SURFACE	Lithonia Lighting	ZL SERIES	3500K, 3000 LM	120 V	
J1	EXTERIOR RECTANGULAR WALL PACK, BLACK	WALL SURFACE	BEGA	24 314	3000k, 85+ CRI,	120 V	
K1	LED Plant Growth Strip Light, 150 cm, 150 deg. dist.	Suspended	PL LIGHT	HORTILED TOP SERIES	RB MB, 860 umols/s	120 V	
K2	HPS Plant Growth Light	Suspended	PL LIGHT	PLX SERIES	HPS, 400W, 53000L, 75umols/s	120 V	Match reused existing fixtures



1 GREENHOUSE LIGHTING PLAN
 1/8" = 1'-0"

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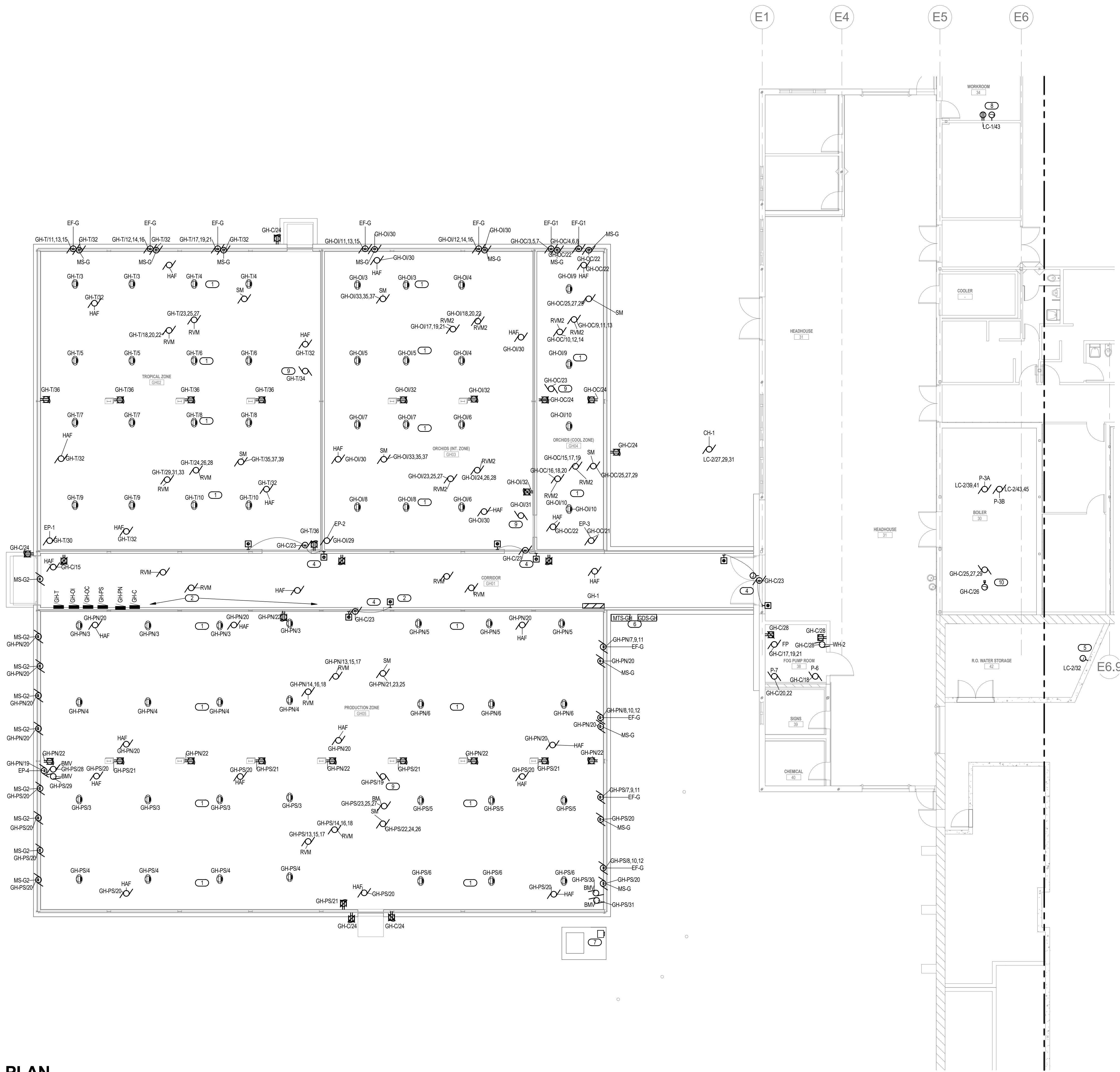
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GREENHOUSE LIGHTING PLAN

**EXHIBIT N
 E111**

GREENHOUSE POWER PLAN

1/8" = 1'-0"



GENERAL POWER NOTES

A. SEE SHEET E000 FOR SYMBOLS, ABBREVIATIONS, AND PROJECT GENERAL NOTES.

B. SEE ARCHITECTURAL, MECHANICAL AND GREENHOUSE DRAWINGS FOR ADDITIONAL INFORMATION ON EQUIPMENT LOCATIONS.

C. SEE MOTOR AND EQUIPMENT SCHEDULE FOR MOTOR CONNECTION INFORMATION. COORDINATE THE LOCATION OF EQUIPMENT CONNECTIONS AND DISCONNECTS MEANS WITH THE EQUIPMENT SUPPLIER.

D. VERIFY ROUGH-IN REQUIREMENTS OF ALL OWNER FURNISHED EQUIPMENT PRIOR TO INSTALLATION.

E. GFCI PROTECTED RECEPTACLES SHALL BE PROVIDED WHERE THE RECEPTACLE IS LOCATED WITHIN 6' OF A SINK AND IN ANY WET LOCATION.

F. MINIMUM HOME RUN CONDUIT SIZE SHALL BE 3/4".

G. PANEL CIRCUIT DESIGNATIONS PROVIDED FOR DESIGN INTENT. EC SHALL VERIFY AND DOCUMENT EXACT CIRCUIT NUMBERS AS CIRCUITED IN THE FIELD.

KEYED NOTES

1 WEATHER-PROOF, GFCI SWITCHED DUPLEX RECEPTACLES SHALL BE MOUNTED ON OVERHEAD RAILS AT 9' AFF (RECEPTACLES LOCATED FOR GROW LIGHTS). CIRCUITS TO RECEPTACLES SHALL BE ROUTED VIA GREENHOUSE LIGHTING CONTROL PANELS - SEE GREENHOUSE SHEET GH6-3.

2 EC SHALL PROVIDE CONDUIT AND WIRE FOR ALL CONTROL WIRING FOR GREENHOUSE CONTROL PANELS AND FROM CONTROL PANELS TO ALL EQUIPMENT. SEE GREENHOUSE DRAWINGS GH6 FOR EQUIPMENT SCHEDULE, GH6-3, GH6-4, GH6-5, AND GH6-6 FOR POWER DIAGRAMS AND CONTROL WIRING DETAILS.

3 PROVIDE POWER FOR ELECTRONIC LOCK AND DOOR STRIKE FOR CONTROLLED DOOR. SEE TECHNOLOGY DRAWING T300 FOR CONTROLLED DOOR DETAIL.

4 PROVIDE POWER FOR MOTORIZED DOOR AUTOMATIC OPERATOR AND PUSH BUTTON PADS. SEE DETAIL ON SHEET E500 AND DOOR DETAILS ON SHEET GH10. DOOR ACTIVATOR PROVIDED BY GREENHOUSE CONTRACTOR.

5 PROVIDE 40A CIRCUIT FOR CONTROL PANEL OF SKID. SEE SKID DETAIL ON IRRIGATION PUMP/SKID SHEET RUN 1". FOR POWER AND 3/4" C. FOR SENSOR WIRING TO ACCESS HATCH FOR STORMWATER IN MECHANICAL ROOM - SEE SHEET E102.

6 PROVIDE 300V 3PH, 400A MANUAL TRANSFER SWITCH AND GENERATOR DOCKING STATION MOUNTED ON EXTERIOR OF CONNECTING CORRIDOR TO GREENHOUSE AND CONNECTED PER ONE-LINE DIAGRAM.

7 LOCATE AC DISCONNECT SWITCH FOR PV ARRAY (ON LEARNING CENTER ROOF) ON THE EXISTING METERING MOUNT ON THE EXISTING TRANSFORMER PAD. LABEL SWITCH WITH "PV ARRAY INTERCONNECTION DISCONNECT SWITCH".

8 PROVIDE 20A CIRCUIT TO JUNCTION BOX FOR POWER TO CARD READER ACCESS FOR DATA CABINET SC-CAB-1. SEE TECHNOLOGY DRAWINGS FOR CABINET POWER DETAILS.

9 MOTOR SHOWN IS PLACEHOLDER FOR GREENHOUSE FLOOR HEAT PUMP. SEE GREENHOUSE DRAWINGS FOR LOCATION AND WIRING REQUIREMENTS.

10 MOTOR AND JUNCTION BOX SHOWN ARE PLACEHOLDERS FOR GREENHOUSE BOILER SYSTEM AND PUMP - SEE GREENHOUSE DRAWINGS FOR LOCATION AND WIRING REQUIREMENTS.

MSR 710 South 2nd Street, 8th Floor
Minneapolis, Minnesota 55401-2282
Architecture 612.375.0336 tel
Interiors and 612.342.2216 fax
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608.223.9600 tel

MEP Engineer
MEP Associates, LLC
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575 Minnehaha Ave West
St. Paul, MN 55103
651.251.1880 tel

Greenhouse Design
Rough Brothers, Inc.
5513 Vine Street
Cincinnati, OH 45217
513.242.0310 tel

Olbriich Botanical Gardens Expansion Phase 1

BPW Project #8162
3330 Atwood Avenue
Madison, WI 53704

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Engineer under the Laws of the State of Wisconsin.
ENGINEER SEAL



Signature: _____
Print Name: Randall A. Jacobs
Date: JUNE 4, 2018 License No. 35771

MARK	DATE	DESCRIPTION
	09.09.2017	SCHEMATIC DESIGN SUBMISSION
	12.08.2017	00 PRICING SET
	01.10.2018	DESIGN DEVELOPMENT SUBMISSION
	01.17.2018	UDC SUBMISSION
	03.31.2018	75% CD PRICING ISSUE
	05.04.2018	90% CONSTRUCTION DOCUMENTS
	06.01.2018	BID ISSUE
	06.04.2018	PERMIT ISSUE

PROJECT NO. 2017016
PROJECT PHASE BID DOCUMENTS
DRAWN BY: MSR CHECKED BY: MSR
Design: 2017 Copyright: MSR, Shaver & Rossmore, LLC

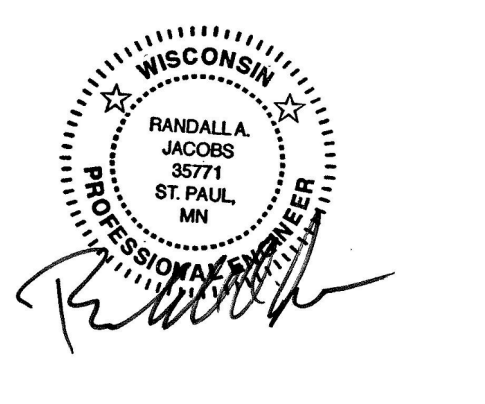
GREENHOUSE
POWER PLAN

EXHIBIT N
E112

Drawing: 2017 Copyright: MSR, Shaver & Rossmore, LLC 1/25/2018 1:58:14 PM C:\Users\randall.a.jacobs\OneDrive\Projects\2017016\002_CD\DWG\18_E112_Greenhouse.rvt

**Olbrich Botanical Gardens
 Expansion Phase 1**
 BPW Project #8162
 3330 Atwood Avenue
 Madison, WI 53704

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Engineer under the Laws of the State of Wisconsin.
 ENGINEER SEAL



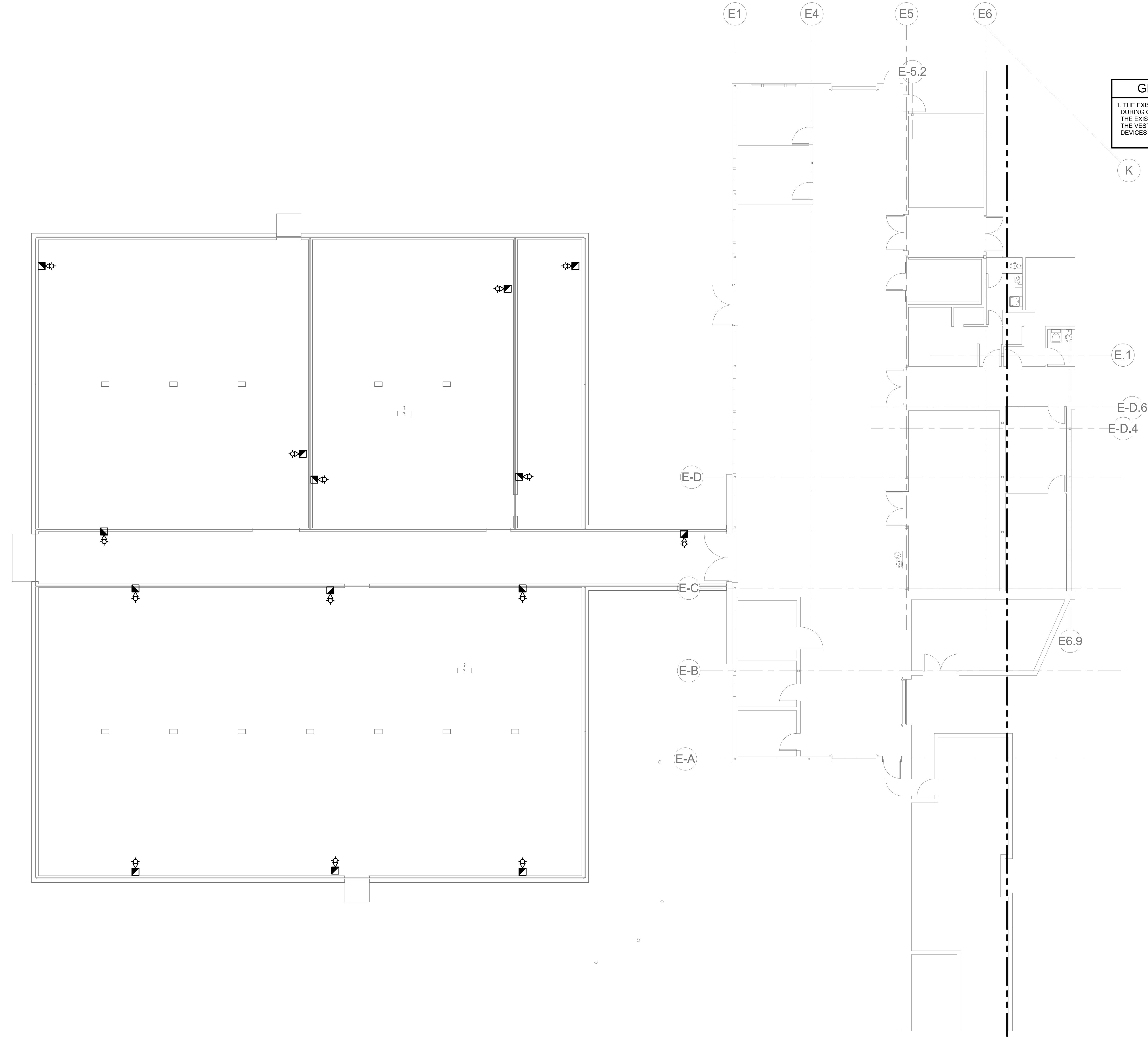
Signature: _____
 Print Name: Randall A. Jacobs
 Date: JUNE 4, 2018 License No. 35771

MARK	DATE	DESCRIPTION
	09.09.2017	SCHEMATIC DESIGN SUBMISSION
	12.08.2017	10% PRICING SET
	01.10.2018	DESIGN DEVELOPMENT SUBMISSION
	01.17.2018	UDC SUBMISSION
	03.31.2018	70% CD PRICING ISSUE
	05.04.2018	90% CONSTRUCTION DOCUMENTS
	06.01.2018	BID ISSUE
	06.04.2018	PERMIT ISSUE

PROJECT NO. 2017016
 PROJECT PHASE BID DOCUMENTS
 DRAWN BY MSR CHECKED BY MSR
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GREENHOUSE FIRE DETECTION PLAN

**EXHIBIT N
 E113**



1 GREENHOUSE FIRE DETECTION PLAN
 1/8" = 1'-0"

Branch Panel: LC-1
 Location: MECH 120
 Supply From: SURFACE
 Mounting: SURFACE
 Top/Bottom Feed

Volts: 120/208 Wye
 Phases: 3
 Wires: 4

A.I.C. Rating: 22000
 Mains: 400 A

CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT
1	RCPT: OUTDOOR CLASSROOM 124	20 A	1	1.1...	3.6...	0.9...	2.3...	--	--	4
3	RCPT: CLASSROOM 123	20 A	1	--	--	--	--	--	--	6
5	RCPT: CLASSROOM 123	20 A	1	0.9...	1.1...	0.5...	2.0...	--	--	8
7	RCPT: CLASSROOM 123	20 A	1	1.4...	0.9...	0.7...	0.7...	1	20 A RCPT: CIRC 110	10
9	FLOOR BOX: CLASSROOM 123	20 A	1	--	--	1.4...	0.9...	1	20 A RCPT: LINK 110, JC 101, EF-3	12
11	RCPT: CLASSROOM 122	20 A	1	0.7...	0.5...	1.1...	1.4...	1	20 A RCPT: EXTERIOR EAST	14
13	RCPT: CLASSROOM 122	20 A	1	0.7...	0.5...	1.1...	1.4...	1	20 A FAN COIL UNIT: LEVEL 1	16
15	RCPT: EXTERIOR NORTH	20 A	1	--	--	1.4...	1.4...	1	20 A FAN COIL UNIT: LEVEL 1	18
17	FLOOR BOX: CLASSROOM 122	20 A	1	0.9...	1.4...	1.1...	1.4...	1	20 A FAN COIL UNIT: LEVEL 2	20
19	RCPT: CLASSROOM 121	20 A	1	1.1...	1.4...	0.7...	0.4...	1	20 A Receptacle	22
21	RCPT: CLASSROOM 121	20 A	1	0.7...	0.1...	1.4...	1.9...	1	20 A UNIT HEATER UH-1	24
23	RCPT: CLASSROOM 122	20 A	1	0.7...	0.1...	1.4...	1.9...	1	20 A CLASSROOM LIGHTING	26
25	RCPT: CLASSROOM 121	20 A	1	1.4...	1.9...	1.1...	0.7...	1	20 A CIRCULATION LINK LIGHTING	28
27	FLOOR BOX: CLASSROOM 121	20 A	1	1.6...	1.0...	0.5...	0.5...	1	20 A FIRST FLOOR LIGHTING	30
29	RCPT: MECH 120	20 A	1	--	--	0.8...	1.4...	1	20 A SECOND FLOOR LIGHTING	32
31	RCPT: CIRC. 110, STR 103, LINK 100	20 A	1	0.9...	0.1...	0.8...	1.4...	1	20 A SECOND FLOOR OFFICE LIGHTING	34
33	RCPT: CIRC. 110 & AV CLOSET	20 A	1	0.9...	0.1...	0.0...	0.1...	1	20 A FIRST FLOOR OUTDOOR LIGHTING	36
35	RCPT: CIRC. 110, FP 106, UH-2	20 A	1	0.9...	0.1...	0.0...	0.1...	1	20 A SECOND FLOOR OUTDOOR LIGHT	40
37	RCPT: FAN, DOOR: TOILET 104, 105	20 A	1	0.0...	0.1...	0.0...	0.2...	1	20 A ELEVATOR PIT LIGHT & RECEP	42
39	ELEV CAB LIGHTS	20 A	1	0.4...	1.8...	0.9...	0.5...	1	20 A OUTDOOR TERRACE RECEP.	44
41	ELEV CAB VENTILATION	20 A	1	0.9...	0.5...	0.0...	0.0...	1	20 A OUTDOOR NW TRAM RECEP.	46
43	RECEPT & LOCK WORKRM 34	20 A	1	0.0...	0.0...	0.0...	0.0...	1	20 A Spare	48
45	OUTDOOR COURTYARD & TRAM RCPT	20 A	1	0.0...	0.0...	0.0...	0.0...	1	20 A Spare	50
47	Spare	20 A	1	0.0...	0.0...	0.0...	0.0...	1	20 A Spare	52
49	Spare	20 A	1	0.0...	0.0...	0.0...	0.0...	1	20 A Spare	54
51	Spare	20 A	1	0.0...	0.0...	0.0...	0.0...	1	20 A Spare	56
53	Spare	20 A	1	0.0...	0.0...	0.0...	0.0...	1	20 A Spare	58
55	Spare	20 A	1	0.0...	0.0...	0.0...	0.0...	1	20 A Spare	60
57	Spare	20 A	1	0.0...	0.0...	0.0...	0.0...	1	20 A Spare	60
59	Spare	20 A	1	0.0...	0.0...	0.0...	0.0...	1	20 A Spare	60
Total Load:		17 kVA	16 kVA	12 kVA						
Total Amps:		145 A	143 A	100 A						

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
HVAC Blowers	12 VA	100.00%	12 VA	Total Conn. Load: 45 kVA
HVAC Heating	144 VA	100.00%	144 VA	Total Est. Demand: 32 kVA
Lighting	5054 VA	125.00%	6317 VA	Total Conn. Current: 125 A
Motor	336 VA	100.00%	336 VA	Total Est. Demand Current: 89 A
Other	642 VA	100.00%	642 VA	Non-Coincident...: 0 A
Receptacle	39000 VA	62.82%	24500 VA	Total Est. Demand - NC: 89 A

Branch Panel: LC-2
 Location: MECH 120
 Supply From: SURFACE
 Mounting: SURFACE
 Top/Bottom Feed

Volts: 120/208 Wye
 Phases: 3
 Wires: 4

A.I.C. Rating: 22000
 Mains: 400 A

CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT
1	AHU-1: MECH RM 120	80 A	3	7.2...	0.8...	7.2...	0.2...	1	20 A RCPT: WATER 201, TOILET 202	2
3	--	--	--	7.2...	0.2...	7.2...	0.9...	1	20 A REFRIGERATOR: STORAGE 211	4
5	--	--	--	7.2...	0.9...	7.2...	0.9...	1	20 A RCPT: STORAGE 211	6
7	P-4A - MECH RM 120	20 A	2	0.9...	0.9...	0.9...	1.1...	1	20 A RCPT: DIRECTOR'S OFFICE 213	8
9	--	--	--	0.9...	0.9...	0.9...	1.5...	1	20 A RCPT: OFFICE/WORKROOM 210	10
11	P-4B - MECH RM 120	20 A	2	0.9...	0.7...	0.9...	1.5...	1	20 A RCPT: OFFICE/WORKROOM 210	12
13	--	--	--	0.9...	0.7...	0.9...	0.7...	1	20 A RCPT: PATIO 402	14
15	P-5A - MECH RM 120	20 A	2	0.9...	0.7...	0.9...	0.7...	1	20 A RCPT: PATIO 402	16
17	--	--	--	0.9...	1.1...	0.9...	1.1...	1	20 A RCPT: OFFICE/WORKROOM 210	18
19	P-5B - MECH RM 120	20 A	2	0.9...	0.9...	0.9...	0.9...	1	20 A RCPT: OFFICE/WORKROOM 210	20
21	--	--	--	0.9...	0.7...	0.9...	1.1...	1	20 A RCPT: OFFICE/WORKROOM 210	22
23	SUMP PUMP S1	20 A	1	0.0...	1.1...	0.0...	1.1...	1	20 A J-BOX: BELOW RAISD FLOOR RM 210	24
25	SUMP PUMP S2	20 A	1	0.0...	1.1...	0.0...	1.1...	1	20 A J-BOX: BELOW RAISD FLOOR RM 210	26
27	CHILLER CH-1	90 A	3	7.7...	1.1...	7.7...	1.1...	1	20 A J-BOX: BELOW RAISD FLOOR RM 210	28
29	--	--	--	7.7...	0.7...	7.7...	0.7...	1	20 A LOBBY 201 RCPT, DOOR OPENER	30
31	--	--	--	7.7...	0.2...	7.7...	0.2...	1	40 A SKID CONTROL PANEL RM 42	32
33	LIFT STATION	40 A	3	2.7...	0.0...	2.7...	0.0...	1	20 A Spare	34
35	--	--	--	2.7...	0.0...	2.7...	0.0...	1	20 A Spare	36
37	--	--	--	2.7...	0.0...	2.7...	0.0...	1	20 A Spare	38
39	P-3A - BOILER ROOM	20 A	2	0.3...	0.0...	0.3...	0.0...	1	20 A Spare	40
41	--	--	--	0.3...	0.0...	0.3...	0.0...	1	20 A Spare	42
43	P-3B - BOILER ROOM	20 A	2	0.3...	0.0...	0.3...	0.0...	1	20 A Spare	44
45	--	--	--	0.3...	0.0...	0.3...	0.0...	1	20 A Spare	46
47	Spare	20 A	1	0.0...	0.0...	0.0...	0.0...	1	20 A Spare	48
49	Spare	20 A	1	0.0...	0.0...	0.0...	0.0...	1	20 A Spare	50
51	Spare	20 A	1	0.0...	0.0...	0.0...	0.0...	1	20 A Spare	52
53	Spare	20 A	1	0.0...	0.0...	0.0...	0.0...	1	20 A Spare	54
55	Spare	20 A	1	0.0...	0.0...	0.0...	0.0...	1	20 A Spare	56
57	Spare	20 A	1	0.0...	0.0...	0.0...	0.0...	1	20 A Spare	58
59	Spare	20 A	1	0.0...	0.0...	0.0...	0.0...	1	20 A Spare	60
Total Load:		25 kVA	25 kVA	25 kVA						
Total Amps:		210 A	206 A	208 A						

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
HVAC Blowers	23249 VA	100.00%	23249 VA	Total Conn. Load: 75 kVA
Motor	29672 VA	100.00%	29672 VA	Total Est. Demand: 73 kVA
Receptacle	13590 VA	86.79%	11795 VA	Total Conn. Current: 208 A
HVAC	8322 VA	100.00%	8322 VA	Total Est. Demand Current: 203 A
Non-Coincident...: 0 A				
Total Est. Demand - NC: 203 A				

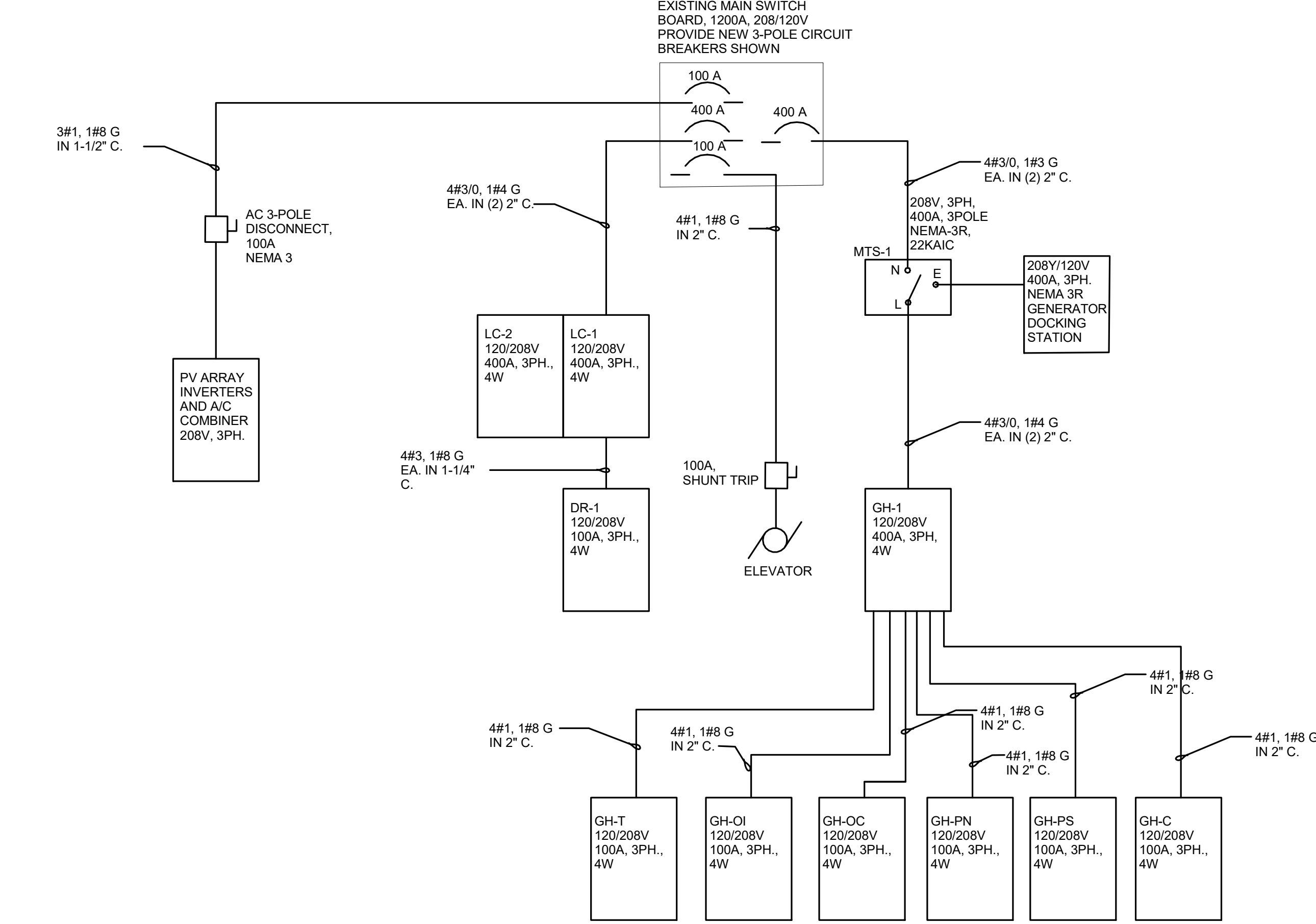
Branch Panel: DR-1
 Location: DATA 102
 Supply From: LC-1
 Mounting: SURFACE
 Top/Bottom Feed

Volts: 120/208 Wye
 Phases: 3
 Wires: 4

A.I.C. Rating: 10K AIC
 Mains:

CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT
1	RCPT: DATA 102 RACK	20 A	1	1.6...	0.0...	--	--	1	20 A Spare	2
3	RCPT: DATA 102 RACK	20 A	1	1.6...	0.0...	1.6...	0.0...	1	20 A Spare	4
5	RCPT: DATA 102 RACK	20 A	1	1.6...	0.0...	1.6...	0.0...	1	20 A Spare	6
7	RCPT: DATA 102 RACK	20 A	1	1.6...	0.0...	1.6...	0.0...	1	20 A Spare	8
9	RCPT: DATA 102 NORTH	20 A	1	0.4...	0.0...	0.4...	0.0...	1	20 A Spare	10
11	RCPT: DATA 102 WEST	20 A	1	0.4...	0.0...	0.4...	0.0...	1	20 A Spare	12
13	RCPT: DATA 102 SOUTH	20 A	1	0.4...	0.0...	0.4...	0.0...	1	20 A Spare	14
15	RCPT: DATA 102 EAST	20 A	1	0.4...	0.0...	0.4...	0.0...	1	20 A Spare	16
17	Spare	20 A	1	0.0...	0.0...	0.0...	0.0...	1	20 A Spare	18
Total Load:		4 kVA	2 kVA	2 kVA						
Total Amps:		30 A	20 A	16 A						

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Receptacle	7840 VA	100.00%	7840 VA	Total Conn. Load: 8 kVA
Total Est. Demand: 8 kVA				
Total Conn. Current: 22 A				
Total Est. Demand Current: 22 A				
Non-Coincident...: 0 A				
Total Est. Demand - NC: 22 A				



1 ELECTRICAL ONE LINE

12" = 1'-0"

MOTOR SCHEDULE

EQUIPMENT NO.	EQUIPMENT DESCRIPTION	LOCATION	VOLTAGE	PHASE	HP	FLA	CONDUIT & WIRE SIZE	CONTROLS BY	CONTROLLER	DISCONNECT BY	DISCONNECT TYPE	PANEL	NOTE
AHU-1	AIR HANDLER UNIT	MECH ROOM 120	208 V	3	59.6	1-1/4" C, (3) #3, (1) #8 G.	MC	MC	MC				
BM	BLACKOUT MOTOR	GREENHOUSE	208 V	3	1	3/4" C, (2) #12, (1) #12 G.	GREENHOUSE	GREENHOUSE				GH-PS	
BMV	VERTICAL BLACKOUT MOTOR	GREENHOUSE	120 V	1	3/8	2.3 3/4" C, (2) #12, (1) #12 G.	GREENHOUSE	GREENHOUSE				GH-PS	
CH-1	CHILLER	OUTSIDE GREENHOUSE	208 V	3	64.5	1-1/2" C, (3) #2, (1) #8 G.	MC	MC	MC			LC-2	
EF-1	EXHAUST FAN RESTROOM	TOILET 105	120 V	1		3/4" C, (2) #12, (1) #12 G.	MC	EC	MRS			LC-1	
EF-2	EXHAUST FAN	TOILET 104	120 V	1		3/4" C, (2) #12, (1) #12 G.	MC	EC	MRS			LC-1	
EF-3	EXHAUST FAN	JANITOR CLOSET 101	120 V	1		3/4" C, (2) #12, (1) #12 G.	MC	EC	MRS			LC-1	
EF-4	EXHAUST FAN	DATA RM 102	120 V	1		3/4" C, (2) #12	MC	EC	MRS			LC-1	
EF-5	EXHAUST FAN	TOILET 202	120 V	1		3/4" C, (2) #12, (1) #12 G.	MC	EC	MRS			LC-2	
EF-6	EXHAUST FAN GREENHOUSE	GREENHOUSE	208 V	3	1-1/2	6 3/4" C, (3) #12, (1) #12 G.	GREENHOUSE	GREENHOUSE					
EF-G1	SMALL EXH. FAN GREENHOUSE	GREENHOUSE	208 V	3	3/4	3.3 3/4" C, (3) #12, (1) #12 G.	GREENHOUSE	GREENHOUSE				GH-OC	
ELEV-1	ELEVATOR	MECH ROOM 120	208 V	3		SEE ONE LINE DIAGRAM	ELEVATOR	EC				SHUNT TRIP	GH-OC
EP	EVAPORATIVE PAD PUMP	GREENHOUSE	120 V	1	13	3/4" C, (2) #12, (1) #12 G.	GREENHOUSE	GREENHOUSE					
EP-1	SMALL EVAP PAD PUMP	GREENHOUSE	120 V	1	13	3/4" C, (2) #12, (1) #12 G.	GREENHOUSE	GREENHOUSE				GH-OC	
FP	FOG PUMP	FOG ROOM 38	208 V	3	1.5	5.2 3/4" C, (3) #12, (1) #12 G.	GREENHOUSE	GREENHOUSE				GH-C	
HAF	GREENHOUSE FAN	GREENHOUSE	120 V	1	1.9	3/4" C, (2) #12, (1) #12 G.	GREENHOUSE	EC				WALL SWITCH	
LSM	LIFT STATION MOTOR	OUTSIDE LEARNING CENTER	208 V	3		1" C, (3) #8, (1) #10 G.	MC	EC				SHUNT TRIP	LC-2
MS-1	CLASSROOM SHADE MOTOR	CLASSROOMS 101, 102, 103	120 V	1		3/4" C, (2) #12, (1) #12 G.	MC	MC					
MS-G	SHUTTER MOTOR GREENHOUSE	GREENHOUSE	120 V	1		3/4" C, (2) #12, (1) #12 G.	GREENHOUSE	GREENHOUSE					
MS-G2	SHUTTER MOTOR GREENHOUSE 2	GREENHOUSE	120 V	1		3/4" C, (2) #12, (1) #12 G.	GREENHOUSE	GREENHOUSE					
P-3	MECHANICAL PUMP	BOILER ROOM 30	208 V	1	1/8	2.4 3/4" C, (3) #12, (1) #12 G.	MC	EC				NFS	LC-2
P-4	MECHANICAL PUMP	MECH ROOM 120	208 V	1	1	8.8 3/4" C, (3) #12, (1) #12 G.	MC	EC				NFS	LC-2
P-5	MECHANICAL PUMP	MECH ROOM 120	208 V	1	1	8.8 3/4" C, (3) #12, (1) #12 G.	MC	EC				NFS	LC-2
P-6	RECIRCULATION PUMP	FOG ROOM 38	120 V	1	1/12	2.2 3/4" C, (2) #12, (1) #12 G.	MC	EC				MRS	GH-C
P-7	MISTING PUMP	FOG ROOM 38	208 V	1	1/2	2.0 3/4" C, (2) #12, (1) #12 G.	MC	EC				MRS	GH-C
RF-C1	RECESSED FAN COIL	CLASSROOMS & 2ND LVL OFFICES	120 V	1		3/4" C, (2) #12, (1) #12 G.	MC	MC					
RV1	ROOF VENT MOTOR	GREENHOUSE	208 V	3	1.7	3/4" C, (3) #12, (1) #12 G.	GREENHOUSE	GREENHOUSE					
RV2	SMALL ROOF VENT MOTOR	GREENHOUSE	208 V	3	0.9	3/4" C, (3) #12, (1) #12 G.	GREENHOUSE	GREENHOUSE					
SM	Shade Motor Greenhouse Roof	GREENHOUSE	208 V	3		3/4" C, (3) #12, (1) #12 G.	GREENHOUSE	GREENHOUSE					
SP-1	SUMP PUMP	BELOW MECH ROOM 120	120 V	1		3/4" C, (2) #12, (1) #12 G.	MC	MC				RECEPTACLE	LC-2
SP-2	SUMP PUMP	BELOW MECH ROOM 1											

Distribution Pnl: GH-1

Location: CORRIDOR GH01
Supply From: GH-1
Mounting: Surface
Top/Bottom Feed

Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 22K AIC
Mains: 400 A
MLO Rating: 400 A

CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT	
1	GH-T	20 A	3	4801...3152				3	20 A	GH-OI	2
3	--	--	--	--	5250...3762			--	--	--	4
5	--	--	--	--	5955...4389			--	--	--	6
7	GH-OC	20 A	3	1308...3476				3	20 A	GH-PS	8
9	--	--	--	--	2048...5216			--	--	--	10
11	--	--	--	--	1398...3952			--	--	--	12
13	GH-PN	20 A	3	4485...2316				3	20 A	GH-C	14
15	--	--	--	--	5000...3776			--	--	--	16
17	--	--	--	--	3280...3701			--	--	--	18
19	--	--	--	--				--	--	--	20
21	--	--	--	--				--	--	--	22
23	--	--	--	--				--	--	--	24
Total Load:				19538 VA	25051 VA	22675 VA					
Total Amps:				163 A	213 A	193 A					
Legend:		Connected Load	Demand Factor	Estimated Demand	Panel Totals						
Lighting		23047 VA	125.00%	28809 VA	Total Conn. Load: 67264 VA						
Motor		36837 VA	100.00%	36837 VA	Total Est. Demand: 73025 VA						
HVAC Heating		0 VA	0.00%	0 VA	Total Conn. Current: 187 A						
					Total Est. Demand Current: 203 A						
					Non-Coincident... 0 A						
					Total Est. Demand - NC: 203 A						

Notes:

Branch Panel: GH-C

Location: CORRIDOR GH01
Supply From: GH-1
Mounting: SURFACE
Top/Bottom Feed

Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 22000
Mains: 100 A

CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT	
1	CONTROL PANEL CORRIDOR	15 A	1	180... 280...				1	15 A	COIL POWER & SHUTTERS	2
3	ROOF VENT MOTOR 1	20 A	3	204... 204...				3	20 A	ROOF VENT MOTOR 2	4
5	--	--	--	204... 204...				--	--	--	6
7	--	--	--	204... 204...				--	--	--	8
9	ROOF VENT MOTOR 3	20 A	3	204... 204...				3	20 A	ROOF VENT MOTOR 4	10
11	--	--	--	204... 204...				--	--	--	12
13	--	--	--	204... 204...				--	--	--	14
15	HAF CORRIDOR	20 A	1	468... 1272...				1	20 A	GREENHOUSE & FOG LIGHTING	16
17	FOG PUMP	20 A	3		624... 85 VA			1	20 A	RECIRCULATION PUMP P-6	18
19	--	--	--	624... 235...				2	20 A	MISTING PUMP P-7	20
21	--	--	--	624... 235...				--	--	--	22
23	DOOR OPENERS - GREENHOUSE	20 A	1	1260... 900...				1	20 A	GREENHOUSE OUTDOOR RECEPT	24
25	BOILER PUMP	20 A	3	0 VA 180...				1	20 A	BOILER SYSTEM	26
27	--	--	--	0 VA 360...				1	20 A	RECEPT & WATER HEATER WH-2	28
29	--	--	--	0 VA 15 VA				1	20 A	EXTERIOR LIGHTING	30
31	Spare	20 A	1	0 VA 0 VA				1	20 A	Spare	32
33	Spare	20 A	1	0 VA 0 VA				1	20 A	Spare	34
35	Spare	20 A	1	0 VA 0 VA				1	20 A	Spare	36
37	Spare	20 A	1	0 VA 0 VA				1	20 A	Spare	38
39	Spare	20 A	1	0 VA 0 VA				1	20 A	Spare	40
41	Spare	20 A	1	0 VA 0 VA				1	20 A	Spare	42
Total Load:				2316 VA	3776 VA	3701 VA					
Total Amps:				19 A	33 A	33 A					
Load Classification		Connected Load	Demand Factor	Estimated Demand	Panel Totals						
HVAC Heating		0 VA	0.00%	0 VA	Total Conn. Load: 9793 VA						
Lighting		1287 VA	125.00%	1600 VA	Total Est. Demand: 10115 VA						
Motor		6706 VA	100.00%	6706 VA	Total Conn. Current: 27 A						
Receptacle		1800 VA	100.00%	1800 VA	Non-Coincident... 0 A						
					Total Est. Demand - NC: 28 A						

Notes:

Branch Panel: GH-T

Location: CORRIDOR GH01
Supply From: GH-1
Mounting: SURFACE
Top/Bottom Feed

Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 22000 AIC
Mains: 100 A

CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT	
1	CONTROL PANEL POWER	15 A	1	180... 180...				1	15 A	COIL POWER	2
3	GROW LIGHT RECEPT 1	20 A	1	800... 800...				1	20 A	GROW LIGHT RECEPT 2	4
5	GROW LIGHT RECEPT 3	20 A	1	800... 800...				1	20 A	GROW LIGHT RECEPT 4	6
7	GROW LIGHT RECEPT 5	20 A	1	800... 800...				1	20 A	GROW LIGHT RECEPT 6	8
9	GROW LIGHT RECEPT 7	20 A	1	800... 800...				1	20 A	GROW LIGHT RECEPT 8	10
11	EXHAUST FAN 1	20 A	3	416... 416...				3	20 A	EXHAUST FAN 2	12
13	--	--	--	416... 416...				--	--	--	14
15	--	--	--	416... 416...				--	--	--	16
17	EXHAUST FAN 3	20 A	3	416... 416...				3	20 A	ROOF VENT MOTOR 1	18
19	--	--	--	416... 118...				--	--	--	20
21	--	--	--	416... 118...				--	--	--	22
23	ROOF VENT MOTOR 2	20 A	3	118... 118...				3	20 A	ROOF VENT MOTOR 3	24
25	--	--	--	118... 118...				--	--	--	26
27	--	--	--	118... 118...				--	--	--	28
29	ROOF VENT MOTOR 4	20 A	3	118... 118...				3	20 A	EVAPORATIVE PAD PUMP	30
31	--	--	--	118... 881...				1	20 A	HAF & SHUTTERS TROPICAL...	32
33	--	--	--	118... 90 VA				1	20 A	FLOOR HEAT PUMP	34
35	SHADE MOTOR	20 A	3	240... 900...				1	20 A	TROPICAL RECEPTACLES	36
37	--	--	--	240... 0 VA				1	20 A	Spare	38
39	--	--	--	240... 0 VA				1	20 A	Spare	40
41	Spare	20 A	1	0 VA 0 VA				1	20 A	Spare	42
Total Load:				4801 VA	5250 VA	5955 VA					
Total Amps:				40 A	44 A	50 A					
Load Classification		Connected Load	Demand Factor	Estimated Demand	Panel Totals						
Lighting		6400 VA	125.00%	8000 VA	Total Conn. Load: 16006 VA						
Motor		8346 VA	100.00%	8346 VA	Total Est. Demand: 17606 VA						
Receptacle		1260 VA	100.00%	1260 VA	Total Conn. Current: 44 A						
					Total Est. Demand Current: 49 A						
					Non-Coincident... 0 A						
					Total Est. Demand - NC: 49 A						

Notes:

Branch Panel: GH-PN

Location: CORRIDOR GH01
Supply From: GH-1
Mounting: SURFACE
Top/Bottom Feed

Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 22000
Mains: 100 A

CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT	
1	CONTROL PANEL PRODUCTION N	15 A	1	180... 180...				1	20 A	COIL POWER	2
3	GROW LIGHT RECEPT 1	20 A	1	1280... 1280...				1	20 A	GROW LIGHT RECEPT 2	4
5	GROW LIGHT RECEPT 3	20 A	1	960... 960...				1	20 A	GROW LIGHT RECEPT 4	6
7	EXHAUST FAN N 1	20 A	3	416... 416...				3	20 A	EXHAUST FAN N 2	8
9	--	--	--	416... 416...				--	--	--	10
11	--	--	--	416... 416...				--	--	--	12
13	ROOF VENT MOTOR N 1	20 A	3	204... 204...				3	20 A	ROOF VENT MOTOR N 2	14
15	--	--	--	204... 204...				--	--	--	16
17	--	--	--	204... 204...				--	--	--	18
19	EVAPORATIVE PAD PUMP	20 A	1	1495... 1270...				1	20 A	HAF & SHUTTERS -PRODUCTION N	20
21	SHADE MOTOR	20 A	3	120... 1060...				1	20 A	PRODUCTION N RECEPT	22
23	--	--	--	120... 1060...				1	20 A	Spare	24
25	--	--	--	120... 0 VA				1	20 A	Spare	26
27	Spare	20 A	1	0 VA 0 VA				1	20 A	Spare	28
29	Spare	20 A	1	0 VA 0 VA				1	20 A	Spare	30
31	Spare	20 A	1	0 VA 0 VA				1	20 A	Spare	32
33	Spare	20 A	1	0 VA 0 VA				1	20 A	Spare	34
35	Spare	20 A	1	0 VA 0 VA				1	20 A	Spare	36
37	Spare	20 A	1	0 VA 0 VA				1	20 A	Spare	38
39	Spare	20 A	1	0 VA 0 VA				1	20 A	Spare	40
41	Spare	20 A	1	0 VA 0 VA				1	20 A	Spare	42
Total Load:				4485 VA	5000 VA	3260 VA					
Total Amps:				39 A	43 A	27 A					
Load Classification		Connected Load	Demand Factor	Estimated Demand	Panel Totals						
Lighting		4480 VA	125.00%	5600 VA	Total Conn. Load: 12785 VA						
Motor		6845 VA	100.00%	6845 VA	Total Est. Demand: 13985 VA						
Receptacle		1440 VA	100.00%	1440 VA	Total Conn. Current: 39 A						
					Total Est. Demand Current: 39 A						
					Non-Coincident... 0 A						
					Total Est. Demand - NC: 39 A						

Notes:

Branch Panel: GH-OI

Location: CORRIDOR GH01
Supply From: GH-1
Mounting: SURFACE
Top/Bottom Feed

Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 22000 AIC
Mains: 100 A

CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT	
1	CONTROL PANEL ORCHID	15 A	1	180... 180...				1	15 A	COIL POWER	2
3	GROW LIGHT RECEPT INT 1	20 A	1	800... 800...				1	20 A	GROW LIGHT RECEPT INT 2	4
5	GROW LIGHT RECEPT INT 3	20 A	1	800... 800...				1	20 A	GROW LIGHT RECEPT INT 4	6
7	GROW LIGHT RECEPT INT 5	20 A	1	800... 800...				1	20 A	GROW LIGHT RECEPT INT 6	8
9	GROW LIGHT RECEPT COOL 1	20 A	1	800... 800...				1	20 A	GROW LIGHT RECEPT COOL 2	10
11	EXHAUST FAN 1	20 A	3	36 VA 36 VA				3	20 A	EXHAUST FAN 2	12
13	--	--	--	36 VA 36 VA				--	--	--	14
15	--	--	--	36 VA 36 VA				--	--	--	16
17	ROOF VENT MOTOR 1	20 A	3	62 VA 62 VA				3	20 A	ROOF VENT MOTOR 2	18
19	--	--	--	62 VA 62 VA				--	--	--	20
21	--	--	--	62 VA 62 VA				--	--	--	22
23	ROOF VENT MOTOR 3	20 A	3	62 VA 62 VA				3	20 A	ROOF VENT MOTOR 4	24
25	--	--	--	62 VA 62 VA				--	--	--	26
27	--	--	--	62 VA 62 VA				--	--	--	28
29	EVAPORATIVE PAD PUMP	20 A	1	1560... 667...				1	20 A	HAF & SHUTTERS ORCHID INT.	30
31	FLOOR HEAT PUMP	20 A	1	90 VA 540...				1	20 A	ORCHID INT. RECEPT	32
33	SHADE MOTOR	20 A	3	240... 0 VA				1	20 A	Spare	34
35	--	--	--	240... 0 VA				1	20 A	Spare	36
37	--	--	--	240... 0 VA				1	20 A	Spare	38
39	Spare	20 A	1	0 VA 0 VA				1	20 A	Spare	40
41	Spare	20 A	1	0 VA 0 VA				1	20 A	Spare	42
Total Load:				3152 VA	3762 VA	4389 VA					
Total Amps:				26 A	32 A	37 A					
Load Classification		Connected Load	Demand Factor	Estimated Demand	Panel Totals						
Lighting		6400 VA	125.00%	8000 VA	Total Conn. Load: 11302 VA						
Motor		4002 VA	100.00%	4002 VA	Total Est. Demand: 12902 VA						
Receptacle		900 VA	100.00%	900 VA	Total Conn. Current: 31 A						
					Total Est. Demand Current: 36 A						
					Non-Coincident... 0 A						
					Total Est. Demand - NC: 36 A						

Notes:

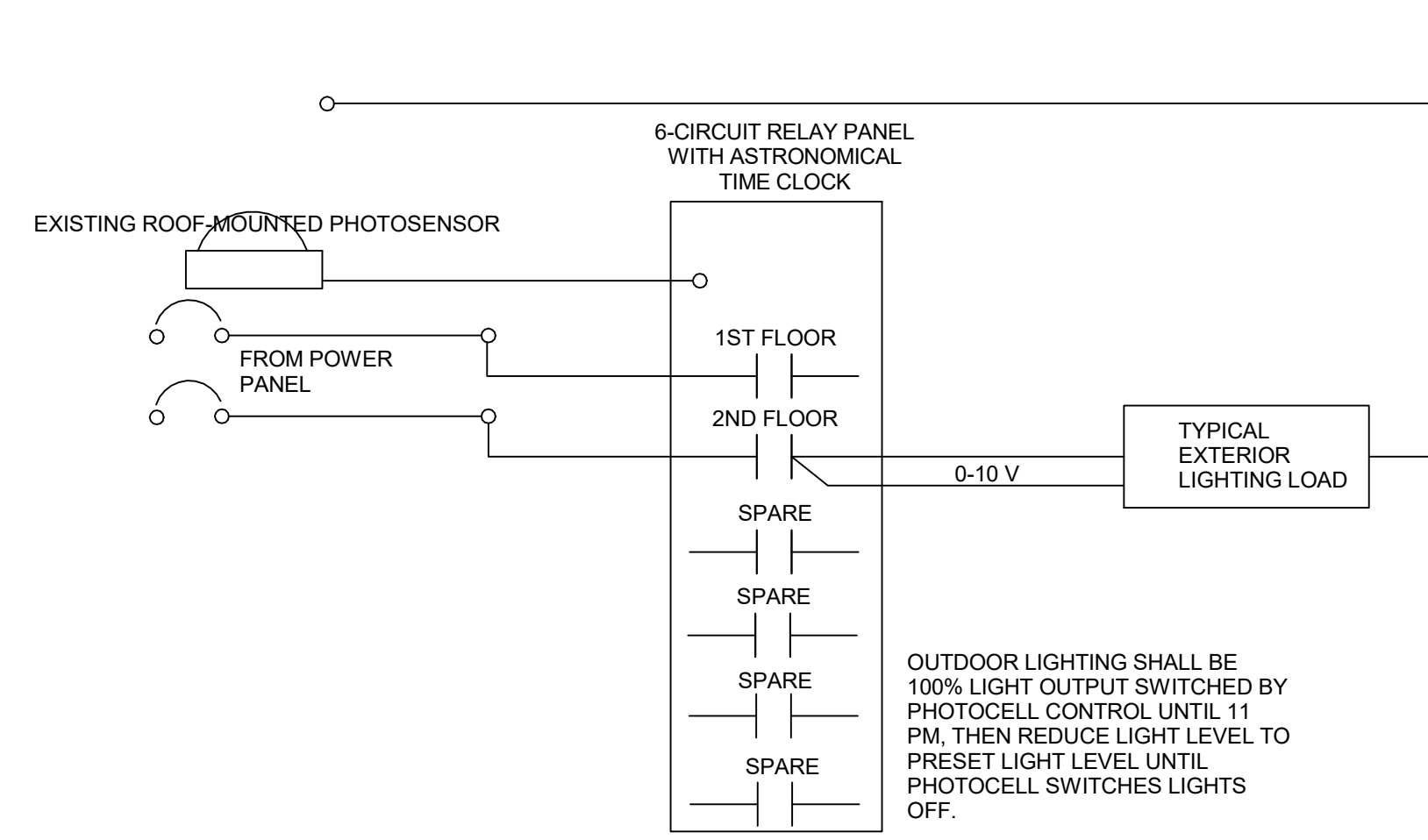
Branch Panel: GH-PS

Location: CORRIDOR GH01
Supply From: GH-1
Mounting: SURFACE
Top/Bottom Feed

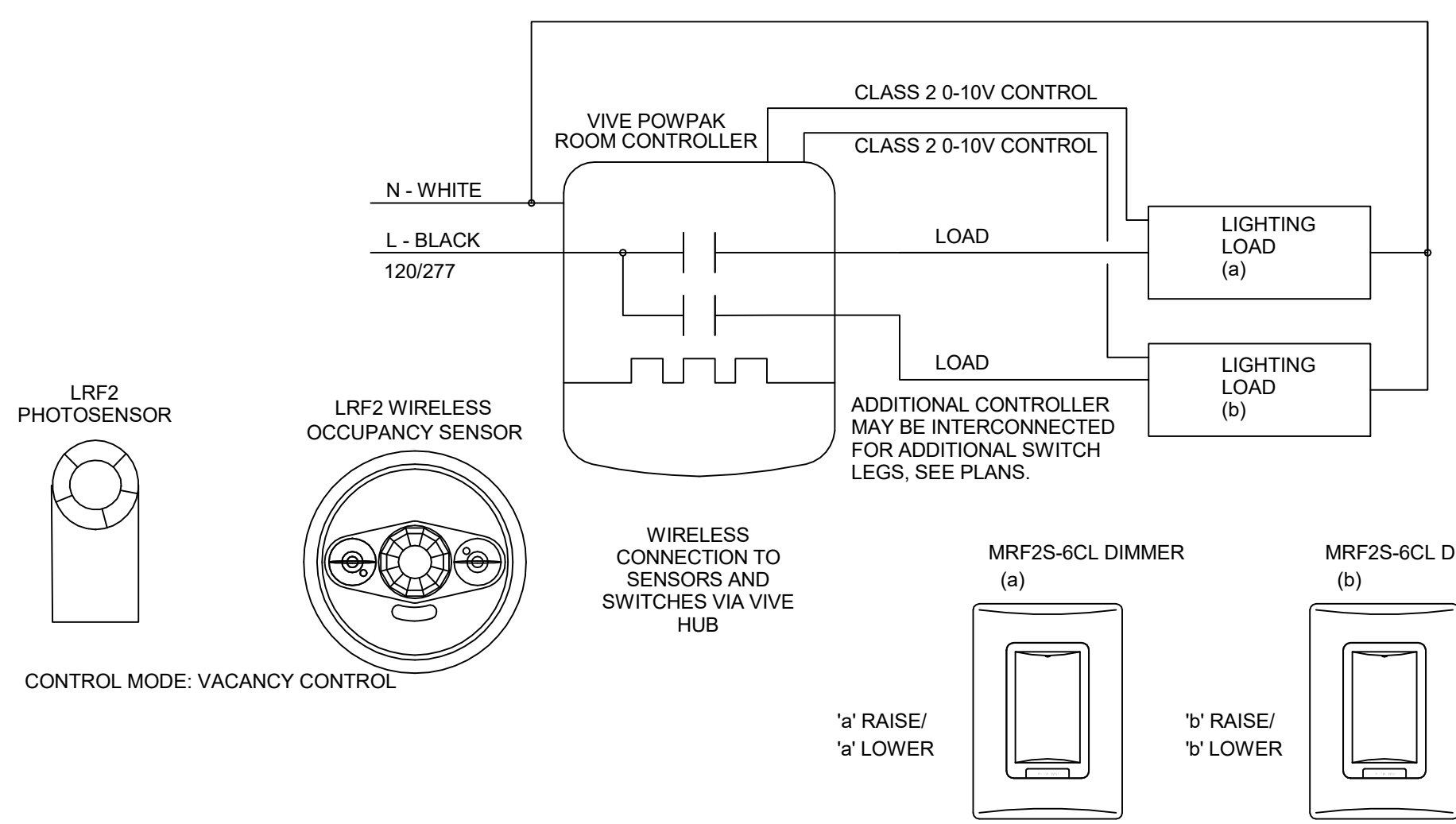
Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 22000 AIC
Mains: 100 A

CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT	
1	CONTROL PANEL PRODUCTION S	15 A	1	180... 180...				1	15 A	COIL POWER	2
3	GROW LIGHT RECEPT 1	20 A	1	1280... 1280...				1	20 A	GROW LIGHT RECEPT 2	4
5	GROW LIGHT RECEPT 3	20 A	1	960... 960...				1	20 A	GROW LIGHT RECEPT 4	6



OUTDOOR LIGHTING CONTROL
CONTROL MODE: PHOTOCELL AND RELAY



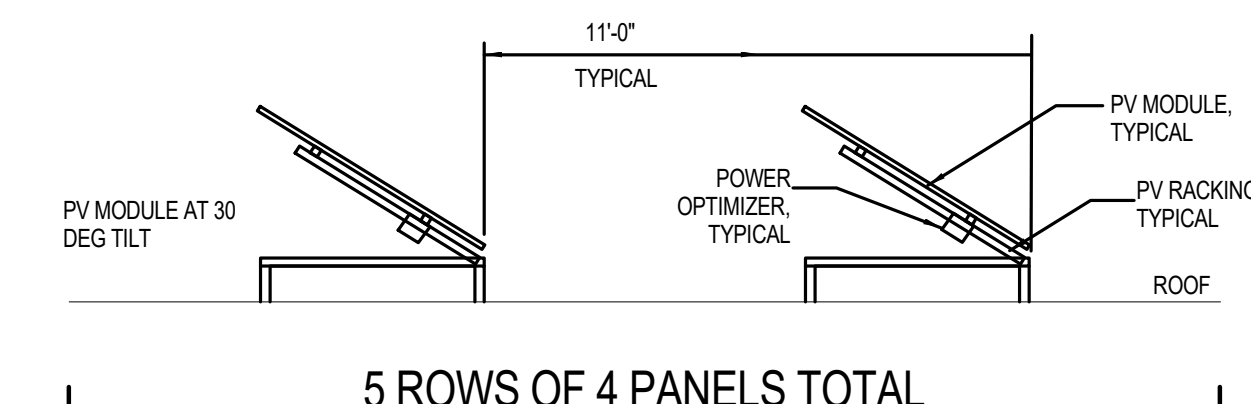
OCCUPANCY SENSOR, DAYLIGHTING PHOTOCELL, AND 0-10V DIMMING, MULTIPLE SWITCH LEGS

- DETAIL NOTES**
1. ALL LIGHTING CONTROL CABLING SHALL BE PROVIDED IN ACCORDANCE WITH SPECIFICATION DIVISION 27.
 2. BASIS OF DESIGN IS LUTRON VIVE SERIES DIGITAL LIGHTING CONTROL.
 3. SEE FLOOR PLANS FOR OCCUPANCY SENSOR TYPES.
 4. SEE PLANS FOR QUANTITY AND LOCATION OF OCCUPANCY SENSORS.
 5. DETAIL SHOWN WITH DIMMERS, OCCUPANCY SENSORS, AND DAYLIGHT SENSOR AS USED IN LEARNING CENTER CLASSROOM AND SECOND FLOOR OFFICES. SEE DRAWINGS FOR SPECIFIC CONFIGURATIONS OF OTHER AREAS.

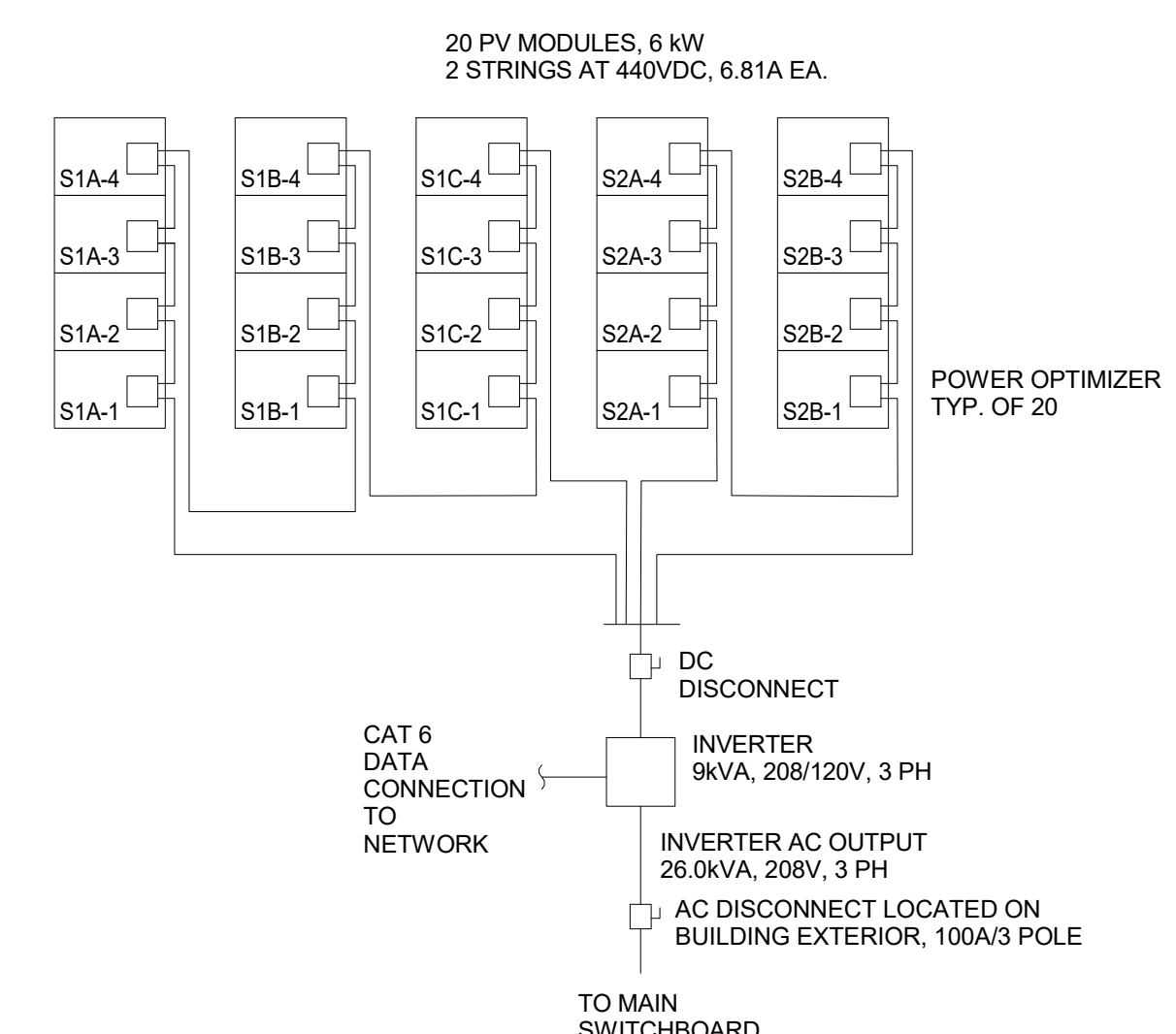
1 LIGHTING CONTROLS
NTS

- PHOTOVOLTAIC GENERAL NOTES**
1. INSTALLING CONTRACTOR SHALL PROVIDE SUBMITTALS OF ALL EQUIPMENT INSTALLED WITHIN THE COMPLETED SYSTEM. SUBMITTALS SHALL INCLUDE PHYSICAL LAYOUT DRAWINGS AND INTERCONNECTION DIAGRAMS.
 2. THE PV SYSTEM SHALL INCLUDE RAPID SHUTDOWN MEETING THE 2017 NEC REQUIREMENTS AT A MINIMUM.
 3. THE PV SYSTEM SHALL INCLUDE LABELING AS REQUIRED WITHIN THE NEC. LABELING SHALL INCLUDE A PLACARD AT THE ELECTRICAL SERVICE IDENTIFYING THE LOCATION OF INVERTERS AND RAPID SHUTDOWN DEVICES - SEE SHEET E112 FOR DISCONNECT LOCATION.
 4. COORDINATE INSTALLATION OF THE PV SYSTEM WITH THE UTILITY. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL APPLICATIONS, INSPECTIONS, AND ADDITIONAL REQUIREMENTS THE UTILITY MAY HAVE FOR A UTILITY INTERACTIVE SYSTEM. THE CITY SHALL PAY ANY PERMIT COSTS.
 5. DC STRINGS AND INVERTED AC POWER SHALL EACH INCLUDE DISCONNECTING MEANS AND FUSE PROTECTION.
 6. SEE ARCHITECTURAL SHEET A105 AND ELECTRICAL ROOF PLAN E104 FOR FURTHER INFORMATION ON PHYSICAL LAYOUT.

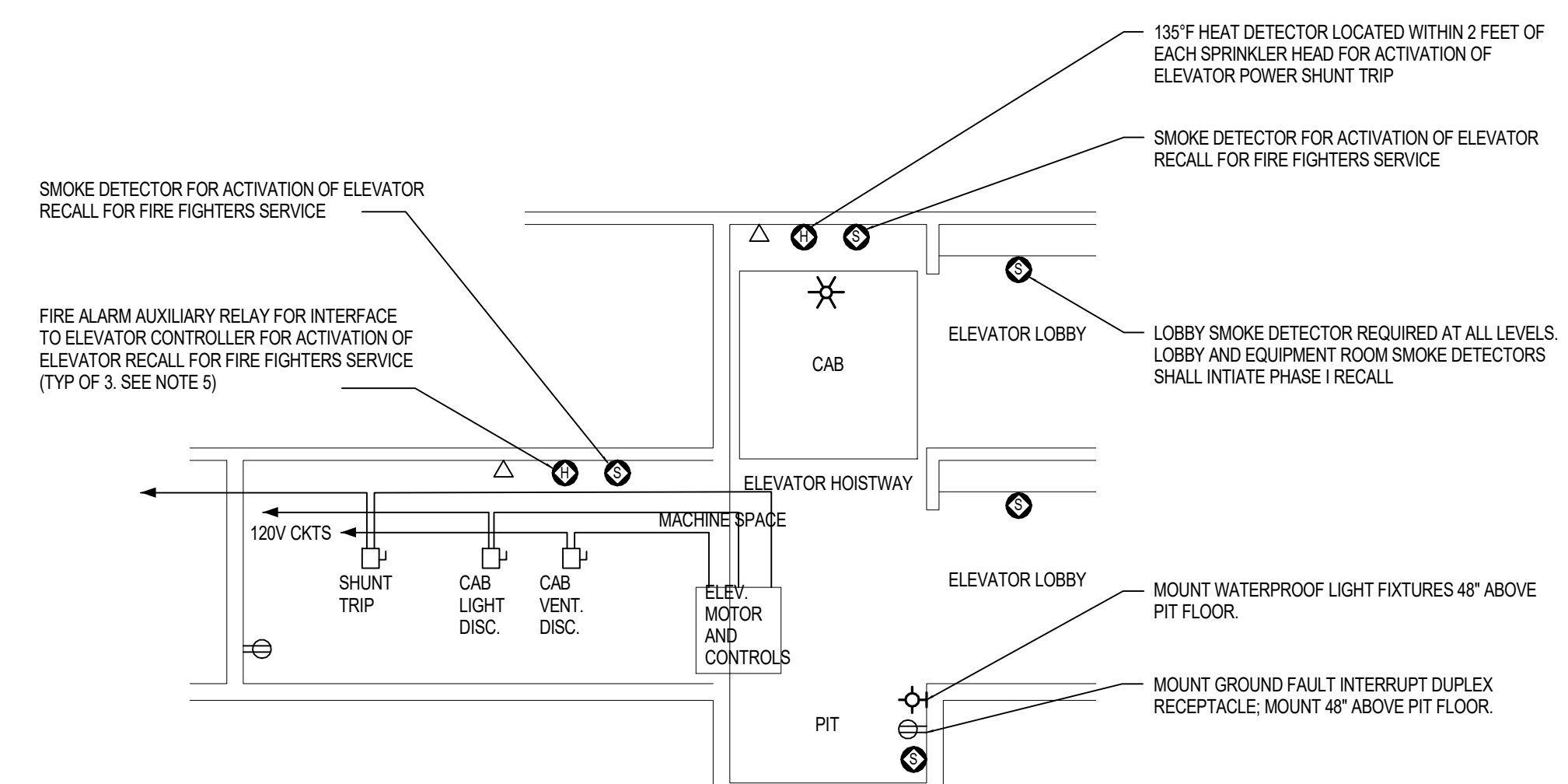
- PV ARRAY BASIS OF DESIGN**
- BASIS OF DESIGN**
- MODULES: SEE SPECIFICATION FOR MANUFACTURERS & MODELS
 MAX POWER: 285 - 300W
 OPEN CKT VOLTAGE: 40.1V MAX
 SHORT CIRCUIT CURRENT: 10.23A MAX
 MAXIMUM POWER POINT CURRENT: 9.57A
 DIMENSIONS: 37.8" X 65.9" X 1.3"
 INVERTER: SOLAREEDGE 3 PHASE INVERTER 120/208V GRID, SE9KUS INPUT
 MAX DC POWER: 12.16kW
 MAX INPUT VOLTAGE DC+ TO DC-: 500VDC
 NOMINAL INPUT VOLTAGE DC+ TO DC-: 400VDC
 MAXIMUM INPUT CURRENT: 26.5ADC
OUTPUT
 RATED AC OUTPUT: 9kVA
 AC OUTPUT VOLTAGE NOMINAL (L-N/L-L): 120/208V
 AC FREQUENCY (NOMINAL): 60 HZ
 MAX CONTINUOUS OUTPUT CURRENT (PER PHASE): 25
RAPID SHUTDOWN - ADD ON KIT COMMUNICATES WITH OPTIMIZERS.
 POWER OPTIMIZER: SOLAREEDGE P520
 MPPT OPERATING RANGE: 8-48VDC
 MAXIMUM DC INPUT CURRENT: 13.75ADC
 MAXIMUM OUTPUT CURRENT: 15ADC
 MAX OUTPUT VOLTAGE: 60VDC
 RACK: SEE SPECIFICATION.



3 PV SECTION
NTS



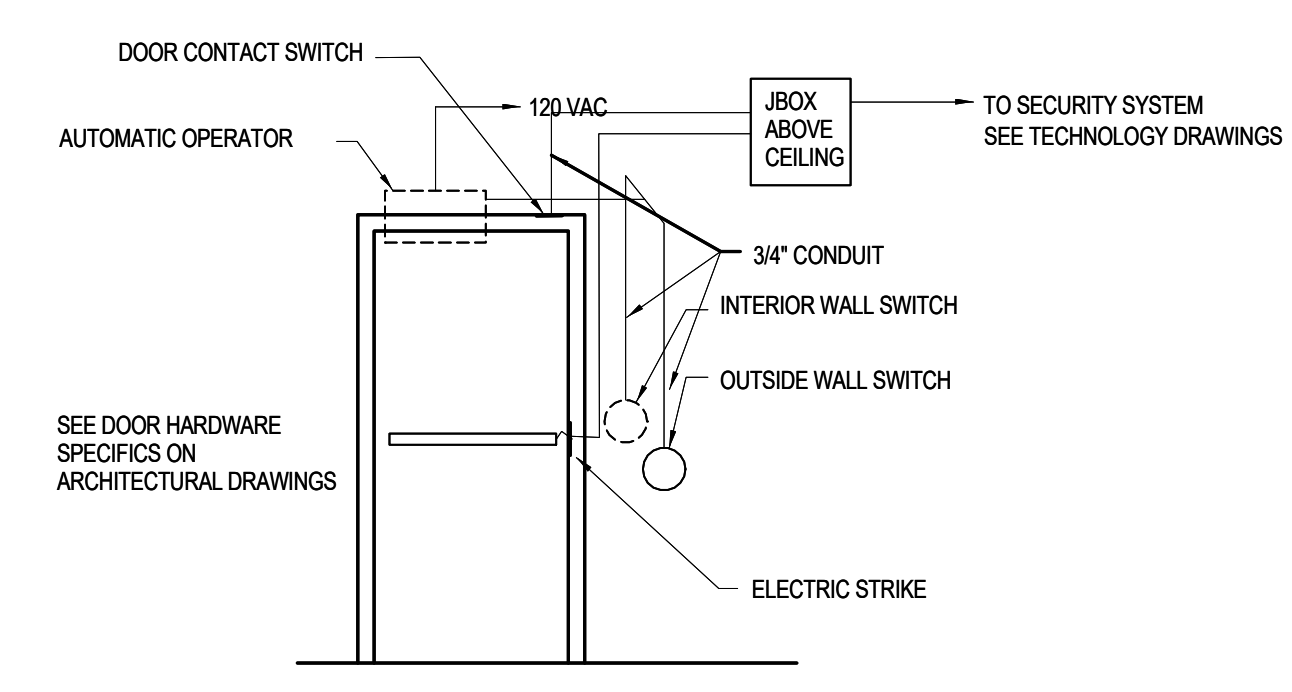
2 PV ARRAY ONE LINE
NTS



- NOTES:**
1. ANSIA/ISE A17.1-1998/17.1a-1997/17.1b-1998, SAFETY CODE FOR ELEVATORS AND ESCALATORS.
 2. THE HOISTWAY AND MACHINE ROOM FOR THIS INSTALLATION ARE SPRINKLED. THEREFORE, ANSIA/ISE A17.1 REQUIRES THAT THE MAIN POWER SUPPLY TO THE AFFECTED ELEVATOR BE AUTOMATICALLY DISCONNECTED UPON OR PRIOR TO APPLICATION OF WATER.
 3. IN ACCORDANCE WITH SECTION 3-9.4 OF ANSINFA 72, NATIONAL FIRE ALARM CODE, HEAT DETECTORS USED TO SHUT DOWN ELEVATOR POWER PRIOR TO SPRINKLER OPERATION SHALL HAVE BOTH LOWER TEMPERATURE RATING AND A HIGHER SENSITIVITY THAN THE SPRINKLER HEADS. COORDINATE REQUIREMENTS WITH INSTALLATION OF FIRE PROTECTION SYSTEM.
 4. FIRE ALARM SYSTEM SMOKE DETECTORS SHALL BE INSTALLED IN ELEVATOR LOBBIES, ELEVATOR HOISTWAY AND ELEVATOR MACHINE ROOM TO INITIATE ELEVATOR RECALL FOR FIRE FIGHTERS SERVICE IN ACCORDANCE WITH RULE 211.3 OF ANSIA/ISE A17.1 AND SECTION 3-9.3 OF ANSINFA 72.
 5. IN ACCORDANCE WITH SECTION 3-9.3.7 OF ANSINFA 72, THREE (3) EACH FIRE ALARM AUXILIARY RELAYS SHALL BE PROVIDED IN THE ELEVATOR MACHINE ROOM TO INTERFACE WITH THE ELEVATOR CONTROLLER. EACH RELAY SHALL PROVIDE THE FOLLOWING SIGNAL (OPERATION OF CONTACTS), RESPECTIVELY:
 A. SMOKE DETECTOR IN THE DESIGNATED (PRIMARY) ELEVATOR LOBBY IS ACTIVATED.
 B. SMOKE DETECTOR IN ANY OF THE ELEVATOR LOBBIES EXCEPT THE DESIGNATED (PRIMARY) LOBBY IS ACTIVATED.
 C. SMOKE DETECTOR(S) IN THE HOISTWAY AND/OR ELEVATOR MACHINE ROOM IS ACTIVATED.

SYMBOLS LEGEND

△	SPRINKLER HEAD
⊙	SMOKE DETECTOR
⊕	HEAT DETECTOR
⊖	SHUNT TRIP
⊗	WALL MOUNTED LIGHT
⊘	DUPLEX RECEPTACLE



4 DOOR DETAILS
1/4" = 1'-0"

5 ELEVATOR DETAILS
1/8" = 1'-0"

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 513.242.0310 tel

Olbrich Botanical Gardens
Expansion Phase 1
 BPW Project #8162
 3330 Atwood Avenue
 Madison, WI 53704

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Engineer under the Laws of the State of Wisconsin. ENGINEER SEAL



Signature: _____
 Print Name: Randall A. Jacobs
 Date: JUNE 4, 2018 License No. 35771

ISSUE	MARK	DATE	DESCRIPTION
		09.09.2017	SCHEMATIC DESIGN SUBMISSION
		12.08.2017	DD PRICING SET
		01.10.2018	DESIGN DEVELOPMENT SUBMISSION
		01.17.2018	UDC SUBMISSION
		03.31.2018	75% CD PRICING ISSUE
		05.04.2018	90% CONSTRUCTION DOCUMENTS
		06.01.2018	BID ISSUE
		06.04.2018	PERMIT ISSUE

PROJECT NO. 2017016

PROJECT PHASE BID DOCUMENTS

DRAWN BY: MSR CHECKED BY: MSR

Design: 2017 George M. Moore, Steven A. Rosales, Ltd.

ELECTRICAL DETAILS

EXHIBIT N E500