NORTH CENTRAL CORRECTIONAL FACILITY
POWERHOUSE WATER HEATER REPLACEMENTS

DAS PROJECT NUMBER: 9458.00 RFB: 945800-01

OWNER INFORMATION:

DEPARTMENT OF ADMINISTRATIVE SERVICES
109 SE 13TH STREET
DES MOINES, IA 50319

PROJECT LOCATION:

NORTH CENTRAL CORRECTION FACILITY
CENTRAL PLANT
313 LANEDALE
ROCKWELL CITY, IA 50579

CONSTRUCTION MANAGER:

McGOUGH CONSTRUCTION
217 E 2ND STREET
SUITE 120
DES MOINES, IOWA 50309

DAS PROJECT NUMBER: 9548

RCE PROJECT NUMBER: 2049.029.00

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APPLICABLE CODES:

A. 2015 INTERNATIONAL BUILDING CODE AS ADOPTED BY IOWA ADMINISTRATIVE RULES 661-201 AND 661-301

B. 2015 INTERNATIONAL FIRE CODE AS ADOPTED BY IOWA ADMINISTRATIVE RULE 661-201

C. 2012 INTERNATIONAL ENERGY CONSERVATION CODE AS ADOPTED BY IOWA ADMINISTRATIVE RULE 661-303

D. 2015 INTERNATIONAL EXISTING BUILDING CODE AS ADOPTED BY IOWA ADMINISTRATIVE RULE 661-301 AND 661-350, AS APPLICABLE.

E. 2012 NFPA 101 LIFE SAFETY CODE AS ADOPTED BY IOWA ADMINISTRATIVE RULE 661-205

F. 2010 AMERICANS WITH DISABILITIES ACT AS ADOPTED BY IOWA ADMINISTRATIVE RULE 661-302

G. 2024 INTERNATIONAL MECHANICAL CODE AS ADOPTED BY THE IOWA DEPARTMENT OF PUBLIC HEALTH, IOWA ADMINISTRATIVE RULE 641-61

H. 2021 UNIFORM PLUMBING CODE AS ADOPTED BY THE IOWA DEPARTMENT OF PUBLIC HEALTH, IOWA ADMINISTRATIVE RULE 641-25

I. 2020 NATIONAL ELECTRICAL CODE AS ADOPTED BY THE IOWA ELECTRICAL LICENSING BOARD, IOWA ADMINISTRATIVE RULE 661-504.

LICENSED PROFESSIONAL ENGINEER
SCOTT JASPER
12568
IOWA

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERONSAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

SCOTT JASPER, PE

REG. NO. 12568 DATE:

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2026

PAGES OR SHEETS COVERED BY THIS SEAL:

ALL MECHANICAL SHEETS

LICENSED PROFESSIONAL ENGINEER
DAVID MICHAEL REPAIR
P29277
IOWA

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DAVID MICHAEL REPAIR, PE

REG. NO. P29277 DATE:

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9458.00 - DOC NCCF POWERHOUSE WATER HEATER REPLACEMENTS

NORTH CENTRAL CORRECTIONAL FACILITY - POWERHOUSE
313 LANEDALE
ROCKWELL CITY, IA 50579

KEY PLAN

REVISION INFORMATION

MARK	DATE	DESCRIPTION

ISSUED: 3/14/2025

PROJECT NO: 2024.029

COVER SHEET

G0

MECHANICAL SHEET INDEX

M000	HVAC SYMBOLS AND ABBREVIATIONS
MD101	LEVEL 1 - MECHANICAL PLAN - DEMOLITION
M101	LEVEL 1 - MECHANICAL PLAN - NEW WORK
M500	BOILER AND HW GENERATOR PIPING DIAGRAMS - DEMO & NEW
M501	BOILER VENT DETAILS AND EXISTING SKID DIMENSIONS
M800	MECHANICAL SCHEDULES

GENERAL MECHANICAL SYMBOLS

- REVISION NUMBER - SHOWN ON PLANS
- POINT WHERE NEW CONNECTS TO EXISTING
- NUMBER OF DETAIL ON SHEET / NUMBER OF SHEET WHERE DETAIL APPEARS
- KEYNOTE
- CONTINUATION SYMBOL
- Room 5 — ROOM NAME AND NUMBER
- SECTION VIEW
- ELEVATION VIEW
- ITEM TO BE DEMOLISHED
- AREA NOT IN CONTRACT
- 2" — PIPE SIZE TAG (DIAMETER)
- ABOVE GROUND PIPING
- 1/8" / 12" SLOPE — PIPE SLOPE TAG
- BELOW GROUND PIPING
- INVERT: -105' - 1" — PIPE INVERT ELEVATION TAG
- -E — EXISTING PIPE TAG
- PIPING BEING DEMOLISHED

EQUIPMENT ABBREVIATIONS

AC	AIR-COOLED CHILLER	F	FURNACE
ACCU	AIR COOLING CONDENSING UNIT	FCU	FAN COIL UNIT
AFMS	AIR FLOW MEASURING STATION	FTR	FIN TUBE RADIATOR
AHU	AIR HANDLING UNIT	GFP	GLYCOL FEED PUMP
AS	AIR SEPARATOR	GIH	GRAVITY INTAKE HOOD
B	BOILER	GRV	GRAVITY ROOF VENTILATOR
CB	CHILLED BEAM	H	HUMIDITY SENSOR
CCV	COOLING CONTROL VALVE	HC	HEATING COIL
CD	CONTROL DAMPER	HCV	HEATING CONTROL VALVE
CH	CHILLER	HP	HEAT PUMP
CO	CARBON MONOXIDE	HRU	HEATING RECOVERY UNIT
CO2	CARBON DIOXIDE SENSOR	HWP	HEATING WATER PUMP
CT	COOLING TOWER	HRU	HEAT RECOVERY UNIT
CCT	CLOSED CIRCUIT COOLING TOWER	HU	HUMDIFICATION UNIT
CPF	CHEMICAL POT FEEDER	HX	HEAT EXCHANGER
CRU	CONDENSATE RETURN UNIT	KEH	KITCHEN EXAHUST HOOD
CU	CONDENSING UNIT (ALSO COND)	L	LOUVER
CUH	CABINET UNIT HEATER	MAU	MAKEUP AIR UNIT
CV	CONTROL VALVE	OAT	OUTDOOR AIR TEMPERATURE
CHWP	CHILLED WATER PUMP	PFPB	PARALLEL FAN POWERED BOX
CPF	CHEMICAL POT FEEDER	PHC	ELECTRICAL PREHEAT COIL
DBP	DOMESTIC WATER BOOSTER PUMP	PR	PANEL RADIATOR
DC	DRY COOLER	PRV	POWER ROOF VENTILATOR
DF	DUCT FILTER	RTU	ROOFTOP UNIT
DHU	DEHUMIDIFICATION UNIT	SFPB	SERIES FAN POWER BOX
DOAS	DEDICATED OUTDOOR AIR UNIT	ST	STEAM TRAP
DP	DIFFERENTIAL PRESSURE SENSOR	T	TEMPERATURE SENSOR
DWH	DOMESTIC WATER HEATER	TH	THERMOMETER
ERF	ENERGY RECOVERY FAN	UH	UNIT HEATER
ERM	ENERGY RECOVERY MODULE	VAV	VARIABLE VOLUME AIR TERMINAL
ERW	ENERGY RECOVERY WHEEL	VFD	VARIABLE FREQUENCY DRIVE
ET	EXPANSION TANK	VT	VOLUME TANK
EWH	ELECTRIC WATER HEATER	VRF	VARIABLE REFRIGERANT FLOW
		WWHP	WATER-TO-WATER HEAT PUMP

xF	FANS (ALSO SF, EF, RF, KEF)
xAS	AIR SILENCER (ALSO SAS, RAS, OAS, EAS)
xABD	AIR BALANCING DAMPER (ALSO SABD, EABD, RABD, OABD)
xAT	AIR TERMINAL (ALSO SAT, EAT, RAT, TAB, VAV)
xP	PUMP (ALSO CP, CBP, CHP, ERP, GSP, HWP)
xC	COIL (ALSO PHC, RHC, ERC, HC, CC)
xCV	CONTROL VALVE (ALSO CCV, HCV)

PROJECT MECHANICAL DESIGN NOTES:

A. MECHANICAL DESIGN TO PROVIDE SETBACK CONTROLS PER ASHRAE 90.1-2010 SECTION 6.4.3.3.2 AND BE SET TO THE FOLLOWING TEMPERATURE SETPOINTS DURING NORMAL BUILDING OPERATION:
   a. OCCUPIED COOLING SETPOINT: 75 F.
   b. UNOCCUPIED COOLING SETPOINT: 80 F.
   c. OCCUPIED HEATING SETPOINT: 68 F.
   d. UNOCCUPIED HEATING SETPOINT: 65 F.

HVAC SYMBOLS

- 16"x8" — SQUARE DUCT SIZE TAG (WIDTH x HEIGHT)
- 16"/8" — OVAL DUCT SIZE TAG (WIDTH / HEIGHT)
- 16"Ø — ROUND DUCT SIZE TAG (DIAMETER)
- -E — EXISTING DUCT TAG
- DUCT BEING DEMOLISHED
- SA — SUPPLY AIR
- SOA — CONDITIONED OUTSIDE AIR
- OA — OUTSIDE AIR
- RA — RETURN AIR
- TA — TRANSFER AIR
- EA — EXHAUST AIR
- RLA — RELIEF AIR
- GEA — GREASE EXHAUST AIR
- SEA — SMOKE EXHAUST AIR
- FLUE — EXHAUST GAS FLUE
- CA — COMBUSTION AIR
- DROP — T.O.D. (5'-6") — RECTANGULAR SUPPLY/OUTSIDE AIR DUCT RISE
- DROP — ROUND SUPPLY/OUTSIDE AIR DUCT RISE
- DROP — RECTANGULAR RETURN/TRANSFER AIR DUCT RISE
- DROP — ROUND RETURN/TRANSFER AIR DUCT RISE
- DROP — RECTANGULAR EXHAUST/RELIEF AIR DUCT RISE
- DROP — ROUND EXHAUST/RELIEF AIR DUCT RISE
- ELBOW-RADIUS
- ELBOW-MITERED
- BOTTOM TAKE-OFF
- TOP TAKE-OFF
- TAKE-OFF
- DUCT TRANSITION

GRILLES, REGISTERS & DIFFUSERS TAG

TYPE (SEE SCHEDULE) — SD1 | 400 | 10" / 24x24 | 22 | H-5/7/14

- 3-CONE DIFFUSER
- PLAQUE DIFFUSER
- PERFORATED DIFFUSER WITH DEFLECTORS — SD3 | 300 | 10" / 24x24
- ROUND DIFFUSER WITH ADJUSTABLE PATTERNS — SD9 | 400 | 12" / —
- LOUVERED DOUBLE DEFLECTION GRILLE — SG5 | 500 | 12"x10"
- LINEAR BAR GRILLE — SLB3 | 400 | 48"x2 1/2"

SD1 | 400 | 10" / 24x24 | 22 | H-5/7/14

- 400 — CFM
- 10" / 24x24 — NECK SIZE / MODULE SIZE
- H-5/7/14 — THROW-150FPM/ 100FPM/ 50FPM
- 22 — THROW PATTERN
- MAX NC RATING

RG2 | 500 | 12"x10" / 24x24 | 18 — EGGCRATE RETURN GRILLE

RG11 | 500 | 12"x10" / 24x12 — LOUVERED GRILLE

LINEAR DIFFUSER TAG

TYPE (SEE SCHEDULE) — LSD1 | 200 | 1 / 4' - 0" / 8" | 8' - 0"AFF

- 200 — CFM
- 1 / 4' - 0" / 8" — NUMBER OF SLOTS / ACTIVE SLOT LENGTH (PLENUM LENGTH) / NECK SIZE
- 8' - 0"AFF — ELEVATION (CENTER OF FACE)
- LSD1 | 200 | 1 / 4' - 0" / 8" — SECTION TOTAL TRACK LENGTH
- LINEAR SLOT DIFFUSER — 6' - 0" — LSD1 | 200 | 1 / 4' - 0" / 8"

MECHANICAL EQUIPMENT TAGS

- HEATING COIL FLOW
- OPERATING WEIGHT NOT INCLUDING CURB
- BOTTOM OF EQUIPMENT ELEVATION
- NOMINAL COOLING CAPACITY
- EXISTING EQUIPMENT TO REMAIN
- FUEL INPUT GAS PIPE FLOW
- EXISTING RELOCATED EQUIPMENT
- EQUIPMENT BY OTHERS (REFER TO OTHER DISCIPLINE FOR ADDITIONAL INFORMATION)

MECHANICAL PIPING SYMBOLS

CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CD	CONDENSATE DRAIN
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
GWR	GEOTHERMAL WATER RETURN
GWS	GEOTHERMAL WATER SUPPLY
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
NG	NATURAL GAS
LP	PROPANE GAS
RL	REFRIGERANT-LIQUID
RS	REFRIGERANT-SUCTION
RHG	REFRIGERANT-HOT GAS
STM-L	STEAM
STC	CONDENSATE RETURN
FOS	FUEL OIL SUPPLY
FOR	FUEL OIL RETURN
FOV	FUEL OIL VENT
NPCW	NON-POTABLE COLD WATER

- PIPE DROP
- PIPE RISE
- PIPE TEE
- TOP TAKEOFF
- BOTTOM TAKEOFF
- CAP
- ELBOW
- 4" — 2" — PLUG
- REDUCING 45 DEGREE TEE
- 45 DEGREE TEE

PIPE ACCESSORY TAGS

- DOMESTIC WATER METER
- BALANCING VALVE
- SHUTOFF BALL VALVE
- CHECK VALVE
- 3-WAY MIXING VALVE
- MOTORIZED CONTROL VALVE
- 3 WAY MOTORIZED CONTROL VALVE
- PRESSURE REDUCING VALVE or GAS PRESSURE REGULATOR
- REFRIGERANT SOLENOID VALVE
- BUTTERFLY VALVE

DATA DEVICE TAGS

SYMBOL — EQUIPMENT ID

DAMPER TAGS

- FIRE DAMPER — F
- SMOKE DAMPER — S
- MOTORIZED DAMPER — M
- MANUAL BALANCING DAMPER — B
- BACKDRAFT DAMPER — D
- COMBINATION FIRE/SMOKE DAMPER — C

ABBREVIATIONS

A	AMPS	LDB	LEAVING DRY BULB TEMPERATURE
AAV	AUTOMATIC AIR VENT	LF	LINEAL FOOT/LINEAL FEET
ABV	ABOVE	LP	LOW PRESSURE
AC	AIR CONDITIONING	LPG	LIQUEFIED PETROLEUM GAS
ADJ	ADJUSTABLE	LRA	LOCKED ROTOR AMPS
ADD	ADDENDUM	LVR	LOUVER
AFF	ABOVE FINISHED FLOOR	LWB	LEAVING WET BULB TEMPERATURE
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	LWT	LEAVING WATER TEMPERATURE
AL	ALUMINUM	MAV	MANUAL AIR VENT
ALT	ALTERNATE	MAX	MAXIMUM
AP	ACCESS PANEL	MBH	THOUSANDS OF BTU PER HOUR
ARCH	ARCHITECT/ARCHITECTURAL	MC	MECHANICAL CONTRACTOR
ASSY	ASSEMBLY	MCA	MINIMUM CIRCUIT AMPACITY
BAS	BUILDING AUTOMATION SYSTEM	MCF	ONE THOUSAND CUBIC FEET
BFF	BELOW FINISHED FLOOR	MCP	MAXIMUM OVERCURRENT PROTECTION (ALSO MOCP)
BLW	BELOW	MD	MOTORIZED DAMPER
BOD	BOTTOM OF DUCT	MECH	MECHANICAL
BOP	BOTTOM OF PIPE	MEP	MECHANICAL, ELECTRICAL AND PLUMBING
BTU	BRITISH THERMAL UNIT	MFR	MANUFACTURER
BTUH	BRITISH THERMAL UNIT PER HOUR	MIN	MINIMUM
°C	DEGREES CELSIUS	MISC	MISCELLANOUS
CAP	CAPACITY	MTR	MOTOR
CB	CATCH BASIN	NA	NOT APPLICABLE (ALSO N/A)
CC	COOLING COIL	NC	NORMALLY CLOSED
CEA	COMBINED EXHAUST AIR (LAB/GENERAL)	NC	NOISE CRITERIA
CFH	CUBIC FEET PER HOUR	NIC	NOT IN CONTRACT
CFM	CUBIC FEET PER MINUTE	NO	NORMALLY OPEN
CL	CENTERLINE	NO	NUMBER
CLG	CEILING	NPS	NOMINAL PIPE SIZE
CO	CLEAN OUT	NPT	NATIONAL PIPE THREAD
COD	CENTER OF DUCT	NTS	NOT TO SCALE
COND	CONDENSATE/CONDENSER	O	OXYGEN
COP	CENTER OF PIPE	OC	ON CENTER
CS	CARBON STEEL	OED	OPEN ENDED DUCT
CU	COPPER	OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
CV	CONSTANT VOLUME	OFOI	OWNER FURNISHED, OWNER INSTALLED
CW	COLD WATER	OV	OUTLET VELOCITY
D	DEGREE	PC	PLUMBING CONTRACTOR
DB	DRY BULB	PCF	POUNDS PER CUBIC FOOT
DBA	A-WEIGHTED DECIBELS	PD	PRESSURE DROP
DDC	DIRECT DIGITAL CONTROL	PG	PROPYLENE GLYCOL
DIA	DIAMETER	PH	PHASE
DP	DIFFERENTIAL PRESSURE	PLBG	PLUMBING
DN	DOWN	PRESS	PRESSURE
DT	DIFFERENTIAL TEMPERATURE	PRV	PRESSURE REDUCING VALVE
DW	DISTILLED WATER	PSF	POUNDS PER SQUARE FOOT
EAT	ENTERING AIR TEMPERATURE	PSI	PONDS PER SQUARE INCH
EC	ELECTRICAL CONTRACTOR	PSIA	POUNDS PER SQUARE INCH ABSOLUTE
EDB	ENTERING DRY BULB TEMPERATURE	PSIG	POUNDS PER SQUARE INCH GAUGE
EFT	ENTERING FLUID TEMPERATURE	PWR	POWER
EG	ETHYLENE GLYCOL	QTY.	QUANTITY
EL	ELEVATION	RCP	REFLECTED CEILING PLAN
ELEC	ELECTRICAL	REC	RECESSED
EQUIP	EQUIPMENT	RED	REDUCER
ERV	ENERGY RECOVERY VENTILATION	RH	RELATIVE HUMIDITY
ESP	EXTERNAL STATIC PRESSURE	RM	ROOM
ETR	EXISTING TO REMAIN	RPM	REVOLUTIONS PER MINUTE
EWB	ENTERING WET BULB TEMPERATURE	SCH	SCHEDULE
EWC	ELECTRIC WATER COOLER	SD	SMOKE DAMPER
EWT	ENTERING WATER TEMPERATUR	SF	SQUARE FEET
EXH	EXHAUST	SM	SURFACE MOUNT
EXST	EXISTING	SP	STATIC PRESSURE
°F	DEGREES FAHRENHEIT	SRV	SAFETY RELIEF VENT
FC	FAIL CLOSED	STM	STEAM
FCO	FLOOR CLEANOUT OUT	SS	STAINLESS STEEL
FD	FLOOR DRAIN	TC	TEMPERATURE CONTROL
FD	FIRE DAMPER	TD	TEMEPRATURE DROP
FDV	FIRE DEPARTMENT VALVE	TEMP	TEMPERATURE
FH	FUME HOOD	TEMP	TEMPORARY
FL	FAIL LAST POSITION	TOD	TOP OF DUCT
FL	FLOOR	TOP	TOP OF PIPE
FLA	FULL LOAD AMPS	TSP	TOTAL STATIC PRESSURE
FO	FAIL OPEN	TYP	TYPICAL
FO	FUEL OIL	UG	UNDERGROUND
FPI	FINS PER INCH	V	VENT
FPM	FEET PER MINUTE	V	VOLTS
FPS	FEET PER SECOND	VAC	VACUUM
FS	FLOOR SINK	VAV	VARIABLE AIR VOLUME
FSD	COMBINATION FIRE/SMOKE DAMPER	VENT	VENTILATION
FT	FOOT OR FEET	VFD	VARIABLE FREQUENCY DRIVE
FTG	FOOTING	VP	VELOCITY PRESSURE
GA	GAGE	W	WASTE
GAL	GALLONS	WB	WET BULB
GC	GENERAL CONTRACTOR	WC	WATER COLUMN
GPH	GALLONS PER HOUR	WCO	WALL CLEAN OUT
GPM	GALLONS PER MINUTE	WG	WATER GAUGE
GPR	GAS PRESSURE REGULATOR	WH	WALL HYDRANT
GS	GALVANIZED STEEL	W/	WITH
H	ENTHALPY	WMS	WIRE MESH SCREEN
HB	HOSE BIBB	WCO	WALL CLEAN OUT
HD	HUB DRAIN	WG	WATER GAUGE
HP	HORSEPOWER	WH	WALL HYDRANT
HTG	HEATING	W/	WITH
HTR	HEATER	WMS	WIRE MESH SCREEN
HW	HOT WATER		
HYD	HYDRANT		
HZ	HERTZ		
ID	INDIRECT		
IN	INCH OR INCHES		
INV	INVERT		
KW	KILOWATTDV		
KWH	KILOWATT-HOURS		
LAT	LEAVING AIR TEMPERATURE		
LB	POUND OR POUNDS		
LB/HR	POUND PER HOUR		
LBS	POUNDS		

* NOTE *

ALL OF GENERAL NOTES ON THIS SHEET ARE TO BE APPLIED TO ALL OTHER DRAWINGS IN THIS SET. THE SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY OR MAY NOT BE USED IN THIS SET OF DRAWINGS.

PLUMBING AND PIPING SYMBOLS

CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CD	CONDENSATE DRAINAGE
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
GWR	GEOTHERMAL WATER RETURN
GWS	GEOTHERMAL WATER SUPPLY
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
NG	NATURAL GAS
LP	PROPANE GAS
RL	REFRIGERANT-LIQUID
RS	REFRIGERANT-SUCTION
RHG	REFRIGERANT-HOT GAS
STM-L	STEAM - LOW PRESSURE
STM-M	STEAM - MEDIUM PRESSURE
STM-H	STEAM - HIGH PRESSURE
STC	CONDENSATE RETURN
CWV	COMBINATION WASTE & VENT
CA	COMPRESSED AIR
DCW	DOMESTIC COLD WATER
H-DCW	HARD COLD WATER
S-DCW	SOFT COLD WATER
F-DCW	FILTERED COLD WATER
RO	REVERSE OSMOSIS WATER
DHW	HOT WATER
DHWR	HOT WATER RECIRCULATION
V-G	GREASE VENT
SAN-G	GREASE WASTE
W	INDIRECT WASTE
OV	OIL VENT
OW	OIL WASTE
PD	PUMP DISCHARGE
V	SANITARY VENT
SAN	SANITARY SEWER
SHWR	SOLAR HOT WATER RETURN
SHWS	SOLAR HOT WATER SUPPLY
ST	STORM DRAINAGE
ST-O	OVERFLOW STORM DRAINAGE
DHW (E)	REINSULATE EXISTING DHW (E) PIPING

- PIPE DROP
- PIPE RISE
- PIPE TEE
- CAP
- 4" — 2" — PLUG
- REDUCING 45 DEGREE TEE
- 45 DEGREE TEE

PIPE ACCESSORY TAGS

- DOMESTIC WATER METER
- BALANCING VALVE
- SHUTOFF BALL VALVE
- CHECK VALVE
- 3-WAY MIXING VALVE
- BACKFLOW PREVENTER
- MOTORIZED CONTROL VALVE
- 3 WAY MOTORIZED CONTROL VALVE
- PRESSURE REDUCING VALVE
- REFRIGERANT SOLENOID VALVE
- BUTTERFLY VALVE

DRAIN TAGS

DRAIN SIZE — TYPE (SEE SCHEDULE)

- FLOOR DRAIN — 4" FD-1 — 4" AD-6 — AREA DRAIN
- FLOOR DRAIN — 4" FD-3P — "P" - INDICATES PRIMER CONNECTION — 4" SD-29 — DECK DRAIN
- FLOOR SINK — 4" FS-4 — 4" SD-12 — FLOW CONTROL DRAIN
- HUB DRAIN — 4" FD-13 — 8 WFU — FIXTURE UNITS — 4" SD-15 — STORM DRAIN
- ROOF AREA SERVED BY DRAIN — 4000 SF — 6" SD-1 — COMBINATION DRAINS

PLUMBING FIXTURE TAGS

TYPE (SEE SCHEDULE) — LAV-1A

FIXTURE UNITS — 1.5 CWFU / 1.5 HWFU

WATER CLOSET - WALL HUNG - ADA — WC-1A — WC-1 — LAV-1A — 1 WFU — U-1

PIPE ACCESORY TAG

4" WCO — 4" WCO

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9458.00 - DOC NCCF POWERHOUSE WATER HEATER REPLACEMENTS

NORTH CENTRAL CORRECTIONAL FACILITY - POWERHOUSE
313 LANEDALE
ROCKWELL CITY, IA 50579

KEY PLAN

REVISION INFORMATION

MARK	DATE	DESCRIPTION

ISSUED: 3/14/2025

PROJECT NO: 2024.029

HVAC SYMBOLS AND ABBREVIATIONS

M000

KEYNOTE LEGEND	
KEY VALUE	KEYNOTE TEXT
1	DEMO DOMESTIC HOT WATER HEATING SYSTEM NO. 1, INCLUDING: BOILER, PUMP, HOT WATER GENERATOR (TANK AND HEAT EXCHANGER) AND EXPANSION TANK AND RELATED PIPING, VALVES, PIPING SPECIALTIES AND BACKFLOW PREVENTER - SEE 1/M500
2	DEMO DOMESTIC HOT WATER HEATING SYSTEM NO. 2, INCLUDING: BOILER, PUMP, HOT WATER GENERATOR (TANK AND HEAT EXCHANGER) AND EXPANSION TANK AND RELATED PIPING, VALVES, PIPING SPECIALTIES AND HW CIRC PUMP- SEE 1/M500
3	DEMO DHW BOOSTER PUMP ASSEMBLY AND RELATED PIPE DROPS - SEE 1/M500

MECHANICAL DEMOLITION GENERAL NOTES

A. ALL DUCT, PIPING, AND EQUIPMENT SHOWN DASHED OR HATCHED WITHIN THE AREA OF DEMOLITION SHALL BE DEMOLISHED, UNLESS NOTED OTHERWISE.

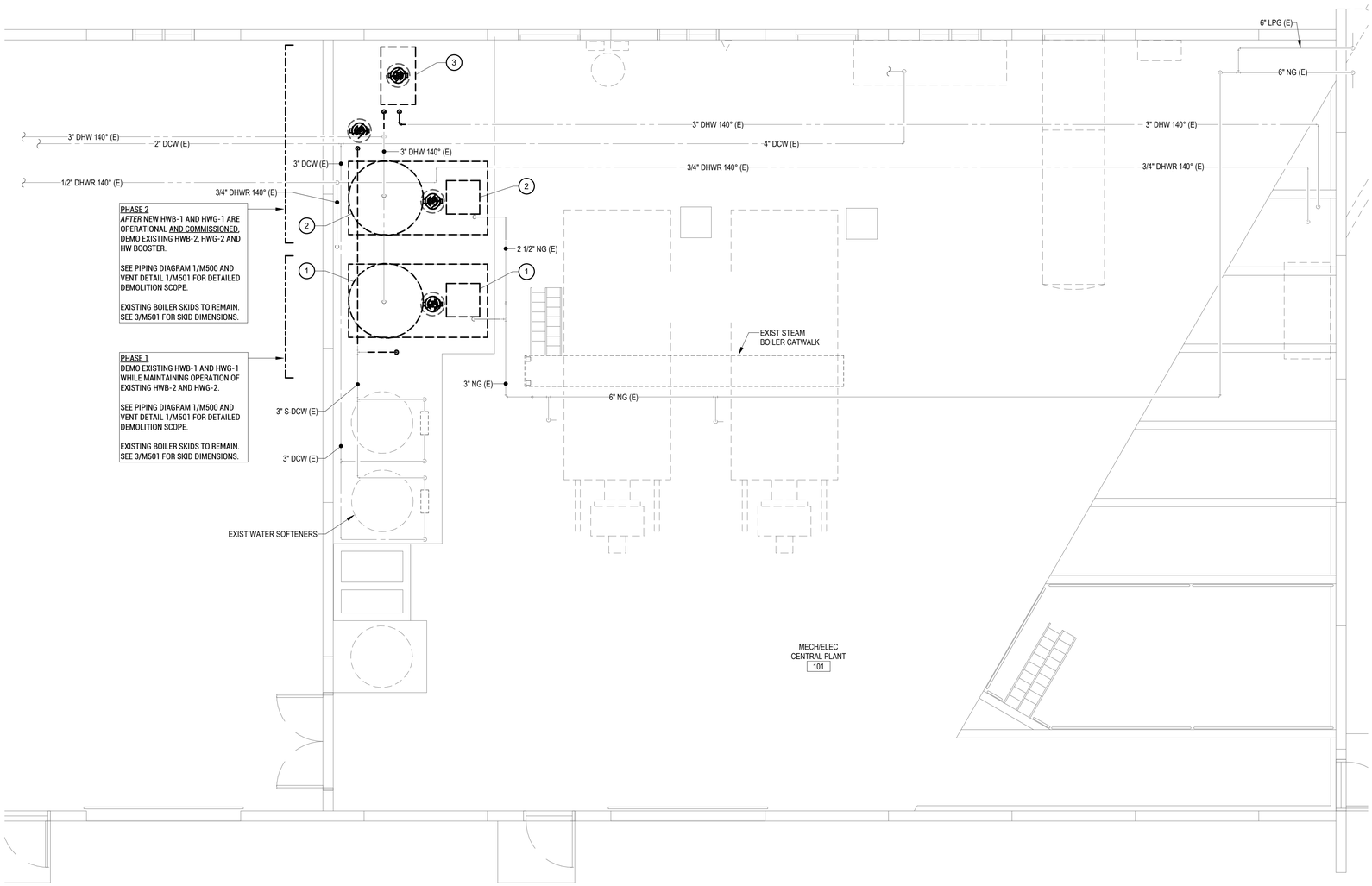
B. DEMOLITION DRAWINGS SHOWING CONDITIONS BASED ON FIELD OBSERVATION AND EXISTING DRAWINGS. ADDITONAL COMPONENTS REQUIRING REMOVAL OR MODIFICATIONS MAY NOT BE SHOWN. CONTRACTOR SHALL FAMILIARIZE THEMSELF WITH EXISTING SYSTEM AND COMPONENTS, AND SHALL BE REPONSIBLE FOR INCLUDING NECESSARY WORK TO PREPARE SYSTEMS FOR REQUIRED MODIFICATIONS.

C. FURNISH ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED TO COMPLETE DEMOLITION OF EXISTING MECHANICAL EQUIPMENT AS SPECIFIED OR INDICATED. DISCONNECT, REMOVE AND RELOCATE ALL ITEMS REQUIRED TO FACILITATE THE WORK.

D. CONTRACTOR SHALL THOROUGHLY FAMILIARIZE THEMSELF WITH EXISTING MECHANICAL SYSTEM(S), WHICH WILL BE AFFECTED BY THE DEMOLITION WORK.

E. CONTRACTOR SHALL OBTAIN PERMISSION FROM OWNER PRIOR TO SHUT OFF OF SERVICES WHICH MAY AFFECT OTHER AREAS BEYOND THE LIMITS OF THE IMMEDIATE AREA.

F. ALL WORK SHALL BE SCHEDULED WITH OWNER.



1 LEVEL 1 - MECHANICAL PLAN - DEMOLITION
1/4" = 1'-0"

RESOURCE CONSULTING ENGINEERS LLC

MEP ENGINEER:
RESOURCE CONSULTING ENGINEERS, LLC

301 ALEXANDER AVENUE
SUITE C
AMES, IA 50010
515-292-2500
www.resourcece.com

100% CD

9458.00 - DOC NCCF POWERHOUSE WATER HEATER REPLACEMENTS

NORTH CENTRAL CORRECTIONAL FACILITY - POWERHOUSE
313 LANEDALE
ROCKWELL CITY, IA 50579

KEY PLAN

REVISION INFORMATION

MARK	DATE	DESCRIPTION

ISSUED: 3/14/2025

PROJECT NO: 2024.029

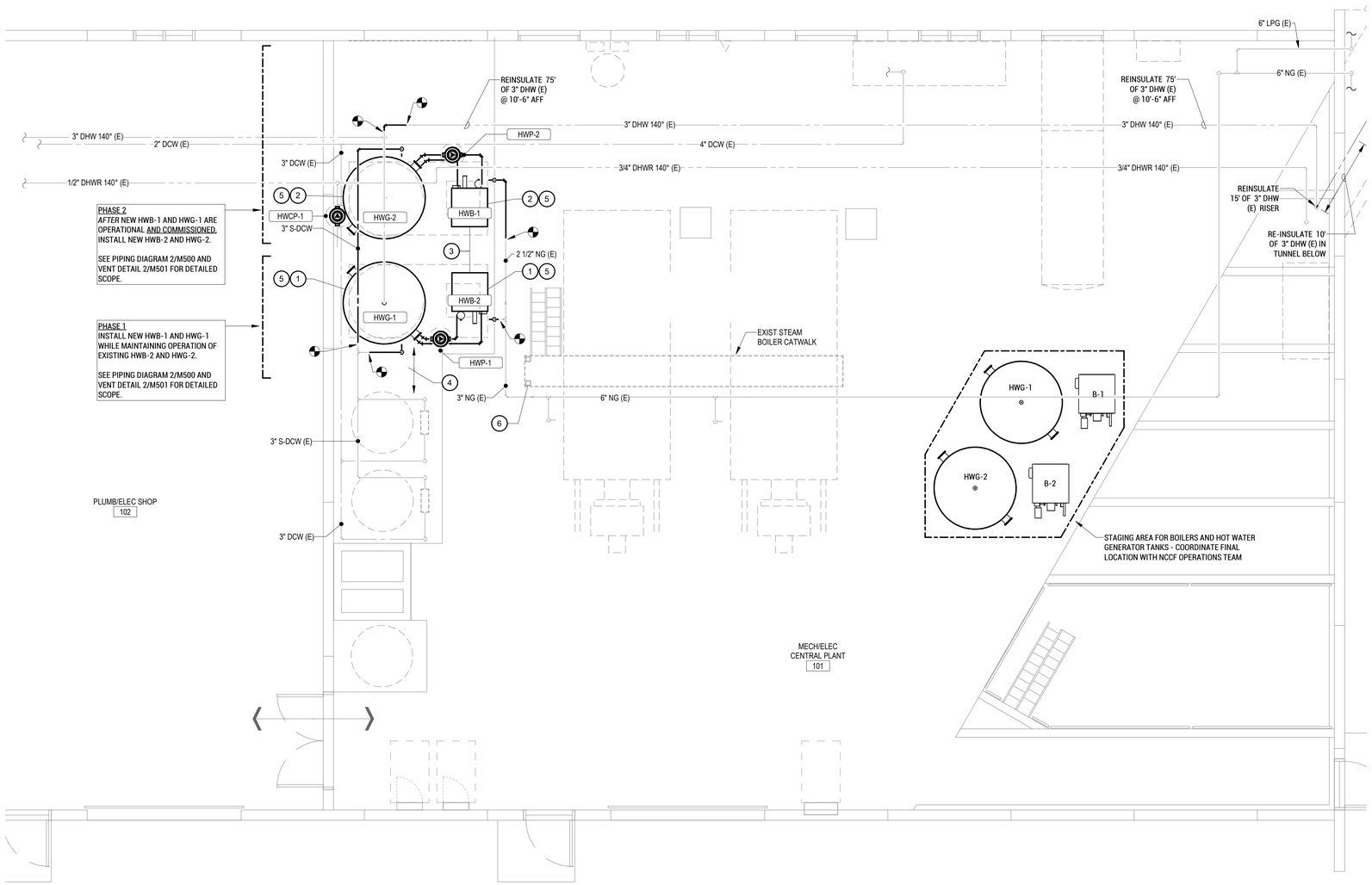
LEVEL 1 - MECHANICAL PLAN - DEMOLITION

MD101

KEYNOTE LEGEND	
KEY VALUE	KEYNOTE TEXT
1	INSTALL NEW DOMESTIC HOT WATER HEATING SYSTEM NO. 1, INCLUDING: BOILER, PUMP, HOT WATER GENERATOR, EXPANSION TANK AND RELATED PIPING, VALVES, PIPING SPECIALTIES AND BACKFLOW PREVENTER - SEE 2/M500.
2	INSTALL NEW DOMESTIC HOT WATER HEATING SYSTEM NO. 2, INCLUDING: BOILER, PUMP, HOT WATER GENERATOR (TANK AND HEAT EXCHANGER) AND EXPANSION TANK AND RELATED PIPING, VALVES, PIPING SPECIALTIES AND HW CIRC PUMP- SEE 2/M500.
3	MAINTAIN 36" OF CLEARANCE, MINIMUM, BETWEEN HWB-1 AND HWB-2 CONTROL PANELS.
4	MAINTAIN 36" OF CLEARANCE NEW HWB-1 PIPING AND EXISTING WATER SOFTENER TANKS AND RELATED CONTROL PANELS.
5	INSTALL NEW HW BOILER AND HW GENERATOR TANK ON EXISTING SKID. FOR SKID DIMENSIONS, SEE 3/501. IF NECESSARY, WELD NEW 6"X2" C-CHANNEL MEMBERS TO EXISTING SKID TO SUPPORT NEW EQUIPMENT. PREP AND PAINT (GREY EPOXY PAINT) BOTH NEW AND EXISTING CHANNELS BEFORE INSTALLING NEW EQUIPMENT.
6	TO MOVE NEW HWG-1 INTO PLACE, TEMPORARILY SHORE-UP EXISTING CATWALK AND REMOVE TWO CATWALK SUPPORT COLUMNS. NET FREE HEIGHT BENEATH CATWALK WILL BE 100.5" (VERIFY).

MECHANICAL PIPING GENERAL NOTES

- A SUPPLY AND RETURN PIPING TO ALL TERMINAL EQUPMENT SHALL BE THE SAME SIZE.
- B CONDENSATE DRAINS SHALL BE SUPPLIED FOR ALL COOLING EQUIPMENT. CONTRACTOR SHALL ENSURE PROPER INSTALLATION AND DRAINAGE AS REQUIRED BY FEDERAL, STATE, AND LOCAL CODES. CONDENSATE PIPING SHALL BE TYPE "L" COPPER.
- C PROVIDE A 4" HOUSEKEEPING PAD FOR EACH PIECE OF MECHANICAL EQUIPMENT MOUNTED ON THE FLOOR. COORDINATE SIZES WITH MECHANICAL EQUIPMENT SELECTED.
- D CONTRACTOR SHALL SECURE AND PAY ALL FEES AND PERMITS PERTAINING TO WORK.
- E CONTRACTOR IS RESPONSIBLE FOR ALL RIGGING, HANDLING, AND PROTECTION OF MATERIALS.
- F ALL EQUIPMENT SHALL BE INSTALLED IN STRICT COMPLIANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS. THE CONTRACTOR SHALL PROVIDE ALL HANGERS AND SUPPORTS REQUIRED FOR A COMPLETE INSTALLATION.
- G FOR CLARITY OF INFORMATION ON DRAWING, ALL CONDUIT, PIPING, DUCTWORK, EQUIPMENT, DEVICES, ETC. ARE NOT SHOWN ON THIS DRAWING. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WORK WITH WORK OF OTHER TRADES AND BUILDING ARCHITECTURAL.
- H REQUIRED ACCESS AREA FOR MECHANICAL EQUIPMENT IS TYPICALLY INDICATED ON DRAWINGS. CONTRACTOR SHALL COORDINATE FINAL EQUIPMENT LOCATIONS WITH WORK OF OTHER TRADES TO ENSURE EQUIPMENT IS ACCESSIBLE FOR MAINTENANCE, FILTER REPLACEMENTS, ETC.
- I CONTRACTOR SHALL PROVIDE COORDINATION DRAWINGS FOR DUCT WORK, HVAC PIPING, PLUMBING PIPING, FIRE SPRINKLER PIPING, STRUCTURE, ELECTRICAL PANELS AND TRANSFORMERS, CONDUITS 2" DIAMETER AND LARGER, CABLE TRAYS. ETC.
- J DRAWINGS ARE DIAGRAMMATIC IN NATURE AND SHOULD NOT BE USED TO DETERMINE EXACT LOCATIONS OF EQUIPMENT, PIPING AND ACCESSORIES, ETC. REFER TO ALL AVAILABLE INFORMATION WITHIN CONTRACT DOCUMENTS (INCLUDING, BUT NOT NECESSARILY LIMITED TO, STRUCTURAL PLANS, FLOOR PLANS, REFLECTED CEILING PLANS, ELECTRICAL LIGHTING, POWER AND SYSTEM PLANS, PLUMBING PLANS, MECHANICAL PIPING PLANS, ETC.) TO COORDINATE EXACT LOCATIONS FOR INSTALLATION OF WORK INDICATED ON THIS DRAWINGS.
- K CONTRACTOR SHALL LOCATE THERMOSTATS AND TEMPERATURE SENSORS AT 4'-0" AFF, A MINIMUM OF 8" FROM LIGHT SWITCH.
- L CONDENSATE DRAINS SHALL BE SUPPLIED FOR ALL COOLING EQUIPMENT. CONTRACTOR SHALL ENSURE PROPER INSTALLATION AND DRAINAGE AS REQUIRED BY FEDERAL, STATE, AND LOCAL CODES. CONDENSATE PIPING SHALL BE TYPE "L" COPPER.



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1 LEVEL 1 - MECHANICAL PLAN - NEW WORK
1/4" = 1'-0"

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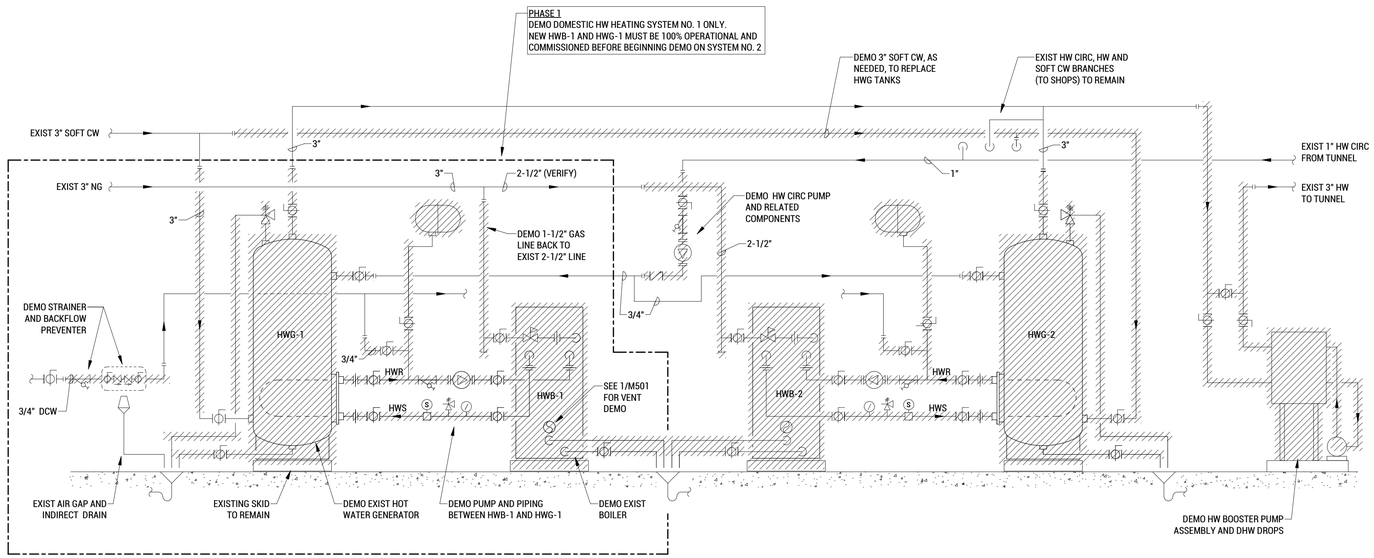
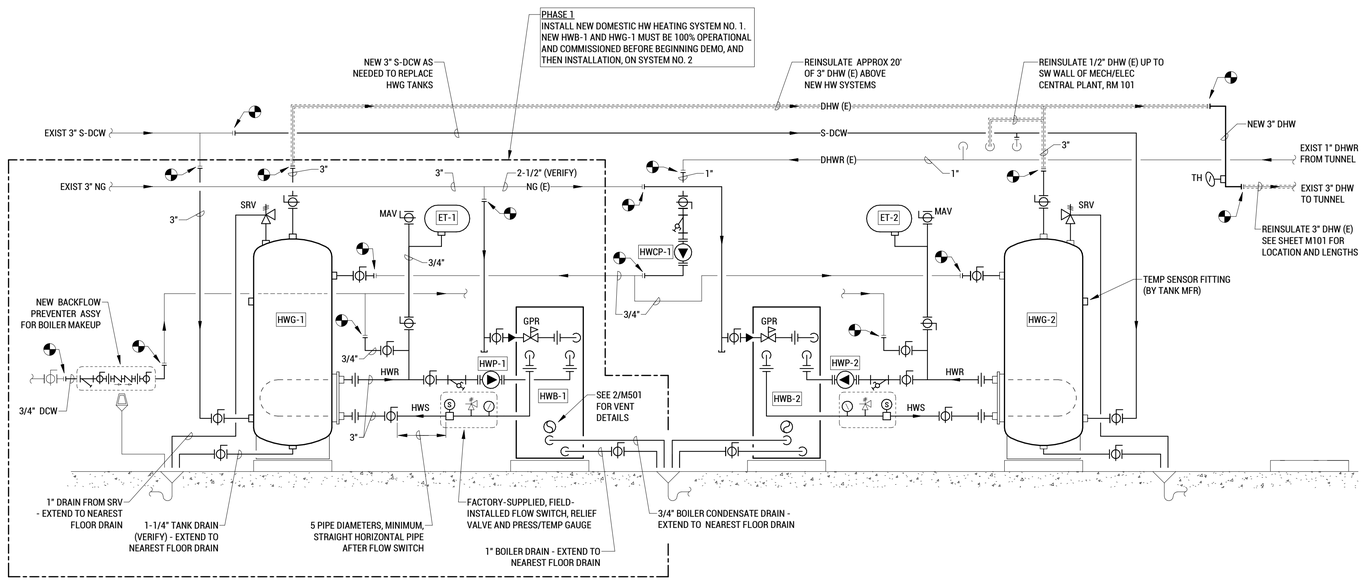
LEVEL 1 - MECHANICAL PLAN - NEW WORK

M101



1 BOILER / HOT WATER GENERATOR PIPING DIAGRAM - DEMO WORK
NOT TO SCALE



2 BOILER / HOT WATER GENERATOR PIPING DIAGRAM - NEW WORK
NOT TO SCALE

ITEM	PIPING AND PIPE INSULATION - APPLICATIONS AND SPECIFICATION EXCERPTS (NOTE 1.)
[1]	NATURAL GAS PIPING (1-1/2" AND 2"): SCREWED SCHEDULE 40 BLACK STEEL PIPE (ASTM A106, GRADE B) WITH SCREWED MALLEABLE FITTINGS (ANSI B16.3, 125 LB) AND MALLEABLE IRON GROUND-JOINT UNIONS WITH BRASS SEATS (250 LB)
[2]	NATURAL GAS PIPING (2-1/2" AND 3"): WELDED AND FLANGED SCHEDULE 40 BLACK STEEL PIPE (ASTM A106, GRADE B) WITH BUTT WELD SCHEDULE 40 STEEL FITTINGS (ANSI B16.9, 125 LB) AND 150 PSIG FORGED STEEL SLIP-ON FLANGES (ANSI B16.5).
[3]	BOILER HOT WATER PIPING (2-1/2" AND 3"): SCHEDULE 40 BLACK STEEL PIPE (ASTM A106, GRADE B) WITH TWO JOINING OPTIONS: OPT 1: SCREWED MALLEABLE IRON FITTINGS (ANSI B16.3, 125 LB) AND MALLEABLE IRON GROUND-JOINT UNIONS WITH BRASS SEATS (250 LB) OPT 2: WELDED AND FLANGED SCHEDULE 40 BLACK STEEL PIPE (ASTM A106, GRADE B) WITH BUTT WELD SCHEDULE 40 STEEL FITTINGS (ANSI B16.9, 125 LB) AND 150 PSIG FORGED STEEL SLIP-ON FLANGES (ANSI B16.5).
[4]	DOMESTIC COLD AND HOT WATER PIPING (3" AND SMALLER): TYPE L HARD TEMPER COPPER PIPE (ASTM B88) WITH WROUGHT COPPER FITTINGS (ANSI B16.22) AND WITH TWO JOINING OPTIONS: OPT 1: 95-5 SOLDER JOINTS OPT 2: PRESS-TYPE JOINTS (ASTM B16-51, 200 PSI, 32 TO 250°F)
[5]	PIPING INSULATION (DOMESTIC COLD AND SOFTENED DOMESTIC COLD WATER): ARMACELL AP ARMAFLEX LAPSEAL OR EQUAL BY AEROFLEX OR K-FLEX BLACK CLOSED-CELL ELASTOMERIC INSULATION WITH SELF-SEAL SYSTEM , 0.254 THERMAL CONDUCTIVITY @ 90°F. INSTALL WITH FOLLOWING THICKNESS: 1-1/4" AND SMALLER PIPE SIZE = 1/2" THICKNESS; 1-1/2" AND LARGER PIPE SIZE = 1" THICKNESS.
[6]	PIPING INSULATION (DOMESTIC HOT WATER AND HOT WATER CIRCULATION): JOHNS MANVILLE MICRO-LOK OR EQUAL BY CERTAINTEED OR KNAUF PREFORMED FIBERGLASS INSULATION WITH ASJ, 4 LB/FT3 DENSITY AND 0.24 THERMAL CONDUCTIVITY @ 100°F. INSTALL WITH FOLLOWING THICKNESS: 1-1/4" AND SMALLER PIPE SIZE = 1" THICKNESS; 1-1/2" AND LARGER PIPE SIZE = 1.5" THICKNESS.

ITEM	VALVES AND PIPING SPECIALTIES - APPLICATIONS AND SPECIFICATION EXCERPTS (NOTE 1.)
[7]	BALL VALVES (NATURAL GAS): APOLLO 80-109-01 OR EQUAL BY MILWAUKEE, NIBCO OR WATTS 2-1/2" LARGE-PORT, TWO-PIECE, BRONZE BALL VALVE WITH NPT CONNECTIONS, REINFORCED TEFLON (RPTFE) SEATS AND SEALS, 250 PSIG RATING FOR LP-GAS. UL LISTED FOR LP-GAS AND NATURAL GAS.
[8]	BALL VALVES (BOILER HOT WATER): APOLLO 94A OR EQUAL BY MILWAUKEE, NIBCO OR WATTS FULL PORT, 2-PIECE, BRASS BALL VALVE WITH NPT CONNECTIONS, TEFLON SEATS AND SEALS, 400 PSIG CWP AND -20 TO 400°F TEMPERATURE RANGE.
[9]	BALL VALVES (DOMESTIC COLD AND HOT WATER): APOLLO 94ALF OR EQUAL BY MILWAUKEE, NIBCO OR WATTS LEAD-FREE, FULL PORT, 2-PIECE, BRASS BALL VALVE WITH NPT CONNECTIONS, TEFLON SEATS AND SEALS, 400 PSIG CWP AND -20 TO 400°F TEMPERATURE RANGE.
[10]	STRAINERS (BOILER HOT WATER AND DOMESTIC HOT WATER RECIRC): APOLLO 59-000, SPIRAX SARCO BT OR APPROVED EQUAL BRONZE, WYE-PATTERN STRAINER WITH NPT CONNECTIONS, STAINLESS STEEL 20 MESH SCREEN AND TAPPING ON POCKET CAP. 3" BOILER HOT WATER: INSTALL 1.25" OR 1.5" APOLLO 70-100 SERIES BALL VALVE ON POCKET CAP TAPPING FOR MANUAL BLOW DOWN. 1" DOMESTIC HOT WATER RECIRC: INSTALL 3/4" APOLLO 70-100 SERIES BALL VALVE ON POCKET CAP FOR MANUAL BLOW DOWN.
[11]	BACKFLOW PREVENTER: WATTS 3/4" U009M2-QT-S OR EQUAL BY APOLLO OR ZURN BRONZE BODY REDUCED PRESSURE ZONE, DOUBLE CHECK VALVE BACKFLOW PREVENTER WITH 3/4" CONNECTIONS, INTEGRAL UNIONS (U), QUARTER-TURN INLET AND OUTLET BALL VALVES (QT) AND BRONZE STRAINER (S). UNIT SHALL PASS 12 GPM @ 7.5 FPS AND 13 PSI PRESSURE DROP.
[12]	GAS PRESSURE REGULATOR (GPR): MAXITROL RV81 OR EQUAL BY AMERICAN METER OR FISHER CONTROLS STRAIGHTH-THRU-FLOW NATURAL GAS PRESSURE REGULATOR. 0.4 INCHES W.C. PRESSURE DROP AT 1500 CFH FLOW. 1/2 PSI (= 14 INCHES W.C.) INLET PRESSURE AND 7 TO 11 INCHES W.C. OUTLET PRESSURE. 1-1/2" NPT INLET/OUTLET CONNECTIONS AND 3/8" NPT VENT CONNECTION.
[13]	SAFETY RELIEF VALVE (SRV): WATTS 140X-9 OR EQUAL BY APOLLO OR ZURN 2-IN-1 TEMPERATURE AND PRESSURE (T&P) RELIEF VALVE WITH 1,670 MBH CAPACITY @ 75 PSI. BRONZE BODY WITH EXTENDED (9" LENGTH) THERMOSTAT AND 1" NPT CONNECTIONS.
[14]	THERMOMETER (TH): ASHCROFT 50CI60R040-0/200F OR EQUAL BY WEISS OR WINTERS TAMPER RESISTANT, BIMETAL THERMOMETER WITH HERMETICALLY-SEALED 304 STAINLESS STEEL (SS) CASE WITH 1/4" DIAMETER SS STEM. THERMOMETER FACE SHALL HAVE ADJUSTABLE VIEWING ANGLE. 5" DIAL (50), 1/2" NPT CONNECTION (60), REAR CONNECTION (R), 4" STEM LENGTH (060) AND 0 TO 200°F SINGLE-SCALE TEMPERATURE RANGE (0/200F). INSTALL THERMOMETER IN BRASS THERMOWELL FROM SAME MANUFACTURER - SEE BELOW.
[15]	THERMOWELL: ASHCROFT 50W0250-H-T-260-AA OR EQUAL BY WEISS OR WINTERS THREADED THERMOWELL WITH 1/2" PROCESS CONNECTION SIZE (50), 2-1/2" PROCESS INSERTION LENGTH (0250), TAPERED SHANK (H), NPT THREADED PROCESS CONNECTION (T) AND BRASS MATERIAL (AA). INSTALL THERMOWELL ON A 1/2" BRASS THREADOLET, OR SIMILAR THREADED FITTING, SOLDERED TO TYPE L COPPER PIPE.

NOTE 1. SEE PROJECT SPECIFICATIONS BOOK FOR DETAILED "GENERAL", "PRODUCT" AND "EXECUTION" REQUIREMENTS.

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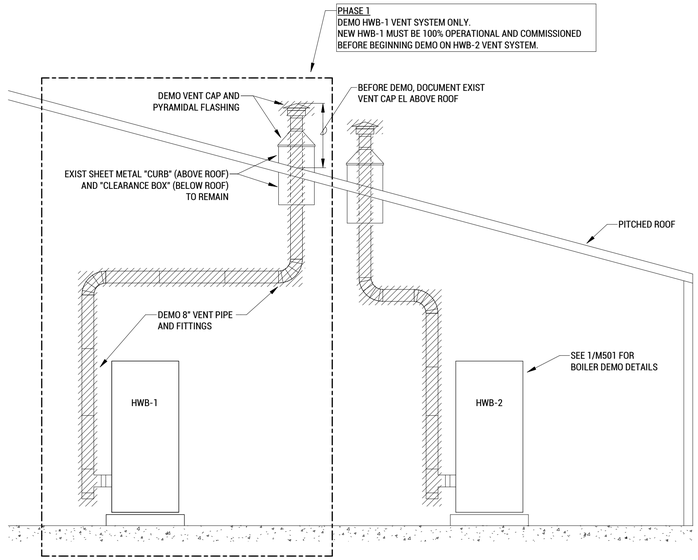
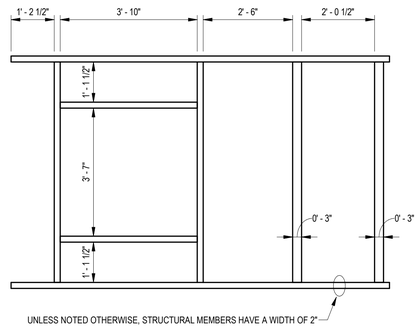
BOILER AND HW GENERATOR PIPING DIAGRAMS - DEMO & NEW

M500

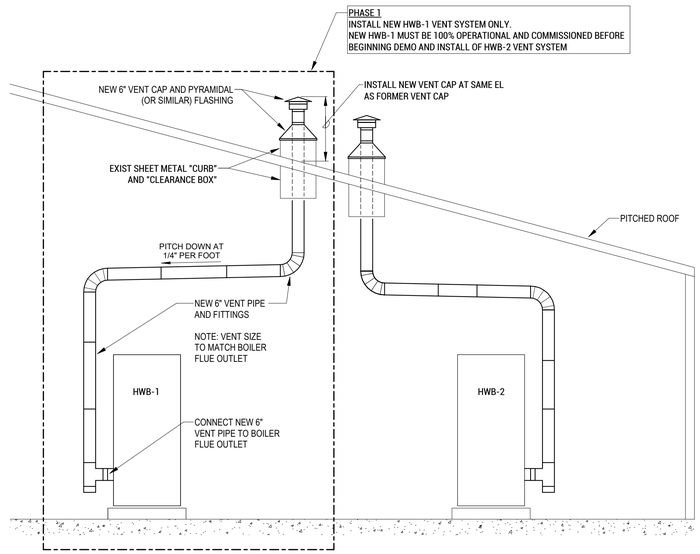


1 BOILER DEMO VENT DETAIL
NOT TO SCALE



NOTE: SKIDS FOR HWB-1 / HWG-1 AND HWB-2 / HWG-2 ARE IDENTICAL

3 EXISTING BOILER SKID DIMENSIONS
NOT TO SCALE



2 BOILER NEW VENT DETAIL
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BOILER VENT DETAILS AND EXISTING SKID DIMENSIONS

M501

HOT WATER BOILER SCHEDULE

DESIGNATION	LOCATION	BASIS OF DESIGN		SERVICE	TYPE	COMBUSTION TYPE	PEAK INPUT (MBH)	PEAK OUTPUT (MBH)	PEAK EFFICIENCY (%)	MIN TURNDOWN RATIO	FLUID TYPE	FLOW (GPM)	ENT. FLUID TEMP. (°F)	LVG. FLUID TEMP. (°F)	FUEL TYPE	GAS INLET PRESS. RANGE (IN. W.C.)	ELECTRICAL DATA				NOTES
		MANUFACTURER	MODEL														VOLTAGE	PHASE	FLA	MOCP	
HWB-1	POWERHOUSE	THERMAL SOLUTIONS	EVS-1500	DOMESTIC HW	WATER-TUBE HX	ROOM AIR	1,500	1,251	83	3:1	WATER	120	160	180	NG	4-14	120	1	7.5	20	1,2,3
HWB-2	POWERHOUSE	THERMAL SOLUTIONS	EVS-1500	DOMESTIC HW	WATER-TUBE HX	ROOM AIR	1,500	1,251	83	3:1	WATER	120	160	180	NG	4-14	120	1	7.5	20	1,2,3

NOTES:

1. SEE PROJECT SPECIFICATIONS BOOK FOR DETAILED "GENERAL", "PRODUCT" AND "EXECUTION" REQUIREMENTS.
2. BOILER SHALL BE PROVIDED WITH ALL ACCESSORIES NECESSARY FOR COMPLIANCE WITH ASME CSD-1. CONTRACTOR SHALL SUBMIT REQUIRED CSD-1 FORMS AND OTHER REQUIRED DOCUMENTATION TO AUTHORITY HAVING JURISDICTION UPON BOILER START-UP.
3. FURNISH BOILER WITH OPTIONAL SUPPLY SYSTEM TEMPERATURE SENSOR

HOT WATER PUMP SCHEDULE

DESIGNATION	LOCATION	BASIS OF DESIGN		SERVICE	TYPE	CAPACITY (GPM)	HEAD (FT W.C.)	FLUID TYPE	AVG. FLUID TEMP. (°F)	MAX NPSHR (FT W.C.)	MIN EFFICIENCY (%)	SUCTION SIZE (INCH)	DISCHARGE SIZE (INCH)	IMPELLER SIZE (INCH)	ELECTRICAL DATA						NOTES
		MANUFACTURER	MODEL												BRAKE HP	MOTOR HP	RPM	VOLTAGE	PHASE	VFD?	
HWP-1	POWERHOUSE	TACO	1941 2x2	HW BOILER #1	CLOSE-COUPLED IN-LINE	125	30	WATER	170	7.5	62	2	2	6.2	1.6	2	1760	480	3	NO	1, 2, 3
HWP-2	POWERHOUSE	TACO	1941 2x2	HW BOILER #2	CLOSE-COUPLED IN-LINE	125	30	WATER	170	7.5	62	2	2	6.2	1.6	2	1760	480	3	NO	1, 2, 3
HWCP-1	POWERHOUSE	TACO	0013-MSSF2-IFC	DHW CIRCULATION	CARTRIDGE CIRCULATOR	10	22.5	WATER	140	N/A	N/A	1	1	N/A	N/A	1/8	3250	120	1	NO	3, 4, 5

NOTES:

1. PUMP TO BE PROVIDED WITH PREMIUM EFFICIENCY, NON-OVERLOADING MOTOR.
2. SUCTION AND DISCHARGE FLANGES SHALL HAVE 1/4" NPT PRESSURE TAPPINGS.
3. IN-LINE PUMP SHALL BE SUITABLE FOR INSTALLATION WITH MOTOR IN EITHER HORIZONTAL OR VERTICAL (MOTOR ABOVE PIPING) ORIENTATIONS.
4. CONSTRUCTION, INCLUDING STAINLESS STEEL CASING, TO BE SUITABLE FOR POTABLE WATER APPLICATIONS.
5. PUMP HAS A REPLACEABLE CARTRIDGE AND COMES WITH 3 SPEED SWITCH AND MATING FLANGES FOR SUCTION AND DISCHARGE PIPE.

HOT WATER GENERATOR TANK SCHEDULE - BASE BID

DESIGNATION	LOCATION	BASIS OF DESIGN		SERVICE	MATERIAL	ORIENTATION	NOMINAL TANK VOLUME (GALLONS)	FLUID TYPE	FLUID OPERATING TEMP (°F)	TANK PRESSURE RATING (PSI)	TANK DIMENSIONS (BEFORE INSULATION)				NOTES
		MANUFACTURER	MODEL								DIAMETER	HEIGHT WITHOUT BASE	HEIGHT WITH 10" BASE	WEIGHT (LBS)	
HWG-1	POWERHOUSE	HUBBELL	1250	DOMESTIC HOT WATER	CEMENT-LINED STEEL	VERTICAL	1250	WATER	140	150	68"	80"	90"	2460	1, 2, 3
HWG-2	POWERHOUSE	HUBBELL	1250	DOMESTIC HOT WATER	CEMENT-LINED STEEL	VERTICAL	1250	WATER	140	150	68"	80"	90"	2460	1, 2, 3

NOTES:

1. SEE PROJECT SPECIFICATIONS BOOK FOR ADDITIONAL PRODUCT REQUIREMENTS.
2. OPTIONAL TANK DIMENSIONS: (OPTION 2: 70" DIAMETER x 75"H); (OPTION 3: 72" DIAMETER x 72"H)
3. FURNISH TANK WITH THE FOLLOWING FEATURES AND CONNECTIONS:
   a. 10"H base support ring or similar legs or support channels. See tank maximum dimensions in schedule.
   b. Flanged round opening and internal support for bundle-type heat exchanger. See Hot Water Generator Heat Exchanger Schedule, this sheet and coordinate with heat exchanger manufacturer.
   c. 3" NPT non-ferrous connection for domestic cold water inlet: Side inlet conn (below tube bundle heat exchanger); accessible from exterior of insulation/jacketing.
   d. 3" NPT non-ferrous connection for domestic hot water outlet: Top outlet conn; accessible from exterior of insulation/jacketing.
   e. 1" NPT non-ferrous connection for domestic hot water recirculation: Side inlet conn (near top of tank); accessible from exterior of insulation/jacketing.
   f. 1/2" NPT non-ferrous connection for immersion-type temperature sensor: Side inlet conn (near top of tank); accessible from exterior of insulation/jacketing.
   g. 1-1/2" non-ferrous connection for tank drain: Bottom or bottom of side outlet conn; Extend drain through side of tank base and terminate with male NPT connection; Drain valve to be field-furnished / field-installed.
   h. 1" male NPT non-ferrous connection for safety relief valve: Top or side conn; accessible from exterior of insulation/jacketing. Safety relief valve to be field-furnished / field-installed.
   i. 12" x 16", minimum, manway; accessible through insulation/jacketing.
   j. R12.5, minimum, insulation and 22 ga., minimum, painted steel jacket. Jacket is not required if using elastomeric insulation (ex. Armaflex).

BID ALTERNATE NO. 1: FABRICATE HOT WATER TANK WITH GRADE 2205 (DUPLEX) STAINLESS STEEL IN LIEU OF CEMENT-LINED STEEL

HOT WATER GENERATOR HEAT EXCHANGER SCHEDULE

DESIGNATION	LOCATION	SERVICE	MANUFACTURER	MODEL	TYPE	NO. OF PASSES	LOAD (MBH)	TUBE SIDE				TANK SIDE				NOTES
								FLUID TYPE	ENTERING FLUID TEMP (°F)	LEAVING FLUID TEMP (°F)	FLOW (GPM)	FLUID TYPE	ENTERING FLUID TEMP (°F)	LEAVING FLUID TEMP (°F)	FLOW (GPH)	
HWG-1	POWERHOUSE	DOMESTIC HW	BELL & GOSSETT	TCW-1260-4	U-TUBE TANK HEATER	4	1250	WATER	180	160	125	WATER	40	140	1500	1, 2, 3, 4
HWG-2	POWERHOUSE	DOMESTIC HW	BELL & GOSSETT	TCW-1260-4	U-TUBE TANK HEATER	4	1250	WATER	180	160	125	WATER	40	140	1500	1, 2, 3, 4

NOTES:

1. SEE PROJECT SPECIFICATIONS BOOK FOR ADDITIONAL PRODUCT REQUIREMENTS.
2. HEAT EXCHANGER PERFORMANCE IS BASED ON TANK IT SERVES. SEE HOT WATER GENERATOR TANK SCHEDULE THIS SHEET AND COORDINATE WITH TANK MANUFACTURER.
3. HEAT EXCHANGER TUBE BUNDLE TUBES TO BE SEAMLESS DOUBLE-WALL COPPER
4. 3" NPT BOILER HW SUPPLY AND RETURN CONNECTIONS

EXPANSION TANK SCHEDULE

DESIGNATION	LOCATION	BASIS OF DESIGN		SERVICE	TYPE	ORIENTATION	TANK VOLUME (GAL)	ACCEPTANCE VOLUME (GAL)	FLUID TYPE	AVG. FLUID TEMP. (°F)	TANK PRESS. RATING (PSI)	PRE-CHARGE PRESSURE (PSI)	DIMENSIONAL DATA				NOTES
		MANUFACTURER	MODEL										DIA. (IN)	LENGTH (IN)	WEIGHT (LBS)	SYS. CONN. (IN)	
ET-1	POWERHOUSE	AMTROL	AX-40-DD	HW BOILER #1 LOOP	DIAPHRAGM	HORIZONTAL	23	11.3	WATER	170	100	12	15	33	66	3/4	1
ET-2	POWERHOUSE	AMTROL	AX-40-DD	HW BOILER #1 LOOP	DIAPHRAGM	HORIZONTAL	23	11.3	WATER	170	100	12	15	33	66	3/4	1

NOTES:

1. FIELD-FURNISH, FIELD INSTALL SADDLES/SUPPORTS FOR MOUNTING ON EXISTING SUSPENDED ANGLE IRON SUPPORTS.

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MECHANICAL SCHEDULES

M800

GENERAL NOTE

ALL SYMBOLS, ABBREVIATIONS, NOTES, ETC. MAY NOT BE USED ON ALL PROJECTS.

ANNOTATIONS

(#)	KEY NOTE, AS INDICATED
(A)	REVISION, AS INDICATED
## / XX	CALLOUT; ## INDICATES VIEW, XX INDICATES SHEET
XXX	LIGHTING CONTROL TAG, REFERENCE SOO
XXX-X	FEEDER TAG, REFERENCE SCHEDULE
HXXX	HORIZONTAL CABLE PATHWAY TAG, REFERENCE SCHEDULE
XXX	FOOD SERVICE EQUIPMENT TAG, REFERENCE SCHEDULE
EXX	MISCELLANEOUS EQUIPMENT TAG, REFERENCE SCHEDULE
AAA / BBB / CCC / DDD	PANEL ZONE BOUNDARY TAG AAA = NORMAL CIRCUIT BBB = EMERGENCY/LIFE SAFETY CIRCUIT (WHEN PRESENT) CCC = REQUIRED STANDBY/CRITICAL CIRCUIT (WHEN PRESENT) DDD = OPTIONAL STANDBY CIRCUIT (WHEN PRESENT)
	CONTINUATION
	CONDUIT STUB
	PANEL ZONE BOUNDARY
	UNDERGROUND WIRING / CONDUIT
	DAYLIGHT ZONE BOUNDARY, P = PRIMARY AND S = SECONDARY WHERE PRESENT
	LIGHTING CONTROL AREA
	NOT IN SCOPE AREA
	DEMOLISHED ITEM / AREA

WIRING DEVICES

	DUPLEX RECEPTACLE, WALL MOUNT
	DUPLEX RECEPTACLE, GFCI, WALL MOUNT
	DUPLEX RECEPTACLE, CEILING MOUNT
	DUPLEX RECEPTACLE, GFCI, CEILING MOUNT (CORD REEL / DROP CORD ONLY)
	DOUBLE DUPLEX RECEPTACLE, WALL MOUNT
	DOUBLE DUPLEX RECEPTACLE, GFCI, WALL MOUNT
	DOUBLE DUPLEX RECEPTACLE, CEILING MOUNT
	DOUBLE DUPLEX RECEPTACLE, GFCI, CEILING MOUNT (CORD REEL / DROP CORD ONLY)
	SIMPLEX RECEPTACLE, WALL MOUNT
	DEAD-FRONT GFCI DEVICE, WALL MOUNT
	EMERGENCY POWER, MOUNTING AS INDICATED
	SPECIAL RECEPTACLE AS NOTED, WALL MOUNT
	SPECIAL RECEPTACLE AS NOTED, CEILING MOUNT
J	JUNCTION BOX, WALL MOUNT
J	JUNCTION BOX, CEILING MOUNT
R	RELAY
PP	POWER POLE
W#	WALL BOX, W# INDICATES TYPE, REFERENCE SCHEDULE
F#	FLOOR BOX, F# INDICATES TYPE, REFERENCE SCHEDULE
	PUSH BUTTON, BUTTON QUANTITY AS REQUIRED
	MULTI-OUTLET ASSEMBLY AS INDICATED
$	MOTOR-RATED SWITCH

WIRING DEVICE TAGS - WHERE APPLICABLE

X #	X: DEVICE TYPE, REFERENCE BELOW #: CIRCUIT NUMBER

DEVICE TYPES

AC	ABOVE COUNTER
C	CONTROLLED
D	DROP CORD
F	SURFACE MOUNT
H	HORIZONTALLY MOUNTED
R	CORD REEL
S	SWITCHED
T	TAMPER RESISTANT
U	USB
W	WEATHERPROOF IN-USE TYPE COVER

STANDARD MOUNTING HEIGHTS UNO

MOUNTING HEIGHT NOTES

WHERE IN CONFLICT, ARCHITECTURAL DRAWINGS SHALL TAKE PRECEDENCE OVER MOUNTING HEIGHTS INDICATED ON ELECTRICAL DRAWINGS. THE INDICATED DIMENSIONS ARE TO CENTERLINE UNO.

RFERENCE WALL DEVICE MOUNTING ELEVATION FOR FURTHER INFORMATION

RECEPTACLES IN EQUIPMENT ROOMS	46"
EXTERIOR AND GARAGE RECEPTACLES	24"
JUNCTION BOXES	18"
OTHER ALARMS, SWITCHES, AND CONTROL DEVICES NOT INDICATED HERE OR ON WALL DEVICE MOUNTING ELEVATION	46"
PANELBOARDS	72" (TOP BREAKER)
CONTROL PANELS	66" (TOP)
ANNUNCIATOR PANELS	48" (TOP)
SAFETY DISCONNECT SWITCHES	54"
STARTERS	54"

POWER DISTRIBUTION

	PANELBOARD, SURFACE MOUNT, AS INDICATED
	PANELBOARD, RECESS MOUNT, AS INDICATED
	ELECTRICAL EQUIPMENT ON CONCRETE PAD, AS INDICATED
T	INTERIOR DRY-TYPE TRANSFORMER AS INDICATED
UTIL T	PAD MOUNT UTILITY TRANSFORMER
UTIL	POLE MOUNT UTILITY TRANSFORMER
	NON-FUSED DISCONNECT SAFETY SWITCH
	FUSED DISCONNECT SAFETY SWITCH
	MOTOR STARTER
	COMBINATION MOTOR STARTER / FUSED DISCONNECT SAFETY SWITCH
M	MOTOR
	ENCLOSED CIRCUIT BREAKER
M	METER
	GROUND BAR, AS INDICATED
RGAP	REMOTE GENERATOR ANNUNCIATOR PANEL
SPD	SURGE PROTECTIVE DEVICE
VFD	VARIABLE FREQUENCY DRIVE
MH	MANHOLE
HH	HANDHOLE

ELECTRICAL SHEET INDEX

SHEET	DESCRIPTION
E000	ELECTRICAL SYMBOL LEGEND
E001	ELECTRICAL PROJECT NOTES AND ABBREVIATIONS
E002	ELECTRICAL PROJECT SCHEDULES
ED101	LEVEL 1 - ELECTRICAL PLAN - DEMOLITION
E201	LEVEL 1 - POWER PLAN - NEW WORK
E820	POWER SCHEDULES

APPLICABLE CODES:

A. 2015 INTERNATIONAL BUILDING CODE AS ADOPTED BY IOWA ADMINISTRATIVE RULES 661-201 AND 661-301
B. 2015 INTERNATIONAL EXISTING BUILDING CODE AS ADOPTED BY IOWA ADMINISTRATIVE RULE 661-301 AND 661-350, AS APPLICABLE.
C. 2010 AMERICANS WITH DISABILITIES ACT AS ADOPTED BY IOWA ADMINISTRATIVE RULE 661-302

100% CD

9458.00 - DOC NCCF POWERHOUSE WATER HEATER REPLACEMENTS

RESOURCE CONSULTING ENGINEERS LLC

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KEY PLAN

REVISION INFORMATION

MARK	DATE	DESCRIPTION

ISSUED: 3/14/2025

PROJECT NO: 2024.029

ELECTRICAL SYMBOL LEGEND

E000

GENERAL NOTE

ALL SYMBOLS, ABBREVIATIONS, NOTES, ETC. MAY NOT BE USED ON ALL PROJECTS.

GENERAL PROJECT NOTES

A. THE ENTIRE INSTALLATION SHOWN IN THE CONSTRUCTION DOCUMENTS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS INDICATED BELOW. IN THE EVENT OF CONFLICT BETWEEN THESE CONSTRUCTION DOCUMENTS AND THE INDICATED REQUIREMENTS, THE STRICTER SHALL APPLY. ANY ADDITIONAL COSTS ASSOCIATED WITH ENSURING THE PROJECT COMPLIES WITH THE INDICATED REQUIREMENTS SHALL BE INCLUDED IN THE PROJECT BID(S).
  a. ALL APPLICABLE LOCAL, CITY, STATE, AND NATIONAL CODES, LAWS, ACTS, AND ORDINANCES
  b. ALL AUTHORITIES HAVING JURISDICTION
  c. THE OWNER'S INSURANCE COMPANY REQUIREMENTS
  d. UTILITY COMPANY REQUIREMENTS
  e. APPLICABLE INDUSTRY STANDARDS OF GOOD PRACTICE AND SAFETY
  f. THE MANUFACTURER'S STRICTEST REQUIREMENTS AND RECOMMENDATIONS FOR EQUIPMENT AND PRODUCT APPLICATION AND INSTALLATION

B. THE CONSTRUCTION DOCUMENTS ARE SCHEMATIC IN NATURE AND SHALL BE ADAPTED TO ACTUAL SITE CONDITIONS AND OWNER'S REQUIREMENTS AS REQUIRED AT NO ADDITIONAL COST. THE CONSTRUCTION DOCUMENTS ARE NOT INTENDED TO CONTAIN EVERY DETAIL THAT IS APPLICABLE TO THE PROJECT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW ALL CONTRACT DOCUMENTS AND TO COORDINATE WITH ALL OTHER TRADES AND EXISTING/SITE CONDITIONS TO PROVIDE A FULLY FUNCTIONAL SYSTEM PER THE INDICATED DESIGN INTENT.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEAN UP DURING AND AT CONCLUSION OF CONSTRUCTION PERIOD. NO MATERIALS SHALL BE LEFT ON SITE WHEN WORK IS COMPLETED, UNLESS REQUESTED BY OWNER'S REPRESENTATIVE. ALL MATERIALS SHALL BE DISPOSED OF PROPERLY.

D. THE CONTRACTOR SHALL COORDINATE SERVICE INTERRUPTIONS WITH THE OWNER'S REPRESENTATIVE A MINIMUM OF 10 DAYS IN ADVANCE.

E. ELECTRICAL WORK SHALL BE PERFORMED ON DE-ENERGIZED SYSTEMS ONLY. WHERE WORK ON EXISTING SYSTEMS WILL REQUIRE INTERRUPTION OF ELECTRICAL SERVICE, THEN TEMPORARY PROVISIONS ACCEPTABLE TO THE OWNER FOR TEMPORARY POWER SHALL BE UTILIZED UNTIL THE WORK IS COMPLETE.

F. COORDINATE FINAL LOCATIONS OF DEVICES IN UNFINISHED AREAS WITH PIPING, DUCTWORK, EQUIPMENT, CABLE TRAY, ETC. TO AVOID CONFLICTS. MAKE MINOR ADJUSTMENTS TO DEVICE LOCATIONS AS REQUIRED.

G. WORK INDICATED IN THESE DOCUMENTS SHALL BE PERFORMED BY INDIVIDUALS LICENSED TO PERFORM SUCH WORK BY THE STATE IN WHICH THE WORK IS PERFORMED AND ADEQUATELY QUALIFIED TO WORK ON THE ASSOCIATED EQUIPMENT, SYSTEM, ETC.

H. OBTAIN ALL PERMITS REQUIRED TO FULLY COMPLETE INDICATED WORK.

I. PROVIDE PULL AND JUNCTION BOXES AS REQUIRED TO MEET CODE AND INSTALLATION REQUIREMENTS. PULL AND JUNCTION BOXES SHALL BE CONCEALED IN FINISHED SPACES.

J. ALL DEVICES, EQUIPMENT, HARDWARE, COMPONENTS, ETC. USED ON THE PROJECT SHALL BE LISTED AND LABELED IN ACCORDANCE WITH THE NEC BY A QUALIFIED ELECTRICAL TESTING LABORATORY RECOGNIZED BY AUTHORITIES HAVING JURISDICTION AND MARKED FOR INTENDED LOCATION AND APPLICATION.

K. EQUIPMENT, DEVICES, ETC. SHALL BE TESTED FOR PROPER CONNECTIVITY AND FUNCTIONALITY AFTER INSTALLATION. COMPLY WITH MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY STANDARDS. REMOVE AND REPLACE DEFECTIVE EQUIPMENT, DEVICES, ETC. AND RETEST UNTIL PROPER FUNCTIONALITY IS CONFIRMED.

L. EQUIPMENT, DEVICES, CONDUCTORS, CABLES, ETC. INSTALLED IN PLENUM SPACES SHALL BE PLENUM RATED.

M. PROTECT EQUIPMENT, DEVICES, ETC. FROM MOISTURE DURING SHIPPING, STORAGE, AND HANDLING.

N. EQUIPMENT, DEVICES, ETC. SHALL BE DELIVERED IN MFR'S ORIGINAL UNOPENED AND UNDAMAGED PACKAGES WITH MFR'S LABELS LEGIBLE AND INTACT. INSPECT MFR'S PACKAGES UPON RECEIPT.

O. EQUIPMENT, DEVICES, ETC. SHALL BE SECURELY FASTENED TO STRUCTURAL SUPPORT WITHOUT DISTORTION AND INSTALLED LEVEL, PLUMB, AND SQUARE WITH CEILINGS, WALLS, FLOORS, AND FINISHED GRADE AS APPLICABLE UNO.

P. PROVIDE ANY PROPRIETARY EQUIPMENT AND SOFTWARE REQUIRED TO MAINTAIN, REPAIR, ADJUST, OR IMPLEMENT FUTURE CHANGES TO DEVICES/EQUIPMENT INSTALLED AS A PART OF THIS PROJECT.

Q. AFTER INSTALLATION, PROTECT DEVICES, EQUIPMENT, ETC. FROM CONSTRUCTION ACTIVITIES. REMOVE AND REPLACE ITEMS THAT ARE CONTAMINATED, DEFACED, DAMAGED, OR OTHERWISE CAUSED TO BE UNFIT FOR USE PRIOR TO ACCEPTANCE BY OWNER.

R. EXAMINE WALLS, FLOORS, CEILINGS, ROOFS, ETC. FOR SUITABLE MOUNTING MOUNTING CONDITIONS PRIOR TO INSTALLING DEVICES, EQUIPMENT, ETC.

S. VISIBLY INSPECT ALL DEVICES, EQUIPMENT, ETC. FOR PHYSICAL AND MECHANICAL CONDITION, CLEANLINESS, ETC. PRIOR TO INSTALLATION. REPLACE ANY ITEMS THAT ARE DAMAGED, DEFECTIVE, OR OTHERWISE UNSUITABLE FOR INSTALLATION.

T. FOR ANY SYSTEMS, DEVICES, ETC. REQUIRING CONNECTION TO OWNER'S IT INFRASTRUCTURE, COORDINATE WITH OWNER'S IT REPRESENTATIVE AS REQUIRED PRIOR TO COMMENCING CONSTRUCTION.

HANGERS AND SUPPORTS PROJECT NOTES

A. UNO: UNISTRUT FRAMING MEMBERS SHALL BE MIN 1-5/8" WIDTH PREFORMED GALVANIZED STEEL CHANNELS WITH MIN 13/32" DIAMETER HOLES AT MAX 8" ON CENTER SPACING IN AT LEAST ONE SURFACE. METALLIC COATINGS SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION AND APPLIED ACCORDING TO MFMA-4. CONNECT EACH FRAMING MEMBER AT EACH INTERSECTION USING WELDED OR BOLTED CONNECTIONS.

B. CONDUIT AND CABLE SUPPORT DEVICES SHALL BE STEEL HANGERS, CLAMPS, AND ASSOCIATED FITTINGS DESIGNED FOR TYPES AND SIZES OF CONDUITS OR CABLES TO BE SUPPORTED.

C. HANGER RODS SHALL BE THREADED STEEL AND MIN 1/4" DIAMETER UNO.

D. SUPPORT ASSEMBLIES SHALL BE SIZED TO ACCOMMODATE THE SUPPORTED COMPONENTS PLUS MIN 200 POUNDS.

E. INSTALL TRAPEZE-TYPE SUPPORTS CONSISTING OF UNISTRUT FRAMING MEMBER AND HANGER RODS FOR MULTIPLE RACEWAYS OR CABLES ADJACENT TO EACH OTHER. SUPPORT SHALL BE SIZED SO THAT THE CAPACITY CAN BE INCREASED BY MIN 25% IN THE FUTURE W/O EXCEEDING DESIGN LOAD LIMITS. SECURE CONDUITS AND CABLES VIA TWO-BOLT CONDUIT CLAMPS.

F. MECHANICAL-EXPANSION ANCHORS SHALL BE INSERT-WEDGE TYPE WITH ZINC-COATED STEEL. DRILL HOLES IN CONCRETE AS REQUIRED TO AVOID THE NEED FOR REINFORCING BARS.

G. TOGGLE BOLTS SHALL BE STAINLESS STEEL SPRINGHEAD TYPE.

H. THROUGH BOLTS SHALL BE HEX HEAD HIGH STRENGTH STRUCTURAL TYPE.

I. STRUCTURAL STEEL CLAMPS SHALL COMPLY WITH ANSI/MSS SP-58.

J. CONCRETE INSERTS SHALL BE STEEL OR MALLEABLE-IRON AND COMPLY WITH ANSI ANSI/MSS SP-58.

K. SUPPORTS SHALL BE PROVIDED WITHOUT CAUSING DEFLECTION OF CEILING, WALL, FLOOR, ETC.

L. PROVIDE FASTENER TYPE PER APPLICATION AS INDICATED BELOW UNO:
  a. WOOD: LAG SCREW OR THROUGH BOLT
  b. EXISTING CONCRETE: EXPANSION ANCHORS
  c. HOLLOW MASONRY: TOGGLE BOLTS
  d. SOLID MASONRY: EXPANSION ANCHORS
  e. LIGHT STEEL: SHEET METAL SCREWS
  f. OTHER STEEL: WELDED THREADED STUDS WITH LOCK WASHERS AND NUTS
  g. HOLLOW WALLS AND NON-STRUCTURAL BUILDING SURFACES: UNISTRUT FRAMING ATTACHED TO SUBSTRATE

EQUIPMENT PROJECT NOTES

A. EQUIPMENT SHALL BE PROPERLY ALIGNED, LUBRICATED, AND OILED BEFORE START-UP AND FINAL ACCEPTANCE BY OWNER. OIL/GREASE FILL PORTS SHALL BE VERTICAL AND EXTENSION FITTINGS SHALL BE PROVIDED AS REQUIRED FOR ACCESS FROM EXTERIOR OF UNIT.

B. EQUIPMENT SHALL BE THOROUGHLY CLEANED AND ALL BARE, SCRATCHED, OR MARRED AREAS SHALL BE PAINTED WITH FACTORY PAINT OR AN OWNER-APPROVED EQUAL.

C. IN A MANNER SATISFACTORY TO THE OWNER'S REPRESENTATIVE, TOUCH-UP OR REFINISH FACTORY-APPLIED PAINTS OR FINISHES WHICH ARE CHIPPED, DEFACED, SCRATCHED, OR IN ANY OTHER WAY DISTURBED DUE TO HANDLING, INSTALLATION, OR GENERAL CONSTRUCTION WORK.

D. PANELBOARDS, DISCONNECT SWITCHES, AND ANY OTHER TYPE OF ELECTRICAL EQUIPMENT SHALL NOT BE USED AS PULL BOXES OR JUNCTION BOXES FOR CONDUCTORS.

E. FOR EACH PIECE OF EQUIPMENT TAGGED ON PLANS, PROVIDE A PERMANENTLY FASTENED TYPED OR ENGRAVED PLASTIC LABEL SUITABLE FOR USE IN THE ASSOCIATED ENVIROMENT INDICATING THE EQUIPMENT TAG AND WHERE THE EQUIPMENT IS FED FROM. LABEL SHALL BE MINIMUM 1"X3.5" AND CONSIST OF BLACK LETTERS ON WHITE BACKGROUND.

F. EQUIPMENT ENCLOSURES SHALL BE FINISHED WITH GRAY BAKED ENAMEL PAINT UNO.

G. ENSURE NEC WORKING CLEARANCE AND DEDICATED SPACE REQUIREMENTS ARE COMPLIED WITH.

H. REMOVE PACKING MATERIAL AND ACCESSORIES NOT REQUIRED FOR INSTALLATION PRIOR TO INSTALLATION.

I. SECURE ALL COVERS, PLATES, ETC. AND TIGHTEN ALL FASTENERS TO MANUFACTURER-RECOMMENDED TORQUES.

CONDUCTOR PROJECT NOTES

A. FOR THE FOLLOWING NOTES, "CONDUCTOR" CAN BE CONSIDERED SYNONYMOUS WITH "CABLE" UNO.

B. PROVIDE XHHW-2 TYPE CONDUCTORS IN LOCATIONS THAT ARE CONCEALED IN CONCRETE, BELOW SLABS-ON-GRADE, AND UNDERGROUND. PROVIDE THHN/THWN-2 TYPE CONDUCTORS FOR ALL OTHER LOCATIONS.

C. CONDUCTORS SHALL BE INSULATED, RATED FOR 600V, AND ROUTED IN RACEWAYS UNO.

D. RACEWAYS SHALL NOT CONTAIN MORE THAN (3) PHASE CONDUCTORS, (3) NEUTRAL CONDUCTORS, AND (1) GROUND CONDUCTOR UNO.

E. PROVIDE A SEPARATE NEUTRAL CONDUCTOR FOR EACH CIRCUIT REQUIRING A NEUTRAL.

F. CONDUCTORS ASSOCIATED WITH CIRCUITS OF DIFFERENT VOLTAGES SHALL NOT SHARE A COMMON CONDUIT.

G. CONDUCTORS ASSOCIATED WITH DIFFERENT BRANCHES OF POWER (NORMAL, EMERGENCY, ETC.) SHALL NOT SHARE A COMMON CONDUIT.

H. DO NOT INSTALL BRUISED, KINKED, SCORED, DEFORMED, OR ABRADED CONDUCTORS.

I. DO NOT SPLICE CONDUCTORS BETWEEN NORMAL TERMINATION POINTS.

J. CONDUCTORS SHALL BE SOLID TYPE FOR #10 AWG AND SMALLER AND STRANDED TYPE FOR #8 AWG AND LARGER.

K. CONDUCTOR MATERIAL SHALL BE CU UNLESS AL IS SPECIFICALLY INDICATED IN THE FEEDER SCHEDULE.

L. CONDUCTOR TYPE SHALL BE SINGLE CONDUCTOR IN RACEWAY UNO.

M. USE MFR-APPROVED PULLING COMPOUND OR LUBRICANT WHERE NECESSARY. COMPOUND USED MUST NOT DETERIORATE CONDUCTOR OR INSULATION. DO NOT EXCEED MFR'S RECOMMENDED MAX PULLING TENSIONS AND SIDEWALL PRESSURE VALUES.

N. USE PULLING MEANS, INCLUDING FISH TAPE, CABLE, ROPE, AND BASKET-WEAVE WIRE/CABLE GRIPS, THAT WILL NOT DAMAGE CABLES OR RACEWAY.

O. PROVIDE MIN 12" SLACK FOR EACH CONDUCTOR AT EACH OUTLET.

P. MAKE SPLICES, TERMINATIONS, AND TAPS THAT ARE COMPATIBLE WITH CONDUCTOR MATERIAL AND THAT POSSESS EQUIVALENT OR BETTER MECHANICAL STRENGTH AND INSULATION RATINGS THAN UNSPLICED CONDUCTORS. USE OXIDE INHIBITOR IN EACH SPLICE, TERMINATION, AND TAP FOR AL CONDUCTORS WHEN PRESENT.

Q. TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES.

R. IDENTIFY EACH SPARE CONDUCTOR AT EACH END WITH IDENTITY NUMBER AND LOCATION OF OTHER END OF CONDUCTOR, AND IDENTIFY AS SPARE CONDUCTOR.

S. PROVIDE CONDUCTOR AND CABLE MARKING PER UL'S "WIRE AND CABLE MARKING AND APPLICATION GUIDE."

T. MINIMUM CONDUCTOR SIZE BY APPLICATION (UNO):
  A. LOW VOLTAGE: #18 AWG
  B. ALL OTHER APPLICATIONS: #12 AWG

U. ANY CONDUCTORS INSTALLED IN PLENUM APPLICATIONS SHALL BE PLENUM-RATED.

V. WIRING WITHIN ENCLOSURES: SEPARATE POWER-LIMITED AND NON-POWER-LIMITED CONDUCTORS AS RECOMMENDED BY MFR. INSTALL CONDUCTORS PARALLEL WITH OR AT RIGHT ANGLES TO SIDES AND BACK OF ENCLOSURE. BUNDLE, LACE, AND TRAIN CONDUCTORS TO TERMINAL POINTS WITH NO EXCESS.

W. CONNECTORS, SPLICES, AND LUGS SHALL BE FACTORY-FABRICATED AND OF SIZE, AMPACITY RATING, MATERIAL, TYPE, AND CLASS FOR APPLICATION AND SERVICE INDICATED.

X. LUGS SHALL BE COPPER, ONE PIECE, SEAMLESS, HAVE COMPRESSION TYPE CONDUCTOR TERMINATIONS, AND BE TWO-HOLE TYPE WITH STANDARD BARRELS.

Y. USE NUMBERED TERMINAL STRIPS IN JUNCTION, PULL, DEVICE, AND OUTLET BOXES, CABINETS, OR EQUIPMENT ENCLOSURES WHERE WIRING CONNECTIONS ARE MADE.

ENCLOSED SWITCHES PROJECT NOTES

A. SAFETY DISCONNECT SWITCHES SHALL BE SINGLE THROW, 600 V, HP-RATED, LOCKABLE HANDLE WITH CAPABILITY TO ACCEPT THREE PADLOCKS, AND INTERLOCKED WITH COVER IN CLOSED POSITION.

B. PROVIDE CLIPS OR BOLT PADS TO ACCOMMODATE INDICATED FUSES IN FUSIBLE SWITCHES.

C. COORDINATE LAYOUT AND INSTALLATION OF SWITCHES AND COMPONENTS WITH EQMT SERVED AND ADJACENT SURFACES.

D. INSTALL WALL-MOUNTED SWITCHES ADJACENT TO EACH OTHER WITH TOPS AT UNIFORM HEIGHT UNO.

E. REMOVE TEMPORARY LIFTING OF EYES, CHANNELS, AND BRACKETS AND TEMPORARY BLOCKING OF MOVING PARTS FROM ENCLOSURES AND COMPONENTS.

F. ADJUST MOVING PARTS AND OPERABLE COMPONENTS TO FUNCTION SMOOTHLY, AND LUBRICATE AS RECOMMENDED BY MFR.

CONDUIT PROJECT NOTES

A. FOR THE FOLLOWING NOTES, "CONDUIT" SHALL BE CONSIDERED SYNONYMOUS WITH "RACEWAY" UNO.

B. MINIMUM CONDUIT SIZE: 3/4" UNO

C. COMPLETE RACEWAY INSTALLATION BETWEEN CONDUCTOR AND CABLE TERMINATION POINTS PRIOR TO PULLING CONDUCTORS AND CABLES.

D. CUT CONDUIT PERPENDICULAR TO THE LENGTH. FOR CONDUITS TRADE SIZE 2" AND LARGER, USE ROLL CUTTER OR A GUIDE TO MAKE CUT STRAIGHT AND PERPENDICULAR TO THE LENGTH. REAM INSIDE OF CONDUIT TO REMOVE BURRS.

E. INSTALL PULL WIRES IN EMPTY RACEWAYS. PROVIDE POLYPROPYLENE OR MONOFILAMENT PLASTIC LINE WITH NOT LESS THAN 200 LB TENSILE STRENGTH. LEAVE AT LEAST 12" OF SLACK AT BOTH ENDS OF PULL WIRE.

F. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING ANY HOLES IN STRUCTURAL BEAMS THAT ARE REQUIRED FOR ROUTING CONDUIT. ALL HOLES SHALL BE MADE IN THE MIDDLE THIRD (HEIGHT AND WIDTH WISE) OF THE STRUCTURAL BEAMS. COORDINATE WITH THE STRUCTURAL ENGINEER AND GENERAL CONTRACTOR BEFORE CUTTING.

G. COORDINATE ALL ROOF AND WALL PENETRATIONS WITH STRUCTURAL CONDITIONS. MAINTAIN ALL ROOF WARRANTIES. ALL PENETRATIONS THROUGH FIRE-RATED WALLS AND FLOORS SHALL BE CAULKED AND SEALED WITH APPROVED FIRE RATED CAULKING MATERIAL.

H. CONDUIT SHALL BE RUN IN STRAIGHT LINES PARALLEL TO OR AT RIGHT ANGLES TO BUILDING LINES.

I. CONCEAL CONDUIT WITHIN FINISHED WALLS, CEILINGS, AND FLOORS UNO.

J. DO NOT INSTALL CONDUITS WITHIN 2" OF BOTTOM SIDE OF A METAL DECK ROOF.

K. KEEP RACEWAYS AT LEAST 6" AWAY FROM PARALLEL RUNS OF FLUES AND STEAM OR HOT-WATER PIPES. INSTALL HORIZONTAL RACEWAY RUNS ABOVE WATER AND STEAM PIPING.

L. INSTALL RACEWAYS SQUARE TO THE ENCLOSURE AND TERMINATE AT ENCLOSURES WITHOUT HUBS WITH LOCKNUTS ON BOTH SIDES OF ENCLOSURE WALL. INSTALL LOCKNUTS HAND TIGHT, PLUS ONE-QUARTER TURN MORE.
  a. TERMINATION FITTINGS WITH SHOULDERS DO NOT REQUIRE TWO LOCKNUTS.

M. CONDUITS TERMINATED WITH LOCKNUTS: PROVIDE BUSHINGS UP TO SIZE 1-1/4" AND INSULATED THROAT METAL BUSHINGS ON TRADE SIZE 1-1/2" AND LARGER.

N. TERMINATE THREADED CONDUITS INTO THREADED HUBS OR WITH LOCKNUTS ON INSIDE AND OUTSIDE OF BOXES OR CABINETS.

O. PROVIDE CONDUIT BUSHING OR INSULATED FITTING TO TERMINATE STUB-UPS OR ANY OTHER CONDUIT RUNS NOT TERMINATED IN HUBS OR IN AN ENCLOSURE.

P. PROVIDE STUB-UPS THROUGH FLOORS WITH COUPLING THREADED INSIDE FOR PLUGS, SET FLUSH WITH FINISHED FLOOR. PLUG COUPLING UNTIL CONDUIT IS EXTENDED ABOVE FLOOR TO FINAL DESTINATION OR A MINIMUM OF 2'-0" AFF.

Q. LABEL EACH EMPTY RACEWAY INSTALLED FOR FUTURE USE AT BOTH ENDS AND PROVIDE NYLON PULLSTRING.

R. PROVIDE STEEL COMPRESSION TYPE FITTINGS UNO.

S. PROVIDE INSULATING BUSHINGS FOR RACEWAY TERMINATIONS AT LOCATIONS SUBJECT TO MOISTURE OR VIBRATION.

T. RACEWAYS EMBEDDED IN SLABS:
  a. RUN DUCT RACEWAYS LARGER THAN TRADE SIZE 1" BELOW CONCRETE SLAB.
  b. ARRANGE RACEWAYS TO CROSS BUILDING EXPANSION JOINTS WITH EXPANSION FITTINGS AT RIGHT ANGLES TO THE JOINT.
  c. ARRANGE RACEWAYS TO ENSURE THAT EACH IS SURROUNDED BY MIN 2" CONCRETE W/O VOIDS.
  d. DO NOT EMBED THREADLESS FITTINGS IN CONCRETE.

U. INSTALL EXPANSION JOINT FITTINGS AT THE FOLLOWING LOCATIONS.
  a. ABOVE-GROUND GRC RUNS GREATER THAN 100' IN LENGTH WHERE ENVIRONMENTAL TEMPERATURE CHANGE MAY EXCEED 100 DEG F
  b. WHERE CONDUITS CROSS BLDG OR STRUCTURE EXPANSION JOINTS

V. EXPANSION JOINT FITTINGS SHALL BE CAPABLE OF THE FOLLOWING MIN EXPANSION AND CONTRACTION LENGTHS PER 1' OF STRAIGHT RUN LENGTH PER DEG F TEMPERATURE CHANGE:
  a. PVC CONDUITS: 0.00041"
  b. METAL CONDUITS: 0.000078 "

DEMOLITION PROJECT NOTES

A. THESE PLANS REPRESENT THE BEST INFORMATION AVAILABLE DURING ON-SITE INVESTIGATION AND/OR EXISTING DRAWINGS. DEMOLITION SCOPE IN ADDITION TO THE SCOPE INDICATED ON THE DRAWINGS MAY BE REQUIRED. PERFORM A FIELD VERIFICATION SITE VISIT PRIOR TO BID SUBMITTAL.

B. EXTEND EXISTING CONDUITS AND WIRES AS REQUIRED TO MAINTAIN THE INTEGRITY OF ANY EXISTING FEEDER, BRANCH CIRCUIT, ETC. THAT WILL REMAIN AFTER DEMOLITION.

C. WHERE A NEW DEVICE, ETC. IS INDICATED TO BE INSTALLED IN THE SAME LOCATION AS A DEMOLISHED EXISTING DEVICE, ETC.: REUSE THE EXISTING CONDUIT, CONDUCTORS, CONTROLS, AND BOX TO THE EXTENT POSSIBLE UNO.

D. DISCONNECT AND REMOVE ALL EQUIPMENT, DEVICES, ETC. IN AREA(S) OF DEMOLITION UNO.

E. DEMOLISHED EQUIPMENT, DEVICES, ETC.: REMOVE ASSOCIATED CONDUCTORS, CONDUIT, ETC. BACK TO SOURCE UNO.

F. PROVIDE KNOCKOUT PLUG FOR ANY KNOCKOUT THAT WOULD OTHERWISE BE LEFT OPEN IN ANY BOX, EQUIPMENT, ETC.

G. MAINTAIN THE INTEGRITY OF ALL EQUIPMENT, DEVICES, ETC. NOT REQUIRED TO BE REMOVED.

H. THE OWNER SHALL HAVE FIRST SALVAGE RIGHTS TO ALL REMOVED EQUIPMENT, DEVICES, ETC. CONTRACTOR SHALL REMOVE FROM SITE ALL DEMOLISHED CONDUITS, BOXES, WIRING, AND ANY OTHER MISCELLANEOUS ELECTRICAL SCRAP; AND ALL DEMOLISHED EQUIPMENT, DEVICES, ETC. NOT RETAINED BY OWNER.

I. EXISTING TO REMAIN ITEMS ARE INDICATED IN HALFTONE.

J. EXISTING ELECTRICAL CONDUIT WHICH IS NOT CONCEALED IN WALLS OR FLOOR SLAB AND WHICH IS NOT BEING REUSED SHALL BE REMOVED. ASSOCIATED WIRING SHALL BE REMOVED. CONDUIT SHALL BE CUT OFF FLUSH WHERE IT ENTERS THE FLOOR OR WALL AND SEALED. EXISTING CONDUIT TO REMAIN SHALL BE SUPPORTED PER NEC.

K. WHERE DEVICES ARE TO BE REMOVED FROM EXISTING SURFACES OR ABANDONED, THE CONTRACTOR SHALL INSTALL BLANK WALL PLATES. ENSURE EXISTING TO REMAIN SURFACES AND FINISHES ARE NOT DAMAGED. ALL REPAIR COSTS SHALL BE AT THE EXPENSE OF THE CONTRACTOR. REPAIR ALL HOLES FROM THE REMOVAL OF ELECTRICAL ITEMS AND PATCH/PAINT AS REQUIRED TO MATCH EXISTING.

L. NEW WIRING/CONDUITS SHALL BE CONCEALED IN WALLS TO THE EXTENT POSSIBLE. EVERY EFFORT SHALL BE MADE TO CONCEAL WIRING IN EXISTING WALLS. 3/4" FLEXIBLE METALLIC CONDUIT MAY BE USED AND ROUTED THROUGH EXISTING WALLS. BOXES SHALL BE CUT IN AND RECESSED WHERE POSSIBLE.

M. PROVIDE SURFACE MOUNT CONDUIT INSTALLATIONS IN UNFINISHED AREAS. SURFACE INSTALLATIONS IN FINISHED AREAS SHALL BE PERMITTED ONLY IF ABSOLUTELY NECESSARY. IF IT IS NOT PHYSICALLY POSSIBLE OR PRACTICAL TO CONCEAL RACEWAYS, THE CONTRACTOR SHALL BE PREPARED TO FURNISH AND INSTALL ONE-PIECE STEEL SURFACE RACEWAY, WIREMOLD 700 SERIES OR EQUAL, WITH COLOR AS INDICATED ON PLANS.

N. ABANDONED AND/OR UNUSED EXISTING CABLING SHALL BE REMOVED UNLESS LABELED FOR FUTURE USE AND SUPPORTED BACK TO SOURCES.

O. DEMOLITION-RELATED ELECTRICAL SYSTEM OUTAGES IMPACTING ANY FUNCTIONAL BUILDING AREA(S) SHALL BE COORDINATED WITH THE OWNER A MINIMUM OF 10 BUSINESS DAYS AHEAD OF TIME. PROVIDE TEMPORARY POWER AS REQUIRED.

IDENTIFICATION PROJECT NOTES

A. SECURELY FASTEN LABELS, IDENTIFYING DEVICES, ETC. TO LOCATION WITH HIGH VISIBILITY AND ACCESSIBILITY.

B. THOROUGHLY CLEAN SURFACES WHERE SELF-ADHESIVE IDENTIFICATION DEVICES WILL BE APPLIED BEFORE APPLYING DEVICES.

C. INSTALL IDENTIFYING DEVICES BEFORE INSTALLING ACOUSTICAL CEILINGS AND SIMILAR CONCEALMENT.

D. APPLY IDENTIFICATION DEVICES TO SURFACES THAT REQUIRE FINISH AFTER COMPLETING FINISH WORK.

E. ELEVATED COMPONENTS: INCREASE SIZES OF LABELS, SIGNS, ETC. TO THOSE APPROPRIATE FOR VIEWING FROM FLOOR.

F. LABELS SHALL BE ABLE TO ACCOMMODATE THERMAL MOVEMENTS RESULTING FROM AMBIENT TEMPERATURE CHANGES OF 120 DEG F AND SURFACE TEMPERATURE CHANGES OF 180 DEG F.

G. SELF-ADHESIVE LABELS SHALL BE POLYESTER, THERMAL, TRANSFER-PRINTED, 3 MIL THICK, MULTICOLOR, WEATHER- AND UV-RESISTANT, PRESSURE-SENSITIVE ADHESIVE LABELS, AND CONFIGURED FOR INTENDED USE AND LOCATION. MIN NOMINAL SIZE SHALL BE 1-1/2" BY 6" FOR CONDUITS AND 3-1/2" BY 5" FOR EQMT. TEXT SHALL BE MIN 1/2" HIGH.

H. SNAP-AROUND LABELS FOR CONDUITS: SLIT, PRETENSIONED, FLEXIBLE, PREPRINTED, COLOR-CODED ACRYLIC SLEEVE, MIN 2" LONG, WITH DIAMETER SIZED TO SUIT DIAMETER OF CONDUIT IT IDENTIFIES AND TO STAY IN PLACE BY GRIPPING ACTION.

I. HEAT-SHRINK PREPRINTED TUBES FOR CONDUCTORS: FLAME-RETARDANT POLYOLEFIN TUBES WITH MACHINE-PRINTED IDENTIFICATION LABELS, SIZED TO SUIT DIAMETER AND SHRUNK TO FIT FIRMLY. FULL SHRINK RECOVERY OCCURS AT MAXIMUM OF 200 DEG F.

J. SELF-ADHESIVE VINYL TAPE SHALL BE COLORED, HEAVY DUTY, WATERPROOF, FADE RESISTANT, COMPOUNDED FOR OUTDOOR USE, AND NOT LESS THAN 3 MIL THICK BY 1" WIDE.

K. FASTENERS FOR LABELS AND SIGNS SHALL BE SELF-TAPPING, STAINLESS STEEL SCREWS OR STAINLESS STEEL MACHINE SCREWS WITH NUTS AND FLAT AND LOCK WASHERS.

L. SIGNS SHALL BE LAMINATED ACRYLIC OR MELAMINE PLASTIC, FRAMED WITH MITERED ACRYLIC MOLDING, AND ARRANGED FOR ATTACHMENT AT APPLICABLE EQUIPMENT. SIGNS SHALL BE MIN 1/16" THICK FOR SIGNS UP TO 20 SQ. INCH AND MIN 1/8" THICK FOR SIGNS LARGER THAN 20 SQ. INCH. SIGNS SHALL BE ENGRAVED WITH WHITE LETTERS ON DARK GRAY BACKGROUND AND PUNCHED OR DRILLED FOR MECHANICAL FASTENERS WITH 1/4" GROMMETS IN CORNERS FOR MOUNTING.

M. TEXT LETTERS ON SIGNS SHALL BE 1/2" HIGH. PROVIDE 1-1/2" HIGH SIGN FOR SINGLE LINE OF TEXT AND 2" HIGH SIGN FOR TWO LINES OF TEXT.

ELECTRICAL BOX PROJECT NOTES

A. FOR THE FOLLOWING NOTES, "WALLPLATE" CAN BE CONSIDERED SYNONYMOUS WITH "COVER PLATE" UNO.

B. PROVIDE BOXES IN WIRING AND/OR RACEWAY SYSTEMS WHEREVER REQUIRED FOR PULLING OF WIRES, MAKING CONNECTIONS, AND/OR MOUNTING OF DEVICES OR FIXTURES. CONTR TO CONFIRM REQUIRED LOCATION(S) AND SIZE(S) OF JUNCTION AND/OR PULL BOXES.

C. PROVIDE CAST METAL BOXES FOR EXPOSED LOCATIONS LESS THAN 8'-0" AFF/AFG. PROVIDE SHEET STEEL BOXES FOR ALL OTHER APPLICATIONS UNO.

D. MIN. BOX SIZE SHALL BE 4"X4"X2-1/8" DEEP UNO. PROVIDE SINGLE GANG MUD RING FOR SINGLE GANG DEVICE APPLICATIONS.

E. PLUG ALL OPEN AND UNUSED KNOCKOUTS FOR ANY BOXES INSTALLED OR MODIFIED AS A PART OF THIS PROJECT.

F. DEVICE BOXES SHALL HAVE PROVISIONS FOR MOUNTING THE ASSOCIATED TYPE OF WIRING DEVICE DIRECTLY TO BOX.

G. PROVIDE GASKETS AND ALL REQUIRED ACCESSORIES FOR DAMP AND WET LOCATIONS.

H. WALLPLATE MATERIAL:
  a. INTERIOR UNFINISHED SPACES: 0.032" THICK, TYPE 302/304 NON-MAGNETIC STAINLESS STEEL WITH BRUSHED FINISH
  b. INTERIOR FINISHED SPACES: 0.060" THICK, HIGH-IMPACT THERMOPLASTIC (NYLON) WITH SMOOTH FINISH

I. WALLPLATE-SECURING SCREWS SHALL BE METAL WITH HEAD COLOR TO MATCH WALLPLATE FINISH.

J. LOCATE BOXES SO THAT COVER OR PLATE WILL NOT SPAN DIFFERENT BUILDING FINISHES.

K. SUPPORT BOXES OF THREE GANGS OR MORE FROM MORE THAN ONE SIDE BY SPANNING TWO FRAMING MEMBERS OR MOUNTING ON BRACKETS SPECIFICALLY DESIGNED FOR PURPOSE.

L. SUPPORT BOXES IN GRID CEILINGS INDEPENDENT OF CEILING TILES AND CEILING GRID.

M. FASTEN JUNCTION AND PULL BOXES TO, OR SUPPORT FROM, BUILDING STRUCTURE. DO NOT SUPPORT BOXES BY CONDUITS.

N. DO NOT RELY ON LOCKNUTS TO PENETRATE NONCONDUCTIVE COATINGS ON ENCLOSURES. REMOVE COATINGS IN THE LOCKNUT AREA PRIOR TO ASSEMBLING CONDUIT TO ENCLOSURE TO ENSURE A CONTINUOUS GROUND PATH.

GROUNDING AND BONDING PROJECT NOTES

A. GROUNDING AND BONDING CONDUCTORS SHALL BE CU AND SOLID TYPE FOR # 8 AWG AND SMALLER, AND STRANDED TYPE FOR #6 AWG AND LARGER UNO.

B. FIELD-PROVIDED EQMT BONDING JUMPERS SHALL BE #6 AWG.

C. BONDING CONDUCTORS SHALL BE #4 AWG OR #6 AWG.

D. BONDING JUMPERS SHALL BE 1-5/8" WIDE BY 1/16" THICK CU TAPE, BRAIDED CONDUCTORS TERMINATED W/ CU FERRULES.

E. INST BONDING STRAPS AND JUMPERS IN LOCATIONS ACCESSIBLE FOR INSPECTION AND MAINTENANCE EXCEPT WHERE ROUTED THROUGH SHORT LENGTHS OF CONDUIT.
  a. BONDING TO STRUCTURE: BOND STRAPS DIRECTLY TO BASIC STRUCTURE, TAKING CARE NOT TO PENETRATE ADJACENT PARTS.
  b. BONDING TO EQMT MOUNTED ON VIBRATION ISOLATION HANGERS AND SUPPORTS: INST BONDING SO VIBRATION IS NOT TRANSMITTED TO RIGIDLY MOUNTED EQMT.

F. BOND INTERIOR METAL DUCTS TO EGC'S OF ASSOCIATED FANS, BLOWERS, ELEC HEATERS, AND AIR CLEANERS. INST BONDING JUMPER TO BOND ACROSS FLEXIBLE DUCT CONNECTIONS TO ACHIEVE CONTINUITY.

G. ROUTE CONDUCTORS ALONG SHORTEST AND STRAIGHTEST PATHS POSSIBLE UNO. AVOID OBSTRUCTING ACCESS OR PLACING CONDUCTORS WHERE THEY MAY BE SUBJECTED TO STRAIN, IMPACT, OR DAMAGE.

H. USE BOLTED CONNECTORS FOR PIPE AND EGC TERMINATIONS.

I. USE EXOTHERMIC WELDED CONNECTORS FOR CONN'S TO STRUCTURAL STEEL.

J. MAKE GROUNDING AND BONDING CONN'S SO POSSIBILITY OF GALVANIC ACTION OR ELECTROLYSIS IS MINIMIZED. SELECT CONNECTORS, CONN HARDWARE, CONDUCTORS, AND CONN METHODS SO METALS IN DIRECT CONTACT ARE GALVANICALLY COMPATIBLE.

K. USE ELECTROPLATED OR HOT-TIN-COATED MATERIALS TO ENSURE HIGH CONDUCTIVITY AND TO MAKE CONTACT POINTS CLOSER IN ORDER OF GALVANIC SERIES.

L. MAKE CONN'S W/ CLEAN, BARE METAL AT POINTS OF CONTACT.

M. MAKE AL TO STEEL CONN'S W/ STAINLESS STEEL SEPARATORS AND MECHANICAL CLAMPS.

N. MAKE AL TO GALVANIZED STEEL CONN'S W/ TIN-PLATED CU JUMPERS AND MECHANICAL CLAMPS.

O. COAT AND SEAL CONN'S HAVING DISSIMILAR METALS W/ INERT MATERIAL TO PREVENT FUTURE PENETRATION OF MOISTURE TO CONTACT SURFACES.

P. BEAM GROUNDING AND BONDING CLAMPS SHALL HAVE MECHANICAL-TYPE WIRE TERMINAL W/ GND WIRE ACCESS FROM FOUR DIRECTIONS AND SILICON BRONZE BOLTS.

Q. EXOTHERMICALLY WELDED CONNECTION KITS SHALL BE OF THE TYPES RECOMMENDED BY MFR FOR MATERIALS BEING JOINED AND INST CONDITIONS.

R. BONDING BUSHINGS SHALL BE THREADED TYPE W/ INSULATED THROAT.

S. GROUNDING BUSHINGS SHALL BE THREADED W/ INSULATED THROAT AND MECHANICAL-TYPE WIRE TERMINAL.

T. GROUNDING AND BONDING HUBS SHALL BE INSULATED, GASKETED, AND WATERTIGHT W/ MECHANICAL-TYPE WIRE TERMINAL.

U. AFTER INST, PROTECT GROUNDING AND BONDING CABLES AND EQMT FROM CONST ACTIVITIES. REMOVE AND REPLACE ITEMS THAT ARE CONTAMINATED, DEFACED, DAMAGED, OR OTHERWISE CAUSED TO BE UNFIT FOR USE PRIOR TO ACCEPTANCE BY OWNER.

ABBREVIATIONS

A	AMPERE
AC	AIR CONDITIONER
ADO	AUTOMATIC DOOR OPENER
AFCI	ARC FAULT CIRCUIT INTERRUPTER
AFF	ABOVE FINISHED FLOOR
AFI	ARC FAULT INTERRUPTER
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AL	ALUMINUM
ALT	ALTERNATE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ARCH	ARCHITECTURAL / ARCHITECTURAL
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR-CONDITIONING ENGINEERS
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AV	AUDIO VISUAL
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BFG	BELOW FINISHED GRADE
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM
BOD	BASIS OF DESIGN
BOL	BOTTOM OF LUMINAIRE
C	CONDUIT
CAB	CABINET
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CCT	CORRELATED COLOR TEMPERATURE
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CLG	CEILING
CO	CARBON MONOXIDE
COL	CENTER OF LUMINAIRE
COMB	COMBINATION
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUATION / CONTINUOUS
CONTR	CONTRACTOR
CRI	COLOR RENDERING INDEX
CT	CURRENT TRANSFORMER
CTL	CONTROL
CTR	CENTER
CU	COPPER
Cx	COMMISSIONING
CxA	COMMISSIONING AGENT
D	DEMOLISHED
DC	DIRECT CURRENT
DED	DEDICATED
DEPT	DEPARTMENT
DIA	DIAMETER
DISC	DISCONNECT
DIST	DISTRIBUTION
DP	DISTRIBUTION PANEL
DS	SAFETY DISCONNECT SWITCH
DT	DOUBLE THROW
DW	DISHWASHER
(E)	EXISTING
EC	ELECTRICAL CONTRACTOR
EDB	ELECTRICAL DUCT BANK
E.G.	FOR EXAMPLE
ELEC	ELECTRIC / ELECTRICAL
ELEV	ELEVATOR
EM	EMERGENCY
EMD	ESTIMATED MAXIMUM DEMAND
EMI	ELECTROMAGNETIC INTERFERENCE
EMT	ELECTRICAL METALLIC TUBING
EQ	EQUIPMENT
ERCES	EMERGENCY RESPONDER COMMUNICATIONS ENHANCEMENT SYSTEM
ERRCS	EMERGENCY RESPONDER RADIO COMMUNICATIONS SYSTEM
ETC	ET CETERA
ETR	EXISTING TO REMAIN
EXP	EXPLOSION PROOF
FA	FIRE ALARM
FC	FOOTCANDLES
FCC	FIRE COMMAND CENTER
FCU	FAN COIL UNIT
FDS	FUSED SAFETY DISCONNECT SWITCH
FL	FLOOR
FLA	FULL LOAD AMPERES
FLEX	FLEXIBLE
FMC	FLEXIBLE METAL CONDUIT
FSEC	FOOD SERVICE EQUIPMENT CONTRACTOR
FVNR	FULL VOLTAGE NON-REVERSING
GA	GAUGE
GC	GENERAL CONTRACTOR
GD	GENERAL DUTY
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFEP	GROUND FAULT EQUIPMENT PROTECTION
GFI	GROUND FAULT INTERRUPTER
GFP	GROUND FAULT PROTECTION
GND	GROUND
GRC	GALVANIZED RIGID CONDUIT
GYP	GYPSUM BOARD
HA	HIGH ABUSE
HD	HEAVY DUTY
HG	HOSPITAL GRADE
HOO	HOURS OF OPERATION
HP	HORSEPOWER
HT	HEIGHT
HTG	HEATING
HTR	HEATER
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING
IBC	INTERNATIONAL BUILDING CODE
IECC	INTERNATIONAL ENERGY CONSERVATION CODE
IES	ILLUMINATING ENGINEERING SOCIETY
IMC	INTERMEDIATE METAL CONDUIT
INT	INTEGRAL
IR	INFRARED
JB	JUNCTION BOX
KAIC	KILOAMP INTERRUPTING CURRENT
KCMIL	KILO CIRCULAR MILS
KVA	KILOVOLT-AMPERE
KW	KILOWATT
KWH	KILOWATT-HOUR
LAN	LOCAL AREA NETWORK
LCA	LIGHTING CONTROL AREA
LED	LIGHT EMITTING DIODE
LFMC	LIQUID-TIGHT FLEXIBLE METAL CONDUIT
LOC	LOCATE OR LOCATION
LTG	LIGHTING
LTNG	LIGHTNING
LV	LOW VOLTAGE

ABBREVIATIONS (CONT'D)

MAX	MAXIMUM
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCCB	MOLDED CASE CIRCUIT BREAKER
MCM	THOUSAND CIRCULAR MILS
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUG ONLY
MOA	MULTI-OUTLET ASSEMBLY
MOPD	MAXIMUM OVERCURRENT PROTECTION DEVICE
MRS	MOTOR-RATED TOGGLE SWITCH
MSB	MAIN SWITCHBOARD
MT	MOUNT
MTG	MOUNTING
MTR	MOTOR
MV	MEDIUM VOLTAGE
MW	MICROWAVE
N1	NEMA 1
N3R	NEMA 3R
N4X	NEMA 4X
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NDS	NON-FUSED SAFETY DISCONNECT SWITCH
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NF	NON-FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NLP	NATIONAL LIGHTNING PROTECTION CORPORATION
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OC	ON CENTER
OFCI	OWNER-FURNISHED, CONTRACTOR-INSTALLED
OFOI	OWNER-FURNISHED, OWNER-INSTALLED
P	POLE
PA	PUBLIC ADDRESS
PC	PLUMBING CONTRACTOR
PF	POWER FACTOR
PH	PHASE
PIV	POST INDICATOR VALVE
PNL	PANEL
PRI	PRIMARY
PT	POTENTIAL TRANSFORMER
PV	PHOTOVOLTAIC
PVC	POLYVINYL CHLORIDE
PWR	POWER
QTY	QUANTITY
R	RELOCATED
REC	RECESSED
RCE	RESOURCE CONSULTING ENGINEERS
RCPT	RECEPTACLE
RF	RADIO FREQUENCY
RGS	RIGID GALVANIZED STEEL CONDUIT
RSC	RIGID STEEL CONDUIT
RTU	ROOFTOP UNIT
SB	SWITCHBOARD
SEC	SECONDARY
SG	SWITCHGEAR
SIM	SIMILAR
SOO	LIGHTING CONTROL SEQUENCE OF OPERATION
SPD	SURGE PROTECTIVE DEVICE
SPEC	SPECIFY / SPECIFIED / SPECIFICATION
SS	STAINLESS STEEL
SCCR	SHORT CIRCUIT CURRENT RATING
ST	SHUNT TRIP
STD	STANDARD
SURF	SURFACE
SW	SWITCH(ED)
SYS	SYSTEM
TEL	TELEPHONE
TL	TWIST LOCK
TOL	TOP OF LUMINAIRE
TR	TAMPER RESISTANT
TTB	TELECOM TERMINATION BOARD
TV	TELEVISION
TYP	TYPICAL
UC	UNDER COUNTER
UE	UNDERGROUND ELECTRICAL
UG	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTED POWER SUPPLY
UTIL	UTILITY
V	VOLT
VA	VOLT-AMPERE
VD	VOLTAGE DROP
VFD	VARIABLE FREQUENCY DRIVE
VP	VAPORPROOF
W	WATT
W/	WITH
W/O	WITHOUT
WAP	WIRELESS ACCESS POINT
WG	WIREGUARD
WP	WEATHERPROOF
WT	WATERTIGHT
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

APPLICABLE CODES

INDICATED CODES SHALL BE APPLIED WITH LOCAL AMENDMENTS INCLUDED AS APPLICABLE PER PROJECT LOCATION.

A. ELECTRICAL CODE: 2020 **[2023]** NFPA 70 (NEC)
B. ENERGY CODE: 2010 ASHRAE 90.1 **[IECC 2018]**
C. BUILDING CODE: IBC, REFERENCE ARCHITECTURAL SHEETS FOR APPLICABLE YEAR
D. LIFE SAFETY CODE: 2012 NFPA 101
E. 2010 AMERICANS WITH DISABILITIES ACT

100% CD

9458.00 - DOC NCCF POWERHOUSE WATER HEATER REPLACEMENTS

RESOURCE CONSULTING ENGINEERS LLC

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KEY PLAN

REVISION INFORMATION

MARK	DATE	DESCRIPTION

ISSUED: 3/14/2025

PROJECT NO: 2024.029

ELECTRICAL PROJECT NOTES AND ABBREVIATIONS

E001

ELECTRICAL WARRANTY SCHEDULE

DEVICE/EQUIPMENT TYPE	WARRANTY PERIOD (YEARS)	
	MFR	INSTALLER
GENERAL PROJECT INSTALLATION	-	1
ENCLOSED SWITCHES AND CIRCUIT BREAKERS	2	2

GENERAL NOTES

A. THIS IS A MASTER SCHEDULE. ALL INDICATED DEVICE/EQUIPMENT TYPES MAY NOT BE PRESENT ALL PROJECTS. PROVIDE INDICATED WARRANTIES FOR ALL APPLICABLE DEVICE/EQUIPMENT TYPES.
B. MANUFACTURER AND INSTALLER SHALL WARRANT THE DEVICES, EQUIPMENT, COMPONENTS, ASSOCIATED SOFTWARE, ETC. AND INSTALLATION FOR THE INDICATED PERIOD. FAILURE OF THE DEVICE, EQUIPMENT, SYSTEM, INSTALLATION, ETC. SHALL RESULT IN THE MANUFACTURER OR INSTALLER REPAIRING OR REPLACING ANY COMPONENTS OR PART OF THE INSTALLATION AS REQUIRED TO PROVIDE A FULLY FUNCTIONING SYSTEM IN ACCORDANCE WITH THE DESIGN INTENT AT NO ADDITIONAL COST TO OWNER.

CONDUCTOR COLOR SCHEDULE

CONDUCTOR TYPE	APPLICATION	COLOR
208Y/120V 3 PHASE	PHASE A	BLACK
	PHASE B	RED
	PHASE C	BLUE
GROUND	208Y/120V	GREEN
NEUTRAL	208Y/120V	WHITE

GENERAL NOTES

A. THIS IS A MASTER SCHEDULE. ALL APPLICATIONS MAY NOT BE PRESENT ON ALL PROJECTS.
B. CONDUCTOR COLOR CODING MUST BE FACTORY-APPLIED FOR CONDUCTOR SIZES #10 AWG AND SMALLER. FIELD-APPLIED COLOR CODING IS ACCEPTABLE FOR CONDUCTOR SIZES #8 AWG AND LARGER PENDING AHJ APPROVAL.
C. FOR FIELD-APPLIED COLOR CODING, FACTORY-APPLIED CONDUCTOR COLOR SHALL BE BLACK. FIELD-APPLIED COLOR CODING SHALL BE PROVIDED VIA ELECTRICAL TAPE OF THE INDICATED COLOR WITH A MIN OF THREE RINGS ON EACH END OF EACH CONDUCTOR.
D. FOR ANY CONDUCTOR TYPES NOT INDICATED, PROVIDE COLOR CODING AS REQUIRED BY CODE, MANUFACTURER, AND/OR INDUSTRY STANDARDS.

CONDUIT BEND RADIUS SCHEDULE

TRADE SIZE	MIN BEND RADIUS
1/2"	4"
3/4"	4-1/2"
1"	5-3/4"
1-1/4"	7-1/4"
1-1/2"	8-1/4"
2"	9-1/2"

GENERAL NOTES

A. THIS IS A MASTER SCHEDULE. ALL CONDITIONS MAY NOT BE PRESENT IN ALL PROJECTS.
B. UTILIZE ONE SHOT AND/OR FULL SHOE TYPE BENDERS.
C. THE INDICATED MIN BEND RADII ARE APPLICABLE TO ALL CONDUITS TYPES.
D. REFERENCE NEC CHAPTER 9, TABLE 2 FOR FURTHER INFORMATION.

CONDUIT TYPES SCHEDULE

TYPE	DESCRIPTION	COATING		SECURING/SUPPORTING		REMARKS
		EXTERIOR	INTERIOR	MAX INTERVAL	MAX DISTANCE FROM TERMINATION POINT	
EMT	ELECTRICAL METALLIC TUBING	ZINC	ZINC WITH ORGANIC TOP COATING	10'-0"	3'-0"	1,3
FMC	FLEXIBLE METAL CONDUIT	-	-	4'-6"	1'-0"	2,5
GRC	GALVANIZED RIGID CONDUIT	ZINC	ZINC WITH ORGANIC TOP COATING	10'-0"	3'-0"	1,3,4

GENERAL NOTES

A. THE TOTAL NUMBER OF BENDS BETWEEN PULL POINTS SHALL NOT EXCEED THE EQUIVALENT OF (4) QUARTER BENDS (360 DEGREES TOTAL).
B. NO INDIVIDUAL PIECE OF CONDUIT SHALL BE UNSUPPORTED, EVEN IF THE INDICATED MAX INTERVAL BETWEEN SUPPORTS WOULD OTHERWISE NOT BE EXCEEDED.
C. METALLIC CONDUIT TYPES SHALL BE STEEL UNO.
D. WHERE GALVANIZED, STAINLESS STEEL, ETC. VERSIONS OF THE INDICATED CONDUIT TYPES ARE SPECIFIED, THE REQUIREMENTS INDICATED FOR THE ASSOCIATED BASE CONDUIT TYPE SHALL APPLY.

REMARKS

1. WHERE STRUCTURAL MEMBERS DO NOT READILY PERMIT SECURELY FASTENING WITHIN 3'-0" FROM TERMINATION POINT, SECURELY FASTENING UNBROKEN LENGTHS UP TO 5'-0" FROM TERMINATION POINT IS ACCEPTABLE.
2. WHEN FLEXIBILITY IS NECESSARY AFTER INSTALLATION, LENGTHS FROM THE LAST SECURED/SUPPORTED POINT SHALL NOT EXCEED:
   A. 1/2" THROUGH 1-1/4": 3'-0"
   B. 1-1/2" THROUGH 2": 4'-0"
   C. 2-1/2" AND LARGER: 5'-0"
3. HORIZONTAL RUNS SUPPORTED BY OPENINGS THROUGH FRAMING MEMBERS AT INTERVALS NOT EXCEEDING 10'-0" AND SECURELY FASTENED WITHIN 3'-0" OF TERMINATION POINTS ARE ACCEPTABLE.
4. THREADED CONDUIT JOINTS, EXPOSED TO WET, DAMP, OR CORROSIVE CONDITIONS: APPLY LISTED COMPOUND THAT MAINTAINS ELECTRICAL CONDUCTIVITY TO THREADS OF RACEWAY AND FITTINGS BEFORE MAKING UP JOINTS. FOLLOW COMPOUND MFR'S PUBLISHED INSTRUCTIONS.
5. PROVIDE MAX 72" RUN FOR RECESSED AND SEMIRECESSED LUMINAIRES, TRANSFORMERS, MOTORS, AND EQMT SUBJECT TO VIBRATION, NOISE TRANSMISSION, OR MOVEMENT.

CONDUIT APPLICATIONS SCHEDULE

CONDITION	CONDUIT TYPE	REMARKS
EXPOSED AND SUBJECT TO SEVERE PHYSICAL DAMAGE	GRC	
EXPOSED AND SUBJECT TO PHYSICAL DAMAGE	GRC	
EXPOSED AND NOT SUBJECT TO PHYSICAL DAMAGE	EMT	
CONCEALED IN CEILINGS, WALLS, AND PARTITIONS	EMT	
DAMP OR WET LOCATIONS	GRC	
CONNECTION TO VIBRATING EQUIPMENT	FMC	1

GENERAL NOTES

A. THIS IS A MASTER SCHEDULE. ALL CONDITIONS MAY NOT BE PRESENT IN ALL PROJECTS.
B. GRC AND IMC TYPE CONDUIT: PROVIDED THREADED-TYPE FITTINGS UNO.

REMARKS

1. VIBRATING EQUIPMENT INCLUDES TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-DRIVEN EQUIPMENT.

ELECTRICAL ENCLOSURE SCHEDULE

ENVIRONMENTAL CONDITIONS	NEMA ENCLOSURE TYPE	REMARKS
INDOOR DRY AND CLEAN	TYPE 1	
OTHER WET OR DAMP INDOOR LOCATIONS	TYPE 4	1,2
INDOOR LOCATIONS SUBJECT TO DUST, FALLING DIRT, AND/OR DRIPPING NON-CORROSIVE LIQUIDS	TYPE 12	1,2

GENERAL NOTES

A. THIS IS A MASTER SCHEDULE. ALL CONDITIONS MAY NOT BE PRESENT IN ALL PROJECTS. FOR EACH ELECTRICAL ENCLOSURE PRESENT, PROVIDE ENCLOSURE TYPE MOST CLOSELY MATCHING THE ASSOCIATED ENVIRONMENTAL CONDITION. WHERE THE APPLICABLE ENVIRONMENTAL CONDITION IS NOT CLEAR, NOTIFY ENGINEER PRIOR TO ORDERING EQUIPMENT, ENCLOSURES, ETC.

REMARKS

1. ENCLOSURE SHALL NOT CONTAIN KNOCKOUTS.
2. PROVIDE DUAL COVER INTERLOCK MECHANISM TO PREVENT UNINTENTIONAL OPENING OF COVER.

ELECTRICAL FINISH SCHEDULE

DEVICE/EQUIPMENT	TYPE/LOCATION	FINISH
WALL MOUNT WIRING DEVICES	OTHER INTERIOR FINISHED AREAS	WHITE
	INTERIOR UNFINISHED AREAS	WHITE DEVICE, STAINLESS STEEL COVER PLATE
NON-FIRE ALARM CONDUIT	FINISHED AREAS - CONCEALED	MFR'S STD FINISH
	FINISHED AREAS - EXPOSED	PAINT TO MATCH CEILING/WALL
	UNFINISHED AREAS	MFR'S STD FINISH

GENERAL NOTES

A. THIS IS A MASTER SCHEDULE. ALL CONDITIONS MAY NOT BE PRESENT IN ALL PROJECTS.
B. WHERE APPLICABLE, COVER PLATE FINISH SHALL MATCH DEVICE FINISH UNO.

ACCEPTABLE MANUFACTURERS SCHEDULE

DEVICE/EQUIPMENT TYPE	ACCEPTABLE MANUFACTURER(S)
ENCLOSED SWITCHES AND BREAKERS	SQUARE D
	SIEMENS
	ABB
	EATON
BUILDING WIRE CONDUCTORS	BELDEN
	SOUTHWIRE
	CERRO
	ENCORE

GENERAL NOTES

A. THIS IS A MASTER SCHEDULE. ALL DEVICE/EQUIPMENT TYPES MAY NOT BE PRESENT IN ALL PROJECTS.
B. PROVIDE SINGLE MANUFACTURER FOR EACH DEVICE/EQUIPMENT TYPE.

ELECTRICAL STANDARDS SCHEDULE

UL STANDARDS	
STANDARD	TOPIC
1	FLEXIBLE METAL CONDUIT
6	ELECTRICAL RIGID METAL CONDUIT - STEEL
20	GENERAL-USE SNAP SWITCHES
44	XHHW-2 CONDUCTORS
50/50E	ELECTRICAL EQUIPMENT ENCLOSURE TESTIING
83	THHN/THWN-2 CONDUCTORS
98	ENCLOSED AND DEAD-FRONT SWITCHES
224	INSULATING TUBING TESTING AND CERTIFICATION
467	GROUNDING AND BONDING EQUIPMENT
486A-486B	WIRE CONNECTORS
489	MOLDED-CASE CIRCUIT BREAKERS, SWITCHES, AND CIRCUIT BREAKER ENCLOSURES
498	ATTACHMENT PLUGS AND RECEPTACLES
514A	METALLIC OUTLET BOXES
514B	CONDUIT, TUBING, AND CABLE FITTINGS
514D	COVER PLATES FOR FLUSH MOUNTED WIRING DEVICES
651	EXPANSION AND DEFLECTION FITTINGS
797	ELECTRICAL METALLIC TUBING - STEEL
969	MARKING AND LABELING SYSTEMS
1077	SUPPLEMENTARY PROTECTORS
1242	ELECTRICAL INTERMEDIATE METAL CONDUIT - STEEL
1310	CLASS 2 POWER UNITS
2043	FIRE TEST FOR PRODUCTS INSTALLED IN AIR HANDLING SPACES
2196	FIRE TEST FOR CIRCUIT INTEGRITY OF INSTRUMENTATION, CONTROL, AND DATA CABLES
AXUT	ATTACHMENT PLUGS, FUSELESS
BGUZ	BOXES, JUNCTION AND PULL
DWTT	CONDUIT FITTINGS
DXUZ	FLEXIBLE METAL CONDUIT
DYWV	RIGID NONFERROUS METALLIC CONDUIT
FJMX	ELECTRICAL METALLIC TUBING
FKAV	ELECTRICAL METALLIC TUBING FITTINGS
FOIZ	ELECTRICALLY CONDUCTIVE CORROSION-RESISTANT COMPOUND FOR THREADED CONDUIT
ILNR	FITTINGS, FLEXIBLE METALLIC TUBING
KDER	GROUNDING AND BONDING EQUIPMENT
QCIT	METALLIC OUTLET BOXES
WMUZ	SWITCHES, FLUSH
NEMA STANDARDS	
STANDARD	TOPIC
250	ENCLOSURE TYPES
FB 2.10	FITTINGS FOR USE WITH NON-FLEXIBLE ELECTRICAL METAL CONDUIT OR TUBING
FB 2.20	FITTINGS FOR USE WITH FLEXIBLE ELECTRICAL CONDUIT AND CABLE
FB 2.40	INSTALLATION OF EXPANSION AND EXPANSION/DEFLECTION FITTINGS
FU 1	LOW-VOLTAGE CARTRIDGE FUSES
ICS 2	MOTOR STARTERS
KS 1	ENCLOSED AND MISCELLANEOUS DISTRIBUTION EQUIPMENT SWITCHES
NECA STANDARDS	
STANDARD	TOPIC
1	GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION
101	INSTALLATION AND SUPPORT OF STEEL CONDUIT
130	INSTALLING AND MAINTAINING WIRING DEVICES
407	INSTALLING AND MAINTAINING PANELBOARDS
ANSI STANDARDS	
STANDARD	TOPIC
Z535.1	SAFETY COLORS
Z535.2	FACILITY SAFETY SIGNS
Z535.3	SAFETY SYMBOLS
Z535.4	PRODUCT SAFETY SIGNS AND LABELS
Z535.5	SAFETY TAGS AND BARRICADE TAPES FOR TEMPORARY HAZARDS
ASTM STANDARDS	
STANDARD	TOPIC
A36/A36M	CARBON STRUCTURAL STEEL
A240/240M	STAINLESS STEEL
A568/A568M	SHEET STEEL
A641/A641M	ZINC-COATED CARBON STEEL WIRE
A653/A653M	GALVANIZED STEEL
B3	SOFT OR ANNEALED COPPER WIRE
B8	CONCENTRIC-LAY-STRANDED COPPER WIRES
F3125/F3125M	HIGH STRENGTH STRUCTURAL BOLTS AND ASSEMBLIES

GENERAL NOTES

A. THIS IS A MASTER SCHEDULE. ALL INDICATED STANDARDS MAY NOT BE APPLICABLE TO ALL PROJECTS. COMPLY WITH ALL STANDARDS APPLICABLE TO THIS PROJECT.

ELECTRICAL SUBMITTALS SCHEDULE

PRODUCT DATA (PD) / SHOP DRAWINGS (SD)				
SUBMITAL NUMBER	DEVICE / EQUIPMENT TYPE	PD	SD	REMARKS
262816-01A-#	SAFETY DISCONNECT SWITCHES	X		

GENERAL NOTES

A. THIS IS A MASTER SCHEDULE. ALL INDICATED DEVICES, EQUIPMENT, ETC. MAY NOT BE PRESENT ON ALL PROJECTS. PROVIDE SUBMITTAL FOR EACH DEVICE / EQUIPMENT TYPE PRESENT ON PROJECT.
B. DESIGNATIONS INDICATED ON SUBMITTALS SHALL MATCH DESIGNATIONS INDICATED ON PLANS AS APPLICABLE.
C. SUBMITTALS SHALL HAVE APPLICABLE OPTIONS CLEARLY INDICATED VIA HIGHLIGHTING OR OTHER SIMILAR MEANS.
D. EACH SUBMITTAL SHALL INCLUDE EACH APPLICABLE DEVICE / EQUIPMENT TYPE PRESENT ON PROJECT. PARTIAL SUBMITTALS WITHOUT PRIOR APPROVAL WILL BE REJECTED WITHOUT BEING REVIEWED.
E. FOR DEVICE / EQUIPMENT TYPES REQUIRING PRODUCT DATA AND SHOP DRAWING SUBMITTALS, SUBMIT PRODUCT DATA AND SHOP DRAWINGS AS ONE COMBINED SUBMITTAL.
F. "#" IN SUBMITTAL NUMBER COLUMN = PLACEHOLDER FOR SUBMITTAL VERSION IDENTIFIER. "#" SHALL = "1" FOR INITIAL SUBMITTAL AND INCREASE SEQUENTIALLY FOR EACH ENSUING RESUBMITTAL.
G. BOOK SPECIFICATIONS MAY NOT BE PROVIDED FOR ALL SECTIONS ON ALL PROJECTS.

100% CD

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9458.00 - DOC NCCF POWERHOUSE WATER HEATER REPLACEMENTS

NORTH CENTRAL CORRECTIONAL FACILITY - POWERHOUSE
313 LANEDALE
ROCKWELL CITY, IA 50579

KEY PLAN

REVISION INFORMATION

MARK	DATE	DESCRIPTION

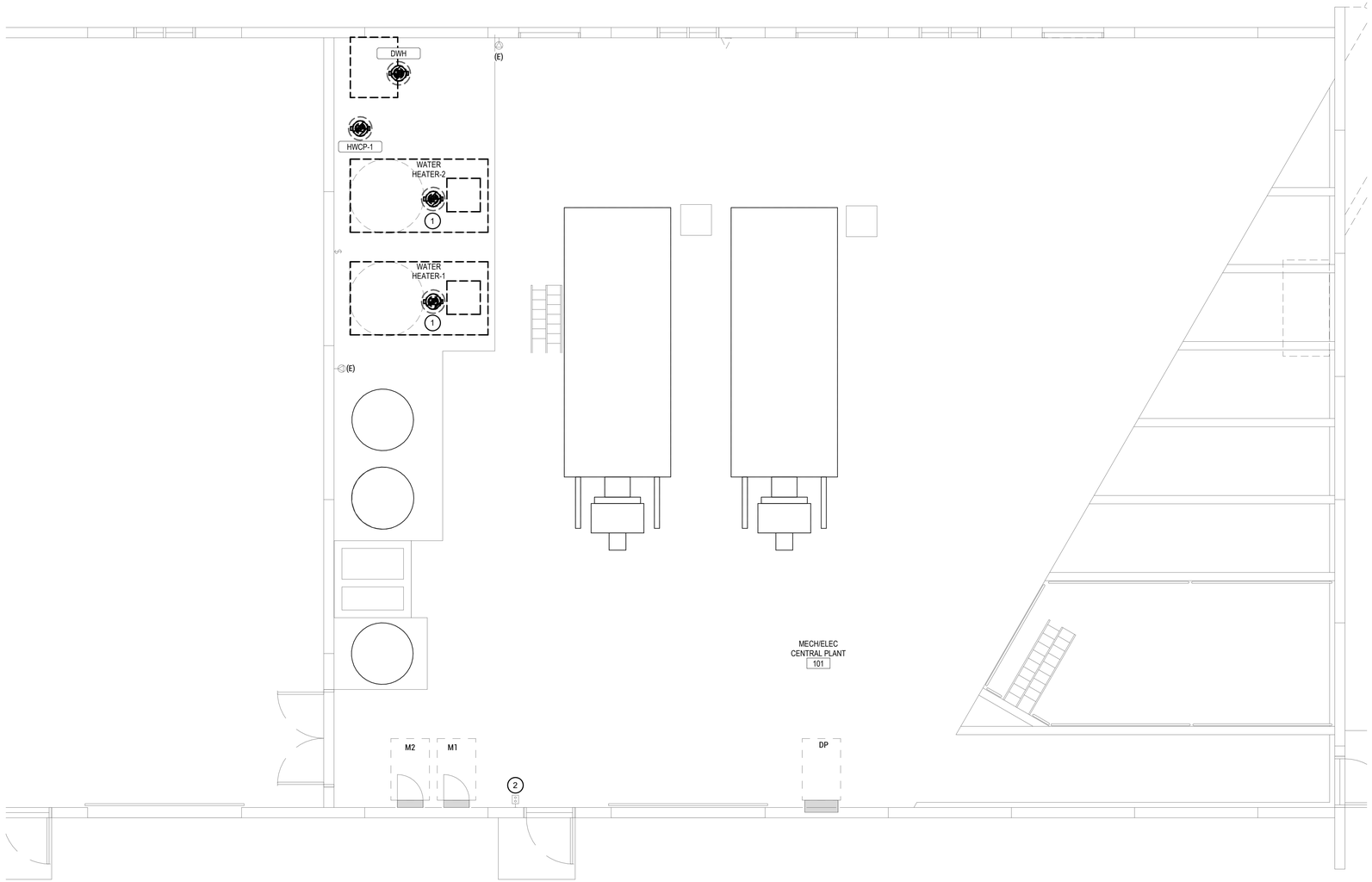
ISSUED: 3/14/2025

PROJECT NO: 2024.029

ELECTRICAL PROJECT SCHEDULES

E002

KEYNOTE LEGEND	
KEY VALUE	KEYNOTE TEXT
1	EXISTING PUMP FED VIA EXISTING WATER HEATER CONNECTION.
2	(E) BOILER SHUTOFF SWITCH.



1 LEVEL 1 - ELECTRICAL PLAN - DEMOLITION
1/4" = 1'-0"

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KEY PLAN

REVISION INFORMATION

MARK	DATE	DESCRIPTION

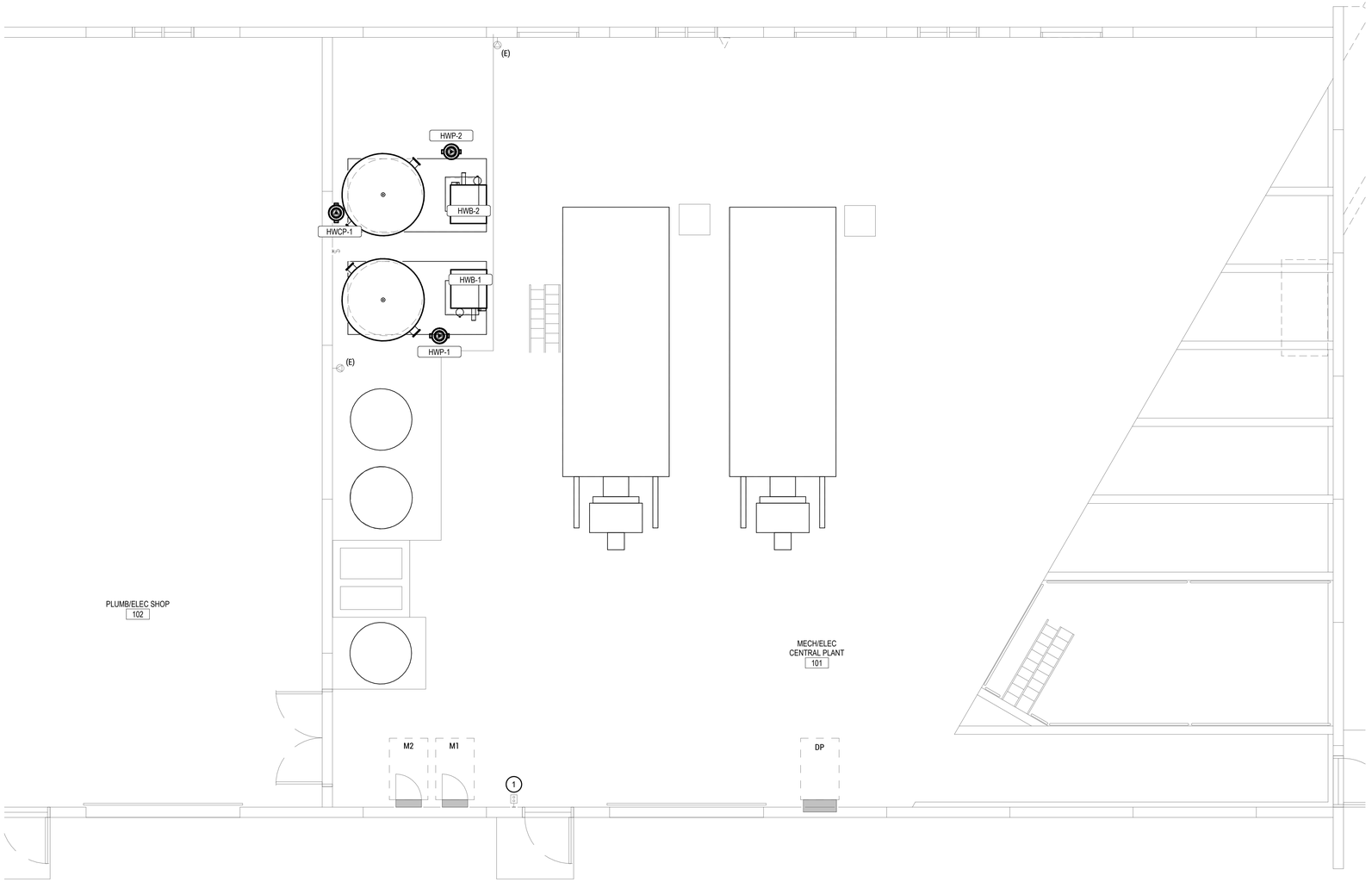
ISSUED: 3/14/2025

PROJECT NO: 2024.029

LEVEL 1 - ELECTRICAL PLAN - DEMOLITION

ED101

KEYNOTE LEGEND	
KEY VALUE	KEYNOTE TEXT
1	WIRE CONDUCTORS OF DOMESTIC HOT WATER UNITS SUCH THAT HOT WATER BOILERS SHUTDOWN UPON DEPRESSION OF EXISTING EMERGENCY BOILER SHUTOFF BUTTON.



1 LEVEL 1 - POWER PLAN - NEW WORK
1/4" = 1'-0"

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KEY PLAN

REVISION INFORMATION

MARK	DATE	DESCRIPTION

ISSUED: 3/14/2025

PROJECT NO: 2024.029

LEVEL 1 - POWER PLAN - NEW WORK

E201

MECHANICAL EQUIPMENT CONNECTION SCHEDULE

EQUIPMENT									ELECTRICAL CONNECTION					DISCONNECT						REMARKS
TAG	DESCRIPTION	HP	KW	FLA	MCA	MOCP	LOAD (VA)	VOLTAGE	CIRCUIT	FEEDER	PLUG	NEMA CONFIG.	DIRECT	FB	IB	TYPE	RATING (A)	FUSE RATING (A)	ENCL.	
HWB-1	HOT WATER BOILER	-	-	7.5	9.4	20	1128	120/1	M2-33	20-2G	-	-	X	EC	EC	MRS	20	-	N1	-
HWB-2	HOT WATER BOILER	-	-	7.5	9.4	20	1128	120/1	M2-32	20-2G	-	-	X	EC	EC	MRS	20	-	N1	-
HWCP-1	HOT WATER CIRCULTION PUMP	1/8	-	4.5	5.6	20	672	120/1	M1-21	20-2G	-	-	X	EC	EC	MRS	20	-	N1	-
HWP-1	HOT WATER PUMP	2	-	7.5	9.4	20	3384	208/3	M1-28,30,32	20-3G	-	-	X	EC	EC	SEE REMARK	30	-	N1	1
HWP-2	HOT WATER PUMP	2	-	7.5	9.4	20	3384	208/3	M2-37,39,41	20-3G	-	-	X	EC	EC	SEE REMARK	30	-	N1	1

GENERAL NOTES

A. LOCATE DISCONNECT AT EQMT PER NEC UNO.
B. CONTROLLER BY MC AND LOW VOLTAGE CONTROL WIRE BY CONTROLS CONTRACTOR UNO.

REMARKS

1. PROVIDE N1 2HP COMBINATION MOTOR STARTER/NON-FUSED DISCONNECT THAT RECEIVES 24V CONTROL SIGNAL FROM ASSOCIATED BOILER. REFERENCE MECHANICAL FOR FURTHER INFORMATION.

EXISTING BRANCH PANEL: M1

LOCATION: MECH ELEC 101 | VOLTAGE: 208Y/120
SUPPLY FROM: MDP | SCCR (KA): FIELD VERIFY
MOUNTING: SURFACE | MAINS TYPE: MLO
ENCLOSURE: N1 | OCPD RATING (A): 400

PANEL NOTES

ETR PANEL. BOLD INDICATES DEMO SCOPE.
CB TRIP RATINGS INDICATED AS "_" WERE UNABLE TO BE CONFIRMED DURING DESIGN. FIELD VERIFY.

REMARKS	CKT	DESCRIPTION	TRIP (A/P)	TRIP (A/P)	DESCRIPTION	CKT	REMARKS
	1	N RCPT	20/1	20/1	LIGHTS - EAST MECH ROOM	2	
	3	LIGHTS - CENTER MECH ROOM	20/1	20/1	LIGHTS - WEST MECH ROOM	4	
	5	EXTERIOR LIGHTS	20/1	20/1	SPARE TO N WALL RCPT	6	
	7	PFUH N MECH RM	20/1	20/1	SPARE	8	
	9	SHUNT TRIP OUTSIDE FUEL STATION	20/1	-	SPACE	10	
	11	SPACE	-	-	SPACE	12	
	13	SPARE	20/1	20/1	SIEMENS BAS CONTROL POWER	14	
	15	SPARE	20/1	20/1	SPARE	16	
	17	PFUH S MECH ROOM	20/1	20/1	SPRINKLER BELL	18	
	19	WATER SOFTENER	20/1	20/1	SPARE	20	
	21	**HW CIRCULATION WATER PUMP**	20/1	20/1	RCPT (OUTSIDE LIGHTS)	22	
	23	SPACE	-	20/1	UNKNOWN	24	
	25	SPARE	40/1	-	SPACE	26	
	27	50A 250V WELDER OUTLET TO LEFT	_/3	-	SPACE	28	
	29	-	-	-	SPACE	30	
	31	-	-	-	SPACE	32	
	33	FIRE ALARM PANEL	20/1	_/3	BOILER FEED PUMP	34	
	35	SPARE	20/1	-	-	36	
	37	SPARE	20/1	-	-	38	
	39	RCPT - SOUTH MECH ROOM	20/1	20/1	SPARE	40	
	41	UNKNOWN	20/1	-	SPACE	42	

BRANCH PANEL: M1

LOCATION: MECH ELEC 101 | **VOLTAGE:** 208Y/120 | **SCCR (KA):** FIELD VERIFY
SUPPLY FROM: | **PHASE:** 3 | **MAINS TYPE:** MLO
MOUNTING: SURFACE | **WIRE:** 4 | **OCPD RATING (A):** 400
ENCLOSURE: N1

PANEL NOTES

ETR PANEL. (E) CB TRIP RATINGS IND'D AS "--" WERE UNABLE TO BE VERIFIED DURING DESIGN. FIELD VERIFY.

REMAR...	CKT	LOAD CLASS	DESCRIPTION	TRIP (A)	POLES	A (VA)		B (VA)		C (VA)		POLES	TRIP (A)	DESCRIPTION	LOAD CLASS	CKT	REMAR...
--	1	--	N RCPT	20	1	0	0					1	20	LIGHTS - EAST MECH...	--	2	--
--	3	--	LIGHTS CENTER MECH RM	20	1			0	0			1	20	LIGHTS - WEST MECH...	--	4	--
--	5	--	EXTERIOR LIGHTS	20	1					0	0	1	20	SPARE TO N WALL RCPT	--	6	--
--	7	--	PFUH N MECH RM...	20	1	0	0					1	20	SPARE	--	8	--
--	9	--	SHUNT TRP OUT FUEL...	20	1			0	--			1	--	SPACE	--	10	--
--	11	--	SPACE	--	1					--	--	1	--	SPACE	--	12	--
--	13	--	SPARE	20	1	0	0					1	20	SIEMENS BAS CONTROL...	--	14	--
--	15	--	SPARE	20	1			0	0			1	20	SPARE	--	16	--
--	17	--	PFUH S MECH ROOM	20	1					0	0	1	20	SPRINKLER BELL	--	18	--
--	19	--	WATER SOFTENER	20	1	0	0					1	20	SPARE	--	20	--
	21	Motor	M: HWCP-1 (NEW)	20	1			672	0			1	20	RCPT (OUTSIDE LIGHTS)	--	22	--
--	23	--	SPACE	--	1					--	0	1	20	UNKNOWN	--	24	--
--	25	--	SPARE	40	1	0	0					1	20	SPACE	--	26	--
--	27	--	50A 250V WELDER OUTLET TO LEFT	--	3			--	1128			3	20	M:HWP-1 (NEW)	Motor	28	
	29									--	1128					30	
	31					--	1128									32	
--	33	--	FIRE ALARM PANEL	20	1			0	--							34	
--	35	--	SPARE	20	1					0	--	3	--	BOILER FEED PUMP	--	36	--
--	37	--	SPARE	20	1	0	--									38	
--	39	--	RCPT - SOUTH MECH...	20	1			0	0			1	20	SPARE	--	40	--
--	41	--	UNKNOWN	20	1					0	--	1	--	SPACE	--	42	--
					TOTAL (KVA):	1.1		1.8		1.1							
					TOTAL (A):	9		15		9							

REMARKS

A = AFCI TYPE CB, F = SUBFEED TYPE CB, G = GFCI TYPE CB, H = CB WITH HANDLE LOCK, S = SHUNT TRIP TYPE CB

LOAD CLASS	CONNECTED LOAD (VA)	DEMAND FACTOR	EMD (VA)	PANEL TOTALS	
Motor	4056 VA	120.86%	4902 VA		
				TOTAL CONN. (KVA):	4.1
				TOTAL EMD (KVA):	4.9
				TOTAL CONN. (A):	11.3
				TOTAL EMD (A):	13.6

EXISTING BRANCH PANEL: M2

LOCATION: MECH ELEC 101 | VOLTAGE: 208Y/120
SUPPLY FROM: MDP | SCCR (KA): FIELD VERIFY
MOUNTING: SURFACE | MAINS TYPE: MLO
ENCLOSURE: N1 | OCPD RATING (A): 400

PANEL NOTES

ETR PANEL. BOLD INDICATES DEMO SCOPE.
CB TRIP RATINGS INDICATED AS "_" WERE UNABLE TO BE CONFIRMED DURING DESIGN. FIELD VERIFY.

REMARKS	CKT	DESCRIPTION	TRIP (A/P)	TRIP (A/P)	DESCRIPTION	CKT	REMARKS
	43	BOILER #2	_/3	_/3	BOILER #1	44	
	45	-	-	-	-	46	
	47	-	-	-	-	48	
	49	PANEL B BASEMENT	_/3	_/3	PANEL L OFFICE	50	
	51	-	-	-	-	52	
	53	-	-	-	-	54	
	55	208/480 TRANSFORMER PHASE B	150/2	20/1	SPARE	56	
	57	-	-	20/1	SPARE	58	
	59	208/480 TRANSFORMER PHASE A	150/2	20/1	SPARE	60	
	61	-	-	20/1	SPARE	62	
	63	208/480 TRANSFORMER PHASE C	150/2	20/1	SPARE	64	
	65	-	-	_/3	FUEL ISLAND	66	
	67	SHUNT TRIP CONTROL POWER	20/1	-	-	68	
	69	SPARE	20/1	-	-	70	
	71	SPACE	-	-	ST COIL SPACE	72	
	73	ST COIL SPACE	-	-	**WATER HEATER #2**	74	
	75	**WATER HEATER #1**	-	-	-	76	
	77	-	-	-	ST COIL SPACE	78	
	79	**SPACE**	-	_/3	PUMP HOUSE	80	
	81	**SPACE**	-	-	-	82	
	83	**SPACE**	-	-	-	84	

BRANCH PANEL: M2

LOCATION: MECH ELEC 101 | **VOLTAGE:** 208Y/120 | **SCCR (KA):** FIELD VERIFY
SUPPLY FROM: | **PHASE:** 3 | **MAINS TYPE:** MLO
MOUNTING: SURFACE | **WIRE:** 4 | **OCPD RATING (A):** 400
ENCLOSURE: N1

PANEL NOTES

ETR PANEL. (E) CB TRIP RATINGS IND'D AS "--" WERE UNABLE TO BE VERIFIED DURING DESIGN. FIELD VERIFY.

REMAR...	CKT	LOAD CLASS	DESCRIPTION	TRIP (A)	POLES	A (VA)		B (VA)		C (VA)		POLES	TRIP (A)	DESCRIPTION	LOAD CLASS	CKT	REMAR...
	1					--	--									2	
--	3	--	BOILER #2	--	3			--	--			3	--	BOILER #1	--	4	--
	5									--	--					6	
	7					--	--									8	
--	9	--	PANEL B BASEMENT	--	3			--	--			3	--	PANEL L OFFICE	--	10	--
	11									--	--					12	
	13					0	0					1	20	SPARE	--	14	--
--	15	--	208/480 TRF PHASE B	150	2			0	0			1	20	SPARE	--	16	--
	17									0	0	1	20	SPARE	--	18	--
--	19	--	208/480 TRF PHASE A	150	2	0	0					1	20	SPARE	--	20	--
	21							0	0			1	20	SPARE	--	22	--
--	23	--	208/480 TRF PHASE C	150	2					0	--					24	
--	25	--	SHUNT TRIP CNTRL PWR	20	1	0	--					3	--	FUEL ISLAND	--	26	--
--	27	--	SPARE	20	1			0	--							28	
--	29	--	SPACE	--	1					--	--	1	--	SHUNT TRIP COIL	--	30	--
--	31	--	SHUNT TRIP COIL	--	1	--	1128					1	20	M:HWB-2 (NEW)	HVAC	32	
	33	HVAC	M:HWB-1 (NEW)	20	1			1128	--			1	--	SPARE (NEW)	--	34	--
--	35	--	SPARE (NEW)	20	1					0	--	1	--	ST COIL SPACE	--	36	--
	37					1128	--									38	
	39	Motor	M:HWP-2 (NEW)	20	3			1128	--			3	--	PUMP HOUSE	--	40	--
	41									1128	--					42	
					TOTAL (KVA):	2.3		2.3		1.1							
					TOTAL (A):	20		20		9							

REMARKS

A = AFCI TYPE CB, F = SUBFEED TYPE CB, G = GFCI TYPE CB, H = CB WITH HANDLE LOCK, S = SHUNT TRIP TYPE CB

LOAD CLASS	CONNECTED LOAD (VA)	DEMAND FACTOR	EMD (VA)	PANEL TOTALS	
HVAC	2256 VA	100.00%	2256 VA		
Motor	3384 VA	125.00%	4230 VA		
				TOTAL CONN. (KVA):	5.6
				TOTAL EMD (KVA):	6.5
				TOTAL CONN. (A):	15.7
				TOTAL EMD (A):	18.0

FEEDER SCHEDULE

TAG	COPPER
	2 WIRE + GROUND
20-2G	(2)#12, (1)#12 GND IN 3/4"C
30-2G	(2)#10, (1)#10 GND IN 3/4"C
40-2G	(2)#8, (1)#10 GND IN 3/4"C
50-2G	(2)#6, (1)#10 GND IN 3/4"C
60-2G	(2)#4, (1)#10 GND IN 1"C
70-2G	(2)#4, (1)#8 GND IN 1"C
80-2G	(2)#3, (1)#8 GND IN 1"C
90-2G	(2)#2, (1)#8 GND IN 1"C
100-2G	(2)#1, (1)#8 GND IN 1-1/4"C
	3 WIRE + GROUND
20-3G	(3)#12, (1)#12 GND IN 3/4"C
30-3G	(3)#10, (1)#10 GND IN 3/4"C
40-3G	(3)#8, (1)#10 GND IN 3/4"C
50-3G	(3)#6, (1)#10 GND IN 1"C
60-3G	(3)#4, (1)#10 GND IN 1"C
70-3G	(3)#4, (1)#8 GND IN 1-1/4"C
80-3G	(3)#3, (1)#8 GND IN 1-1/4"C
90-3G	(3)#2, (1)#8 GND IN 1-1/4"C
100-3G	(3)#1, (1)#8 GND IN 1-1/2"C
110-3G	(3)#1, (1)#6 GND IN 1-1/2"C
125-3G	(3)#1/0, (1)#6 GND IN 1-1/2"C
150-3G	(3)#1/0, (1)#6 GND IN 1-1/2"C
175-3G	(3)#2/0, (1)#6 GND IN 2"C
200-3G	(3)#3/0, (1)#6 GND IN 2"C
225-3G	(3)#4/0, (1)#4 GND IN 2"C
250-3G	(3)250 KCMIL, (1)#4 GND IN 2-1/2"C
300-3G	(3)350 KCMIL, (1)#4 GND IN 3"C
350-3G	(3)500 KCMIL, (1)#3 GND IN 3"C
400-3G	2 SETS OF (3)#3/0, (1)#3 GND IN 2"C
	4 WIRE + GROUND
20-4G	(4)#12, (1)#12 GND IN 3/4"C
30-4G	(4)#10, (1)#10 GND IN 3/4"C
40-4G	(4)#8, (1)#10 GND IN 1"C
50-4G	(4)#6, (1)#10 GND IN 1"C
60-4G	(4)#4, (1)#10 GND IN 1-1/4"C
70-4G	(4)#4, (1)#8 GND IN 1-1/4"C
80-4G	(4)#3, (1)#8 GND IN 1-1/4"C
90-4G	(4)#2, (1)#8 GND IN 1-1/2"C
100-4G	(4)#1, (1)#8 GND IN 1-1/2"C
110-4G	(4)#1, (1)#6 GND IN 1-1/2"C
125-4G	(4)#1/0, (1)#6 GND IN 2"C
150-4G	(4)#1/0, (1)#6 GND IN 2"C
175-4G	(4)#2/0, (1)#6 GND IN 2"C
200-4G	(4)#3/0, (1)#6 GND IN 2"C
225-4G	(4)#4/0, (1)#4 GND IN 2-1/2"C
250-4G	(4)250 KCMIL, (1)#4 GND IN 3"C
300-4G	(4)350 KCMIL, (1)#4 GND IN 3"C
350-4G	(4)500 KCMIL, (1)#3 GND IN 3-1/2"C
400-4G	2 SETS OF (4)#3/0, (1)#3 GND IN 2-1/2"C
	EQUIPMENT
MECH	REFER TO MECHANICAL EQUIPMENT CONNECTION SCHEDULE
XFMR	REFER TO TRANSFORMER SCHEDULE

GENERAL NOTES

A. THIS IS A MASTER SCHEDULE. ALL SIZES MAY NOT OCCUR IN ALL PROJECTS.
B. AL CONDUCTORS ARE NOT ALLOWED.
C. FIELD VERIFY CABLE SIZES DO NOT RESULT IN TOTAL CKT VD GREATER THAN 5% AFTER ACCOUNTING FOR INTENDED CABLE ROUTING.

RESOURCE CONSULTING ENGINEERS LLC

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ROCKWELL CITY, IA 50579

KEY PLAN

REVISION INFORMATION

MARK	DATE	DESCRIPTION

ISSUED: 3/14/2025
PROJECT NO: 2024.029

POWER SCHEDULES

E820