

1. WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER, PER INDUSTRY STANDARD, AND TO THE SATISFACTION OF THE ARCHITECT AND ENGINEER.
2. WORK, MATERIALS, AND EQUIPMENT SHALL CONFORM TO THE LATEST EDITIONS OF LOCAL, STATE AND NATIONAL CODES, STANDARDS AND ORDINANCES.
3. ALL MATERIALS USED IN THIS INSTALLATION SHALL BE U.L. APPROVED AND NEW.
4. DO NOT PENETRATE STRUCTURAL ELEMENTS OF FLOORS, WALLS, CEILINGS, ROOF, ETC.
5. DETAILS ARE SHOWN ON DIFFERENT SHEETS. THE CONTRACTOR SHALL REFER TO THOSE DETAILS WHETHER OR NOT CALLED IN REFERENCE NOTES.
6. ELECTRICAL CONTRACTOR SHALL NOTIFY AND COOPERATE WITH THE MECHANICAL CONTRACTOR SUCH THAT NO DUCTS, PIPING, OR EQUIPMENT FOREIGN TO THE OPERATION OF THE ELECTRICAL EQUIPMENT SHALL BE PERMITTED TO BE INSTALLED IN, ENTER, OR PASS THROUGH ELECTRICAL ROOMS OR SPACES, OR ABOVE OR BELOW ELECTRICAL EQUIPMENT IN OTHER AREAS.
7. NO WIRING SHALL RUN IN DUCT WORK.
8. THE MINIMUM SIZE OF THE CONDUCTORS ARE TO BE #12 AWG. THHN COPPER, UNLESS INDICATED OTHERWISE ON THE DRAWINGS. STRANDED CONDUCTORS ARE NOT ALLOWED IN THE CONDUCTORS SMALLER THAN #10 AWG.
9. USE EPOXY ANCHORS TO SUPPORT THE ELECTRICAL EQUIPMENT. EXPANSION ANCHOR BOLTS ARE NOT ACCEPTED.
10. THE ELECTRICAL CONTRACTOR SHALL REVIEW AND COORDINATE WITH ARCHITECTURAL, CIVIL, STRUCTURAL, MECHANICAL, PLUMBING, AND OTHER DRAWINGS PRIOR TO BID.
11. ELECTRICAL CONTRACTOR SHALL REVIEW ALL ARCHITECT'S ELEVATIONS, SECTIONS, AND FLOOR PLANS PRIOR TO ROUGH-IN OF ELECTRICAL JUNCTION BOXES.
12. ALL JUNCTION BOXES SHALL HAVE MINIMUM DEPTH OF 2-1/8" UNLESS OTHERWISE SPECIFIED. SECURE ALL JUNCTION BOXES AS SHOWN IN THE DETAILS. FURNISH AND INSTALL PROPER PLASTER RINGS.
13. REFER TO ARCHITECTURAL CABINET CASEWORK ELEVATION DRAWINGS FOR CLARIFICATION ON MOUNTING AND PLACEMENT OF ALL RACEWAY, RECEPTACLES, AND SWITCHES.
14. MANY DEVICE MOUNTING LOCATIONS ARE DEPENDENT ON MILLWORK LOCATIONS. COORDINATE ALL APPLICABLE LOCATIONS WITH MILLWORK INSTALLER PRIOR TO BEGINNING WORK.
15. LIGHT SWITCHES INSTALLED ADJACENT TO EACH OTHER, SHALL BE GANGED TOGETHER WITH ONE PIECE COVER PLATE.
16. ALL WALL MOUNTED MOTION SENSORS SHALL BE A DUAL TECHNOLOGY MOTION SENSOR WITH INTEGRAL OVERRIDE SWITCH. MOTION SENSOR TO MOUNT IN A STANDARD SWITCH BOX. MOTION SENSER RING TO HAVE A FIFTEEN MINUTE ACT TIME DELAY UNIT AND SWITCH TO SENSOR SET TO MANUAL ON. USE HUBBELL, SENSOR SWITCH, LEVITON, OR APPROVED EQUAL.
17. CONSULT ARCHITECTS REFLECTED CEILING PLANS FOR EXACT LOCATION OF LIGHTING FIXTURES, SPEAKERS, SMOKE DETECTORS, ETC.
18. ELECTRICAL CONTRACTOR SHALL MEET WITH THE CEILING AND MECHANICAL CONTRACTORS TO COORDINATE LOCATIONS, CLEARANCES, CEILING TYPES, AND ROUGH-IN REQUIREMENTS OF ALL LIGHTING FIXTURES PRIOR TO DUCT, PIPING, AND CEILING INSTALLATIONS.
19. ALL CEILING MOUNTED MOTION SENSORS SHALL BE A DUAL TECHNOLOGY MOTION SENSOR WITH POWER PACK AS REQUIRED TO CONTROL LIGHTING. MOTION SENSOR TO HAVE A FIFTEEN MINUTE DELAY. AT TEN MINUTES TO SENSOR SET TO MANUAL. ON. CONTRACTOR TO SUBMIT FLOOR PLAN TO MOTION SENSOR SUPPLIER FOR FACTORY TO LOCATED MOTION SENSOR FOR OPTIMAL PERFORMANCE TO AVOID NUISANCE SHUT OFF OF LIGHTING. MANUFACTURERS LAYOUT PLAN TO BE PART OF SUBMITTALS. PROVIDE SUFFICIENT BOX DEPTH AND CORRECT SENSER RING TO HAVE A FIFTEEN MINUTE ACT TIME DELAY UNIT AND OCCUPANCY SENSOR INSTALLED. PROVIDE PROPER SEPARATION OF 120 VOLT AND CLASS 2 WIRING AS NECESSARY IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE. USE HUBBELL, SENSOR SWITCH, LEVITON OR APPROVED EQUAL.
20. CONNECT ALL EM FIXTURES, NIGHT LIGHTS, EGRESS LIGHTS, AND EXIT SIGNS TO UNSWITCHED CONDUCTOR.
21. HEAT TRACE SHALL BE RAN IN ALL NON-CONDITIONED ROOF DRAINS, GUTTERS, AND DOWNSPOUTS AND SHALL EXTEND AT LEAST 8' BEYOND THE DOWNSPOUT DISCHARGE.
22. THE ELECTRICAL CONTRACTOR SHALL TERMINATE THE ELECTRICAL CONNECTIONS TO ALL THE EQUIPMENT BY PROVIDING THE NECESSARY MALE/FEMALE CONNECTOR, RECEPTACLE, PLUG, ETC.
23. FINAL CONNECTIONS TO EQUIPMENT SHALL BE MADE AS PER MANUFACTURERS WRITTEN INSTRUCTIONS AND APPROVED WIRING DIAGRAMS AND DETAILS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO PROVIDE ALL MATERIALS AND EQUIPMENT COMPATIBLE WITH EQUIPMENT ACTUALLY SUPPLIED. THE ELECTRICAL CONTRACTOR SHALL VERIFY ALL ELECTRICAL LOADS (VOLTAGE, PHASE, CONNECTION REQUIREMENTS, ETC.) OF EQUIPMENT FURNISHED UNDER OTHER DIVISIONS WITH APPROVED SHOP DRAWINGS PRIOR TO BEGINNING ROUGH-IN.
24. VERIFY EXACT LOCATION(S) OF ALL EQUIPMENT TO BE FURNISHED BY OTHERS PRIOR TO ROUGH-IN.
25. AT THE END OF THE JOB, PROVIDE BLANK COVER PLATES TO MATCH THE OTHER COVER PLATES FOR ALL JUNCTION BOXES WHERE DEVICES HAVE NOT YET BEEN INSTALLED.
26. PROVIDE TAMPER RESISTANT RECEPTACLES AS REQUIRED BY NEC 406.12.
27. INTERCONNECT ALL SMOKE ALARMS IN EACH INDIVIDUAL UNIT IN SUCH A MANNER THAT THE ACTIVATION OF ONE ALARM WILL ACTIVATE ALL THE OTHER ALARMS WITHIN SUCH UNIT.
28. ELECTRICAL PANELS & MEDIA CABINETS LOCATED IN CORRIDOR WALL SHALL MEET THE FIRE RATED REQUIREMENTS OF IBC 714.3.2(2). COORDINATE WALL PENETRATIONS WITH OTHER TRADES AS REQUIRED TO MAINTAIN INTEGRITY OF FIRE RATED ASSEMBLIES.

SYMBOL	EXPLANATION	SYMBOL	EXPLANATION	SYMBOL	EXPLANATION	
	BRANCH CIRCUIT CONCEALED IN CEILING OR WALL	F1	FIXTURE TYPE SYMBOL		TAMPER AND FLOW	
	BRANCH CIRCUIT CONCEALED IN GROUND OR FLOOR		LINIER FIXTURE (TYPICAL)		FIRE ALARM CONTROL PANEL	
	BRANCH CIRCUIT HOMERUNS TO PANEL		EMERGENCY LIGHTING UNIT		REMOTE FIRE ALARM ANNUNCIATOR PANEL	
	ROOM NUMBER		SURFACE OR PENDANT MOUNTED FIXTURE		FIRE ALARM NAC PANEL	
	MECHANICAL EQUIPMENT SYMBOL		RECESSED FIXTURE		FIRE ALARM VOICE PANEL	
	KEYED NOTE REFERENCE		WALL MOUNTED FIXTURE		DOOR HOLDER	
	FEEDER TAG (SEE FEEDER SCHEDULE)		WALL PACK		FIRE/SMOKE DAMPER	
	LIGHTING AND POWER PANELBOARD		STRIP FIXTURE		FIRE ALARM PULL STATION	
	DISCONNECT SWITCH		TRACK LIGHTING		FIRE ALARM STROBE	
	DISCONNECT SWITCH WITH MOTOR STARTER		EMERGENCY LIGHTING UNIT		FIRE ALARM HORN/STROBE	
	MOTOR STARTER		WALL MOUNTED EXIT LIGHT (SINGLE FACE)		FIRE ALARM HORN/STROBE (LF = LOW FREQUENCY)	
	VARIABLE FREQUENCY DRIVE		WALL MOUNTED EXIT LIGHT (DOUBLE FACE)		FIRE ALARM HORN/STROBE WITH PROTECTIVE COVER	
C	CONDUIT STUB		CEILING MOUNTED EXIT LIGHT		FIRE ALARM SPEAKER/STROBE	
J	JUNCTION BOX		CEILING MOUNTED EXIT LIGHT (DOUBLE FACE)		FIRE ALARM SPEAKER/STROBE (LF = LOW FREQUENCY)	
	ELECTRIC VEHICLE CHARGING STATION		EXIT LIGHT WITH PROTECTIVE COVER		FIRE ALARM SPEAKER	
	DUPLEX RECEPTACLE OUTLET		SINGLE POLE SWITCH (SUBSCRIPT AS INDICATED BELOW)		FIRE ALARM SPEAKER (LF = LOW FREQUENCY)	
	WP WEATHERPROOF COVER & LISTED WEATHER RESISTANT DEVICE GFCI PROTECTED BY FAULT CIRCUIT INTERRUPTER +44 MOUNTING HEIGHT ABOVE FLOOR OR GRADE GIVEN IN INCHES. REF REFRIGERATOR DW DISHWASHER DISP DISPOSAL WASH WASHING MACHINE EWC ELECTRIC WATER COOLER USB COOPER TR7746 OR EQUAL DUPLEX PLUS USB CHARGER TR TAMPER RESISTANT	2 TWO POLE SWITCH 3 3-WAY SWITCH 4 4-WAY SWITCH D DIMMER SWITCH K KEYED SWITCH T TIMER SWITCH M MANUAL STARTER WITH THERMAL OVERLOAD F PADDLE FAN SPEED CONTROL. (CANARM "CN" SERIES) OC OCCUPANCY SENSOR SWITCH LV LOW VOLTAGE CONTROL SWITCH LV/D LOW VOLTAGE CONTROL SWITCH WITH DIMMER OC/D OCCUPANCY SENSOR CONTROL SWITCH WITH DIMMER OC/2 DUAL RELAY OCCUPANCY SENSOR CONTROL SWITCH		FIRE ALARM HORN		FIRE ALARM HORN (LF = LOW FREQUENCY)
	QUAD RECEPTACLE OUTLET		DOUBLE GANG SWITCH		FIRE ALARM STROBE CEILING MOUNTED	
	SPLIT WIRED DUPLEX RECEPTACLE OUTLET		LOW VOLTAGE MULTI BUTTON CONTROL SWITCH (LETTER INDICATES CONTROL OF CORRESPONDING FIXTURES)		FIRE ALARM HORN/STROBE CEILING MOUNTED	
	220V RECEPTACLE OUTLET		CONTROLLING SWITCH (LETTER INDICATES CONTROL OF CORRESPONDING FIXTURES)		FIRE ALARM HORN/STROBE CEILING MOUNTED (LF = LOW FREQUENCY)	
	ISOLATED GROUND RECEPTACLE		OCCUPANCY SENSOR (CEILING MOUNTED)		FIRE ALARM HORN CEILING MOUNTED	
	RECEPTACLE FLOOR DEVICE		DUAL TECHNOLOGY OCCUPANCY SENSOR (CEILING MOUNTED)		FIRE ALARM HORN CEILING MOUNTED (LF = LOW FREQUENCY)	
	CEILING MOUNTED DEVICE		PASSIVE INFRARED OCCUPANCY SENSOR (CEILING MOUNTED)		SMOKE DETECTOR (SUBSCRIPT AS INDICATED BELOW)	
	SPECIAL RECEPTACLE		ROOM CONTROLLER		SMOKE ALARM BATTERY-BACKED	
	MOTOR OUTLET		DAYLIGHT SENSOR		SMOKE/CARBON MONOXIDE ALARM COMBO BATTERY-BACKED	
	EXHAUST FAN		PHOTOCELL		DUCT SMOKE DETECTOR	
	THERMOSTAT OUTLET		VOLUME CONTROL		SMOKE DETECTOR WITH ADDRESSABLE RELAY	
	REMOTE SENSOR OUTLET		WALL SPEAKER		SMOKE DETECTOR WITH SOUNDER BASE	
	TELEPHONE OUTLET		CEILING SPEAKER		HEAT DETECTOR	
	COMPUTER DATA OUTLET (#) INDICATES JACK QUANTITIES		SURVEILLANCE CAMERA		GAS DETECTOR	
	NETWORK AND VOICE OUTLET		SURVEILLANCE DIGITAL VIDEO RECORDER		CARBON MONOXIDE DETECTOR	
	WIRELESS ACCESS POINT CEILING MOUNTED		NURSE CALL ANNUNCIATOR PANEL		CARBON MONOXIDE/NITROGEN DIOXIDE SENSOR (GARAGE)	
	TELEVISION OUTLET		NURSE CALL EMERGENCY CALL DEVICE		ADA TWO-WAY COMMUNICATIONS SYSTEM	
			NURSE CALL EMERGENCY CALL LIGHT		ACCESS CONTROL KEY PAD	
					ACCESS CONTROL CARD READER	
					ACCESS CONTROL DOOR STRIKE	
					ACCESS CONTROL MAG LOCK	
					ACCESS CONTROL DOOR SENSOR	
					ACCESS CONTROL REQUEST TO EXIT	
					PUSHBUTTON	
					BELL	

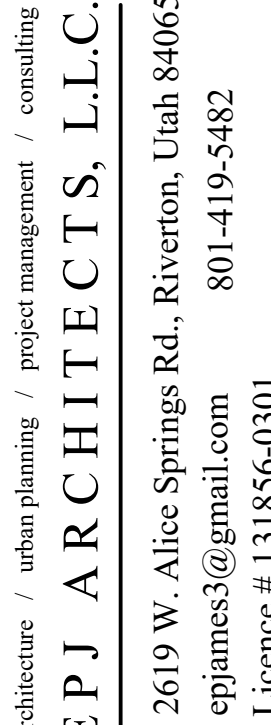
NOTE: ALL SYMBOLS MAY NOT BE USED.

1	PHASE	DISP	DISPOSAL	LRA	LOCKED ROTOR AMPS	PV	PHOTOVOLTAIC
1	SINGLE PHASE	DRY	DRYER	LTG	LIGHTING	PVC	POLYVINYL CHLORIDE
2P	TWO-POLE	DW	DISHWASHER	MATV	MASTER ANTENNA TELEVISION	(R)	RELOCATE
3	THREE PHASE	DWG	DRAWING	MAX	MAXIMUM	RECP	RECEPTACLE
4P	FOUR-POLE	EC	EMPTY CONDUIT	MB	MAIN BUS	REF	REFRIGERATOR
AC	ALTERNATING CURRENT	EM	EMERGENCY	MCB	MAIN CIRCUIT BREAKER	REQ	REQUIRED
AFB	ABOVE FINISHED FLOOR	EMG	EMERGENCY GENERATOR	MCC	MOTOR CONTROL CENTER	RLA	RATED LOAD AMPS
AFG	ABOVE FINISHED GRADE	EMT	ELECTRICAL METALLIC TUBING	MCM	1000 CIRCULAR MILLS	RMS	ROOT MEAN SQUARE
AFP	ARC FAULT PROTECTOR	EPO	EMERGENCY POWER OFF	MH	MANHOLE	SE	SERVICE ENTRANCE
AHJ	AUTHORITY HAVING JURISDICTION	EWG	ELECTRIC WATER COOLER	MC	MICROPHONE	SPD	SURGE PROTECTION DEVICE
AIC	AMP INTERRUPTING CURRENT (SYMMETRICAL)	EWL	ELECTRIC WATER HEATER	MIN	MINIMUM	SPEC	SPECIFICATION
		AL	ALUMINUM	ML	EXISTING	SPK	SPEAKER
AM	AMPS METER	(F)	FUTURE	MNF	MANUFACTURER	SS	SELECTOR SWITCH
AMP	AMPERE	FA	FIRE ALARM	MTG	MOUNTING	SW	SWITCH
ANN	ANNUNCIATOR	FACP	FIRE ALARM CONTROL PANEL	MTR	MOTOR	SWBD	SWITCHBOARD
ATS	AUTOMATIC TRANSFER SWITCH	FC	FOOT CANDLE	MR	MICROWAVE	SWGR	SWITCHGEAR
AUX	AUXILIARY	FLA	FULL LOAD AMPS	(N)	NEW	TB	TELEPHONE TERMINAL BOARD
AWG	AMERICAN WIRE GAUGE	FT	FOOT	NA	NOT APPLICABLE	TBC	TELEPHONE TERMINAL CABINET
BC	BARE COPPER	FRZ	FREEZER	NC	NORMALLY CLOSED	TV	TELEVISION
BFG	BELOW FINISH GRADE	FS	FUSED SWITCH	NEC	NATIONAL ELECTRICAL CODE	TYP	TYPICAL
C	CONDUIT	GFAF	DUAL FUNCTION GFCI/AFCI CIRCUIT BREAKER	NEMA	NATIONAL MANUFACTURING ASSOCIATION	UG	UNDERGROUND
CAB	CABINET	GFCI	GROUND FAULT CIRCUIT INTERRUPTER	NFPA	NATIONAL FIRE CODE	UNO	UNLESS NOTED OTHERWISE
CABT	COMMUNITY ANTENNA TELEVISION	GFEF	GROUND-FAULT EQUIPMENT PROTECTION	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION	UPS	UNINTERRUPTIBLE POWER SUPPLY
CAV	CABLE TELEVISION	GFP	GROUND FAULT PROTECTOR	NFS	NON FUSED SWITCH	V	VOLT (K=KILOVOLT)
CFKI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED	GRC	GALVANIZED RIGID CONDUIT	NC	NOT IN CONTRACT	VA/R	VOLT-AMPS/REACTIVE
CKT	CIRCUIT	GRD	GROUND	NL	NIGHT LIGHT	VM	VOLT METER
CLG	CEILING	HP	HORSE POWER	NO	NORMALLY OPEN	W	WATTS
CNTR	CONTRACTOR	HZ	HERTZ	NTS	NOT TO SCALE	W/	WITH
CONV	CONVENIENCE OUTLET	IG	ISOLATED GROUND	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED	WASH	WASHER
CT	COMPUTER TERMINAL	IM	INTERMEDIATE METALLIC CONDUIT	OFOW	OWNER FURNISHED OWNER INSTALLED	WH	WATTHOUR
CR	CURRENT TRANSFORMER	IN	INCH	OS&Y	OUTSIDE SCREW AND YOKE	W/O	WITHOUT
CU	COPPER	J-BOX	JUNCTION BOX	PB	PUSH BUTTON	WP	WEATHER PROOF
C/W	CONDUIT WITH	KV	KILOVOLT	PF	POWER FACTOR	XFMR	TRANSFORMER
(D)	DEMOLISH/DELETE	KVA	KILOVOLT AMPERES	PFR	PHASE FAILURE RELAY	XFMR-SW	TRANSFORMER SWITCH
DB	DECIBEL	KVAR	KILOVAR	PNL	PANEL	XP	EXPLOSION PROOF

NOTE: THIS IS A TYPICAL ABBREVIATION LIST. NOT ALL ABBREVIATIONS MAY BE USED ON THIS PROJECT.

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ELECTRICAL TEAM LEAD:	RYAN BEAGLES
ELECTRICAL DESIGNER:	ELLJOTT BREINHOLT

SHEET NUMBER	SHEET TITLE
E000	ELECTRICAL COVER SHEET
ES100	PHOTOMETRIC SITE PLAN
ES101	ELECTRICAL SITE PLAN
E101	PARKING & RETAIL LEVEL POWER PLAN
E102	2ND LEVEL POWER PLAN
E103	3RD LEVEL POWER PLAN
E104	ROOF POWER PLAN
E151	PARKING & RETAIL LEVEL LIGHTING PLAN
E152	2ND LEVEL LIGHTING PLAN
E153	3RD LEVEL LIGHTING PLAN
E401	TYPICAL UNIT ELECTRICAL PLANS
E501	ELECTRICAL DIAGRAMS
E502	ELECTRICAL WIRING DIAGRAMS
E503	ELECTRICAL INSTALLATION DETAILS
E601	ELECTRICAL SCHEDULES
E602	ELECTRICAL SCHEDULES
E603	ELECTRICAL SCHEDULES
E701	ELECTRICAL SPECIFICATIONS



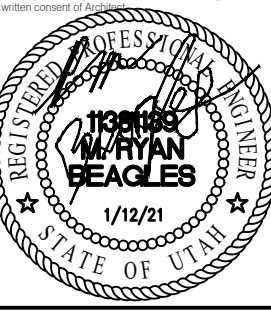
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ELECTRICAL
COVER SHEET

1	06/05/20	
2	06/26/20	Changes per WC# Plan Chk.
3	07/08/20	Changes per WC# Plan Chk.

PROJECT: A-19-001
SCALE (11x17): 1/16"=1'-0"
SCALE: (24x36): 1/8"=1'-0"
CHECKED BY: RB
DATED: 03/03/2020

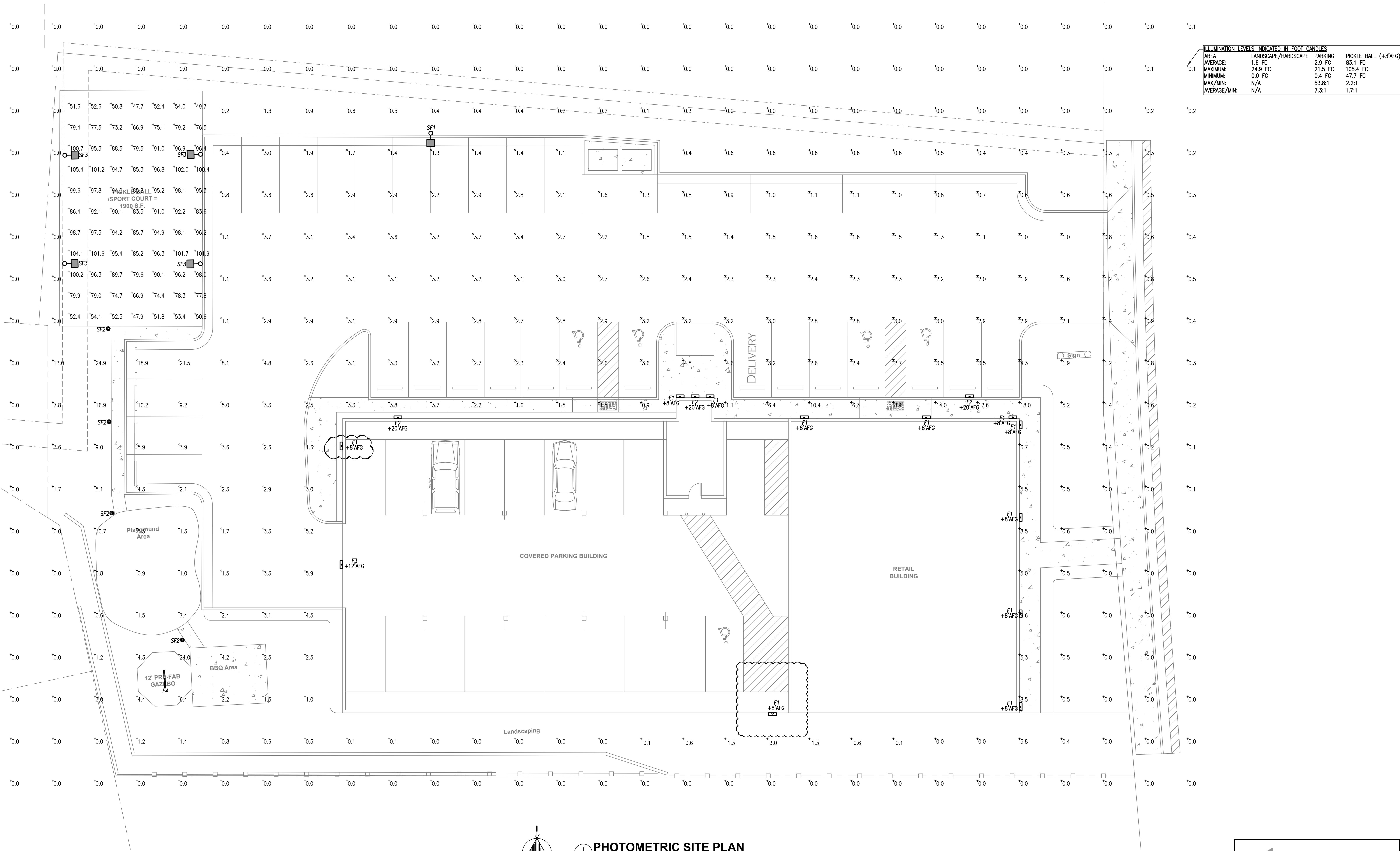


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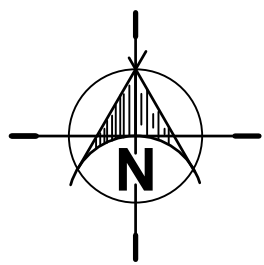


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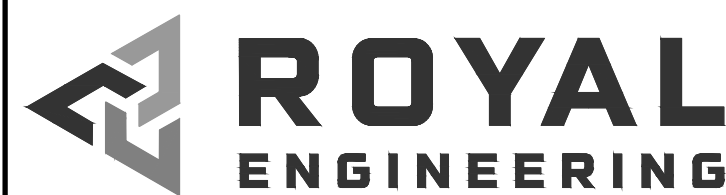


ILLUMINATION LEVELS INDICATED IN FOOT CANDLES			
AREA	LANDSCAPE/HARDSCAPE	PARKING	PICKLE BALL (+3'AFG)
AVERAGE:	1.6 FC	2.9 FC	83.1 FC
MAXIMUM:	24.9 FC	21.5 FC	105.4 FC
MINIMUM:	0.0 FC	0.4 FC	47.7 FC
MAX/MIN:	N/A	53.8:1	2.2:1
AVERAGE/MIN:	N/A	7.3:1	1.7:1



1
ES100 SCALE: 1" = 10'-0"

PHOTOMETRIC SITE PLAN

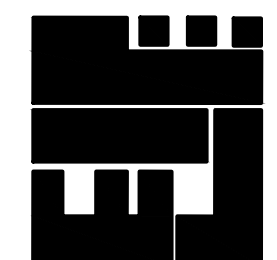


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PHONE: 801.375.2228

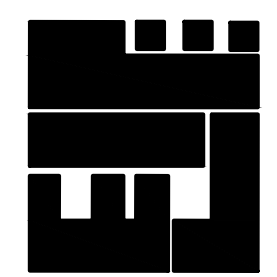
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MIXED USE SITE
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PHOTOMETRIC
SITE PLAN

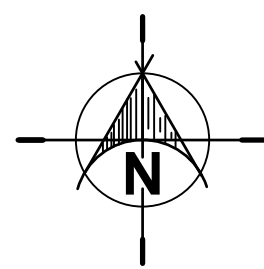
MARK	DATE	DESCRIPTION
1	06/05/20	Changes per WC# Plan Chk.
2	06/26/20	Changes per WC# Plan Chk.
3	07/06/20	Changes per WC# Plan Chk.

PROJECT: A-19-001
SCALE (11x17): 1/16" = 1'-0"
SCALE (24x36): 1/8" = 1'-0"
CHECKED BY: RB
ISSUED: 03/03/2020

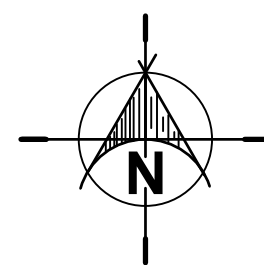
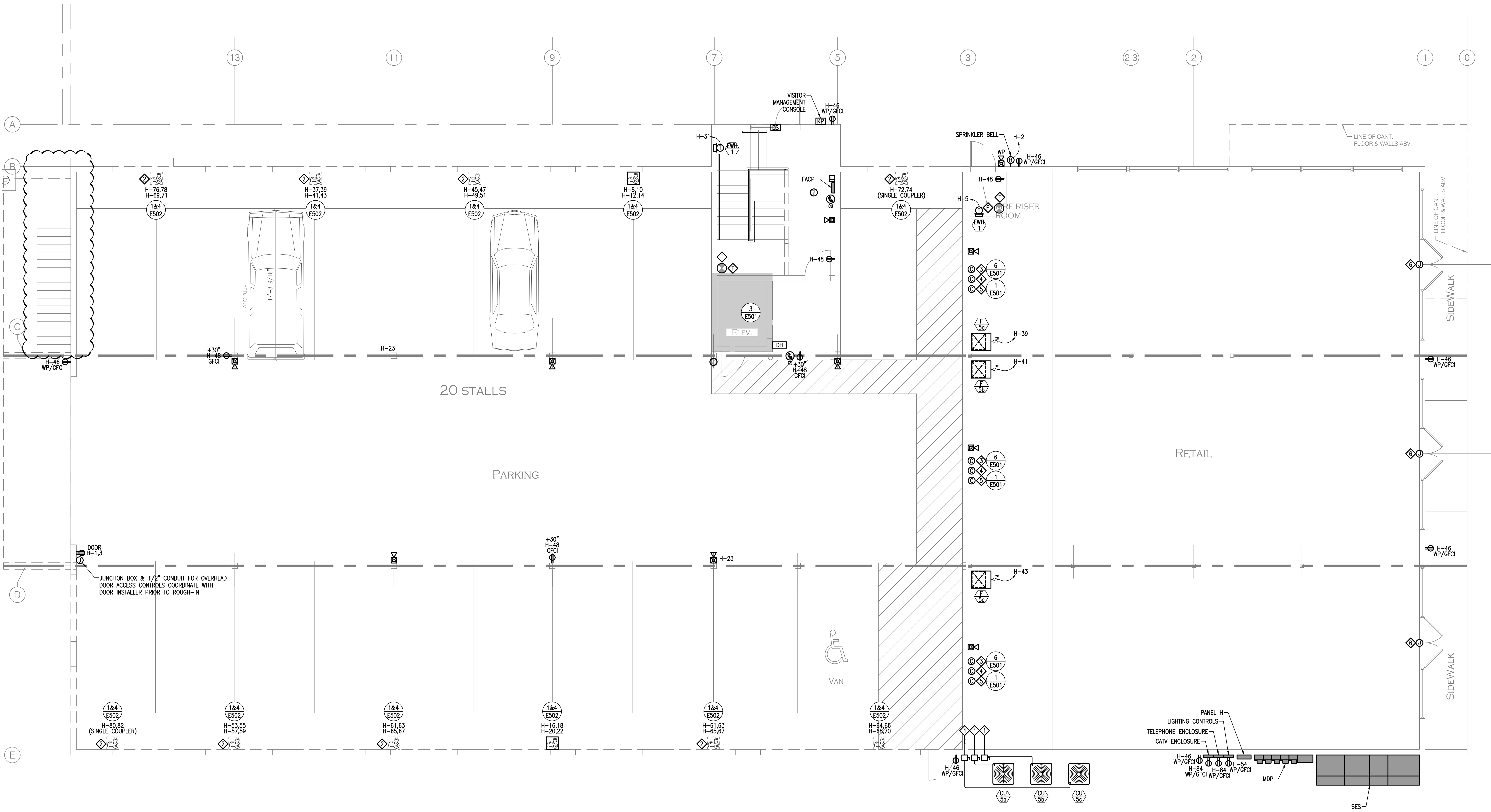


SHEET

ES100



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1 PARKING & RETAIL LEVEL POWER PLAN
E101 SCALE: 3/16" = 1'-0"

ELECTRICAL KEYED NOTES:

- ◆ FINAL CONNECTION TO BE MADE TO TENANT PANEL DURING TENANT IMPROVEMENT.
- ◆ PROVIDE PROVISIONS FOR FUTURE ELECTRIC VEHICLE CHARGING STATION AS DIRECTED BY OWNER.
- ◆ PROVIDE POWER CONDUIT TO RETAIL CEILING SPACE FOR FUTURE TENANT ELECTRICAL PANEL.
- ◆ PROVIDE POWER CONDUIT TO RETAIL CEILING SPACE FOR FUTURE AUTOMATIC TRANSFER SWITCH.
- ◆ PROVIDE COMMUNICATIONS CONDUIT TO RETAIL CEILING SPACE FOR FUTURE TENANT SPACE TELEPHONE TERM BOARD.
- ◆ PROVIDE WEATHERPROOF JUNCTION BOX AND 1" CONDUIT INTO TENANT CEILING SPACE FOR FUTURE TENANT SIGNAGE.

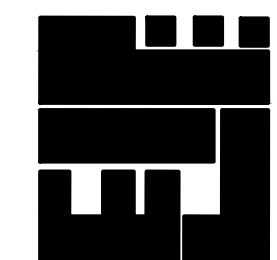


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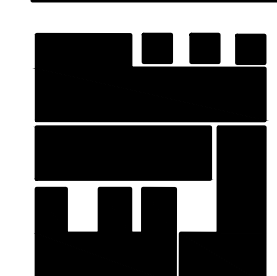
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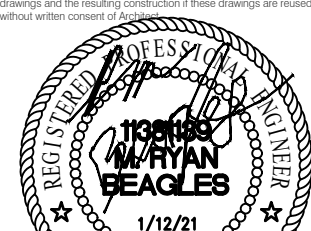
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4572 S. & 4600 S. 900 EAST
MILLCREEK, UTAH 84107
Contacts:
Mehran 801-408-9382
Jay Mirraile 801-408-9382
Mehranjan@arml.com
JMirrall@arml.com

PARKING &
RETAIL LEVEL
POWER PLAN

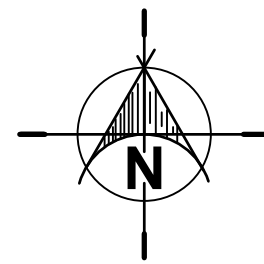
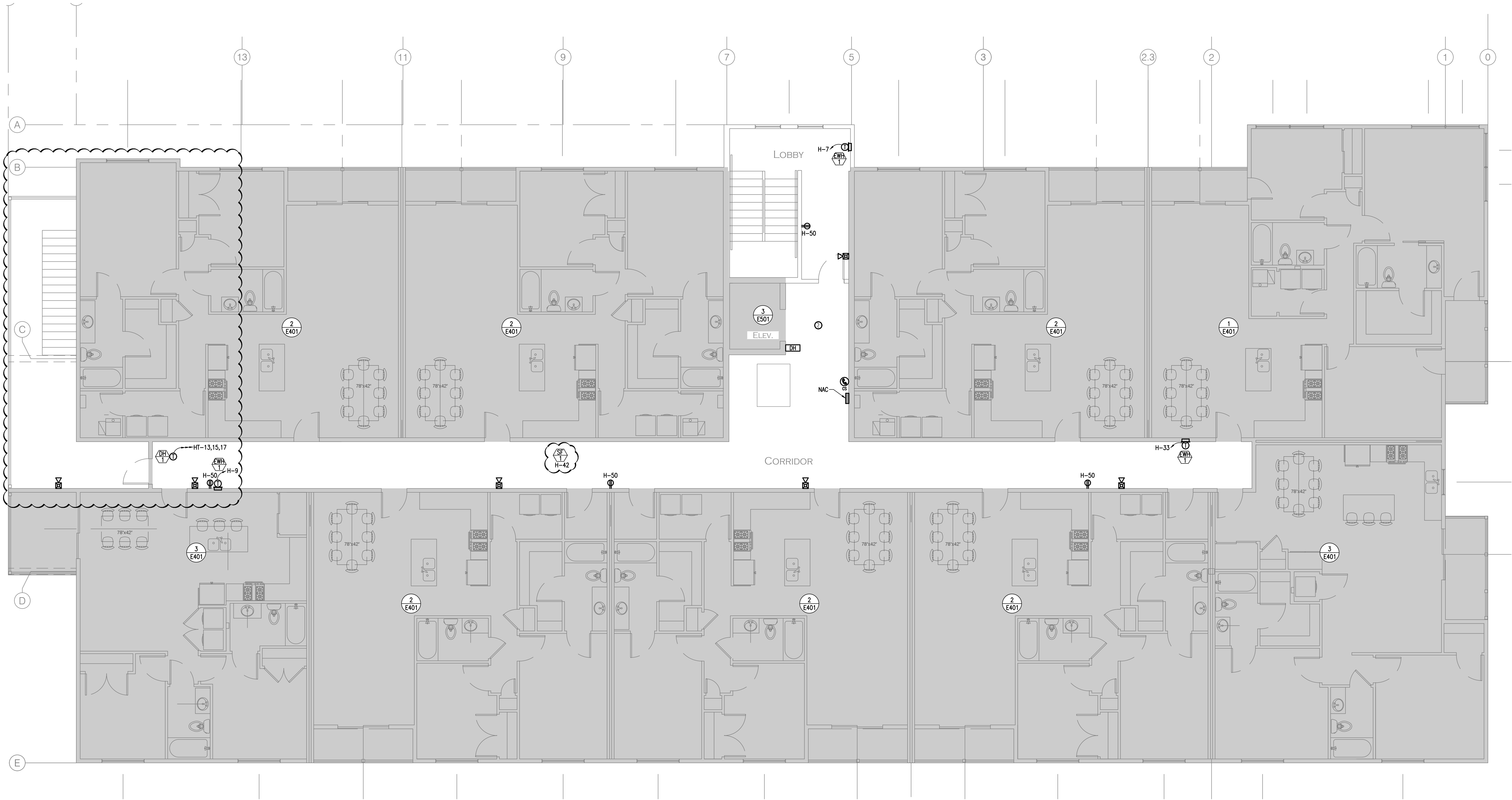
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2	06/26/20	Changes per WC# Plan Chk.
3	07/06/20	Changes per WC# Plan Chk.

PROJECT: A-19-001
SCALE (11x17): 1/16" = 1'-0"
SCALE (24x36): 1/8" = 1'-0"
CHECKED BY: RB
ISSUED: 03/03/2020

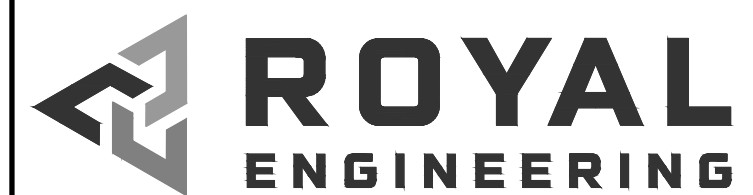


SHEET

E101



1 2ND LEVEL POWER PLAN
E102 SCALE: 3/16" = 1'-0"

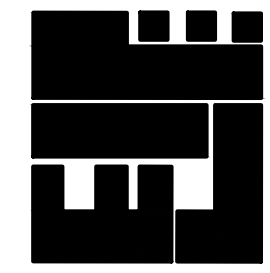


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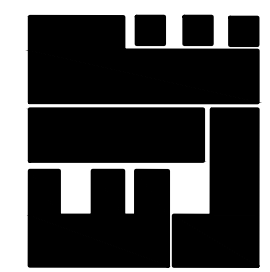
MECHANICAL
PROVO, UTAH 84606
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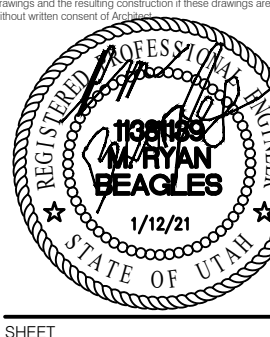
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JMirrallie@gmail.com
801-808-9382

2ND LEVEL
POWER PLAN

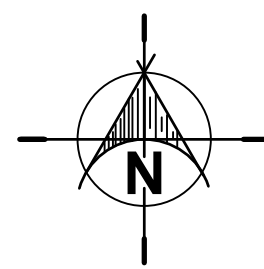
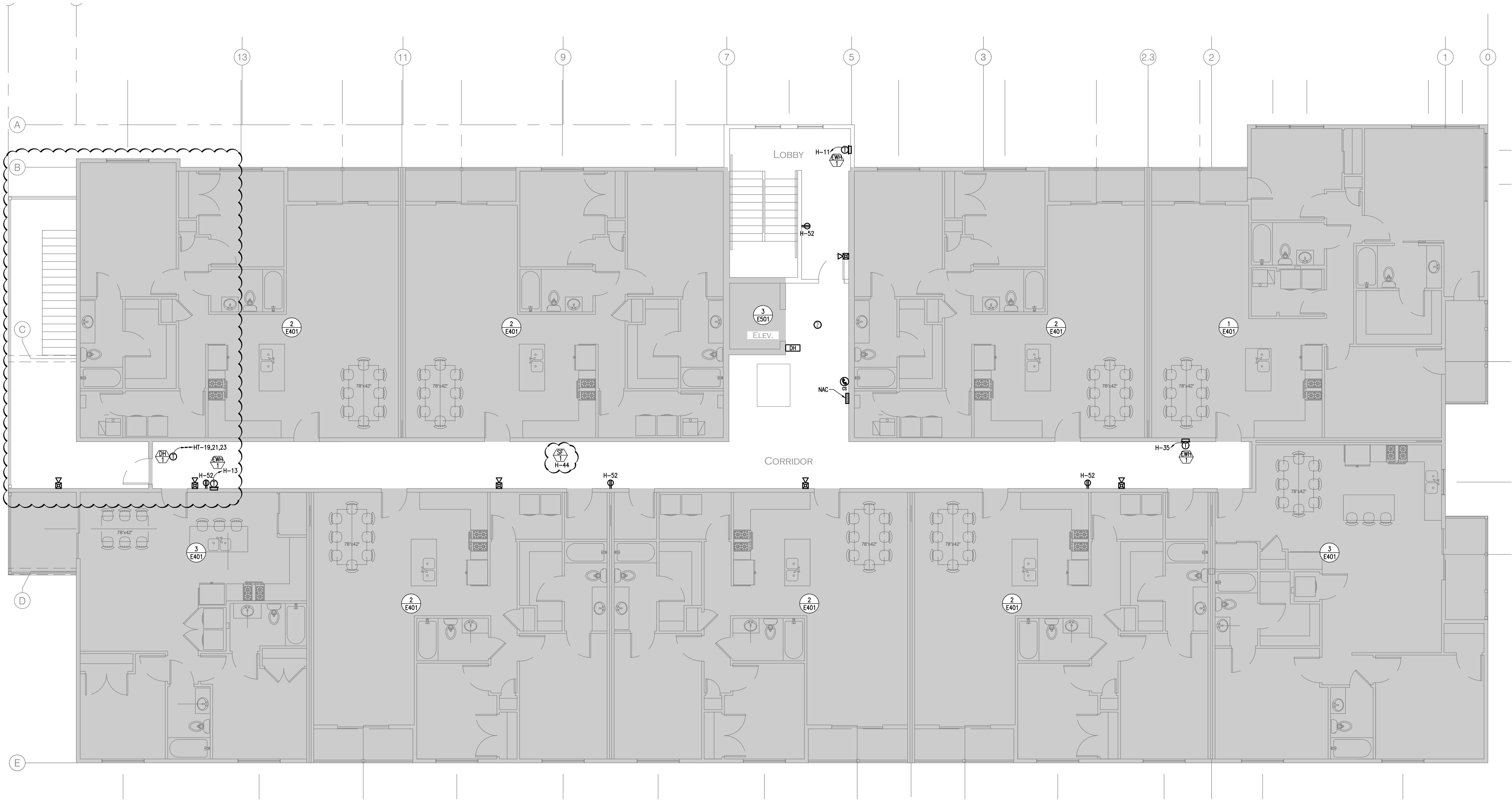
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2	06/26/20	Changes per WC# Plan Chk.
3	07/06/20	Changes per WC# Plan Chk.

PROJECT: A-19-001
SCALE (11x17): 1/16" = 1'-0"
SCALE (24x36): 1/8" = 1'-0"
CHECKED BY: RB
ISSUED: 03/03/2020

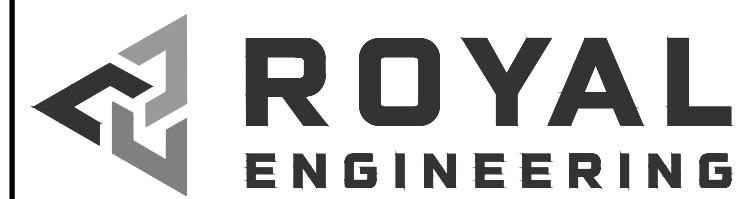


SHEET

E102



1 3RD LEVEL POWER PLAN
E103 SCALE: 3/16" = 1'-0"

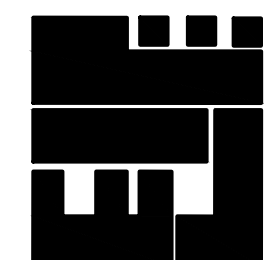


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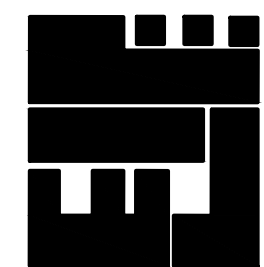
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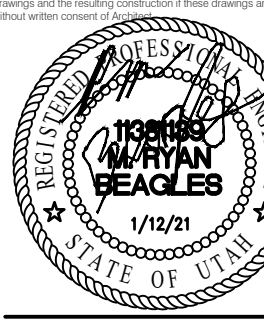
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Contacts:
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Mehranjan@me.com
JMirrallie@gmail.com
801-808-9382

3RD LEVEL
POWER PLAN

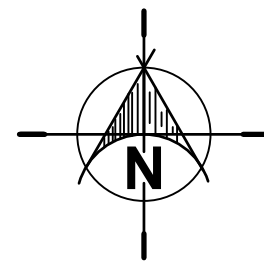
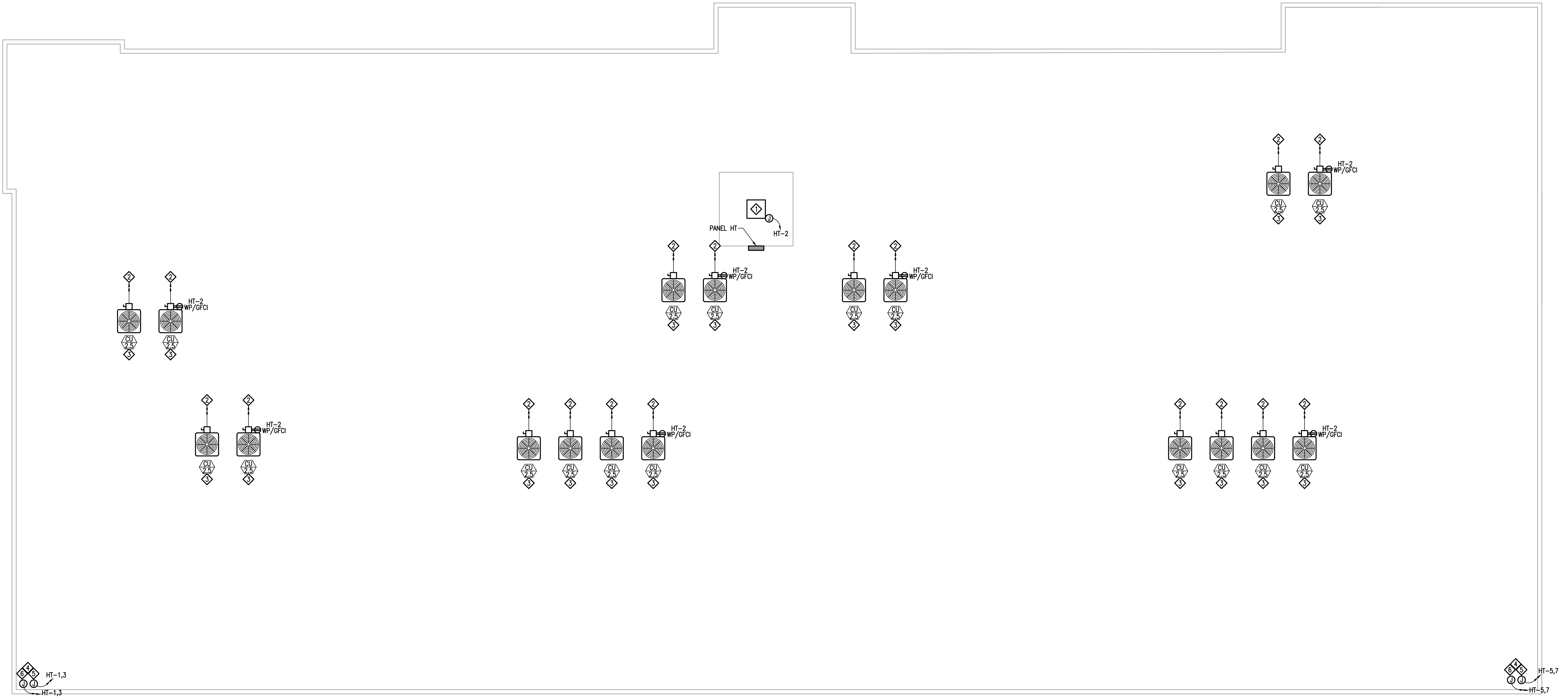
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2	06/26/20	Changes per WC# Plan Chk.
3	07/06/20	Changes per WC# Plan Chk.

PROJECT: A-19-001
SCALE (11x17): 1/16" = 1'-0"
SCALE (24x36): 1/8" = 1'-0"
CHECKED BY: RB
ISSUED: 03/03/2020



SHEET

E103

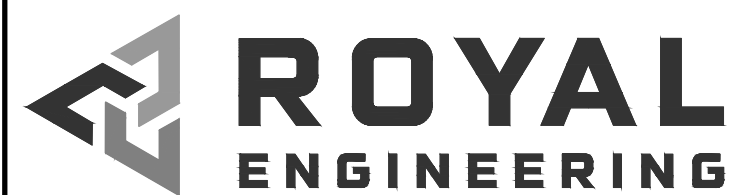


1
E104 SCALE: 3/16" = 1'-0"

ROOF POWER PLAN

ELECTRICAL KEYED NOTES:

- ◇ PROVIDE POWER TO AND FACP INTERLOCK, IF REQUIRED, FOR ELEVATOR SHAFT VENT SMOKE DAMPER MOTOR.
- ◇ SEE FLOOR PLANS, UNIT PLANS, LOAD CENTER SCHEDULES, AND PANEL SCHEDULES FOR CIRCUIT DESIGNATIONS. COORDINATE MECHANICAL EQUIPMENT UNIT ASSOCIATION WITH MECHANICAL CONTRACTOR.
- ◇ SEE MECHANICAL PLANS FOR CONDENSING UNIT DESIGNATIONS AND UNITS SERVED.
- ◇ CONTRACTOR SHALL PROVIDE AND INSTALL HEAT TAPE (RAYCHEM GM-1XT) AND ACCESSORIES REQUIRED FOR COMPLETE INSTALLATION. PROVIDE LENGTH SUFFICIENT TO INSTALL HEAT CABLE ALONG SOUTH SIDE OF BUILDING IN GUTTER AND (2) DOWNSPOUTS. COORDINATE EXACT LENGTHS WITH ARCHITECTURAL ROOF PLAN AND ELEVATIONS. PROVIDE GFEP PROTECTION FOR HEAT TAPE CIRCUIT AS REQUIRED BY NEC 426.28. PROVIDE AMBIENT THERMOSTAT (RAYCHEM AMC-F5) TO CONTROL EACH BRANCH CIRCUIT.
- ◇ JUNCTION BOX FOR HEAT CABLE SENSOR. VERIFY LOCATION WITH OWNER PRIOR TO ROUGH-IN.
- ◇ JUNCTION BOX FOR HEAT CABLE POWER. VERIFY LOCATION WITH OWNER PRIOR TO ROUGH-IN.

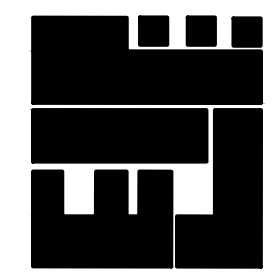


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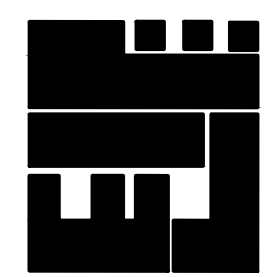
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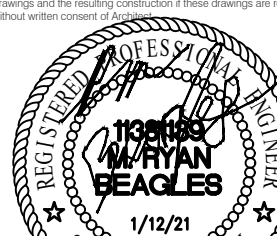
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ROOF POWER
PLAN

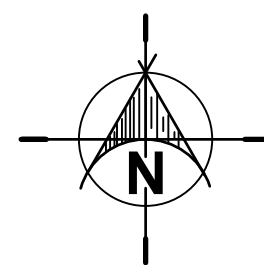
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2	06/26/20	Changes per WC# Plan Chk.
3	07/06/20	Changes per WC# Plan Chk.

PROJECT: A-19-001
SCALE (11x17): 1/16" = 1'-0"
SCALE (24x36): 1/8" = 1'-0"
CHECKED BY: RB
ISSUED: 03/03/2020



SHEET

E104



① INTERIOR LIGHTING IN RETAIL AREA TO BE PROVIDED WITH FUTURE TENANT IMPROVEMENT(S).

② AIM LIGHT FIXTURE AT BUILDING ADDRESS SIGNAGE.



ROYAL
ENGINEERING

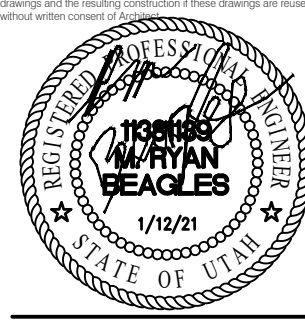
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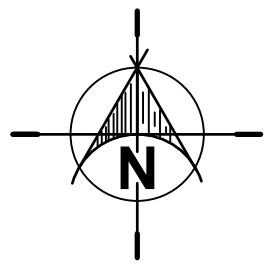
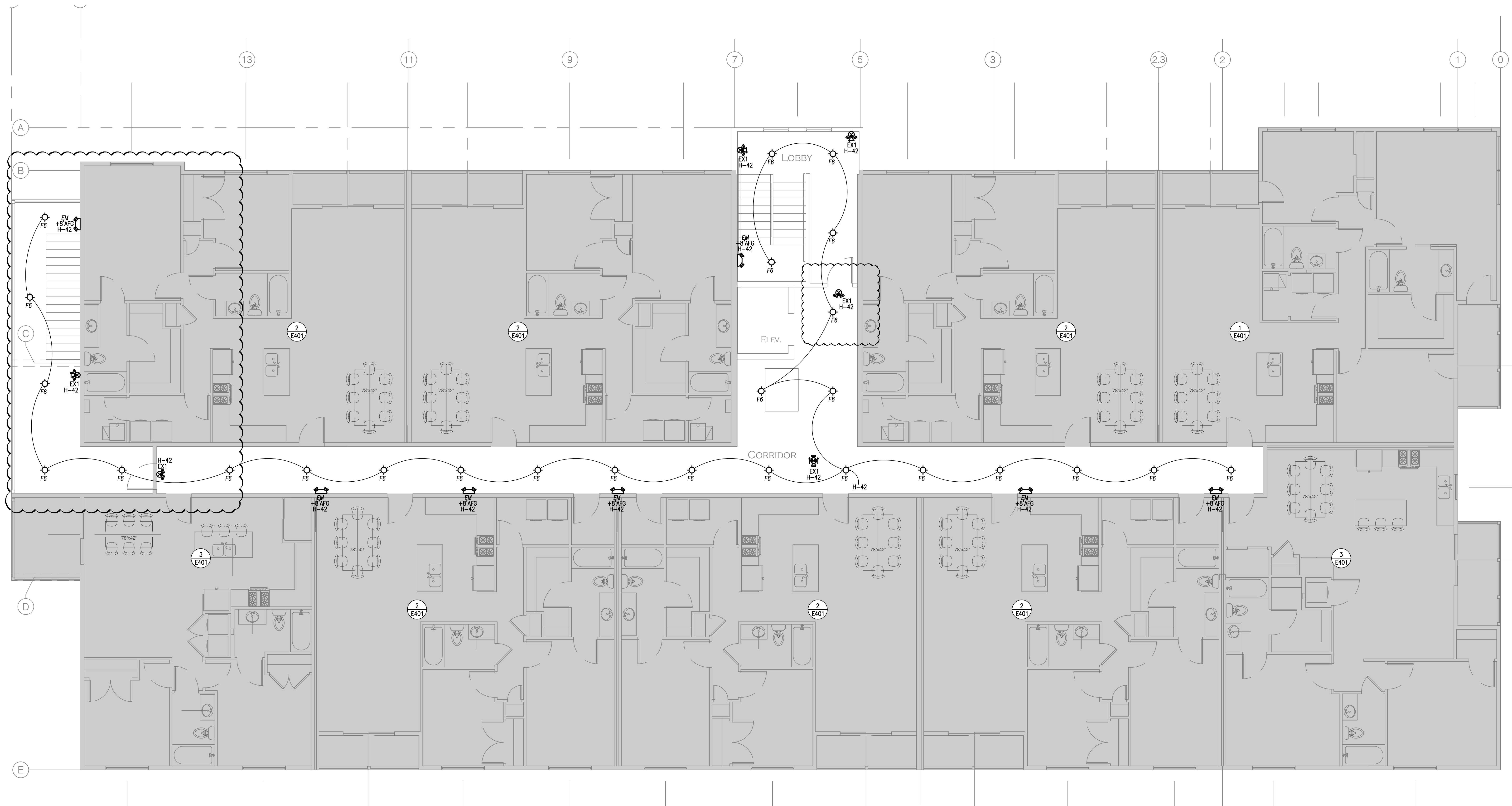
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PROJECT: A-19-001
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SCALE: (24x36): 1/8" = 1'-0"
CHECKED BY: RB
ISSUED: 03/03/2020

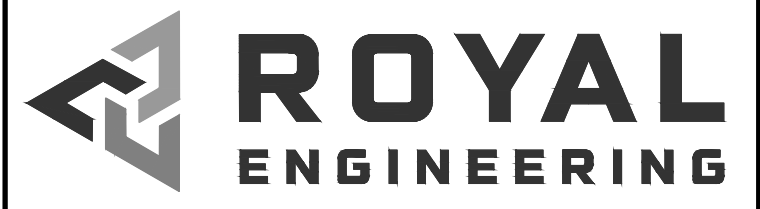


SHEET

E151



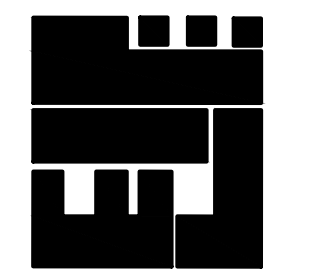
1 2ND LEVEL LIGHTING PLAN
E152 SCALE: 3/16" = 1'-0"



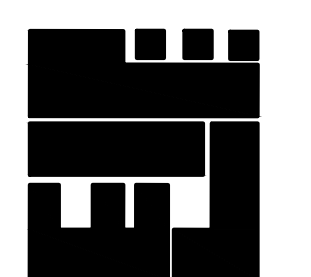
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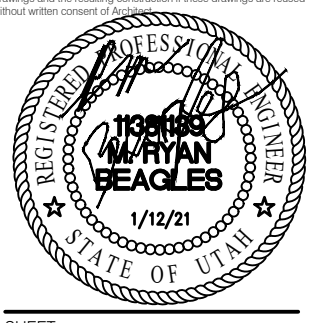
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Contacts: Mehman 801-408-9382 Mehmanjan@me.com
Jay Mirraie jmirraie@gmail.com

2ND LEVEL LIGHTING PLAN

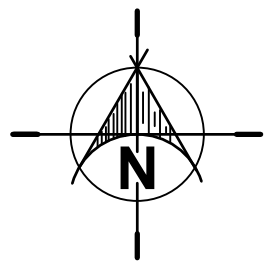
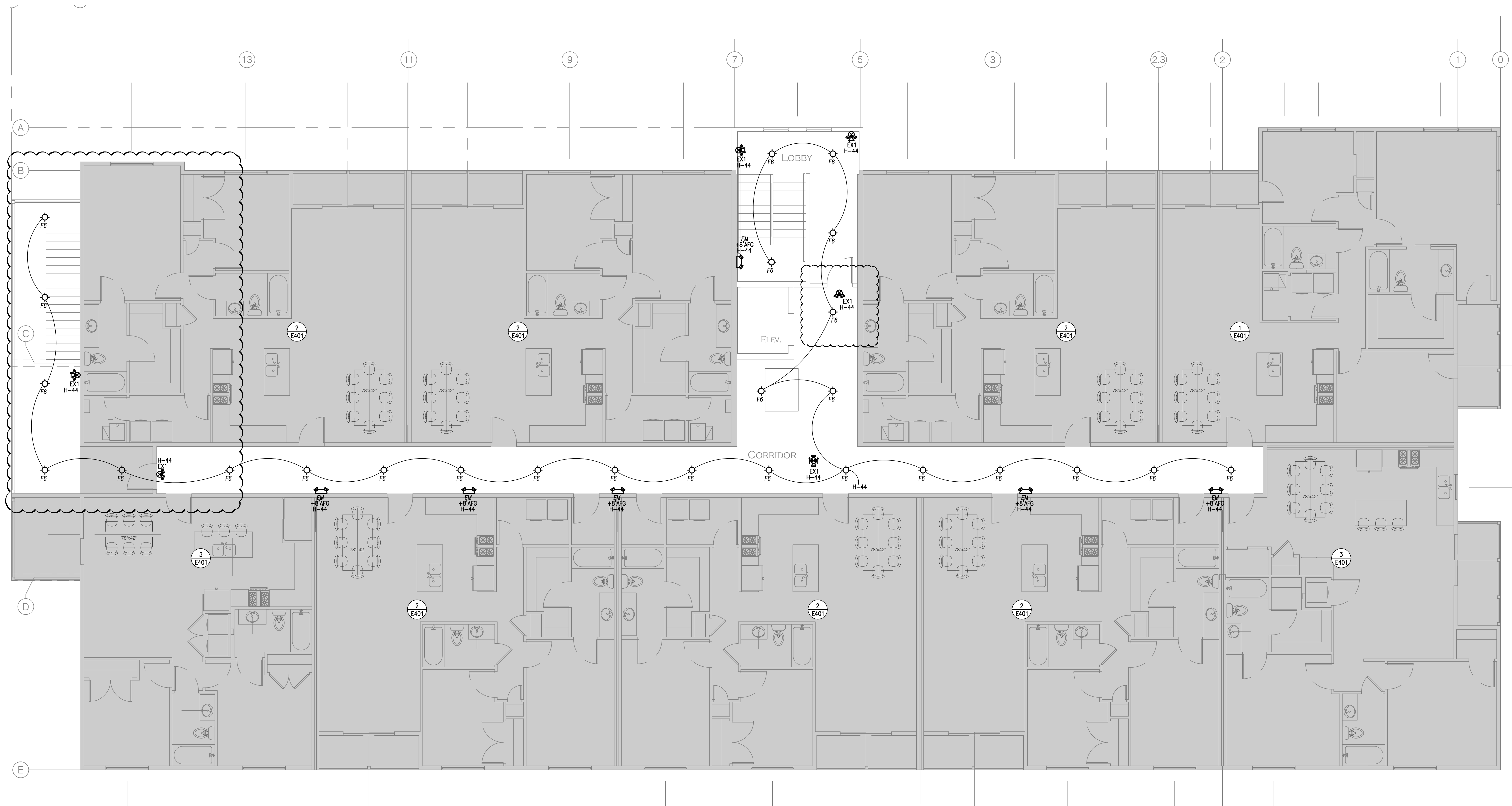
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3	07/06/20	Changes per WC# Plan Chk.

PROJECT: A-19-001
SCALE (11x17): 1/16" = 1'-0"
SCALE (24x36): 1/8" = 1'-0"
CHECKED BY: RB
ISSUED: 03/03/2020

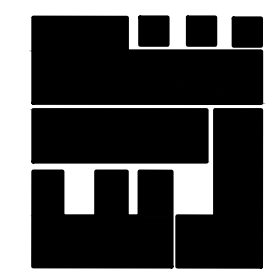


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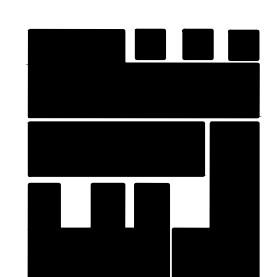
E152



1 3RD LEVEL LIGHTING PLAN
E153 SCALE: 3/16" = 1'-0"



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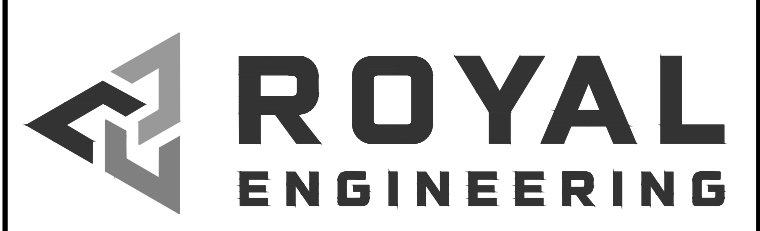
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Contacts: Mehman 801-908-9382
Jay Mirraie JMirrallie@gmail.com

3RD LEVEL
LIGHTING PLAN

MARK	DATE	DESCRIPTION
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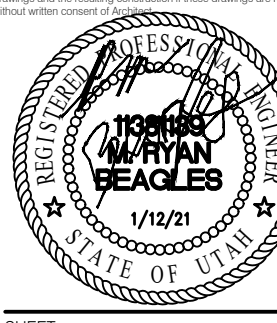
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SCALE (24x36): 1/8" = 1'-0"
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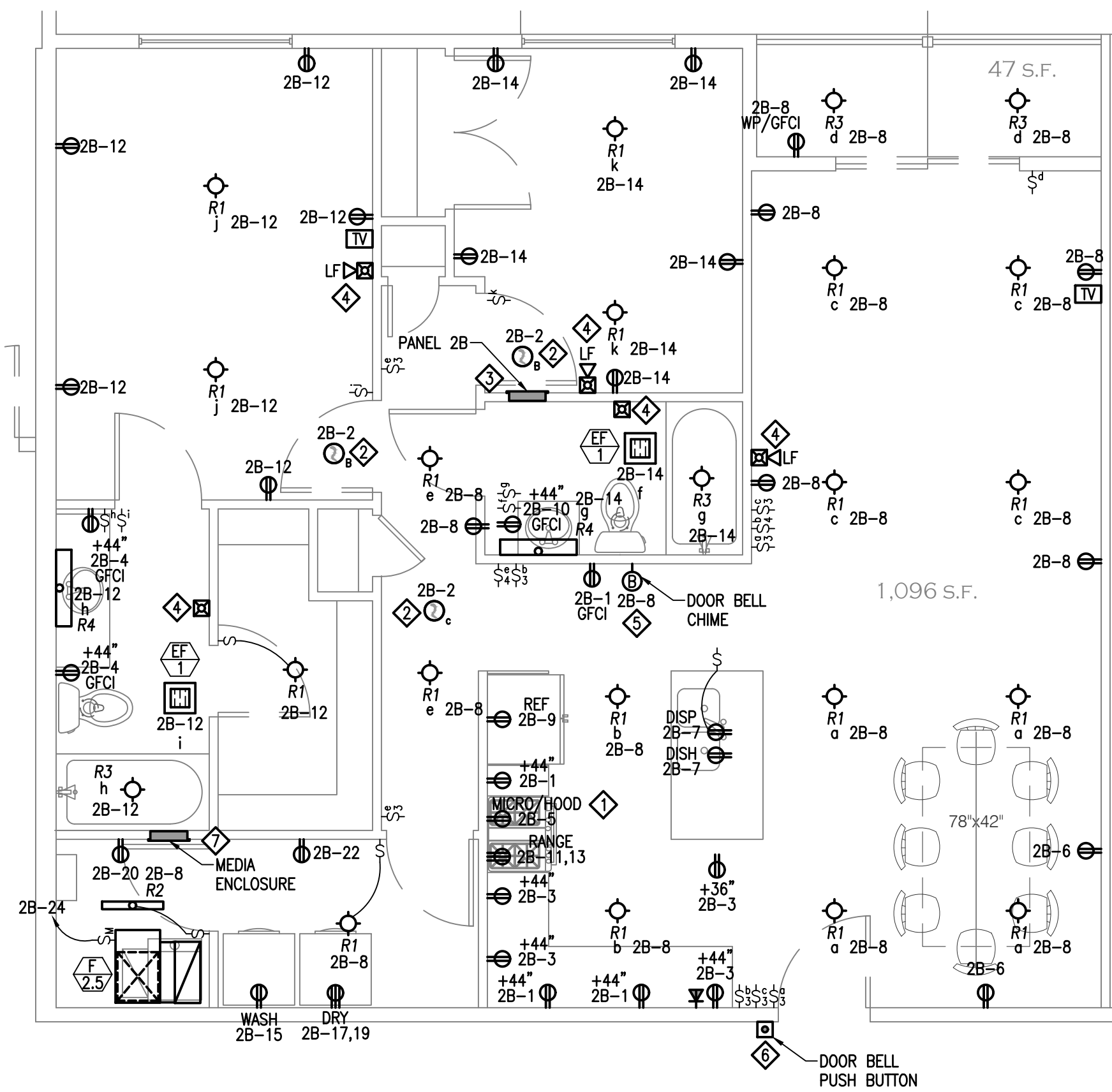
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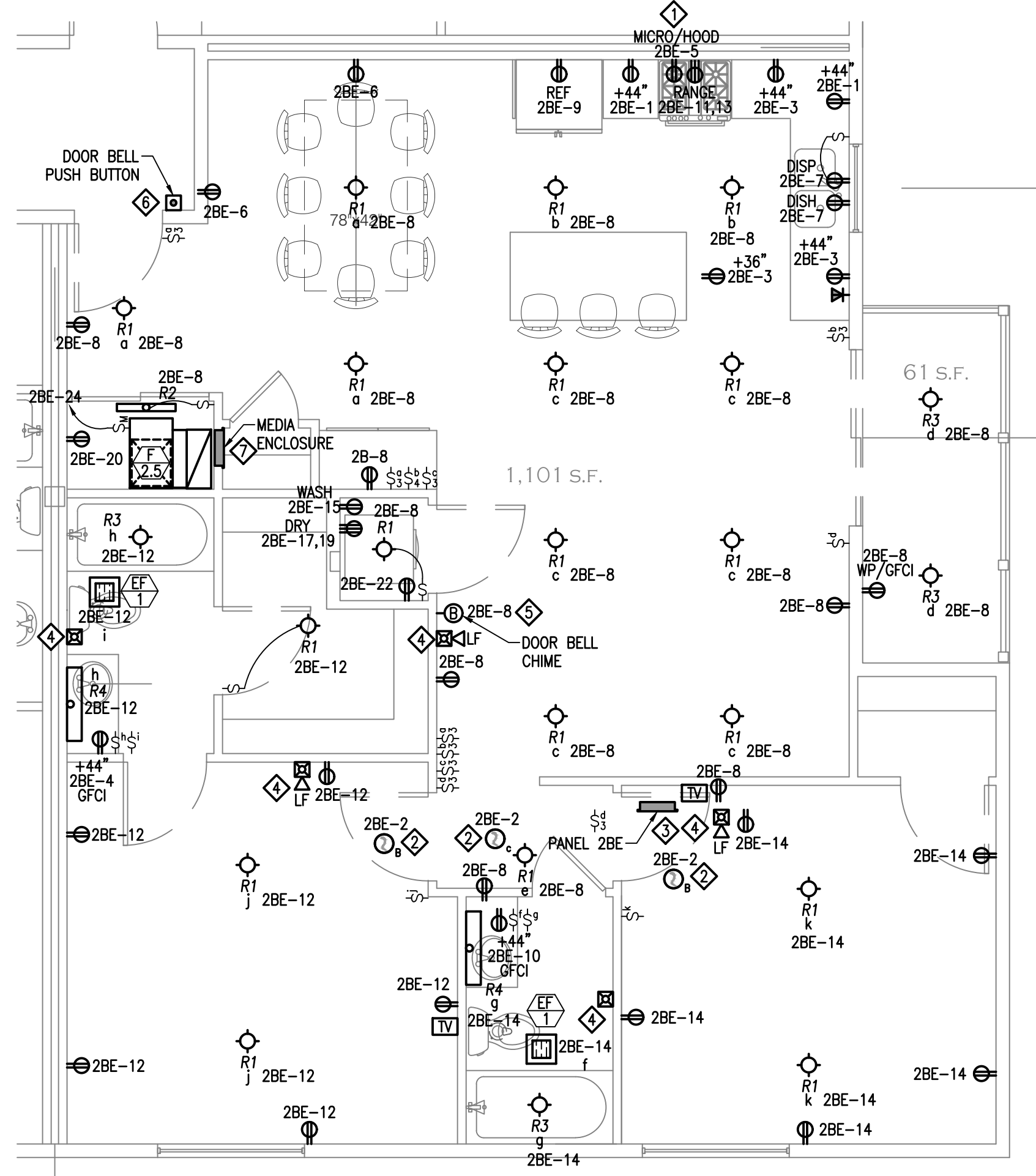


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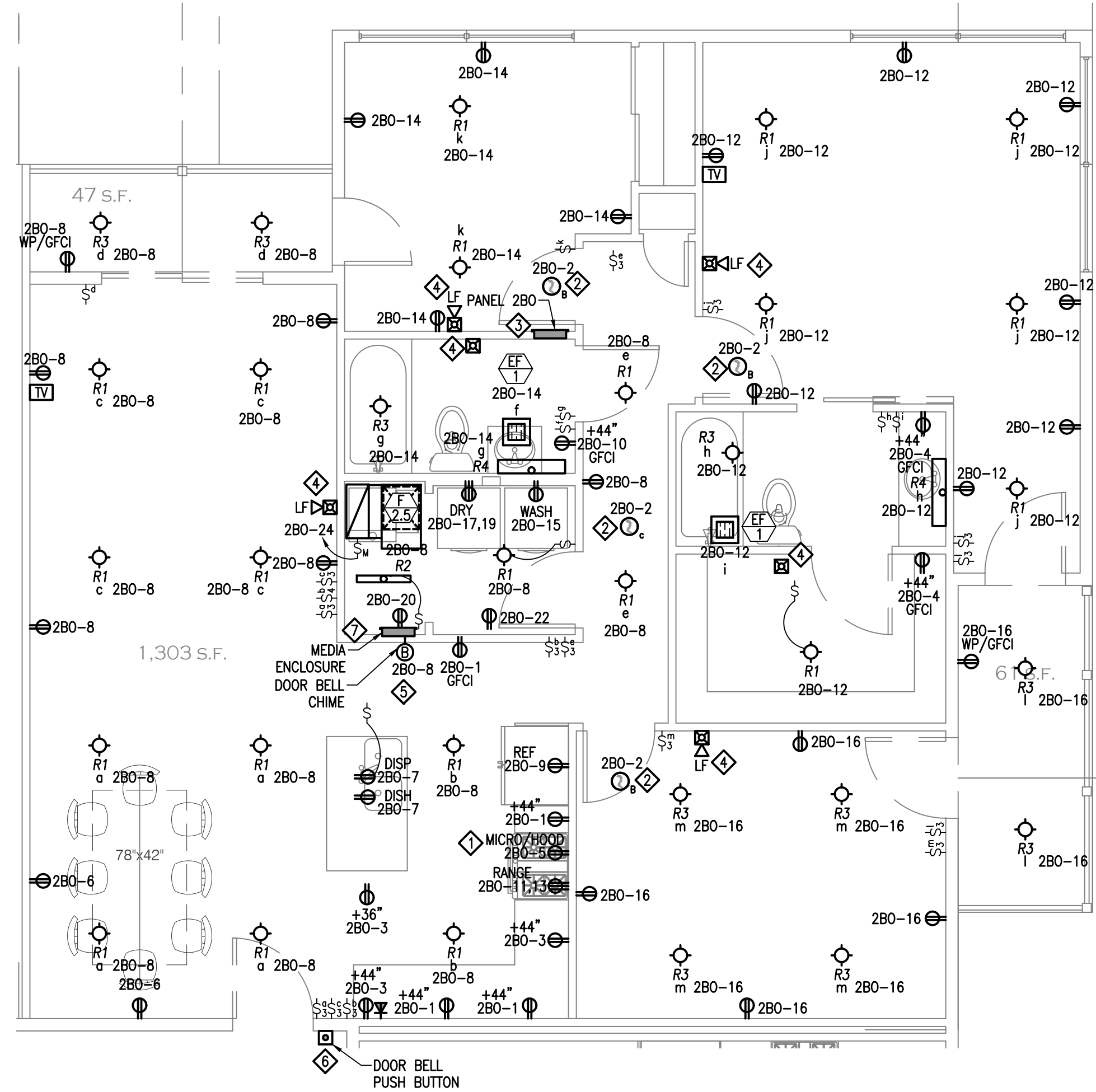
E153



2 TYPICAL UNIT ELECTRICAL PLAN - 2 BEDROOM UNIT
E401 SCALE: 1/4" = 1'-0"



3 TYPICAL UNIT ELECTRICAL PLAN - 2 BEDROOM UNIT END
E401 SCALE: 1/4" = 1'-0"



1 TYPICAL UNIT ELECTRICAL PLAN - 2 BEDROOM + OFFICE
E401 SCALE: 1/4" = 1'-0"

ELECTRICAL KEYED NOTES:

- ◆ RECEPTACLE FOR HOOD IN ADA UNITS OR MICROWAVE IN NON-ADA UNITS. VERIFY MOUNTING HEIGHT WITH CABINET INSTALLER PRIOR TO ROUGH-IN.
- ◆ PROVIDE AUDIBLE/VISUAL SINGLE STATION SMOKE ALARM AND SMOKE/CO ALARM IN ADA UNITS.
- ◆ MOUNT ADA DWELLING UNIT LOAD CENTERS +48" AFF MAX TO TOP CIRCUIT BREAKER. SEE ELECTRICAL DEVICE MOUNTING HEIGHT INSTALLATION DETAIL FOR REQUIREMENTS.
- ◆ PROVIDE FIRE ALARM STROBE IN BEDROOMS AND HORN/STROBES IN BEDROOMS AND LIVING ROOMS IN ADA UNITS. PROVIDE HORN IN BEDROOMS AND LIVING ROOMS IN NON-ADA UNITS.
- ◆ DOOR BELL CHIME (ADA UNITS ONLY).
- ◆ DOOR BELL PUSH BUTTON (ADA UNITS ONLY).
- ◆ MEDIA ENCLOSURE. VERIFY FINAL LOCATION WITH OWNER PRIOR TO ROUGH-IN. PROVIDE RECEPTACLE FOR MEDIA ENCLOSURE.



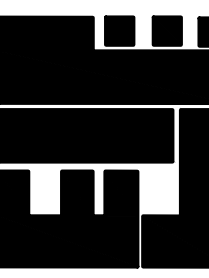
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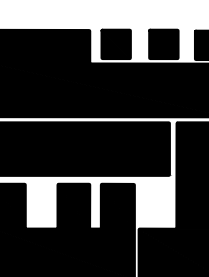
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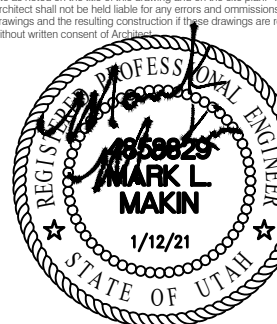
4572 S. & 4600 S. 900 EAST
MILLCREEK, UTAH 84107

Contacts:
Mehran 801-908-9382
Jay Mirraie jmirraie@gmail.com

**TYPICAL UNIT
ELECTRICAL
PLANS**

MARK:	DATE:	DESCRIPTION:
1	06/05/20	Changes per WC# Plan Chk.
2	06/26/20	Changes per WC# Plan Chk.
3	07/06/20	Changes per WC# Plan Chk.

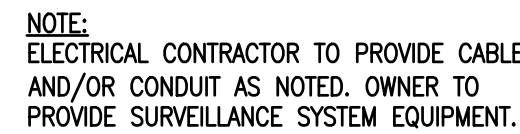
PROJECT: A-19-001
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SCALE (24x36): 1/8" = 1'-0"
CHECKED BY: RB
ISSUED: 03/03/2020



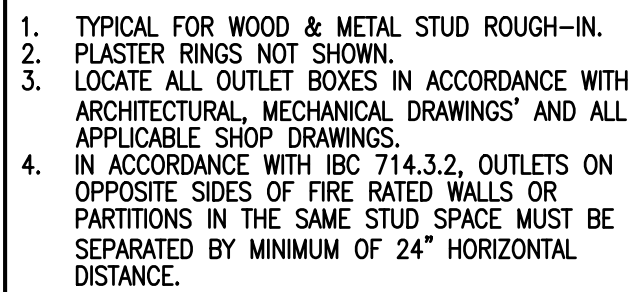
MARK L. MARKIN
1/12/21

SHEET

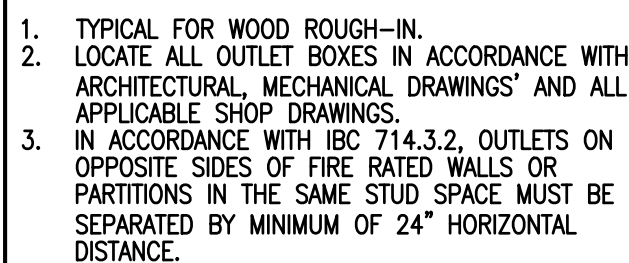
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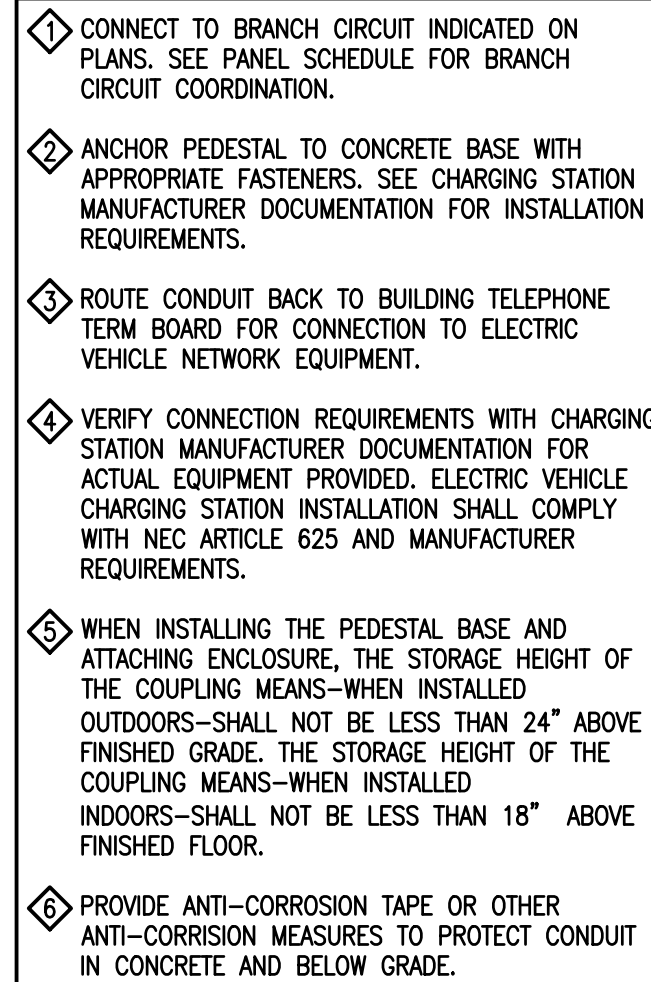
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SCALE: NTS



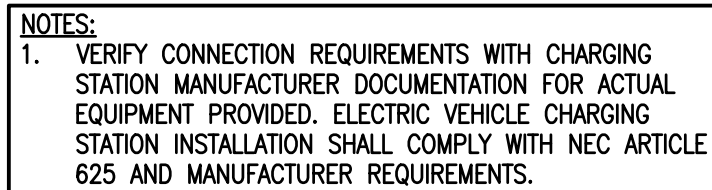
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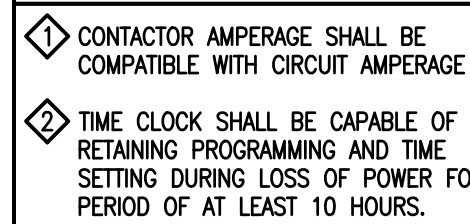
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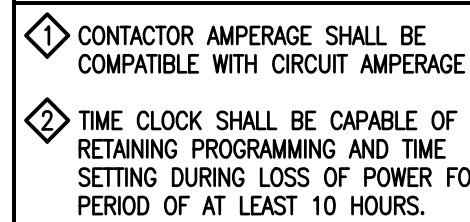
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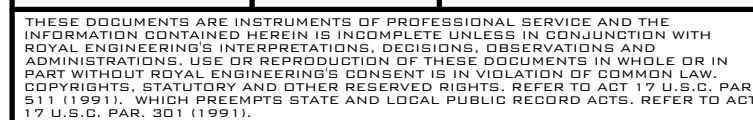
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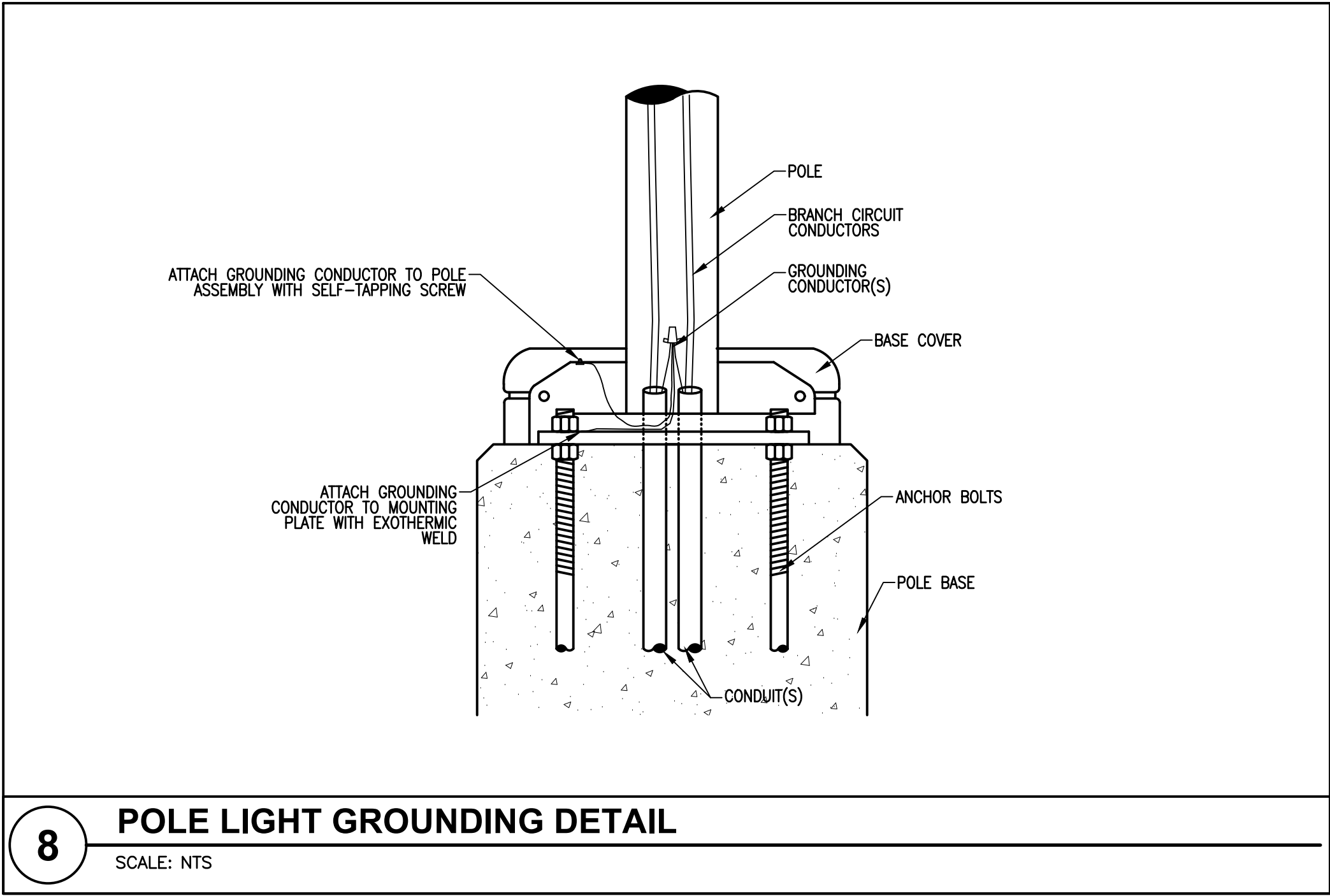


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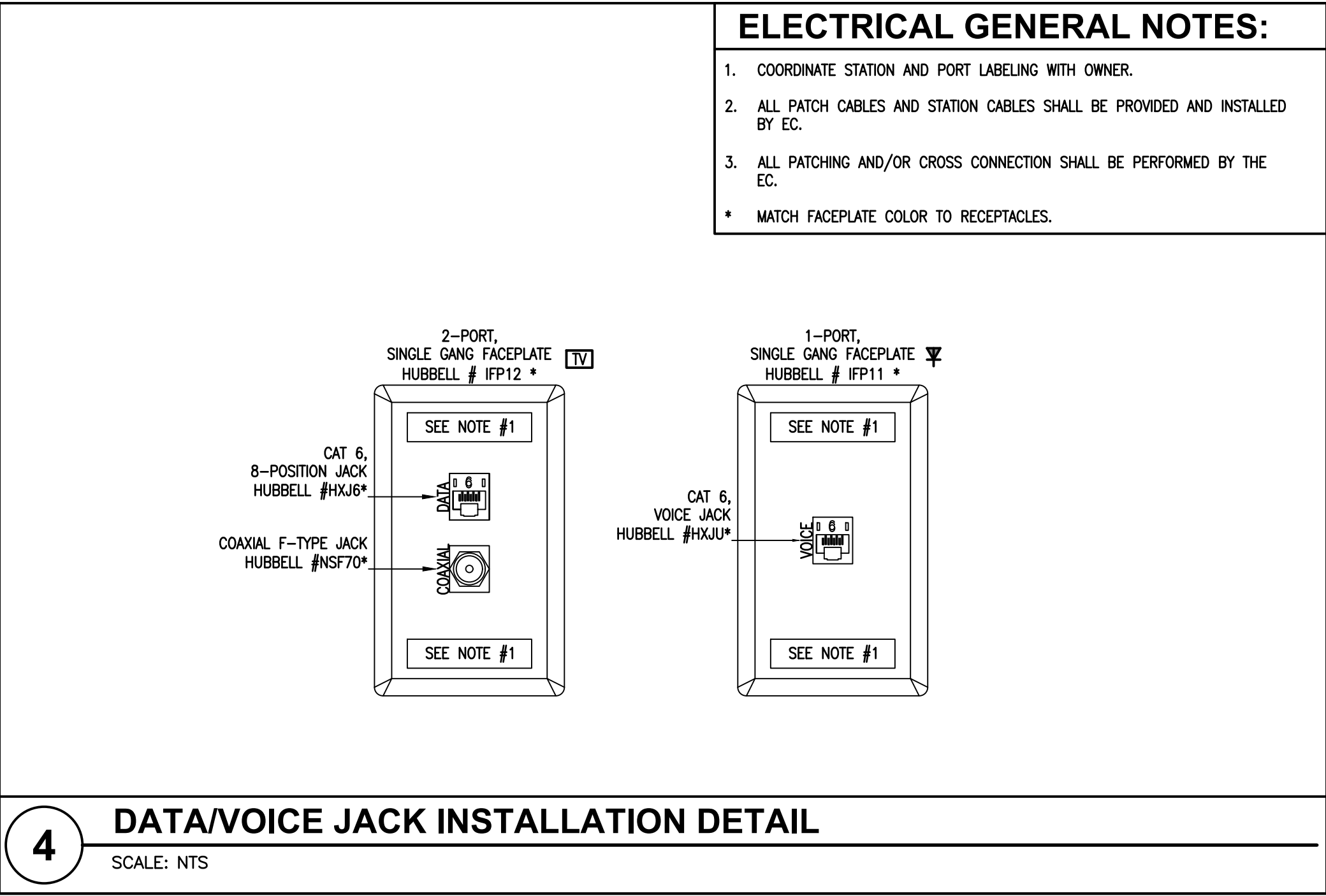


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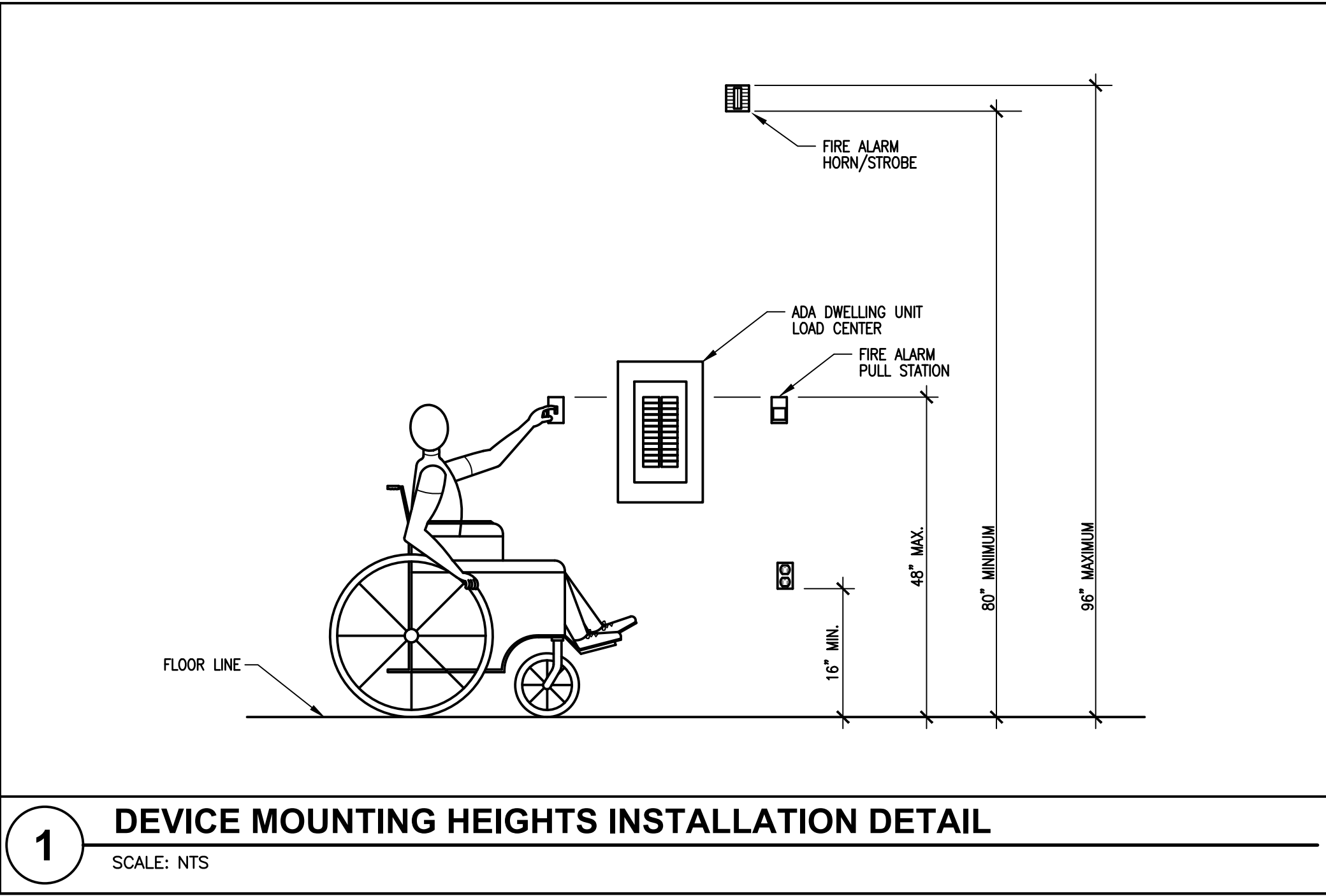




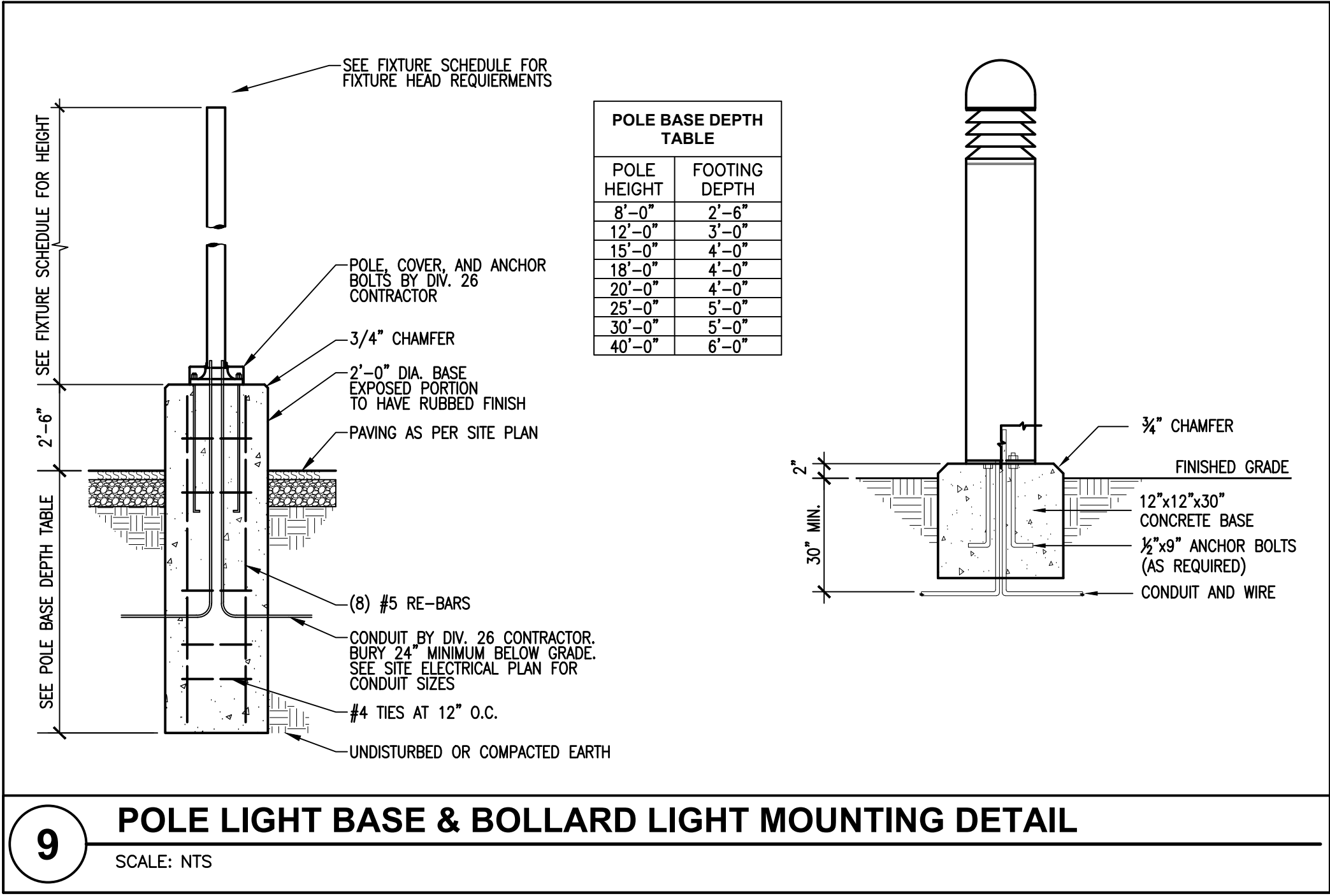
8 POLE LIGHT GROUNDING DETAIL
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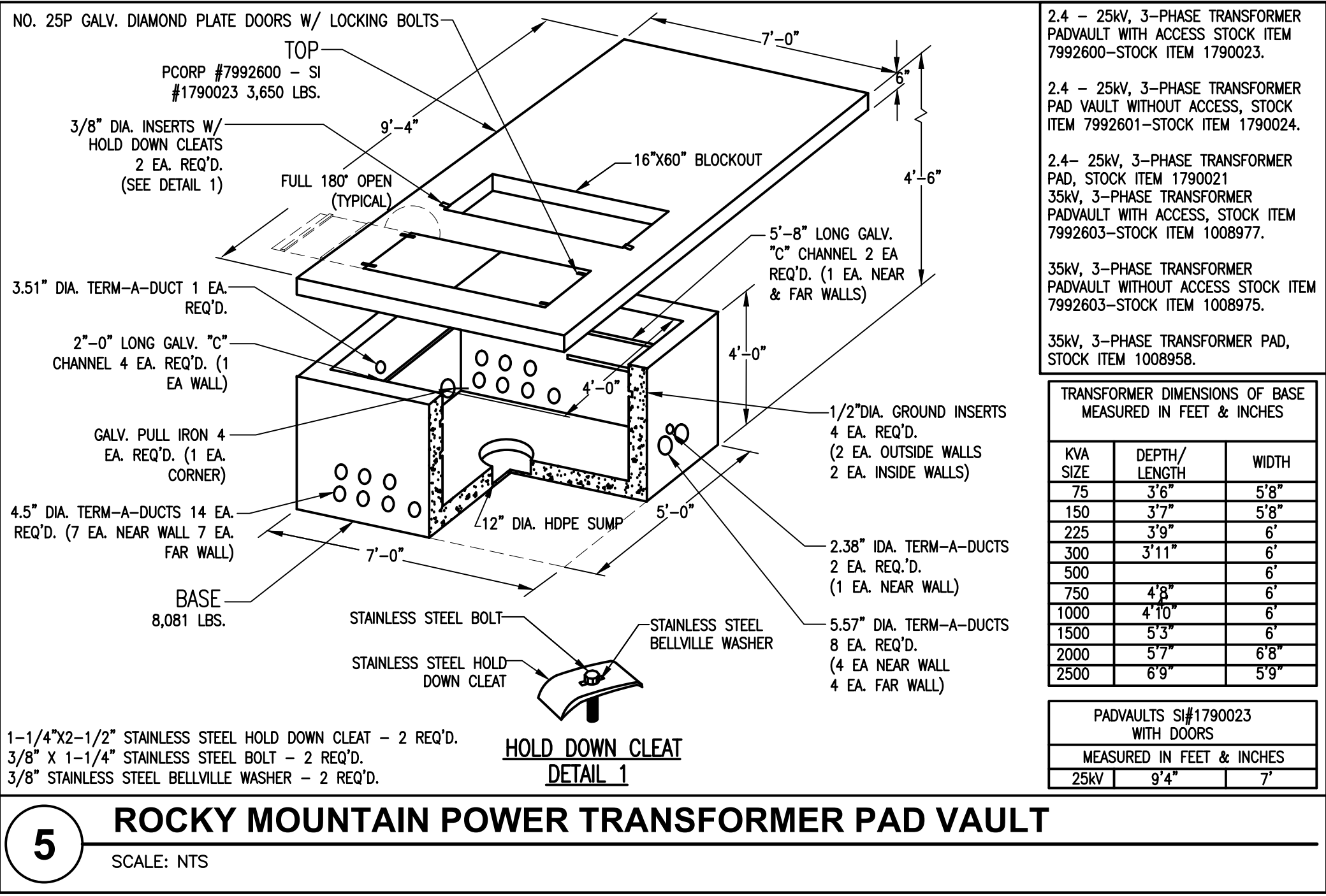
4 DATA/VOICE JACK INSTALLATION DETAIL
SCALE: NTS



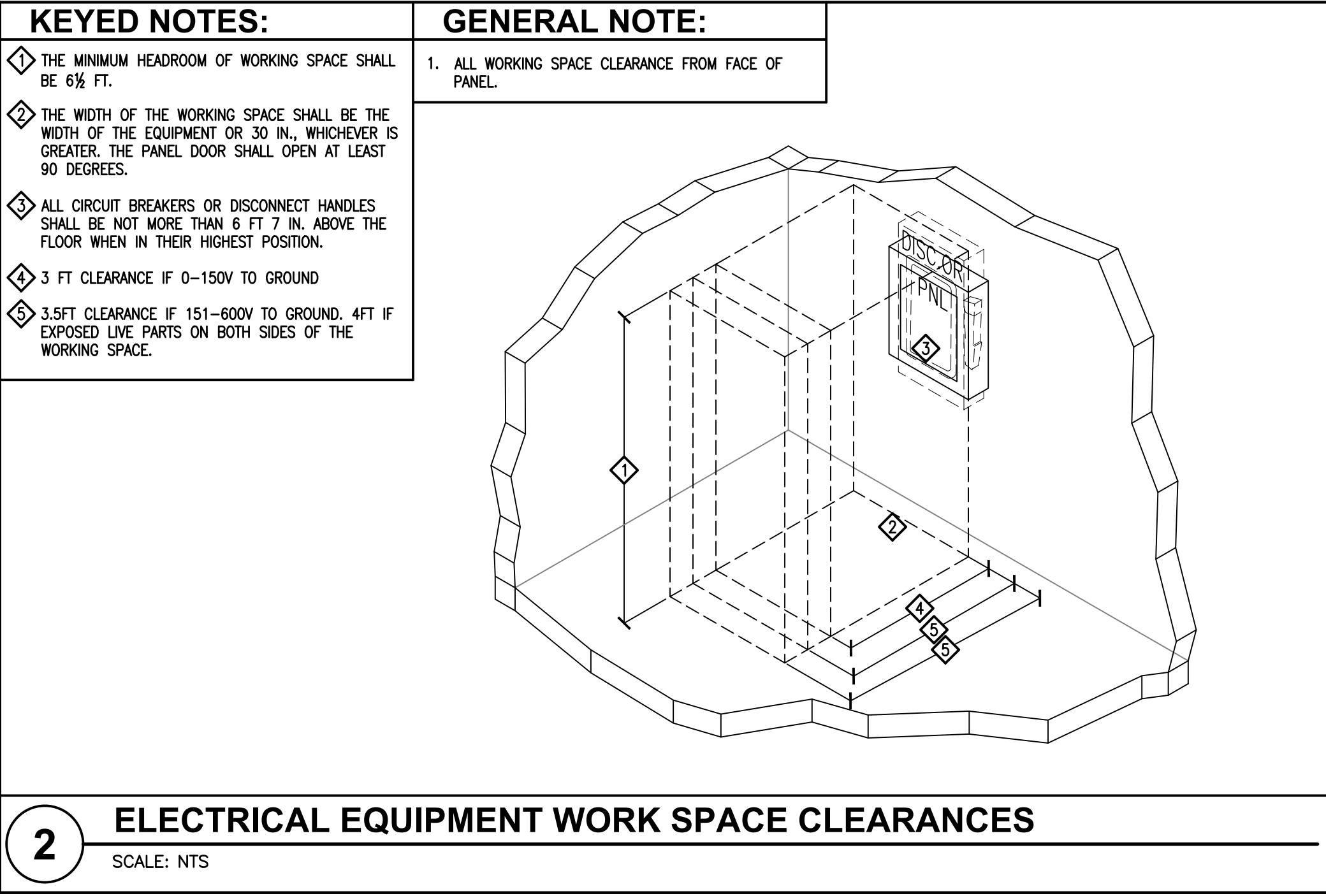
1 DEVICE MOUNTING HEIGHTS INSTALLATION DETAIL
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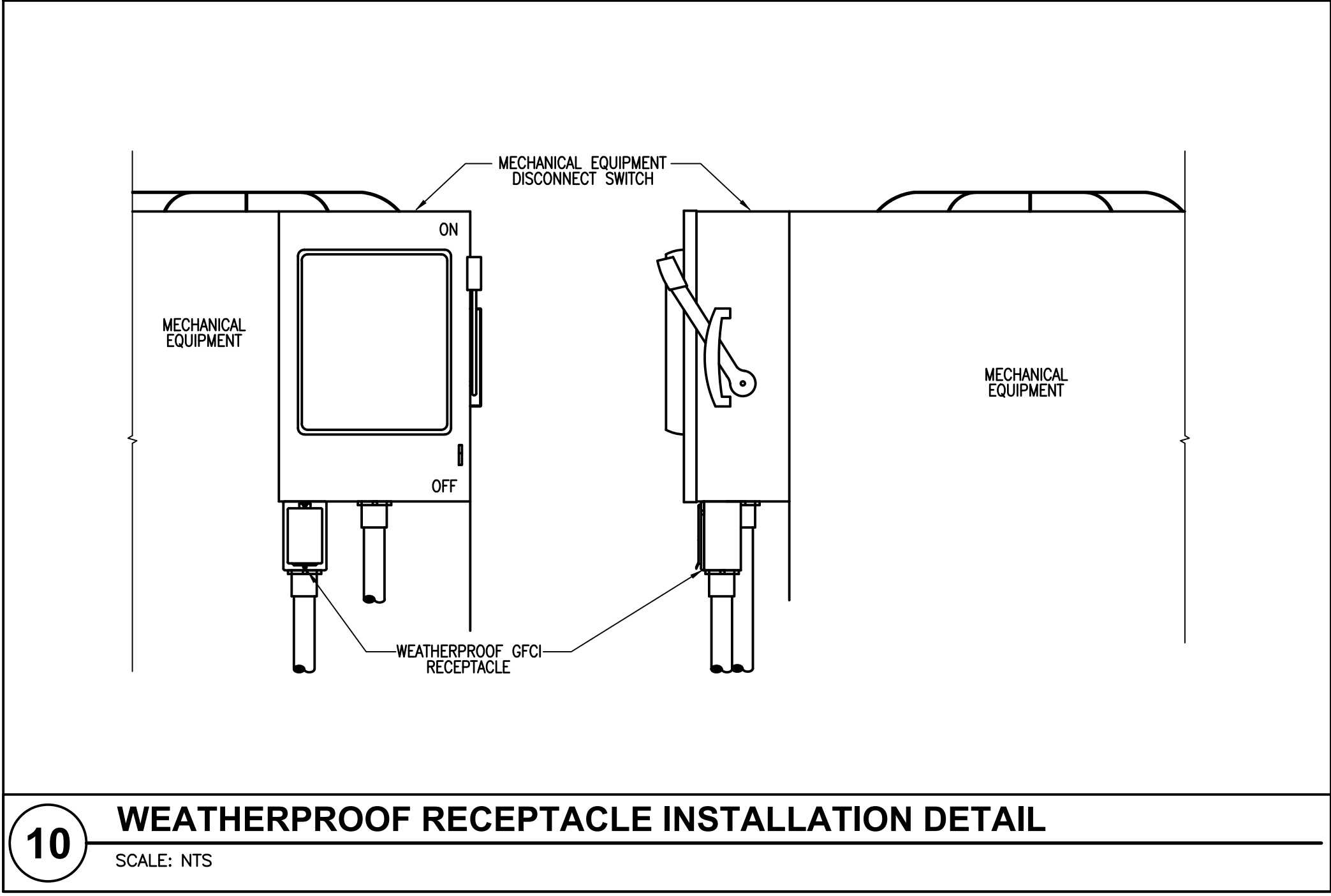
9 POLE LIGHT BASE & BOLLARD LIGHT MOUNTING DETAIL
SCALE: NTS



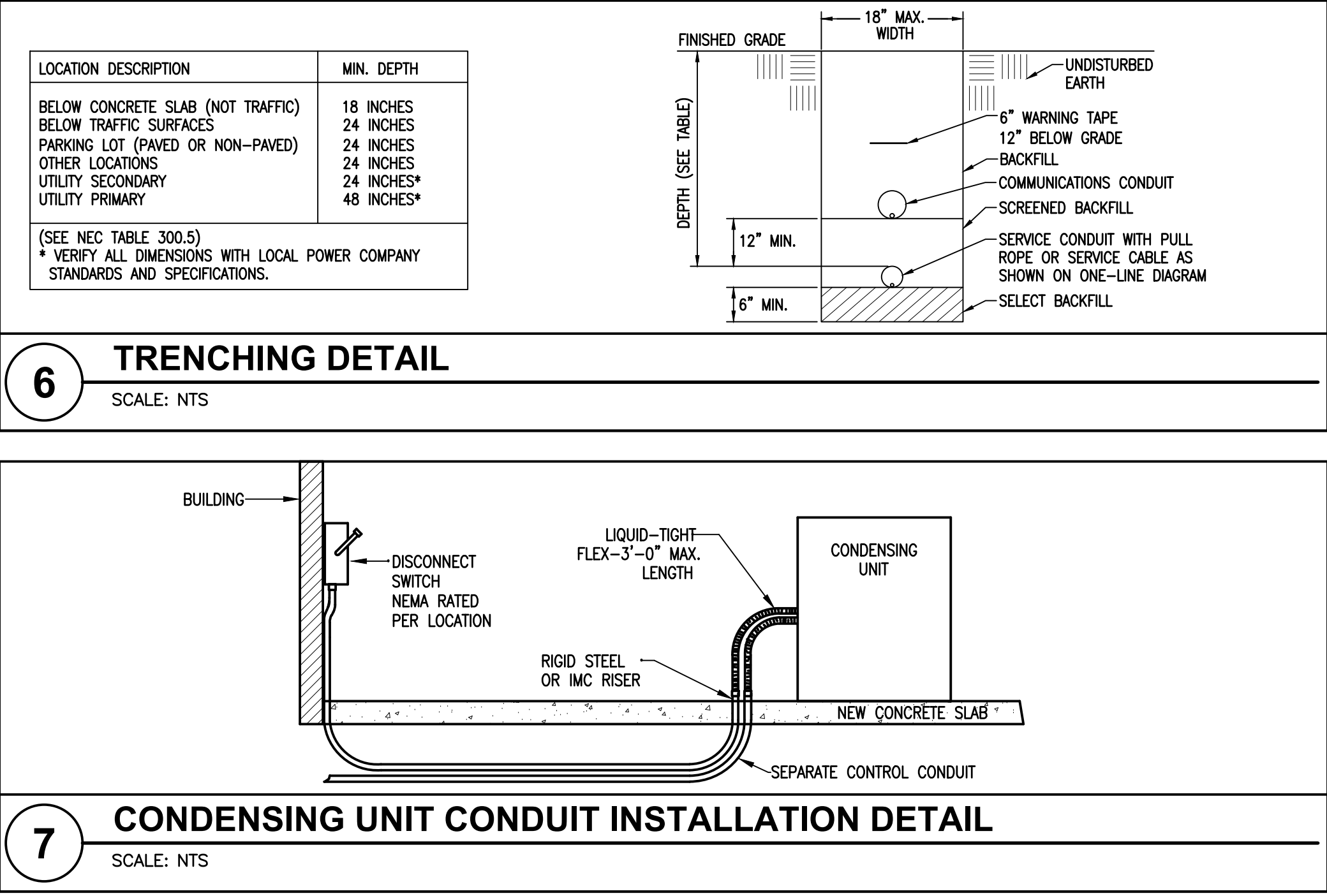
5 ROCKY MOUNTAIN POWER TRANSFORMER PAD VAULT
SCALE: NTS



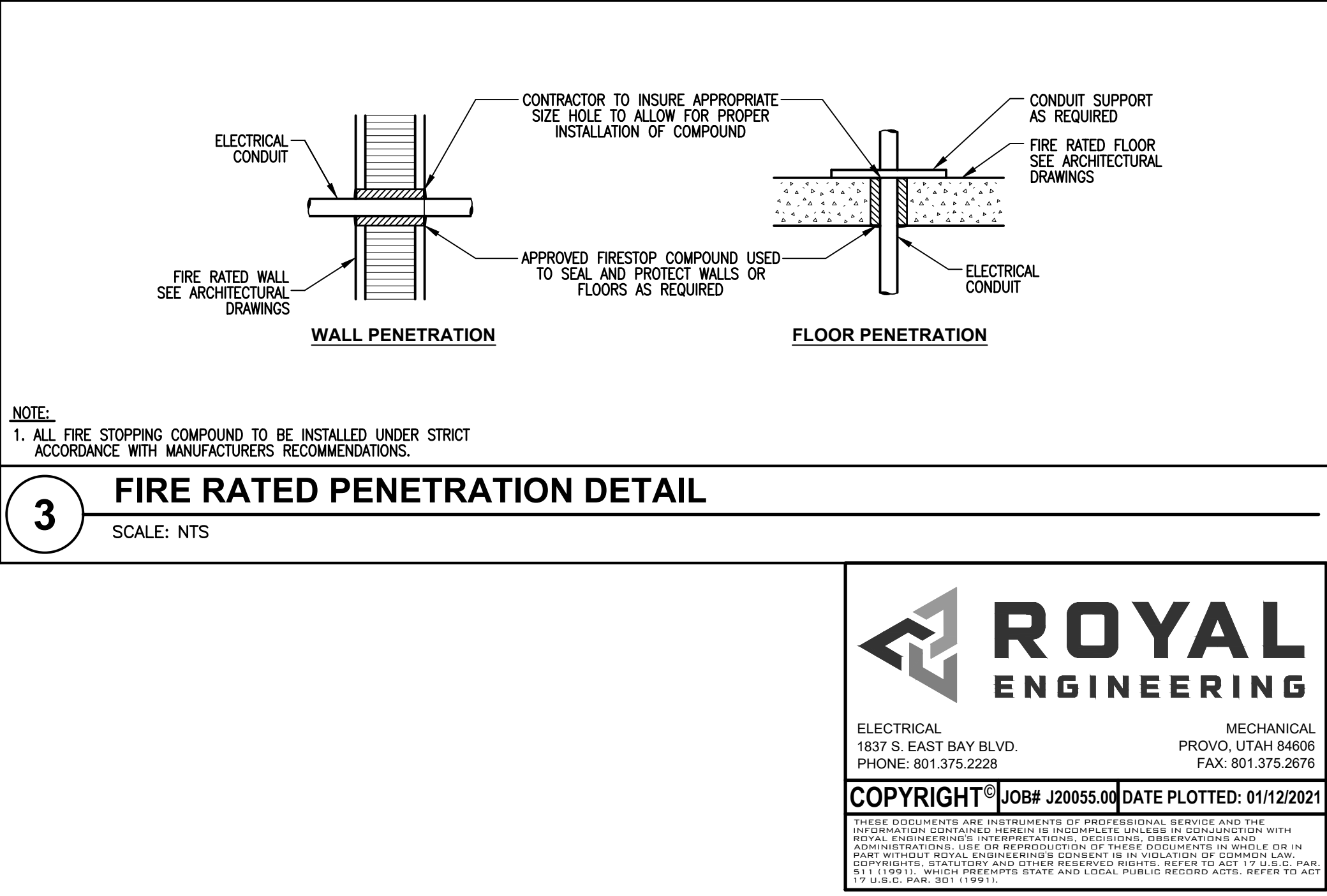
2 ELECTRICAL EQUIPMENT WORK SPACE CLEARANCES
SCALE: NTS



10 WEATHERPROOF RECEPTACLE INSTALLATION DETAIL
SCALE: NTS



7 CONDENSING UNIT CONDUIT INSTALLATION DETAIL
SCALE: NTS



3 FIRE RATED PENETRATION DETAIL
SCALE: NTS

SITE LIGHTING FIXTURE SCHEDULE												
FXIT #	FIXTURE						POLE			REMARKS		
	MANUFACTURER	CATALOG #	VOLTS	#POLE	WATTS	MOUNTING	LAMPS TYPE	MANUFACTURER	HEIGHT	CATALOG #		
SF1	LSI	MRM-LED-07L-SIL-3-UNV-DIM-40-70CRI-IL-MSBT1-CBA	208	1	53	POLE	LED 7000 LUMEN 4000 KELVIN 70CRI TYPE III DISTRIBUTION	LSI	18'-0"	4SQBX-S11G-18-X-4BC	AS SPECIFIED OR APPROVED EQUAL.	
SF2	LSI	MRB-LED-25L-ACR-S-UNV-DIM-40-CBA	208	1	30.5	GROUND	LED 2500 LUMEN 4000 KELVIN 70CRI SYMMETRIC DISTRIBUTION	-	-	-	AS SPECIFIED OR APPROVED EQUAL.	
SF3	LSI	XARL-FT-LED-HQ-NH-UE-CBA-DIM-HSS RM	208	1	527.7	POLE	LED 56960 LUMEN 4000 KELVIN 70CRI TYPE IV DISTRIBUTION	LSI	20'-0"	4RPBX-S10G-20-X-SRBC	AS SPECIFIED OR APPROVED EQUAL.	

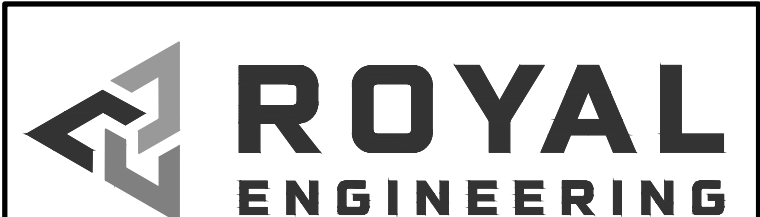
EQUIPMENT SCHEDULE										
SYMBOL	DESCRIPTION	SERVICE		DISCONNECT		STARTER	LOAD			REMARKS
		VOLTS	PHASE	SIZE	FUSE		HP/TON	VA	AMPS	
	FURNACE FAN	120 V	1Ø	MANUAL STARTER	-	INTEGRAL	2½ TON	1,200	10.0A	
	FURNACE FAN	120 V	1Ø	MANUAL STARTER	-	INTEGRAL	5 TON	2,040	17.0A	
	FURNACE FAN	120 V	1Ø	MANUAL STARTER	-	INTEGRAL	5 TON	2,040	17.0A	
	FURNACE FAN	120 V	1Ø	MANUAL STARTER	-	INTEGRAL	5 TON	2,040	17.0A	
	AIR COOLED CONDENSING UNIT	208 V	1Ø	30A NEMA 3R	-	INTEGRAL	2½ TON	3,765	18.1A	
	AIR COOLED CONDENSING UNIT	208 V	1Ø	60A NEMA 3R	-	INTEGRAL	5 TON	6,136	29.5A	
	AIR COOLED CONDENSING UNIT	208 V	1Ø	60A NEMA 3R	-	INTEGRAL	5 TON	6,136	29.5A	
	AIR COOLED CONDENSING UNIT	208 V	1Ø	60A NEMA 3R	-	INTEGRAL	5 TON	6,136	29.5A	
	EXHAUST FAN	120 V	1Ø	INTEGRAL PLUG	-	-	-	100	0.8A	SEE PLAN FOR EF CONTROL
	SUPPLY FAN	120 V	1Ø	COMBO STARTER	-	-	-	55	0.5A	EF SHALL OPERATE CONTINUOUSLY
	ELECTRIC WALL HEATER	120 V	1Ø	T-STAT	-	-	-	1,500	12.5A	
	DUCT HEATER	208 V	3Ø	T-STAT	-	-	-	1,500	4.2A	
	SUMP PUMP	120 V	1Ø	PLUG/ CORD	-	-	½ HP	1,176	9.8A	
	ELEVATOR	208 V	3Ø	200A NEMA 1	175	-	30 HP	33,145	92.0A	PROVIDE DISCONNECT WITH SHUNT-TRIP CONTROL AND AUXILIARY CONTACT.
NOTES: 1. VERIFY ALL EQUIPMENT LOCATIONS AND CONNECTION REQUIREMENTS (i.e. VOLTAGE, PHASE, FLA, ETC.) WITH MECHANICAL DRAWINGS/SUBMITTALS BEFORE FOR ACTUAL EQUIPMENT INSTALLED. 2. ALL FUSES SHALL BE DUAL ELEMENT TIME DELAY. FINAL BREAKER/FUSE & DISCONNECT SIZE SHALL BE DETERMINED BY MANUFACTURER'S RECOMMENDATION FOR ACTUAL EQUIPMENT INSTALLED. 3. MAXIMUM VALUES INDICATED. 4. DISCONNECTING MEANS NOT REQUIRED FOR EQUIPMENT WITHIN SIGHT (AS DEFINED IN NEC) OF BRANCH PANEL SERVING EQUIPMENT. SEE NEC 422.31 (B). 5. DISCONNECTING MEANS NOT REQUIRED FOR APPLIANCES NOT OVER 300 VA. SEE NEC 422.31 (A).										

FAULT CURRENT CALCULATION TABLE																
MAIN UTILITY COMPANY TRANSFORMER (ROCKY MOUNTAIN POWER)			TRANSFORMER KVA		AFC AT UTILITY		%Z									
3Ø 120/208V -1600A PAD MOUNTED			500		38,233 A		3.63%									
CONFIGURATION					FEEDER			SYSTEM					FAULT CURRENT AT EQUIPMENT	FULL OR SERIES RATED	MINIMUM SYMMETRICAL EQUIPMENT AIC RATING	
FROM		TO	LENGTH	SOURCE FAULT CURRENT	FEEDER SIZE	FEEDERS PER PHASE	WIRE CONSTANT	LINE TO LINE VOLTS	XFMR SECONDARY VOLTS	PHASE	KVA	%Z				MOTOR LOAD
TRANSFORMER	UTILITY	SWITCHBOARD	SES	25'-0"	38,233 AIC	500 AL	6	21,390	208 V		3Ø	-		36,000 AIC	FULL	42,000 AIC
SWITCHBOARD	SES	PANELBOARD	H	15'-0"	36,000 AIC	350 CU	2	22,736	208 V		3Ø	-	30HP	33,147 AIC	FULL	42,000 AIC
SWITCHBOARD	SES	SWITCHBOARD	MDP	5'-0"	36,000 AIC	350 CU	2	22,736	208 V		3Ø	-		34,852 AIC	FULL	42,000 AIC
SWITCHBOARD	MDP	PANELBOARD	UNIT	40'-0"	34,852 AIC	1 AL	1	4,678	208 V		3Ø	-		10,010 AIC	FULL	22,000 AIC
SWITCHBOARD	MDP	PANELBOARD	UNIT	41'-0"	34,852 AIC	1 AL	1	4,678	208 V		3Ø	-		9,835 AIC	FULL	10,000 AIC
SWITCHBOARD	MDP	PANELBOARD	UNIT	101'-0"	34,852 AIC	1/0 AL	1	5,838	208 V		3Ø	-		5,788 AIC	FULL	10,000 AIC
SWITCHBOARD	MDP	PANELBOARD	UNIT	151'-0"	34,852 AIC	2/0 AL	1	7,301	208 V		3Ø	-		4,977 AIC	FULL	10,000 AIC
SWITCHBOARD	MDP	PANELBOARD	UNIT	191'-0"	34,852 AIC	3/0 AL	1	9,110	208 V		3Ø	-		4,919 AIC	FULL	10,000 AIC
SWITCHBOARD	MDP	PANELBOARD	UNIT	241'-0"	34,852 AIC	4/0 AL	1	11,174	208 V		3Ø	-		4,801 AIC	FULL	10,000 AIC
SWITCHBOARD	MDP	PANELBOARD	UNIT	321'-0"	34,852 AIC	3/0 CU	1	13,923	208 V		3Ø	-		4,531 AIC	FULL	10,000 AIC
SWITCHBOARD	MDP	PANELBOARD	UNIT	401'-0"	34,852 AIC	4/0 CU	1	16,673	208 V		3Ø	-		4,367 AIC	FULL	10,000 AIC
SWITCHBOARD	MDP	PANELBOARD	UNIT	501'-0"	34,852 AIC	250 CU	1	18,593	208 V		3Ø	-		3,951 AIC	FULL	10,000 AIC
SWITCHBOARD	MDP	PANELBOARD	UNIT	601'-0"	34,852 AIC	300 CU	1	20,867	208 V		3Ø	-		3,724 AIC	FULL	10,000 AIC
PANELBOARD	H	SWITCH	EL-1	136'-0"	33,147 AIC	2 CU	1	6,044	208 V		3Ø	-	30HP	4,983 AIC	FULL	10,000 AIC
PANELBOARD	H	PANELBOARD	HT	166'-0"	33,147 AIC	2 CU	1	6,044	208 V		3Ø	-		3,863 AIC	FULL	10,000 AIC
NOTE: DISTANCES INDICATED ARE FOR FAULT-CURRENT ANALYSIS ONLY. CONTRACTOR SHALL USE FIELD MEASUREMENTS ESTABLISH CONDUCTOR LENGTHS FOR ORDERING PURPOSES.																

NOTE: DISTANCES INDICATED ARE FOR FAULT-CURRENT ANALYSIS ONLY. CONTRACTOR SHALL USE FIELD MEASUREMENTS ESTABLISH CONDUCTOR LENGTHS FOR ORDERING PURPOSES.

UNIT LIGHTING FIXTURE SCHEDULE									
FIXTURE NUMBER	FIXTURE MANUFACTURER	FIXTURE CATALOG #	LAMPS	FIXTURE			DESCRIPTION	REMARKS	
			TYPE	VOLTS	WATTS	MOUNTING			
R1	GM LIGHTING ELCO SATCO	GM-RND8-30-WH ELSP6330W S29331	LED 3000 KELVIN 820 LUMENS 90 CRI	102	15	SURFACE CEILING	7" LED FLUSH MOUNT ROUND DISK LIGHT (UNIT GENERAL LIGHTING)	AS SPECIFIED OR APPROVED EQUAL.	
R2	LSI FSC LIGHTING STARTEK	SDL-2-LED-LW-WW-UE L285-24-35K SSF-2S-35K-PW-FC-SM-NSE-ND-U-PN	LED 3000 KELVIN 1490 LUMENS 80 CRI	120	19	SURFACE WALL	24" WALL MTD LED STRIP LIGHT (MECHANICAL)	AS SPECIFIED OR APPROVED EQUAL.	
R3	GM LIGHTING ELCO SATCO	GM-RND8-30-WH ELSP6330W S29331	LED 3000 KELVIN 820 LUMENS 90 CRI	120	15	SURFACE CEILING	WET LOCATION RATED 7" LED FLUSH MOUNT ROUND DISK LIGHT (SHOWER/BALCONY)	AS SPECIFIED OR APPROVED EQUAL.	
R4	DESIGNERS FOUNTAIN BROWNLEE LIGHTING	LED67804-SP 5654-CBA-G47LED-ES	LED 3000 KELVIN 1800 LUMENS 90 CRI	120	40	SURFACE WALL	VANITY LIGHT (BATHROOM)	AS SPECIFIED OR APPROVED EQUAL.	

COMMON AREA LIGHTING FIXTURE SCHEDULE									
FIXTURE NUMBER	FIXTURE MANUFACTURER	FIXTURE CATALOG #	LAMPS	FIXTURE			DESCRIPTION	REMARKS	
			TYPE	VOLTS	WATTS	MOUNTING			
F1	ASTRALITE MULE LIGHTING	WP-AP CBA SD PIR MERU-LED AC CBA PIR	LED 1600 LUMEN 4000 KELVIN 70 CRI TYPE III DISTRIBUTION	120	17	SURFACE WALL	LED WALL PACK WITH INTEGRAL PIR MOTION SENSOR	AS SPECIFIED OR APPROVED EQUAL	
F1E	ASTRALITE MULE LIGHTING	WP-AP CBA SD PIR C MERU-LED ACEM CBA IH PIR	LED 1600 LUMEN 4000 KELVIN 70 CRI TYPE III DISTRIBUTION	120	32	SURFACE WALL	LED WALL PACK WITH INTEGRAL PIR MOTION SENSOR AND COLD WEATHER EMERGENCY BATTERY PACK	AS SPECIFIED OR APPROVED EQUAL	
F2	LSI	XWM-FT-LED-12L-40-UE-CBA-MSBT1	LED 12000 LUMEN 4000 KELVIN 70 CRI TYPE IV DISTRIBUTION	120	102.2	SURFACE WALL	LED WALL PACK WITH INTEGRAL PIR MOTION/DAYLIGHT SENSOR	AS SPECIFIED OR APPROVED EQUAL	
F3E	LSI	XWM-FT-LED-08L-40-UE-CBA-MSBT1-CWBB	LED 8000 LUMEN 4000 KELVIN 70 CRI TYPE IV DISTRIBUTION	120	62	SURFACE WALL	LED WALL PACK WITH INTEGRAL PIR MOTION/DAYLIGHT SENSOR	AS SPECIFIED OR APPROVED EQUAL	
F4	ATG ELECTRONICS	VP4FT-24W-40-F	LED 3432 LUMEN 4000 KELVIN 85 CRI WIDE OPTIC	208	39.7	SURFACE CEILING	LED 4' VAPOR TIGHT	AS SPECIFIED OR APPROVED EQUAL	
F5	AMERLUX	G300A-T5-4L-SLV-OSR	LED 3800 LUMEN 4000 KELVIN 85 CRI TYPE V DISTRIBUTION	120	37	PENDANT	LED 15.65" PARKING GARAGE LIGHT WITH BI-LEVEL DIMMING SENSOR CONTROL	AS SPECIFIED OR APPROVED EQUAL	
F6	HALO JUNO LIGHTOLIER WESTINGHOUSE PRESCOLITE SATCO	SMD6R6935WH 6RLS 10LM 30K 90CRI 120 FRPC WH S-S-R-8-35K-10 63221 LBS5LED410L-35K-8-WH S9331	LED 600 LUMENS 3500 KELVIN 80 CRI	120	16.4	SURFACE CEILING	LED SURFACE LIGHT	AS SPECIFIED OR APPROVED EQUAL	
F7	METALUX LITHONIA DAY-BRITE LSI COLUMBIA ORACLE	2SNLED-LD4-20SL-LW-UNV-L835-CD1-U ZLIN-L24-250LM-FST-MVOLT-35K-80CRI-WH FSS220L835-UNV-DIM SDL-2-LED-SS-WW-UE LCL2-35ML-EU 2-OC1-LED-2000L-DIM10-MVOLT-35K-80	LED 3000 LUMENS 3500 KELVIN 80 CRI	120	26	SURFACE/CHAIN	24" LED STRIP	AS SPECIFIED OR APPROVED EQUAL	
F8	ELCO LIGHTING	E2L18WF40CBA	LED 1100 LUMEN 4000 KELVIN 93 CRI 60 DEGREE BEAM ANGLE	120	10.5	RECESSED	2" LED AIMABLE DOWNLIGHT	AS SPECIFIED OR APPROVED EQUAL	
F9	AMERLUX	VMACCS-3500K-H9060-K-CBA-18	LED 610 LUMEN 3500 KELVIN 70 CRI	120	10	SURFACE WALL	LED EXTERIOR WALL-MOUNT ACCENT	AS SPECIFIED OR APPROVED EQUAL	
EM	SURELITE LITHONIA LIGHTOLIER LSI DUAL-LITE MAXILUME	SEL17 ELM2 EB11W LTEM-WH EZ-2 ELM-LED-861	INCLUDED	120	5.4	SURFACE WALL	2-HEAD EM WALL PACK (SURFACE)	AS SPECIFIED OR APPROVED EQUAL	
EX1	SURELITES LITHONIA LIGHTOLIER LSI MAXILUME	LPX-70-DGWHDH LHQM-S-1-G-EL-N LC18NH71GW LPRX-G-U-WH-LD11 ELX-703-G-W	INCLUDED	120	5.4	SURFACE WALL	2-HEAD EM WALL PACK (SURFACE) WITH EXIT LIGHT	AS SPECIFIED OR APPROVED EQUAL	

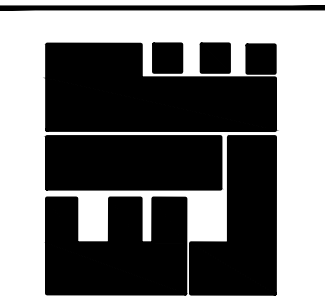


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PHONE: 801.375.2228

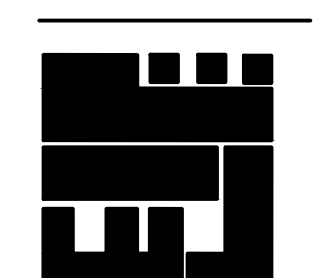
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PROVO, UTAH 84606
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MIXED USE SITE DEVELOPEMENT

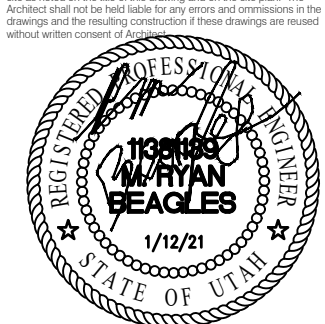
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MILLCREEK, UTAH 84107
Contacts: Mehman jMirzale@gmail.com
801-908-9382

ELECTRICAL SCHEDULES

MARK: DATE:

1	06/05/20
2	06/26/20
3	07/06/20

PROJECT: A-19-001
SCALE (11x17): 1/16" = 1'-0"
SCALE (24x36): 1/8" = 1'-0"
CHECKED BY: RB
ISSUED: 03/03/2020



E601

LOAD CALCULATIONS (PANEL MDP)			
VOLTAGE:	208	VOLTS	
PHASE	3	PHASE	
RESIDENTIAL LOADS:			
UNIT TYPE: UNIT TYPE: 2B	1131	SQ. FT.	27550 VA
NUMBER OF UNIT TYPE: 2B UNITS	12		
UNIT TYPE: UNIT TYPE: 2B0	1342	SQ. FT.	28183 VA
NUMBER OF UNIT TYPE: 2B0 UNITS	2		
UNIT TYPE: UNIT TYPE: 2BE	1169	SQ. FT.	27664 VA
NUMBER OF UNIT TYPE: 2BE UNITS	4		
Total Residential Load			497618 VA
Total Number Of Units	18		
Residential Load Demand Factor			38 %
Total Revised Residential Load			189095 VA
TOTAL COMPUTED LOAD (VA, VOLTS):			525 AMPS

LOAD CALCULATIONS (PANEL SES)			
GROSS BUILDING AREA:	34946	SQ. FT	
BUILDING VOLTAGE:	208	VOLTS	
PHASE	3	PHASE	
OCCUPANCY TYPE:	MULTIFAMILY		
RESIDENTIAL LOADS:			
UNIT TYPE: UNIT TYPE: 2B	1131	SQ. FT.	27550 VA
NUMBER OF UNIT TYPE: 2B UNITS	12		
UNIT TYPE: UNIT TYPE: 2B0	1342	SQ. FT.	28183 VA
NUMBER OF UNIT TYPE: 2B0 UNITS	2		
UNIT TYPE: UNIT TYPE: 2BE	1169	SQ. FT.	27664 VA
NUMBER OF UNIT TYPE: 2BE UNITS	4		
Total Residential Load			497618 VA
Total Number Of Units	18		
Residential Load Demand Factor			38 %
Total Revised Residential Load			189095 VA
GENERAL LOADS:			
LIGHTING LOAD W/ 125% DEMAND:	5694	VA	
RECEPTACLE LOAD:			
FIRST 10,000 VA @ 100%	6715	VA	
REMAINDER @50%	-	VA	
TOTAL LOAD:	6715	VA	
SMALL APPLIANCE LOAD:	0	VA	
KITCHEN EQUIPMENT	0	VA	
MISC & FUTURE:	176653	VA	
TOTAL LOAD:	176653	VA	
HVAC LOADS:			
COOLING/HEATING	6120	VA	
RESISTANCE HEATING:	16800	VA	
EXHAUST:	0	VA	
WATER HEATING:	0	VA	
TOTAL:	22920	VA	
EQUIPMENT LOADS:			
MACHINERY:	0	VA	
ELEVATOR:	33145	VA	
PUMPS:	1176	VA	
WELDERS:	0	VA	
AIR COMPRESSORS:	0	VA	
MOTORS	1664	VA	
NET COMPUTED LOAD	437062	VA	
NET COMPUTED LOAD (VA, VOLTS):			1213 AMPS

ELECTRICAL LOAD CALCULATION			
OPTIONAL METHOD USED (NEC 220 SECTION IV)			
UNIT TYPE: 2B			
TOTAL SQUARE FOOTAGE	1,131	SQ FT	
UNIT ELECTRICAL LOADS (PER UNIT)			
SMALL APPLIANCE LOAD (INCLUDES REFRIGERATOR)	3,000	VA	
LAUNDRY CIRCUIT (INCLUDES WASHER)	1,500	VA	
LIGHTING/RECEPTACLE LOAD (sq ft. x 3 VA)	3,393	VA	
RANGE	8,000	VA	
DRYER	5,000	VA	
DISHWASHER	864	VA	
DISPOSAL	828	VA	
TOTAL GENERAL LOADS	22,585	VA	
10,000 VOLT-AMPERES @ 100%	10,000	VA	
12,585 VOLT-AMPERES @ 40%	5,034	VA	
TOTAL GENERAL LOADS WITH DEMAND FACTOR APPLIED	15,034	VA	
FURNACE -- @ 100%	1,200	VA	
AIR CONDITIONER LOAD -- @100%	3,765	VA	
TOTAL UNIT VA			19,999 VA
CALCULATED AMPS FOR 1 PHASE UNIT @ 208 V			96 A
REQUIRED SERVICE SIZE IN AMPS			100 A

ELECTRICAL LOAD CALCULATION			
OPTIONAL METHOD USED (NEC 220 SECTION IV)			
UNIT TYPE: 2B0			
TOTAL SQUARE FOOTAGE	1,342	SQ FT	
UNIT ELECTRICAL LOADS (PER UNIT)			
SMALL APPLIANCE LOAD (INCLUDES REFRIGERATOR)	3,000	VA	
LAUNDRY CIRCUIT (INCLUDES WASHER)	1,500	VA	
LIGHTING/RECEPTACLE LOAD (sq ft. x 3 VA)	4,026	VA	
RANGE	8,000	VA	
DRYER	5,000	VA	
DISHWASHER	864	VA	
DISPOSAL	828	VA	
TOTAL GENERAL LOADS	23,218	VA	
10,000 VOLT-AMPERES @ 100%	10,000	VA	
13,218 VOLT-AMPERES @ 40%	5,287	VA	
TOTAL GENERAL LOADS WITH DEMAND FACTOR APPLIED	15,287	VA	
FURNACE -- @ 100%	1,200	VA	
AIR CONDITIONER LOAD -- @100%	3,765	VA	
TOTAL UNIT VA			20,252 VA
CALCULATED AMPS FOR 1 PHASE UNIT @ 208 V			97 A
REQUIRED SERVICE SIZE IN AMPS			100 A

ELECTRICAL LOAD CALCULATION			
OPTIONAL METHOD USED (NEC 220 SECTION IV)			
UNIT TYPE: 2BE			
TOTAL SQUARE FOOTAGE	1,169	SQ FT	
UNIT ELECTRICAL LOADS (PER UNIT)			
SMALL APPLIANCE LOAD (INCLUDES REFRIGERATOR)	3,000	VA	
LAUNDRY CIRCUIT (INCLUDES WASHER)	1,500	VA	
LIGHTING/RECEPTACLE LOAD (sq ft. x 3 VA)	3,507	VA	
RANGE	8,000	VA	
DRYER	5,000	VA	
DISHWASHER	864	VA	
DISPOSAL	828	VA	
TOTAL GENERAL LOADS	22,699	VA	
10,000 VOLT-AMPERES @ 100%	10,000	VA	
12,699 VOLT-AMPERES @ 40%	5,080	VA	
TOTAL GENERAL LOADS WITH DEMAND FACTOR APPLIED	15,080	VA	
FURNACE -- @ 100%	1,200	VA	
AIR CONDITIONER LOAD -- @100%	3,765	VA	
TOTAL UNIT VA			20,044 VA
CALCULATED AMPS FOR 1 PHASE UNIT @ 208 V			96 A
REQUIRED SERVICE SIZE IN AMPS			100 A

LOAD CENTER SCHEDULE "2B"															
VOLTAGE: 208 / 120 VOLTS				BUS RATING (AMPS): 100				REMARKS: COORDINATE WITH MECHANICAL CONTRACTOR ON THE PLACEMENT OF THE CERTIFICATE REQUIRED BY IECC R401.3 IN EACH UNIT.							
MOUNTING: FLUSH				PHASE: 1				MAIN LUGS ONLY							
ENCLOSURE: NEMA 1				WIRE: 3				SHORT CIRCUIT RATING: SEE FAULT CURRENT TABLE							
CIRCUIT BREAKER				CIRCUIT NAME				CIRCUIT BREAKER				CIRCUIT NAME			
No.	AMPS	POLE	MOD.	WIRE	GRD	DEMAND FACTOR	WATTS	ØA	ØB	WATTS	DEMAND FACTOR	GRD	WIRE	MOD.	POLE
1	20	1	GFAF												
3	20	1	GFAF												
5	20	1	GFAF												
7	20	1	GFAF												
9	20	1	GFAF												
11	50	2	-												
13	-	-	-												
15	20	1	GFAF												
17	30	2	-												
19	-	-	-												
21	30	2	-												
23	-	-	-												
NOTES:															
* TOTAL LOAD REFLECTS TOTAL CALCULATED LOAD. SEE ELECTRICAL LOAD CALCULATIONS FOR NEC 220 SECTION IV OPTIONAL METHOD CALCULATION FOR SERVICE SIZE CALCULATION.															
GFAF DUAL FUNCTION AFCI/GFCI CIRCUIT BREAKER															

ØA	ØB	TOTALS
15,007	16,724	31,732
		153
		96
47%	53%	

LOAD CENTER SCHEDULE "2B0"															
VOLTAGE: 208 / 120 VOLTS				BUS RATING (AMPS): 100				REMARKS: COORDINATE WITH MECHANICAL CONTRACTOR ON THE PLACEMENT OF THE CERTIFICATE REQUIRED BY IECC R401.3 IN EACH UNIT.							
MOUNTING: FLUSH				PHASE: 1				MAIN LUGS ONLY							
ENCLOSURE: NEMA 1				WIRE: 3				SHORT CIRCUIT RATING: SEE FAULT CURRENT TABLE							
CIRCUIT BREAKER				CIRCUIT NAME				CIRCUIT BREAKER				CIRCUIT NAME			
No.	AMPS	POLE	MOD.	WIRE	GRD	DEMAND FACTOR	WATTS	ØA	ØB	WATTS	DEMAND FACTOR	GRD	WIRE	MOD.	POLE
1	20	1	GFAF												
3	20	1	GFAF												
5	20	1	GFAF												
7	20	1	GFAF												
9	20	1	GFAF												
11	50	2	-												
13	-	-	-												
15	20	1	GFAF												
17	30	2	-												
19	-	-	-												
21	30	2	-												
23	-	-	-												
NOTES:															
* TOTAL LOAD REFLECTS TOTAL CALCULATED LOAD. SEE ELECTRICAL LOAD CALCULATIONS FOR NEC 220 SECTION IV OPTIONAL METHOD CALCULATION FOR SERVICE SIZE CALCULATION.															
GFAF DUAL FUNCTION AFCI/GFCI CIRCUIT BREAKER															

ØA	ØB	TOTALS
15,007	17,629	32,637
		157
		97
46%	54%	

LOAD CENTER SCHEDULE "2BE"																		
VOLTAGE: 208 / 120 VOLTS				BUS RATING (AMPS): 100				REMARKS: COORDINATE WITH MECHANICAL CONTRACTOR ON THE PLACEMENT OF THE CERTIFICATE REQUIRED BY IECC R401.3 IN EACH UNIT.										
MOUNTING: FLUSH				PHASE: 1				MAIN LUGS ONLY										
ENCLOSURE: NEMA 1				WIRE: 3				SHORT CIRCUIT RATING: SEE FAULT CURRENT TABLE										
CIRCUIT BREAKER				CIRCUIT NAME										CIRCUIT BREAKER				
No.	AMPS	POLE	MOD.	WIRE	GRD	DEMAND FACTOR	WATTS	ØA	ØB	WATTS	DEMAND FACTOR	GRD	WIRE	CIRCUIT NAME	MOD.	POLE	AMPS	No.
1	20	1	GFAF	#12	#12	1.00	1,500	2,000		500	1.00	#14	#14	LIFE SAFETY AND MEDIA CENTER	AFCI	1	15	2
3	20	1	GFAF	#12	#12	1.00	1,500		1,680	180	1.00	#12	#12	CO - BATHROOM			1	20
5	20	1	GFAF	#12	#12	1.00	1,500	1,860		360	1.00	#12	#12	CO - DINING			1	20
7	20	1	GFAF	#12	#12	1.00	1,692		2,982	1,290	1.00	#14	#14	LIVING ROOM	AFCI	1	15	8
9	20	1	GFAF	#12	#12	1.00	1,500	1,680		180	1.00	#12	#12	CO - BATHROOM			1	20
11	50	2	-	#6	#10	1.00	4,000		5,100	1,100	1.00	#14	#14	BEDROOM	AFCI	1	15	12
13	-	-	-	#6	-	1.00	4,000	4,905		905	1.00	#14	#14	BEDROOM	AFCI	1	15	14
15	20	1	GFAF	#12	#12	1.00	1,200		1,200		1.00			SPACE				16
17	30	2	-	#10	#10	1.00	2,500	2,500			1.00			SPACE	-	-		18
19	-	-	-	#10	-	1.00	2,500		2,680	180	1.00	#14	#14	CO - MECH	GFAF	1	15	20
21	30	2	-	#10	#10	1.00	1,882	2,062		180	1.00	#12	#12	CO - LAUNDRY	GFAF	1	20	22
23	-	-	-	#10	-	1.00	1,882		3,082	1,200	1.00	#14	#14	F-2.5	-	1	15	24
NOTES:																		
* TOTAL LOAD REFLECTS TOTAL CALCULATED LOAD. SEE ELECTRICAL LOAD CALCULATIONS FOR NEC 220 SECTION IV OPTIONAL METHOD CALCULATION FOR SERVICE SIZE CALCULATION.																		
DUAL FUNCTION AFCI/GFCI CIRCUIT BREAKER																		
								ØA		ØB		TOTALS						
								15,007		16,724		31,732		CONNECTED LOAD (VA)				
												153		CONNECTED LOAD (A)				
												96		TOTAL LOAD (A)*				
								47%		53%				PHASE BALANCE				

NOTES:	
1.	ALL INSULATION ON CONDUCTORS TO BE THIN UNLESS NOTED OTHERWISE. INSULATION ON ALL UNDERGROUND EXTERIOR CONDUCTORS SHALL BE THIN.
2.	LOAD DEMANDS CALCULATED AS PER SECTIONS 210 & 220 OF THE NATIONAL ELECTRICAL CODE.
3.	PANEL COVER SHALL BE FIELD MARKED FOR FLASH PROTECTION WITH A PERMANENT LABEL AS REQUIRED BY THE NATIONAL ELECTRICAL CODE SECTION 110. LABEL SHALL READ: "DANGER. POTENTIAL ARC FLASH HAZARD"
4.	C. SHALL COORDINATE WITH HVAC CONTRACTOR FOR PLACEMENT OF PANEL EFFICIENCY CERTIFICATES PER IECQ R4013.
5.	FIRE ALARM SYSTEMS SHALL HAVE BRANCH CIRCUITS IDENTIFIED BY RED LABELS IDENTIFYING "FIRE ALARM CIRCUIT" AS REQUIRED BY THE NATIONAL ELECTRICAL CODE ARTICLE 760.418.
6.	ABBREVIATIONS: CO=CONVENTION OUTLET, RR=RESTROOM, NYRTH=JOUTH, (EAST, WEST)

1. ALL INSULATION ON CONDUCTORS TO BE THIN UNLESS NOTED OTHERWISE.	0A	0B	0C	TOTALS	
INSULATION ON ALL UNDERGROUND EXTERIOR CONDUCTORS SHALL BE THIN.	70,908	63,328	59,649	193,885	CONNECTED LOAD (VA)
2. LOAD DEMANDS CALCULATED AS PER SECTIONS 210 & 220 OF THE NATIONAL ELECTRICAL CODE.				538	CONNECTED LOAD (VA)
3. PANEL COVER SHALL BE FIELD MARKED FOR FLASH PROTECTION WITH A PERMANENT LABEL AS REQUIRED BY THE NATIONAL ELECTRICAL CODE SECTION 110. LABEL SHALL READ: "DANGER, POTENTIAL ARC FLASH HAZARD."	-3,951	-2,853	-4,058	-10,861	DEMAND FACTOR ADJUSTMENTS (VA)
	66,957	60,475	55,591	183,024	TOTAL LOAD (VA)
	558	504	463		TOTAL LOAD (A)
				558	MAXIMUM LOAD (A)
4. E.C. SHALL PROVIDE METALLIC CONTRACTOR FOR PLACEMENT OF LABEL.	275	225	205		PHASE BALANCE

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MIXED USE SITE
DEVELOPEMENT

ARLINGTON PROPERTY LLC
4572 S. & 4600 S. 900 EAST
MILLCREEK, UTAH 84107

Contacts: Mehman
Mehran
Jay Mirralle
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ELECTRICAL
SCHEDULES

MARK:		DATE:	DESCRIPTION:
1	06/05/20		
2	08/26/20		Changes per WC# Plan Chk.
3	07/08/20		Changes per WC# Plan Chk.

PROJECT: A-19-001
SCALE (1/4")= 1'-0"
SCALE (3/16")= 1'-0"
CHECKED BY: RB
ISSUED: 03/03/2020

In preparation of the Architect, Engineer, Surveyor or Professional Seal, the undersigned has examined the drawings and specifications and the work shown thereon and has found that they conform to the requirements of the contract and the laws of the State of Utah. The undersigned hereby certifies that the work shown on the drawings and specifications is in accordance with the contract and the laws of the State of Utah.

SHEET

E603

ELECTRICAL SPECIFICATIONS

GENERAL PROVISION

A. REFERENCE

1. THE GENERAL CONDITIONS AND OTHER CONTRACT DRAWINGS AS SET FORTH IN THE FOREGOING PAGES ARE HEREBY INCORPORATED INTO AND BECOME A PART OF THE SPECIFICATIONS FOR WORK UNDER THIS TITLE, INsofar AS THEY APPLY HERETO.
2. ALL SPECIFICATIONS UNDER THIS DIVISION TITLE ARE DIRECTED TO AND ARE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR, UNLESS OTHER TRADES OR PERSONS ARE SPECIFICALLY MENTIONED, "ELECTRICAL CONTRACTOR" IS INFERRED AND INTENDED.

B. CONTRACT DRAWINGS

1. THE DRAWINGS ACCOMPANYING THESE SPECIFICATIONS ARE COMPLEMENTARY EACH TO THE OTHER AND WHAT IS CALLED FOR BY ONE SHALL BE AS IF CALLED FOR BY BOTH.
2. CONSULT ALL CONTRACT DRAWINGS WHICH MAY AFFECT THE LOCATION OF EQUIPMENT, CONDUIT AND WIRING AND MAKE MINOR ADJUSTMENTS IN LOCATION TO SECURE COORDINATION.
3. WIRING LAYOUT IS SCHEMATIC AND EXACT LOCATIONS SHALL BE DETERMINED BY FIELD CONDITIONS.
4. OTHER THAN MINOR ADJUSTMENTS SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR APPROVAL BEFORE PROCEEDING WITH THE WORK.

C. JOB-SITE COPY OF DOCUMENTS

1. MAINTAIN AT THE SITE, ONE COPY OF ALL DRAWINGS, SPECIFICATIONS, ADDENDA APPROVED SHOP DRAWINGS, CHANGE ORDERS AND OTHER MODIFICATIONS, IN GOOD ORDER AND MARKED TO RECORD ALL CHANGES MADE DURING CONSTRUCTION. THESE SHALL BE AVAILABLE TO THE OWNER'S REPRESENTATIVE. THE DRAWINGS MARKED TO RECORD ALL CHANGES MADE DURING CONSTRUCTION SHALL BE DELIVERED TO THE OWNER'S REPRESENTATIVE FOR THE OWNER UPON COMPLETION OF THE WORK. AN ADDITIONAL SET OF DRAWINGS WILL BE FURNISHED BY THE OWNER'S REPRESENTATIVE FOR THIS PURPOSE UPON REQUEST.

D. MANUFACTURER'S DRAWINGS

1. THE CONTRACTOR SHALL SUBMIT TO THE ARCHITECT FOR REVIEW, (6) COPIES OF MANUFACTURER'S DRAWINGS AND WIRING DIAGRAMS. THE ENGINEER WILL REVIEW CONTRACTOR'S SHOP DRAWINGS AND RELATED SUBMITTALS (AS INDICATED BELOW) WITH RESPECT TO THE ABILITY OF THE DETAILED WORK, WHEN COMPLETE, TO BE A PROPERLY FUNCTIONING INTEGRAL ELEMENT OF THE OVERALL SYSTEM DESIGNED BY THE ENGINEER. BEFORE SUBMITTING A SHOP DRAWING OR ANY RELATED MATERIAL TO THE ENGINEER, CONTRACTOR SHALL REVIEW EACH SUCH SUBMISSION FOR CONFORMANCE WITH THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND OPERATIONS OF CONSTRUCTION, AND SAFETY PRECAUTIONS AND PROGRAMS INCIDENTAL THERETO, ALL OF WHICH ARE THE SOLE RESPONSIBILITY OF CONTRACTOR. APPROVE EACH SUCH SUBMISSION BEFORE SUBMITTING IT; AND SO STAMP EACH SUCH SUBMISSION BEFORE SUBMITTING IT. THE ENGINEER SHALL ASSUME THAT NO SHOP DRAWING OR RELATED SUBMITTAL COMPRISES A VARIATION UNLESS CONTRACTOR ADVISES ENGINEER OTHERWISE VIA A WRITTEN INSTRUMENT WHICH IS ACKNOWLEDGED BY ENGINEER IN WRITING. THE ITEMS, TYPES OF SUBMITTALS AND RELATED MATERIAL (IF ANY) CALLED FOR ARE INDICATED BELOW:

ITEMS	TYPE SUBMITTALS REQUESTED
LIGHTING AND POWER PANELS	SHOP DRAWINGS
LIGHTING FIXTURES	CATALOG CUTS

E. GUARANTEES

1. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEFECTS, REPAIRS AND REPLACEMENTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR AFTER DATE OF SUBSTANTIAL COMPLETION AS DETERMINED BY THE OWNER'S REPRESENTATIVE. PRODUCT GUARANTEES GREATER THAN ONE (1) YEAR SHALL BE PASSED ALONG TO THE OWNER FOR FULL BENEFIT OF THE MANUFACTURER'S WARRANTY.

WORK INCLUDED

A. INSTALLATION, MATERIALS, AND WORKMANSHIP

1. FURNISH AND INSTALL ALL NECESSARY ANCHORS, SUPPORTS, STRAPS, BOXES, FITTINGS AND OTHER SIMILAR APPURTENANCES NOT INDICATED ON THE DRAWINGS BUT WHICH ARE REQUIRED FOR A COMPLETE AND PROPERLY INSTALLED SYSTEM CONSISTENT WITH THE ARCHITECTURAL TREATMENT OF THE BUILDING.
 2. THE ELECTRICAL CONTRACTOR, INsofar AS THE WORK IS CONCERNED, SHALL AT ALL TIMES KEEP THE PREMISES IN A NEAT AND ORDERLY CONDITION. AND AT THE COMPLETION OF THE WORK, SHALL PROPERLY CLEAN UP AND CART AWAY DEBRIS AND EXCESS MATERIALS. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF DUMPSTER & REFUSED DISPOSAL AS REQUIRED FOR ELECTRICAL WORK.
 3. ALL MATERIALS SHALL BE NEW AND UNDETERIORATED AND OF A QUALITY NOT LESS THAN THE MINIMUM SPECIFIED.
- B. COORDINATION OF PLANS AND SPECIFICATIONS
1. CONTACT THE OWNER'S REPRESENTATIVE IMMEDIATELY IF THERE IS ANY QUESTIONS REGARDING THE MEANING OR INTENT OF EITHER PLANS OR SPECIFICATIONS, OR UPON NOTICING ANY DISCREPANCIES OR OMISSIONS IN EITHER PLANS OR SPECIFICATIONS.
- C. CUTTING AND PATCHING
1. ALL ELECTRICAL EQUIPMENT SHALL BE KEPT DRY AND CLEAN DURING THE CONSTRUCTION PERIOD. INTERIOR OF ALL ENCLOSURES SHALL BE CLEANED OF DIRT AND DEBRIS BEFORE INSTALLING TRIM OR COVERS.
 2. ALL FINISHED SURFACES OF EQUIPMENT FURNISHED UNDER THIS CONTRACT SHALL BE THOROUGHLY CLEANED OF DIRT AND ALL SCRATCHED OR DAMAGED SURFACES SHALL BE TOUCHED UP WITH MATCHING MATERIALS BEFORE FINAL ACCEPTANCE OF THE WORK.
 3. WHEN ALL WORK IS COMPLETED AND ALL WORK HAS BEEN SATISFACTORILY TESTED AND ACCEPTED BY THE OWNER'S REPRESENTATIVE, ALL CONDUIT AND OTHER EXPOSED SURFACES SHALL BE THOROUGHLY CLEANED.

CODES AND FEES

A. CODES

1. ALL WORK PERFORMED UNDER THIS SPECIFICATION SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AS PREPARED AND PUBLISHED BY THE NATIONAL FIRE PROTECTION ASSOCIATION AND ANY APPLICABLE STATE OR LOCAL CODES.

B. FEES:

1. OBTAIN AND PAY FOR ANY AND ALL PERMITS REQUIRED BY ALL LAWS AND REGULATIONS AND PUBLIC AUTHORITY HAVING SUCH JURISDICTION.

TESTS AND INSPECTIONS

1. OBTAIN ALL INSPECTIONS REQUIRED BY ALL LAWS, ORDINANCES, RULES, REGULATIONS OR PUBLIC AUTHORITY HAVING JURISDICTION AND OBTAIN CERTIFICATES OF SUCH INSPECTIONS AND SUBMIT SAME TO THE OWNER'S REPRESENTATIVE. PAY ALL FEES, CHARGES AND OTHER EXPENSES IN CONNECTION THEREIN. OBTAIN OCCUPANCY PERMIT AS REQUIRED BY OWNER. FINAL PAYMENT SHALL NOT BE MADE UNTIL OCCUPANCY PERMIT IS OBTAINED.
2. WORK SHALL BE UNACCEPTABLE WHEN FOUND TO BE DEFECTIVE OR CONTRARY TO THE PLANS SPECIFICATIONS, CODES SPECIFIED OR ACCEPTED STANDARDS OF GOOD WORKMANSHIP.
3. THE CONTRACTOR SHALL PROMPTLY CORRECT ALL WORK FOUND UNACCEPTABLE BY THE OWNER'S REPRESENTATIVE WHETHER OBSERVED BEFORE OR AFTER SUBSTANTIAL COMPLETION AND WHETHER OR NOT FABRICATED, INSTALLED OR COMPLETED. THE CONTRACTOR SHALL BEAR ALL COSTS OF CORRECTING SUCH UNACCEPTABLE WORK, INCLUDING COMPENSATION FOR THE OWNER'S REPRESENTATIVE ADDITIONAL SERVICES MADE NECESSARY THEREBY.

CONDUIT

1. FURNISH AND INSTALL ALL CONDUITS, BOXES, FITTINGS, ETC., FOR A COMPLETE RACEWAY SYSTEM.
2. ALL WIRING SHALL BE RUN IN EMT CONDUIT OR WITH GROUND CONDUCTOR UNLESS OTHERWISE NOTED.
3. ALL CONDUIT SIZES STATED HEREIN OR MARKED ON THE DRAWINGS ARE MINIMUM SIZE AND SHALL BE NO LESS THAN 1/2" UNLESS OTHERWISE NOTED.
4. ALL CONDUIT SHALL BE SUBSTANTIALLY SUPPORTED BY PIPE STRAPS OR SUITABLE CLAMPS OR HANGERS ATTACHED TO THE ELEMENTS OF THE BUILDING STRUCTURE TO PROVIDE RIGID INSTALLATION; IN NO CASE SHALL CONDUIT BE ATTACHED OR SUPPORTED FROM ADJOINING PIPE OR INSTALLED IN SUCH A MANNER AS TO PREVENT THE READY REMOVAL OF OTHER PIPE FOR REPAIRS.

WIRE AND CABLE

1. ALL CONDUCTORS SHALL BE COPPER AND OF THE AWG SIZE AND TYPE SHOWN ON THE DRAWINGS. WHERE NO SIZE OR TYPE IS SHOWN, CONDUCTORS SHALL NOT BE LESS THAN #12 TYPE XHHW, THHN, OR THWN. CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED COPPER AND HAVE 600 VOLT INSULATION; BE UL LABELED AND OF AMERICAN MANUFACTURER.
 2. TYPE NM OR MC CABLE.
 3. ALL CONNECTIONS ARE TO BE MADE USING PRESSURE TYPE TERMINALS.
 4. THE FOLLOWING COLOR CODE SHALL BE USED:
- | | 120/240 VOLT | 120/208 VOLT | 277/480 VOLT |
|---------|--------------|--------------|--------------|
| PHASE A | BLACK | BLACK | BROWN |
| PHASE B | RED | RED | ORANGE |
| PHASE C | BLUE | BLUE | YELLOW |
| NEUTRAL | WHITE | WHITE | WHITE |
| GROUND | GREEN | GREEN | GREEN |
1. CONDUCTORS NO. 10 AWG OR SMALLER SHALL HAVE INSULATION COLORED AS NOTED ABOVE.
 2. CONDUCTORS NO. 8 AWG OR LARGER SHALL HAVE INSULATION COLORED AS NOTED ABOVE OR COLORED TAPE, MINIMUM SIZE 1/2", WRAPPED THREE AROUND AT THE FOLLOWING POINTS:
 1. AT EACH TERMINAL
 2. AT EACH CONDUIT ENTRANCE
 3. AT INTERVALS NOT MORE THAN 12 INCHES APART IN ALL BOXES, PANEL TUBS, SWITCHBOARDS, ETC
 3. ALL BRANCH CIRCUITS SHALL BE MARKED IN THE PANEL BOARD GUTTERS. MARKERS SHALL INDICATE CORRESPONDING BRANCH--CIRCUIT NUMBERS.
 4. EACH BRANCH CIRCUIT REQUIRING A NEUTRAL SHALL BE FURNISHED WITH A SEPARATE INDIVIDUAL NEUTRAL CONDUCTOR.

BOXES AND PLATES

1. FURNISH AND INSTALL ALL OUTLET, JUNCTION, AND PULL BOXES AS INDICATED ON THE DRAWINGS AND AS NECESSARY TO INSTALL THE REQUIRED CONDUIT AND WIRING IN A NEAT AND WORKMANLIKE MANNER.
 2. PULL BOXES AND JUNCTION BOXES SHALL BE GALVANIZED OR PLASTIC AND OF THE CORRECT SIZE AND GAUGE, SIZED IN ACCORDANCE WITH CODE REQUIREMENTS AND SHALL BE UL LABELED.
 3. BOXES AT EXTERIOR AREAS TO BE WATERTIGHT AND DUST-TIGHT WITH GASKETED COVERS.
 4. ALL BOXES FOR EXPOSED WORK IN FINISHED SPACES SHALL BE "FS" TYPE WITH THREADED HUBS WITH RIGID CONDUIT RISER (DEEP WIRE MOLD BOXES)
 5. ALL BOXES SHALL BE RIGIDLY SUPPORTED INDEPENDENT OF THE CONDUIT SYSTEM. BOXES CAST INTO MASONRY OR CONCRETE ARE CONSIDERED TO BE RIGIDLY SUPPORTED.
- F. FLOOR BOXES
1. DESCRIPTION: FLOOR BOXES COMPATIBLE WITH FLOOR BOX SERVICE FITTINGS PROVIDED IN ACCORDANCE WITH THE WIRING DEVICES SECTION OF THIS SPECIFICATION; WITH PARTITIONS TO SEPARATE MULTIPLE SERVICES; FURNISHED WITH ALL COMPONENTS, ADAPTERS, AND TRIMS REQUIRED FOR COMPLETE INSTALLATION.
 2. USE CAST IRON OR NONMETALLIC FLOOR BOXES WITHIN SLAB ON GRADE.

3. USE SHEET-STEEL, CAST IRON, OR NONMETALLIC FLOOR BOXES WITHIN SLAB ABOVE GRADE.
 4. METALLIC FLOOR BOXES: FULLY ADJUSTABLE (WITH INTEGRAL MEANS FOR LEVELING ADJUSTMENT PRIOR TO AND AFTER CONCRETE POUR).
 5. MANUFACTURER: SAME AS MANUFACTURER OF FLOOR BOX SERVICE FITTINGS.
- G. UNDERGROUND BOXES/ENCLOSURES:
1. DESCRIPTION: IN-GROUND, OPEN BOTTOM BOXES FURNISHED WITH FLUSH, NON-SKID COVERS WITH LEGEND INDICATING TYPE OF SERVICE AND STAINLESS STEEL TAMPER RESISTANT COVER BOLTS.
 2. SIZE: AS INDICATED ON DRAWINGS.
 3. DEPTH: AS REQUIRED TO EXTEND BELOW FROST LINE TO PREVENT FROST UPEHAVAL, BUT NOT LESS THAN 12 INCHES.
 4. APPLICATIONS:
 - a. SIDEWALKS AND LANDSCAPED AREAS SUBJECT ONLY TO OCCASIONAL NONDELIBERATE VEHICULAR TRAFFIC. USE POLYMER CONCRETE OR COMPOSITE ENCLOSURE WITH MINIMUM SCTE 77, TIER 8 LOAD RATING.
 - b. PARKING LOTS, IN AREAS SUBJECT ONLY TO OCCASIONAL NONDELIBERATE VEHICULAR TRAFFIC: USE POLYMER CONCRETE OR COMPOSITE ENCLOSURE WITH MINIMUM SCTE 77, TIER 15 LOAD RATING.
 - c. DO NOT USE POLYMER CONCRETE ENCLOSURES IN AREAS SUBJECT TO DELIBERATE VEHICULAR TRAFFIC.
 5. COMPOSITE UNDERGROUND BOXES/ENCLOSURES: COMPLY WITH SCTE 77.

WIRING DEVICES

- A. WIRING DEVICES SHALL BE SIMILAR TO THOSE LISTED BELOW AND OF SPECIFIED AMPERAGE. OTHER SPECIAL PURPOSE DEVICES SHALL BE AS SPECIFIED ON THE DRAWINGS.
- D. DUPLEX GROUNDING TYPE RECEPTACLE--20 AMP, 125 VOLT--
1. LEVITON TWR20-X TAMPER RESISTANT
- E. OR APPROVED EQUAL
- C. SINGLE POLE SWITCHES -- 20 AMP, 120 VOLT
- D. WEATHERPROOF RECEPTACLES - 20 AMP, 125 VOLT--NEMA 5-20R
1. HUBBELL--5352 WITH 5205 COVER INTERMATIC GUARDIAN
 2. I SERIES, NEMA 3R COVER
 3. ARROW HART--5352 WITH 4500 COVER
- F. G.F.C.I. RECEPTACLE: 20 AMP, 125 VOLT--NEMA 5-20 R
- E. LEVITON T7599-X TAMPER RESISTANT WITH MATCHING NYLON COVER PLATE OR W-26 W.P. COVER
- F. GROUND ALL RECEPTABLES IN ACCORDANCE WITH ARTICLE 250-146 OF NEC AND AS INDICATED IN THE GROUNDING SECTION OF THIS SPECIFICATION.

IDENTIFICATION

- A. IDENTIFICATION OF SERVICE EQUIPMENT AND INDIVIDUAL SWITCHES, ALL DISCONNECTS, STARTERS, ALL EXHAUST FAN MANUAL STARTING SWITCHES
- B. IDENTIFICATION SHALL BE IN THE FORM OF LAMINATED PLASTIC NAMEPLATES, BLACK RACE, WITH THE LETTERS ENGRAVED INTO THE WHITE BACKGROUND, MINIMUM 1/2" HIGH. PLATES SHALL BE DRILLED ON EACH END FOR SHEET METAL SCREW ATTACHMENT. NO "DYMO" OR SIMILAR TYPE LABELS WILL BE ALLOWED.
- C. PANEL BOARD DIRECTORY: A TYPED CIRCUIT DIRECTORY SHALL BE PROVIDED INDICATING LOCAL AREA SERVED AND LOCATION FOR EACH BRANCH CIRCUIT.

GROUNDING

- A. ALL FEEDERS AND BRANCH CIRCUITS OVER 100 VOLTS SHALL INCLUDE A GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH NEC TABLE 250.122, EXCEPT NOT BE SMALLER THAN #12 FOR POWER AND LIGHTING CIRCUITS AND #14 FOR CONTROL CIRCUITS. ALL GROUND CONDUCTORS SHALL BE GREEN AS SPECIFIED UNDER THE WIRE AND CABLE SECTION OF THIS SPECIFICATION.
- B. ALL GROUND CABLES SHALL BE PENN-UNION "GPI" TYPE OR SIMILAR BY O.Z. OR BURNDY.
- C. CONDUIT FOR SOLITARY GROUND CONDUCTORS SHALL BE RIGID SCHEDULE 40 PVC NON- METALLIC ELECTRICAL CONDUIT WITH U.L. LABEL. SOLITARY GROUND CONDUCTORS SHALL NOT BE PLACED THROUGH METALLIC SLEEVES OR CONDUITS AND SHALL NOT BE COMPLETELY ENCRICLED BY METALLIC HANGERS OR SUPPORTS.
- D. THE GROUND CONDUCTOR SHALL BE CONNECTED TO THE NEUTRAL IN ONLY TWO LOCATIONS: ON THE SUPPLY SIDE OF THE SERVICE DISCONNECT AND SEPARATELY ON THE LOAD SIDE OF THE SERVICE DISCONNECT.
- E. AT EACH RECEPTACLE BOX, THE GROUND CONDUCTOR SHALL ENTER AND CONNECT, WITH NORMAL WIRING, CONNECTOR, TO: 1) THE GROUND PITGAIL TO RECEPTACLE; 2) THE GROUND PITGAIL TO THE BOX GROUND SCREW; AND 3) THE OUTGOING GROUND CONDUCTOR TO NEXT DEVICE, IF NOT AT END OF RUN. METAL TO METAL CONTACT BETWEEN THE DEVICE YOKE AND THE OUTLET BOX IS NOT ACCEPTABLE AS A BOND FOR EITHER SURFACE. MOUNTED BOXES OR FLUSH TYPE BOXES.
- F. CONDUIT SYSTEM SHALL BE ELECTRICALLY CONTINUOUS. ALL LOCK NUTS SHALL CUT THROUGH ENAMELED OR PAINTED SURFACES ON ENCLOSURES. WHERE ENCLOSURES AND NON-CURRENT CARRYING METALS ARE ISOLATED FROM THE CONDUIT SYSTEM, USE BONDING JUMPERS WITH APPROVED CLAMPS. WHERE REDUCING WASHERS ARE USED AND WHERE CONCENTRIC OR ECCENTRIC KNOCKOUTS ARE NOT COMPLETELY REMOVED BONDING BUSHINGS SHALL BE REQUIRED.

POWER AND LIGHTING PANELS

- A. FURNISH AND INSTALL AS SCHEDULED AND SHOWN ON THE DRAWINGS, POWER PANELS FOR OPERATION ON VOLTAGES INDICATED.
- B. ALL TERMINATIONS SHALL BE MARKED "75°C ONLY", "60/75° C" OR LISTED FOR USE OF 75° C INSULATED CONDUCTORS AT FULL 75° C CAPACITY.
- C. ALL BUS BARS SHALL BE SILVER OR TIN PLATED COPPER.
- D. CABINETS SHALL BE OF COMMERCIAL GALVANIZED SHEET STEEL, CODE GAUGE AND SIZE, SURFACE OR RECESSED MOUNTED AS CALLED FOR IN THE DRAWINGS.
- E. NEUTRAL ASSEMBLY SHALL HAVE INDIVIDUAL ANTI-TURN SOLDERLESS TERMINALS, SIMILAR TO SQUARE D TYPE PK, FOR CONNECTION OF ULTIMATE NUMBER OF NEUTRAL WIRES. SHEET METAL TERMINAL STRIPS AND CONNECTIONS WILL BE REJECTED.
- F. PANEL SHALL HAVE A COPPER GROUND BAR SIMILAR TO NEUTRAL BAR IN NUMBER, SIZE, AND TYPE OF ANTI-TURN SOLDERLESS LUGS. THIS GROUND BAR SHALL BE BONDED TO THE PANEL TUB IN THE GUTTER SPACE OPPOSITE THE MAINS AND THE NEUTRAL ASSEMBLY AND SHALL HAVE THE SCREWDRIVER SLOTS FACING THE FRONT OF THE PANEL.
- G. QUALITY STANDARD: SQUARE D TYPE QO OR HOMELINE

LIGHTING FIXTURES

- A. CONTRACTOR SHALL FURNISH AND INSTALL LIGHTING FIXTURES AS INDICATED IN FIXTURE SCHEDULE SHOWN ON DRAWINGS, AND SPECIFIED HEREIN
- B. NEUTRAL ASSEMBLY SHALL HAVE INDIVIDUAL ANTI-TURN SOLDERLESS TERMINALS, SIMILAR TO SQUARE D TYPE PK, FOR CONNECTION OF ULTIMATE NUMBER OF NEUTRAL WIRES. SHEET METAL TERMINAL STRIPS AND CONNECTIONS WILL BE REJECTED.
- C. ALL LIGHTING FIXTURES INSTALLED BY THE ELECTRICAL CONTRACTOR SHALL BE FURNISHED COMPLETE WITH AS INDICATED ON THE FIXTURE SCHEDULE
- D. ANY LIGHTING FIXTURES SCRATCHED, BENT, CRACKED OR IN ANY WAY DAMAGED BEFORE ACCEPTANCE BY OWNER SHALL BE REPLACED AT THIS CONTRACTOR'S EXPENSE.
- E. ALL LIGHTING FIXTURES SHALL BE IN WORKING ORDER AT THE TIME OF FINAL ACCEPTANCE OF THE WORK BY THE OWNER.
- F. ALL LIGHTING FIXTURES ARE TO BE GROUNDED ON THE INTERIOR OF THE FIXTURE HOUSING, ON CLEAN BARE METAL (FREE OF PAINT), BY USE OF PITGAIL AND FASTENED BY A SCREW USED FOR NO OTHER PURPOSE.

ALARM & DETECTION SYSTEMS

A. SUMMARY

1. INCLUDES BUT NOT LIMITED TO: FURNISH AND INSTALL MICROPROCESSOR-CONTROLLED, INTELLIGENT REPORTING FIRE ALARM EQUIPMENT REQUIRED TO FORM A COMPLETE COORDINATED SYSTEM THAT IS READY FOR OPERATION

B. SYSTEM DESCRIPTION

1. THE FIRE ALARM SYSTEM SHALL COMPLY WITH REQUIREMENTS OF NFPA STANDARD NO. 72 FOR PROTECTED PREMISES SIGNALING SYSTEMS EXCEPT AS MODIFIED AND SUPPLEMENTED BY THIS SPECIFICATION. THE SYSTEM SHALL BE ELECTRICALLY SUPERVISED AND MONITOR THE INTEGRITY OF ALL CONDUCTORS.
2. THE SYSTEM SHALL BE AN ACTIVE/INTERROGATIVE TYPE SYSTEM WHERE EACH DEVICE IS REPETITIVELY SCANNED, CAUSING A SIGNAL TO BE TRANSMITTED TO THE MAIN FIRE ALARM CONTROL PANEL (FACP) INDICATING THAT THE ASSOCIATED INITIATING DEVICE AND NOTIFICATION APPLIANCE CIRCUIT WIRING IS FUNCTIONAL. LOSS OF SUCH A SIGNAL AT THE MAIN FACP SHALL RESULT IN A TROUBLE INDICATION AS SPECIFIED HEREINAFTER FOR THE PARTICULAR INPUT.
3. SYSTEM OPERATION: OPERATION OF MANUAL STATION OR AUTOMATIC ACTIVATION OF ANY SMOKE DETECTOR OR HEAT DETECTOR SHALL --
 - a. CAUSE SYSTEM EVACUATION HORNS TO SOUND AND LAMPS TO FLASH.
 - b. THE 80 CHARACTER LCD DISPLAY SHALL INDICATE ALL INFORMATION ASSOCIATED WITH THE FIRE ALARM CONDITION, INCLUDING THE TYPE OF ALARM POINT AND ITS LOCATION WITHIN THE PROTECTED PREMISES.
 - c. INITIATE OFF-SITE ALARM NOTIFICATION.
 - d. RELEASE MAGNETIC DOOR HOLDERS.
 - e. INITIATE SHUT DOWN OF MECHANICAL UNITS WITH AIR FLOW IN EXCESS OF 2000CFM.
4. WIRING: THE MULTIPLE BUSS AND DATA COMMUNICATION BUS (OPTIONS BUS) SHALL BE WIRED WITH STANDARD NEC 760 COMPLIANT WIRING. ALL FACP SCREW TERMINALS SHALL BE CAPABLE OF ACCEPTING 14 AWG (1.8 MM) TO 18 AWG (1.2 MM) WIRE. ALL SYSTEM WIRING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 70, THE NATIONAL ELECTRICAL CODE (NEC) AND ALSO COMPLY WITH ARTICLE 760 OF THE NEC.

C. QUALITY ASSURANCE

1. REGULATORY REQUIREMENTS -
 - a. SYSTEM SHALL MEET APPROVAL OF AUTHORITY HAVING JURISDICTION (AHJ). CHANGES OR ADDITIONS SHALL BE MADE TO THE SYSTEM AS REQUIRED WITHOUT ADDITIONAL COST TO OWNER.
 - b. EQUIPMENT, DEVICES, AND CABLE SHALL BE UL OR FACTORY MUTUAL LISTED FOR USE IN FIRE ALARM SYSTEMS.

D. FACP COMPONENTS:

1. EQUIPMENT AND ACCESSORIES FURNISHED UNDER TERMS OF THIS SPECIFICATION SHALL BE STANDARD PRODUCTS OF SINGLE MANUFACTURER, OR INCLUDE WRITTEN STATEMENT BY CONTROL PANEL MANUFACTURER CONFIRMING COMPATIBILITY OF COMPONENTS AND INCLUSION OF THESE COMPONENTS UNDER SYSTEM WARRANTY.
2. THE MAIN FACP CENTRAL CONSOLE SHALL CONTAIN A MICROPROCESSOR BASED CENTRAL PROCESSING UNIT (CPU). THE FACP SHALL HAVE THE FOLLOWING TYPE OF EQUIPMENT USED TO MAKE UP THE SYSTEM: ADDRESSABLE DETECTORS, ADDRESSABLE MODULES, LOCAL AND REMOTE OPERATOR TERMINALS, ANNUNCIATORS, AND OTHER SYSTEM CONTROLLED DEVICES.
 - a. THE MAIN FACP AND CENTRAL CONSOLE SHALL PERFORM THE FOLLOWING FUNCTIONS:
 1. SUPERVISE AND MONITOR ALL ADDRESSABLE DETECTORS AND MONITOR MODULES CONNECTED TO THE SYSTEM FOR NORMAL, TROUBLE AND ALARM CONDITIONS.

- c. SUPERVISE ALL NOTIFICATION CIRCUITS THROUGHOUT THE FACILITY.
 - d. VISUALLY AND AUDIBLY ANNUNCIATE ANY TROUBLE, SUPERVISORY OR ALARM CONDITION ON OPERATOR'S TERMINAL, PANEL DISPLAY, AND ANNUNCIATORS.
3. THE FIRE ALARM CONTROL PANEL SHALL INCLUDE A FULL FEATURED OPERATOR INTERFACE CONTROL AND ANNUNCIATION PANEL WHICH SHALL INCLUDE A BACKLIT LIQUID CRYSTAL DISPLAY, INDIVIDUAL, COLOR CODED SYSTEM STATUS LEADS, AND AN ALPHA-NUMERIC KEYPAD FOR FIELD PROGRAMMING AND CONTROL OF THE FIRE ALARM SYSTEM AND NOTIFICATION SYSTEM.
 4. THE SYSTEM SHALL INCLUDE EMERGENCY EVACUATION SIGNAL UTILIZING INTELLIGENCE SUCH THAT LOSS OF OPERATION BY THE MAIN FACP WILL NOT RESULT IN THE LOSS OF EVACUATION SIGNAL THROUGHOUT THE BALANCE OF THE BUILDING.
 5. THE MAIN COMMUNICATION BUS (OPTIONS BUS) SHALL BE CAPABLE OF CLASS A OR CLASS B CONFIGURATION WITH A TOTAL BUS LENGTH OF 5,900 FEET (1,798 M).
 6. OFF-SITE ALARM NOTIFICATION SYSTEM:
 - a. PROVIDE TELEPHONE LINE CONNECTION FROM TELEPHONE TERMINAL BOARD TO FIRE ALARM CONTROL PANEL.
 - b. PROVIDE DIALER DEVICE TO NOTIFY OFF-SITE PERSONNEL OF ALARM OR ABNORMAL CONDITIONS.
 - c. CONNECT TO FIRE ALARM CONTROL PANEL SO SPECIFIED CONDITIONS INITIATE OFF-SITE CALL. USE ONE ALARM CODE FOR ALARM AND SECOND CODE FOR SUPERVISORY/TROUBLE ALARM.
 7. AUDIBLE HORN OR ANNUNCIATION -
 - a. PROVIDE SEPARATE AND DISTINCT ALARM SIGNALS FOR ALARM AND TROUBLE CONDITIONS.
 - b. ALARM SIGNAL SHALL ALSO OPERATE STROBE LIGHTS, IF SPECIFIED.
 - c. PROVIDE ALARM SILENCE SWITCHES AT CONTROL PANEL.
 - d. TROUBLE ALARM SHALL BE HORN INTEGRAL TO CONTROL PANEL.
 - e. SUPERVISORY ALARM MAY BE SAME AUDIBLE ALARM AS TROUBLE ALARM, BUT WITH SEPARATE VISUAL ANNUNCIATION.

F. FIELD MOUNTED SYSTEM COMPONENTS

1. FIRE ALARM INITIATING DEVICES
 - a. DUCT DETECTOR HOUSING: PROVIDE SMOKE DETECTOR DUCT HOUSING ASSEMBLIES TO MOUNT AN ADDRESSABLE DETECTOR ALONG WITH A STANDARD, RELAY OR ISOLATOR DETECTOR MOUNTING BASE. THE HOUSING SHALL ALSO PROTECT THE MEASURING CHAMBER FROM DAMAGE AND INSECTS. THE HOUSING SHALL BE 1/2" THICK AND HAVE AN AIR SAMPLING INLET TUBE THAT EXTENDS INTO THE DUCT AIR STREAM UP TO TEN FEET. DRILLING TEMPLATES AND GASKETS TO FACILITATE LOCATING AND MOUNTING THE HOUSING SHALL ALSO BE PROVIDED. THE HOUSING SHALL BE FINISHED IN BAKED RED ENAMEL. REMOTE ALARM LED INDICATORS AND REMOTE TEST STATIONS SHALL BE PROVIDED.
 - b. ADDRESSABLE SMOKE DETECTORS
 - 1) CEILING MOUNTED, ADDRESSABLE PHOTOELECTRIC
 - 2) UL LISTED COMPACTORS WITH THE "FIRE ALARM" CONTROL PANEL.
 - 3) SHALL HAVE A FLASHING STATUS LED FOR VISUAL SUPERVISION. WHEN THE DETECTOR IS ACTUATED, THE FLASHING LED WILL LATCH ON SOLID. THE LED SHALL FLASH AT A 1/SEC RATE IF THE CHAMBER IS OUT OF CALIBRATION RANGE. THE DETECTOR MAY BE RESET BY ACTUATING THE CONTROL PANEL'S RESET SWITCH.
 - c. SMOKE DETECTOR GUARDS
 - 1) UNDERWRITERS LABORATORIES TESTED AND LISTED BY FOR USE WITH THE SMOKE DETECTORS THEY PROTECT.
 - 2) GUARD DESIGN SHALL NOT AFFECT THE DETECTOR OPERATING SENSITIVITY AND SHALL NOT REDUCE THE LISTED DETECTOR SPACING.
 - 3) CONSTRUCTED OF 16-GAUGE STEEL WITH A BAKED WHITE FINISH TO MATCH THE DETECTORS.
 - 4) TAMPERPROOF MOUNTING HARDWARE SHALL BE PROVIDED.
 - d. ADDRESSABLE FIXED TEMPERATURE-ROR HEAT DETECTOR
 - 1) ADDRESSABLE COMBINATION FIXED TEMPERATURE / RATE-OF-RISE
 - 2) NOMINAL FIXED TEMPERATURE ALARM POINT RATING OF 135°F (57°C) AND A RATE OF RISE ALARM POINT OF 15°F(9°C) PER MINUTE.
 - 3) RATED FOR CEILING INSTALLATION AT A MINIMUM OF 70 FT (21.3M) CENTERS AND BE SUITABLE FOR WALL MOUNT APPLICATIONS.
2. DETECTOR BASES: STANDARD DETECTOR MOUNTING BASES SUITABLE FOR MOUNTING ON EITHER NORTH AMERICAN 1-GANG, 3/4" OR 4 INCH OCTAGON BOX AND 4 INCH SQUARE BOX, OR EUROPEAN BESA OR 1-GANG BOX. THE BASE SHALL, CONTAIN NO ELECTRONICS AND SUPPORT ALL SERIES DETECTOR TYPES.

f. ADDRESSABLE MANUAL STATION

- 1) ADDRESSABLE DOUBLE ACTION, SINGLE STAGE
- 2) POLYCARBONATE CONSTRUCTION WITH INTERNAL TOGGLE SWITCH.
- 3) FINISHED IN RED WITH SILVER "F" LETTERING
- 4) SUITABLE FOR MOUNTING ON NORTH AMERICAN 2 1/2 (64MM) DEEP 1-GANG BOXES AND 1 1/2 (38MM) DEEP 4 SQUARE BOXES WITH 1-GANG COVERS.

2. FIRE ALARM ACTUATING DEVICES

- a. DOOR HOLDING DEVICES: DOOR RELEASE UNITS SHALL BE ELECTRICALLY OPERATED MAGNETIC DEVICES WHICH HOLD DOORS OPEN UNTIL RELEASED BY THE MAIN CONTROL UNIT. PROVIDE DOOR PLATES AND COORDINATE WITH THE GENERAL CONTRACTOR TO INSURE THAT THE PLATES ARE PROPERLY MOUNTED ON THE DOORS.

b. NOTIFICATION APPLIANCES

- 1) LOW PROFILE HORN-STROBES
 - a) AUDIBLE OUTPUT OF 92 DBA AT 10 FT. WHEN MEASURED IN REVERBERATION ROOM PER UL-464.
 - b) INTEGRALLY MOUNTED FLASHING LIGHT UNIT WITH BLOCK LETTERS "FIRE". MULTI-CANDELA WITH RED SELECTABLE FLASH RATE OF 30CD, 60CD, 75CD & 110CD, AND FLASH RATE BETWEEN ONE AND THREE HERTZ. ALL UNITS SHALL FLASH IN SYNCHRONIZATION WITH EACH OTHER.
 - c) THE HORN SHALL HAVE A SELECTABLE STEADY OR SYNCHRONIZED TEMPORAL OUTPUT.
 - d) IN AND OUT SCREW TERMINALS SHALL BE PROVIDED FOR WIRING.
 - e) LOW PROFILE HORN-STROBES SHALL MOUNT IN A NORTH AMERICAN 1-GANG BOX.
- 2) LOW PROFILE STROBE WALL MOUNTED STROBES AT THE LOCATIONS SHOWN ON THE DRAWINGS. IN AND OUT SCREW TERMINALS SHALL BE PROVIDED FOR WIRING. STROBES SHALL PROVIDE SYNCHRONIZED FLASH OUTPUTS. STROBE OUTPUT SHALL BE DETERMINED AS REQUIRED BY ITS SPECIFIC LOCATION AND APPLICATION FROM A FAMILY OF 15CD, 30CD, 60CD, 75CD, OR 110CD DEVICES. LOW PROFILE STROBES SHALL MOUNT IN A NORTH AMERICAN 1-GANG BOX.
- 3) LOW FREQUENCY HORN-STROBES
 - a) SHALL COMPLY WITH NFPA 72 18.4.5.3.
 - b) 520 HZ (+/- 10%) SQUARE WAVE TONE.
 - c) AUDIBLE OUTPUT OF 76 DBA AT 10 FT. WHEN MEASURED IN REVERBERATION ROOM PER UL-464.
 - d) INTEGRALLY MOUNTED FLASHING LIGHT UNIT WITH BLOCK LETTERS "FIRE". MULTI-CANDELA WITH RED SELECTABLE FLASH RATE OF 30CD, 60CD, 75CD & 100CD, AND FLASH RATE BETWEEN ONE AND THREE HERTZ. STROBE OUTPUT SHALL BE DETERMINED AS REQUIRED BY ITS SPECIFIC LOCATION AND APPLICATION.
 - e) ALL UNITS SHALL FLASH IN SYNCHRONIZATION WITH EACH OTHER.
- 4) LOW FREQUENCY HORNS
 - a) SHALL COMPLY WITH NFPA 72 18.4.5.3.
 - b) 520 HZ (+/-10%) SQUARE WAVE TONE.
 - c) AUDIBLE OUTPUT OF 76 DBA AT 10 FT. WHEN MEASURED IN REVERBERATION ROOM PER UL-464.

3. INITIATION & CONTROL MODULES

a. RELAY MODULE

- 1) PROVIDE ADDRESSABLE CONTROL RELAY CIRCUIT MODULES AS REQUIRED. THE MODULE SHALL PROVIDE ONE (1) FORM C DRY RELAY CONTACTS RATED AT 24VDC @ 2 AMPS (PILOT DUTY) TO CONTROL EXTERIOR APPLIANCE OR EQUIPMENT. THE POSITION OF THE RELAY CONTACT SHALL BE CONFIRMED BY THE SYSTEM FIRMWARE.

F. BATTERIES

1. SHALL BE 12 VOLT, GELL-CELL TYPE.
2. BATTERY SHALL HAVE SUFFICIENT CAPACITY TO POWER THE FIRE ALARM SYSTEM FOR NOT LESS THAN TWENTY-FOUR HOURS PLUS 5 MINUTES OF ALARM UPON A NORMAL AC POWER FAILURE.
3. THE BATTERIES ARE TO BE COMPLETELY MAINTENANCE FREE. NO LIQUIDS ARE REQUIRED. FLUID LEVEL CHECKS, REFILLING, SPILLS AND LEAKAGE SHALL NOT BE REQUIRED.

G. INSTALLATION

1. INSTALL FIRE ALARM AND DETECTION SYSTEMS AS INDICATED, IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S WRITTEN INSTRUCTIONS, AND COMPLYING WITH APPLICABLE PORTIONS OF NEC, NFPA AND NECAS "STANDARD OF INSTALLATION".
2. INSTALL WIRING, CABLEWAYS, CONDUCTORS, ELECTRICAL BOXES AND FITTINGS IN ACCORDANCE WITH SECTION 16.050 - BASIC MATERIALS AND METHODS
3. LABEL PULL AND JUNCTION BOXES "FIRE ALARM" WITH RED INDELIBEL INK.
4. LOOP WIRES THROUGH EACH DEVICE ON ZONE FOR PROPER SUPERVISION. TEE-TAPS NOT PERMITTED.
5. PROVIDE DUST PROTECTION FOR INSTALLED SMOKE DETECTORS UNTIL FINISH WORK IS COMPLETED AND BUILDING IS READY FOR OCCUPANCY.
6. PROTECT CABLES AND CONDUCTORS FROM CUTS, ABRASION AND OTHER DAMAGE DURING CONSTRUCTION.
7. MINIMUM CONDUCTOR SIZE SHALL BE 14 AWG UNLESS OTHERWISE SPECIFIED.
8. DO NOT INSTALL CEILING MOUNTED DETECTORS WITHIN 3 FEET OF AIR DISCHARGE GRILLS. COORDINATE WITH OTHER TRADES AS REQUIRED.
9. POST COPY OF WIRE IDENTIFICATION LIST INSIDE FIRE ALARM PANEL DOOR OR OTHER AREA ACCESSIBLE TO FIRE ALARM SERVICE PERSONNEL.
10. PROVIDE DUST SMOKE DETECTORS FOR ALL MECHANICAL UNITS WITH AIR FLOW IN EXCESS OF 2000 CFM AND TIE INTO FIRE ALARM CONTROL PANEL. PROVIDE FAN SHUT DOWN CIRCUIT AND ASSOCIATED CONTROL EQUIPMENT FOR ALL REQUIRED MECHANICAL UNITS.
11. INSTALL CONDUCTORS AND MAKE CONNECTIONS TO ALL, WATER FLOW SWITCHES, VALVE TAMPER SWITCHES, LOW AIR PRESSURE SWITCHES, AND DOOR HOLDING DEVICES.
12. INSTALL CONDUCTORS AND MAKE CONNECTIONS TO ALL FIRE/SMOKE DAMPERS. REFER TO MECHANICAL FOR EXACT NUMBER AND LOCATIONS.

FIELD QUALITY CONTROL

1. TEST & INSPECTION

- a. ALL INTELLIGENT ADDRESSABLE DEVICES SHALL BE TESTED FOR CURRENT ADDRESS AND USER DEFINED MESSAGE
- a. ALL WIRING SHALL BE TESTED FOR CONTINUITY, SHORTS, AND GROUNDS BEFORE THE SYSTEM IS COMPLETED.
- a. ALL TEST EQUIPMENT, INSTRUMENTS, TOOLS AND LABOR REQUIRED TO CONDUCT THE TESTS SHALL BE MADE AVAILABLE BY THE INSTALLING CONTRACTOR.
- d. THE SYSTEM INCLUDING ALL ITS SEQUENCE OF OPERATIONS SHALL BE DEMONSTRATED TO THE OWNER, HIS REPRESENTATIVE, AND THE LOCAL FIRE INSPECTOR. IN THE EVENT THE SYSTEM DOES NOT OPERATE PROPERLY, THE TEST SHALL BE TERMINATED. CORRECTIONS SHALL BE MADE AND THE TESTING

PROCEDURE SHALL BE REPEATED UNTIL IT IS ACCEPTABLE TO THE OWNER, HIS REPRESENTATIVES AND THE FIRE INSPECTOR.

- e. ALL FIRE ALARM TESTING SHALL BE IN ACCORDANCE WITH NATIONAL FIRE ALARM CODE, NFPA 72 - 2002, CHAPTER 10.
- I. MANUFACTURER'S FIELD SERVICE -
 1. INSTRUCT OWNER'S REPRESENTATIVE IN PROPER OPERATION AND MAINTENANCE PROCEDURES.
 2. PROVIDE A MINIMUM OF 4 HOURS TRAINING.

TELEPHONE/DATA SYSTEMS

A. SUMMARY

1. INCLUDES BUT NOT LIMITED TO
 - a. FURNISH AND INSTALL BUILDING TELEPHONE AND COMPUTER NETWORK RACEWAY AND CABLE SYSTEM AS DESCRIBED IN CONTRACT DOCUMENTS INCLUDING, BUT NOT LIMITED TO: RACEWAY, OUTLETS, MODULAR JACKS, DEVICE PLATES, CABLES, PUNCH DOWN BLOCKS, BACKBOARDS, CABINETS, PATCH PANELS, GROUNDING AND OTHER MISCELLANEOUS ITEMS REQUIRED FOR A COMPLETE SYSTEM.
 - b. FURNISH AND INSTALL MAIN SERVICE RACEWAY AS DESCRIBED IN CONTRACT DOCUMENTS AND TO COMPLY WITH TELEPHONE COMPANY REQUIREMENTS.
2. BUILDING TELEPHONE AND COMPUTER NETWORK SYSTEM CABLE
 - a. 23 GAUGE, SOLID TINNED COPPER, FOUR TWISTED PAIRS, CATEGORY 6
 - b. USE PLENUM-RATED CABLE IN CEILINGS AND AREAS USED FOR PLENUM AIR RETURN
3. TELEPHONE TERMINATION BLOCKS
 - a. UL VERIFIED CATEGORY 6
 - b. 110 TERMINATION WITH TIN LEAD PLATED IDC
4. TELEPHONE/NETWORK JACKS
 - a. WALL JACKS
 - 1) CAT6 - HUBBELL HXJ6 OR ALTERNATE MANUFACTURER WITH EQUIVALENT PERFORMANCE STANDARD.
 - b. PLATES
 - 1) HUBBELL - IFF SERIES (PORT QUANTITY AS REQUIRED, COLOR BY ARCHITECT)
5. BACKBOARDS: INTERIOR GRADE PLYWOOD WITHOUT VOIDS, 1/2" INCH THICK; UL-LABELED FIRE RETARDANT.
 - a. SIZE: 48 INCHES WIDE 96 INCHES HIGH
 - b. DO NOT PAINT OVER UL LABEL
 - c. PROVIDE ONE 48" MULTI-OUTLET POWER STRIP WITH INTEGRAL SURGE PROTECTION AND OUTLETS AT 6" O.C. (MINIMUM 7 OUTLETS) MOUNTED AT CENTER OF TERMINAL BOARD.
6. STRUCTURED MEDIA CENTERS
 - a. FLUSH-MOUNT ENCLOSURE WITH COVER.
 - b. MINIMUM DIMENSIONS: 14.38" X 14.38" X 3.60"
 - c. INCLUDE THE FOLLOWING CABLING PANELS:
 - 1) TELEPHONE PATCHING BOARD WITH 7 MULTI-LINE TELEPHONE CONNECTIONS
 - 2) CATEGORY 5E VOICE & DATA MODULE WITH 6 RJ45 PORTS
 - 3) 4-WAY 2GHz VIDEO SPLITTER
7. CONNECTOR BLOCKS FOR CATEGORY 6 AND UP CABLEING: TYPE 110 INSULATION DISPLACEMENT CONNECTORS; CAPACITY SUFFICIENT FOR CABLES TO BE TERMINATED PLUS 25 PERCENT SPARE.

C. INSTALLATION

1. RUN 1" CONDUIT TO ACCESSIBLE CEILING SPACE FROM EACH OUTLET. INSTALL CABLE FROM TERMINAL BOARD TO EACH TELEPHONE/NETWORK OUTLET.
2. TERMINATE CABLES AT EACH OUTLET WITH SPECIFIED MODULAR JACK ASSEMBLY
3. TERMINATE CABLES ON PUNCH DOWN BLOCKS OR PATCH PANELS AT TERMINAL BOARD.
4. PROVIDE TYPED LABELS AT ALL JACKS CORRESPONDING TO TYPED NUMBERING SYSTEM AT PATCH PANEL OR TERMIN