



**Blumentals
Architecture**

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SIGNATURES

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 Professional Engineer under the laws of the State of MINNESOTA

06/07/19
16544
reg. no.

Steven M. Young
06/30/20
reg. exp. date

**STEEN
ENGINEERING INC.**

763-585-6742
763-585-6757 fax
Email: steen@steeneng.com
5430 Douglas Drive North
Crystal, MN 55429

PROJECT INFO

Project No.
BLA201802
Drawn By:
DJL
Issue Date
02/05/19

△ SUBMITTALS / REVISIONS

04-20-18	50% CONTRACT DOCUMENTS
06-21-18	100% REVIEW
07-20-18	100% CD
08-24-18	100% MHFA REVIEW
02-05-19	ISSUED FOR CITY REVIEW
02-21-19	ADDENDUM #2
04-19-19	MDU REVIEW
06-07-19	ISSUED FOR CONSTRUCTION

GENERAL ELECTRICAL SITE NOTES

- CIRCUIT NUMBERS SHOWN ARE FOR REFERENCE ONLY. PROVIDE #10 CONDUCTORS MINIMUM.
- OBTAIN POWER FROM PANEL LP11, UNLESS NOTED OTHERWISE.
- EXTERIOR LIGHTING TO BE CONTROLLED WITH TIME CLOCK, PHOTOCELL & CONTACTOR CONTACTOR, SEE SPECIFICATIONS.

SPECIFIC ELECTRICAL SITE NOTES

- UTILITY TRANSFORMER. PROVIDE CONCRETE PAD & CONDUIT STUB OUTS. INSTALL PER LOCAL UTILITY REQUIREMENTS.
- PROVIDE SEPARATE 4" CONDUIT FOR TELEPHONE BACKBOARD & CATV BACKBOARD TO PROPERTY LINE OR AS REQUIRED BY UTILITY.
- PHOTO CONTROL FOR EXTERIOR LIGHTS. MOUNT ABOVE LUMINAIRE AT AN ACCESSIBLE LOCATION.
- MAKE CONNECTION TO BLUE LIGHT INDICATING SNOW REMOVAL IN PROCESS. SEE MECHANICAL ROOM FOR PILOT SWITCH. VERIFY LOCATION WITH ARCHITECT/OWNER.

SCALE
AS NOTED

West Birch Apartments

W Branch Street
Princeton, MN

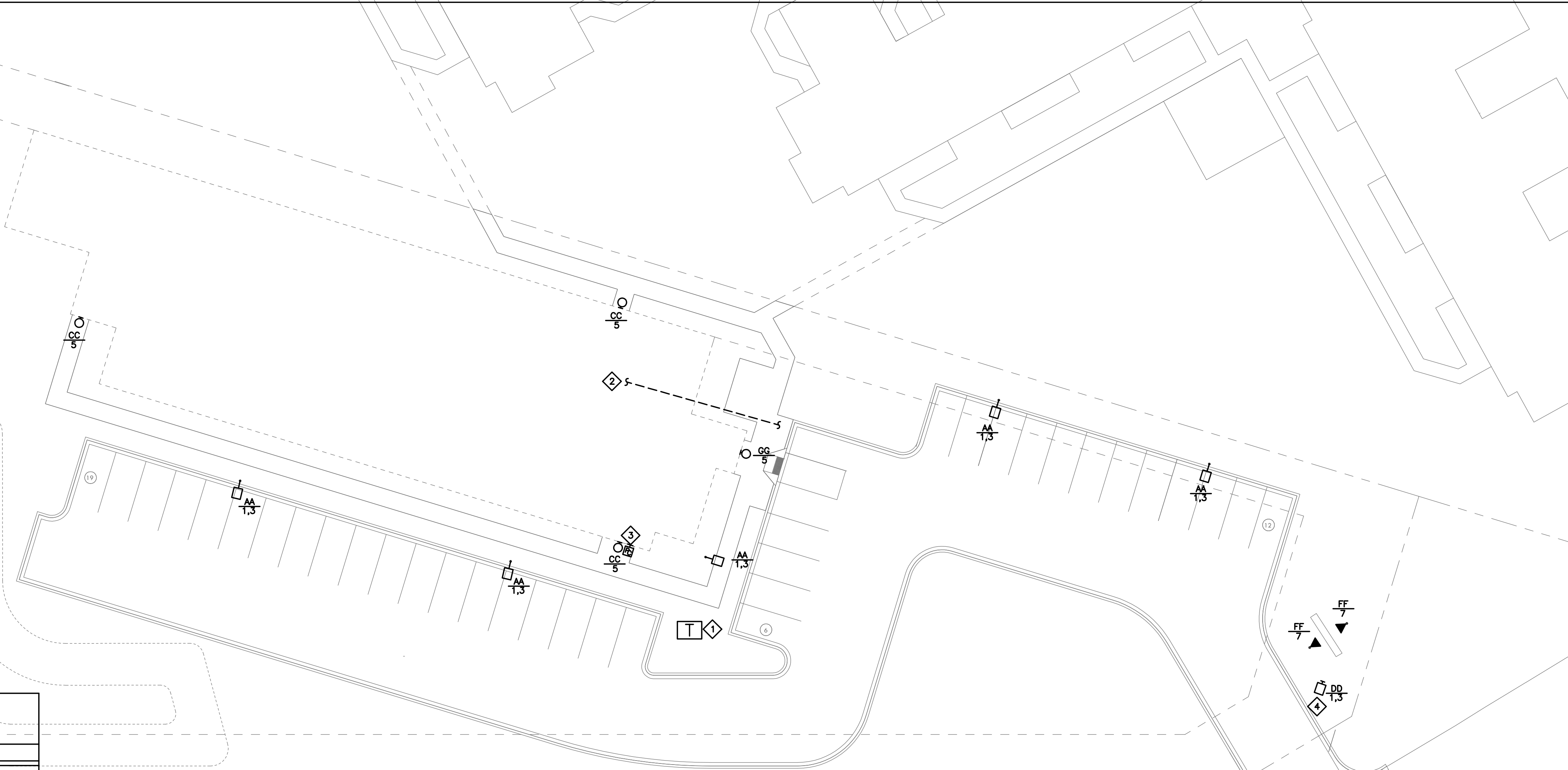
SITE ELECTRICAL PLAN

E111

ELECTRICAL SYMBOL SCHEDULE

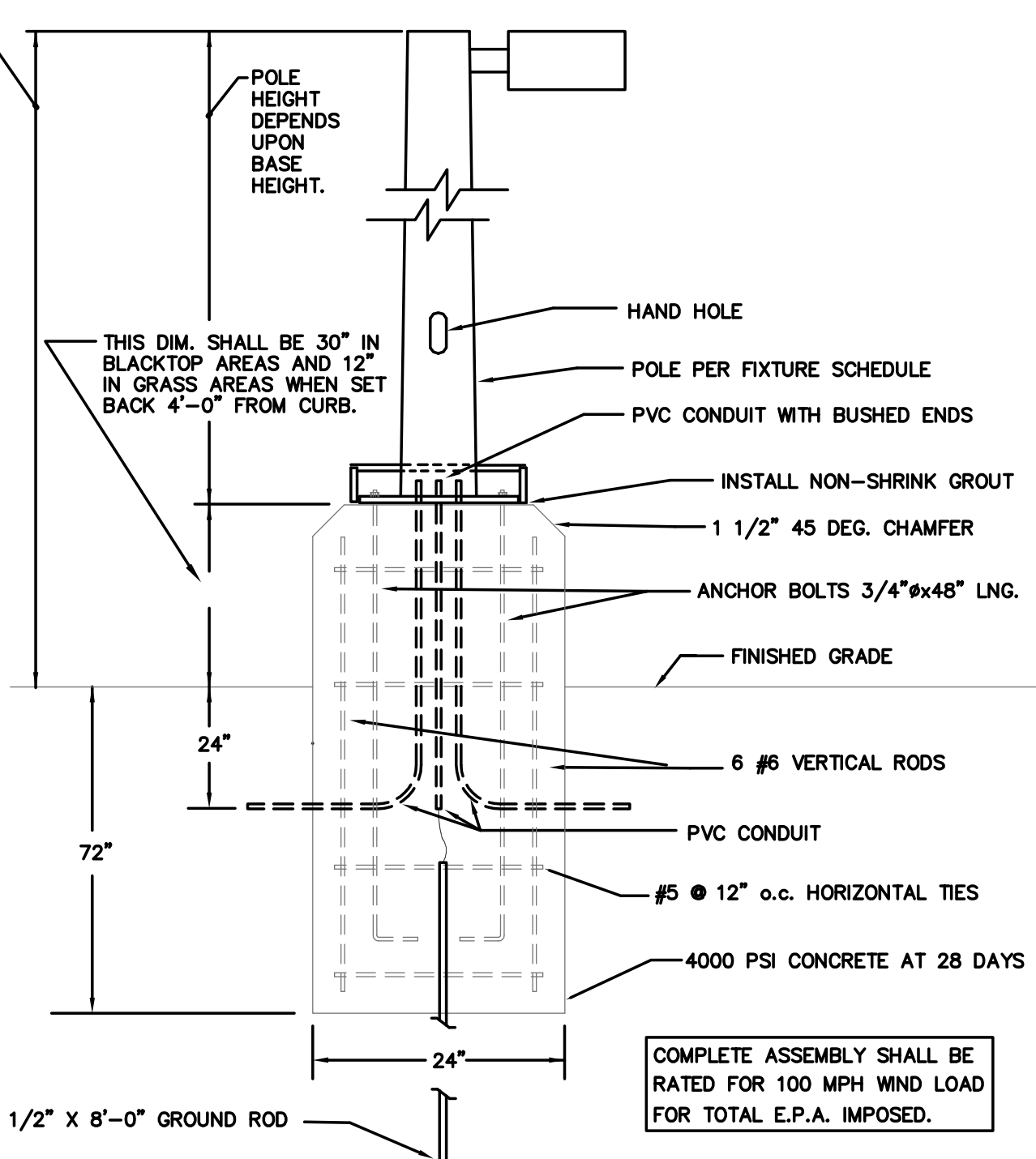
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
LIGHTING					
	LIGHTING FIXTURES (TYPICAL OF MANY, NOT ALL SYMBOLS ARE SHOWN).		RECEPTACLE, SINGLE		TELEVISION CAMERA
	NOTE: SLASH MARK INDICATES RECESSED. SIDE BRACKET INDICATES WALL MOUNT. SOLID FILL INDICATES EMERGENCY OR NIGHT EGRESS. LIGHT FIXTURE TYPE INDICATES DIRECTION.		RECEPTACLE, DUPLEX		PUSHBUTTON
	EMERGENCY BATTERY PACK		RECEPTACLE, DOUBLE DUPLEX		CHIME/BELL/BUZZER
	EXTERIOR POLE MOUNTED DOUBLE HEAD		RECEPTACLE, DUPLEX SPLIT WRED		RESCUE ASSISTANCE SIGNAGE
	EXTERIOR FLOOD LIGHT GROUND MOUNT		RECEPTACLE, SPECIAL		RESCUE ASSISTANCE CALL STATION
	BOLLARD LIGHT		RECEPTACLE, DUPLEX FLOOR		RESCUE ASSISTANCE MASTER STATION
	BUILDING MOUNT LIGHT		RECEPTACLE, DUPLEX SWITCHED	FIRE ALARM	
	LIGHT FIXTURE TYPE		THERMOSTAT		F.A. PULL STATION
	CIRCUIT NUMBER		THERMOSTAT, REVERSE ACTING		F.A. HORN
	CEILING FAN		CLOCK OUTLET		F.A. STROBE
SWITCHES					
	SWITCH, SINGLE, DOUBLE, THREE OR FOUR POLE		GANGED DUPLEX RECEPTACLE SPACE		F.A. SPEAKER
	SWITCH, KEYED		277/480V PANELBOARD		F.A. SPEAKER/STROBE
	SWITCH, MOMENTARY CONTACT		120/208V PANELBOARD		F.A. CHIME
	SWITCH W/ PILOT LIGHT		TERMINAL CABINET		F.A. CHIME/STROBE
	SWITCH, DIMMER		TRANSFORMER		F.A. IONIZATION DETECTOR
	SWITCH, MOTOR CONTROL		PLUGSTRIP, TYPE AS SPEC'D		F.A. PHOTOELECTRIC DETECTOR
	SWITCH, TIMER		DISCONNECT		PHOTOELECTRIC DETECTOR WITH SOUNDER BASE
	GANGED SWITCH, SPACE		MOTOR STARTER		F.A. HEAT DETECTOR
	PHOTO CONTROL		COMBINATION MOTOR STARTER		F.A. COMBINATION SMOKE/CO DETECTOR
	OCCUPANCY SENSOR		ENCLOSED CIRCUIT BREAKER		F.A. CO DETECTOR
	DAY-LIGHT SENSOR		ELECTRIC HEAT CIRCUIT NUMBER		F.A. DUCT SMOKE DETECTOR
	TIME CLOCK	COMMUNICATIONS			
	LIGHTING CONTACTOR		OUTLET, TELEPHONE		F.A. DOOR HOLDER
MISC.					
	DRAWING CHANGE		OUTLET, VOICE/DATA		F.A. DIALING TERMINAL
	SPECIFIC NOTE		OUTLET, INTERCOM		F.A. WEATHER PROOF HORN/STROBE
	M/E EQUIPMENT TAG		OUTLET, TELEPHONE - FLOOR		F.A. SPRINKLER TAMPER SWITCH
	KITCHEN EQUIPMENT TAG		OUTLET, MICROPHONE		F.A. SPRINKLER FLOW SWITCH
			OUTLET, VOLUME CONTROL		F.A. AIR PRESSURE SWITCH
			OUTLET, TELEVISION		F.A. SMOKE/FIRE DAMPER
			OUTLET, SPEAKER - WALL		F.A. SMOKE DAMPER
			OUTLET, SPEAKER - CEILING		F.A. PANEL
			JUNCTION BOX		

NOT ALL SYMBOLS APPEAR ON DRAWINGS.



1 SITE ELECTRICAL PLAN
1" = 20'-0"

THIS DIM. SHALL BE AS NOTED IN THE LIGHT FIXTURE SCHEDULE.



2 POLE BASE DETAIL
NO SCALE



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SCALE
AS NOTED

West Birch Apartments

W Branch Street
Princeton, MN

FIRST FLOOR LIGHTING PLAN

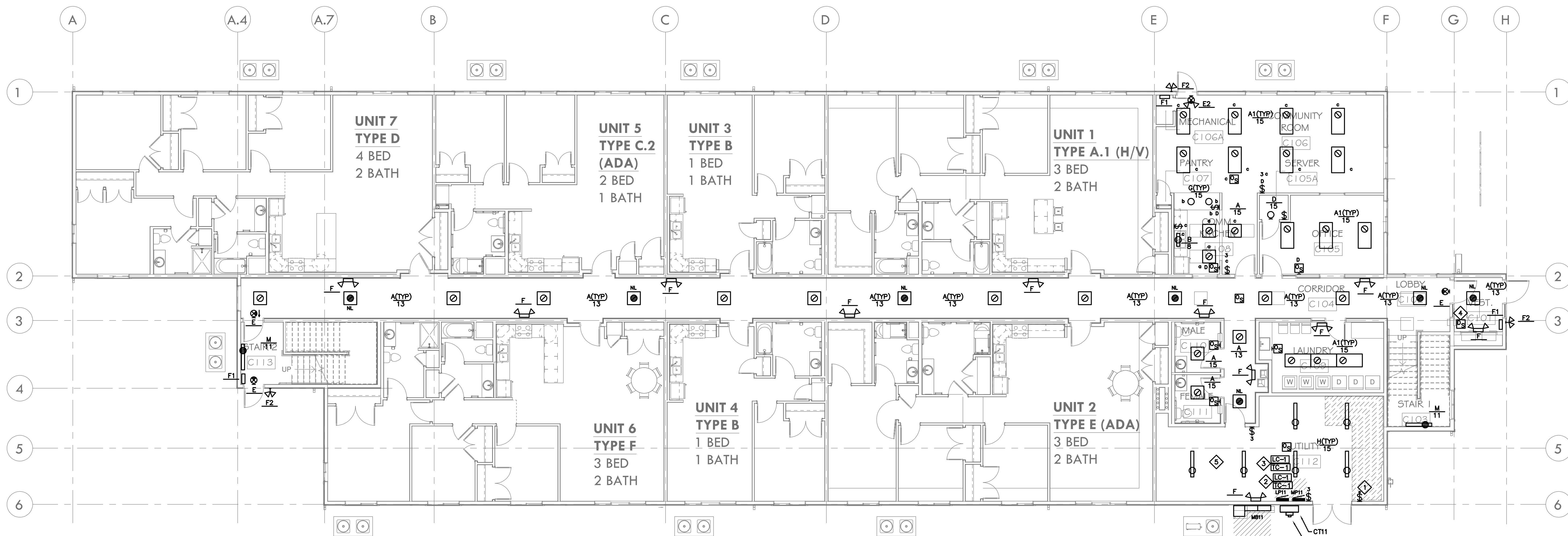
E211

GENERAL ELECTRICAL NOTES:

- VERIFY LOCATION OF ALL FIXTURES WITH ARCHITECT PRIOR TO INSTALLATION.
- REFER TO UNIT PLANS FOR TYPICAL UNIT CONFIGURATIONS. CONTRACTOR SHALL COMPLETE ALL UNITS BASED ON TYPICAL UNITS.
- OBTAIN POWER FROM PANEL LP11, UNLESS NOTED OTHERWISE.

SPECIFIC ELECTRICAL NOTES:

- PROVIDE JELLY-JAR (BLUE LAMP) INDICATING LIGHT FOR 'PARKING LOT BEING PLOWED' ON SITE. COORDINATE LOCATION & EXACT REQUIREMENTS WITH OWNER.
- PROVIDE 6-POLE LIGHTING CONTACTOR & TIME CLOCK FOR CONTROL WITH PHOTO-CELL FOR EXTERIOR SITE LIGHTING. VERIFY TIME SETTINGS WITH OWNER. SEE SITE PLAN FOR MORE INFORMATION.
- PROVIDE 6-POLE LIGHTING CONTACTOR WITH TIMELOCK FOR CONTROL OF CORRIDOR LIGHTING. VERIFY WITH OWNER EXACT SETTINGS.
- PROVIDE A DAY-LIGHTING SENSOR FOR CONTROL OF VESTIBULE LIGHTING.
- COORDINATE LOCATION OF LIGHT FIXTURES WITH THE MECHANICAL/PLUMBING CONTRACTORS.



1 FIRST FLOOR LIGHTING PLAN
1/8" = 1'-0"

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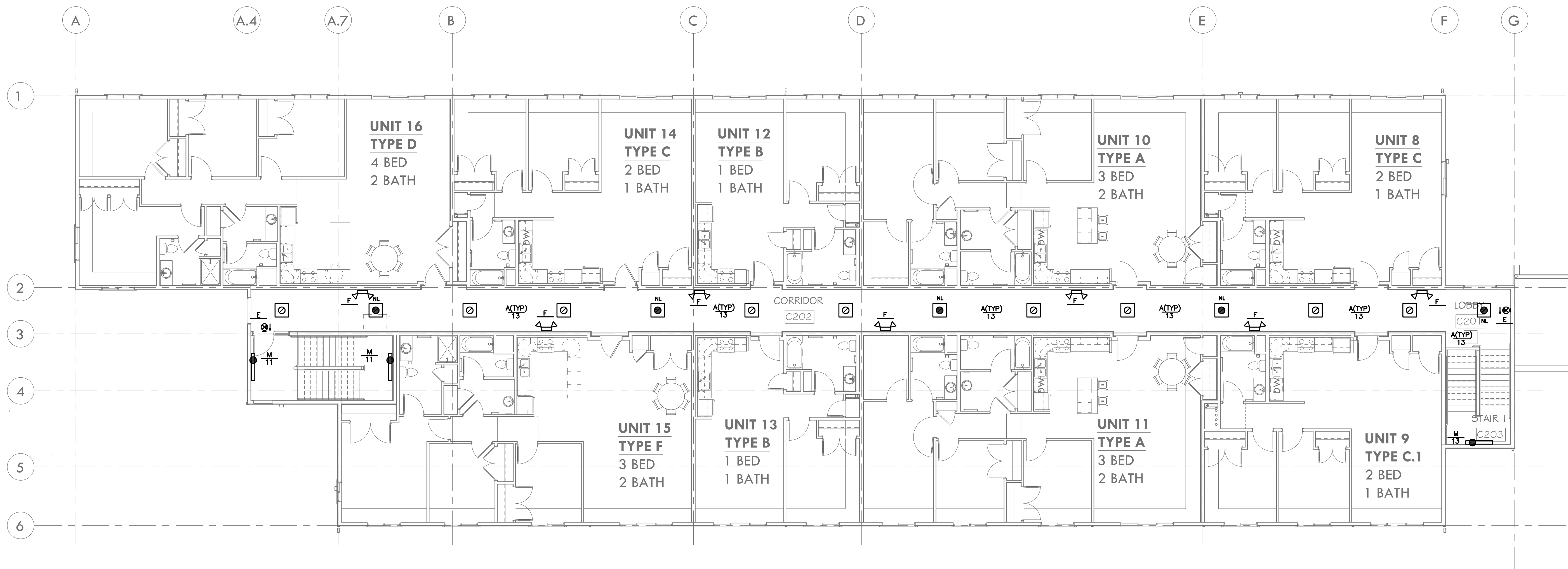
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SECOND FLOOR LIGHTING
PLAN



1 SECOND FLOOR LIGHTING PLAN
1/8" = 1'-0"



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AS NOTED

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FIRST FLOOR POWER &
SYSTEMS PLAN

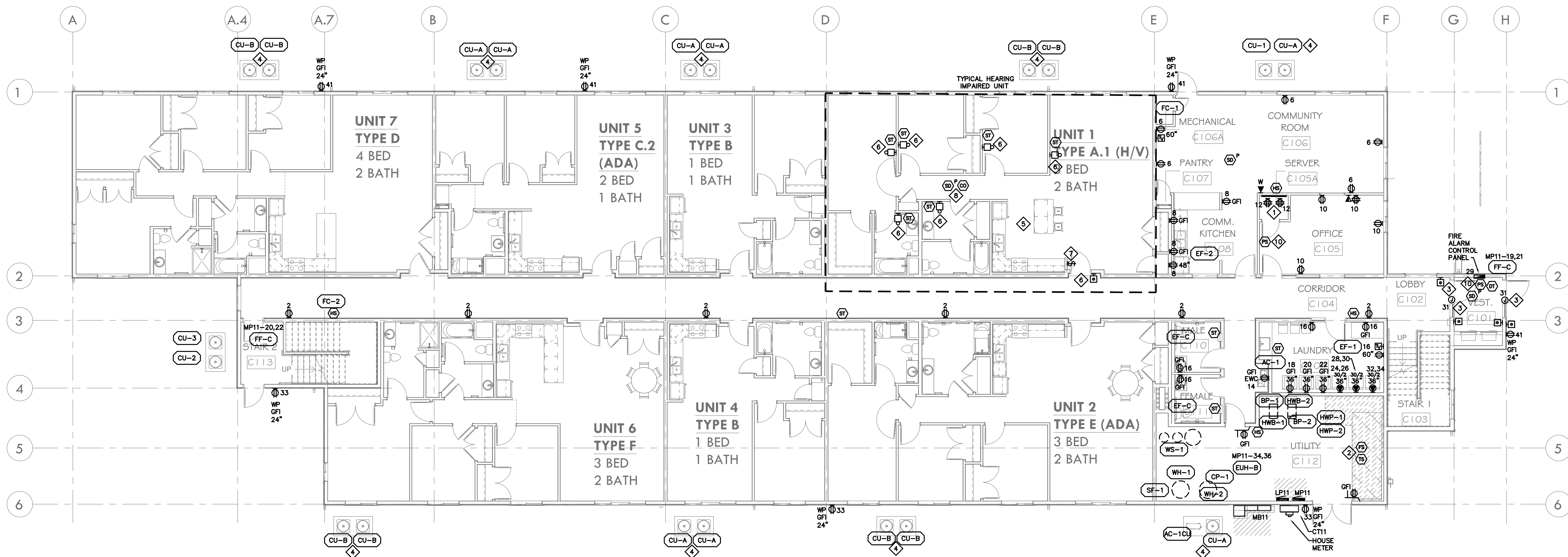
E311

GENERAL ELECTRICAL NOTES

- A. REFER TO UNIT PLANS FOR TYPICAL UNIT CONFIGURATIONS. CONTRACTOR SHALL COMPLETE ALL UNITS BASED ON TYPICAL UNITS.
- B. OBTAIN POWER FROM PANEL LP11, UNLESS NOTED OTHERWISE.
- C. ELECTRICAL CONTRACTOR TO COORDINATE COMMON AREA DEVICE LOCATION WITH OWNER BEFORE ROUGH-IN.

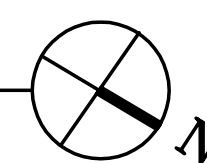
SPECIFIC ELECTRICAL NOTES

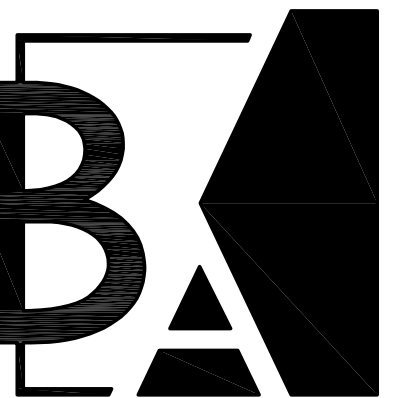
- 1. PROVIDE 3/4" FIRE RATED PLYWOOD FOR MAIN COMMUNICATIONS. PROVIDE DEDICATED RECEPTACLES AS REQUIRED BY LOW VOLTAGE SUPPLIER.
- 2. AREA DEDICATED FOR INCOMING WATER & SPRINKLER SERVICE. PROVIDE CONNECTION TO FIRE ALARM FLOW & TAMPER SWITCHES, VERIFY QUANTITY & LOCATION WITH FIRE SPRINKLER CONTRACTOR.
- 3. PROVIDE J-BOXES FOR POWERED DOOR CONTROLS PROVIDED BY OTHERS). PROVIDE POWER & CONTROL CONNECTIONS BETWEEN PUSHBUTTONS, KEYED SWITCH & ACCESS CONTROL SYSTEM AS REQUIRED FOR PROPER OPERATION.
- 4. OBTAIN POWER FROM UNIT LOAD CENTER.
- 5. HEARING IMPAIRED UNIT. PROVIDE AUDIO/VISUAL SIGNALING DEVICES, SYSTEM STROBES, SYSTEM HORN/STROBES, RESIDENTIAL DETECTORS WITH STROBES & RESIDENTIAL C/O DETECTOR. TYPICAL, REFER TO ARCHITECTURAL PLANS FOR ALL LOCATIONS.
- 6. PROVIDE AUDIO/VISUAL SIGNALING DEVICE WITH HORN/STROBE, LIGHTED PUSHBUTTON WITH ENGRAVED PLATE & TRANSFORMER. MINIMUM TONE SHALL BE 82 dBA AT 10 FEET WITH A HIGH INTENSITY 110 CANDELA VISUAL SIGNAL. EDWARDS SIGNALING DIVISION TYPE 7005-G5 HOTEL ROOM ANNUNCIATOR KIT OR EQUAL.
- 7. PROVIDE ON/OFF SWITCH FOR AUDIO/VISUAL SYSTEM. PROVIDE PERMANENT LABEL. VERIFY LOCATION WITH OWNER/ARCHITECT.
- 8. CONNECT CO DETECTOR TO SMOKE DETECTOR. CO DETECTOR ACTIVATION SHALL CAUSE SMOKE DETECTOR TO ALARM.
- 9. DEDICATED FOR RADON SYSTEM EXHAUST FAN. PROVIDE CIRCUIT FROM PANEL MP11 AS REQUIRED. MOUNT J-BOX WITHIN ATTIC ADJACENT TO FAN LOCATION. COORDINATE WITH MECHANICAL CONTRACTOR.
- 10. PROVIDE FIRE ALARM PULL STATIONS PER FIRE MARSHAL REQUIREMENTS, VERIFY LOCATION.



**FIRST FLOOR
POWER & SYSTEMS PLAN**

1/8" = 1'-0"





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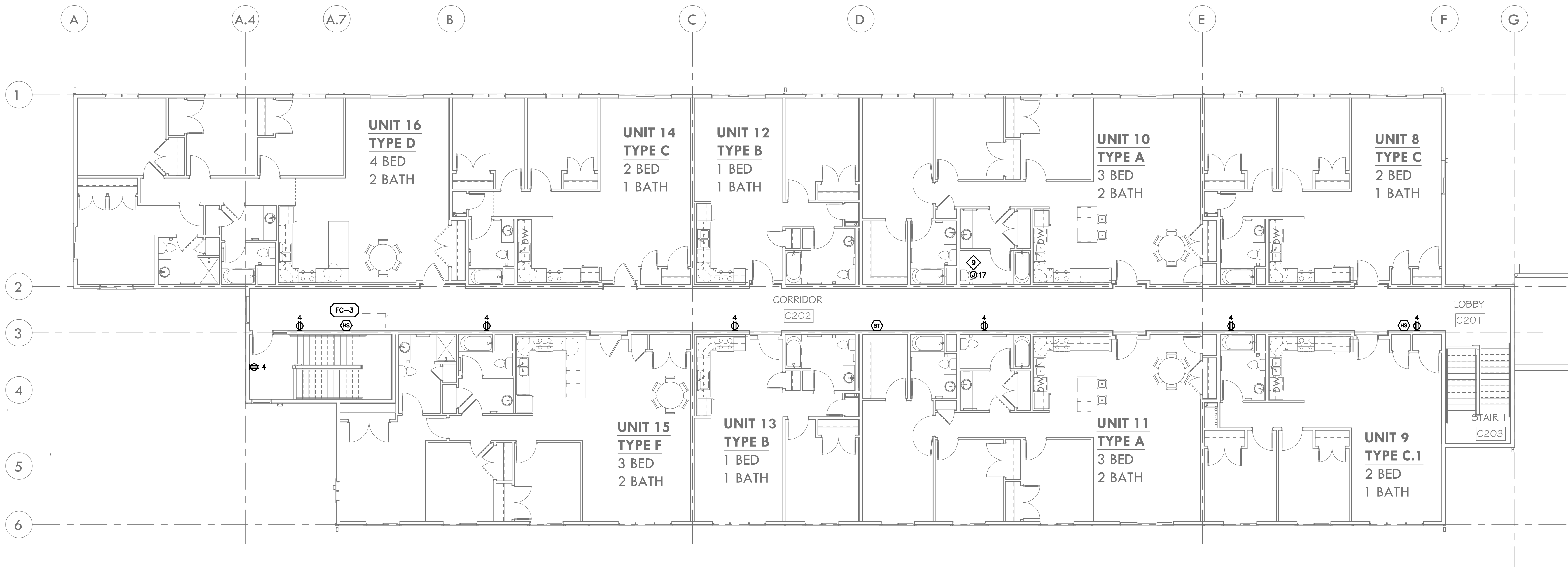
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SCALE
AS NOTED

West Birch Apartments

W Branch Street
Princeton, MN

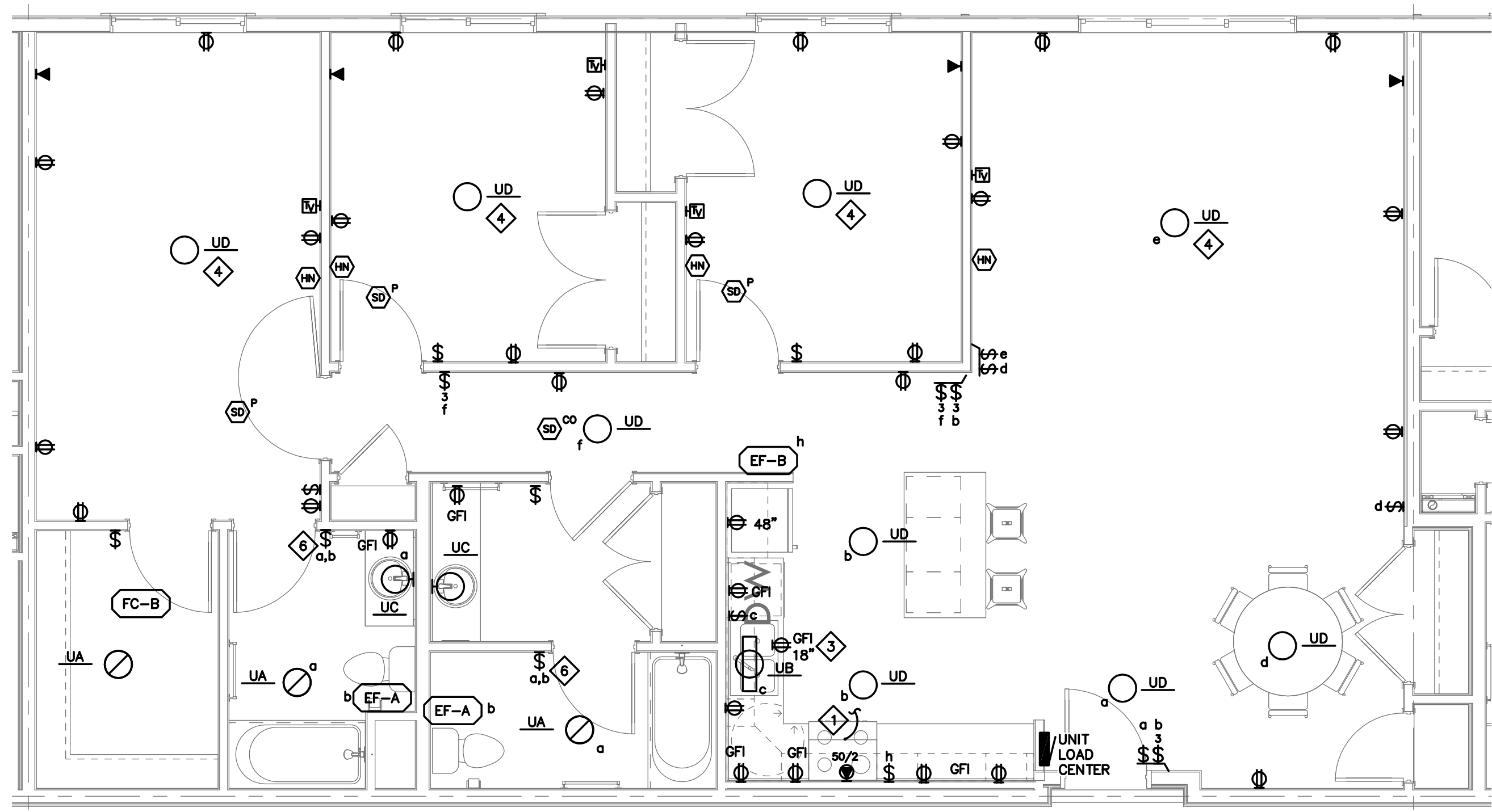
SECOND FLOOR POWER &
SYSTEMS PLAN



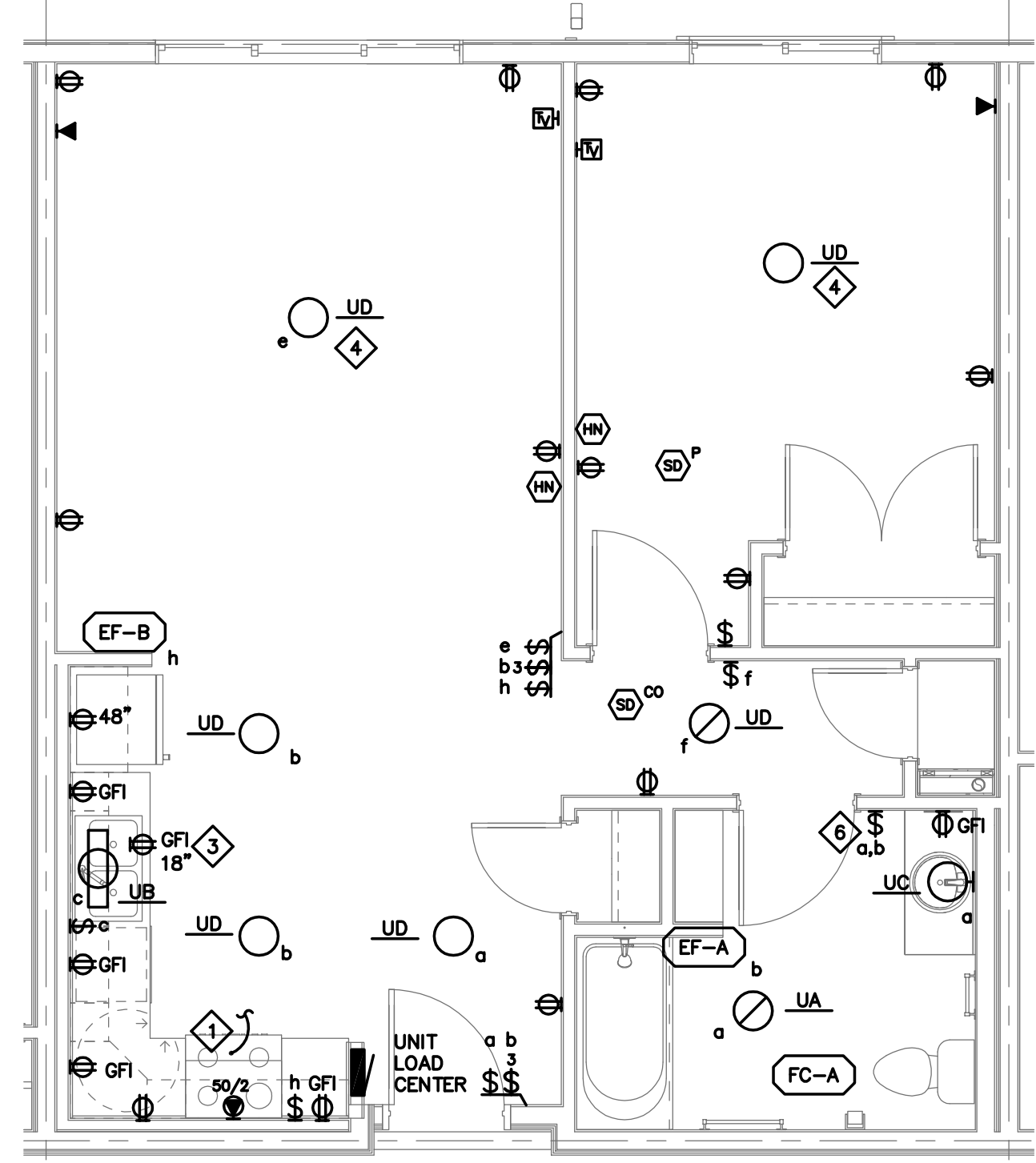
**1 SECOND FLOOR
POWER & SYSTEMS PLAN**
1/8" = 1'-0"

REFER TO SHEET E311 FOR NOTES

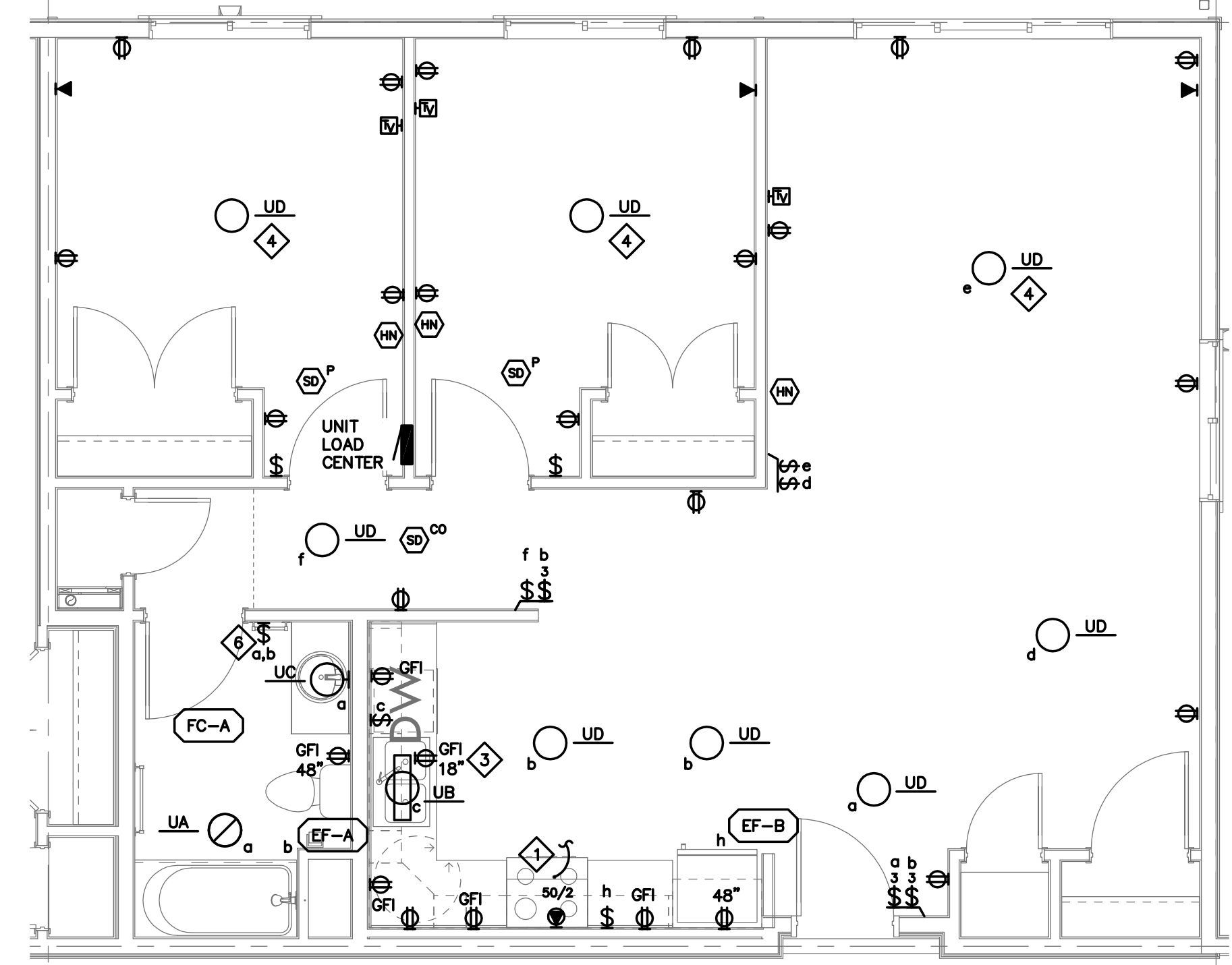
E312



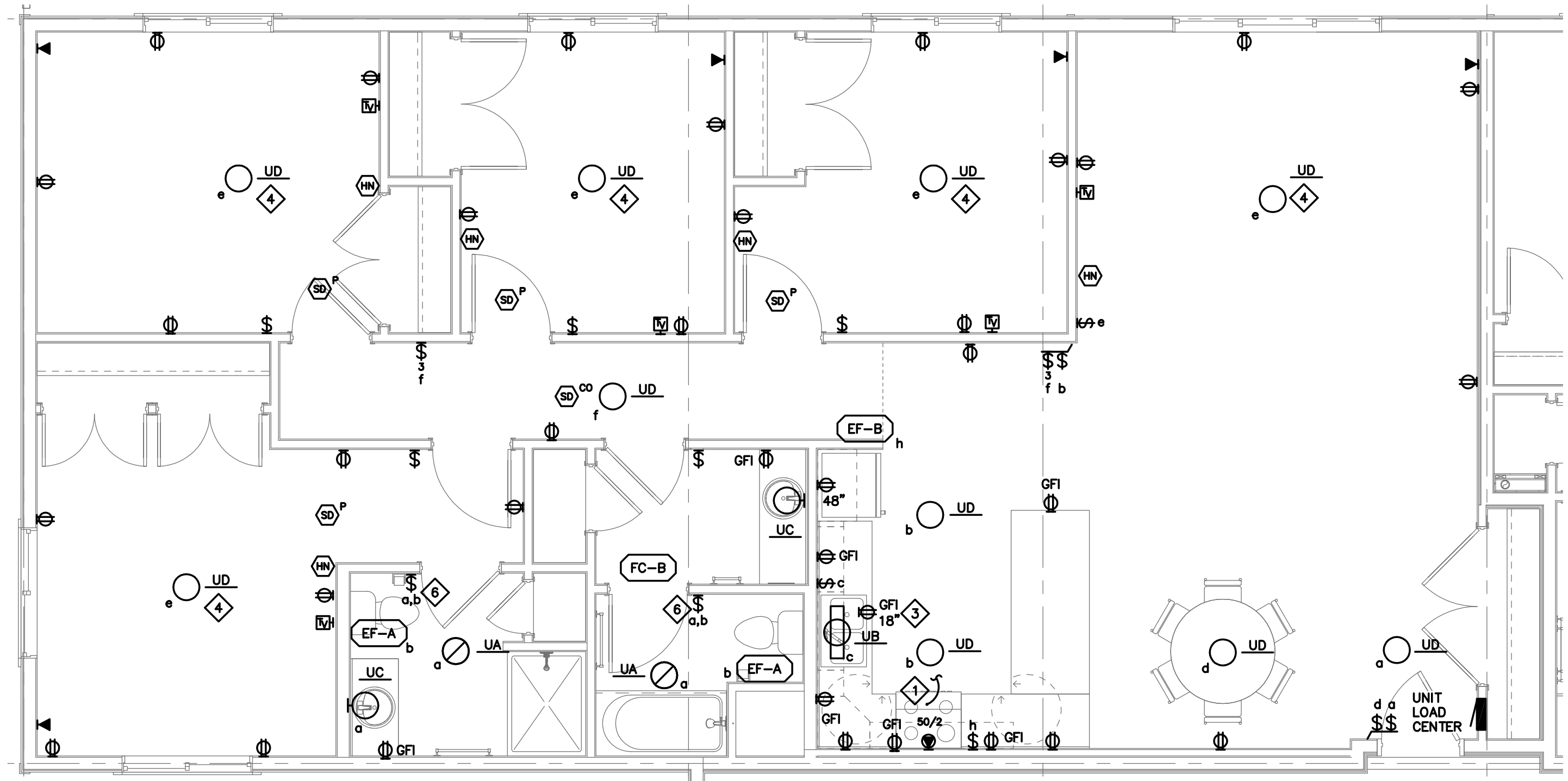
1 UNIT A ELECTRICAL PLAN
1/4" = 1'-0"



2 UNIT B ELECTRICAL PLAN
1/4" = 1'-0"



3 UNIT C ELECTRICAL PLAN
1/4" = 1'-0"



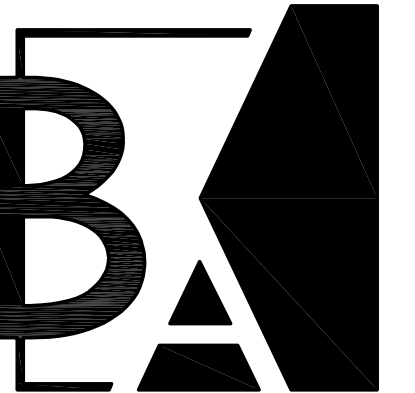
4 UNIT D ELECTRICAL PLAN
1/4" = 1'-0"

GENERAL ELECTRICAL UNIT NOTES:

- A. CONTRACTOR SHALL COMPLETE ALL UNITS BASED ON TYPICAL UNIT DESIGNS.
- B. CONTRACTOR SHALL VERIFY QUANTITY & LOCATIONS OF ALL ANSI 'A' & HEARING IMPAIRED UNITS PRIOR TO BID. REFER TO ARCHITECTURAL PLANS.
- C. PROVIDE RESIDENTIAL SMOKE DETECTORS WITHIN UNITS, REFER TO SPECIFICATIONS.
- D. CONTRACTOR SHALL COMPARE TYPICAL UNIT DESIGNS WITH ARCHITECTURAL REFLECTED CEILING PLANS PRIOR TO BID. THE QUANTITY & CONDITION OF LIGHT FIXTURES MOST FAVORABLE TO THE OWNER SHALL BE BID.
- E. CONTRACTOR SHALL VERIFY ALL COMMUNICATION DEVICE LOCATIONS WITH ARCHITECT/OWNER BEFORE ROUGH-IN.
- F. CONTRACTOR TO VERIFY ALL UNIT LOAD CENTER LOCATION WITH OWNER/ARCHITECT.

SPECIFIC ELECTRICAL UNIT NOTES:

- 1. CONNECT RANGE HOOD TO NON-SWITCHED GENERAL LIGHTING CIRCUIT.
- 2. PROVIDE FLUSH MOUNTED SWITCHES FOR RANGEHOOD/LIGHT.
- 3. DEDICATED FOR DISHWASHER. MOUNT BELOW SINK TO ALLOW FOR PLUG CONNECTION.
- 4. PROVIDE FLUSH J-BOX WITH SUPPORT TO ALLOW FOR FUTURE REPLACEMENT OF PROVIDED FIXTURE WITH COMBINATION CEILING FAN/FIXTURE. PROVIDE 3-WIRE CONDUCTOR FROM J-BOX TO SWITCH BOX FOR FUTURE CEILING FAN/FIXTURE CONTROLS.
- 5. ACCESSIBLE UNIT. PROVIDE SWITCHES AS NOTED.
- 6. TIMER SWITCH. REFER TO MECHANICAL EQUIPMENT SCHEDULE.



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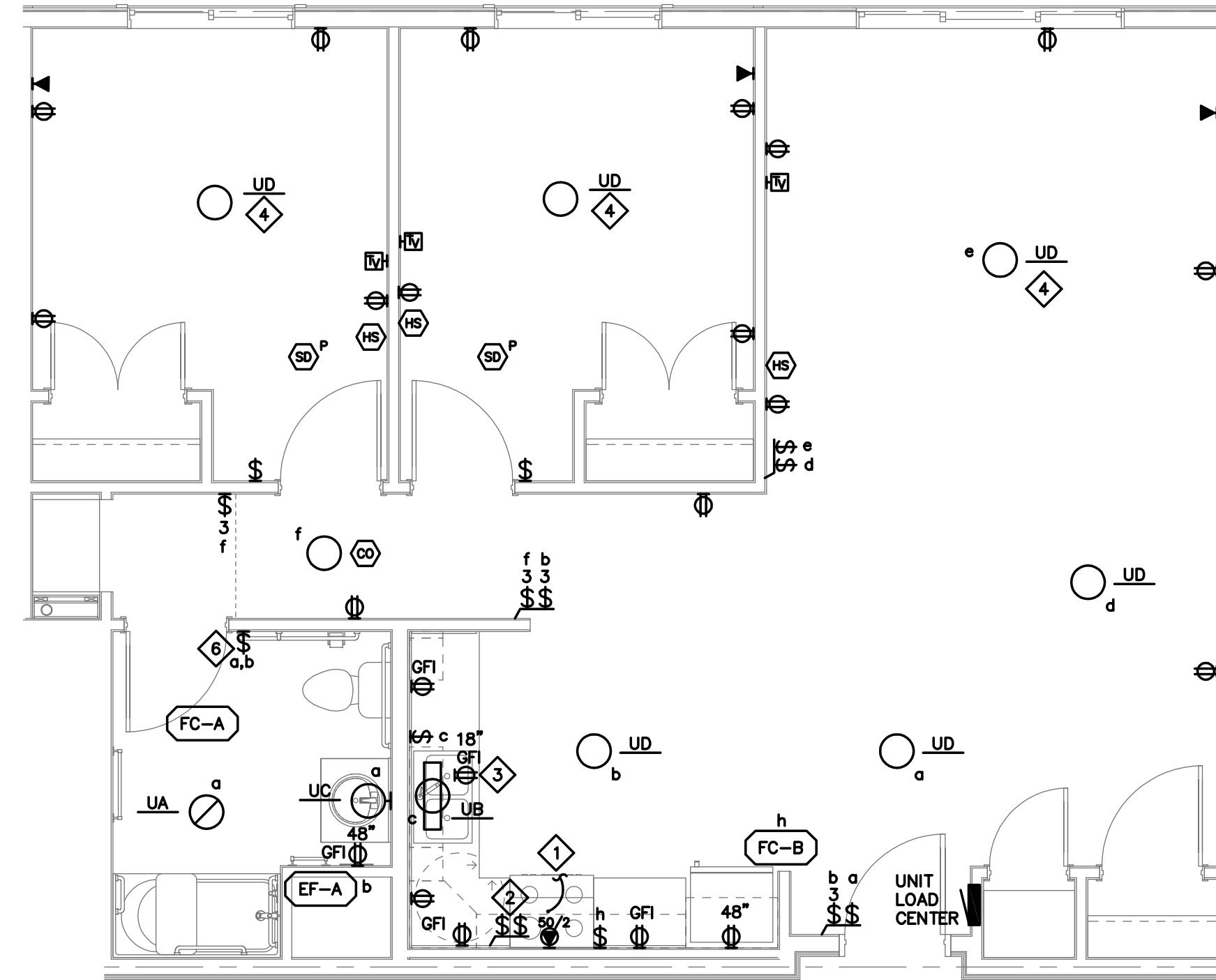
SCALE AS NOTED

West Birch Apartments

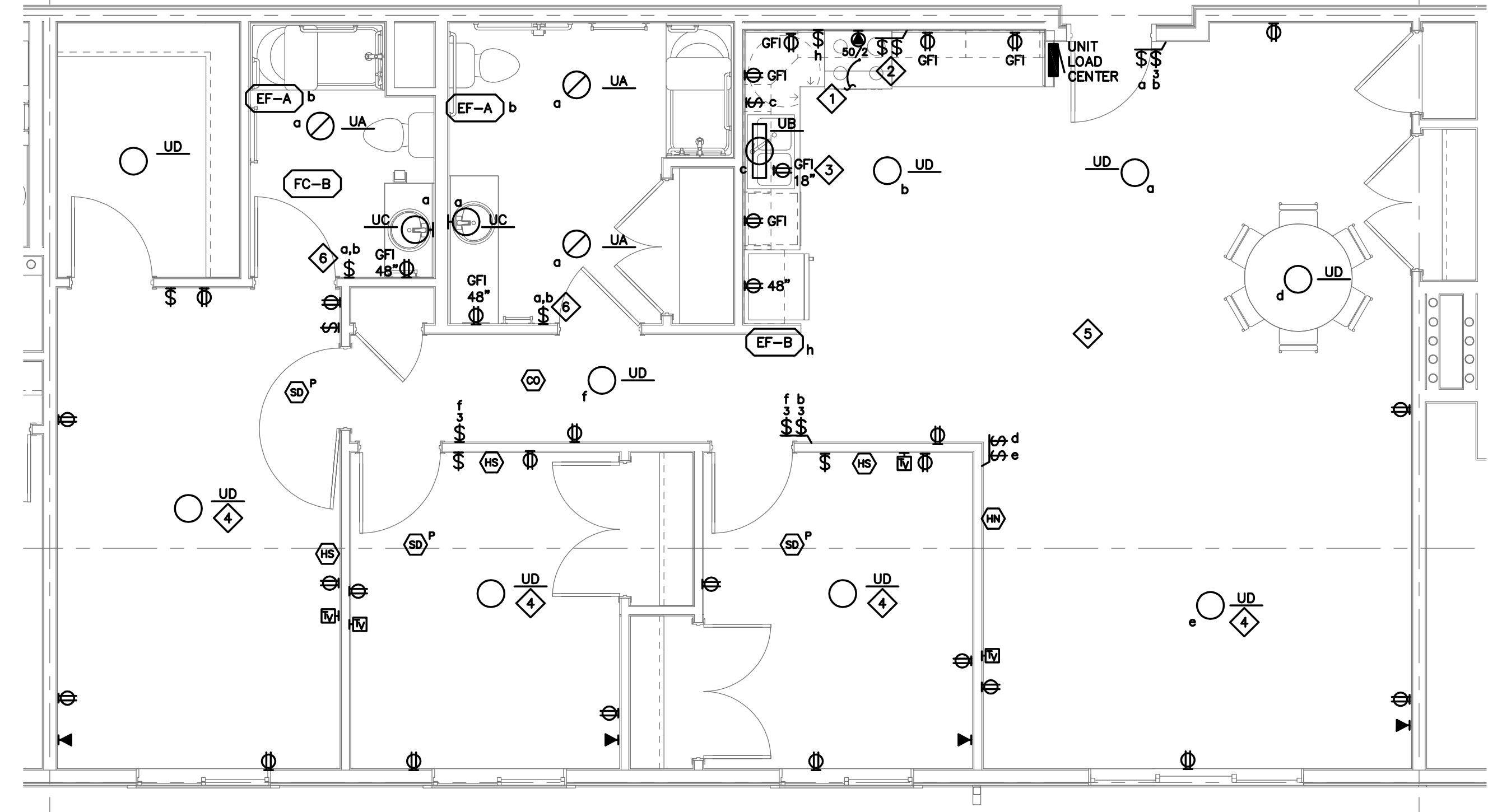
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UNIT ELECTRICAL PLANS

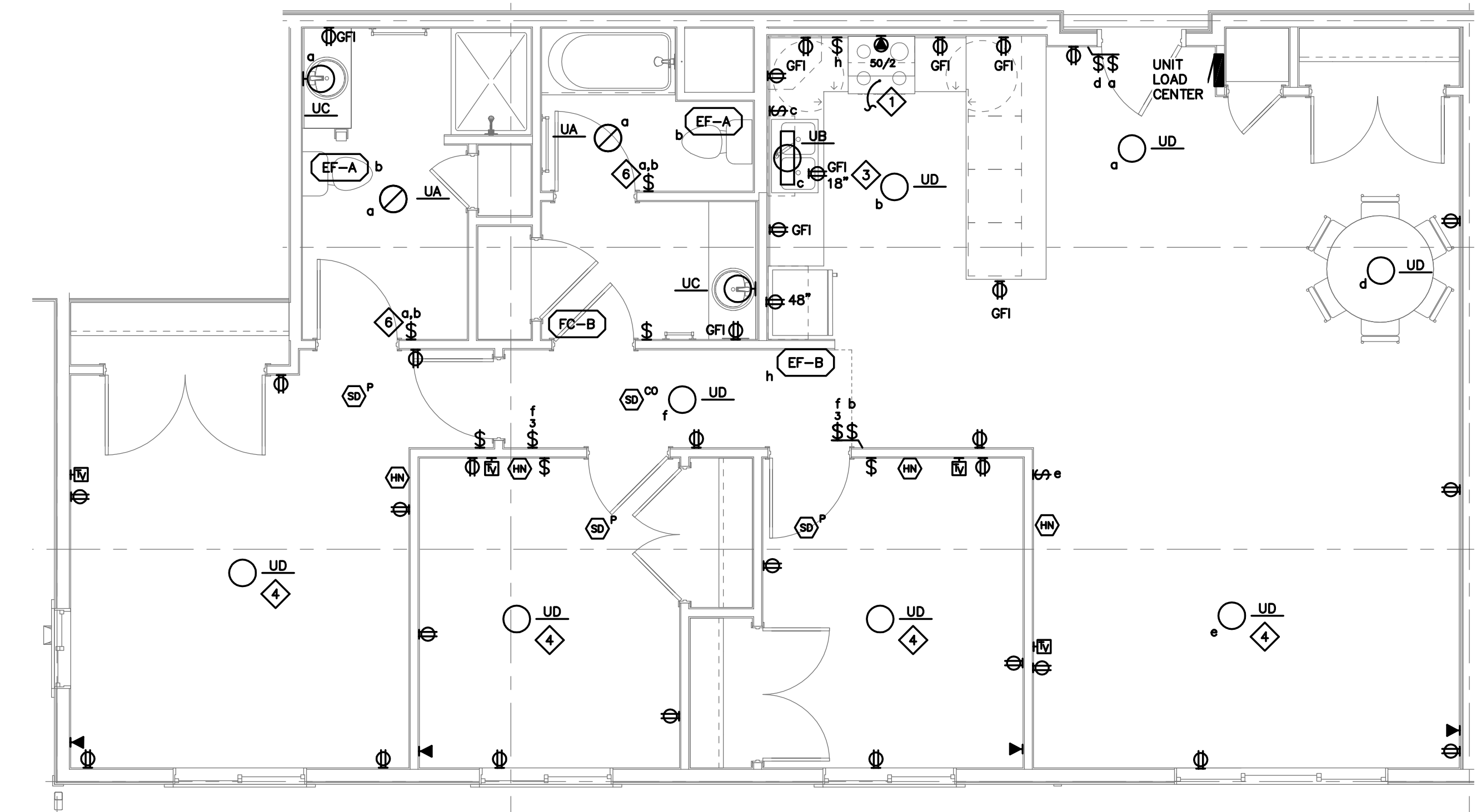
E411



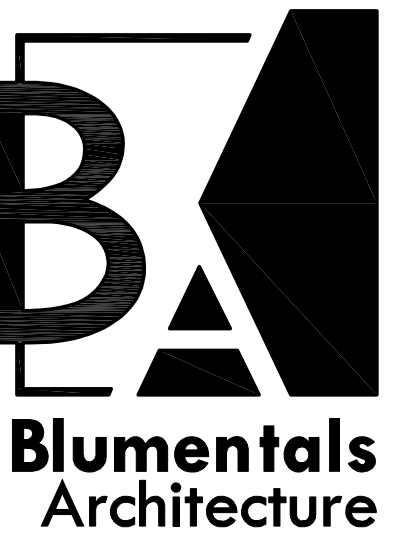
3 UNIT C.2 ACCESSIBLE
ELECTRICAL PLAN
1/4" = 1'-0"



1 UNIT E ACCESSIBLE
ELECTRICAL PLAN
1/4" = 1'-0"



2 UNIT F
ELECTRICAL PLAN
1/4" = 1'-0"



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UNIT ELECTRICAL PLANS

E412



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ELECTRICAL RISER DIAGRAM
AND SCHEDULES

E511

DISTRIBUTION EQUIPMENT SCHEDULE								
PANEL NO.	VOLTAGE	MOUNTING	AIC	MAIN / RATING	# OF CCTS	BREAKERS DISC REQUIRED	FEEDER FROM	NOTES
CT11	120/240V 1PH, 3W	SURFACE	42K	400A MLO	---	---	3°C, 3#500 FROM UTILITY TRANSFORMER	3
MB11	120/240V 1PH, 3W	SURFACE	35K	600A MLO	(16)	100/2	(2) 3" PVC, 3#350, #1 G. FROM UTILITY XFMR	3
LP11	120/240V 1PH, 3W	SURFACE	22K	400A MCB	42	(1) 150/2 (3) 30/2 (1) 20/2	2 1/2"C, 3#350 #4 G. FROM CT11	1,2
MP11	120/240V 1PH, 3W	SURFACE	22K	200A MLO	42	(3) 30/2 (1) 20/2	1-1/2"C, 3#1/0 #6G. FROM LP11	1

SPECIFIC DISTRIBUTION SCHEDULE NOTES

- FILL REMAINDER OF PANEL WITH 20/1 POLE BREAKERS.
- PROVIDE SERVICE ENTRANCE RATED PANEL BOARD FOR COMMON AREA.
- EQUIPMENT SHALL BE PRE-APPROVED BY LOCAL UTILITY.

UNIT LOAD CENTER - 1 BEDROOM			
SERVICE:	120/208V, 1PH, 3W	BUS:	100A
A.I.C. RATING:	10K	SPACES:	16
FEEDER FROM	PER SCHEDULE MB11	MTG:	FLUSH
CCT	CB	WIRE	LOAD DESCRIPTION
1	20/1	#12	SMALL APPLIANCE
3	20/1	#12	SMALL APPLIANCE
5	20/1	#12	BATHROOM RECEPTACLE
7	15	#12	CU-A
9	2	-	-
11	15/1	#14	GENERAL LIGHTING
13	-	-	SPACE
15	-	-	SPACE
2	50	#8	RANGE
4	2	-	-
6	15/1	#14	GENERAL LIGHTING
8	20/1	#12	DISHWASHER
10	15/1	#14	FC-A/FC-B
12	-	-	SPACE
14	-	-	SPACE
16	-	-	SPACE

CONTRACTOR SHALL WIRE ALL INDIVIDUAL UNITS PER THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE. VERIFY THAT THE CONTRACTOR RUSH-IN, LAYOUT AND UNIT PANEL CIRCUIT BREAKER COUNT MATCH. PROVIDE CIRCUIT BREAKERS IN UNIT PANELS PER CODE FOR GENERAL LIGHTING, APPLIANCE LOADS AND SPECIFIC APPLIANCES AND MECHANICAL EQUIPMENT.

PROVIDE ARC-FAULT PROTECTIVE DEVICES FOR ALL 125 VOLT, SINGLE PHASE BRANCH CIRCUITS IN ALL ROOMS, EXCEPT FOR BATHROOMS, GARAGES AND UNFINISHED BASEMENTS PER 2014 NEC. PROVIDE GFI PROTECTIVE DEVICES OR COMBINATION ARC-FAULT/GFI PROTECTIVE DEVICES WHERE GFI PROTECTION IS NOTATED OR REQUIRED BY CODE.

REFER TO SPECIFICATIONS FOR SER CABLE INSTALLATION RESTRICTIONS.

UNIT LOAD CENTER - 2/3 BEDROOM			
SERVICE:	120/208V, 1PH, 3W	BUS:	100A
A.I.C. RATING:	10K	SPACES:	16
FEEDER FROM	PER SCHEDULE MB11	MTG:	FLUSH
CCT	CB	WIRE	LOAD DESCRIPTION
1	20/1	#12	SMALL APPLIANCE
3	20/1	#12	SMALL APPLIANCE
5	20/1	#12	BATHROOM RECEPTACLE
7	20	#12	CU-B
9	2	-	-
11	15/1	#14	GENERAL LIGHTING
13	15/1	#14	GENERAL LIGHTING
15	-	-	SPACE
2	50	#8	RANGE
4	2	-	-
6	20/1	#12	BATHROOM RECEPTACLE
8	20/1	#12	DISHWASHER
10	15/1	#14	FC-A/FC-B
12	15/1	-	SPACE
14	-	-	SPACE
16	-	-	SPACE

CONTRACTOR SHALL WIRE ALL INDIVIDUAL UNITS PER THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE. VERIFY THAT THE CONTRACTOR RUSH-IN, LAYOUT AND UNIT PANEL CIRCUIT BREAKER COUNT MATCH. PROVIDE CIRCUIT BREAKERS IN UNIT PANELS PER CODE FOR GENERAL LIGHTING, APPLIANCE LOADS AND SPECIFIC APPLIANCES AND MECHANICAL EQUIPMENT.

PROVIDE ARC-FAULT PROTECTIVE DEVICES FOR ALL 125 VOLT, SINGLE PHASE BRANCH CIRCUITS IN ALL ROOMS, EXCEPT FOR BATHROOMS, GARAGES AND UNFINISHED BASEMENTS PER 2014 NEC. PROVIDE GFI PROTECTIVE DEVICES OR COMBINATION ARC-FAULT/GFI PROTECTIVE DEVICES WHERE GFI PROTECTION IS NOTATED OR REQUIRED BY CODE.

REFER TO SPECIFICATIONS FOR SER CABLE INSTALLATION RESTRICTIONS.

UNIT LOAD CENTER FEEDER SCHEDULE (2.0% VD, AL)					
UNIT AMP LOAD	0-50 FEET	51-100 FEET	101-150 FEET	151-200 FEET	201-250 FEET
100	#1	#1/0	#3/0	#4/0	#300

NOTES:

- SIZES SHOWN ARE MINIMUM REQUIRED FOR INDICATED DISTANCE RANGE.
- SCHEDULE BASED ON ALUMINUM SER CABLE AT 0.9 PF AND 208 VOLTS.
- SER CABLE RATED AT 75°C SHALL NOT BE INSTALLED IN INSULATED WALLS, CEILINGS, FIXED OPEN WEB TRUSSES, 2 BY X FRAMING OR OTHER INSULATED AREAS. PROVIDE 60°C SER CABLE OR 75°C M/C CABLE WITHIN INSULATED AREAS, INCREASING CONDUCTOR SIZE TO ACCOUNT FOR LOAD VARIATIONS AND TO NOT EXCEED MAXIMUM VOLTAGE DROP.
- PROVIDE CONDUIT AND WIRE FOR FEEDERS LARGER THAN #300 OR FOR PARALLEL FEEDERS.
- CONTRACTOR SHALL PROVIDE AN APPROPRIATELY SIZED GUTTER ADJACENT TO THE EQUIPMENT WHENEVER THE CONDUCTOR SIZE NECESSARY TO MAINTAIN THE REQUIRED VOLTAGE DROP IS TOO LARGE TO PROPERLY FORM AND TERMINATE IN THE EQUIPMENT. SPLICE PHASE AND NEUTRAL CONDUCTORS TO CORRECTLY SIZED PIGTAILS AND TERMINATE PER MANUFACTURER'S RECOMMENDATIONS WITHIN THE EQUIPMENT.

AVAILABLE FAULT CURRENT SCHEDULE			
EQUIPMENT IDENT	SOURCE AIC (AMPS)	FEEDER LENGTH (FT)	AVAILABLE AIC (AMPS)
UTILITY TRANS.	---	---	36,000
CT11	36,000	50	21,325
MB11	36,000	50	25,140
LP11	25,140	10	19,560
MP11	19,560	10	16,540

NOTES:

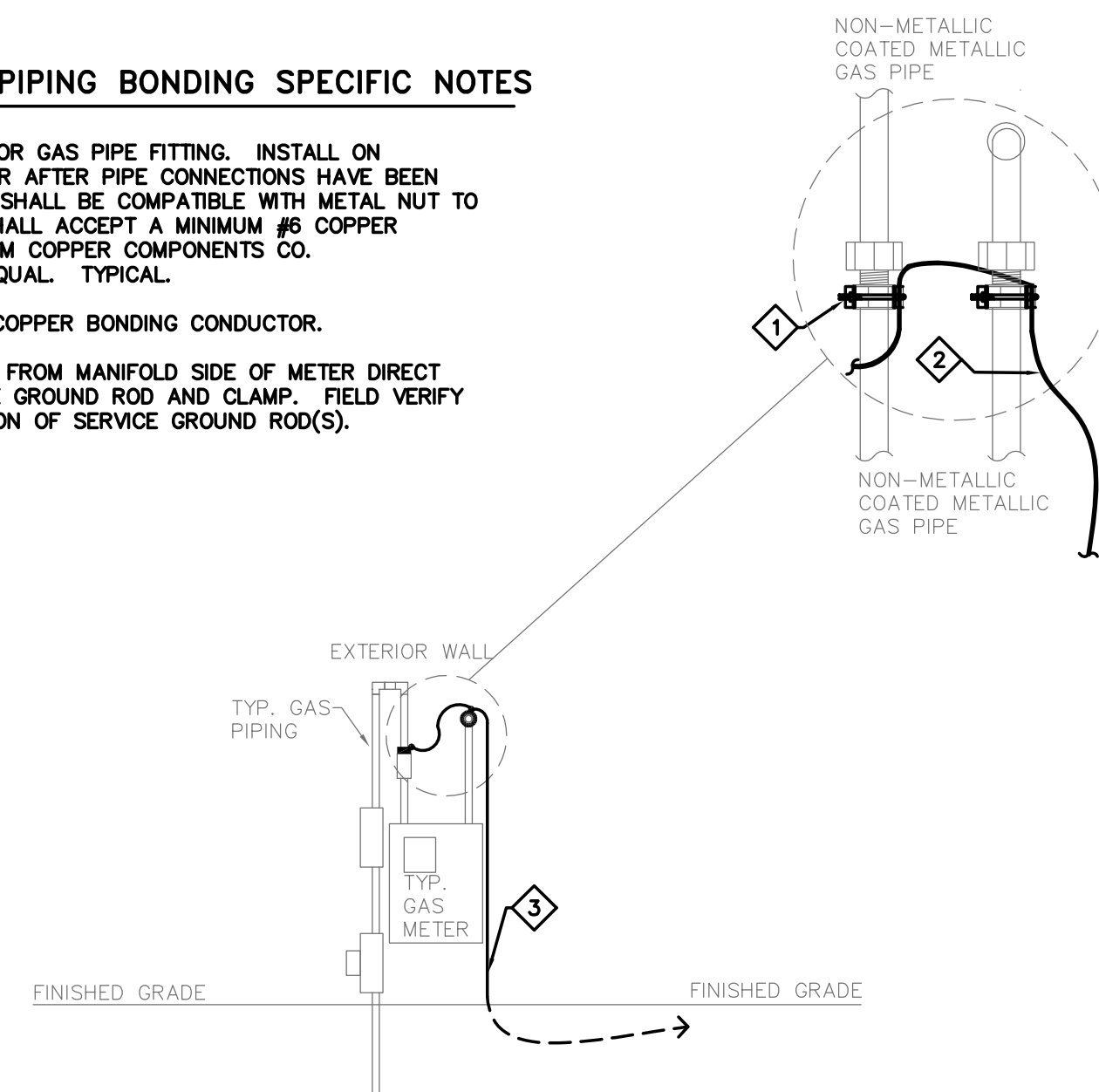
- CALCULATIONS BASED UPON FEEDERS SHOWN IN THE DISTRIBUTION EQUIPMENT SCHEDULE & APPROXIMATE EQUIPMENT LOCATIONS. CONTRACTOR SHALL RECALCULATE BASED UPON ANTICIPATED FIELD CONDITIONS PRIOR TO SUBMITTING SHOP DRAWINGS.
- PRIOR TO FINAL ELECTRICAL INSPECTION, CONTRACTOR SHALL PROVIDE LABELS ON ALL DISTRIBUTION EQUIPMENT, PER CODE, INDICATING CALCULATED AVAILABLE FAULT CURRENT BASED UPON ACTUAL FIELD CONDITIONS.

SINGLE METER GAS PIPING BONDING GENERAL NOTES

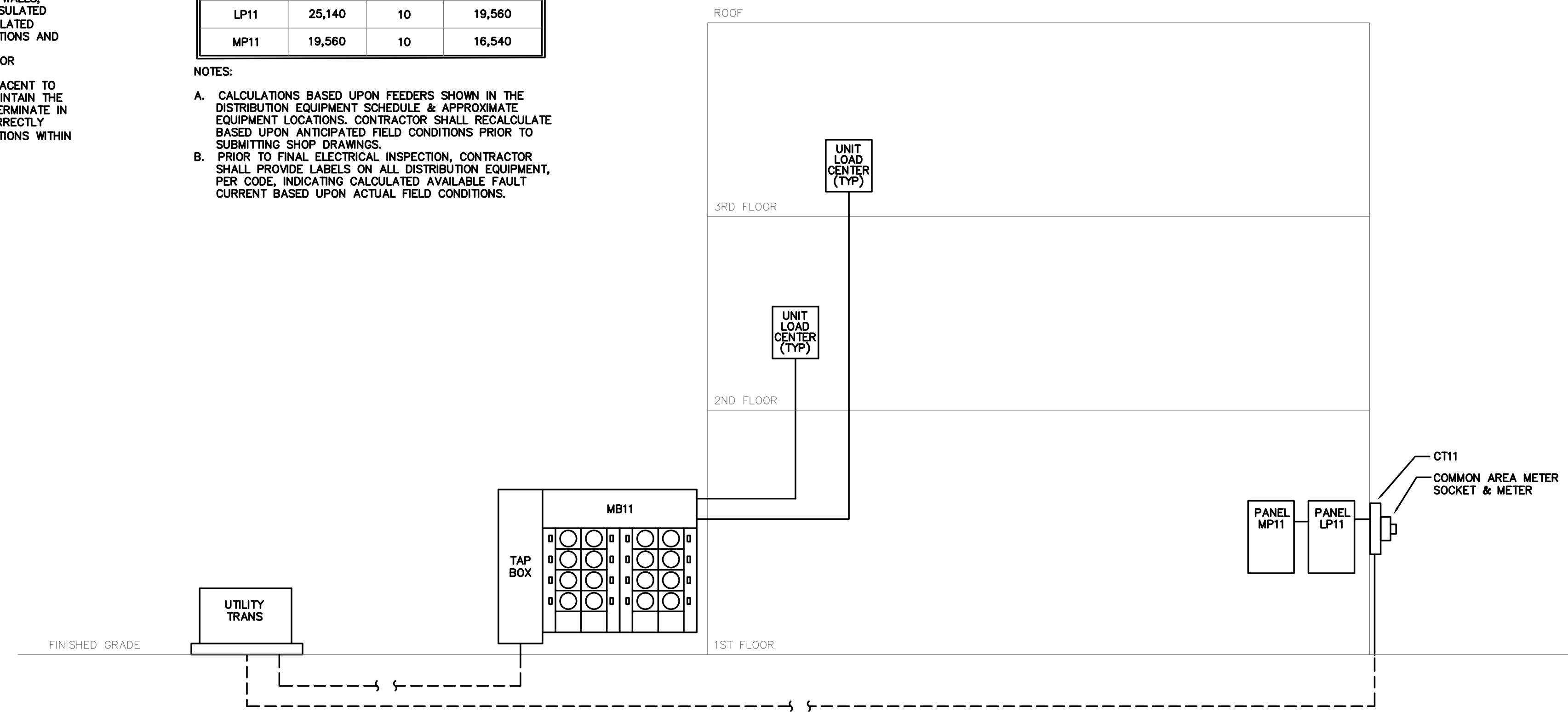
- COMPLETE BONDING INSTALLATION SHALL CONFORM TO NFPA-70, NEC-250 AND UL467.
- CLAMPS SHALL NOT BE INSTALLED ON NON-METALLIC COATED GAS PIPING.
- THE #6 BONDING CONDUCTOR SHALL BE ONE CONTINUOUS PIECE WITH NO SPLICES.

◇ SINGLE METER GAS PIPING BONDING SPECIFIC NOTES

- PROVIDE BONDING CLAMPS FOR GAS PIPE FITTING. INSTALL ON METALLIC NUT OF CONNECTOR AFTER PIPE CONNECTIONS HAVE BEEN MADE AND TESTED. CLAMP SHALL BE COMPATIBLE WITH METAL NUT TO PREVENT CORROSION AND SHALL ACCEPT A MINIMUM #6 COPPER BONDING CONDUCTOR. STORM COPPER COMPONENTS CO. #NAE-UPC-GVN-JRD OR EQUAL. TYPICAL.
- PROVIDE MINIMUM #6 BARE COPPER BONDING CONDUCTOR.
- ROUTE BONDING CONDUCTOR FROM MANIFOLD SIDE OF METER DIRECT BURIED TO BUILDING SERVICE GROUND ROD AND CLAMP. FIELD VERIFY EXACT ROUTING AND LOCATION OF SERVICE GROUND ROD(S).



2 SINGLE METER GAS PIPING BONDING DETAIL
NO SCALE



1 RISER DIAGRAM
NO SCALE

**MECHANICAL AND ELECTRICAL
EQUIPMENT SCHEDULE GENERAL NOTES**

- A. THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL EQUIPMENT SCHEDULED.
- B. THE ELECTRICAL CONTRACTOR SHALL PROVIDE POWER WIRING AND MAKE FINAL CONNECTION TO EACH PIECE OF EQUIPMENT SCHEDULED.
- C. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL STARTERS AND DISCONNECTS.
- D. THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL CONTROL DEVICES AS WELL AS ALL 120/208/240 VOLT POWER REQUIREMENTS AND LOW VOLTAGE WIRING NECESSARY TO INSTALL AND MAKE FULLY OPERATIONAL SPECIFIED CONTROL SYSTEMS, UNLESS NOTED OTHERWISE.
- E. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL SINGLE PHASE LINE VOLTAGE CONTROL DEVICES, SUCH AS 120/208/240 VOLT THERMOSTATS, SWITCHES AND TIME CLOCKS DIRECTLY CONTROLLING EXHAUST FANS, UNIT HEATERS, ETC., INCLUDING ALL ELECTRICAL MATERIALS AND FINAL CONNECTIONS.
- F. THE ELECTRICAL CONTRACTOR SHALL PROVIDE RECEPTACLES ADJACENT TO WATER HEATERS, SUMP PUMPS AND WATER SOFTENERS.
- G. MECHANICAL CONTRACTOR SHALL PROVIDE EQUIPMENT AFFIXED WITH A VISIBLE NAMEPLATE MARKED WITH SHORT CIRCUIT CURRENT RATING (SCCR) TO COMPLY WITH SECTION 440.4(B) OF THE 2017 NEC. MINIMUM EQUIPMENT SCCR SHALL BE 5,000 AIC, UNLESS NOTED OTHERWISE.

WATER SOFTENER SCHEDULE

UNIT NO.	MANUFACTURER & MODEL NO.	LOCATION	SERVES	MANIFOLD CONN. SIZE	PEAK FLOW 15 PSI P.D.	PEAK FLOW 25 PSI P.D.	EXIST WATER HARDNESS	DESIGN WATER HARDNESS	BACKWASH GPM	MOTOR DATA		PANEL				NOTES	
										KVA	V/PH	PANEL/CIRCUIT	CONDUIT	WIRE SIZE	BREAKER	MECH	ELEC
WS-1	CULLIGAN HE-060	UTILITY RM	DOMESTIC HW	1 1/2"	25	31	10	0	6	0.5	120/1	MP11 3	1/2"	#12	15/1	1	-

- MECHANICAL NOTES**
- REFER TO PLUMBING SPECIFICATIONS SECTION 22 30 00 FOR FURTHER DETAILS.

DOMESTIC WATER HEATER SCHEDULE (GAS COMBINATION INTERNAL HEAT SOURCE & STORAGE TANK)

UNIT NO.	MANUFACTURER & MODEL NO.	LOCATION	SERVES	MAX. TEMP. RISE (deg. F)	GALLON STORAGE	RECOVERY (GPH)	CFH INPUT	MOTOR DATA		PANEL				NOTES	
								KVA	V/PH	PANEL/CIRCUIT	CONDUIT	WIRE SIZE	BREAKER	MECH	ELEC
WH-1	AO SMITH Mxl BTH 150	UTILITY RM	ENTIRE FACILITY	90	100	198	150	0.7	120/1	MP11 7	1/2"	#12	15/1	1	1
WH-2	AO SMITH Mxl BTH 150	UTILITY RM	ENTIRE FACILITY	90	100	198	150	0.7	120/1	MP11 9	1/2"	#12	15/1	1	1

- MECHANICAL NOTES**
- REFER TO PLUMBING SPECIFICATIONS SECTION 22 30 00 FOR FURTHER DETAILS.

- ELECTRICAL NOTES**
- PROVIDE DEDICATED CIRCUIT AND DEDICATED NEUTRAL.

DOMESTIC HOT WATER CIRC PUMP AND SUMP PUMP SCHEDULE

UNIT NO.	MANUFACTURER & MODEL NO.	LOCATION	AREA SERVED	GPM	HEAD ('HD)	MOTOR DATA				PANEL				NOTES	
						WATTS	HP	RPM	V/PH	PANEL/CIRCUIT	COND.	WIRE SIZE	BRKR	MECH	ELEC
CP-1	TACO VR3452	UTILITY RM	DOMESTIC HW CIRC	5	20	-	1/4	-	120/1	MP11 5	1/2"	#12	15/1	1,2	-

- MECHANICAL NOTES**
- REFER TO PLUMBING SPECIFICATIONS SECTION 22 30 00 FOR FURTHER DETAILS.
 - BUILT IN SELFSENSING VARIABLE SPEED PUMP.

EXHAUST FAN SCHEDULE

UNIT NO.	MANUFACTURER & MODEL NO.	LOCATION	AREA SERVED	FAN DATA			MOTOR DATA				VIBR. ISO.	PANEL				NOTES		
				CFM	ESP ("WC)	FAN RPM	DRIVE TYPE	HP	RPM	V/PH		SPEC	DEFL. (in.)	PANEL/CIRCUIT	COND.	WIRE SIZE	BRKR	MECH
EF-A	PANASONIC FV-05VS	WALL	UNITS	50	0.1	759	DIRECT	FRAC	-	120/1	-	-	-	1/2"	14	15/1	-	2,3
EF-B	PANASONIC FV-10VS	WALL	UNITS	100	0.1	840	DIRECT	FRAC	-	120/1	-	-	-	1/2"	14	15/1	-	1
EF-C	PANASONIC FV-08VS	WALL	PUB RR	60	0.2	1026	DIRECT	FRAC	-	120/1	-	-	-	1/2"	12	15/1	-	2
EF-1	COOK GC-342	CEILING	LAUNDRY	200	.25	1725	DIRECT	FRAC	-	120/1	-	-	-	1/2"	12	15/1	1	2
EF-2	COOK GC-342	CEILING	COM ROOM	200	.25	1725	DIRECT	FRAC	-	120/1	-	-	-	1/2"	12	15/1	1	2

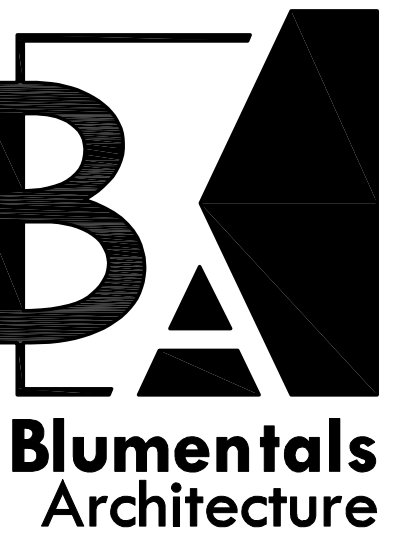
- MECHANICAL NOTES**
- PROVIDE COMPLETE WITH MATCHING CEILING RADIATION DAMPER.

- ELECTRICAL NOTES**
- PROVIDE DEDICATED SWITCH.
 - OBTAIN POWER FROM ROOM SWITCHED LIGHTING CIRCUIT.
 - PROVIDE 120 VOLT TIME DELAY OFF AND PERIODIC VENTILATION SWITCH SETTABLE FROM 0-60 MINUTES BY ADJUSTMENT SCREWS BEHIND COVERPLATE. CONNECT FIXTURE TO INSTANTANEOUS CONTACTS AND FAN TO TIME DELAY/PERIODIC VENTILATION CONTACTS. SET TIME DELAY TO 15 MINUTES. SET VENTILATION TO 10 MINUTES PER HOUR. PANASONIC #FV-WC02-X OR EQUAL. VERIFY COLOR WITH ARCHITECT PRIOR TO SUBMITTING SHOP DRAWINGS.

SUPPLY FAN SCHEDULE

UNIT NO.	MANUFACTURER & MODEL NO.	LOCATION	AREA SERVED	FAN DATA			MOTOR DATA				VIBR. ISO.	PANEL				NOTES			
				CFM	ESP ("WC)	FAN RPM	DRIVE TYPE	HP	RPM	V/PH		SPEC	DEFL. (in.)	PANEL/CIRCUIT	COND.	WIRE SIZE	BRKR	MECH	ELEC
SF-1	COOK 10XWS24D15	WALL	MECHANICAL	400	.125	1550	DIRECT	FRAC	-	120/1	-	-	-	MP11 32	1/2"	12	15/1	1	-

- MECHANICAL NOTES**
- FURNISH AUTO CHANGEOVER THERMOSTAT: EUH-B ON < 60F, SF-1 ON > 75F. NORMALLY CLOSED DAMPERS SHALL OPEN UPON ANY CALL FOR COOLING.



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SIGNATURES

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 Professional Engineer under the laws of the State of MINNESOTA

Steven M. Youngs 06/07/19 reg. no. 16544

06/30/20 reg. exp. date

STEEN ENGINEERING INC.
763-585-6742
763-585-6757 fax
Email: steen@steeneng.com
5430 Douglas Drive North
Crystal, MN 55429

PROJECT INFO

Project No.
BLA201802
Drawn By:
DJL
Issue Date
02/05/19

△ SUBMITTALS / REVISIONS

DATE	DESCRIPTION
04-20-18	50% CONTRACT DOCUMENTS
06-21-18	100% REVIEW
07-20-18	100% CD
08-24-18	100% MHFA REVIEW
02-05-19	ISSUED FOR CITY REVIEW
02-21-19	ADDENDUM #2
04-19-19	MDU REVIEW
06-07-19	ISSUED FOR CONSTRUCTION

SCALE
AS NOTED

West Birch Apartments

W Branch Street
Princeton, MN

MECHANICAL EQUIPMENT
SCHEDULES

E611

BOILER SCHEDULE

UNIT NO.	MANUFACTURER & MODEL NO.	LOCATION	AREA SERVED	HEATING DATA			MOTOR DATA		PANEL				NOTES	
				INPUT MBH	OUTPUT MBH	EDR (SQ.FT.)	MCA	V/PH	PANEL/CIRCUIT	COND.	WIRE SIZE	BRKR	MECH	ELEC
HWB-1	LOCHINVAR KBN400	MECH BUILDING		399	376	-	FRAC	120/1	MP11 27	1/2"	#12	15/1	-	1
HWB-2	LOCHINVAR KBN400	MECH BUILDING		399	376	-	FRAC	120/1	MP11 29	1/2"	#12	15/1	-	1

ELECTRICAL NOTES

1. PROVIDE DEDICATED CIRCUIT AND DEDICATED NEUTRAL.

COMPRESSION TANK/AIR SEPARATOR SCHEDULE

UNIT NO.	MANUFACTURER & MODEL NO.	LOCATION	SYSTEM SERVED	TANK VOLUME (GAL)	ACCEPT. VOLUME (GAL)	BLADDER PRESSURE (PSI)	CONN. SIZE	AIR SEPARATOR MODEL #	NOTES
ET-1	WESSELS NTA-15	MECH	BUILDING	7.8	6.3	-	3/4"	-	-

MECHANICAL AND ELECTRICAL EQUIPMENT SCHEDULE GENERAL NOTES

- THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL EQUIPMENT SCHEDULED.
- THE ELECTRICAL CONTRACTOR SHALL PROVIDE POWER WIRING AND MAKE FINAL CONNECTION TO EACH PIECE OF EQUIPMENT SCHEDULED.
- THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL STARTERS AND DISCONNECTS.
- THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL CONTROL DEVICES AS WELL AS ALL 120/208/240 VOLT POWER REQUIREMENTS AND LOW VOLTAGE WIRING NECESSARY TO INSTALL AND MAKE FULLY OPERATIONAL SPECIFIED CONTROL SYSTEMS, UNLESS NOTED OTHERWISE.
- THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL SINGLE PHASE LINE VOLTAGE CONTROL DEVICES, SUCH AS 120/208/240 VOLT THERMOSTATS, SWITCHES AND TIME CLOCKS DIRECTLY CONTROLLING EXHAUST FANS, UNIT HEATERS, ETC., INCLUDING ALL ELECTRICAL MATERIALS AND FINAL CONNECTIONS.
- THE ELECTRICAL CONTRACTOR SHALL PROVIDE RECEPTACLES ADJACENT TO WATER HEATERS, SUMP PUMPS AND WATER SOFTENERS.
- MECHANICAL CONTRACTOR SHALL PROVIDE EQUIPMENT AFFIXED WITH A VISIBLE NAMEPLATE MARKED WITH SHORT CIRCUIT CURRENT RATING (SCCR) TO COMPLY WITH SECTION 440.4(B) OF THE 2017 NEC. MINIMUM EQUIPMENT SCCR SHALL BE 5,000 AIC, UNLESS NOTED OTHERWISE.

FAN COIL UNIT SCHEDULE (HW/DX)

UNIT NO.	MANUFACTURER & MODEL NO.	DESCRIP.	AREA SERVED	FAN DATA				HEATING COIL DATA								DX COOLING COIL DATA				VIBR. ISOLATION		MOTOR DATA				PANEL				NOTES				
				CFM	O.A. CFM	ESP ("WC)	TSP ("WC)	GPM	ROWS	PD (FT)	APD ("WC)	MBH	GLY (%)	EWT ("F)	LWT ("F)	EAT ("F)	LAT ("F)	EAT DB	EAT WB	LAT DB	LAT WB	SENS.	TOTAL	SPEC	DEFL. (in.)	HP	AMPS	KVA	RPM	V/PH	PANEL/CIRCUIT	COND.	WIRE SIZE	BRKR
FC-A	1ST COMPANY 19CDX-HW-C	HORIZONTAL RECESSED	UNITS	600	-	.25	-	1.0	-	0.9	-	17.0	30	160	130	-	-	80	67	-	-	-	-	FRAC	3.0	-	1550	120/1	-	1/2"	14	15/1	1.2	1
FC-B	1ST COMPANY 25CDX-HW-C	HORIZONTAL RECESSED	UNITS	800	-	.25	-	2.0	-	2.6	-	24.4	30	160	130	-	-	80	67	-	-	-	-	FRAC	5.0	-	1550	120/1	-	1/2"	14	15/1	1.2	1
FC-1	1ST COMPANY 36HXB-HW	HORIZONTAL RECESSED	COMMUNITY	1000	225	.25	-	2.0	-	1.3	-	36.4	30	160	130	-	-	80	67	-	-	-	-	FRAC	10.6	-	1550	120/1	MP11 14	1/2"	12	15/1	1.2	-
FC-2	1ST COMPANY 19CDX-HW-C	HORIZONTAL RECESSED	CORRIDOR	600	60	.25	-	1.0	-	0.9	-	17.0	30	160	130	-	-	80	67	-	-	-	-	FRAC	3.0	-	1550	120/1	MP11 16	1/2"	12	15/1	1.2	-
FC-3	1ST COMPANY 19CDX-HW-C	HORIZONTAL RECESSED	CORRIDOR	600	60	.25	-	1.0	-	0.9	-	17.0	30	160	130	-	-	80	67	-	-	-	-	FRAC	3.0	-	1550	120/1	MP11 18	1/2"	12	15/1	1.2	-

MECHANICAL NOTES

1. HEATING CAPACITY AND PRESSURE DROP HAVE BEEN ADJUSTED FOR 30% GLYCOL.
2. PROVIDE DUCTED RETURN WITH FILTER RETURN GRILLE AS SHOWN.

ELECTRICAL NOTES

1. REFER TO PLANS FOR CIRCUITING.

CONDENSING UNIT SCHEDULE

UNIT NO.	MANUFACTURER & MODEL NO.	LOCATION	SERVES	COOLING DATA			MOTOR DATA		VIBR. ISO.	PANEL				NOTES		
				TONS	MBH	SEER	MCA	V/PH		SPEC	DEFL. (in.)	PANEL/CIRCUIT	COND.	WIRE SIZE	BRKR	MECH
CU-A	CARRIER 24ABB318	GRADE	FC-A	1.5	17.4	13.0	11.8	208/1	-	-	-	1/2"	#12	15/2	-	1
CU-B	CARRIER 24ABB324	GRADE	FC-A	2.0	22.4	13.0	17.6	208/1	-	-	-	1/2"	#12	20/2	-	1
CU-1	CARRIER 24ABB330	GRADE	FC-1	2.5	27.6	13.0	16.8	208/1	-	-	MP11 2,4	1/2"	#12	20/2	-	-
CU-2	CARRIER 24ABB318	GRADE	FC-2	1.5	17.4	13.0	11.8	208/1	-	-	MP11 6,8	1/2"	#12	15/2	-	-
CU-3	CARRIER 24ABB318	GRADE	FC-3	1.5	17.4	13.0	11.8	208/1	-	-	MP11 10,12	1/2"	#12	15/2	-	-

ELECTRICAL NOTES

1. REFER TO PLANS FOR CIRCUITING.

ELECTRIC HEATER SCHEDULE

UNIT NO.	MANUFACTURER MODEL NO.	DESCRIP.	AREA SERVED	HEATING COIL DATA				PANEL				NOTES	
				LENGTH (ft.)	TOTAL WATTS	TOTAL (Btuh)	V/PH	PANEL/CIRCUIT	CONDUIT	WIRE SIZE	BREAKER	MECH	ELEC
ECH-A	BERKO OHC-4512	COVE RADIANT	SEE PLANS	3	450	1536	120/1	-	1/2"	#12	15/1	1,3	1,2,3
FF-C	BERKO FRC-4820	COMMERCIAL WALL CABINET	SEE PLANS	-	4800	16,382	208/1	-	1/2"	#10	30/2	1,2	1,2
EUH-B	BERKO HUHA-520	HORIZONTAL UTILITY	SEE PLANS	-	5000	-	208/1	-	1/2"	#10	30/2	1,3	1,2,3

MECHANICAL NOTES

1. EQUIPMENT FURNISHED BY MECHANICAL CONTRACTOR, INSTALLED BY ELECTRICAL CONTRACTOR.
2. PROVIDE INTEGRAL THERMOSTAT AND DISCONNECT SWITCH.
3. FURNISH REMOTE THERMOSTAT. BERKO #M602W OR EQUAL.

ELECTRICAL NOTES

1. EQUIPMENT FURNISHED BY MECHANICAL CONTRACTOR, INSTALLED BY ELECTRICAL CONTRACTOR. COORDINATE LOCATIONS WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.
2. REFER TO PLAN FOR CIRCUITING.
3. INSTALL THERMOSTAT FURNISHED BY MECHANICAL. REFER TO MECHANICAL PLANS FOR LOCATION.

UNIT HEATER SCHEDULE

UNIT NO.	MANUFACTURER & MODEL NO.	LOCATION	AREA SERVED	CFM	HEATING COIL DATA				MOTOR DATA			PANEL				NOTES		
					GPM	MBH	EWT ("F)	LWT ("F)	WPD ("WC)	HP	RPM	V/PH	PANEL/CIRCUIT	CONDUIT	WIRE SIZE	BREAKER	MECH	ELEC
UH-A	AIRTHERM HA-60	GARAGE	PLENUM	900	2.6	28.1	160	130	.07	FRAC	1000	120/1	-	1/2"	#12	15/1	1.2	1

MECHANICAL NOTES

1. SUPPORTED FROM STRUCTURE.
2. HEATING CAPACITY AND PRESSURE DROP HAVE BEEN ADJUSTED FOR 30% ETHYLENE GLYCOL.

ELECTRICAL NOTES

1. REFER TO PLAN FOR CIRCUITING.

PUMP SCHEDULE

UNIT NO.	MANUFACTURER & MODEL NO.	LOCATION	AREA SERVED	GPM	HEAD ('HD)	ΔT ("F)	VIBR. ISO.		MOTOR DATA				PANEL				NOTES	
							SPEC	DEFL. (in.)	WATTS	HP	RPM	V/PH	PANEL/CIRCUIT	COND.	WIRE SIZE	BRKR	MECH	ELEC
HWP-1	B & G ECOCIRC XL 70-145	MECH	HEATING WATER	55.0	36.0	30.0	-	-	-	2.0	2744	208/1	MP11 11,13	1/2"	10	30/2	1.2	1
HWP-2	B & G ECOCIRC XL 70-145	MECH	HEATING WATER	55.0	36.0	30.0	-	-	-	2.0	2744	208/1	MP11 15,17	1/2"	10	30/2	1.2	1
BP-1	B & G ECOCIRC XL 36-45	MECH	HEATING WATER	26.0	11.0	30.0	-	-	-	FRAC	3040	120/1	MP11 23	1/2"	12	15/1	2,3	-
BP-2	B & G ECOCIRC XL 36-45	MECH	HEATING WATER	26.0	11.0	30.0	-	-	-	FRAC	3040	120/1	MP11 23	1/2"	12	15/1	2,3	-

MECHANICAL NOTES

1. EACH PUMP IS SELECTED AT 100% OF REQUIRED FLOW, WITH ONE PUMP ON STANDBY. PROVIDE LEAD/LAG CONTROL.
2. SELECTION IS BASED ON 30% PROPYLENE GLYCOL.
3. WIRE EACH BOILER PUMP TO ITS CORRESPONDING BOILER CONTROL PANEL.

ELECTRICAL NOTES

1. ECM MOTOR. PROVIDE NEUTRAL CONDUCTOR WITH PHASE CONDUCTORS.

DUCTLESS AIR CONDITIONER AND CONDENSING UNIT SCHEDULE

UNIT NO.	MANUFACTURER & MODEL NO.	LOCATION	TYPE/SERVES	AIR HANDLING DATA			HEATING DATA			COOLING DATA			MOTOR DATA			PANEL				NOTES		
				CFM	O.A.	"ESP	MBH	COP	HSPF	MBH	SEER	EER	TONS	WATTS	MCA	V/PH	PANEL/CIRCUIT	COND.	WIRE SIZE	BRKR	MECH	ELEC
AC-1	CARRIER 40MAQB12B	ELEV	HI-WALL	210	-	-	12.0	3.22	10.0	12.0	21.5	13.0	-	-	-	120/1	MP11 25	1/2"	#12	15/1	1	1
AC-1CU	CARRIER 38MAQB12B	GRADE	AC-1	-	-	-	-	-	-	-	1.0	-	15.0	120/1	MP11 25	1/2"	#12	15/1	-	-	-	-

MECHANICAL NOTES

1. ROUTE CONDENSATE DOWN TO WASHING MACHINE WALL BOX. PROVIDE AIR GAP.

ELECTRICAL NOTES

1. PROVIDE POWER AND CONTROL CONNECTIONS FROM CU TO AC.
2. REFER TO PLANS FOR CIRCUITING.
3. PROVIDE FUSED DISCONNECT WITHIN ELEVATOR EQUIPMENT ROOM.



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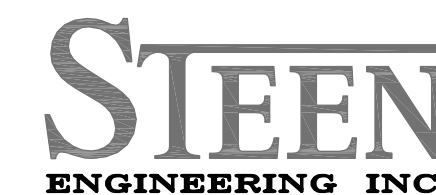
SIGNATURES

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 Professional Engineer under the laws of the State of

MINNESOTA 06/07/19
reg. exp. date

Steven M. Youngs 16544
reg. no.

Steven M. Youngs
06/30/20
reg. exp. date



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PROJECT INFO

Project No.

BLA201802

Drawn By:

DJL

Issue Date

02/05/19

△ SUBMITTALS / REVISIONS

04-20-18	50% CONTRACT DOCUMENTS
06-21-18	100% REVIEW
07-20-18	100% CD
08-24-18	100% MHFA REVIEW
02-05-19	ISSUED FOR CITY REVIEW
02-21-19	ADDENDUM #2
04-19-19	MDU REVIEW
06-07-19	ISSUED FOR CONSTRUCTION

SCALE

AS NOTED

West Birch Apartments

W Branch Street
Princeton, MN

MECHANICAL EQUIPMENT SCHEDULES

E612