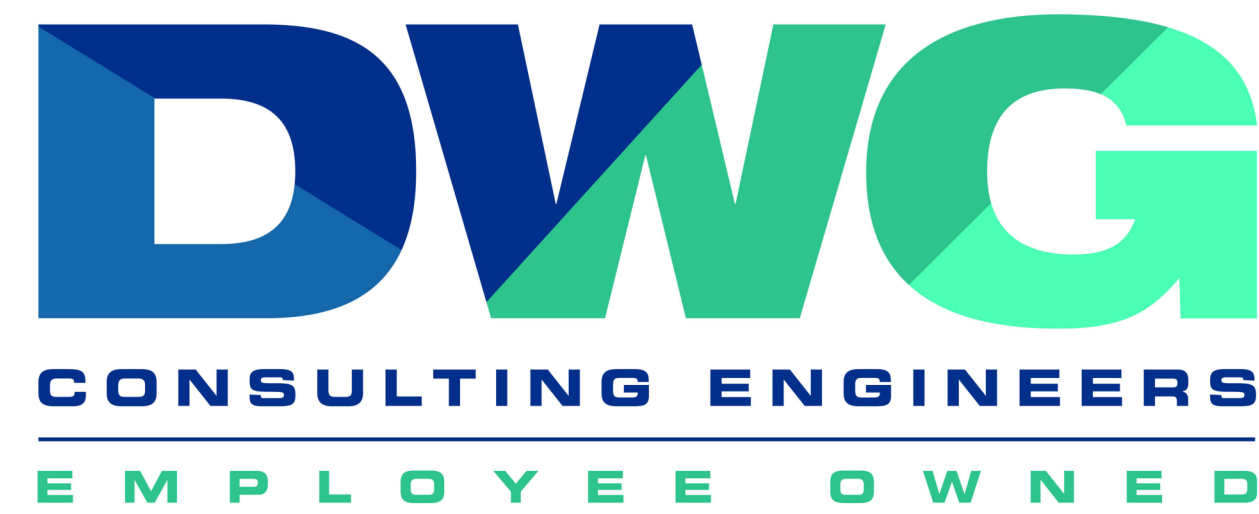




ATHENEUM HALL UNDERGROUND HW REPLACEMENT

STATE PROJECT NUMBER: H17-0111-WW
104 INDEPENDENCE DRIVE
CONWAY, SC 29528



SCOPE OF WORK

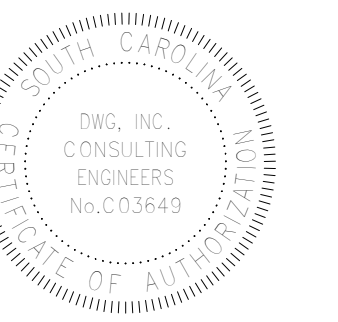
THE SCOPE OF THIS PROJECT IS THE RELOCATION AND INSTALLATION OF AN EXISTING BOILER ON CCU'S CAMPUS TO PROVIDE HEATING HOT WATER TO ATHENEUM HALL. THE BOILER AND ASSOCIATED PUMPS WILL BE INSTALLED OUTSIDE IN A PREFABRICATED HEATED ENCLOSURE. SOME WORK WILL BE REQUIRED IN THE BUILDING INTERIOR TO LOCATE HEATING SYSTEM PIPING APPURTENANCES AND PROVIDE POWER TO THE EQUIPMENT.

SHEET INDEX SHEET NAME

#	TITLE
T000	TITLE SHEET
E001	ELECTRICAL NOTES
E101	POWER PLAN
M001	MECHANICAL NOTES & LEGENDS
M002	MECHANICAL DETAILS
M003	MECHANICAL FLOW DIAGRAMS
M101	MECHANICAL PIPING PLAN

PROJECT SCHEDULE

PLEASE REFER TO PROJECT MANUAL FOR PROJECT DURATION AND LIQUIDATED DAMAGES.



COASTAL CAROLINA
UNIVERSITY
ATHENEUM HALL UNDERGROUND HW REPLACEMENT
104 INDEPENDENCE DRIVE
CONWAY, SC 29528

TITLE SHEET

STATE PROJECT NO.:

H17-0111-WW

REV:

DWG JOB NO.: 19162-05

DATE: 01/27/23

DRAWN BY: KMM

CHECK BY: WDB

SHEET

T000

ELECTRICAL SYSTEMS SEISMIC REQUIREMENTS PER IBC-2018/ASCE 7-16

- A. PER THE 2018 INTERNATIONAL BUILDING CODE, MECHANICAL, PLUMBING AND ELECTRICAL EQUIPMENT AND COMPONENTS, INCLUDING THEIR SUPPORTS AND ATTACHMENTS, SHALL BE DESIGNED FOR SEISMIC FORCES IN ACCORDANCE WITH CHAPTER 13 OF ASCE 7-16.
- B. EXTERIOR EQUIPMENT (INCLUDING ROOF CURBS, RAILS, SUPPORTS) EXPOSED TO WIND SHALL BE DESIGNED AND INSTALLED TO RESIST THE WIND PRESSURES DETERMINED IN ACCORDANCE WITH CHAPTER 26 TO 29 OF ASCE 7-16.
- C. WHERE DESIGN FOR SEISMIC AND WIND LOADS IS REQUIRED, THE MORE DEMANDING FORCE MUST BE USED.
- D. REFERENCE THE STRUCTURAL DRAWINGS FOR SITE SPECIFIC INFORMATION ON SEISMIC DESIGN CATEGORY, WIND SPEEDS, ETC.
- E. USE THE TABLE BELOW TO DETERMINE SEISMIC RESTRAINT REQUIREMENTS FOR EACH COMPONENT.
- F. FOR ALL COMPONENTS REQUIRING SEISMIC RESTRAINT, THE COMPONENT SUPPORTS AND ATTACHMENTS SHALL BE DESIGNED BY A REGISTERED DESIGN PROFESSIONAL REGISTERED IN THE STATE THE JOB IS LOCATED. SUBMITTALS MUST INCLUDE STAMPED AND SIGNED DRAWINGS AND CALCULATIONS.
- G. WHERE SEISMIC RESTRAINT IS REQUIRED, HOUSEKEEPING PADS NEEDED FOR THE INSTALLATION OF EQUIPMENT UNDER THIS CONTRACT MUST BE DESIGNED BY THE SEISMIC ENGINEER. DO NOT POUR ANY HOUSEKEEPING PADS PRIOR TO THE RECEIPT OF THE APPROVED SEISMIC SUBMITTAL.
- H. SEISMIC RESTRAINTS FOR DUCTWORK, PIPING, CONDUIT, CABLE TRAYS AND BUS DUCT MUST BE SHOWN ON LAYOUT DRAWINGS SHOWING SPECIFIC RESTRAINT LOCATIONS ALONG WITH ACCOMPANYING DETAILS AND CALCULATIONS.

ELECTRICAL COMPONENT IMPORTANCE FACTOR (Ip) DESIGNATION

Ip = 1.0

- ALL ASSOCIATED ELECTRICAL WORK UNLESS NOTED OTHERWISE

SEISMIC DESIGN CATEGORIES D,E,F

COMPONENT IMPORTANCE FACTOR (Ip)

1.0

COMPONENT IDENTIFICATION	SEISMIC RESTRAINT REQUIREMENT	NOTES
FLOOR MOUNTED	RESTRAIN ALL	1,2
WALL MOUNTED	RESTRAIN ALL	1,2
COMPONENT SUPPORTS	RESTRAIN ALL	1
SUSPENDED EQUIPMENT	RESTRAIN ALL	1
SINGLE CONDUIT	RESTRAIN IF ≥ 2.5"	3
CABLE TRAY/BUS DUCT TRAPEZED CONDUIT	DO NOT DELETE ON TRAPEZE > 2.5". RESTRAIN IF TOTAL WEIGHT OF SUSPENDED COMPONENT > 10 LBS/FT	3
COMPONENT CERTIFICATION	NOT REQUIRED	-

NOTES:

1. EQUIPMENT 20 LBS. OR LESS IS EXEMPT IF THE COMPONENT IS POSITIVELY ATTACHED TO THE STRUCTURE AND FLEXIBLE CONNECTIONS ARE PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING AND CONDUIT.
2. RESTRAINTS ARE NOT REQUIRED IF THE COMPONENT WEIGHS 400 LBS. OR LESS, IS MOUNTED WITH THE CENTER MASS AT 4' OR LESS ABOVE A FLOOR, IS POSITIVELY ATTACHED TO THE STRUCTURE, AND HAS FLEXIBLE CONNECTIONS BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING AND CONDUIT.
3. RESTRAINT IS NOT REQUIRED IF THE CONDUIT IS SUPPORTED BY HANGERS AND EACH HANGER IN THE RUN IS 12" IN. OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE SUPPORTING STRUCTURE, WHERE PIPES ARE SUPPORTED ON A TRAPEZE, THE TRAPEZE SHALL BE SUPPORTED BY HANGERS HAVING A LENGTH OF 12" IN. OR LESS, WHERE ROD HANGERS ARE USED, THEY SHALL BE EQUIPPED WITH SWIVELS, EYE NUTS OR OTHER DEVICES TO PREVENT BENDING IN THE ROD.
4. THE RESTRAINT OF PENDANT, LAY-IN AND CAN LIGHTS IS ADDRESSED IN ASTM C636 AND E580.
5. COMPONENT CERTIFICATION MUST BE SUPPLIED BY THE EQUIPMENT MANUFACTURER AT TIME OF SUBMITTAL FOR REVIEW BY ENGINEER OF RECORD.

GENERAL ELECTRICAL NOTES

1. BRANCH CIRCUIT WIRING FOR 20A CIRCUITS SHALL BE SIZED PER WIRE SIZING CHART, WHERE CONDUCTOR AND RACEWAY SIZE ARE SHOWN AT HOMERUN, SUCH SIZE SHALL BE USED FOR THE ENTIRE CIRCUIT. EXCEPTION: FINAL CONNECTION TO DEVICES IN OUTLET BOXES IS NOT REQUIRED TO BE LARGER THAN #12.
2. PRIOR TO ROUGH-IN, IN THE EVENT OF A CONFLICT, NOTIFY THE ENGINEER. MINOR ADJUSTMENTS IN DEVICE LOCATION, SUCH AS 5'-0" IN ANY DIRECTION, SHALL BE DONE AT NO ADDITIONAL COST TO THE OWNER.
3. RACEWAYS SHALL BE INSTALLED CONCEALED IN NEW WALL CONSTRUCTION, ABOVE CEILINGS, BELOW FLOOR AND IN OTHER CAVITIES TO THE GREATEST EXTENT POSSIBLE. EXPOSED RACEWAYS MAY BE USED IN UNFINISHED SPACES, WHERE EXPLICITLY NOTED ON PLANS AND WHERE APPROVED BY THE ENGINEER. LAY OUT EXPOSED RACEWAYS TO MINIMIZE THE NUMBER OF VERTICAL RUNS.
4. BRANCH CIRCUITS ROUTING SHALL COMPLY WITH DETAILS ON DRAWINGS AND SHALL BE COORDINATED WITH THE WORK OF OTHER TRADES BEFORE AND DURING CONSTRUCTION. COORDINATE THE ROUTING OF UNDERGROUND CONDUCTORS/CONDUITS WITH STRUCTURAL FOOTINGS OF BUILDING. BRANCH CIRCUITS SHALL BE ROUTED OVERHEAD UNLESS PRIOR APPROVAL HAS BEEN GRANTED BY THE ENGINEER.
5. A FIRESTOP SYSTEM SHALL BE USED TO SEAL ALL PENETRATIONS OF ELECTRICAL CONDUITS AND CABLES THROUGH FIRE-RATED PARTITIONS. THE FIRESTOP SYSTEM SHALL CONSIST OF A FIRE-RATED CAULK TYPE SUBSTANCE AND HIGH TEMPERATURE FIBER INSULATION BY STI OR APPROVED EQUAL. ONLY METAL CONDUIT SHALL BE USED TO PENETRATE FIRE-RATED PARTITIONS. SEE ARCHITECTURAL DRAWINGS FOR ALL LOCATIONS OF FIRE-RATED WALLS.
6. THE USE OF MC CABLE IS ALLOWED ABOVE ACCESSIBLE CEILINGS AND IN STUD CONSTRUCTION ONLY. HOMERUNS TO PANEL SHALL BE WIRE IN RACEWAY ONLY, MC CABLE IS NOT ACCEPTABLE FOR HOMERUNS. MC CABLE IS ONLY ACCEPTABLE FOR 20A BRANCH CIRCUITS.
7. PROVIDE A LISTED EXPANSION/DEFLECTION FITTING FOR ALL CONDUIT CROSSING EXPANSION JOINTS PER NEC 300.4.H. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS OF EXPANSION JOINTS.
8. WHEREVER THE WORD "PROVIDE" IS USED ON THE ELECTRICAL DRAWINGS, IT SHALL BE INFERRED TO MEAN "FURNISH AND INSTALL," UNLESS NOTED OTHERWISE.
9. THE ARRANGEMENT, GROUPING, AND ROUTING OF BRANCH CIRCUITS SHALL BE PROVIDED AT THE CONTRACTOR'S DISCRETION IN ACCORDANCE WITH GENERALLY ACCEPTED PRACTICE FOR ELECTRICAL WORK, THE NATIONAL ELECTRICAL CODE REQUIREMENTS, LOCAL ORDINANCES, AND THE FOLLOWING: 1 - A COMMON NEUTRAL MAY BE INSTALLED IN A HOMERUN FOR 2 OR 3 BRANCH CIRCUITS ONLY IF A MEANS TO SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT OF ORIGIN IS PROVIDED PER NEC 210.4.B. 2 - MULTIPLE SINGLE-POLE BRANCH CIRCUITS (UP TO 3 HOTS, 3 NEUTRALS AND 1 GROUND) RATED FOR 30A OR LESS MAY BE PULLED INTO A SINGLE RACEWAY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SIZING THE RACEWAYS AND DE-RATING CONDUCTORS PER NEC §10.15. 3 - A GROUND CONDUCTOR SHALL BE PROVIDED IN ALL RACEWAYS UNLESS NOTED OTHERWISE.

GENERAL POWER NOTES

1. PROVIDE NEMA CONFIGURATION RECEPTACLES TO MATCH PLUGS ON EQUIPMENT FURNISHED.

GENERAL DEMOLITION NOTES

1. ALL ELECTRICAL EQUIPMENT TO BE REMOVED SHALL REMAIN THE PROPERTY OF THE OWNER. THE CONTRACTOR SHALL NOT DISPOSE OF ANY MATERIALS UNTIL RELEASED BY THE OWNER'S PROJECT MANAGER. MATERIALS THAT THE OWNER'S PROJECT MANAGER CHOOSES TO RETAIN SHALL BE DELIVERED BY THE CONTRACTOR TO A LOCATION DESIGNATED BY THE PROJECT MANAGER. ALL OTHER MATERIALS SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR.

GENERAL EXISTING CONDITION NOTES

1. AREAS OF WORK EXIST FOR THIS PROJECT WHICH WERE NOT ACCESSIBLE OR HAD LIMITED ACCESS DURING DESIGN. AS SUCH, CONTRACTOR SHALL VERIFY ALL UTILITIES IN AREA OF WORK BEFORE DEMOLITION OF ANY SERVICE. ANY ELECTRICAL COMPONENTS NOT SHOWN SHALL BE IDENTIFIED AND THE ARCHITECT AND ENGINEER SHALL BE NOTIFIED AS SOON AS POSSIBLE. NO ELECTRICAL REWORK SHALL BE COMMENCED WITHOUT COORDINATION OF BOTH ARCHITECT AND ENGINEER. WHERE INFORMATION SHOWN ON THESE DRAWINGS CONFLICTS WITH VERIFIED FIELD CONDITIONS, IT SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER.
2. IN AREAS WHERE THE EXISTING CEILINGS ARE NOT SLATED TO BE REPLACED, THE CONTRACTOR SHALL WORK THROUGH THE EXISTING CEILINGS (SEE ARCHITECTURAL REFLECTED CEILING PLAN FOR AREA OF WORK). THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ANY DAMAGED TILE OR GRID THAT IS A RESULT OF THEIR WORK. ALL WORK PERFORMED ABOVE EXISTING CEILINGS SHALL BE PERFORMED AFTER HOURS AND SCHEDULED WITH THE OWNER IN ADVANCE.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A FIRESTOP SYSTEM IN ALL PENETRATIONS OF FIRE-RATED FLOORS AND WALLS CREATED BY THE REMOVAL OF EXISTING ELECTRICAL CONDUIT OR CABLES, AS WELL AS THOSE CREATED BY NEWLY INSTALLED CONDUITS AND SLEEVES.
4. WHERE INSTALLATION REQUIRES CUTTING OR DRILLING OF THE EXISTING FLOOR SLAB, THE CONTRACTOR SHALL X-RAY THE EXISTING SLAB PRIOR TO WORK TO ENSURE THAT NO EXISTING UTILITIES OR STRUCTURAL ELEMENTS IN THE SLAB WILL BE COMPROMISED BY THE WORK. NOTIFY THE A/E OF ANY CONFLICTS THAT WILL REQUIRE RELOCATING THE PROPOSED SLAB WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF ANY DAMAGED UTILITIES OR STRUCTURAL ELEMENTS CAUSED BY THE SLAB DEMOLITION.

GENERAL HVAC CONTROLS CONDUIT NOTES

1. PROVIDE CONDUIT FOR HVAC CONTROL CIRCUITS AS REQUIRED TO INTERCONNECT PUMPS/BOILERS TO CONTROL CIRCUITS. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH MECHANICAL CONTRACTOR AND CONTROLS PROVIDER TO DETERMINE SCOPE OF CONDUITS REQUIRED FOR PLUMBING/PUMP CONTROLS. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL REQUIRED CONDUIT, COORDINATE POINTS OF CONNECTION WITH DIVISION 23. PROVIDE PULL CORD IN ALL EMPTY CONDUITS. SEE MECHANICAL PLANS FOR EXACT LOCATIONS OF ALL PLUMBING EQUIPMENT (PUMPS, CONTROLLERS, BOILERS, ETC).

POWER AND TELECOMMUNICATIONS SYMBOL LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
⊕ x	DUPLEX RECEPTACLE	⊕ x	CONTROL SWITCH, "X" INDICATES SWITCH TYPE
⊕ x	GFCI DUPLEX RECEPTACLE	■	PANELBOARD - BRANCH, SURFACE MOUNTED
■	PANELBOARD - DISTRIBUTION, SURFACE MOUNTED		

ELECTRICAL ABBREVIATIONS

ABBR	DESCRIPTION
(E)	EXISTING
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
BFC	BELOW FINISHED CEILING
BFG	BELOW FINISHED GRADE
BOD	BOTTOM OF DEVICE
ECB	ENCLOSED CIRCUIT BREAKER
FACP	FIRE ALARM CONTROL PANEL
FDS	FUSED DISCONNECT SWITCH
GFCI	GROUND-FAULT CIRCUIT-INTERRUPTING
GFI	GROUND-FAULT INTERRUPTING
GP	GENERAL PURPOSE
J-BOX	JUNCTION BOX
KW	KILOWATTS
NEC	NATIONAL ELECTRICAL CODE
NFDS	NON-FUSED DISCONNECT SWITCH
UNO	UNLESS NOTED OTHERWISE
W/	WITH
WP	WEATHERPROOF
RECEPTACLE	DESCRIPTION
WP	WEATHERPROOF

WIRE SIZING CHART 20 AMP BRANCH CIRCUITS

DISTANCE, 120V	MINIMUM WIRE SIZE
0 - 90 FEET	#12 AWG
90 - 230 FEET	#10 AWG
230 - 446 FEET	#8 AWG

LINE LEGEND

SYMBOL	DESCRIPTION
—	EXISTING TO REMAIN
—	NEW CONSTRUCTION
---	DEMOLISH

ELECTRICAL CODES AND STANDARDS (WITH ALL SOUTH CAROLINA MODIFICATIONS)

CODE	DESCRIPTION
IBC (2018)	INTERNATIONAL BUILDING CODE
NFPA 70 (2017)	NATIONAL ELECTRICAL CODE

EQUIPMENT CONNECTION SCHEDULE

UNIT I.D.	VOLTS	# OF POLES	LOAD (VA)	BRANCH CIRCUIT WIRING	DISCONNECT / STARTER	NOTES
BOILERS						
B-1	120 V	1	876	2#12 & 1#12G IN 3/4" CONDUIT	15A FUSED / 30A FDS/ NEMA 4X	1
PUMPS						
BP-1	120 V	1	888	2#12 & 1#12G IN 3/4" CONDUIT	MOTOR RATED SWITCH W/ WP COVER	1
HWP-1	208 V	3	1729	3#12 & 1#12G IN 3/4" CONDUIT	15A FUSED / 30A FDS/ NEMA 4X	1

EQUIPMENT NOTES:

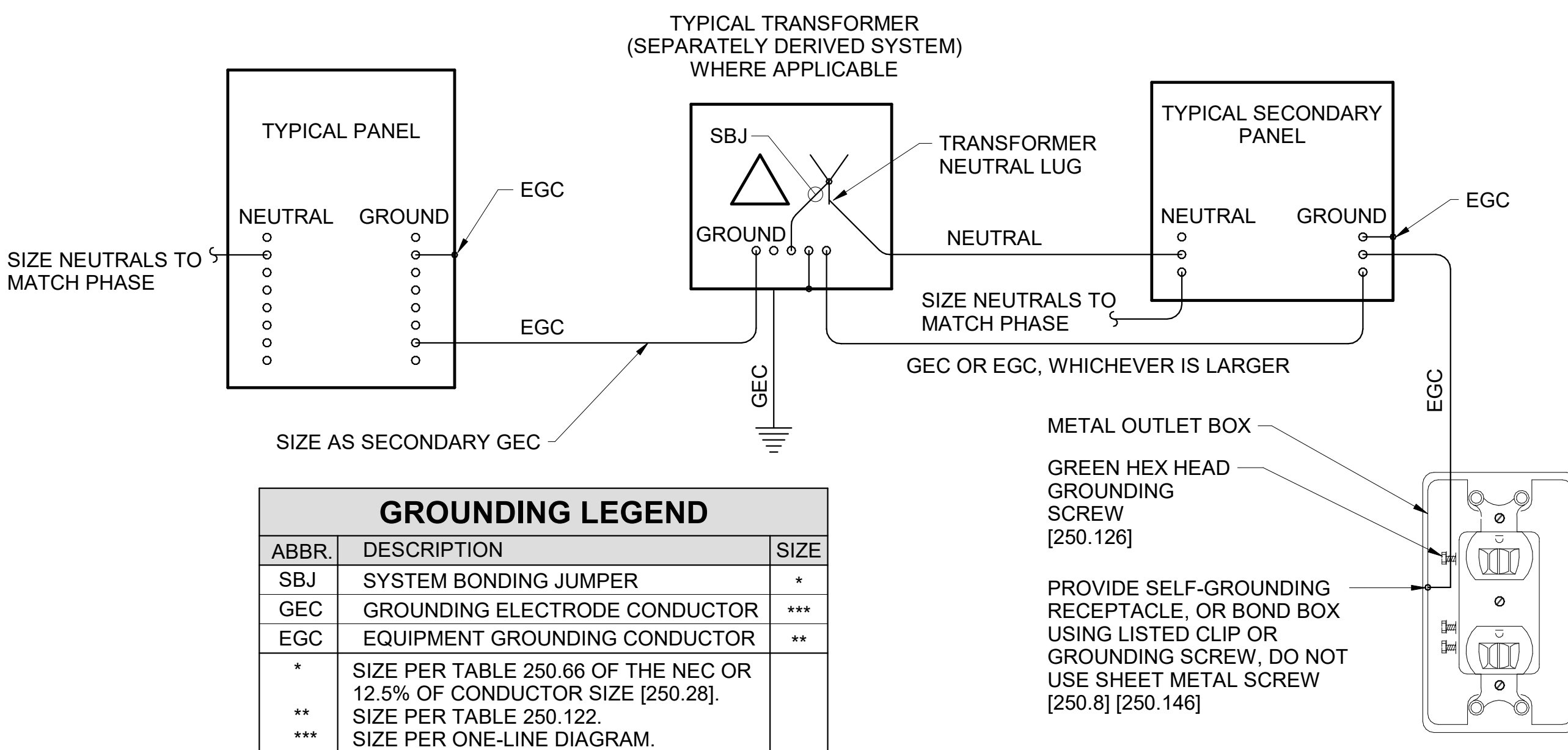
1. LOCATE DISCONNECTS AGAINST NEAREST EXTERIOR WALL.

EXISTING PANELBOARD SCHEDULE

CKT NO.	CIRCUIT DESIGNATION	TRIP	POLES	A	B	C	POLES	TRIP	CIRCUIT DESIGNATION	CKT NO.
1	(E) WIREMOLD 101A	20 A	1	0 VA / 0 VA			1	20 A	(E) REC 112F	2
3	(E) SPARE 101A	20 A	1		0 VA / 0 VA		1	20 A	(3) REC 112F	4
5	EXTERIOR CIRCULATION PUMP BP-1	20 A	1			890 VA / 580 VA				6
7	EXTERIOR BOILER B-1	20 A	1	880 VA / 580 VA			3	20 A	EXTERIOR SYSTEM PUMP	8
9	EXTERIOR PUMP ENCLOSURE HEAT	20 A	1		100 VA / 580 VA					10
11	(E) SPARE	20 A	1			0 VA / 0 VA	1	20 A	(E) SPARE	12
13	(E) SPARE	20 A	1	0 VA / 0 VA			1	20 A	(E) SPARE	14
15	(E) SPARE	20 A	1		0 VA / 0 VA		1	20 A	(E) SPARE	16
17	(E) SPARE	20 A	1			0 VA / 0 VA	1	20 A	(E) SPARE	18
TOTAL PHASE LOAD:				1450 VA	676	1464				
TOTAL PHASE CURRENT:				13 A	6 A	13 A				
PANEL TOTALS										
TOTAL ADDITIONAL LOAD:				3590 VA						
TOTAL ADDITIONAL CURRENT:				10 A						

PANEL SCHEDULE NOTES:

1. UTILIZE EXISTING SPARE BREAKER IN PANEL
2. PROVIDE HANDLE TIE FOR (3) EXISTING 20A-1P SQUARE D QO BREAKERS.

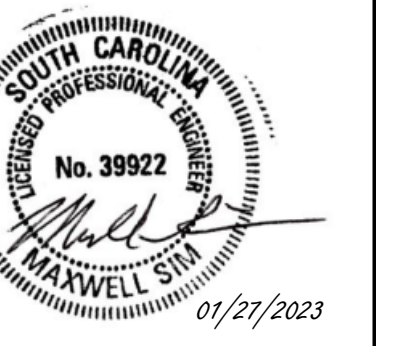
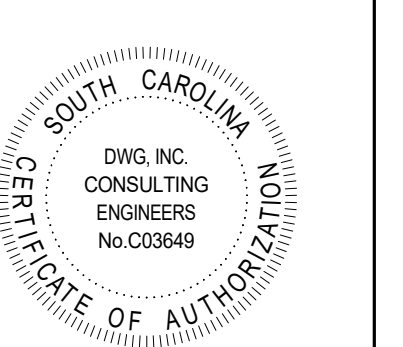


GROUNDING LEGEND

ABBR.	DESCRIPTION	SIZE
SBJ	SYSTEM BONDING JUMPER	*
GEC	GROUNDING ELECTRODE CONDUCTOR	***
EGC	EQUIPMENT GROUNDING CONDUCTOR	**
*	SIZE PER TABLE 250.66 OF THE NEC OR 12.5% OF CONDUCTOR SIZE [250.28].	
**	SIZE PER TABLE 250.122.	
***	SIZE PER ONE-LINE DIAGRAM.	

GROUNDING NOTES:

1. NUMBERS IN BRACKETS REFER TO SPECIFIC SECTIONS OF THE NATIONAL ELECTRICAL CODE.
2. ALL UNDERGROUND OR OTHERWISE INACCESSIBLE GROUND CONNECTIONS AND SPLICES SHALL BE EXOTHERMICALLY WELDED [250.68].
3. GROUND ELECTRODE FOR SEPARATELY DERIVED SYSTEMS SHALL BE THE NEAREST METAL WATER PIPE OR STRUCTURAL METAL. IF EITHER IS NOT AVAILABLE, PROVIDE GROUNDING CONDUCTOR BACK TO MAIN GROUND BUS AT SERVICE ENTRANCE.
4. PROVIDE A GROUND WIRE IN ALL CONDUITS.
5. EARTH SHALL NOT BE USED AS THE SOLE GROUND RETURN PATH FOR ANY EQUIPMENT POWERED UNDER THIS PROJECT. OTHERWISE OVERCURRENT PROTECTION MIGHT NOT WORK, OR IT MIGHT CAUSE POWER QUALITY PROBLEMS.
6. NO ALUMINUM SHALL BE USED FOR GROUNDING WORK WITHOUT THE SPECIFIC WRITTEN PERMISSION OF THE ENGINEER. EXCEPTION: ALUMINUM BUILDING STRUCTURAL MATERIALS SHALL BE BONDED WITH LISTED ALUMINUM EQUIPMENT WITH ALUMINUM TO COPPER CONNECTORS FOR ROUTING COPPER EGC'S.
7. ALL METAL ENCLOSURES AND RACEWAYS SHALL BE BONDED TO GROUND [250.86]. FOR CIRCUITS OVER 250V PROVIDE BOND PER [250.97]. STANDARD LOCKNUTS ARE NOT ACCEPTABLE.
8. PROVIDE EGC CONNECTED TO ANY JUNCTION BOX WHERE SPLICE IS MADE [250.148].
9. PROVIDE BOND TO EXPOSED METAL ON ALL MOTORS, PUMPS, AND LIGHTING FIXTURES PER [250.112].



COASTAL CAROLINA
UNIVERSITY
ATHENEUM HALL UNDERGROUND HW REPLACEMENT
104 INDEPENDENCE DRIVE
CONWAY, SOUTH CAROLINA 29528
ELECTRICAL NOTES

STATE PROJECT NO.:

H17-0111-WW

REV:

DWG JOB NO.:

19162-05

DATE:

01/27/23

DRAWN BY:

MHS

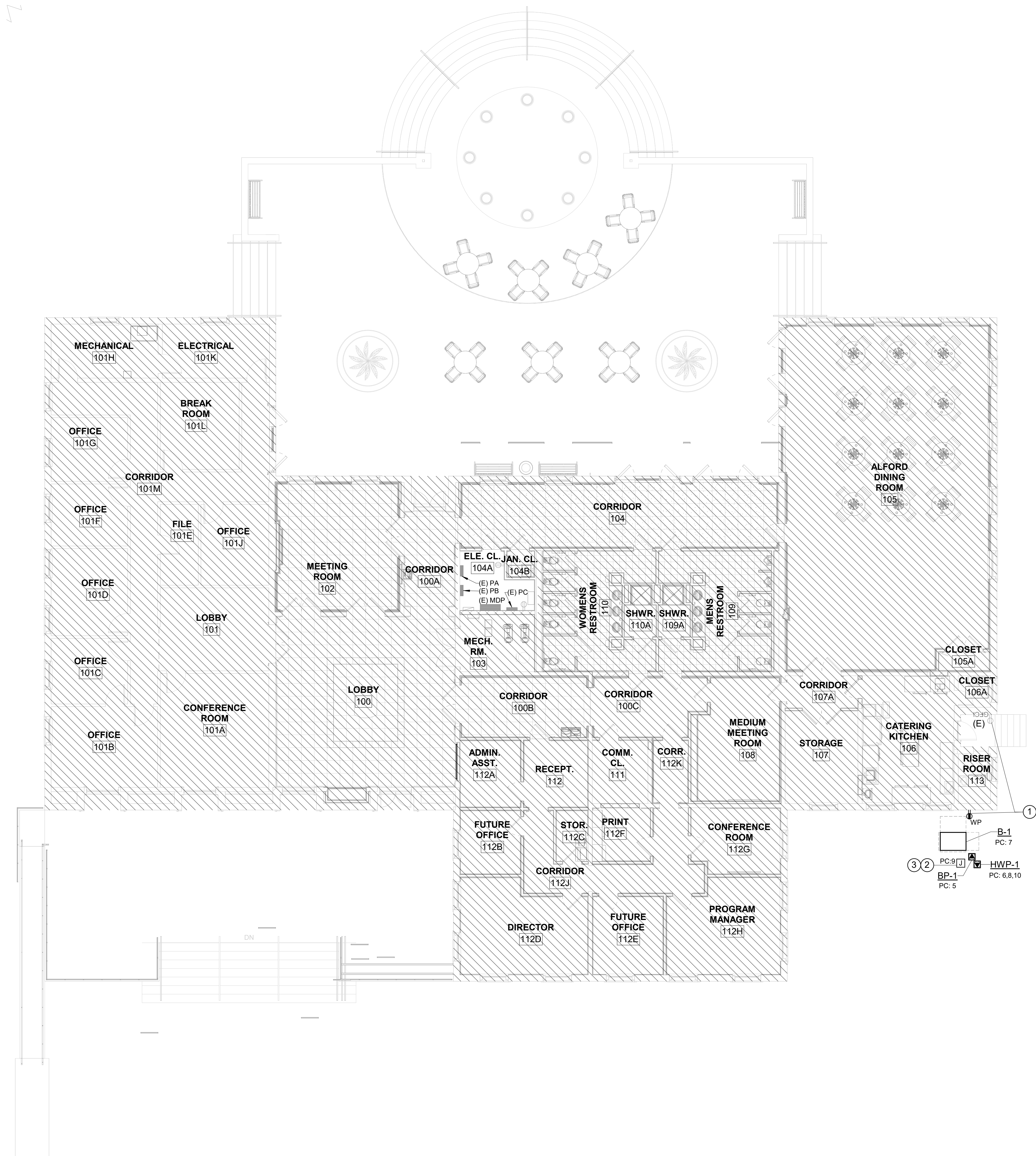
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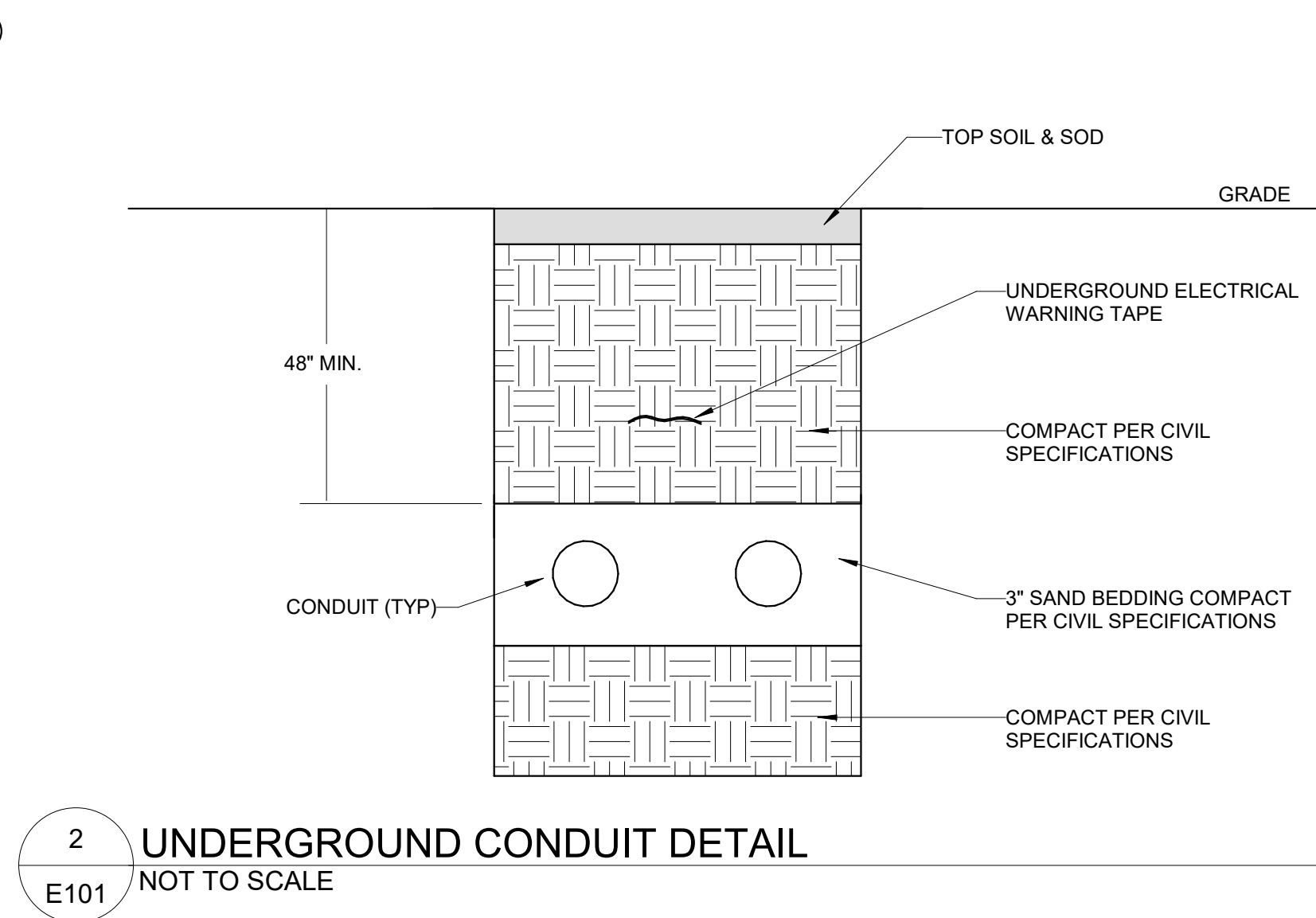
SHEET

E001

2



1 POWER PLAN
E101 SCALE: 1/8" = 1'-0"



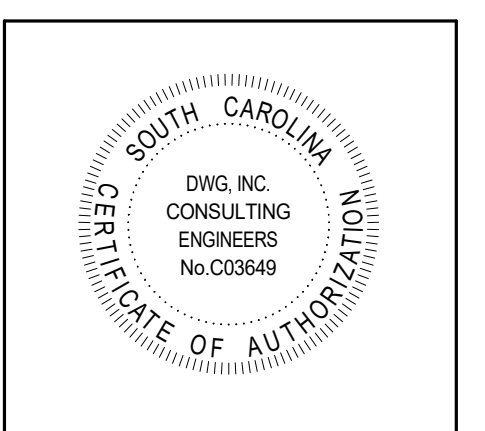
CONSIDERABLE EFFORT HAS BEEN MADE TO DETERMINE THE EXTENT OF UNDERGROUND UTILITIES. SOME LOCATIONS ARE ACTUAL FIELD MEASUREMENTS AND SOME ARE TAKEN FROM UTILITY RECORDS. THIS PLAN DOES NOT WARRANT THAT UTILITIES ARE SHOWN ACCURATELY NOR THAT ALL UTILITIES ARE SHOWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL UTILITIES PRIOR TO BEGINNING DIGGING OPERATIONS. CALL PALMETTO UTILITIES LOCATION SERVICE AT 811 A MINIMUM OF 3 WORKING DAYS BEFORE DIGGING. ANY UTILITIES DAMAGED OR DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE. ADDITIONALLY, THE CONTRACTOR SHALL CONFIRM THE CONNECTION POINTS OF NEW UTILITIES TO EXISTING UTILITIES PRIOR TO BEGINNING NEW CONSTRUCTION.

GENERAL NOTES

1. DIAGONAL HATCHED AREA IS NOT IN ELECTRICAL SCOPE OF WORK.

RENOVATION KEYNOTES

1. TIE NEW RECEPTACLE TO EXISTING EXTERIOR RECEPTACLE CIRCUIT.
2. PROVIDE FINAL CONNECTION TO PUMP ENCLOSURE HEATER. PROVIDE WEATHERPROOF TOGGLE SWITCH FOR LOCAL CONTROL. LOCATE SWITCH ON NEARBY EXTERIOR WALL.
3. PROVIDE 1" CONDUIT FROM ELECTRICAL ROOM TO THE PUMP ENCLOSURE.



COASTAL CAROLINA UNIVERSITY
 ATHENEUM HALL UNDERGROUND HW REPLACEMENT
 104 INDEPENDENCE DRIVE
 CONWAY, SOUTH CAROLINA 29528
POWER PLAN

STATE PROJECT NO.:	H17-0111-WW
REV:	
DWG JOB NO.:	19162-05
DATE:	01/27/23
DRAWN BY:	MHS
CHECK BY:	MHS/BJJ
SHEET	

E101

PLOT DATE: DATE

**MECHANICAL SYSTEMS
SEISMIC AND WIND REQUIREMENTS
PER IBC-2018/ASCE 7-16**

- A. PER THE 2018 INTERNATIONAL BUILDING CODE, MECHANICAL, PLUMBING AND ELECTRICAL EQUIPMENT AND COMPONENTS, INCLUDING THEIR SUPPORTS AND ATTACHMENTS, SHALL BE DESIGNED FOR SEISMIC FORCES IN ACCORDANCE WITH CHAPTER 13 OF ASCE 7-16.
- B. EXTERIOR EQUIPMENT (INCLUDING ROOF CURBS, RAILS, SUPPORTS) EXPOSED TO WIND SHALL BE DESIGNED AND INSTALLED TO RESIST THE WIND PRESSURES DETERMINED IN ACCORDANCE WITH CHAPTER 26 TO 29 OF ASCE 7-16.
- C. WHERE DESIGN FOR SEISMIC AND WIND LOADS IS REQUIRED, THE MORE DEMANDING FORCE MUST BE USED.
- D. REFERENCE THE STRUCTURAL DRAWINGS FOR SITE SPECIFIC INFORMATION ON SEISMIC DESIGN CATEGORY, WIND SPEEDS, ETC.
- E. USE THE TABLE BELOW TO DETERMINE SEISMIC RESTRAINT REQUIREMENTS FOR EACH COMPONENT.
- F. FOR ALL COMPONENTS REQUIRING SEISMIC RESTRAINT, THE COMPONENT SUPPORTS AND ATTACHMENTS SHALL BE DESIGNED BY A REGISTERED DESIGN PROFESSIONAL REGISTERED IN THE STATE THE JOB IS LOCATED. SUBMITTALS MUST INCLUDE STAMPED AND SIGNED DRAWINGS AND CALCULATIONS.
- G. WHERE SEISMIC RESTRAINT IS REQUIRED, HOUSEKEEPING PADS NEEDED FOR THE INSTALLATION OF EQUIPMENT UNDER THIS CONTRACT MUST BE DESIGNED BY THE SEISMIC ENGINEER. DO NOT POUR ANY HOUSEKEEPING PADS PRIOR TO THE RECEIPT OF THE APPROVED SEISMIC SUBMITTAL.
- H. SEISMIC RESTRAINTS FOR DUCTWORK, PIPING, CONDUIT, CABLE TRAYS AND BUS DUCT MUST BE SHOWN ON LAYOUT DRAWINGS SHOWING SPECIFIC RESTRAINT LOCATIONS ALONG WITH ACCOMPANYING DETAILS AND CALCULATIONS.

MECHANICAL COMPONENT IMPORTANCE FACTOR (Ip) DESIGNATION	
Ip = 1.0	Ip = 1.5
• ALL HVAC COMPONENTS EXCEPT AS NOTED IN Ip=1.5	• NATURAL GAS PIPING & APPURTENANCES

SEISMIC DESIGN CATEGORIES D,E,F				
COMPONENT IMPORTANCE FACTOR (Ip)				
		1.0	1.5	
COMPONENT IDENTIFICATION	SEISMIC RESTRAINT REQUIREMENT	NOTES	SEISMIC RESTRAINT REQUIREMENT	NOTES
ROOF MOUNTED	RESTRAIN ALL	1	RESTRAIN ALL	-
FLOOR MOUNTED	RESTRAIN ALL	1, 2	RESTRAIN ALL	-
WALL MOUNTED	RESTRAIN ALL	1, 2	RESTRAIN ALL	-
COMPONENT SUPPORTS	RESTRAIN ALL	1	RESTRAIN ALL	-
SUSPENDED EQUIPMENT	INLINE W/ DUCT	RESTRAIN IF >75 LBS PROVIDE FLEX. CONN.	RESTRAIN IF >75 LBS PROVIDE FLEX. CONN.	3
	NOT INLINE W/ DUCT/PIPE	RESTRAIN ALL	RESTRAIN ALL	-
SUSPENDED DUCTILE PIPING (STEEL, ALUMINUM, COPPER, ETC.)	>3"	4	>1"	4
SUSPENDED NON DUCTILE PIPING (CAST IRON, PLASTIC, CERAMIC)	RESTRAIN ALL	4	RESTRAIN ALL	4
SUSPENDED PIPE ON TRAPEZE	RESTRAIN IF ANY PIPE ON TRAPEZE > 3' RESTRAIN IF TOTAL WEIGHT OF PIPES ON TRAPEZE >	4	RESTRAIN IF ANY PIPE ON TRAPEZE > 1' RESTRAIN IF TOTAL WEIGHT OF PIPES ON TRAPEZE > 10	4
DUCTWORK	6 SQ.FT. AND LARGER AND >17 LBS/FT	4,5	6 SQ.FT. AND LARGER AND > 17 LBS/FT	4,5
MULTIPLE DUCTS ON TRAPEZE	RESTRAIN IF TOTAL WEIGHT OF DUCTS ON TRAPEZE > 10 LBS/FT	4,5	RESTRAIN IF TOTAL WEIGHT OF DUCTS ON TRAPEZE > 10 LBS/FT	4,3
COMPONENT CERTIFICATION	NOT REQUIRED	-	REQUIRED	6

- NOTES:
- EQUIPMENT 20 LBS. OR LESS IS EXEMPT IF THE COMPONENT IS POSITIVELY ATTACHED TO THE STRUCTURE AND FLEXIBLE CONNECTIONS ARE PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT.
 - RESTRAINTS ARE NOT REQUIRED IF THE COMPONENT WEIGHS 400 LBS. OR LESS, IS MOUNTED WITH THE CENTER OF MASS LOCATED AT 4 FT. OR LESS ABOVE A FLOOR, IS POSITIVELY ATTACHED TO THE STRUCTURE AND HAS FLEXIBLE CONNECTIONS BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT.
 - FLEXIBLE CONNECTIONS REQUIRED FOR PIPE CONNECTIONS ONLY.
 - RESTRAINT IS NOT REQUIRED IF THE PIPING / DUCTWORK IS SUPPORTED BY HANGERS AND EACH HANGER IN THE PIPING RUN IS 12 IN. OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE SUPPORTING STRUCTURE. WHERE PIPES ARE SUPPORTED ON A TRAPEZE, THE TRAPEZE SHALL BE SUPPORTED BY HANGERS HAVING A LENGTH OF 12 IN. OR LESS. WHERE ROD HANGERS ARE USED, THEY SHALL BE EQUIPPED WITH SWIVELS, EYE NUTS OR OTHER DEVICES TO PREVENT BENDING IN THE ROD.
 - ALL DUCTWORK, REGARDLESS OF SIZE, DESIGNED TO CARRY TOXIC, HIGHLY TOXIC, OR EXPLOSIVE GASES OR USED FOR SMOKE CONTROL MUST BE RESTRAINED.
 - COMPONENT CERTIFICATION MUST BE SUPPLIED BY THE EQUIPMENT MANUFACTURER AT TIME OF SUBMITTAL FOR REVIEW BY ENGINEER OF RECORD.

ABBR	DESCRIPTION
(E)	EXISTING
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
BHP	BRAKE HORSE POWER
BMS	BUILDING MANAGMENT SYSTEM
BOD	BASIS OF DESIGN
BOP	BOTTOM OF PIPE
C	DOMESTIC COLD WATER SUPPLY
CFM	CUBIC FEET PER MINUTE
CHF	CHEMICAL FEED
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CO	CLEANOUT
CP	CENTRAL PLANT
DB	DECIBELS
DCW	DOMESTIC COLD WATER
DDC	DIRECT DIGITAL CONTROLS
DIA	DIAMETER
DRN	DRAIN
EMCS	ENERGY MANAGEMENT CONTROL SYSTEM
EQ	EQUALIZER
FD	FLOOR DRAIN
FT	FEET
GPM	GALLONS PER MINUTE
HD	HUB DRAIN
HP	HEAT PUMP
HP	HORSEPOWER
HWR	HEATING HOT WATER RETURN
HWS	HEATING HOT WATER SUPPLY
IN	INCHES
MBH	THOUSANDS OF BTU'S PER HOUR
MC	MECHANICAL CONTRACTOR
NG	NATURAL GAS PIPING
NO	NORMALLY OPEN
PD	PRESSURE DROP
PS	PIPE SUPPORT
PSD	PUMP SUCTION DIFFUSER
RM	REMOTE MONITOR
RPM	ROTATIONS PER MINUTE
RPZ	REDUCED PRESSURE ZONE
TDV	TRIPLE DUTY VALVE
TYP	TYPICAL
UG	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
VFD	VARIABLE FREQUENCY DRIVE
W/	WITH
WMS	WIRE MESH SCREEN
*F	DEGREES FAHRENHEIT

HVAC SYMBOL LEGEND			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	EQUIPMENT CLEARANCE		CONNECTION TO EXISTING SYSTEM
	AUTOMATIC AIR VENT		AUTOMATIC BALANCING CONTROL VALVE
	BACKFLOW PREVENTER		BALL VALVE
	BASKET STRAINER		CIRCUIT SENSOR
	CIRCUIT SETTER		CONCENTRIC REDUCER/INCREASER
	DIRECTION OF PIPING FLOW		END SUCTION PUMP
	DRAIN VALVE W/ HOSE CONNECTION		GATE VALVE
	FLANGE CONNECTION		MOTORIZED BALL VALVE
	HOSE BIBB		PIPE CAP
	MOTORIZED BUTTERFLY VALVE		PLUG VALVE
	PIPING SLOPE		PUMP CONNECTOR/FLEX CONNECTOR
	PRESSURE REDUCING VALVE		RELIEF VALVE
	PUMP SUCTION DIFFUSER		
	UNION		
	WYE STRAINER		TRIPLE DUTY VALVE
	2-WAY CONTROL VALVE		WAFER CHECK VALVE
			WYE STRAINER W/BLOWDOWN BALL VALVE WITH HOSE CONNECTION
			3-WAY CONTROL VALVE

MECHANICAL CODES AND STANDARDS (WITH ALL SOUTH CAROLINA MODIFICATIONS)	
CODE	DESCRIPTION
IBC (2018)	INTERNATIONAL BUILDING CODE
IECC (2009)	INTERNATIONAL ENERGY CONSERVATION CODE
IMC (2018)	INTERNATIONAL MECHANICAL CODE
IFGC (2018)	INTERNATIONAL FUEL GAS CODE

GENERAL HVAC NOTES

- THE DRAWINGS SHOW THE GENERAL ARRANGEMENT AND LOCATION OF EQUIPMENT, DUCTWORK, PIPING, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE MECHANICAL INSTALLATION W/ THE STRUCTURE AND OTHER TRADES AND SHALL PROVIDE ADDITIONAL OFFSETS AND FITTINGS AS NECESSARY.
- THE HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS SHALL COMPLY WITH THE THE CODES LISTED ON THIS SHEET AS WELL AS ALL LOCAL CODE OFFICIAL REQUIREMENTS. IN THE EVENT OF A CONFLICT BETWEEN CODES, THE MOST STRINGENT SHALL ALWAYS GOVERN.
- THE CONTRACTOR SHALL CHECK AND VERIFY ALL CLEARANCES PRIOR TO FABRICATION OR INSTALLATION OF EQUIPMENT AND PIPING SYSTEMS. WHERE CONDITIONS REQUIRE A CHANGE IN EQUIPMENT LOCATION OR PIPE ROUTING, NOTIFY THE ENGINEER FOR AN ACCEPTABLE ALTERNATIVE METHOD. AVOID ROUTING PIPING DIRECTLY OVER LIGHT FIXTURES, DIFFUSERS, AND OTHER CEILING MTD. DEVICES. LOCATE ALL MECHANICAL EQUIPMENT AND ASSOCIATED APPURTENANCES SO THAT COMPONENTS REQUIRING ACCESS (SERVICE AND MAINTENANCE) ARE FULLY ACCESSIBLE.
- ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS WITH PRESCRIBED CLEARANCES FOR SERVICE AND MAINTENANCE. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF RECOMMENDED CLEARANCES ARE NOT POSSIBLE BEFORE INSTALLING EQUIPMENT.
- ALL ROTATING MECHANICAL EQUIPMENT SHALL BE PROVIDED WITH VIBRATION ISOLATION. SEISMIC PROTECTION OF EQUIPMENT, PIPING AND UTILITIES SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 16 OF THE INTERNATIONAL BUILDING CODE, 2018 EDITION. ALL SEISMIC RESTRAINT AND BRACING SHALL BE SUBSTANTIATED BY MANUFACTURER'S SUBMITTALS PER THE SPECIFICATIONS. FOR ADDITIONAL INFORMATION, SEE 'MECHANICAL SYSTEMS SEISMIC AND WIND REQUIREMENTS' ON THIS SHEET. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING INSTALLATION OF SEISMIC BRACING DEVICES WITH THE AGENCY'S SEISMIC SPECIAL INSPECTOR. PROVIDE A MINIMUM OF SEVEN DAYS ADVANCE NOTICE OF INSTALLATION.
- ALL CONTROL WIRING, CONDUIT AND CONTROLS ACCESSORIES NECESSARY TO IMPLEMENT THE OUTLINED SEQUENCES OF OPERATION SHALL BE PROVIDED BY THE CONTROLS CONTRACTOR.
- WIND LOAD PROTECTION OF EQUIPMENT SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 16 OF THE INTERNATIONAL BUILDING CODE, 2018 EDITION. ALL WIND LOAD RESTRAINT AND BRACING SHALL BE SUBSTANTIATED BY MANUFACTURER'S SUBMITTALS PER THE SPECIFICATIONS.
- WHERE "APPROXIMATELY" IS USED TO DEFINE INSTALLATION LOCATIONS, CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADES TO VERIFY THERE ARE NO CONFLICTS PRIOR TO INSTALLATION AT DIMENSION LISTED.

BOILER SCHEDULE (EXISTING, OWNER FURNISHED/CONTRACTOR INSTALLED)

MARK	CAPACITY (MBH)	FLOW RATE	FLUID TEMPERATURE		MANUFACTURER	MODEL
			ENTERING	LEAVING		
B-1	990	90 GPM	160 °F	180 °F	LOCHINVAR	CHN0992

PUMP SCHEDULE

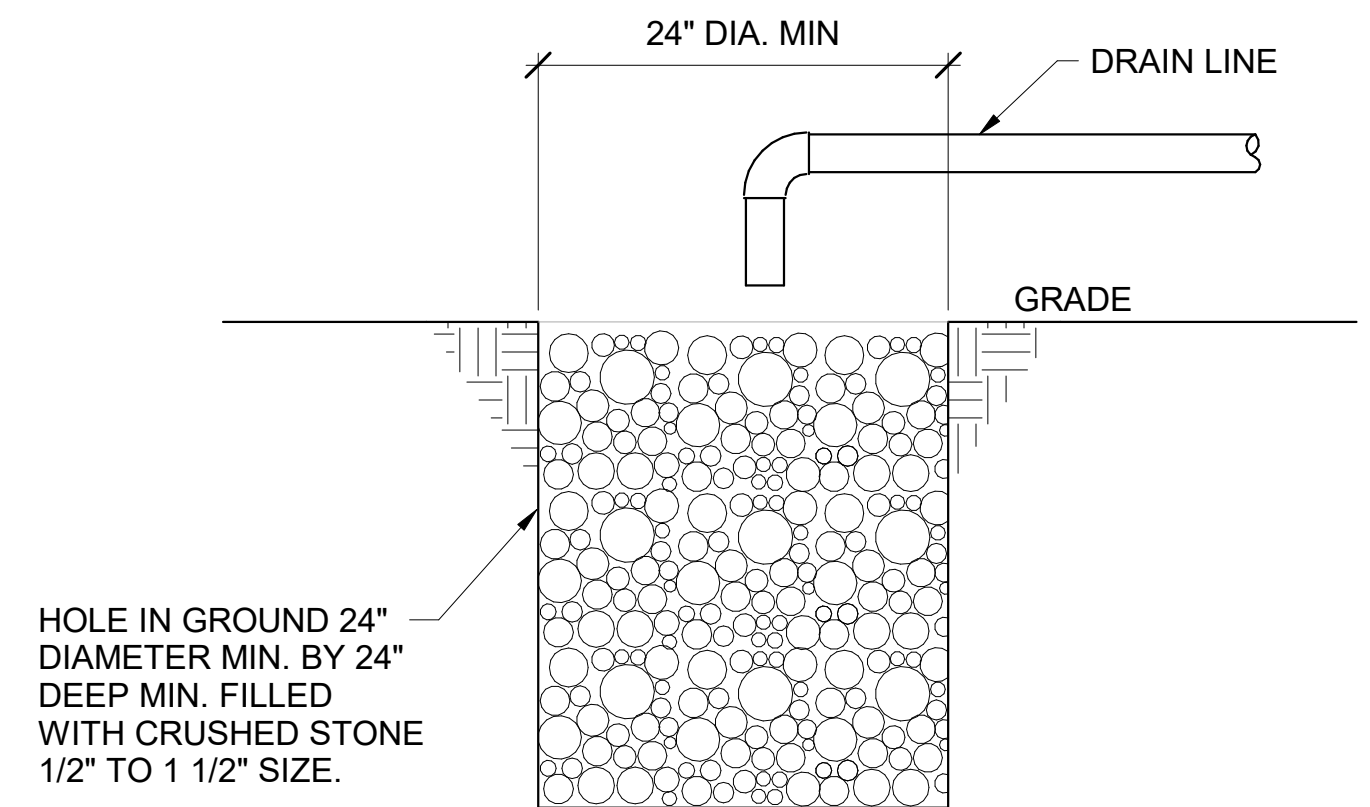
MARK	FLOW RATE	PUMP HEAD	MAX HP	TYPE	VFD	MANUFACTURER	MODEL
HWP-1	46 GPM	30 FT	1	VERTICAL IN-LINE	Yes	XYLEM/BELL & GOSSETT	e-90 1.5AB



COASTAL CAROLINA UNIVERSITY
 ATHENEUM HALL UNDERGROUND HW REPLACEMENT
 104 INDEPENDENCE DRIVE
 CONWAY, SOUTH CAROLINA 29528
MECHANICAL NOTES & LEGENDS

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 DATE: 01/27/23
 DRAWN BY: KMM
 CHECK BY: WDB
 SHEET

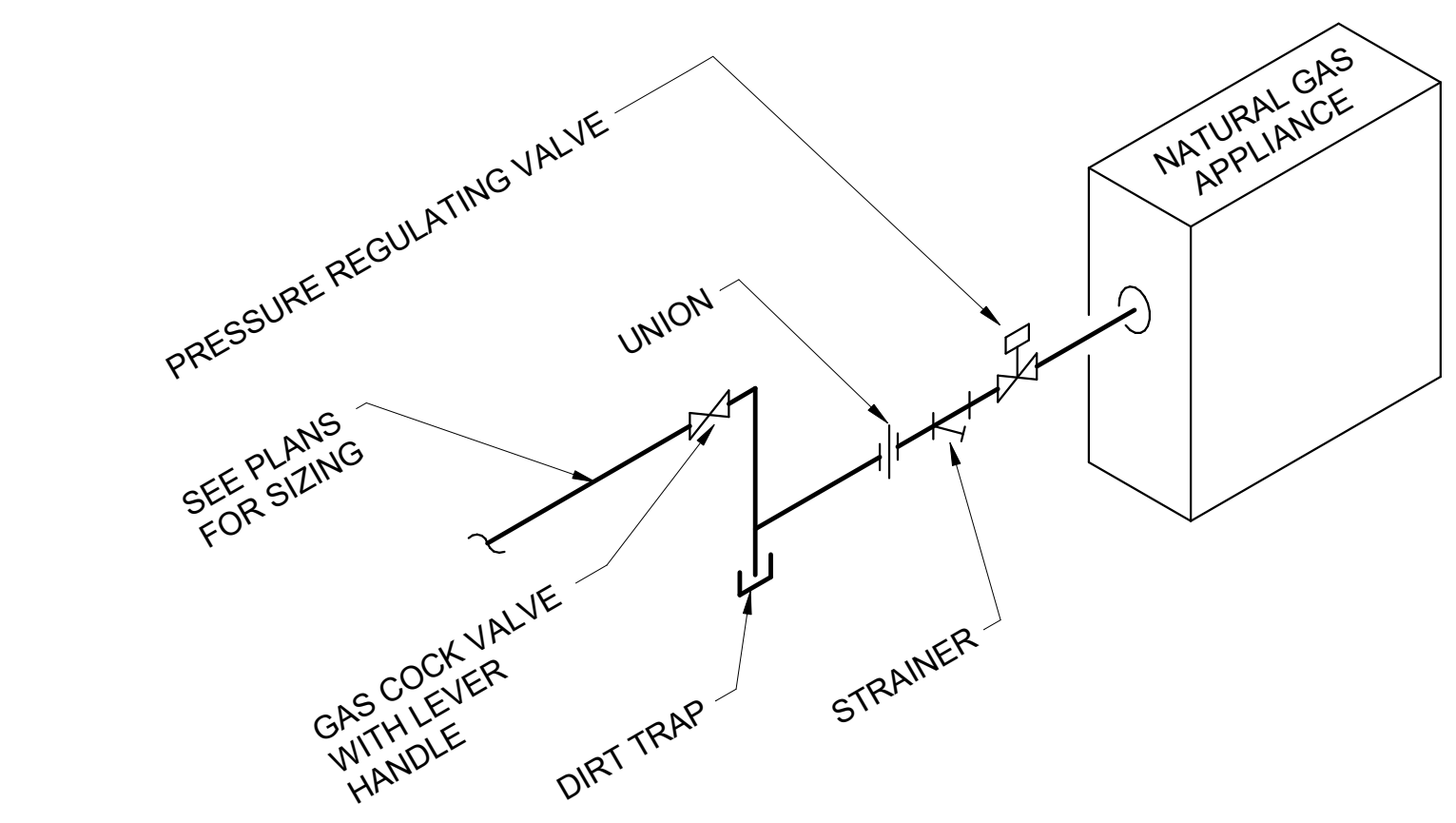
M001



HOLE IN GROUND 24" DIAMETER MIN. BY 24" DEEP MIN. FILLED WITH CRUSHED STONE 1/2" TO 1 1/2" SIZE.

- NOTES:
1. DRAIN LINE SHALL TERMINATE 6" ABOVE FINISHED GRADE OVER TOP OF THE DRAIN PIT.

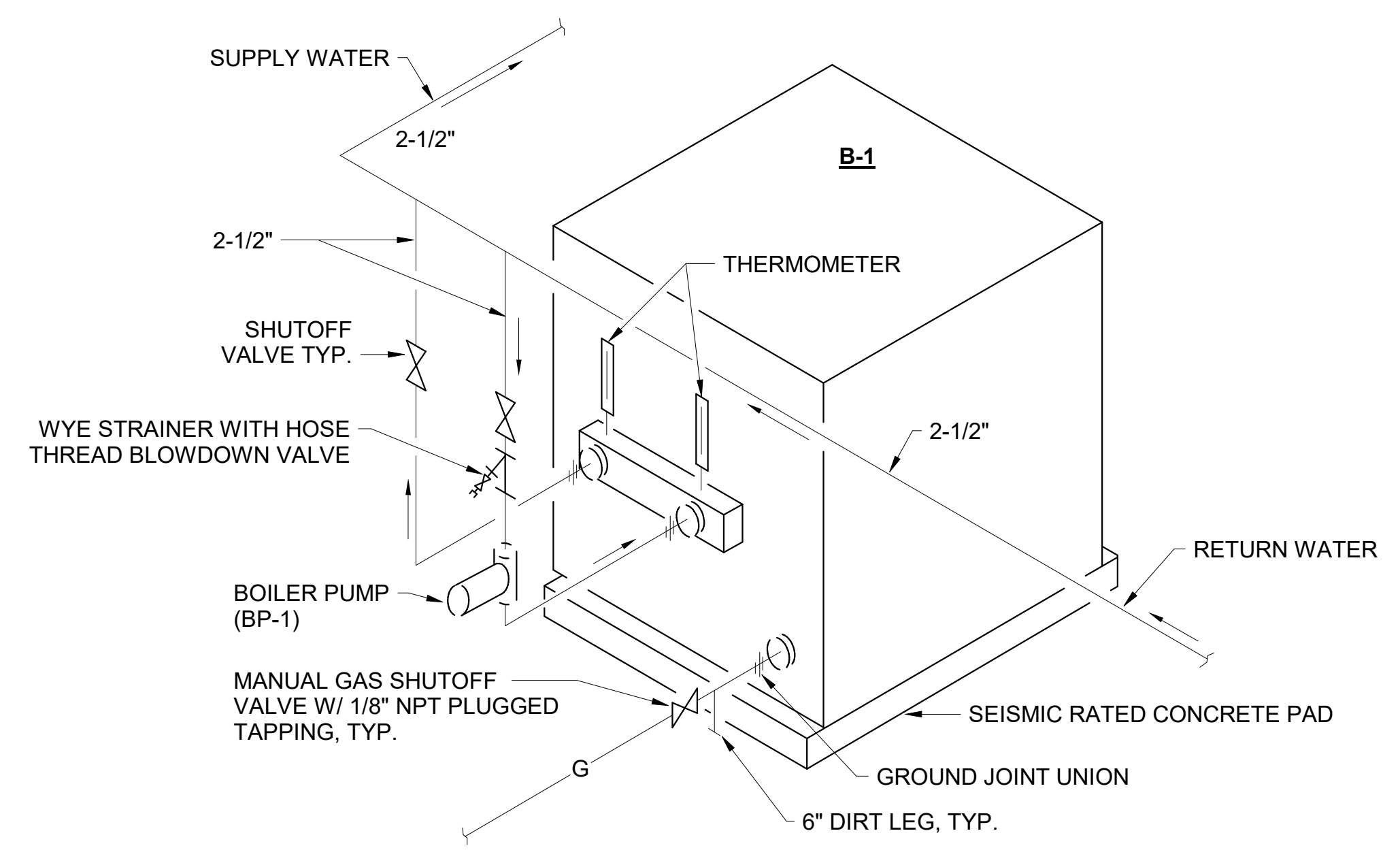
1 DRAIN PIT DETAIL
M002 NOT TO SCALE



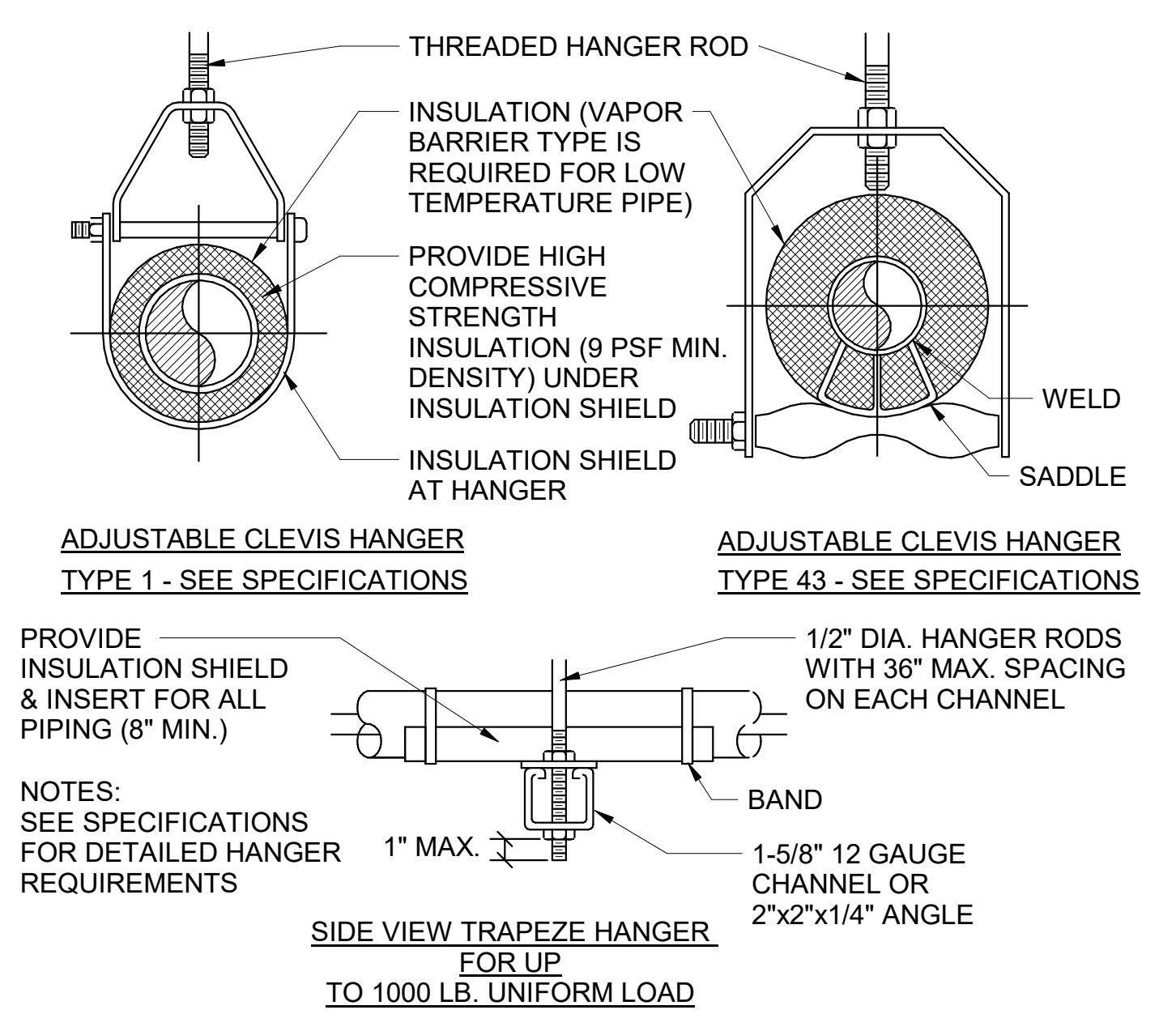
2 GAS FIRED APPLIANCE CONNECTION DETAIL
M002 NOT TO SCALE

MAXIMUM PIPE/TUBING SUPPORT SPACING												
NOM. SIZE	IN.	THRU 3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8
PIPE	FT.	7	7	7	9	10	11	12	14	16	17	19
TUBING	FT.	5 FT	6	7	8	8	9	10	12	13	14	16

NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE



3 BOILER PIPING DETAIL
M002 NOT TO SCALE



4 MECHANICAL PIPE SUPPORT DETAIL
M002 NOT TO SCALE



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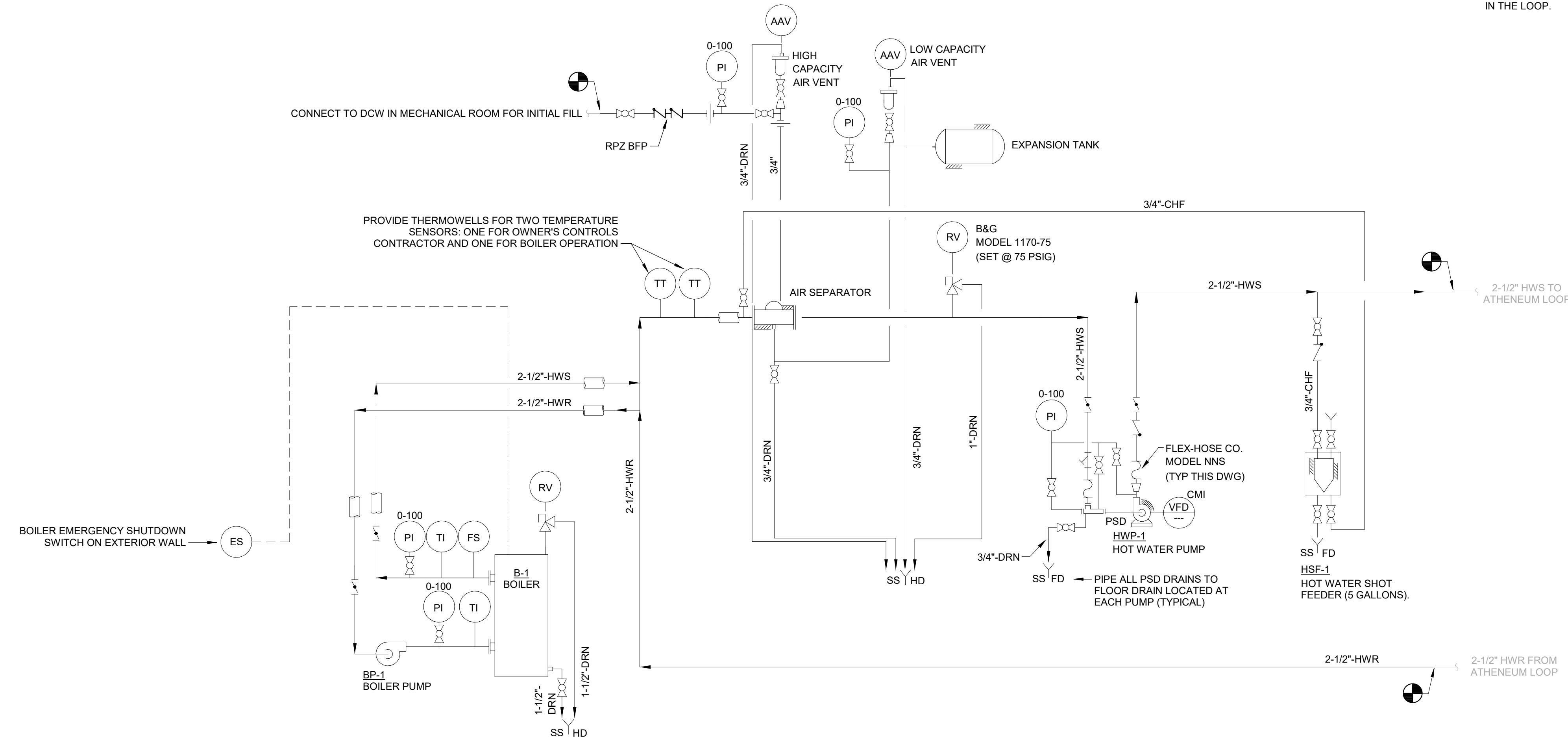
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SHEET	

M002

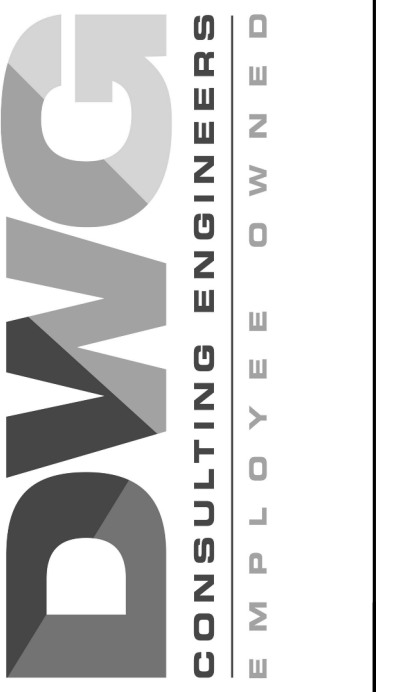
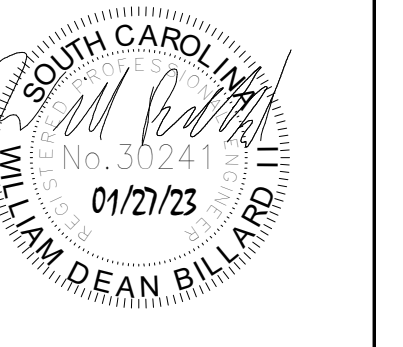
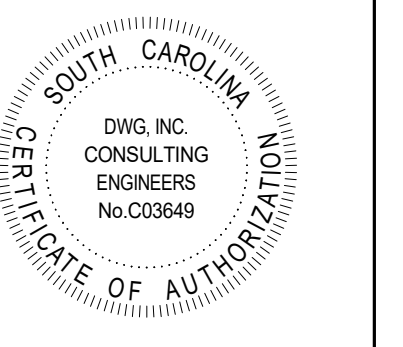
SYMBOL LEGEND			
(ES)	EMERGENCY BOILER SHUTOFF SWITCH	(TT)	THERMOWELL
(PI)	PRESSURE GAUGE	(AAV)	AIR ADMITTANCE VALVE
(TI)	TEMPERATURE GAUGE	(RV)	RELIEF VALVE
(FS)	FLOW SENSOR	(VFD)	VARIABLE FREQUENCY DRIVE

GENERAL NOTES:

1. THE WORK FOR THE HVAC CONTROLS SYSTEM WILL BE PERFORMED BY CONTROL MANAGEMENT, INC. UNDER DIRECT CONTRACT WITH COASTAL CAROLINA UNIVERSITY.
2. SEE SPECIFICATION SECTION 23 09 23 FOR DELINEATION OF WORK.
3. PROVIDE INSULATION AND JACKETING ON ALL EQUIPMENT.
4. CONTRACTOR SHALL PROVIDE ALL WELD-OLETS FOR CONTROL DEVICES.
5. PROVIDE SUFFICIENT QUANTITY OF CHEMICAL TREATMENT FOR VOLUME OF HOT WATER SYSTEM OF THIS BUILDING AND TURN OVER TO OWNER.
6. HOT WATER SYSTEM SHALL BE VARIABLE SPEED PRIMARY WITH VARIABLE SPEED SECONDARY. BOILER AND PRIMARY LOOP ECM BOILER PUMP SHALL BE CONTROLLED VIA THE BOILER'S INTERNAL MANUFACTURER PROVIDED CONTROL SEQUENCE. SECONDARY HOT WATER LOOP PUMP VARIABLE FREQUENCY DRIVE SHALL BE CONTROLLED BY CMI VIA PRESSURE SENSORS IN THE LOOP.



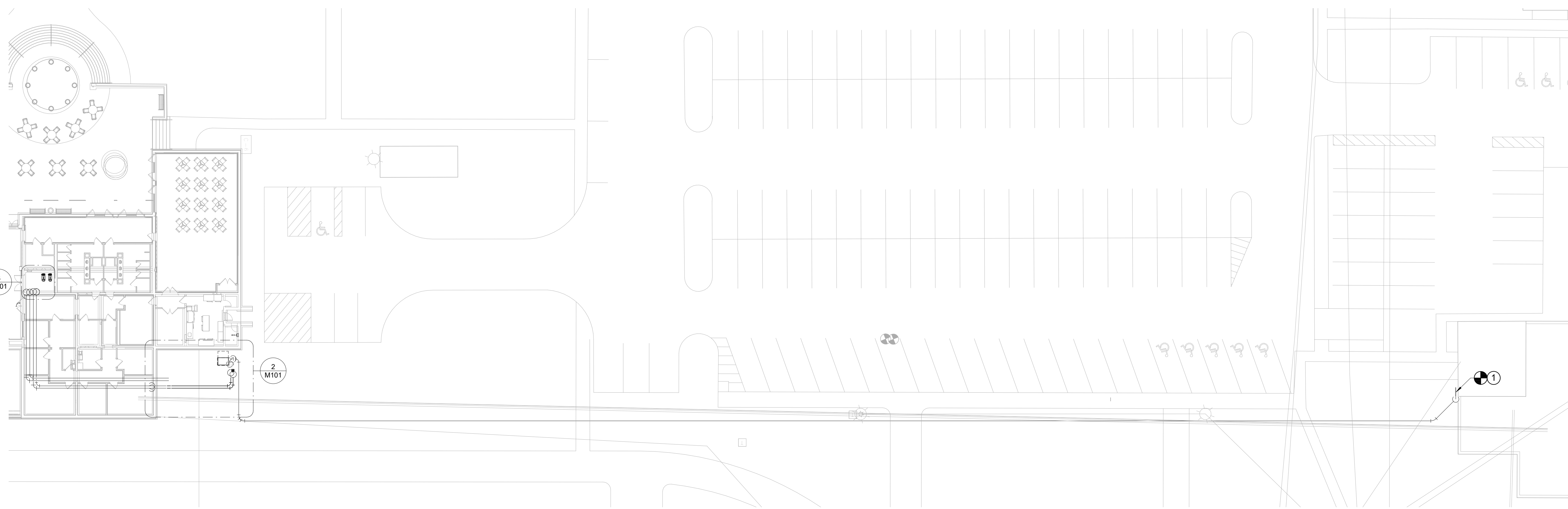
1 HEATING HOT WATER SYSTEM FLOW DIAGRAM
M003 NOT TO SCALE



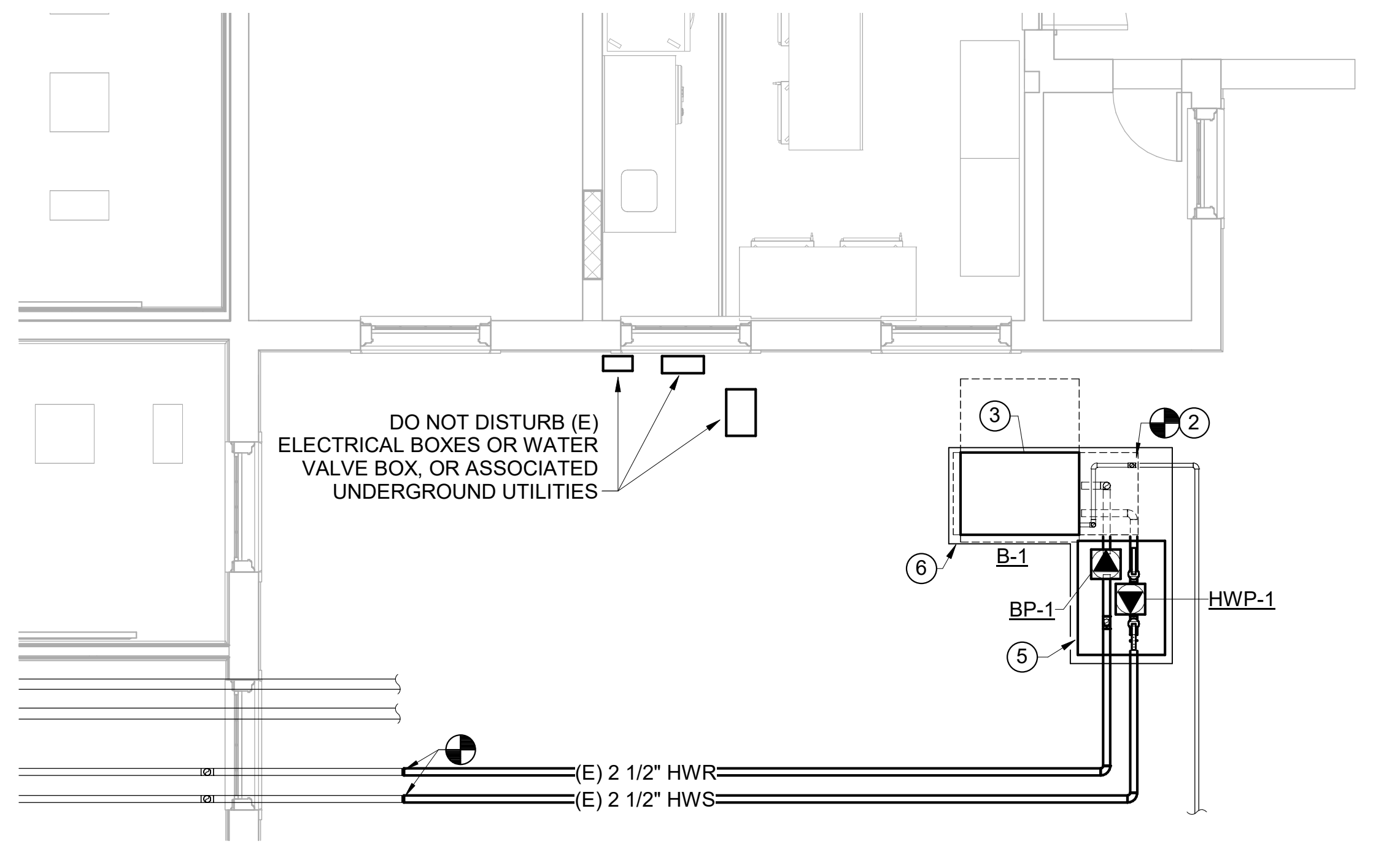
COASTAL CAROLINA UNIVERSITY
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 MECHANICAL FLOW DIAGRAMS

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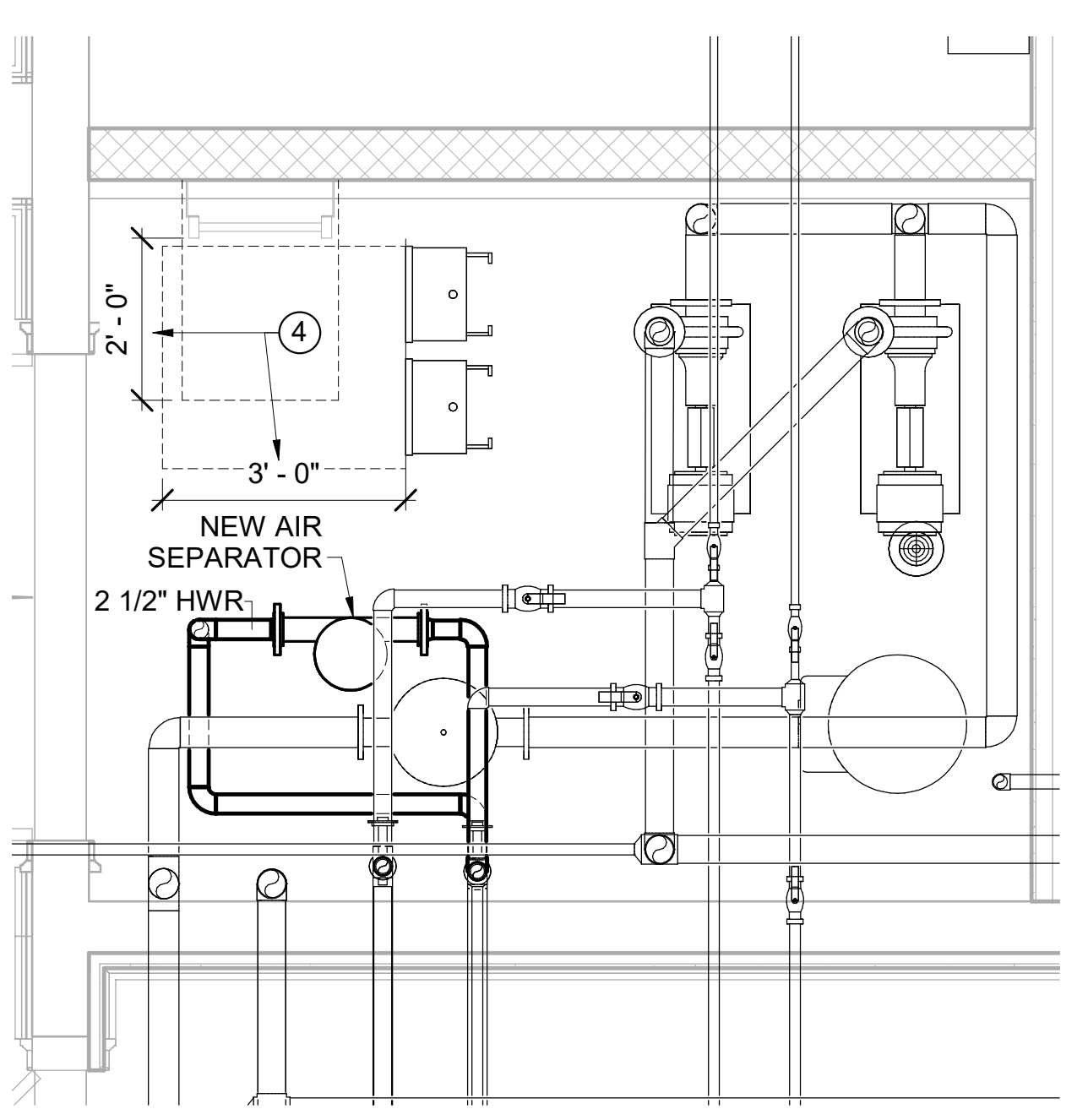
M003



1 MECHANICAL SITE PLAN
M101 SCALE: 1" = 20'-0"



2 ENLARGED EXTERIOR MECHANICAL PIPING PLAN
M101 SCALE: 1/4" = 1'-0"

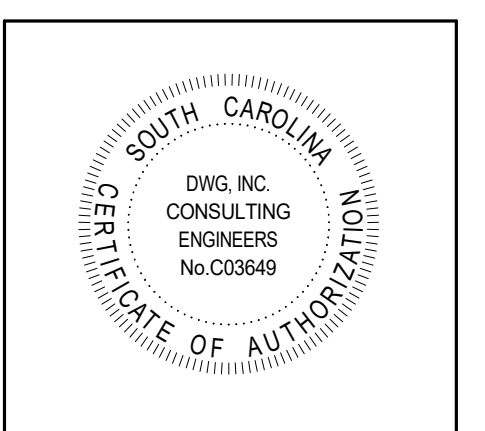


3 ENLARGED MECHANICAL ROOM PIPING PLAN
M101 SCALE: 1/2" = 1'-0"

GENERAL NOTES

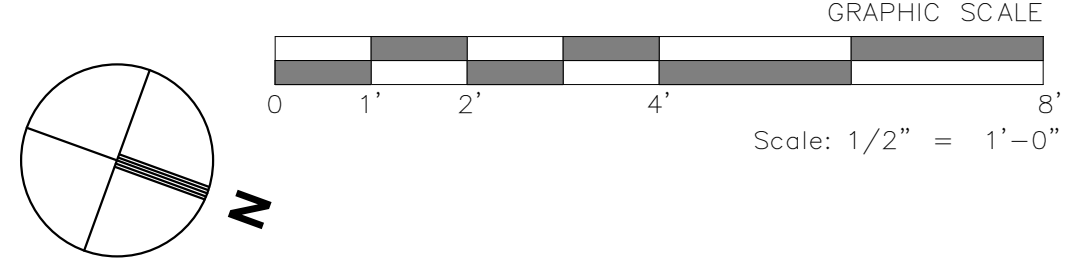
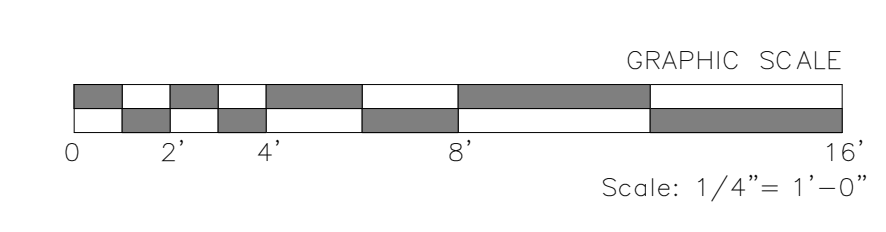
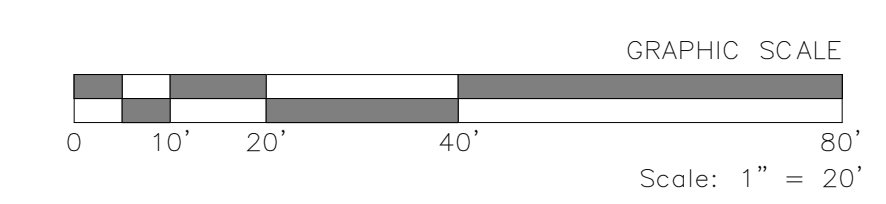
RENOVATION KEYNOTES

- 1 CONNECT (E) GAS STUB-UP FROM U/G AT THIS LOCATION TO GAS SUPPLY UPSTREAM OF REGULATOR. COORDINATE SCHEDULE OF UTILITY DOWNTIME AND SHUTDOWN AND START-UP OF EQUIPMENT WITH CCU PROJECT MANAGER.
- 2 CONNECT (E) GAS STUB-UP FROM U/G AT THIS LOCATION TO RELOCATED BOILER. PROVIDE NEW SHUTOFF VALVE, STRAINER, AND PRESSURE REGULATOR FOR THE BOILER.
- 3 THE BOILER IS OWNER FURNISHED. HOWEVER THIS CONTRACTOR SHALL BE RESPONSIBLE FOR RELOCATION AND INSTALLATION. THE BOILER IS AN EXISTING BOILER LOCATED AT KEARNS HALL ON CCU CAMPUS. THIS CONTRACTOR SHALL RELOCATE BOILER AND REINSTALL AT THE NEW LOCATION INDICATED. PROVIDE NEW CONCRETE PAD, TO PLACE THE BOILER.
- 4 MAINTAIN 2'-0" CLEARANCE IN FRONT OF ATTIC ACCESS LADDER. MAINTAIN 3'-0" CLEARANCE IN FRONT OF ELECTRICAL PANELS, DISCONNECTS, AND VFD'S.
- 5 PROVIDE INSULATED, HEATED, FIBERGLASS FLIP-TOP ENCLOSURE TO PROTECT PUMPS FROM THE ELEMENTS. BASIS OF DESIGN: HUBBELL HOT BOX HLO52061052 OR EQUAL. SIZE MAY BE REDUCED PROVIDED CLEARANCES ARE MAINTAINED AND ALL CONTROLS, VALVES, ETC. ARE EASILY ACCESSIBLE.
- 6 PROVIDE SEISMIC RATED CONCRETE SLAB IN "L" SHAPE TO SUPPORT BOILER AND PUMP ENCLOSURE.



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SHEET
M101