MARBIONC
Heat Recovery System Repair

FOR

UNCW

5598 Marvin K Moss Lane
Wilmington, NC 28409
STATE ID#: 23-27454-01A

CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NC# P-0506

NORTH CAROLINA PROFESSIONAL SEAL 043801 ENGINEER ROY O. GRADY
03/25/2024

NORTH CAROLINA PROFESSIONAL SEAL 35230 ENGINEER JASON P. FAMIGLIETTI
03/22/2024

CONTRACT ID: 23-27454-01A

DRAWING INDEX

GENERAL
COVER SHEET
G-001 APPENDIX B BUILDING CODE SUMMARY

MECHANICAL
M-001 MECHANICAL LEGENDS, ABBREVIATIONS AND NOTES
MD101 MECHANICAL DEMOLITION PARTIAL FIRST FLOOR PLAN - MECHANICAL ROOM 1012
MD201 MECHANICAL DEMOLITION PARTIAL SECOND FLOOR PLAN - MECHANICAL ROOM 2016
MD301 MECHANICAL DEMOLITION PARTIAL ROOF PLAN
MD302 MECHANICAL DEMOLITION PARTIAL ROOF PLAN
MD303 MECHANICAL DEMOLITION PARTIAL ROOF PLAN
MP101 MECHANICAL PIPING PARTIAL FIRST FLOOR PLAN - MECHANICAL ROOM 1012
MP201 MECHANICAL PIPING PARTIAL SECOND FLOOR PLAN - MECHANICAL ROOM 2016
MP202 MECHANICAL PIPING PARTIAL SECOND FLOOR PLAN - MECHANICAL ROOM 2004
MP301 MECHANICAL PIPING PARTIAL ROOF PLAN
MP302 MECHANICAL PIPING PARTIAL ROOF PLAN
MP303 MECHANICAL PIPING PARTIAL ROOF PLAN
M-501 MECHANICAL DETAILS
M-601 MECHANICAL SCHEDULES AND CONTROLS
M-701 MECHANICAL RISER DIAGRAM

ELECTRICAL
E-001 ELECTRICAL LEGEND & ABBREVIATIONS
E-002 ELECTRICAL GENERAL NOTES & DETAILS
E-601 ELECTRICAL PANEL SCHEDULES & DETAILS
ED201 ELECTRICAL DEMOLITION PARTIAL SECOND FLOOR PLAN
ED301 ELECTRICAL DEMOLITION PARTIAL ROOF PLAN
EP201 ELECTRICAL POWER PARTIAL SECOND FLOOR PLAN

Project No: 23260

2018 APPENDIX B
BUILDING CODE SUMMARY
FOR ALL COMMERCIAL PROJECTS
(EXCEPT 1 AND 2-FAMILY DWELLINGS AND TOWNHOUSES)
(Reproduce the following data on the building plans sheet 1 or 2)

Name of Project: MARBIONC HEAT RECOVERY SYSTEM REPAIR
Address: 5598 MARVIN K MOSS LANE, WILMINGTON, NC Zip Code 28409
Owner/Authorized Agent: STEVE SHARPE Phone # (910) 962 - 7454 E-Mail SHARPES@UNCW.EDU
Owned By: UNCW ☐ City/County ☐ Private ☒ State
Code Enforcement Jurisdiction: ☐ City_____ ☐ County_____ ☒ State

CONTACT: TROY GRADY, P.E.

DESIGNER	FIRM	NAME	LICENSE #	TELEPHONE #	E-MAIL
Architectural				(___)_____	
Civil				(___)_____	
Electrical	CBHF ENGINEERS	JASON FAMIGLETTI, P.E.	035230	(910)791-4000	JFAM@CBHFENGINEERS.COM
Fire Alarm				(___)_____	
Plumbing				(___)_____	
Mechanical	CBHF ENGINEERS	TROY GRADY, P.E.	034801	(910)791-4000	TGRADY@CBHFENGINEERS.COM
Sprinkler-Standpipe				(___)_____	
Structural				(___)_____	
Retaining Walls >5' High				(___)_____	
Other				(___)_____	

("Others" should include firms and individuals such as truss, precast, pre-engineered, interior designers, etc.)

2018 NC CODE FOR: ☐ New Construction ☐ Addition ☐ Renovation
☐ 1st Time Interior Completion
☐ Shell/Core
☐ Phased Construction – Shell/Core
☐ Renovation

2018 NC EXISTING BUILDING CODE: ☐ Prescriptive ☒ Repair ☐ Chapter 14
Alteration: ☐ Level I ☐ Level II ☐ Level III
☐ Historic Property ☐ Change of Use
CONSTRUCTED:(date) 2013 **ORIGINAL OCCUPANCY(S)** (Ch. 3): BUSINESS
RENOVATED: (date)_____ **CURRENT OCCUPANCY(S)** (Ch. 3):_____
RISK CATEGORY (table 1604.5) **Current:** ☐ I ☐ II ☐ III ☐ IV
Proposed: ☐ I ☐ II ☐ III ☐ IV

BASIC BUILDING DATA
Construction Type: ☐ I-A ☐ II-A ☐ III-A ☐ IV ☐ V-A
(check all that apply) ☐ I-B ☒ II-B ☐ III-B ☐ V-B
Sprinklers: ☐ No ☐ Partial ☒ Yes ☒ NFPA 13 ☐ NFPA 13R ☐ NFPA 13D
Standpipes: ☒ No ☐ Yes Class ☐ I ☐ II ☐ III ☒ Wet ☐ Dry
Fire District: ☒ No ☐ Yes (Primary) **Flood Hazard Area:** ☒ No ☐ Yes
Special Inspections Required: ☐ No ☐ Yes

Gross Building Area:

FLOOR	EXISTING (SQ FT)	NEW (SQ FT)	RENO/ALTER (SQ.FT)	SUB-TOTAL
6th Floor				
5th Floor				
4th Floor				
3rd Floor				
2nd Floor	33,397 SF			33,397 SF
Mezzanine				
1st Floor	33,397 SF			33,397 SF
Basement				
TOTAL	66,601 SF			66,601 SF

ALLOWABLE AREA

Primary Occupancy Classification: SELECT ONE
Assembly ☐ A-1 ☐ A-2 ☐ A-3 ☐ A-4 ☐ A-5
Business ☒
Educational ☐
Factory ☐ F-1 Moderate ☐ F-2 Low
Hazardous ☐ H-1 Detonate ☐ H-2 Deflagrate ☐ H-3 Combust ☐ H-4 Health ☐ H-5 HPM
Institutional ☐ I-1 Condition ☐ 1 ☐ 2
☐ I-2 Condition ☐ 1 ☐ 2
☐ I-3 Condition ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
☐ I-4
Mercantile ☐
Residential ☐ R-1 ☐ R-2 ☐ R-3 ☐ R-4
Storage ☐ S-1 Moderate ☐ S-2 Low ☐ High-piled
☐ Parking Garage ☐ Open ☐ Enclosed ☐ Repair Garage
Utility and Miscellaneous ☐

Accessory Occupancy Classification(s): BUSINESS (EDUCATION ABOVE THE 12TH GRADE)
Incidental Uses (Table 509): _____
Special Uses (Chapter 4 – List Code Sections) _____
Special Provisions: (Chapter 5 – List Code Sections): _____
Mixed Occupancy: ☒ No ☐ Yes Separation: _____ Hr. Exception: _____
☐ Non-Separated Use (508.3)
The required type of construction for the building shall be determined by applying the height and area limitations for each of the applicable occupancies to the entire building. The most restrictive type of construction, so determined, shall apply to the entire building.
☐ Separated Use (508.4) -
See below for area calculations for each story, the area of the occupancy shall be such that the sum of the ratios of the actual floor area of each use divided by the allowable floor area for each use shall not exceed 1.

$$\frac{\text{Actual Area of Occupancy A}}{\text{Allowable Area of Occupancy A}} + \frac{\text{Actual Area of Occupancy B}}{\text{Allowable Area of Occupancy B}} \leq 1$$

_____ + _____ + ... = _____ ≤ 1.00

STORY NO.	DESCRIPTION AND USE	(A) BLDG AREA PER STORY (ACTUAL)	(B) TABLE 506.2[4] AREA	(C) AREA FOR FRONTAGE INCREASE[1,5]	(D) ALLOWABLE AREA PER STORY OR UNLIMITED[2,3]
FIRST	BUSINESS	33,204 SF	23,000 SF	NOT REQ.	69,000 SF
SECOND	BUSINESS	33,397 SF	23,000 SF	NOT REQ.	69,000 SF
TOTAL		66,601 SF	46,000 SF		138,000 SF

[1] Frontage area increases from Section 506.3 are computed thus:
a. Perimeter which fronts a public way or open space having 20 feet minimum width = ____-____ (F)
b. Total Building Perimeter = ____-____ (P)
c. Ratio (F/P) = ____-____ (F/P)
d. W = Minimum width of public way = ____-____ (W)
e. Percent of frontage increase I$_f$ = 100 [F/P - 0.25] x W/30 = ____-____ (%)
[2] Unlimited area applicable under conditions of Section 507.
[3] Maximum Building Area = total number of stories in the building x D (maximum 3 stories) (506.2).
[4] The maximum area of open parking garages must comply with Table 406.5.4
[5] Frontage increase is based on the unsprinklered area value in Table 506.2.

ALLOWABLE HEIGHT

	ALLOWABLE (TABLE 503)	SHOWN ON PLANS	CODE REFERENCE
Building Height in Feet (Table 504.3)	55'-0"	35'0"	504.2
Building Height in Stories (Table 504.4)	2	2	504.2

[1] Provide code reference if the "Show on Plans" quantity is not based on Table 504.3 or 504.4.
[2] The maximum height of air traffic control towers must comply with Table 412.3.1
[3] The maximum height of open parking garages must comply with Table 406.5.4

FIRE PROTECTION REQUIREMENTS

BUILDING ELEMENT	FIRE SEPARATION DISTANCE (FEET)	RATING REQ'D	RATING PROVIDED (W/ 1HR * REDUCTION)	DETAIL # AND SHEET #	DESIGN # FOR RATED ASSEMBLY	DESIGN # FOR RATED PENETRATION	DESIGN # FOR RATED JOINTS
Structural Frame, including columns, girders, trusses	>30'	0	EX	EX	EX	EX	EX
Bearing Walls	>30'						
Exterior	>30'	0	EX	EX	EX	EX	EX
North		0	EX	EX	EX	EX	EX
East		0	EX	EX	EX	EX	EX
West		0	EX	EX	EX	EX	EX
South		0	EX	EX	EX	EX	EX
Interior		0	EX	EX	EX	EX	EX
Nonbearing Walls and Partitions Exterior walls	>30'						
North		0	EX	EX	EX	EX	EX
East		0	EX	EX	EX	EX	EX
West		0	EX	EX	EX	EX	EX
South		0	EX	EX	EX	EX	EX
Interior walls and partitions		0	EX	EX	EX	EX	EX
Floor Construction Including supporting beams and joists		0	EX	EX	EX	EX	EX
Floor Ceiling Assembly			EX	EX	EX	EX	EX
Column Supporting Floors		0	EX	EX	EX	EX	EX
Roof Construction, including supporting beams and joists		0	EX	EX	EX	EX	EX
Roof Ceiling Assembly		0	EX	EX	EX	EX	EX
Column Supporting Roof		0	EX	EX	EX	EX	EX
Shaft Enclosures - Exit		1HR	EX	EX	EX	EX	EX
Shaft Enclosures - Other		N/A	EX	EX	EX	EX	EX
Corridor Separation		0	EX	EX	EX	EX	EX
Occupancy/Fire Barrier Separation		0	EX	EX	EX	EX	EX
Party/Fire Wall Separation		N/A	EX	EX	EX	EX	EX
Smoke Barrier Separation		N/A	EX	EX	EX	EX	EX
Smoke Partition		N/A	EX	EX	EX	EX	EX
Tenant/Dwelling Unit/ Sleeping Unit Separation		N/A	EX	EX	EX	EX	EX
Incidental Use Separation		1HR	EX	EX	EX	EX	EX

* Indicate section number permitting reduction

LIFE SAFETY SYSTEM REQUIREMENTS

Emergency Lighting: ☐ No ☒ Yes
Exit Signs: ☐ No ☒ Yes
Fire Alarm: ☐ No ☒ Yes
Smoke Detection Systems: ☐ No ☒ Yes ☐ Partial _____
Carbon Monoxide Detection: ☐ No ☒ Yes

Revision No	DESCRIPTION:	Date:
0	ISSUED FOR CONSTRUCTION	03.21.24

REVISIONS

CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NCP # 4086

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HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

APPENDIX B
BUILDING CODE SUMMARIES

JOB NO.:	CBHF: 23260
DRAWN:	CRG
DESIGNED:	CRG
CHECKED:	TOG

DRAWING NO:
G-001

REVISION:
0

MECHANICAL PIPE SYMBOLS

	2-WAY CONTROL VALVE
	3-WAY CONTROL VALVE
or	45 DEGREE ELBOW DOWN
or	45 DEGREE ELBOW SIDE
or	45 DEGREE ELBOW UP
	ANGLE VALVE
BFP	BACKFLOW PREVENTER
or	BALL VALVE SIDE
	BLOCK VALVE / SHUTOFF VALVE
	BOILER BLOWDOWN VALVE (SUPPLIED WITH BOILER)
	BOILER STOP CHECK VALVE
or or or	BUTTERFLY VALVE SIDE
or	CHECK VALVE SIDE
	CIRCUIT SETTER
WM	DOMESTIC WATER METER
	DRAIN
or	ELBOW DOWN
or	ELBOW SIDE
or	ELBOW UP
	FLANGE
	FLANGED STARTUP STRAINER
	FLOW MEASURING ORIFICE
	FLOW TRANSMITTER
	GATE VALVE SIDE
	GAUGE
	GLOBE VALVE
	PUMP END
or	PUMP SIDE
or	PUMP
RPZ	RPZ
	SLIP ON FLANGE END
	SLIP ON FLANGE SIDE
T	STEAM TRAP
or	TEE BRANCH DOWN
or	TEE END UP
or	TEE SIDE
or	TRIPLE DUTY VALVE
	WELD NECK FLANGE END
	WELD NECK FLANGE SIDE

NOTE: ALL ITEMS LISTED MAY NOT BE USED IN THIS PROJECT.

MECHANICAL PIPE LEGEND

	CHILLED WATER RETURN PIPING
(X)CHWR	CHILLED WATER RETURN PIPING - EXISTING
CHWS	CHILLED WATER SUPPLY PIPING
(X)CHWS	CHILLED WATER SUPPLY PIPING - EXISTING
C	CONDENSATE PIPING
(X)C	CONDENSATE PIPING - EXISTING
GLS	GLYCOL WATER SUPPLY PIPING
(X)GLS	GLYCOL WATER SUPPLY PIPING - EXISTING
GLR	GLYCOL WATER RETURN PIPING
(X)GLR	GLYCOL WATER RETURN PIPING - EXISTING
HWR	HEATING HOT WATER RETURN PIPING
(X)HWR	HEATING HOT WATER RETURN PIPING - EXISTING
HWS	HEATING HOT WATER SUPPLY PIPING
(X)HWS	HEATING HOT WATER SUPPLY PIPING - EXISTING
MU	MAKE-UP WATER PIPING
(X)MU	MAKE-UP WATER PIPING - EXISTING
NG	NATURAL GAS PIPING
(X)NG	NATURAL GAS PIPING - EXISTING
R	REFRIGERANT LINE-SET PIPING
(X)R	REFRIGERANT LINE-SET PIPING - EXISTING

NOTE: ALL ITEMS LISTED MAY NOT BE USED IN THIS PROJECT.

MECHANICAL LEGEND

	EXTENT OF DEMOLITION
	INDICATES TO DEMOLISH
	POINT OF CONNECTION
T	THERMOSTAT / TEMPERATURE SENSOR

WALL LEGEND

(X)	1 HOUR RATED WALL - EXISTING

MECHANICAL GENERAL NOTES:

1. USE APPENDIX C1 OF THE NCECC TO DOCUMENT FUNCTIONAL PERFORMANCE TESTING AND ENGINEER APPROVAL OF THE COMPLETED PROJECT.
2. ALL MECHANICAL WORK SHALL BE IN STRICT COMPLIANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND STANDARDS.
3. ALL DIMENSIONS AND ELEVATIONS FOR NEW EQUIPMENT, DUCTWORK, PIPING AND APPARATUS ARE APPROXIMATE AND ARE ONLY FOR CONTRACTOR'S GUIDANCE. CONTRACTOR SHALL SUBMIT DIMENSIONS AND ELEVATIONS VERIFIED IN THE FIELD. DUCTWORK AND PIPING INDICATED ON THE DRAWINGS, SECTIONS AND PROSPECTIVE VIEWS ARE SHOWN DIAGRAMMATICALLY. DUCT AND PIPE ELEVATIONS IN EXACT LOCATIONS SHALL BE DETERMINED BY THE INSTALLING CONTRACTOR AND DETAILED ON THE SHOP DRAWINGS.
4. ALL DUCT DIMENSIONS INDICATED ON PLAN ARE CLEAR INSIDE DIMENSIONS. CONTRACTOR MUST ACCOUNT FOR THE THICKNESS OF EXTERIOR INSULATION WHEN DETERMINING INSTALLATION CLEARANCES.
5. THE CONTRACTOR SHALL TEMPORARILY COVER ALL EXPOSED DUCT AND PIPE OPENINGS WITH A NON-COMBUSTIBLE MATERIAL, AND SEAL THEM AIR TIGHT TO PREVENT CONTAMINATION OF THE RESPECTIVE SYSTEMS DURING CONSTRUCTION.
6. CONTRACTOR SHALL REMOVE AND DISPOSE OF OFFSITE ALL DEMOLISHED WORK IN ACCEPTABLE AND SAFE MANNER AND SHALL KEEP ALL NON-WORK AREAS CLEAN AND SAFE.
7. ALL EXISTING EQUIPMENT AND CONNECTIONS THAT NEED TO BE TEMPORARILY DEMOLISHED FOR RIGGING AND / OR INSTALLATION SHALL BE REINSTALLED AND BROUGHT BACK TO ORIGINAL CONDITIONS PRIOR TO TEMPORARY REMOVAL.
8. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.

MECHANICAL DEMOLITION NOTES:

1. THE CONTRACTOR SHALL REVIEW THE DRAWINGS AND SPECIFICATIONS FOR DEMOLITION REQUIREMENTS AND LAYOUT HIS WORK IN A COMPATIBLE AND COMPLEMENTARY MANNER. REMOVE ALL EQUIPMENT, DUCTWORK, SUPPORTS, CONTROLS, ACCESSORIES, ETC..., AND MECHANICAL ITEMS MADE OBSOLETE BY THESE ALTERATIONS AS SHOWN IN THE MECHANICAL DRAWINGS. ALL ITEMS TO BE REMOVED OR MODIFIED MAY NOT BE SHOWN, HOWEVER, THIS CONTRACTOR SHALL REMOVE ANY MECHANICAL WORK AS REQUIRED BY THE CONSTRUCTION OR AS DIRECTED BY THE BUILDING OWNER. SURVEY THE AFFECTED AREAS BEFORE SUBMITTING A BID.
2. SCHEDULING OF DEMOLITION - COORDINATE SCHEDULING OF MECHANICAL DEMOLITION WORK WITH THE BUILDING OWNER SO AS TO MINIMIZE DISRUPTION OF THE OWNERS USE OF THE FACILITIES AND MAINTAIN THE CONSTRUCTION SEQUENCE. SEE DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INSTRUCTIONS CONCERNING PHASING AND SEQUENCE OF WORK.
3. DEMOLISHED MATERIALS - UNLESS SPECIFICALLY REQUESTED BY THE OWNER, ALL DEMOLISHED MECHANICAL MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.
4. CUTTING AND PATCHING - PERFORM CUTTING AND PATCHING FOR MECHANICAL WORK SO AS TO MINIMIZE DAMAGE TO CEILINGS, FLOORS AND WALLS.
5. THESE DRAWINGS ARE COMPILED BY THE ENGINEER FROM THE OWNER'S AS-BUILT RECORD DRAWINGS AND LIMITED FIELD VERIFICATION OF EXISTING CONDITIONS FOR THE PURPOSE OF INDICATING THE WORK REQUIRED AND ARE BELIEVED TO BE CORRECT. NOTWITHSTANDING, THE CONTRACTOR SHALL VERIFY ALL DUCTWORK, EQUIPMENT LOCATIONS, DIMENSIONS AND ALL FIELD CONDITIONS AFFECTING HIS WORK.
6. WHERE MECHANICAL SYSTEMS PASS THROUGH THE DEMOLITION AREAS TO SERVE OTHER PORTIONS OF THE PREMISES, THEY SHALL REMAIN OR BE SUITABLY RELOCATED AND THE SYSTEM RESTORED TO NORMAL OPERATION. ADVISE THE OWNER IMMEDIATELY IF SUCH CONDITIONS ARE UNCOVERED BEFORE PROCEEDING WITH ADDITIONAL WORK.
7. PROTECT ALL EXISTING LIFE SAFETY SYSTEMS, FIRE ALARM AND PUBLIC ADDRESS SYSTEMS AND MAINTAIN THEM IN OPERATION THROUGHOUT THE PROGRESS OF THE WORK. NOTIFY THE OWNER IN WRITING OF SHUTDOWNS ARE REQUIRED PRIOR TO ANY OUTAGE OF SERVICE. WHERE THE DURATION OF A PROPOSED OUTAGE CANNOT BE TOLERATED BY THE OWNER, PROVIDE TEMPORARY CONNECTIONS AS REQUIRED MAINTAINING SERVICE.
8. SURVEY THE AFFECTED AREAS BEFORE STARTING DEMOLITION AS ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DEPICTED ON THE DRAWINGS AND SOME UNUSUAL CONDITIONS EXIST.
9. IF ANY UNUSUAL STRUCTURAL OR ARCHITECTURAL CONDITIONS ARE ENCOUNTERED DURING DEMOLITION, CONTACT THE OWNER FOR ASSISTANCE.

ABBREVIATIONS

TERM	ABBREVIATION	TERM	ABBREVIATION
ABOVE FINISHED FLOOR	AFF	INCH OF WATER GAUGE	INWG
ABOVE GROUND	AG	INDOOR UNIT	IDU
ABOVE SEA LEVEL	ASL	IRON PIPE SIZE	IPS
ACROSS THE LINE	ACL	KILOVOLT-AMP	KVA
AIR ADMITTANCE VALVE	AAV	KILOWATT	KW
AIR CONDITION(-ING, -ED)	AIR COND	KILOWATT HOUR	KWH
AIR-HANDLING UNIT	AHU OR AH	LEAVING AIR TEMPERATURE	LAT
AIR FLOW MEASURING STATION	AFMA	LEAVING WATER TEMPERATURE	LWT
AMBIENT	AMB	LENGTH	LG
AMPERE (AMP, AMPS)	AMP	LINEAR FEET	LF
ANALOG INPUT	AI	MAXIMUM	MAX
ANALOG OUTPUT	AO	MAXIMUM OVERCURRENT PROTECTION	MOCP
AND	&	MEDIUM-PRESSURE STEAM	MPS
APPARATUS DEW POINT	ADP	MILES PER HOUR	MPH
APPROXIMATE	APPROX	MINIMUM	MIN.
ARCHITECT	ARCH	MINIMUM CIRCUIT AMPERES	MCA
ATMOSPHERE	ATM	MINUTE	MIN
AVERAGE	AVG	MANUFACTURER	MFR
BRAKE HORSEPOWER	BHP	MOTOR CONTROL CENTER	MCC
BROWN & SHARPE WIRE GAGE	B&S	NOISE CRITERIA	NC
BRITISH THERMAL UNIT	BTU	NON-STANDARD PART LOAD	NPLV
BRITISH THERMAL UNIT PER HOUR	MBH	NORMALLY OPEN	NO
1000 BRITISH THERMAL UNIT	MBH	NORMALLY CLOSED	NC
BUILDING	BLDG	NOT APPLICABLE	N/A
BUILDING AUTOMATION SYSTEM	BAS	NOT IN CONTRACT	N I C
CELSIUS	°C	NOT TO SCALE	NTS
CHILLED WATER RETURN	CHWR	NUMBER	NO
CHILLED WATER SUPPLY	CHWS	ON CENTER	OC
COEFFICIENT, VALVE FLOW	CV	OUNCE	OZ
COEFFICIENT OF PERFORMANCE FACTOR	COP	OUTDOOR UNIT	ODU
COMPRESSOR	COMP	OUTSIDE AIR	OA
CONCRETE	CONC	PACKAGE UNIT	PU
CONDENS(-ER, -ING, -ATION)	COND	PACKAGE TERMINAL AIR CONDITIONER	PTAC
CONNECTION	CONN	PARTS PER MILLION	PPM
CONTINUATION	CONT	PERCENT	%
COOLING LOAD	CLG LOAD	PHASE	PH
CUBIC FEET	CU FT	POUNDS	LBS
CUBIC INCH	CU IN	POUNDS PER SQUARE FOOT	PSF
CUBIC FEET PER MINUTE	CFM	POWER VENTILATOR	PV
CFM, STANDARD CONDITIONS	SCFM	PRESSURE	PRESS
DECIBEL	DB	PRESSURE REDUCING VALVE	PRV
DEGREE	DEG OR °	PRESSURE SAFETY VALVE	PSV
DEDICATED OUTDOOR AIR SYSTEM	DOAS	PUMPED CONDENSATE	PC
DEGREES FAHRENHEIT	DEG. F	QUANTITY	QTY
DETAIL	DET	RATED LOAD AMPS	RLA
DEW-POINT TEMPERATURE	DPT	RECIRCULATE	RECIRC
DIAMETER	DIA	REDUCED PRESSURE BACKFLOW PREVENTER	RPZ
DIAMETER, INSIDE	ID	REFRIGERANT (12, 22, ETC.)	R22, R410
DIAMETER, OUTSIDE	OD	REFRIGERANT LIQUID	RL
DIFFERENCE OR DELTA	DIFF	REFRIGERANT SUCTION	RS
DIGITAL INPUT	DI	REQUIRED	REQD OR REQ'D
DIGITAL OUTPUT	DO	RELATIVE HUMIDITY	RH
DOMESTIC HOT WATER	DHW	RETURN AIR	RA
DOMESTIC HOT WATER RECIRCULATION	DHWR	REVOLUTIONS PER MINUTE	RPM
DRY-BULB TEMPERATURE	DBT	REVOLUTIONS PER SECOND	RPS
DUCTLESS SPLIT SYSTEM AIR HANDLER	DAH	ROOF VENTILATOR	RV
DUCTLESS SPLIT SYSTEM HEAT PUMP	DHP	ROOF TOP UNIT	RTU
ENERGY EFFICIENCY RATING	ERR	SAFETY FACTOR	SF
EFFICIENCY	EFF	SEASONAL ENERGY EFFICIENCY RATIO	SEER
ELECTRIC UNIT HEATER	EUH	SECOND	S
ELEVATION	EL	SHADING COEFFICIENT	SC
ENERGY RECOVERY	ER	SPECIFICATION	SPEC
ENTERING	ENT	SQUARE	SQ
ENTERING WATER TEMPERATURE	EWT	STANDARD	STD
ENTERING AIR TEMPERATURE	EAT	STATIC PRESSURE	SP
EXISTING	(X)	SUPPLY	SPLY
EXTERNAL AMBIENT TEMPERATURE	EAT	SUPPLY AIR	SA
EXTERNAL STATIC PRESSURE	ESP	TEMPERATURE	TEMP
EXHAUST AIR	EA	TEMPERATURE DIFFERENCE	TD
EXHAUST FAN	EF	THERMOSTAT	T STAT
FACE VELOCITY	FVEL	TONS OF REFRIGERATION	TONS
FAHRENHEIT	°F	TO BE DETERMINED	TBD
FEET PER MINUTE	FPM	TOP OF STEEL	TOS
FEET PER SECOND	FPS	TOTAL DYNAMIC HEAD	TDH
FLOOR	FLR	TYPICAL	TYP
FOOT OR FEET	FT	U-FACTOR	U
FULL LOAD AMPS	FLA	UNDER GROUND	UG
GAGE OR GAUGE	GA	UNLESS OTHERWISE NOTED	UON
GALLONS	GAL	UNIT HEATER - ELECTRIC	UH
GALLONS PER HOUR	GPH	VARIABLE AIR VOLUME	VAV
GALLONS PER MINUTE	GPM	VARIABLE FREQUENCY DRIVE	VFD
GLYCOL RETURN	GLR	VELOCITY	VEL
GLYCOL SUPPLY	GLS	VENTILATION, VENT	VENT
GRAINS	GR	VENT THRU ROOF	VTR
HEAD	HD	VERTICAL	VERT
HEAT EXCHANGER	HX	VOLT	V
HEATING AND VENTILATION UNIT	HV	VOLT AMPERE	VA
HEATING, VENTILATION AND AIR CONDITIONING	HVAC	VOLUME	VOL
HEIGHT	HGT	WATER PRESSURE DROP	WPD
HERTZ	HZ	WATER GAUGE	WG
HIGH DENSITY POLYPROPYLENE	HDPE	WATT	W
HORSEPOWER, HEAT PUMP	HP	WATT-HOUR	WH
HOT WATER COIL	HWC	WITH	W/
HOUR(S)	HR	WEIGHT	WT
HUMIDITY, RELATIVE	RH	WET BULB	WB
INTEGRATED PART LOAD VALUES	IPLV	YARD	YD
INCH	IN.	YEAR	YR

NOTE: ALL ABBREVIATIONS MAY NOT BE USED IN PROJECT.

Revision No	DESCRIPTION:	Date:
0	ISSUED FOR CONSTRUCTION	03.21.24

REVISIONS

CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NC# P-0586

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043801 CRAIG R. GRAY
03/25/2024

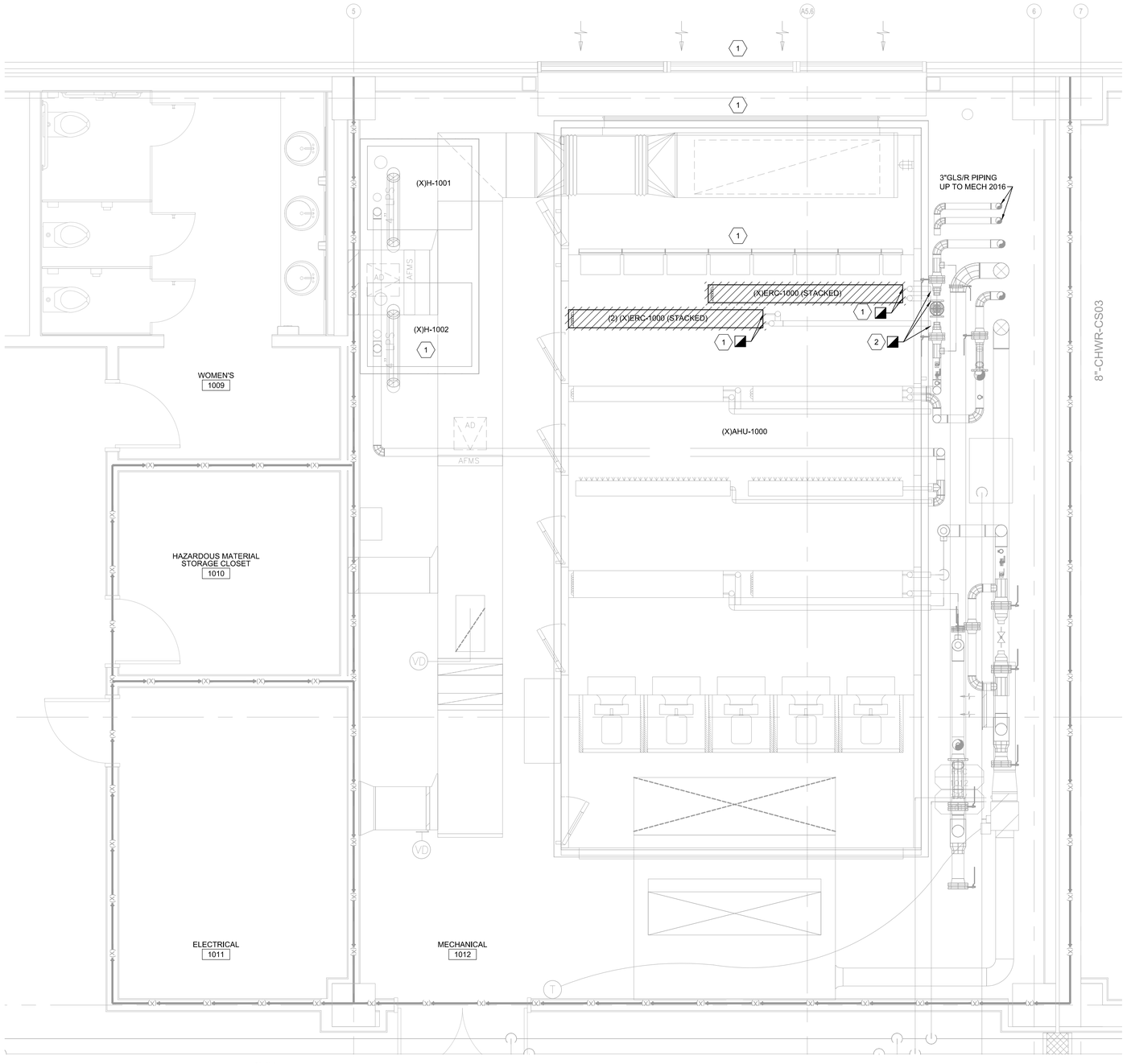
UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

MECHANICAL LEGENDS, ABBREVIATIONS AND NOTES

JOB NO.:	CBHF: 23260
DRAWN:	CRG
DESIGNED:	CRG
CHECKED:	TOG

DRAWING NO:
M-001

REVISION:
0



A1 **PARTIAL FLOOR PLAN**
3/8" = 1'-0"
0 2' 4' 6'

PLAN NORTH

GENERAL NOTES

1. DRAWINGS ARE DEVELOPED FROM AS-BUILT DRAWINGS AND LIMITED FIELD OBSERVATIONS. THE MECHANICAL CONTRACTOR IS REQUIRED TO CONFIRM ALL WORK THROUGH FIELD VERIFICATION PRIOR TO COMMENCING ANY WORK.

WALL LEGEND

(X)	1 HOUR RATED WALL - EXISTING

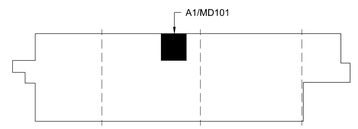
DEMOLITION KEYED NOTES

1. DISCONNECT THE ENERGY RECOVERY (ER) PIPING AND PREPARE THE FOUR (4) STACKED ER COILS FOR REMOVAL. THE MECHANICAL CONTRACTOR (MC) IS REQUIRED TO COORDINATE WITH THE BUILDING OWNER TO DETERMINE THE PREFERRED METHOD OF ER COIL REMOVAL AND SUBSEQUENT INSTALLATION OF THE NEW COIL. PROPOSED OPTIONS ARE OUTLINED BELOW, BUT THE FINAL DECISION RESTS WITH THE MC AND BUILDING OWNER.

   OPTION 1 INVOLVES THE REMOVAL OF THE 2" PRE-FILTER (96" X 224"), 12" FINAL-FILTER (96" X 224"), OUTSIDE AIR DAMPER (154" X 90") SECTIONS, AND EXTERIOR WALL LOUVER. THE DEMOLISHED AND NEW ER COIL SHOULD BE BROUGHT OUT THROUGH THE EXTERIOR WALL. AFTER INSTALLING THE ER COIL, ALL REMOVED ITEMS SHALL BE RE-INSTALLED TO THEIR ORIGINAL STATE, ENSURING PROPER SEALS AND WEATHER-TIGHT SEAL ON THE EXTERIOR WALL LOUVER.

   OPTION 2 REQUIRES THE DISCONNECTION AND TEMPORARY RELOCATION OF HUMIDIFIER (X)H-1002, ALONG WITH ANY DUCT OR PIPING MODIFICATIONS NECESSARY FOR THE ER COIL REMOVAL. THE DEMOLISHED COIL AND NEW ER COIL SHALL BE BROUGHT THROUGH THE ACCESS DOOR ON THE AIR-HANDLING UNIT. AFTER INSTALLING THE NEW ER COIL, HUMIDIFIERS SHALL BE RE-INSTALLED, DUCT, PIPING, CONTROLS & ETC. SHALL BE RESTORED BACK TO IT'S ORIGINAL STATE.

2. SEPARATE THE FLANGE CONNECTION AND DEMOLISH THE ER PIPING OUTSIDE THE AIR HANDLING UNIT AS NECESSARY TO FACILITATE THE INSTALLATION OF TWO (2) ISOLATION VALVES FOR EACH ER COIL. REFER TO RISER DIAGRAM A2/M-701 FOR MORE INFORMATION.



A5 **KEYPLAN**
NOT TO SCALE

PLAN NORTH

Revision No	DESCRIPTION:	Date:
0	ISSUED FOR CONSTRUCTION	03.21.24

REVISIONS

CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NC# P-0586

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043801 CHRISTOPHER R. GRAD
03/25/2024

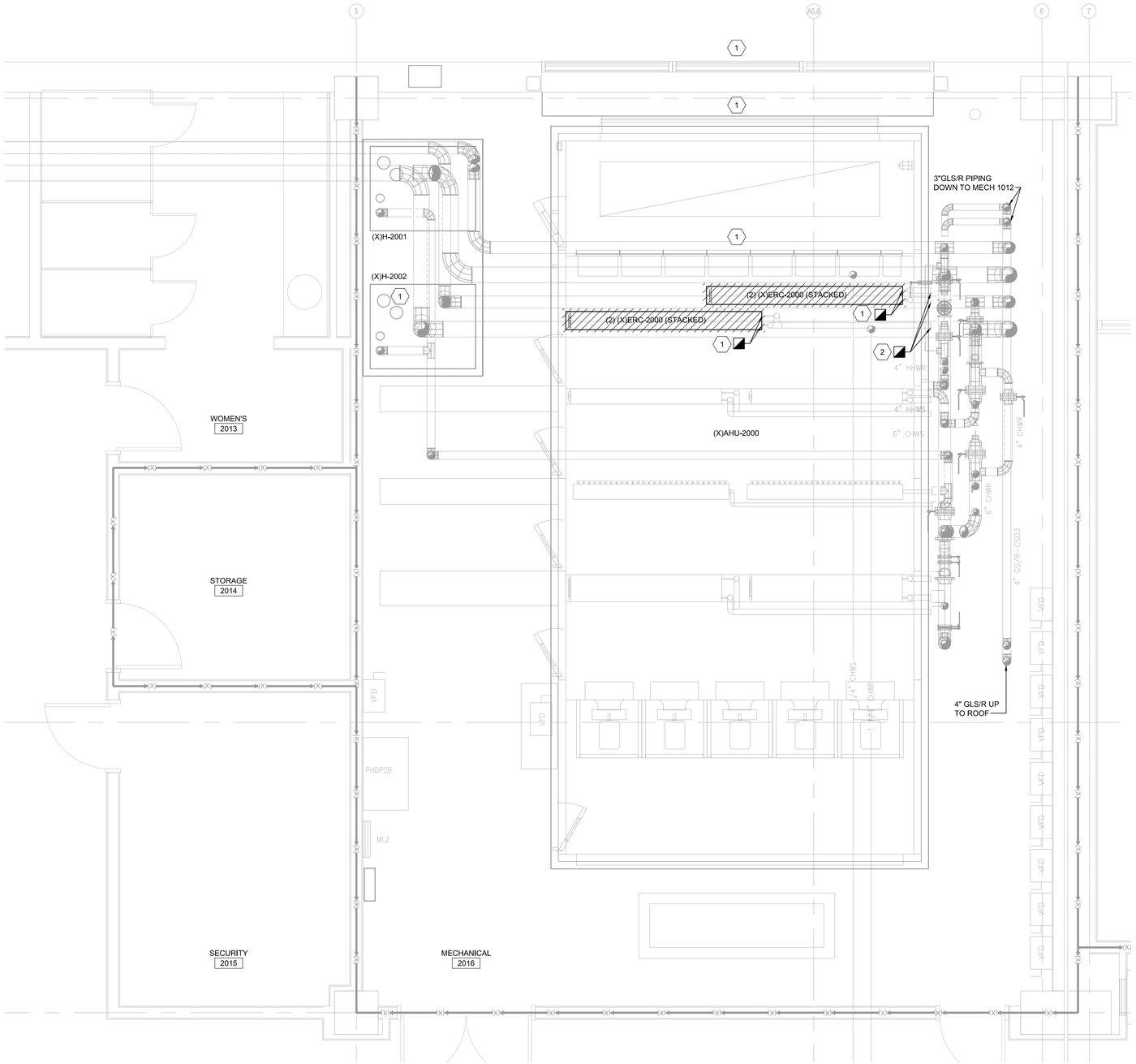
UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

MECHANICAL DEMOLITION
PARTIAL FIRST FLOOR PLAN -
MECHANICAL ROOM 1012

JOB NO.:	CBHF: 23260
DRAWN:	CRG
DESIGNED:	CRG
CHECKED:	TOG

DRAWING NO:
MD101

REVISION:
0



A1 PARTIAL FLOOR PLAN

3/8" = 1'-0"

0 2' 4' 6'

PLAN NORTH

GENERAL NOTES

1. DRAWINGS ARE DEVELOPED FROM AS-BUILT DRAWINGS AND LIMITED FIELD OBSERVATIONS. THE MECHANICAL CONTRACTOR IS REQUIRED TO CONFIRM ALL WORK THROUGH FIELD VERIFICATION PRIOR TO COMMENCING ANY WORK.

WALL LEGEND

(X)	1 HOUR RATED WALL - EXISTING

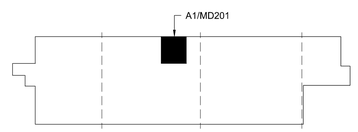
DEMOLITION KEYED NOTES

1. DISCONNECT THE ENERGY RECOVERY (ER) PIPING AND PREPARE THE FOUR (4) STACKED ER COILS FOR REMOVAL. THE MECHANICAL CONTRACTOR (MC) IS REQUIRED TO COORDINATE WITH THE BUILDING OWNER TO DETERMINE THE PREFERRED METHOD OF ER COIL REMOVAL AND SUBSEQUENT INSTALLATION OF THE NEW COIL. PROPOSED OPTIONS ARE OUTLINED BELOW, BUT THE FINAL DECISION RESTS WITH THE MC AND BUILDING OWNER.

   OPTION 1 INVOLVES THE REMOVAL OF THE 2" PRE-FILTER (96" X 224"), 12" FINAL-FILTER (96" X 224"), OUTSIDE AIR DAMPER (154" X 90") SECTIONS, AND EXTERIOR WALL LOUVER. THE DEMOLISHED AND NEW ER COIL SHOULD BE BROUGHT OUT THROUGH THE EXTERIOR WALL. AFTER INSTALLING THE ER COIL, ALL REMOVED ITEMS SHALL BE RE-INSTALLED TO THEIR ORIGINAL STATE. ENSURING PROPER SEALS AND WEATHER-TIGHT SEAL ON THE EXTERIOR WALL LOUVER.

   OPTION 2 REQUIRES THE DISCONNECTION AND TEMPORARY RELOCATION OF HUMIDIFIER (X)H-1002, ALONG WITH ANY DUCT OR PIPING MODIFICATIONS NECESSARY FOR THE ER COIL REMOVAL. THE DEMOLISHED COIL AND NEW ER COIL SHALL BE BROUGHT THROUGH THE ACCESS DOOR ON THE AIR-HANDLING UNIT. AFTER INSTALLING THE NEW ER COIL, HUMIDIFIERS SHALL BE RE-INSTALLED, DUCT, PIPING, CONTROLS & ETC. SHALL BE RESTORED BACK TO IT'S ORIGINAL STATE.

2. SEPARATE THE FLANGE CONNECTION AND DEMOLISH THE ER PIPING OUTSIDE THE AIR HANDLING UNIT AS NECESSARY TO FACILITATE THE INSTALLATION OF TWO (2) ISOLATION VALVES FOR EACH ER COIL. REFER TO RISER DIAGRAM A2/M-701 FOR MORE INFORMATION.



A5 KEYPLAN

NOT TO SCALE

PLAN NORTH

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CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NC# P-0586

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043801 CHRISTOPHER R. GRADY
03/25/2024

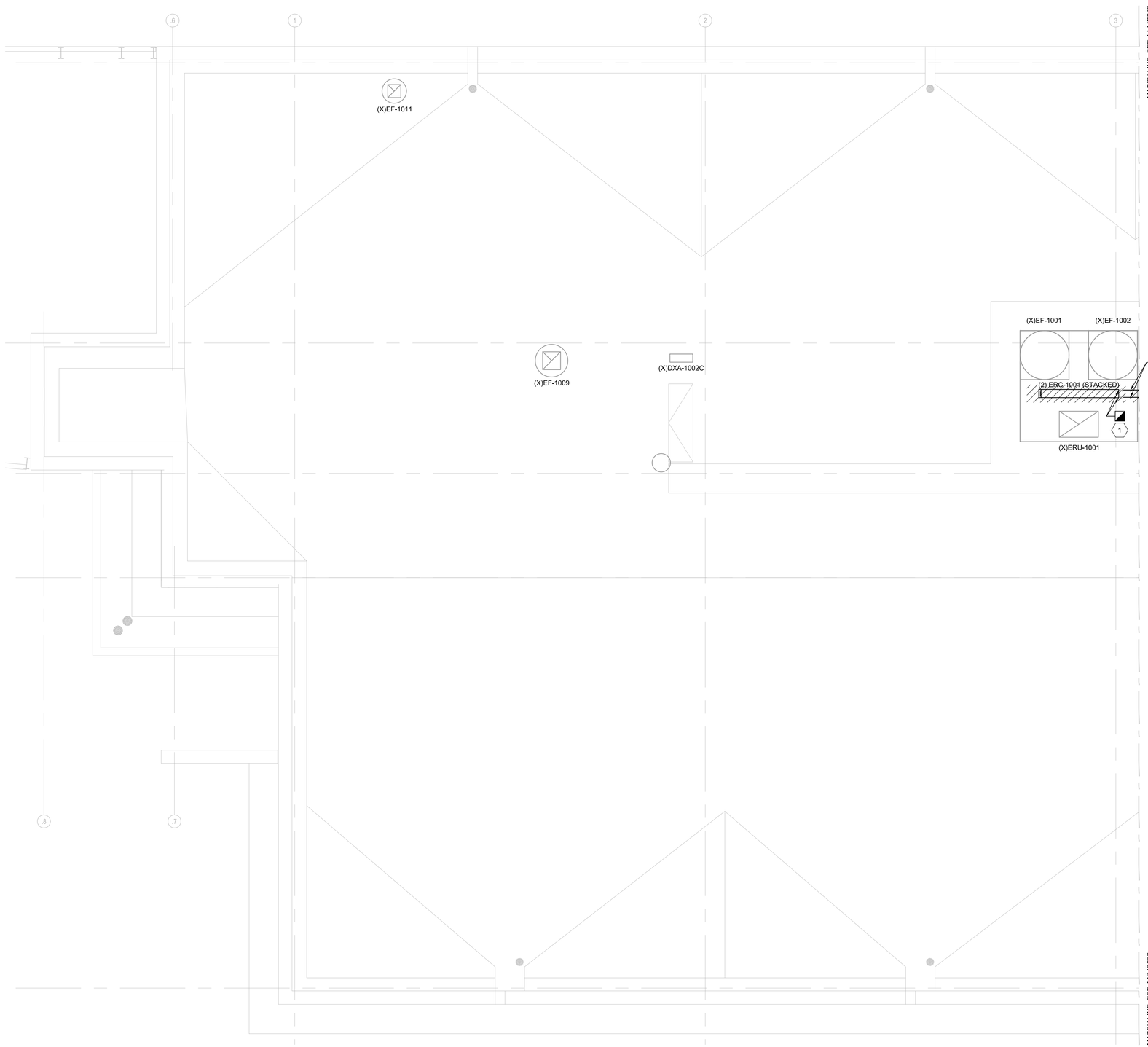
UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5568 MARVIN K MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

MECHANICAL DEMOLITION
PARTIAL SECOND FLOOR PLAN -
MECHANICAL ROOM 2016

JOB NO.:	CBHF: 23260
DRAWN:	CRG
DESIGNED:	CRG
CHECKED:	TOG

DRAWING NO:
MD201

REVISION:
0



A1 **PARTIAL ROOF PLAN**
3/16" = 1'-0"
0 4' 8' 12'

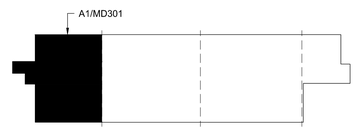
PLAN NORTH

GENERAL NOTES

1. DRAWINGS ARE DEVELOPED FROM AS-BUILT DRAWINGS AND LIMITED FIELD OBSERVATIONS. THE MECHANICAL CONTRACTOR IS REQUIRED TO CONFIRM ALL WORK THROUGH FIELD VERIFICATION PRIOR TO COMMENCING ANY WORK.

DEMOLITION KEYED NOTES

1. DISCONNECT THE ENERGY RECOVERY (ER) PIPING TO THE EXTENT INDICATED AND REMOVE THE TWO (2) ER COILS. REFER TO RISER DIAGRAM A2/M-701 FOR MORE INFORMATION.
2. DEMOLISH THE ER PIPING AS NECESSARY TO FACILITATE THE INSTALLATION OF TWO (2) ISOLATION VALVES FOR EACH OF THE TWO (2) ER COILS. SEE A1/MD302 FOR PLAN CONTINUATION. REFER TO RISER DIAGRAM A2/M-701 FOR MORE INFORMATION.



A5 **KEYPLAN**
NOT TO SCALE

PLAN NORTH

Revision No	DESCRIPTION:	Date:
0	ISSUED FOR CONSTRUCTION	03.21.24

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CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NC# P-0586

NORTH CAROLINA PROFESSIONAL SEAL 043801 ENGINEER TRACY O'GRADY
03/25/2024

UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

MECHANICAL DEMOLITION PARTIAL ROOF PLAN

JOB NO.:	CBHF: 23260
DRAWN:	CRG
DESIGNED:	CRG
CHECKED:	TOG

DRAWING NO:
MD301

REVISION:
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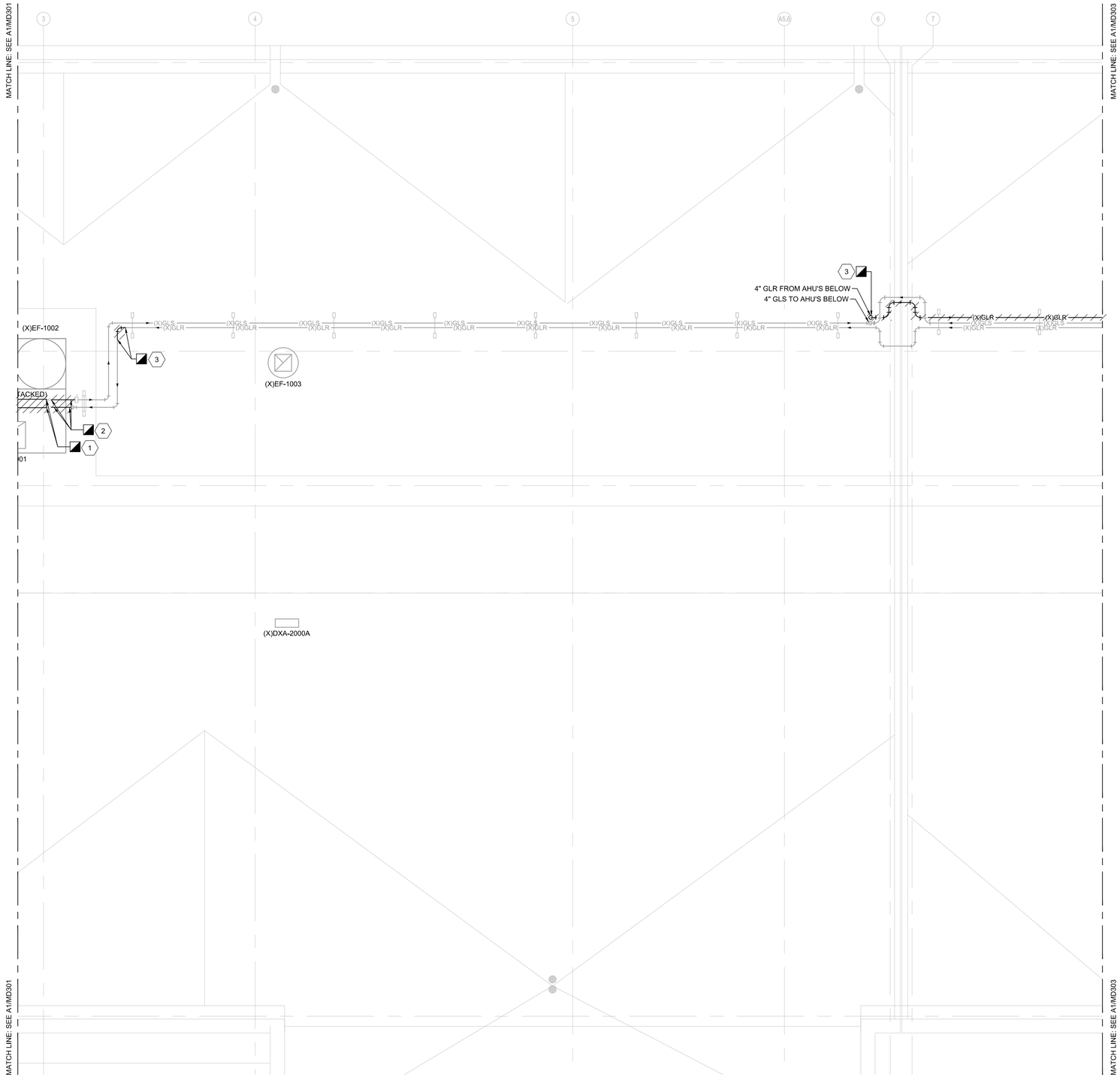


A1 **PARTIAL ROOF PLAN**

3/16" = 1'-0"

0 4' 8' 12'

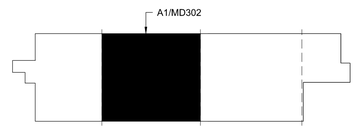
PLAN NORTH

GENERAL NOTES

1. DRAWINGS ARE DEVELOPED FROM AS-BUILT DRAWINGS AND LIMITED FIELD OBSERVATIONS. THE MECHANICAL CONTRACTOR IS REQUIRED TO CONFIRM ALL WORK THROUGH FIELD VERIFICATION PRIOR TO COMMENCING ANY WORK.

DEMOLITION KEYED NOTES

1. DISCONNECT THE ENERGY RECOVERY (ER) PIPING TO THE EXTENT INDICATED AND REMOVE THE FOUR (4) ER COILS. REFER TO RISER DIAGRAM A2/M-701 FOR MORE INFORMATION.
2. DEMOLISH THE ER PIPING AS NECESSARY TO FACILITATE THE INSTALLATION OF TWO (2) ISOLATION VALVES FOR EACH OF THE FOUR (4) ER COILS. SEE A1/MD301 FOR PLAN CONTINUATION. REFER TO RISER DIAGRAM A2/M-701 FOR MORE INFORMATION.
3. DEMOLISH ER PIPING TO EXTENT INDICATED ON PLANS AND PREPARE FOR THE INSTALLATION OF NEW PIPING. REFER TO RISER DIAGRAM A2/M-701 FOR MORE INFORMATION.



A5 **KEYPLAN**

NOT TO SCALE

PLAN NORTH

Revision No	DESCRIPTION:	Date:
0	ISSUED FOR CONSTRUCTION	03.21.24

REVISIONS

CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NCBF P-4086

NORTH CAROLINA PROFESSIONAL SEAL 043801 ENGINEER TRACY O'GRADY

03/25/2024

UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

MECHANICAL DEMOLITION PARTIAL ROOF PLAN

JOB NO.:	CBHF: 23260
DRAWN:	CRG
DESIGNED:	CRG
CHECKED:	TOG

DRAWING NO:

MD302

REVISION:
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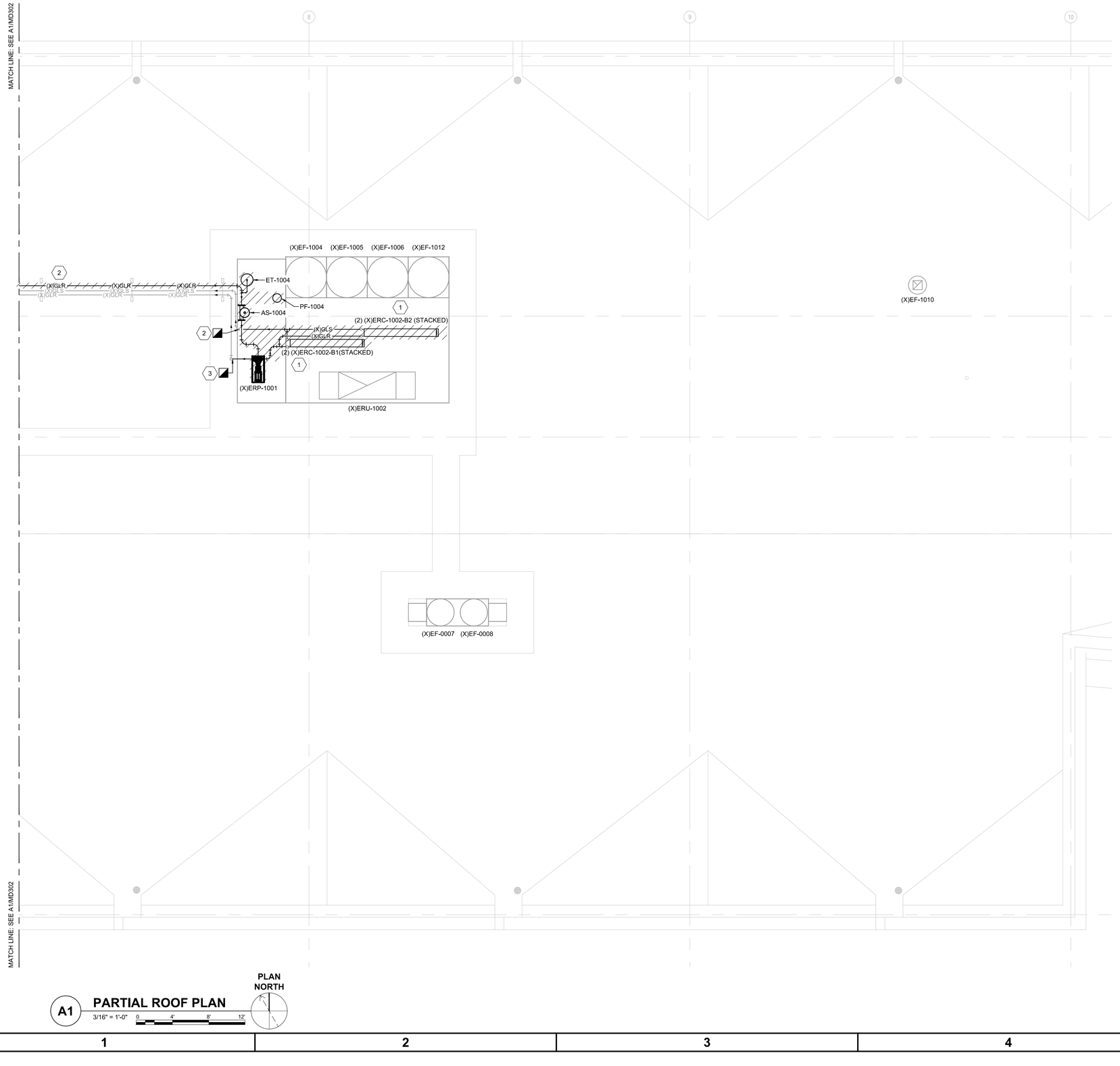


A1 PARTIAL ROOF PLAN

3/16" = 1'-0"

0 4' 8' 12'

PLAN NORTH

GENERAL NOTES

1. DRAWINGS ARE DEVELOPED FROM AS-BUILT DRAWINGS AND LIMITED FIELD OBSERVATIONS. THE MECHANICAL CONTRACTOR IS REQUIRED TO CONFIRM ALL WORK THROUGH FIELD VERIFICATION PRIOR TO COMMENCING ANY WORK.

DEMOLITION KEYED NOTES

1. DISCONNECT THE ENERGY RECOVERY (ER) PIPING AND REMOVE THE FOUR (4) ER COILS.
2. DEMOLISH ER PIPING TO THE EXTENT INDICATED ON PLANS AND PREPARE FOR THE INSTALLATION OF NEW PIPING. SEE A1/MD302 FOR PLAN CONTINUATION. REFER TO RISER DIAGRAM A2/M-701 FOR MORE INFORMATION.
3. REMOVE AND DISPOSE OF EXISTING ER PUMP, AIR-SEPARATOR, EXPANSION TANK, CHEMICAL FEEDER, PIPING, AND PIPING COMPONENTS TO THE EXTENT INDICATED ON PLANS.

A5 KEYPLAN

NOT TO SCALE

PLAN NORTH

Revision No	DESCRIPTION:	Date:
0	ISSUED FOR CONSTRUCTION	03.21.24

REVISIONS

CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NCBF P-4088

NORTH CAROLINA PROFESSIONAL SEAL 043801 ENGINEER TIMOTHY O'GRADY

03/25/2024

UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

MECHANICAL DEMOLITION PARTIAL ROOF PLAN

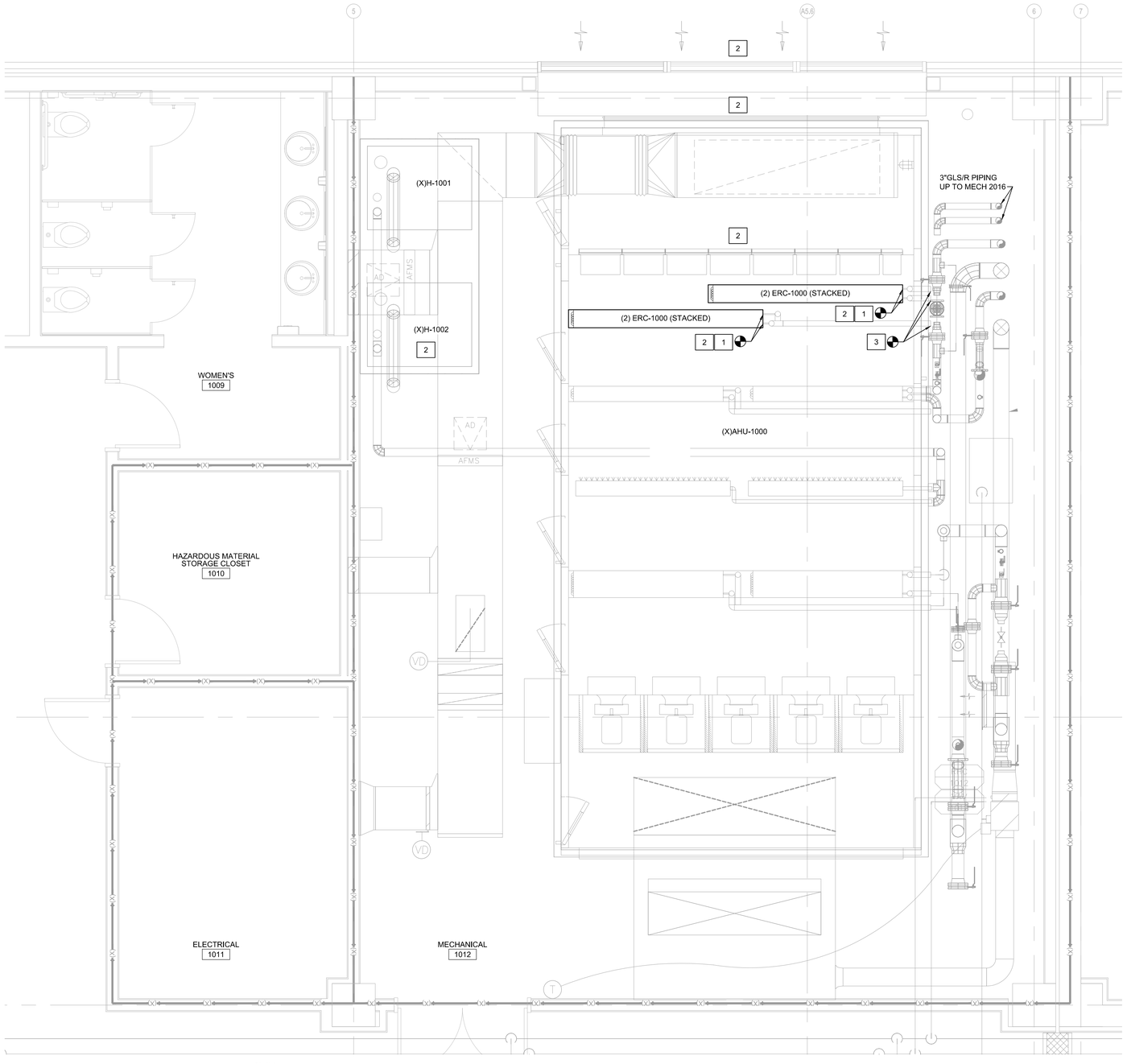
JOB NO.:	CBHF: 23260
DRAWN:	CRG
DESIGNED:	CRG
CHECKED:	TOG

DRAWING NO:

MD303

REVISION:

0



A1 **PARTIAL FLOOR PLAN**
3/8" = 1'-0"
0 2' 4' 6'

PLAN NORTH

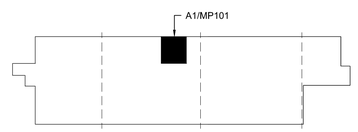
GENERAL NOTES

1. DRAWINGS ARE DEVELOPED FROM AS-BUILT DRAWINGS AND LIMITED FIELD OBSERVATIONS. THE MECHANICAL CONTRACTOR IS REQUIRED TO CONFIRM ALL WORK THROUGH FIELD VERIFICATION PRIOR TO COMMENCING ANY WORK.
2. TEST AND BALANCE ENTIRE HEAT RECOVERY HYDRONIC SYSTEM.
3. MECHANICAL CONTRACTOR MUST TEST PIPING FOR LEAKS BEFORE INSTALLING INSULATION AND JACKET.
4. ALL EXISTING ENERGY RECOVERY PIPING TO BE CLEANED AND FLUSHED PRIOR TO BEING PUT BACK INTO SERVICE.
5. PAINT ALL PIPE IDENTIFICATION AND FLOW ARROWS ON ALL (NEW AND EXISTING) ENERGY RECOVERY PIPING.

WALL LEGEND	
(X)	1 HOUR RATED WALL - EXISTING

KEYED NOTES

1. INSTALL FOUR (4) NEW ENERGY RECOVERY (ER) COILS AS SCHEDULED.
2. SEE DEMOLITION KEYED NOTE 1 ON SHEET MD101 FOR DETAILED INFORMATION ON THE REMOVAL AND INSTALLATION OF THE NEW ER COILS.
3. FOR EACH OF THE FOUR (4) ER COILS, INSTALL TWO (2) NEW ISOLATION VALVES PRIOR TO THE FLANGE CONNECTION OUTSIDE THE AIR HANDLING UNIT. REFER TO RISER DIAGRAM A2/M-701 FOR MORE INFORMATION.



A5 **KEYPLAN**
NOT TO SCALE

PLAN NORTH

Revision No	DESCRIPTION: REVISIONS	Date:
0	ISSUED FOR CONSTRUCTION	03.21.24

CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NC# P-4086

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043801 CHRISTOPHER R. GRAD
03/25/2024

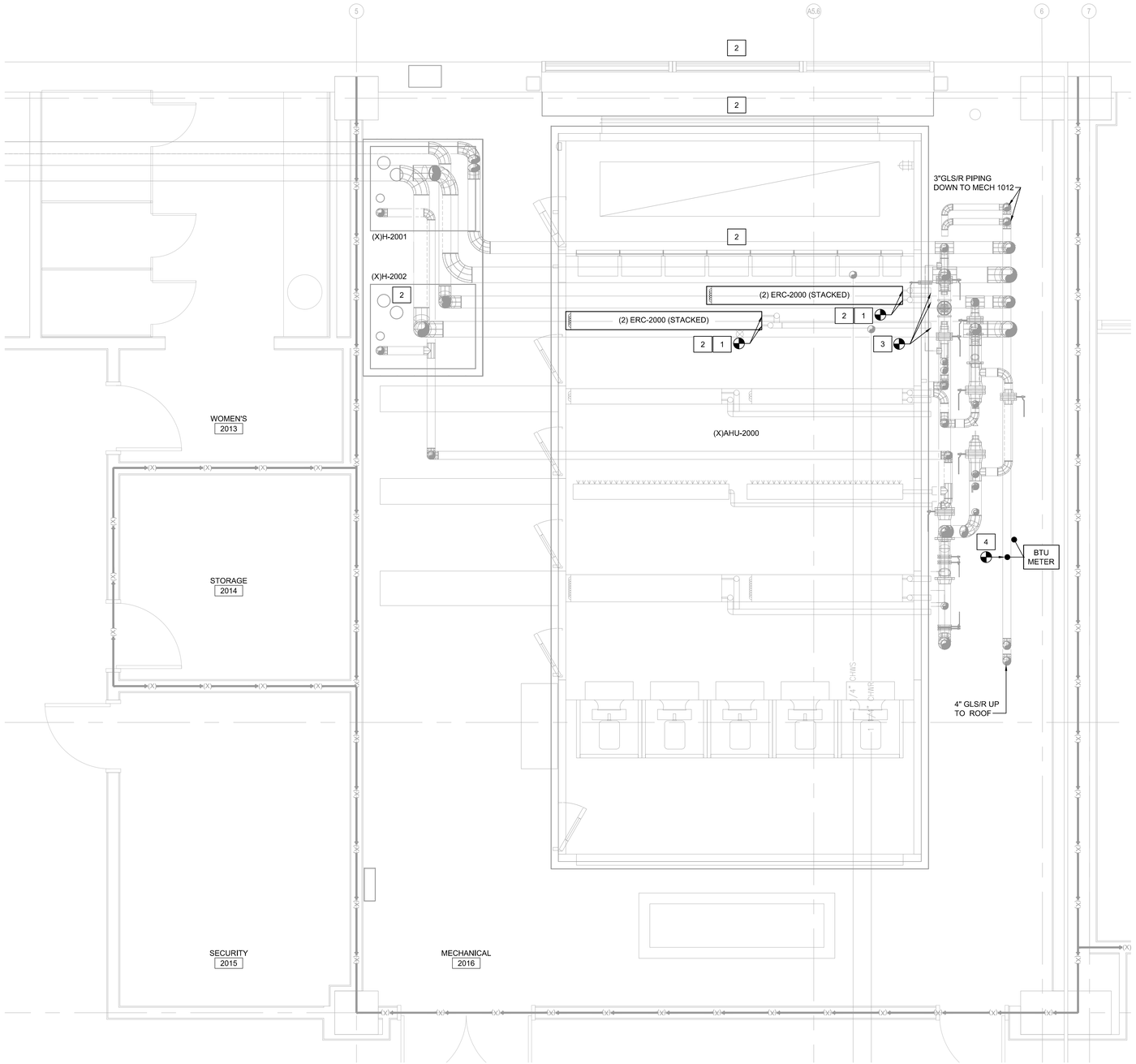
UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

MECHANICAL PIPING
PARTIAL FIRST FLOOR PLAN - MECHANICAL ROOM 1012

JOB NO.:	CBHF: 23260
DRAWN:	CRG
DESIGNED:	CRG
CHECKED:	TOG

DRAWING NO:
MP101

REVISION:
0



A1 **PARTIAL FLOOR PLAN**
3/8" = 1'-0"
0 2' 4' 6'
PLAN NORTH

GENERAL NOTES

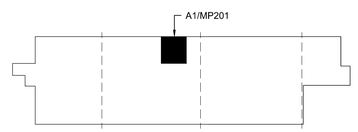
1. DRAWINGS ARE DEVELOPED FROM AS-BUILT DRAWINGS AND LIMITED FIELD OBSERVATIONS. THE MECHANICAL CONTRACTOR IS REQUIRED TO CONFIRM ALL WORK THROUGH FIELD VERIFICATION PRIOR TO COMMENCING ANY WORK.
2. TEST AND BALANCE ENTIRE HEAT RECOVERY HYDRONIC SYSTEM.
3. MECHANICAL CONTRACTOR MUST TEST PIPING FOR LEAKS BEFORE INSTALLING INSULATION AND JACKET.
4. ALL EXISTING ENERGY RECOVERY PIPING TO BE CLEANED AND FLUSHED PRIOR TO BEING PUT BACK INTO SERVICE.
5. PAINT ALL PIPE IDENTIFICATION AND FLOW ARROWS ON ALL (NEW AND EXISTING) ENERGY RECOVERY PIPING.

WALL LEGEND

(X)	1 HOUR RATED WALL - EXISTING

KEYED NOTES

1. INSTALL FOUR (4) NEW ENERGY RECOVERY (ER) COILS AS SCHEDULED.
2. SEE DEMOLITION KEYED NOTE 1 ON SHEET MD201 FOR DETAILED INFORMATION ON THE REMOVAL AND INSTALLATION OF THE NEW ER COIL.
3. FOR EACH OF THE FOUR (4) ER COILS, INSTALL TWO (2) NEW ISOLATION VALVES PRIOR TO THE FLANGE CONNECTION OUTSIDE THE AIR HANDLING UNIT. REFER TO RISER DIAGRAM A2/M-701 FOR MORE INFORMATION.
4. INSTALL BTU METER WITH CONNECTIONS TO BOTH 4" GLR AND GLS LABELED ER PIPING (STACKED ON PLAN). REFER TO CONTROLS NOTES ON SHEET M-601 FOR MORE INFORMATION.



A5 **KEYPLAN**
NOT TO SCALE
PLAN NORTH

Revision No	DESCRIPTION:	Date:
0	ISSUED FOR CONSTRUCTION	03.21.24

REVISIONS

CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NC# P-0586

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043801 TIMOTHY O. GRADY
03/25/2024

UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

MECHANICAL PIPING
PARTIAL SECOND FLOOR PLAN - MECHANICAL ROOM 2016

JOB NO.:	CBHF: 23260
DRAWN:	CRG
DESIGNED:	CRG
CHECKED:	TOG

DRAWING NO:
MP201

REVISION:
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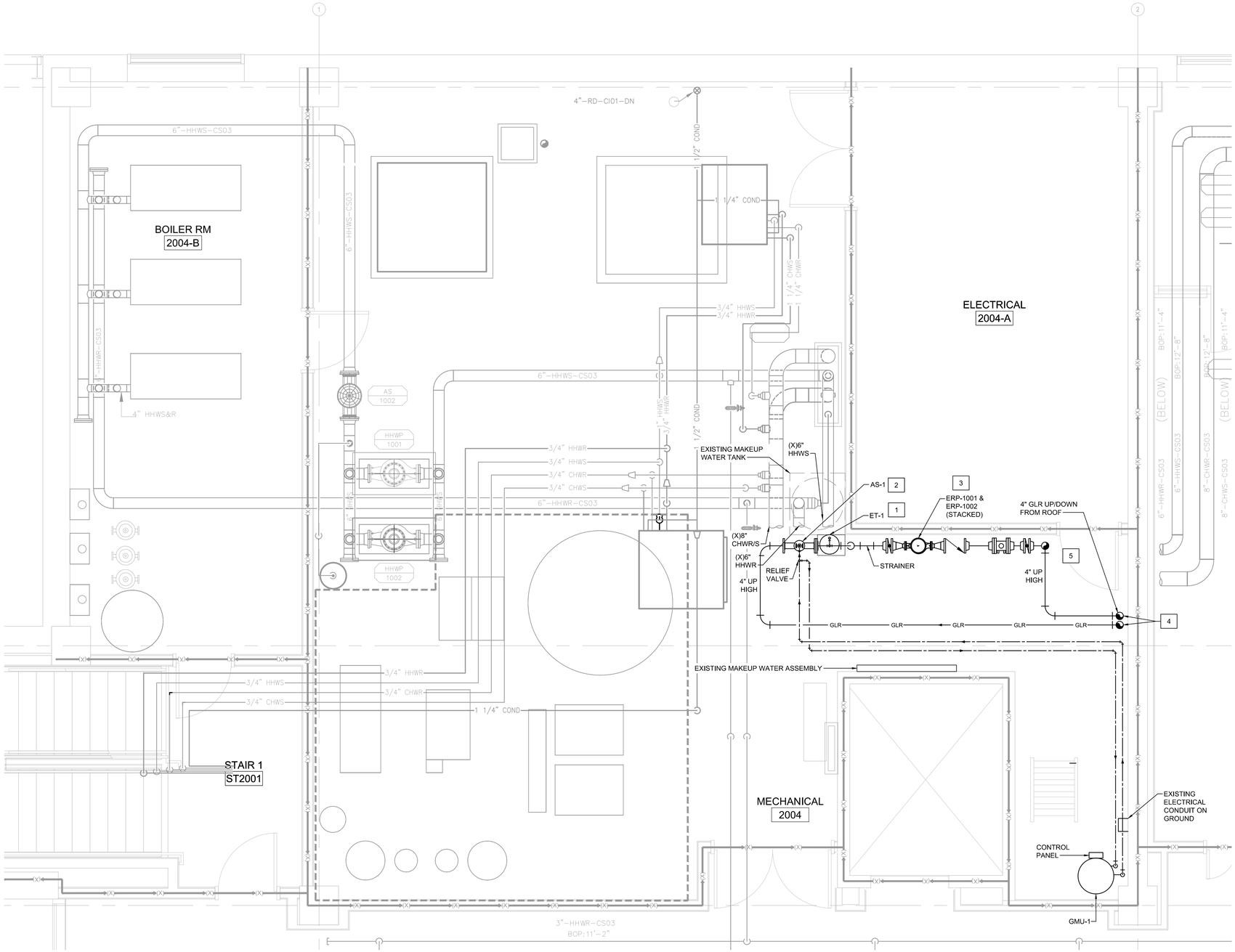

A1 **PARTIAL FLOOR PLAN**
3/8" = 1'-0"
0 2' 4' 6'

PLAN NORTH

GENERAL NOTES

1. DRAWINGS ARE DEVELOPED FROM AS-BUILT DRAWINGS AND LIMITED FIELD OBSERVATIONS. THE MECHANICAL CONTRACTOR IS REQUIRED TO CONFIRM ALL WORK THROUGH FIELD VERIFICATION PRIOR TO COMMENCING ANY WORK.
2. TEST AND BALANCE ENTIRE HEAT RECOVERY HYDRONIC SYSTEM.
3. MECHANICAL CONTRACTOR MUST TEST PIPING FOR LEAKS BEFORE INSTALLING INSULATION AND JACKET.
4. ALL EXISTING ENERGY RECOVERY PIPING TO BE CLEANED AND FLUSHED PRIOR TO BEING PUT BACK INTO SERVICE.
5. PAINT ALL PIPE IDENTIFICATION AND FLOW ARROWS ON ALL (NEW AND EXISTING) ENERGY RECOVERY PIPING.

WALL LEGEND	
-(X)-	1 HOUR RATED WALL - EXISTING

KEYED NOTES

1. INSTALL NEW EXPANSION TANK ON CONCRETE HOUSEKEEPING PAD, SEE DETAIL B4/M-501 FOR MORE INFORMATION.
2. INSTALL AIR SEPARATOR INLINE AND OVERHEAD FOLLOWING MANUFACTURER'S INSTALLATION INSTRUCTIONS, SEE DETAIL B4/M-501 FOR MORE INFORMATION.
3. INSTALL INLINE PUMPS STACKED ABOVE ONE ANOTHER WHILE MAINTAINING MANUFACTURER'S RECOMMENDED CLEARANCES AND FOLLOWING DETAILS A3/M-501 AND A4/M-501.
4. ROUTE 4" GLR PIPING UP TO ROOF. SEE MP301 FOR PLAN CONTINUATION.
5. PIPING INSTALLATION SHALL NOT INTERFERE WITH EXISTING ELECTRICAL ROOM 2004-A DOOR WAY CLEARANCES.

A5 **KEYPLAN**
NOT TO SCALE

PLAN NORTH

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CBHF Engineers, PLLC
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Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NC# P-4086

NORTH CAROLINA PROFESSIONAL SEAL 043801 ENGINEER CRAIG R. GRADY
03/25/2024

UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

MECHANICAL PIPING
PARTIAL SECOND FLOOR PLAN - MECHANICAL ROOM 2004

JOB NO.:	CBHF: 23260
DRAWN:	CRG
DESIGNED:	CRG
CHECKED:	TOG

DRAWING NO:
MP202

REVISION:
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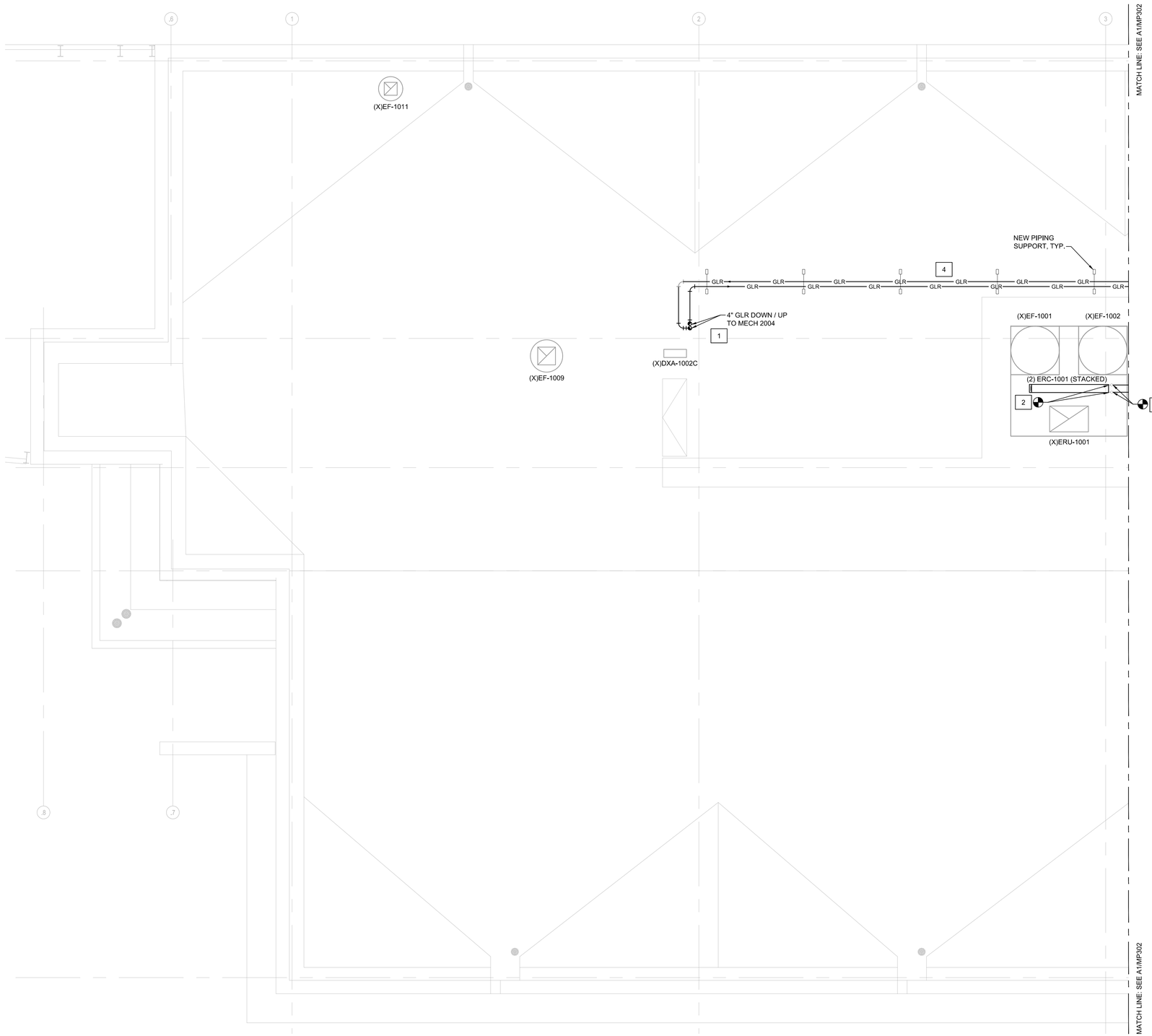


A1 **PARTIAL ROOF PLAN**
3/16" = 1'-0"
0 4' 8' 12'

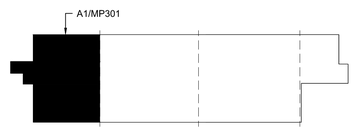
PLAN NORTH

GENERAL NOTES

1. DRAWINGS ARE DEVELOPED FROM AS-BUILT DRAWINGS AND LIMITED FIELD OBSERVATIONS. THE MECHANICAL CONTRACTOR IS REQUIRED TO CONFIRM ALL WORK THROUGH FIELD VERIFICATION PRIOR TO COMMENCING ANY WORK.
2. TEST AND BALANCE ENTIRE HEAT RECOVERY HYDRONIC SYSTEM.
3. MECHANICAL CONTRACTOR MUST TEST PIPING FOR LEAKS BEFORE INSTALLING INSULATION AND JACKET.
4. ALL EXISTING ENERGY RECOVERY PIPING TO BE CLEANED AND FLUSHED PRIOR TO BEING PUT BACK INTO SERVICE.
5. PAINT ALL PIPE IDENTIFICATION AND FLOW ARROWS ON ALL (NEW AND EXISTING) ENERGY RECOVERY PIPING.

KEYED NOTES

1. ROUTE NEW GLR PIPING THROUGH ROOF TO MECHANICAL ROOM 2004 BELOW AND SEAL PENETRATION WEATHER-TIGHT; REFER TO DETAIL D2/M-501. SEE A1/MP202 FOR PLAN CONTINUATION. FOR ADDITIONAL DETAILS, SEE PIPING DIAGRAM ON A2/M-701.
2. INSTALL TWO (2) NEW ENERGY RECOVERY COILS AS SCHEDULED.
3. FOR EACH OF THE TWO (2) ER COILS, INSTALL TWO (2) NEW ISOLATION VALVES. REFER TO RISER DIAGRAM A2/M-701 FOR MORE INFORMATION.
4. INSTALL NEW PIPING ON NEW PIPE SUPPORTS. REFER TO DETAIL B2-M-501 FOR MORE INFORMATION.



A5 **KEYPLAN**
NOT TO SCALE

PLAN NORTH

Revision No	DESCRIPTION:	Date:
0	ISSUED FOR CONSTRUCTION	03.21.24

REVISIONS

CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NCBF P-4088

NORTH CAROLINA PROFESSIONAL SEAL 043801 ENGINEER TRACY O'GRADY
03/25/2024

UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

MECHANICAL PIPING PARTIAL ROOF PLAN

JOB NO.:	CBHF: 23260
DRAWN:	CRG
DESIGNED:	CRG
CHECKED:	TOG

DRAWING NO:
MP301

REVISION:
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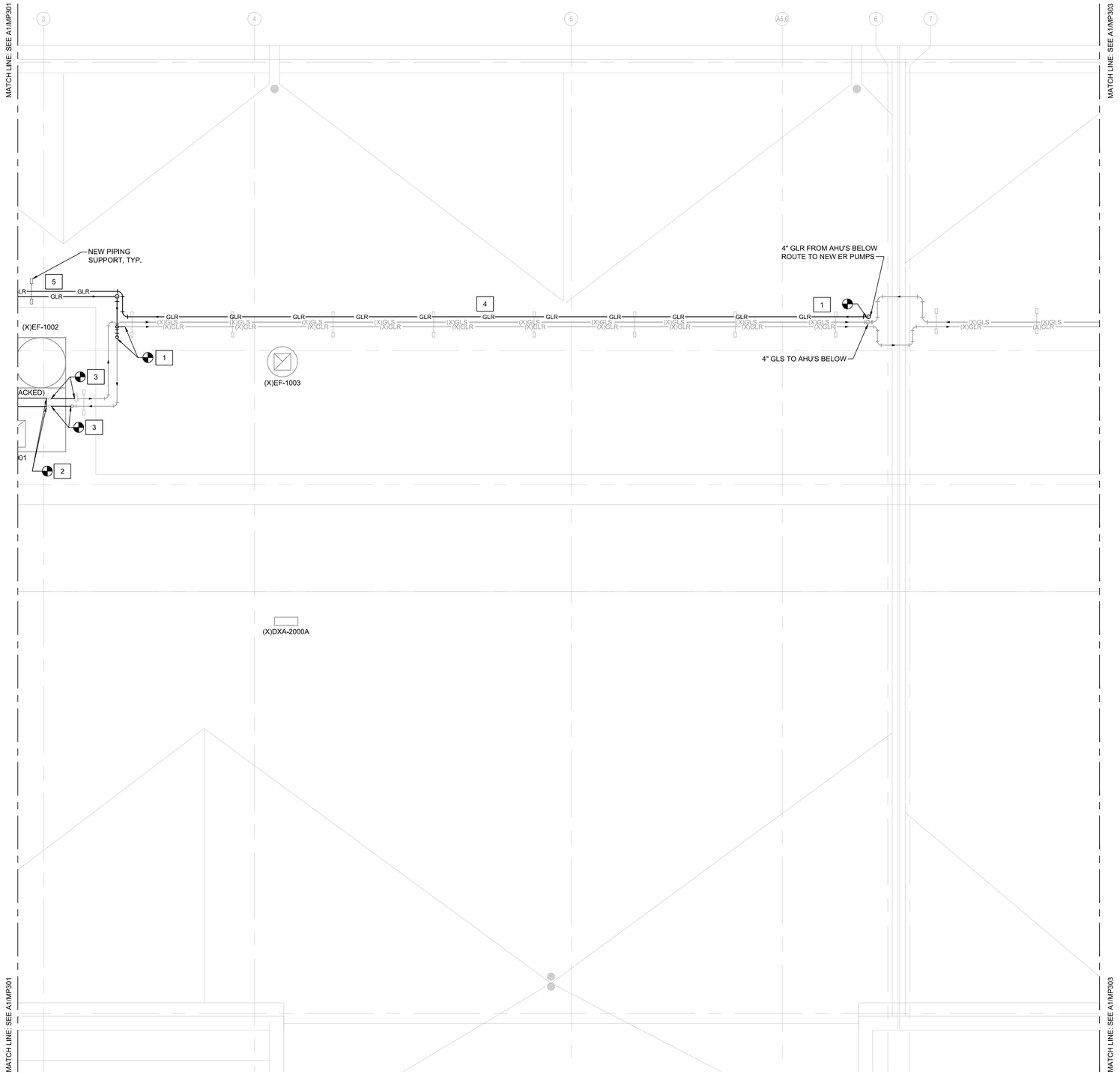


A1 **PARTIAL ROOF PLAN**
3/16" = 1'-0"
0 4' 8' 12'

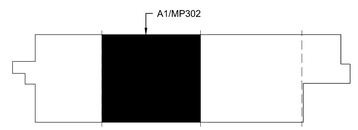
PLAN NORTH

GENERAL NOTES

1. DRAWINGS ARE DEVELOPED FROM AS-BUILT DRAWINGS AND LIMITED FIELD OBSERVATIONS. THE MECHANICAL CONTRACTOR IS REQUIRED TO CONFIRM ALL WORK THROUGH FIELD VERIFICATION PRIOR TO COMMENCING ANY WORK.
2. TEST AND BALANCE ENTIRE HEAT RECOVERY HYDRONIC SYSTEM.
3. MECHANICAL CONTRACTOR MUST TEST PIPING FOR LEAKS BEFORE INSTALLING INSULATION AND JACKET.
4. ALL EXISTING ENERGY RECOVERY PIPING TO BE CLEANED AND FLUSHED PRIOR TO BEING PUT BACK INTO SERVICE.
5. PAINT ALL PIPE IDENTIFICATION AND FLOW ARROWS ON ALL (NEW AND EXISTING) ENERGY RECOVERY PIPING.

KEYED NOTES

1. INSTALL NEW GLR PIPING AND TIE INTO THE EXISTING PIPING AS INDICATED. FOR ADDITIONAL DETAILS, SEE PIPING DIAGRAM ON A2/M-701.
2. INSTALL TWO (2) NEW ENERGY RECOVERY COILS AS SCHEDULED.
3. FOR EACH OF THE TWO (2) ER COILS, INSTALL TWO (2) NEW ISOLATION VALVES. REFER TO RISER DIAGRAM A2/M-701 FOR MORE INFORMATION.
4. SUSPEND NEW PIPING FROM EXISTING PIPE SUPPORTS WHERE APPLICABLE. REFER TO DETAIL B1/M-501 FOR MORE INFORMATION.
5. INSTALL NEW PIPING ON NEW PIPE SUPPORTS. REFER TO DETAIL B2/M-501 FOR MORE INFORMATION.



A5 **KEYPLAN**
NOT TO SCALE

PLAN NORTH

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CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NCBF P-4086

NORTH CAROLINA PROFESSIONAL SEAL 043801 ENGINEER TRACY O'GRADY
03/25/2024

UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

MECHANICAL PIPING PARTIAL ROOF PLAN

JOB NO.:	CBHF: 23260
DRAWN:	CRG
DESIGNED:	CRG
CHECKED:	TOG

DRAWING NO:
MP302

REVISION:
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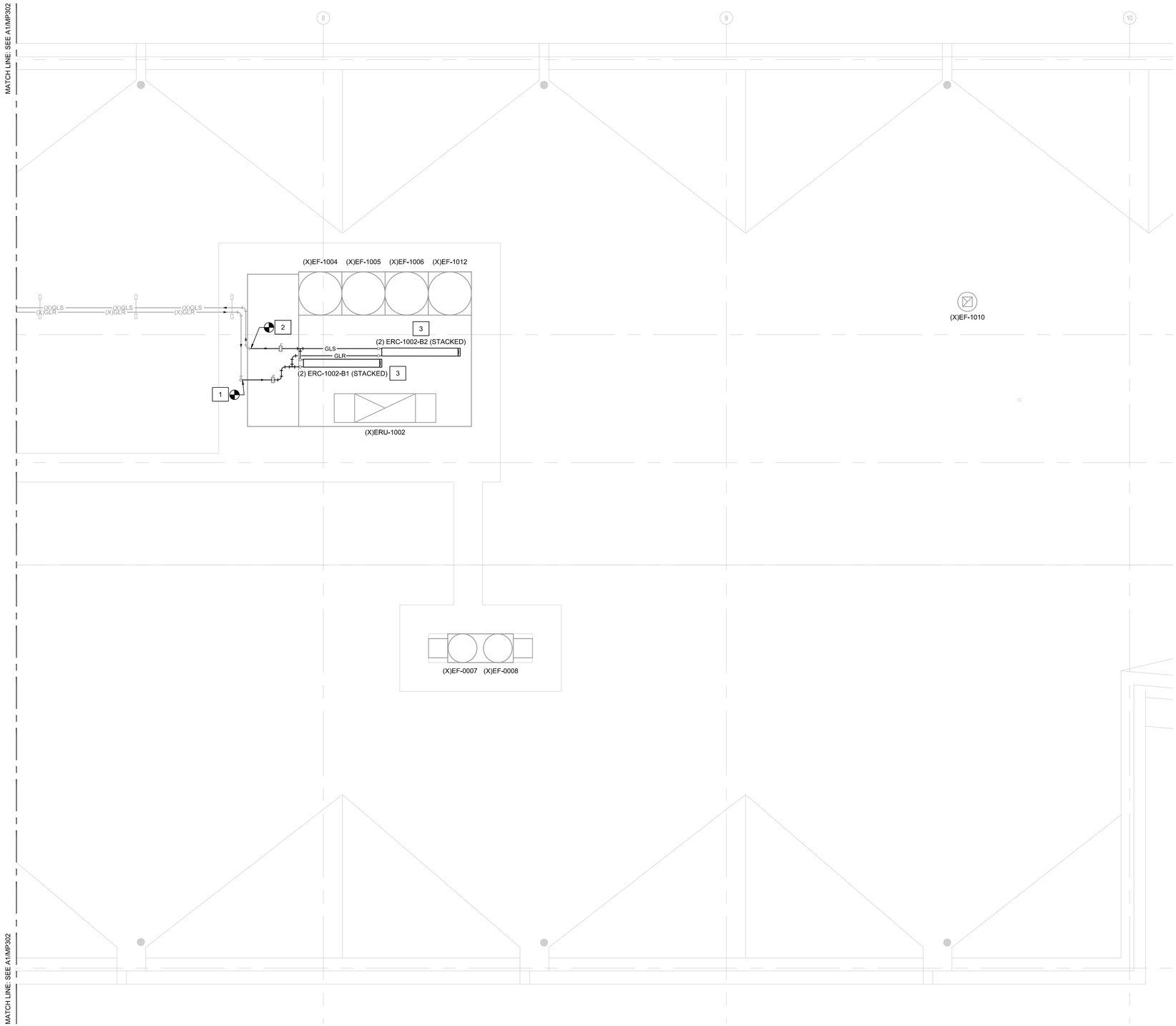

A1 **PARTIAL ROOF PLAN**
3/16" = 1'-0"
0 4' 8' 12'

PLAN NORTH

GENERAL NOTES

1. DRAWINGS ARE DEVELOPED FROM AS-BUILT DRAWINGS AND LIMITED FIELD OBSERVATIONS. THE MECHANICAL CONTRACTOR IS REQUIRED TO CONFIRM ALL WORK THROUGH FIELD VERIFICATION PRIOR TO COMMENCING ANY WORK.
2. TEST AND BALANCE ENTIRE HEAT RECOVERY HYDRONIC SYSTEM.
3. MECHANICAL CONTRACTOR MUST TEST PIPING FOR LEAKS BEFORE INSTALLING INSULATION AND JACKET.
4. ALL EXISTING ENERGY RECOVERY PIPING TO BE CLEANED AND FLUSHED PRIOR TO BEING PUT BACK INTO SERVICE.
5. PAINT ALL PIPE IDENTIFICATION AND FLOW ARROWS ON ALL (NEW AND EXISTING) ENERGY RECOVERY PIPING.

KEYED NOTES

1. INSTALL NEW GLR PIPING AND TIE INTO THE EXISTING PIPING AS INDICATED. FOR ADDITIONAL DETAILS, SEE PIPING DIAGRAM ON A2/M-701.
2. INSTALL NEW GLS PIPING AND TIE INTO THE EXISTING PIPING AS INDICATED. FOR ADDITIONAL DETAILS, SEE PIPING DIAGRAM ON A2/M-701.
3. INSTALL FOUR (4) NEW ENERGY RECOVERY COILS AS SCHEDULED. FOR EACH OF THE FOUR (4) ER COILS, INSTALL TWO (2) NEW ISOLATION VALVES. REFER TO RISER DIAGRAM A2/M-701 FOR MORE INFORMATION.

A5 **KEYPLAN**
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PLAN NORTH

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Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
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NC# P-0586

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STATE ID #: 23-27454-01A

MECHANICAL PIPING PARTIAL ROOF PLAN

JOB NO.:	CBHF: 23260
DRAWN:	CRG
DESIGNED:	CRG
CHECKED:	TOG

DRAWING NO:
MP303

REVISION:
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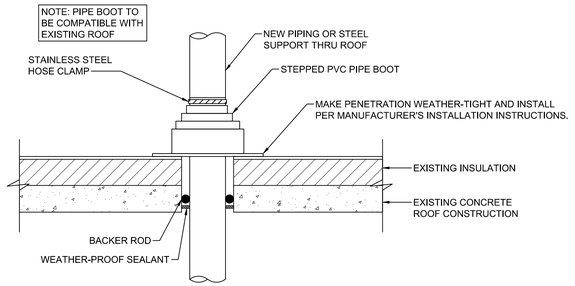
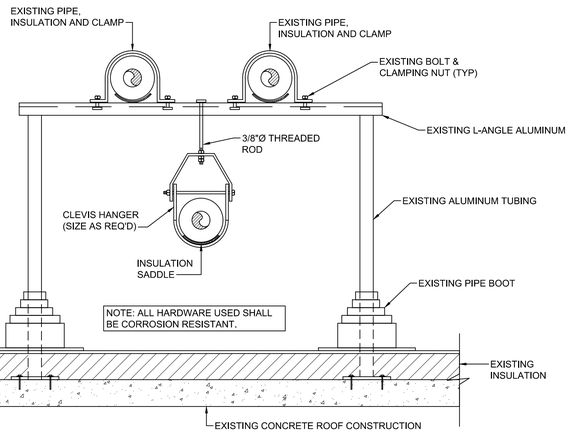


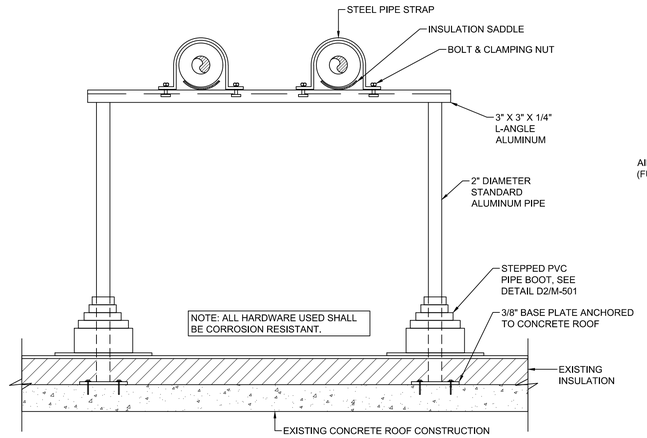
D2 PIPING PENETRATION THRU ROOF DETAIL

NOT TO SCALE



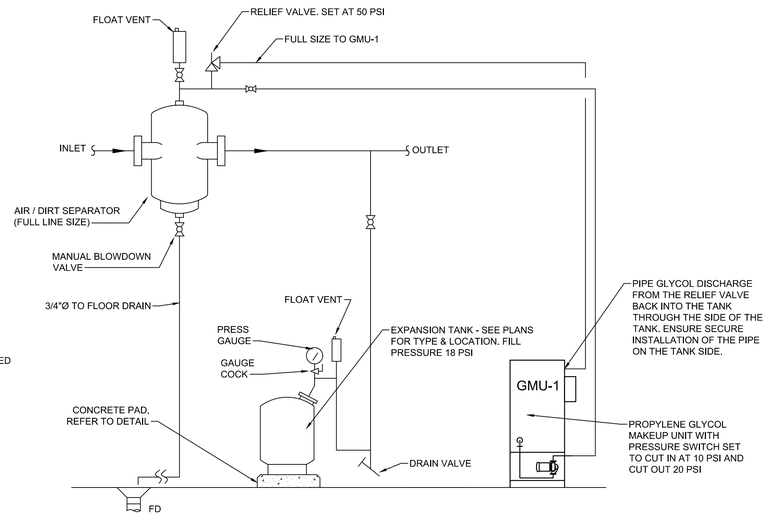
B1 EXISTING EXTERIOR HORIZONTAL PIPE SUPPORT DETAIL

NOT TO SCALE



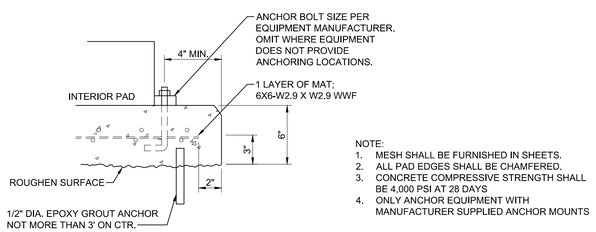
B2 EXTERIOR HORIZONTAL PIPE SUPPORT DETAIL

NOT TO SCALE



B4 AIR/DIRT SEPARATOR, EXPANSION TANK, AND GLYCOL MAKEUP UNIT DETAIL

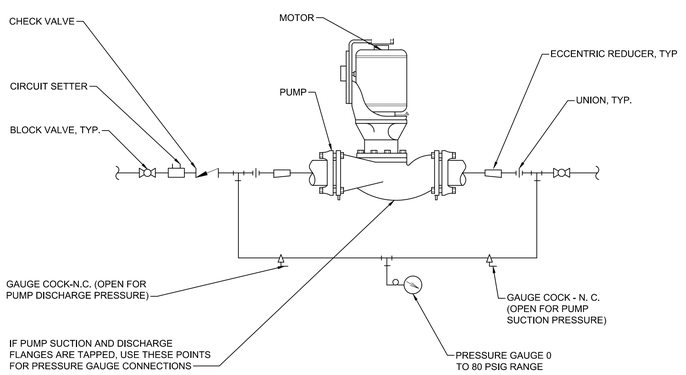
NOT TO SCALE



NOTE:
1. MESH SHALL BE FURNISHED IN SHEETS.
2. ALL PAD EDGES SHALL BE CHAMFERED.
3. CONCRETE COMPRESSIVE STRENGTH SHALL BE 4,000 PSI AT 28 DAYS
4. ONLY ANCHOR EQUIPMENT WITH MANUFACTURER SUPPLIED ANCHOR MOUNTS

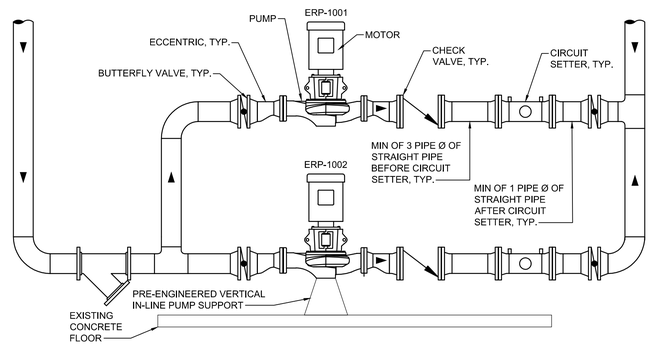
A1 CONCRETE PAD DETAIL

NOT TO SCALE



A3 INLINE PUMP DETAIL

NOT TO SCALE



A4 ENERGY RECOVERY PIPING SECTION

NOT TO SCALE

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REVISIONS

CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NCBF P-0586

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043801 TROY O. GRADY
03/25/2024

UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

MECHANICAL DETAILS

JOB NO.:	CBHF: 23260
DRAWN:	CRG
DESIGNED:	CRG
CHECKED:	TOG

DRAWING NO:
M-501

REVISION:
0

ENERGY RECOVERY COIL SCHEDULE

DRAWING CODE	ASSOCAITED UNIT	LOCATION	DESIGN BASIS MANUFACTURER	MODEL	SYSTEM TYPE	FLUID TYPE	COIL BANK QTY	COIL QTY	AIR FLOW (ACFM)	FLUID FLOW (GPM)	WPD (FT. H20)	PIPE CONN. SIZE (IN)	COIL - SUMMER				COIL - WINTER				OVERALL LENGTH (IN)	CASING HEIGHT (IN)	CASING DEPTH (IN)	TUBE SIZE (IN)	TUBE WALL (IN)	PASSES	ROWS	HAND	FIN MATERIAL	FINS PER INCH	CASE MATERIAL	DRY WEIGHT (LBS.)	NOTES	ACCESSORIES
													EAT (°F db/wb)	LAT (°F db/wb)	EWT (°F)	LWT (°F)	EAT (°F db/wb)	LAT (°F db/wb)	EWT (°F)	LWT (°F)												
ERC-1001	(X)ERU-1001	ROOF	NORTEK COIL SOLUTIONS	5WC8 - 28.5 X 87 X 6 - 10A - LH (NC)	ENERGY RECOVERY	25% PROPYLENE GLYCOL	1	2	14,500	65.0	6.74	2.50	75.5 / N.A	81.7 / N.A	83.5	80.2	68.0 / 67.0	55.6 / 55.6	39.8	55.9	95.00	30.25	10.00	0.625	0.025	8	6	LEFT	ALUMINUM	10	16 GA. 316 SS	377	1-4	A
ERC-1002-B1	(X)ERU-1002	ROOF	NORTEK COIL SOLUTIONS	5WC16 - 40.5 X 90 X 6 - 10A - LH (NC)	ENERGY RECOVERY	25% PROPYLENE GLYCOL	1	2	25,000	32.5	6.74	3.00	75.0 / N.A	78.8 / N.A	82.9	76.3	68.0 / 67.0	62.6 / 62.6	41.7	65.0	98.50	42.25	10.00	0.625	0.025	16	6	LEFT	ALUMINUM	10	16 GA. 316 SS	538	1-4	A
ERC-1002-B2	(X)ERU-1002	ROOF	NORTEK COIL SOLUTIONS	5WC16 - 40.5 X 90 X 6 - 10A - LH (NC)	ENERGY RECOVERY	25% PROPYLENE GLYCOL	1	2	25,000	32.5	6.74	3.00	75.0 / N.A	78.8 / N.A	82.9	76.3	68.0 / 67.0	62.6 / 62.6	41.7	65.0	98.50	42.25	10.00	0.625	0.025	16	6	LEFT	ALUMINUM	10	16 GA. 316 SS	538	1-4	A
ERC-1000	(X)AHU-1000	MECH 1012	INSIGHT PARTNERS	5WC26 - 46.5 x104 x6 - 9A - RH (NC)	ENERGY RECOVERY	25% PROPYLENE GLYCOL	1	4	48,300	65.0	24.00	2.50	84.0 / 75.0	79.9 / 73.9	76.4	83.1	37.0 / N.A	49.4 / N.A.	62.7	40.8	111.50	48.50	10.00	0.625	0.025	26	6	RIGHT	ALUMINUM	9	16 GA. 316 SS	664	1-4	A
ERC-2000	(X)AHU-2000	MECH 2016	INSIGHT PARTNERS	5WC26 - 46.5 x104 x6 - 9A - RH (NC)	ENERGY RECOVERY	25% PROPYLENE GLYCOL	1	4	48,300	65.0	18.00	2.50	84.0 / 75.0	79.9 / 73.9	76.4	83.1	37.0 / N.A	49.4 / N.A.	62.7	40.8	111.50	48.50	10.00	0.625	0.025	26	6	RIGHT	ALUMINUM	9	16 GA. 316 SS	664	1-4	A

NOTES:
1. REFER TO SPECIFICATIONS FOR FURTHER REQUIREMENTS.
2. MECHANICAL CONTRACTOR TO CONFIRM SIZES WITH MANUFACTURER PRIOR TO ORDERING.
3. SCHEDULING OF NEW COIL INSTALLATION SHALL BE COORDINATED WITH BUILDING OWNER.
4. PERFORMANCE PROVIDED ACROSS THE ENTIRE COIL BANK.

ACCESSORIES:
A. COILS SHALL HAVE A FLEXIBLE, EPOXY POLYMER E-COAT UNIFORMLY APPLIED TO ALL COIL SURFACE AREAS WITHOUT MATERIAL BRIDGING BETWEEN FINS. CORROSION DURABILITY WILL BE CONFIRMED THROUGH TESTING TO NO LESS THAN 10,000 HOURS SALT SPRAY RESISTANCE PER ASTMB117. COATED COILS SHALL RECEIVE A SPRAY-APPLIED, UV-RESISTANT POLYURETHANE TOPCOAT TO PREVENT UV DEGRADATION OF THE E-COAT.

PUMP SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	ALTERNATE APPROVED MANUFACTURERS	PUMP TYPE	SERVICE	FLUID	CAPACITY (GPM)	EFFICIENCY (%)	TOTAL DYNAMIC HEAD (FT)	MAX OPERATING PRESSURE (PSIG)	MAX OPERATING TEMPERATURE (°F)	INLET AND OUTLET SIZE (IN.)	CONNECTION TYPE	IMPELLER SIZE (IN.)	MOTOR				NOTES	ACCESSORIES
															ENCLOSURE TYPE	MATERIALS	SPEED (RPM)	(HP) / ELECTRICAL (V/PH/HZ)		
ERP-1001	B&G	E-90-2AAB	TACO, PATTERSON	IN-LINE CENTRIFUGAL	ENERGY RECOVERY WATER MIXTURE LOOP	25% PROPYLENE GLYCOL	130.00	73.80	65.0	175	250	2	FLANGED	4.75	ODP	CAST IRON	3,177	5 / 460/3/60	1	A,B,C
ERP-1002	B&G	E-90-2AAB	TACO, PATTERSON	IN-LINE CENTRIFUGAL	ENERGY RECOVERY WATER MIXTURE LOOP	25% PROPYLENE GLYCOL	130.00	73.80	65.0	175	250	2	FLANGED	4.75	ODP	CAST IRON	3,177	5 / 460/3/60	1	A,B,C

NOTES:
1. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.

ACCESSORIES:
A. PREMIUM EFFICIENT MOTOR
B. BRONZE FITTED
C. VFD

EXPANSION TANK SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	ALTERNATE APPROVED MANUFACTURERS	SERVICE	WORKING PRESSURE (PSIG)	VOLUME (GAL)	ACCEPTANCE VOLUME (GAL)	TYPE	CONFIGURATION	DIM. H/D (IN.)	WEIGHT DRY (LBS)	WEIGHT FULL (LBS)	NOTES	ACCESSORIES
ET-1004	B&G	B35	WESSELS, TACO	ENERGY RECOVERY WATER MIXTURE LOOP	125	10	10.0	BLADDER	VERTICAL	23.5 / 12	40	123	1,2	A

NOTES:
1. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.
2. ASME BOILER AND PRESSURE VESSEL CODE: SECTION VIII, DIVISION 1.

ACCESSORIES:
A. FULL ACCEPTANCE EXPANSION TANK

PROPYLENE GLYCOL MAKEUP UNIT

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	ALTERNATE APPROVED MANUFACTURERS	SERVICE	VOLUME (GAL)	CONFIGURATION	DIM. H/D (IN)	VOLUME (LBS)	NOTES	ACCESSORIES
GMU-1	NEPTUNE	G-50-1-A	B&G, TACO	ENERGY RECOVERY WATER MIXTURE LOOP	50	VERTICAL	61 / 22	592	1,2,3,4,5	A,B,C

NOTES:
1. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.
2. POWER CORD WITH PLUG, 115V AC (60HZ).
3. 50 GALLON POLYETHYLENE TANK MOUNTED IN A STEEL FRAME.
4. BRONZE ROTARY GEAR PUMP, 1/3 HP / 1.5 GPM / 100 PSI.
5. LOW-TANK LEVEL ALARM TO BE INTEGRATED INTO THE BMS.

ACCESSORIES:
A. FLOAT SWITCH FOR LOW LEVEL SAFETY PUMP SHUTOFF AND ALARM
B. AUDIBLE ALARM AND PUSH-BUTTON SILENCER
C. BACNET INTERFACE

AIR/DIRT SEPARATOR SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	ALTERNATE APPROVED MANUFACTURERS	TYPE	FLOW (GPM)	WATER CONNECTIONS		WEIGHT (LBS)	NOTES	ACCESSORIES
						SIZE (IN)	STYLE			
AS-1	B&G	CRSN-4F	WESSELS, TACO	COALESCING, LOW VELOCITY	130.00	4	FLANGED	147	1,2,3	A,B,C

NOTES:
1. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.
2. ASME CERTIFIED, CONSTRUCTED AND STAMPED FOR 125 PSI WORKING PRESSURE @ 200°F.
3. WEIGHT LISTED IS FILLED WEIGHT.

ACCESSORIES:
A. AUTOMATIC AIR VENT
B. MANUAL BLOWDOWN VALVE
C. SKIM VALVE

CONTROL SYSTEM INTEGRATION NOTES:

ENERGY RECOVERY PUMPS: THE CONTROLS CONTRACTOR SHALL MAKE NECCESSARY MODIFICATIONS TO ENSURE THE CURRENT OPERATIONAL SEQUENCES ARE MAINTAINED WITH THE EXCEPTION OF INCORPORATING PUMPS, ERP-1001 AND ERP-1002 TO A LEAD/STANDBY PUMPING ARRANGEMENT, WITH THE LEAD PUMP ROTATING ON THE 1ST AND 15TH OF EVERY MONTH.

A PUMP FAILURE ALARM SHOULD BE INTEGRATED AS FOLLOWS, IF THE PUMP START/STOP RELAY IS ENABLED AND THE CURRENT SWITCH STATUS IS OFF FOR MORE THAN 30 SECONDS(ADJ.), THE BAS CONTROLLER SHALL ANNUNCIATE A PUMP FAILURE ALARM TO THE BMS AND THE BMS CONTROLLER SHALL ENABLE THE STANDBY PUMP. ONCE THE PROBLEM HAS CORRECTED, THE OPERATOR SHALL BE ABLE TO CLEAR THE ALARM FAILURE. THIS SHALL RE-ENABLE THE LEAD/STANDBY SEQUENCE.

EACH PUMP SHALL HAVE A VFD INSTALLED FOR BALANCING. ANY CONTROLS COMPONENTS REQUIRING RELOCATION SHALL HAVE THEIR FUNCTIONALITY CONFIRMED AND REPLACED AS DEEMED NECESSARY. ADDITIONAL CONTROL COMPONENTS REQUIRED TO MAINTAIN THE CURRENT OPERATIONAL SEQUENCE WITH THE ADDITIONAL NEW EQUIPMENT SHALL BE COORDINATED WITH THE MECHANICAL CONTRACTOR AND INSTALLED.

ENERGY RECOVERY COIL CONTROL: COIL SHALL BE BALANCED TO PRESCRIBED FLOW. ASSOCIATED PUMPS ERP-1001 AND ERP-1002 SHALL NOT BE ENERGIZED FOR CIRCULATION TO BOTH COILS UPON AN OUTSIDE AIR TEMPERATURE BETWEEN 40°F AND 55°F. OUTSIDE OF THIS RANGE, BOTH ABOVE AND BELOW, THE PUMP SHALL REMAIN ENERGIZED AND OPERATION AT FULL FLOW CONDITIONS.

BTU METER: INSTALL AT A LOCATION COORDINATED WITH THE MECHANICAL CONTRACTOR, CONTROLS CONTRACTOR AND THE MANUFACTURER'S REPRESENTATIVE. THE SELECTED METER IS TO BE AN ONICON SYSTEM-10 BTU METER, EQUIPPED WITH TWO REGISTERS CAPABLE OF RECORDING BTU USAGE IN EITHER FLOW DIRECTION AS TEMPERATURE CHANGES.

PROPYLENE GLYCOL MAKEUP UNIT: GLYCOL ADDITION IS CONTROLLED BY A PRESSURE SWITCH WITH ADJUSTABLE LOW AND HIGH SET POINTS. WHEN THE PRESSURE IN THE LOOP REACHES THE LOW SET POINT, THE PUMP SHALL BEGIN TO FEED GLYCOL INTO THE SYSTEM UNTIL THE HIGH-PRESSURE SET POINT IS ACHIEVED AND THE SWITCH STOPS THE PUMP. A LOW-TANK LEVEL LIGHT, AUDIBLE ALARM, AND CONTACTS SHALL BE PROVIDED AND INCORPORATED INTO BMS SYSTEM.

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CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
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NC# P-0586

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043801 REGISTERED 03/25/2024

UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

MECHANICAL SCHEDULES AND CONTROLS

JOB NO.:	CBHF: 23260
DRAWN:	CRG
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DRAWING NO:
M-601

REVISION:
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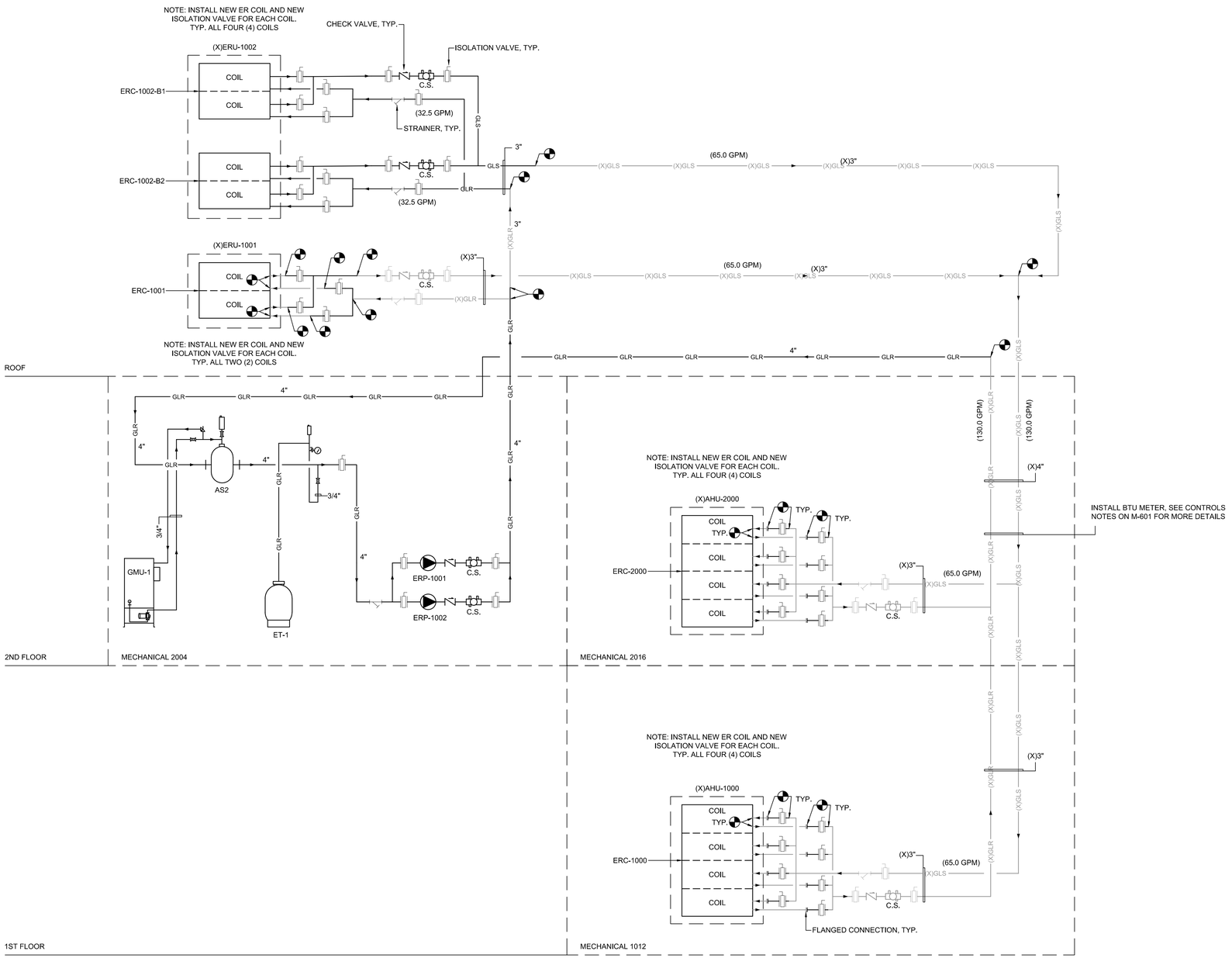

NOTE: SEE EQUIPMENT DETAILS ON SHEET M-501 FOR VALVES, PIPING ACCESSORIES AND ARRANGEMENTS NOT SHOWN ON FLOW DIAGRAM

A2 ENERGY RECOVERY RISER DIAGRAM

NOT TO SCALE

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Fax: 910.791.5266
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043801 CHRISTOPHER R. GRIMM
03/25/2024

UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

MECHANICAL RISER DIAGRAM

JOB NO.:	CBHF: 23260
DRAWN:	CRG
DESIGNED:	CRG
CHECKED:	TOG

DRAWING NO:
M-701

REVISION:
0

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
	CEILING FAN, SEE LIGHTING FIXTURE SCHEDULE FOR TYPE
	2x4 LIGHT FIXTURE, RECESSED OR SURFACE MOUNTED
	2x2 LIGHT FIXTURE, RECESSED OR SURFACE MOUNTED
	4FT OR 8FT LIGHT FIXTURE, RECESSED OR SURFACE MOUNTED
	4FT OR 8FT CHANNEL LIGHT FIXTURE, SUSPENDED OR SURFACE MOUNTED
	UNDER COUNTER LIGHT FIXTURE
	DIRECT/INDIRECT FIXTURE, SUSPENDED
	TRACK WITH LIGHT KIT
	RECESSED LIGHT FIXTURE
	SURFACE LIGHT FIXTURE
	RECESSED WALL WASH LIGHT FIXTURE
	WALL MOUNTED LIGHT FIXTURE
	EXIT SIGN, SINGLE FACE, CEILING, CHEVRON INDICATES DIRECTION.
	EXIT SIGN, DOUBLE FACE, CEILING MOUNTED, CHEVRON INDICATES DIRECTION.
	EXIT SIGN W/EMERGENCY LIGHTING UNIT, CEILING MOUNTED, CHEVRON INDICATES DIRECTION.
	EXIT SIGN, SINGLE FACE, WALL/END MOUNTED, CHEVRON INDICATES DIRECTION.
	EXIT SIGN, DOUBLE FACE, WALL/END MOUNTED, CHEVRON INDICATES DIRECTION.
	EXIT SIGN W/EMERGENCY LIGHTING UNIT, WALL/END MOUNTED, CHEVRON INDICATES DIRECTION.
	EMERGENCY LIGHTING UNIT, 2-HEAD WITH BATTERY BACK-UP, WALL MOUNTED, "NOT SWITCHED"
	EMERGENCY LIGHTING UNIT, 2-HEAD WITH BATTERY BACK-UP, CEILING MOUNTED, "NOT SWITCHED"
	**FOR ALL LIGHTING FIXTURE TYPES ABOVE: LETTER ADJACENT TO FIXTURE INDICATES FIXTURE TYPE, SEE LIGHTING FIXTURE SCHEDULE
	POWER & SWITCH LEG
	UNSWITCHED LEG
	CONDUIT, HOME RUN TO PANEL BOARD
PE	PHOTOCELL, REMOTE MOUNTED, 120V, 10 SECOND TIME DELAY, UL WET LOCATION, RATED FOR 1500 W @ 120 VAC AND 4000 W @ 277 VAC (FOR USE WITH LAMP SOURCE(S) SHOWN.
$	SWITCH, SINGLE POLE, 120/277VAC, 20A, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED, SEE ELECTRICAL DEVICES MOUNTING HEIGHT DETAIL. LOWER CASE LETTER INDICATES FIXTURE SWITCHING, WHEN INDICATED.
$3	3-WAY SWITCH, 120/277 VAC, 20A, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED SEE ELECTRICAL DEVICES MOUNTING HEIGHT DETAIL. LOWER CASE LETTER INDICATES FIXTURE SWITCHING, WHEN INDICATED.
$4	4-WAY SWITCH 120/277 VAC, 20A, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED SEE ELECTRICAL DEVICES MOUNTING HEIGHT DETAIL. LOWER CASE LETTER INDICATES FIXTURE SWITCHING, WHEN INDICATED.
$$	INDICATES BI-LEVEL SWITCHING, 1 SWITCH SWITCHES OUTSIDE LAMPS, 1 SWITCH SWITCHES INSIDE LAMPS. SEE ELECTRICAL DEVICES MOUNTING HEIGHT DETAIL. LOWER CASE LETTER INDICATES FIXTURE SWITCHING, WHEN INDICATED.
$WP	WEATHERPROOF SWITCH, SINGLE POLE 120/277 VAC, 20A, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
D$	DIMMER SWITCH, 0-10V OR LINE VOLTAGE RATING AS REQUIRED BY LIGHTING FIXTURE(S). LINE VOLTAGE RATED DIMMERS MUST BE 1500W FOR 120 VAC AND 4000W 277VAC MINIMUM.
AFC$	ADJUSTABLE FAN CONTROL, 120/277VAC, SINGLE POLE, 20A, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED, SEE ELECTRICAL DEVICES MOUNTING HEIGHT DETAIL. LOWER CASE LETTER INDICATES FIXTURE SWITCHING, WHEN INDICATED

SYMBOL	DESCRIPTION
OS	CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, 360° COVERAGE 2 = SECOND CONTACT TO BE PROVIDED FOR CONNECTION TO BUILDING MANAGEMENT
OS	CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, LONG RANGE COVERAGE 2 = SECOND CONTACT TO BE PROVIDED FOR CONNECTION TO BUILDING MANAGEMENT
OS	WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, 180° COVERAGE 2 = SECOND CONTACT TO BE PROVIDED FOR CONNECTION TO BUILDING MANAGEMENT
OS	WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, PIR TECHNOLOGY OCCUPANCY SENSOR, LOW VOLTAGE (24VDC) 19mA DRAW, WATTSTOPPER CX100-1, LONG RANGE SENSOR. INSTALL WHERE FREE OF OBSTRUCTIONS.
OS	WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, PIR TECHNOLOGY OCCUPANCY SENSOR, LOW VOLTAGE (24VDC) 19mA DRAW, WATTSTOPPER CX100-3, TWO SIDED AISLEWAY. INSTALL WHERE FREE OF OBSTRUCTIONS.
O$	WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, SINGLE BUTTON ON/OFF CONTROL, 180° COVERAGE, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
O$2	WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, DUAL BUTTON ON/OFF CONTROL, 180° COVERAGE, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
O$D	WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, DUAL BUTTON ON/OFF CONTROL WITH 0-10V DIMMING, 180° COVERAGE, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED. WATTSTOPPER DW-311 OR EQUAL.
O$F	WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, DUAL BUTTON ON/OFF CONTROL, 180° COVERAGE, ADDITIONAL POWER SUPPLY FOR FAN OPERATION, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
$T	WALL MOUNTED DIGITAL TIMED SWITCH (5 MIN'S TO 12 HR'S), SINGLE BUTTON ON/OFF CONTROL, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
	RECESSED SINGLE/DOUBLE GANG BOX WITH BLANK COVER PLATE, MOUNTED 16" AFF, UNLESS OTHERWISE NOTED
	RECESSED DEDICATED/PICTURE/CLOCK SINGLE OUTLET, 120VAC, 20A, MOUNTED AS INDICATED ON DRAWING.
	RECEPTACLE, DUPLEX, 120VAC, 20A, MOUNTED 16" AFF, UNLESS OTHERWISE NOTED. (SEE ELECTRICAL MOUNTING HEIGHT DETAIL)
	RECEPTACLE, DUPLEX, 120VAC, 20A, MOUNTED 6" ABOVE COUNTER TOP OR BACK SPLASH.
	RECEPTACLE, QUADPLEX, 120VAC, 20A MOUNTED 16"AFF UNLESS OTHERWISE NOTED (SEE ELECTRICAL MOUNTING HEIGHT DETAIL)
	RECEPTACLE, QUADPLEX, 120VAC, 20A, MOUNTED 6" ABOVE COUNTER TOP OR BACK SPLASH.
	RECEPTACLE, DUPLEX, GROUND FAULT CIRCUIT INTERRUPTER TYPE, 120VAC, 20A, MOUNTED 16" AFF, UNLESS OTHERWISE NOTED. (SEE ELECTRICAL MOUNTING HEIGHT DETAIL)
	RECEPTACLE, DUPLEX, GROUND FAULT CIRCUIT INTERRUPTER TYPE, 120VAC, 20A, MOUNTED 6" ABOVE COUNTER TOP OR BACK SPLASH.
	RECEPTACLE, QUADPLEX, GROUND FAULT CIRCUIT INTERRUPTER TYPE, 120VAC, 20A MOUNTED 16"AFF UNLESS OTHERWISE NOTED (SEE ELECTRICAL MOUNTING HEIGHT DETAIL)
	RECEPTACLE, QUADPLEX, GROUND FAULT CIRCUIT INTERRUPTER TYPE, 120VAC, 20A, MOUNTED 6" ABOVE COUNTER TOP OR BACK SPLASH.
	RECEPTACLE, 250VAC, 2 POLE, 3 WIRE, WALL MOUNTED, SIZE AS INDICATED ON DRAWING
	RECEPTACLE, 480VAC, 2 POLE, 3 WIRE, WALL MOUNTED, SIZE AS INDICATED ON DRAWING
	RECEPTACLE, DUPLEX, 120VAC, 20A CEILING MOUNTED (LAY-IN / GYPBOARD / SUSPENDED)
	RECEPTACLE, DUPLEX, 120VAC, 20A RECESSED FLOOR MOUNTED.
	UPS FED RECEPTACLE, DUPLEX, 120VAC, 20A, MOUNTED 16" AFF, UNLESS OTHERWISE NOTED. (SEE ELECTRICAL MOUNTING HEIGHT DETAIL)
	UPS FED RECEPTACLE, QUADPLEX, 120VAC, 20A, MOUNTED 16" AFF, UNLESS OTHERWISE NOTED. (SEE ELECTRICAL MOUNTING HEIGHT DETAIL)
	**FOR ALL RECEPTACLE TYPES ABOVE: +XX"- INDICATES MOUNTING HEIGHT OF DEVICE IN INCHES AFF (IF GIVEN) (SEE ELECTRICAL MOUNTING HEIGHT DETAIL) WP - LISTED WEATHER-RESISTANT TYPE DEVICE WITH WEATHERPROOF IN USE COVER TR - TAMPER RESISTANT S - INDICATES THE TOP RECEPTACLE OF THE DEVICE IS CONTROLLED VIA WALL SWITCH H - DEVICE MOUNTED HORIZONTALLY U - USB IN-WALL CHARGER
30A/3/3R, W/ 30AF U	DISCONNECT SWITCH, FUSED, HEAVY DUTY, SIZE AS INDICATED ON DRAWINGS ##A = DISCONNECT SIZE / # = NUMBER OF POLES / # = NEMA RATING, / ##AF = FUSE SIZE
CB	ENCLOSED BREAKER, HEAVY DUTY, SIZE AS INDICATED ON DRAWINGS ##A = BREAKER SIZE / # = NUMBER OF POLES / # = NEMA RATING
"Equip" #AMP HMCP (#HP) NEMA #	VARIABLE FREQUENCY DRIVE (VFD)
"Equip" #AMP HMCP (#HP) NEMA #	STARTER, FULL VOLTAGE, SIZE AS INDICATED ON DRAWINGS
U CB	COMBINATION STARTER WITH CIRCUIT BREAKER DISCONNECT, FULL VOLTAGE, SIZE AS INDICATED ON DRAWINGS
M$##	MANUAL MOTOR STARTER, ELECTRICAL CONTRACTOR SHALL COORDINATE POLES AND SIZE WITH EQUIPMENT ## = AMPERAGE RATING WHEN INDICATED ON DRAWING
	1 BUTTON CONTROLLER

SYMBOL	DESCRIPTION
	2 START/STOP PUSHBUTTON CONTROLLER
	3 UP/STOP/DN PUSHBUTTON CONTROLLER
EPO	WALL MOUNTED 120V EMERGENCY OFF PUSH BUTTON WITH RED MUSHROOM STYLE HEAD WITH MANUAL PULL REST, NORMALLY OPEN, WITH CLEAR PROTECTIVE COVER. MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
	WALL MOUNTED PUSH PLATE MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
208/120V / 480/277V	PANELBOARD, SURFACE OR RECESSED MOUNTED AS SHOWN. SIZE, RATINGS, AND MOUNTING AS INDICATED ON PANEL SCHEDULE. CONTRACTOR IS RESPONSIBLE FOR REQUIRED CLEARANCE IN FRONT OF ELECTRICAL PANEL. SEE NEC TABLE 110.26 WORKING SPACES FOR ADDITIONAL CLEARANCE CONDITIONS.
	TRANSFORMER, SIZE AS INDICATED ON DRAWING
	METER
PP	SERVICE POLE, HUBBEL, LEGRAND, OR EQUAL, EXTRUDED ALUMINUM SERVICE POLE, 2-CHANNELS WITH CEILING TRIM, ANODIZED ALUMINUM, MULTI-SERVICE, TWO-CHANNEL POLE WITH (2) KNOCKOUTS, (2) 20AMP RECEPTACLES. ADJUSTABLE T-BAR ASSEMBLY FOR MOUNTING POLES IN MIDDLE OF CEILING. UL LISTED. EACH POWER POLE SHOWN ON PLAN SHALL HAVE PROVISIONS FOR (2) DATA DROPS AND (1) VOICE DROP.
M	ELECTRICAL MOTOR
	GROUND BUS, "E" INDICATES ELECTRICAL GROUND BAR, "TG" INDICATES TELECOMMUNICATIONS GROUND BAR
	CABLE TRAY, LADDER TYPE
	CABLE TRAY, CENTER HUNG TYPE
	CABLE TRAY, BASKET TYPE
	HAND HOLE, IN GRADE, TIER RATING AS INDICATED ON DRAWING
	HATCHING INDICATES ITEMS TO BE DEMOLISHED. REMOVE DEVICE, EQUIPMENT, FIXTURE INDICATED, CIRCUIT, AND CONDUIT BACK TO SOURCE UNLESS OTHERWISE NOTED.
1	DEMOLITION KEY NOTE SYMBOL
1	KEY NOTE SYMBOL
1	REVISION DELTA
WP WAP WALL CLNG	WIRELESS ACCESS POINT, 1 DATA IN A DUAL GANG BOX WITH A SINGLE GANG PLASTER RING, OWNER SHALL PROVIDE SURGE PROTECTOR AND WAP DEVICE, THE ELECTRICAL CONTRACTOR SHALL INSTALL. WP - LISTED WEATHER-RESISTANT TYPE DEVICE
1V/1D	COMBINATION DATA/TELEPHONE OUTLET, MOUNTED 18" AFF UNLESS OTHERWISE NOTED. PROVIDE 11/4" CONDUIT TO ABOVE ACCESSIBLE GRID CEILING W/PULL STRING FOR OUTLETS LOCATED BELOW HARD (GYPBOARD) CEILINGS, ROUTE 11/4" CONDUIT TO TELEPHONE/DATA ROOM. #V = NUMBER OF VOICE CONNECTIONS / #D = NUMBER OF DATA CONNECTIONS, IF INDICATED
	WALL TELEPHONE OUTLET, MOUNTED 60" AFF UNLESS OTHERWISE NOTED. PROVIDE 11/4" CONDUIT TO ABOVE ACCESSIBLE GRID CEILING W/PULL STRING FOR OUTLETS LOCATED BELOW HARD (GYPBOARD) CEILINGS, ROUTE 11/4" CONDUIT TO TELEPHONE/DATA ROOM.
1V/1D	COMBINATION DATA/TELEPHONE OUTLET, RECESSED CEILING MOUNTED (LAY-IN / GYPBOARD) PROVIDE 11/4" CONDUIT TO ABOVE ACCESSIBLE GRID CEILING W/PULL STRING FOR OUTLETS LOCATED BELOW HARD (GYPBOARD) CEILINGS, ROUTE 11/4" CONDUIT TO TELEPHONE/DATA ROOM. #V = NUMBER OF VOICE CONNECTIONS / #D = NUMBER OF DATA CONNECTIONS, IF INDICATED
1V/1D	COMBINATION POWER/DATA/TELEPHONE BOX, RECESSED FLOOR MOUNTED (POKE-THROUGH SIMILAR TO HUBBELL S1PT4X4BRS). PROVIDE BRASS COVER PLATE WITH FLUSH ACCESS COVERS FOR EACH PLUG IN CONNECTION. PROVIDE PULL STRING IN CONDUIT. SEE DETAIL #, SHEET E###
1V/1D 2G	COMBINATION POWER/DATA/TELEPHONE BOX, RECESSED FLOOR MOUNTED (CAST-IN-PLACE). PROVIDE BRASS COVER PLATE WITH FLUSH ACCESS COVERS FOR EACH PLUG IN CONNECTION. PROVIDE PULL STRING IN CONDUIT. SEE DETAIL #, SHEET E### #V = NUMBER OF VOICE CONNECTIONS / #D = NUMBER OF DATA CONNECTIONS; 1"CND UNDER SLAB TO NEAREST WALL, STUB ABOVE CEILING #G = GANG FLOOR BOX WITH TWO DUPLEX RECEPTACLES, VOICE AND DATA
MD FBX	4 GANG FLOOR BOX WITH DUPLEX RECEPTACLE AND DATA CAPABILITIES (CONFIRM WITH OWNER FOR REQUIREMENTS). PROVIDE METALLIC IN-USE COVER (HUBBELL CFB4G30CR OR EQUIVALENT).
	JUNCTION BOX - WALL MOUNTED +##" - INDICATES MOUNTING HEIGHT OF DEVICE IN INCHES AFF (if given)
J	JUNCTION BOX - CEILING/ABOVE CEILING MOUNTED
J	JUNCTION BOX - FLOOR MOUNTED

SYMBOL	DESCRIPTION
	WALL MOUNTED DOUBLE GANG BOX FOR TELEVISION MOUNTED AT 72" AFF UNLESS NOTED OTHERWISE. BOX SHALL HAVE DUPLEX RECEPTACLE AND DATA CONNECTIONS FOR TELEVISION AS DIRECTED BY OWNER/CLIENT/TENANT. BOX SHALL BE PASS & SEYMOUR TV2MW OR APPROVED EQUIVALENT.
	CEILING MOUNTED DOUBLE GANG BOX FOR TELEVISION RECESSED IN CEILING. BOX SHALL HAVE DUPLEX RECEPTACLE AND DATA CONNECTIONS FOR TELEVISION AS DIRECTED BY OWNER/CLIENT/TENANT. BOX SHALL BE PASS & SEYMOUR TV2MW OR APPROVED EQUIVALENT.
ES	ELECTRIC STRIKE
ML	MAGNETIC LOCK
DC	DOOR CONTACTS
CR	CARD READER
K	KEYPAD
MD	MOTION DETECTOR (TYPE DENOTED)
WP	WALL MOUNTED CAMERA, WP INDICATES WEATHERPROOF
	CEILING MOUNTED CAMERA
S	CEILING MOUNTED SPEAKER
S	WALL MOUNTED SPEAKER
	FLOOR MOUNTED DATA RACK
	WALL MOUNTED DATA RACK
	PROJECTOR PAN, CEILING MOUNTED
	1 HOUR RATED FIRE WALL
(X)	1 HOUR RATED FIRE WALL - EXISTING
	2 HOUR RATED FIRE WALL
(X)	2 HOUR RATED FIRE WALL - EXISTING
	3 HOUR RATED FIRE WALL
(X)	3 HOUR RATED FIRE WALL - EXISTING
OHP	OVERHEAD PRIMARY CONDUCTORS
(X)OHP	OVERHEAD PRIMARY CONDUCTORS - EXISTING
UGP	UNDERGROUND PRIMARY CONDUCTORS
(X)UGP	UNDERGROUND PRIMARY CONDUCTORS - EXISTING
OHS	OVERHEAD SECONDARY CONDUCTORS
(X)OHS	OVERHEAD SECONDARY CONDUCTORS - EXISTING
UGS	UNDERGROUND SECONDARY CONDUCTORS
(X)UGS	UNDERGROUND SECONDARY CONDUCTORS - EXISTING
G	COPPER CLASS 1 CONDUCTOR ON ROOF
GA	ALUMINUM CLASS 1 CONDUCTOR ON ROOF
UGG	COPPER CLASS 1 CONDUCTOR BELOW GRADE
C C	CONTROL CABLE CONDUIT
	GROUND ROD, COPPER, 3/4"DIA x 10'-0" LONG
"A"	COPPER AIR TERMINAL IN BRONZE BASE
"B"	ALUMINUM AIR TERMINAL IN ALUMINUM BASE
T	226V - STYLE THRU-ROOF CONNECTOR (TYPE T)
T1	230V - STYLE THRU-ROOF CONNECTOR (TYPE T1)
"BM"	LIGHTNING CONDUCTOR CABLE CONNECTOR
	GROUNDING ELECTRODE CONDUCTOR, 10' COILED ABOVE GRADE

TYPICAL ABBREVIATIONS:

A, AMP	AMPERE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AIC	AMPERE INTERRUPTING CAPACITY
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BOF	BOTTOM OF FIXTURE
BRKR	BREAKER
C, CND	CONDUIT
CAB	CABINET
CAT	CATALOG
CL	CHLORINE
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CLG	CEILING
CP	CONTROL PANEL
CR	CONTROL RELAY, CORROSION RESISTANT
CS	CONTROL SWITCH
CV	CONTROL VALVE
CT	CURRENT TRANSFORMER
CU	COPPER
DC	DIRECT CURRENT
DI	DOOR INTERLOCK
DISC SW	DISCONNECT SWITCH
DN	DOWN
EF	EXHAUST FAN
EM	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
ENCL	ENCLOSURE
EPO	EMERGENCY POWER OFF
EQ, EQIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EPRF	EXPLOSION PROOF
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FBO	FURNISHED BY OTHERS
FLA	FULL LOAD AMPS
FLUOR	FLUORESCENT
FLR	FLOOR
FWE	FURNISHED WITH EQUIPMENT
GEN	GENERATOR
G, GND	GROUND
GFI, GFCI	GROUND FAULT CIRCUIT INTERRUPTER
HH	HANDHOLE
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTO
HP	HORSE POWER
HPF	HIGH POWER FACTOR
HPS	HIGH PRESSURE SODIUM
HTR	HEATER
HV	HIGH VOLTAGE
Hz	HERTZ
IMC	INTERMEDIATE METALLIC CONDUIT
INCAND	INCANDESCENT
JB	JUNCTION BOX
K	THOUSAND
Kcmil	THOUSAND CIRCULAR MILLS
KVA	KILOVOLT AMPERE
KW	KILOWATTS
KWH	KILOWATT-HOURS
LP	LIGHTING PANEL, LIGHT POLE
LTG	LIGHTING
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MH	MANHOLE
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MTG	MOUNTING
MTS	MANUAL TRANSFER SWITCH
MV	MEDIUM VOLTAGE
N, NEUT	NEUTRAL
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
P	POLE
PA	PUBLIC ADDRESS
PB	PULL BOX, PUSH-BUTTON
PF	POWER FACTOR
PH,ϕ	PHASE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PNL	PANEL
PP	POWER PANEL, POWER POLE
PT	POTENTIAL TRANSFORMER
PWR	POWER
RECPT,RCP	RECEPTACLE
REQ'D	REQUIRED
RGS	RIGID GALVANIZED STEEL CONDUIT
RM	ROOM
RTU	REMOTE TELEMETRY UNIT
SCR	DC MOTOR DRIVE
SH	SHEET
SM	SURFACE MOUNTED
SPEC	SPECIFICATION
SS	SELECTOR SWITCH
SST	STAINLESS STEEL
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCH GEAR
TEL	TELEPHONE
TPS	TWISTED PAIR SHIELDED
TVSS, SPD	TRANSIENT VOLTAGE SURGE SUPPRESSER
TYP	TYPICAL
UG, UGND	UNDERGROUND
UH	UNIT HEATER
UON	UNLESS OTHERWISE NOTED
UTIL	UTILITY
V	VOLTS
VFD	VARIABLE FREQUENCY DRIVE
W	WIRE, WATT
WH	WATT-HOUR
WP	WEATHERPROOF
XFMR	TRANSFORMER
(X)	EXISTING

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REVISIONS

CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NCP-P-4086

JASON A. FAMIGLIETTI — NORTH CAROLINA PROFESSIONAL ENGINEER — SEAL 35230 — 03/22/2024

UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K.MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

ELECTRICAL LEGEND & ABBREVIATIONS

JOB NO.:	CBHF: 23260
DRAWN:	AJC
DESIGNED:	AJC
CHECKED:	JPF

DRAWING NO:
E-001

REVISION:
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ELECTRICAL GENERAL NOTES:

1. ALL ELECTRICAL WORK SHALL BE IN FULL COMPLIANCE WITH NFPA 70, THE NORTH CAROLINA STATE BUILDING CODE, ALL LOCAL CODES AND ORDINANCES AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION.

2. ALL EQUIPMENT PROVIDED BY THE CONTRACTOR SHALL BE LISTED AND LABELED BY A THIRD PARTY AGENCY THAT IS AMONGST THOSE ACCREDITED BY THE NORTH CAROLINA BUILDING CODE COUNCIL (NCBCC) TO LABEL ELECTRICAL AND MECHANICAL EQUIPMENT, ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION, FOR THE CONDITIONS OF INSTALLATION. ALL MATERIAL, EQUIPMENT AND DEVICES SHALL BE NEW CURRENT PRODUCTS OF MANUFACTURERS REGULARLY ENGAGED IN THE PRODUCTION OF SUCH PRODUCTS. EQUIPMENT SHALL BE SUITABLE FOR ITS APPLICATION (E.G. WHEN INSTALLED OUTDOORS, IT SHALL BE WEATHERPROOF, ETC.)

3. THE CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS FOR WORK REQUIREMENTS, THE AMOUNT OF SPACE AVAILABLE FOR ELECTRICAL EQUIPMENT, AND LAYOUT HIS WORK IN A COMPATIBLE AND COMPLEMENTARY MANNER.

4. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THOROUGHLY FAMILIARIZING HIMSELF WITH ANY CONTRACTUAL REQUIREMENTS AS MAY BE SET FORTH IN THE OTHER DIVISIONS OF THE PROJECT SPECIFICATIONS.

5. UNLESS SPECIFICALLY NOTED OTHERWISE, SYSTEMS PROVIDED OR INSTALLED BY THE ELECTRICAL CONTRACTOR SHALL BE COMPLETE AND FULLY-FUNCTIONING AFTER INSTALLATION. INCIDENTAL COMPONENTS MAY NOT BE SHOWN, AND ALL WORK WHICH MAY BE REASONABLY IMPLIED AS BEING INCIDENTAL TO THIS WORK, BUT REQUIRED FOR THE PROPER OPERATION OF THE EQUIPMENT OR SYSTEM, SHALL BE PROVIDED BY THE CONTRACTOR AND INCLUDED IN THE BID. ADDITIONAL CIRCUITS SHALL BE INSTALLED WHEREVER NEEDED TO CONFORM TO THE SPECIFIC REQUIREMENTS OF EQUIPMENT.

6. TEMPORARY POWER CONNECTIONS AS REQUIRED SHALL BE PROVIDED BY THE CONTRACTOR AND INCLUDED IN THE BID. ALL TEMPORARY EQUIPMENT WIRING SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE. THE CONTRACTOR SHALL PROVIDE DETAILS, METHODS, MATERIALS, ETC. FOR REVIEW PRIOR TO MAKING TEMPORARY CONNECTIONS. FURNISH AND INSTALL ALL EQUIPMENT AND MATERIALS INCLUDING CONTROL EQUIPMENT, MOTOR STARTERS, BRANCH AND FEEDER CIRCUIT BREAKERS, PANELBOARDS, TRANSFORMERS, ETC. FOR TEMPORARY POWER. COORDINATE WITH THE ELECTRICAL UTILITY COMPANY AS REQUIRED.

7. THE WORK SHALL INCLUDE COMPLETE TESTING OF ALL EQUIPMENT AND WIRING AT THE COMPLETION OF WORK AND ANY MINOR CORRECTIONS, CHANGES OR ADJUSTMENTS NECESSARY FOR THE PROPER FUNCTIONING OF THE SYSTEM AND EQUIPMENT.

8. ALL EQUIPMENT SHOWN DOTTED OR DASHED IS BY OTHERS OR IS EXISTING, AS NOTED.

9. ALL ELECTRICAL EQUIPMENT SHALL, AT ALL TIMES DURING CONSTRUCTION, BE ADEQUATELY PROTECTED AGAINST MECHANICAL INJURY, OR DAMAGE BY WATER AND/OR THE ELEMENTS. ELECTRICAL EQUIPMENT SHALL NOT BE STORED OUT OF DOORS, BUT SHALL BE STORED IN DRY PERMANENT SHELTERS. IF AN APPARATUS HAS BEEN DAMAGED, OR HAS BEEN SUBJECT TO POSSIBLE INJURY BY WATER OR THE ELEMENTS, SUCH DAMAGE SHALL BE REPLACED AT NO ADDITIONAL COST.

10. DO NOT SCALE ELECTRICAL DRAWINGS. FIELD VERIFY ALL DIMENSIONS.

11. CIRCUIT LAYOUTS ARE NOT INTENDED TO SHOW THE NUMBER OF FITTINGS, OR OTHER INSTALLATION DETAILS. UNLESS NOTED OTHERWISE, THE EXACT ROUTING OF FEEDER AND BRANCH CIRCUIT RACEWAYS AND CABLES IS THE RESPONSIBILITY OF THE CONTRACTOR. GENERAL CIRCUIT ARRANGEMENTS ARE SHOWN SCHEMATICALLY/DIAGRAMMATICALLY ONLY. THE CONTRACTOR SHALL ROUTE CONDUITS AS REQUIRED BY THE CONDITIONS OF THE INSTALLATION.

12. UNLESS DIMENSIONED, DEVICE LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. ADJUST EXACT LOCATIONS AS REQUIRED TO SERVE THE INTENDED PURPOSE AND TO AVOID CONFLICTS AND INTERFERENCES WITH OTHER TRADES. EXACT DEVICE LOCATIONS SHALL BE AS INDICATED ON THE ARCHITECTURAL DRAWINGS OR AS DIMENSIONED. IF NOT SHOWN ON THE ARCHITECTURAL DRAWINGS OR DIMENSIONED ON THE ELECTRICAL DRAWINGS, VERIFY EXACT LOCATION WITH THE ARCHITECT/ENGINEER PRIOR TO ROUGH-IN.

13. CONDUIT TERMINATING IN PRESSED STEEL BOXES SHALL HAVE DOUBLE LOCKNUTS AND INSULATED BUSHINGS. CONDUITS TERMINATING IN GASKETED ENCLOSURES SHALL BE TERMINATED WITH GROUNDING TYPE CONDUIT HUBS.

14. DEVICE BOXES SHOWN BACK-TO-BACK SHALL BE OFFSET A MINIMUM OF TWELVE (12) INCHES TO REDUCE SOUND TRANSMISSION BETWEEN ROOMS.

15. BRANCH CIRCUIT HOMERUNS SHOWN ON DRAWINGS INDICATE PHASE CONDUCTORS, NEUTRAL, EQUIPMENT GROUND AS REQUIRED. ADDITIONAL CONDUCTORS REQUIRED FOR CONTROL SHALL BE INCLUDED EVEN IF NOT EXPLICITLY SHOWN.

16. SEAL ALL CONDUIT OPENINGS THROUGH EXTERIOR BUILDING WALLS WATERTIGHT.

17. IN WET LOCATIONS AND EXTERIOR, ALL WIRING DEVICES SHALL BE WEATHER-RESISTANT LISTED WITH WEATHERPROOF WHILE IN USE COVER. LIGHTING FIXTURES SHALL BE APPROPRIATELY RATED AND LISTED FOR THE ENVIRONMENT INCLUDING 0 DEGREE BALLASTS FOR FLUORESCENT.

18. RACEWAYS PENETRATING FLOORS, CEILINGS OR WALLS SHALL BE PROPERLY SEALED SMOKETIGHT.

19. RACEWAYS PENETRATING RATED FLOOR, CEILING OR WALL ASSEMBLIES SHALL BE PROPERLY SEALED IN ACCORDANCE WITH THE CORRESPONDING UNDERWRITERS LABORATORIES (OR OTHER APPROVED THIRD PARTY TESTING AGENCY) APPROVED AND LISTED FIRESTOPPING MATERIALS AND MANUFACTURER APPROVED INSTALLATION TECHNIQUES COMPLYING WITH ALL APPLICABLE CODES. SEE ARCHITECTURAL DRAWINGS FOR IDENTIFICATION OF RATED WALLS AND CEILINGS.

20. ALL RACEWAYS SHALL BE CONCEALED WHERE POSSIBLE. IF APPLICABLE, MATCH EXISTING RACEWAY INSTALLATION METHODS AND ROUTINGS AT OR NEAR EXISTING FACILITIES.

21. INSTALL EXPOSED RACEWAYS PARALLEL TO OR AT RIGHT ANGLES TO NEARBY SURFACES OR STRUCTURAL MEMBERS, AND FOLLOW THE SURFACE CONTOURS AS MUCH AS POSSIBLE. NO DIAGONAL RUNS WILL BE ALLOWED. ALL CONDUITS SHALL BE RUN STRAIGHT AND TRUE. RUN PARALLEL OR BANKED RACEWAYS TOGETHER ON COMMON SUPPORTS WHERE PRACTICAL. MAKE BENDS IN PARALLEL OR BANKED RUNS FROM SAME CENTERLINE TO MAKE BENDS PARALLEL.

22. USE FLUSH MOUNTING OUTLET BOXES IN FINISHED AREAS AND FOR EXTERIOR DEVICES/LIGHT FIXTURES UNLESS NOTED OTHERWISE.

23. PROVIDE AND PLACE ALL SLEEVES FOR CONDUITS PENETRATING WALLS, FLOORS, PARTITIONS, ETC. LOCATE ALL NECESSARY SLOTS FOR ELECTRICAL WORK AND FORM BEFORE CONCRETE IS POURED.

24. PATCHING OF WATERPROOFED SURFACES SHALL RENDER THE AREA OF THE PATCHING COMPLETELY WATERPROOF.

25. ALL MOTORS AND OTHER VIBRATING EQUIPMENT SHALL BE CONNECTED TO THE CONDUIT SYSTEM BY MEANS OF A SHORT SECTION (18 INCH MINIMUM) OF FLEXIBLE CONDUIT UNLESS OTHERWISE INDICATED. AN EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED INSIDE THE FLEXIBLE CONDUIT AND TERMINATE AT THE LOAD END WITH AN APPROVED GROUNDING CLAMP OR LUG.

26. SURFACE MOUNTED PANELBOARDS, JUNCTION, OUTLET AND PULL BOXES, RACEWAYS, ETC., INSTALLED ON EXTERIOR SURFACES OR INSIDE ON EXTERIOR WALLS SHALL BE SUPPORTED BY SPACERS TO PROVIDE A 1/4" MINIMUM CLEARANCE BETWEEN THE WALL AND EQUIPMENT.

27. CEILING MOUNTED DEVICES INSTALLED IN ACOUSTICAL TILE CEILING AREAS SHALL BE SUPPORTED FROM THE STRUCTURE ABOVE WITH RODS OF SUFFICIENT SIZE TO PREVENT VERTICAL MOVEMENT OF THE OUTLET BOX. BRIDGES ALONE ARE NOT ADEQUATE UNLESS SPECIFICALLY APPROVED. CEILING MOUNTED EXIT LIGHT FIXTURES SHALL BE INSTALLED LEVEL. DO NOT SUPPORT DEVICES FROM ACCOUSTICAL CEILING TILE.

28. PROVIDE ADHESIVE BACKED RECEPTACLE DEVICE PLATE LABELS IDENTIFYING THE PANEL AND CIRCUIT FEEDING THE DEVICE. LABELS SHALL INDICATE PANEL AND CIRCUIT NUMBER.

29. FINAL TYPED PANELBOARD DIRECTORIES INSTALLED IN THE PANELBOARD DOOR POCKET SHALL INCLUDE FINAL ACTUAL ROOM NAMES AND NUMBERS IN ADDITION TO THE GENERAL DESCRIPTION SHOWN ON THE PANEL SCHEDULES ON THE DRAWINGS.

30. CONDUCTOR SIZING IS BASED ON 75 DEGREE C. COPPER NEC RATINGS, UNLESS NOTED OTHERWISE. THE CONTRACTOR SHALL VERIFY, PRIOR TO INSTALLATION OF CONDUCTORS OR CONDUIT FEEDING ANY EQUIPMENT, THE ELECTRICAL EQUIPMENT IS RATED FOR USE WITH 75 DEGREE C. WIRING. IF ANY EQUIPMENT IS RATED FOR USE WITH LESS THAN 75 DEGREE C. CONDUCTORS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER IMMEDIATELY FOR EVALUATION/CORRECTION.

31. DO NOT PULL CONDUCTORS UNTIL THE CONDUIT SYSTEM IS COMPLETE IN EVERY DETAIL. IN THE CASE OF CONCEALED WORK, "COMPLETE" MEANS UNTIL ALL ROUGH PLASTERING OR MASONRY HAS BEEN COMPLETED.

32. WHERE SIZE IS NOT SHOWN ON THE DRAWINGS, BRANCH CIRCUITS SHALL CONSIST OF #12 OR #10 AWG MINIMUM PHASE, NEUTRAL AND EQUIPMENT GROUND CONDUCTORS IN 3/4" MINIMUM RACEWAY.

33. USE #10 AWG CONDUCTORS FOR 20 AMPERE, 120 VOLT BRANCH CIRCUITS WITH A TOTAL INSTALLED LENGTH GREATER THAN 75 FEET AND/OR BRANCH CIRCUIT HOMERUNS LONGER THAN 50 FEET, I.E.; #12 AWG INCREASED TO #10 AWG FOR RECEPTACLE BRANCH CIRCUITS OVER 75 FEET TOTAL LENGTH (INCLUDING THE HOMERUN SEGMENT) AND HOMERUNS OVER 50 FEET.

34. KEEP CONDUCTOR SPLICES TO A MINIMUM. INSTALL SPLICES AND TAPES THAT POSSESS EQUIVALENT OR BETTER MECHANICAL STRENGTH AND INSULATION RATINGS THAN CONDUCTORS BEING SPLICED. USE SPLICE AND TAP CONNECTORS COMPATIBLE WITH CONDUCTOR MATERIAL. INSTALL CONDUCTORS AT EACH OUTLET WITH AT LEAST 6 INCHES OF SLACK. CONNECT OUTLETS AND COMPONENTS TO WIRING AND TO GROUND AS INDICATED AND INSTRUCTED BY THE MANUFACTURER.

35. DO NOT SPLICE BRANCH CIRCUIT HOMERUNS WITHOUT THE PERMISSION OF THE ARCHITECT/ENGINEER. HOMERUNS SHALL BE CONTINUOUS FROM THE LAST OUTLET BOX TO THE SERVING PANELBOARD.

36. DO NOT COMBINE BRANCH CIRCUIT HOMERUNS UNLESS SPECIFICALLY INDICATED ON THE DRAWINGS.

37. DO NOT CHANGE CIRCUITING SHOWN WITHOUT PERMISSION OF THE ARCHITECT/ENGINEER.

38. TROUGH TAPS SHALL BE AT SWITCH AMPACITY, UNLESS NOTED OTHERWISE.

39. COORDINATE LOCATIONS OF PLUMBING, MECHANICAL, ELEVATOR, FOOD SERVICE, DATA AND TELEPHONE OF OWNER-PROVIDED EQUIPMENT WITH THE RESPECTIVE CONTRACTORS AND VENDORS AND THE OWNER BEFORE ROUGH-IN. ADJUST RECEPTACLES AND ELECTRICAL EQUIPMENT TO ACCOMMODATE THIS EQUIPMENT. ADVISE THE ARCHITECT/ENGINEER OF CONFLICTS BEFORE ROUGH-IN.

40. BEFORE COMMENCING WORK OR ORDERING MATERIALS, THE CONTRACTOR SHALL COORDINATE WITH OTHER TRADES AND VERIFY THE NAMEPLATE RATINGS OF ALL EQUIPMENT (MOTORS, HEATERS, COMPRESSORS, ETC.) AND ADJUST THE RATINGS OF THE ELECTRICAL EQUIPMENT (SWITCHES, FUSES, CIRCUIT BREAKERS, FEEDERS, ETC.) AS APPROPRIATE TO SERVE THIS EQUIPMENT.

41. UNLESS SPECIFICALLY NOTED OTHERWISE, THE CONTRACTOR PROVIDING THE EQUIPMENT SHALL MAKE FINAL CONNECTIONS TO HIS EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE MECHANICAL, PLUMBING AND GENERAL CONTRACTORS, PRIOR TO ORDERING OR INSTALLATION OF ANY EQUIPMENT, TO VERIFY MECHANICAL, PLUMBING AND GENERAL CONTRACTOR PROVIDED EQUIPMENT REQUIREMENTS ARE PROVIDED IN THE ELECTRICAL DESIGN. IF ELECTRICAL REQUIREMENTS DIFFER FROM THOSE SHOWN ON THE DRAWINGS, THE CONTRACTOR PROVIDING THE EQUIPMENT SHALL BE RESPONSIBLE FOR DESIGN AND CONSTRUCTION COSTS ASSOCIATED WITH CHANGING THE ELECTRICAL SYSTEM TO MATCH UTILIZATION EQUIPMENT.

42. THE MECHANICAL AND PLUMBING CONTRACTORS SHALL FURNISH ALL STARTERS AND CONTROLS FOR THEIR EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL PROVIDE SAFETY SWITCHES AND CIRCUIT BREAKERS AND PROVIDE WIRING AND CONNECTIONS TO THE LINE SIDE OF SAFETY SWITCHES AND/OR CIRCUIT BREAKERS. THE CONTRACTOR PROVIDING THE EQUIPMENT SHALL PROVIDE LOAD SIDE WIRING AND CONNECTIONS TO EQUIPMENT. THE MECHANICAL AND PLUMBING CONTRACTORS SHALL PROVIDE ALL CONTROL WIRING AND CONNECTIONS AND DEVICES FOR THEIR EQUIPMENT.

43. ENERGIZE EQUIPMENT ONLY AFTER OBTAINING PERMISSION FROM THE CONTRACTOR PROVIDING THE EQUIPMENT.

44. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL EQUIPMENT TERMINATIONS, PLUGS AND CORDSETS WITH VENDOR EQUIPMENT AND VERIFY ALL DEVICE LOCATIONS FOR SPECIALITY EQUIPMENT WITH CASEWORK PRIOR TO ROUGH-IN.

45. THE LAYOUT AND PLACEMENT OF ELECTRICAL DISTRIBUTION EQUIPMENT IN ELECTRICAL AND MECHANICAL EQUIPMENT ROOMS IS BASED ON PUBLISHED EQUIPMENT SIZES AND SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE. DEVIATIONS FROM CONFIGURATIONS SHOWN IS THE RESPONSIBILITY OF THE CONTRACTOR. PROVIDE NATIONAL ELECTRIC CODE REQUIRED CLEARANCES FOR ALL ELECTRICAL EQUIPMENT, PANELBOARDS, TRANSFORMERS, SAFETY SWITCHES, SWITCHBOARDS, ETC. COORDINATE RESOLUTION OF CONFLICTS WITH OTHER TRADES. ADVISE THE ARCHITECT/ENGINEER OF CONFLICTS BEFORE ROUGH-IN.

46. COORDINATION WITH THE UTILITY COMPANY FOR PLACEMENT OF THE UTILITY'S FACILITIES AND THE CONTRACTOR'S SERVICE ENTRANCE RACEWAYS AND CONNECTIONS TO THE CONTRACTOR'S SERVICE ENTRANCE CONDUCTORS IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.

47. INSTALLATION INFORMATION PACKED WITH DEVICES AND EQUIPMENT SHALL BE RETAINED FOR INCLUSION IN THE OPERATIONS AND MAINTENANCE MANUALS.

48. PROTECT ALL EXISTING POWER, COMMUNICATIONS, DATA, LIFE SAFETY SYSTEMS, FIRE ALARM AND PUBLIC ADDRESS SYSTEMS AND MAINTAIN THEM IN OPERATION THROUGHOUT THE PROGRESS OF THE WORK. NOTIFY THE OWNER AND ARCHITECT/ENGINEER IF SHUTDOWNS ARE REQUIRED PRIOR TO ANY OUTAGE OF SERVICE. WHERE THE DURATION OF A PROPOSED OUTAGE CANNOT BE TOLERATED BY THE OWNER, PROVIDE TEMPORARY CONNECTIONS AS REQUIRED TO MAINTAIN SERVICE.

49. THE CONTRACTOR SHALL PERFORM ALL CUTTING AND PATCHING NECESSARY TO INSTALL ALL EQUIPMENT AS REQUIRED AND SHALL REESTABLISH ALL FINISHES TO THEIR ORIGINAL CONDITION WHERE CUTTING AND PATCHING OCCUR. ALL CUTTING AND PATCHING SHALL BE DONE IN A THOROUGHLY WORKMANSHIP MANNER. SAW CUT CONCRETE AND MASONRY PRIOR TO BREAKING OUT SECTIONS. ALL PATCHING MATERIALS AND WORKMANSHIP SHALL BE PERFORMED BY TRADESMEN EXPERIENCED IN THAT WORK. ALL WORK SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECT/ENGINEER.

50. CORE DRILL HOLES IN EXISTING CONCRETE WALLS AS REQUIRED.

51. INSTALL WORK AT SUCH TIME AS TO REQUIRE THE MINIMUM AMOUNT TO CUTTING AND PATCHING.

52. CUT OPENINGS ONLY LARGE ENOUGH TO ALLOW EASY INSTALLATION OF THE CONDUIT.

53. WHEN INDICATED, CONNECT NEW LOADS TO EXISTING ABANDONED CIRCUITS SERVING THE SAME AREA AND NOTE CIRCUITS ON AS-BUILT DRAWINGS.

54. EXISTING CIRCUITING WHERE SHOWN IS FOR CONVENIENCE PURPOSES ONLY. VERIFICATION OF EXISTING WIRING DESTINATION, TERMINATION AND ADDITIONS OF NEW LOADS IS THE RESPONSIBILITY OF THE CONTRACTOR.

55. MAINTAIN CONTINUITY OF ALL EXISTING CIRCUITS TO REMAIN OR PORTIONS THEREOF AFFECTED BY THIS WORK.

56. DESIGN AND ADDITION OF NEW CIRCUITING IS BASED ON THE ENGINEER'S BEST INFORMATION REGARDING EXISTING CONDITIONS AND CURRENT DRAWINGS. AVAILABILITY OF ADEQUATE CIRCUIT BREAKER SPACE FOR NEW WORK IN EXISTING PANELBOARDS SHALL BE VERIFIED BY THE CONTRACTOR AFTER DEMOLITION OF THE EXISTING SPACE. IF ADEQUATE SPACE IS NOT AVAILABLE FOR NEW CIRCUIT BREAKERS THE CONTRACTOR SHALL NOTIFY THE ENGINEER FOR RESOLUTION.

57. ABANDONED POWER WIRING, RACEWAYS AND CONDUCTORS, SHALL BE REMOVED BACK TO THEIR SOURCE. THE ACCESSIBLE PORTIONS OF ABANDONED CABLES (VOICE, DATA, VIDEO, ALARM, ETC.) SHALL BE REMOVED.

58. INSOFAR AS POSSIBLE, MATCH EXISTING EXPOSED DEVICES IN FINISHED AREAS IN TYPE, COLOR AND FINISH.

59. THE EXISTING ELECTRICAL SYSTEMS DEPICTED ON THESE DRAWINGS HAVE BEEN COMPILED BY THE ENGINEER FROM THE OWNER'S RECORD DRAWINGS AND LIMITED FIELD VERIFICATION OF THE EXISTING CONDITIONS FOR THE PURPOSE OF INDICATING THE WORK REQUIRED AND ARE BELIEVED TO BE CORRECT. NOTWITHSTANDING, THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, POINTS OF ACCESS AND FIELD CONDITIONS AFFECTING HIS WORK.

60. THE CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH THE EXISTING ELECTRICAL SYSTEMS AND THE EXISTING BUILDING. THE SUBMISSION OF THE PROPOSAL BY THE CONTRACTOR SHALL BE CONSIDERED EVIDENCE THAT HE OR HIS REPRESENTATIVE HAS VISITED THE SITE AND BUILDINGS AND NOTED THE LOCATION AND CONDITIONS UNDER WHICH THE WORK WILL BE PERFORMED AND THAT HE TAKES FULL RESPONSIBILITY OF ALL FACTORS GOVERNING HIS WORK. NO EXTRAS WILL BE CONSIDERED BECAUSE OF ADDITIONAL WORK NECESSITATED BY EXISTING JOB CONDITIONS THAT ARE NOT INDICATED ON THE DRAWINGS.

61. SOME EXISTING RECEPTACLE, LIGHTING OR OTHER LOADS MAY BE SERVED BY CIRCUITS INDICATED TO BE REMOVED. IF SUCH CONDITIONS ARE DISCOVERED, REQUEST THE ARCHITECT/ENGINEER PROVIDE NEW CIRCUIT NUMBER FOR THE LOAD. DO NOT INDISCRIMINATELY CONNECT TO THE NEAREST CIRCUIT.

62. ALL UNUSED OUTLET BOXES SHALL BE REMOVED OR, WITH SPECIFIC APPROVAL OF THE ARCHITECT/ENGINEER, SHALL BE BLANKED WITH STAINLESS STEEL PLATES. ALL OPENINGS IN EXISTING WALLS AND CEILINGS MADE BY THIS CONTRACTOR SHALL BE REPAIRED TO AN EQUAL FINISH AS ADJACENT SURFACES.

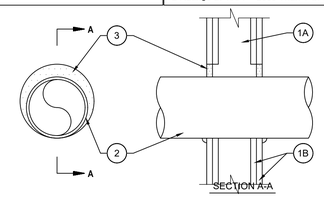
63. THE EXISTING FACILITIES WILL REMAIN OCCUPIED BY STUDENTS AND THE STAFF THROUGHOUT THE PROJECT. AS SUCH, WORK WILL REQUIRE SPECIAL EFFORT BY THIS CONTRACTOR TO ALLOW THE WORK TO PROCEED IN A TIMELY MANNER. ALL ELECTRICAL WORK SHALL BE COORDINATED WITH THE OWNER AND GENERAL CONTRACTOR SO AS TO MINIMIZE DISRUPTION OF THE OWNER'S USE OF THE FACILITIES AND MAINTAIN THE CONSTRUCTION SEQUENCE OF THE GENERAL CONTRACTOR. SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INSTRUCTIONS CONCERNING PHASING AND SEQUENCE OF WORK.

64. SAFETY
   A. COMPLY WITH OSHA AND NEC ARC FLASH PROTECTION REQUIREMENTS.
   B. WHERE EQUIPMENT IS BEING REMOVED, BUT NOT REPLACED, REMOVE THE CONDUCTORS FEEDING THE EQUIPMENT BACK TO THE POINT WHERE THEY RECEIVE POWER. REMOVE ACCESSIBLE CONDUITS. ABANDON IN PLACE INACCESSIBLE CONDUITS. AFTER REMOVAL OF EQUIPMENT, REPAIR ANY OPENING LEFT TO MATCH SURROUNDING WALLS, CEILINGS, OR FLOORS TO THE ARCHITECT/ENGINEER'S SATISFACTION.
   C. COORDINATE WITH THE OTHER TRADES, PRIOR TO BID, AND INCLUDE IN THE BASE BID THE ELECTRICAL DISCONNECTION OF ANY EQUIPMENT BEING DEMOLISHED, EVEN IF NOT EXPLICITLY SHOWN. UNLESS NOTED OTHERWISE, REMOVE ALL DEMOLISHED EQUIPMENT FROM THE PROPERTY.

System No. W-L-1054

January 21, 2020

ANSI / UL1479 (ASTM E814)	CAN / ULC S115
F Ratings - 1 and 2 Hr (See Items 1 & 3)	F Ratings - 1 and 2 Hr (See Items 1 & 3)
T Ratings - 0 Hr	FT Ratings - 0 Hr
L Ratings at Ambient - Less Than 1 CFM / sq ft	FH Ratings - 1and.2 HR (See Items 1 and 3)
L Ratings at 400 F - Less Than 1 CFM / sq ft	FTH Ratings - 0 Hr
	FTH Ratings - 0 Hr L Rating at Ambient - Less Than 1 CFM / sq ft
	L Ratings at 400 F - Less Than 1 CFM / sq ft



1. WALL ASSEMBLY — THE 1 OR 2 HR FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS — WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER SPACED 16 IN. (406 MM) OC. STEEL STUDS TO BE MIN 2-1/2 IN. (64 MM) WIDE AND SPACED MAX 24 IN. (610 MM) OC. FOR M RATING, STEEL STUDS TO BE MIN 3-5/8 IN. (92 MM) WIDE. WHEN STEEL STUDS ARE USED AND THE DIAM OF OPENING EXCEEDS THE WIDTH OF STUD CAVITY, THE OPENING SHALL BE FRAMED ON ALL SIDES USING LENGTHS OF STEEL STUD INSTALLED BETWEEN THE VERTICAL STUDS AND SCREW-ATTACHED TO THE STEEL STUDS AT EACH END. THE FRAMED OPENING IN THE WALL SHALL BE 4 TO 6 IN. (102 TO 152 MM) WIDER AND 4 TO 6 IN. (102 TO 152 MM) HIGHER THAN THE DIAM OF THE PENETRATING ITEM SUCH THAT, WHEN THE PENETRATING ITEM IS INSTALLED IN THE OPENING, A 2 TO 3 IN. (51 TO 76 MM) CLEARANCE IS PRESENT BETWEEN THE PENETRATING ITEM AND THE FRAMING ON ALL FOUR SIDES.
   B. GYPSUM BOARD* — 5/8 IN. (16 MM) THICK, 4 FT (122 CM) WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM BOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 32-1/4 IN. (819 MM) FOR STEEL STUD WALLS. MAX DIAM OF OPENING IS 14-1/2 IN. (368 MM) FOR WOOD STUD WALLS. THE F AND FH RATINGS OF THE FIRESTOP SYSTEM ARE EQUAL TO THE FIRE RATING OF THE WALL ASSEMBLY. THE M RATING IS APPLICABLE ONLY TO 1 HR RATED WALLS.
2. THROUGH-PENETRANTS — ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE SHALL BE MIN 0 IN. TO MAX 2-1/4 IN. (57 MM). PIPE MAY BE INSTALLED WITH CONTINUOUS POINT CONTACT. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:
   A. STEEL PIPE — NOM 30 IN. (762 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
   B. IRON PIPE — NOM 30 IN. (762 MM) DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
   C. CONDUIT — NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR 6 IN. (152 MM) . DIAM STEEL CONDUIT.
   D. COPPER TUBING — NOM 6 IN. (152 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
   E. COPPER PIPE — NOM 6 IN. (152 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
3. FILL, VOID OR CAVITY MATERIAL* — SEALANT — MIN 5/8 IN. (16 MM) THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. AT THE POINT OR CONTINUOUS CONTACT LOCATIONS BETWEEN PIPE AND WALL, A MIN 1/2 IN. (13 MM) DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE PIPE WALL INTERFACE ON BOTH SURFACES OF WALL.

Movement Direction	Penetrant Item	Nominal Penetrant Diameter	Annular Space	Movement	Sealant Depth	F-Rating	L Rating with Movement
Y	2A, 2C*	2 in.	Max 2-1/4 in.	5%	5/8 in.	1 Hr	N/A
Z	2A, 2C*	2 in.	2-1/4 in.	0.25 in.	5/8 in.	1 Hr	N/A

* INDICATES SUCH PRODUCTS SHALL BEAR THE UL OR CUL CERTIFICATION MARK FOR JURISDICTIONS EMPLOYING THE UL OR CUL CERTIFICATION

B4 **1 AND 2 HOUR FIREWALL PENETRATION DETAIL**
NOT TO SCALE

Revision No	DESCRIPTION: REVISIONS	Date:
0	ISSUED FOR CONSTRUCTION	03.21.24

CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NCBELPE-P-0586

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35230 JASON P. FAMIGLIETTI 03/22/2024

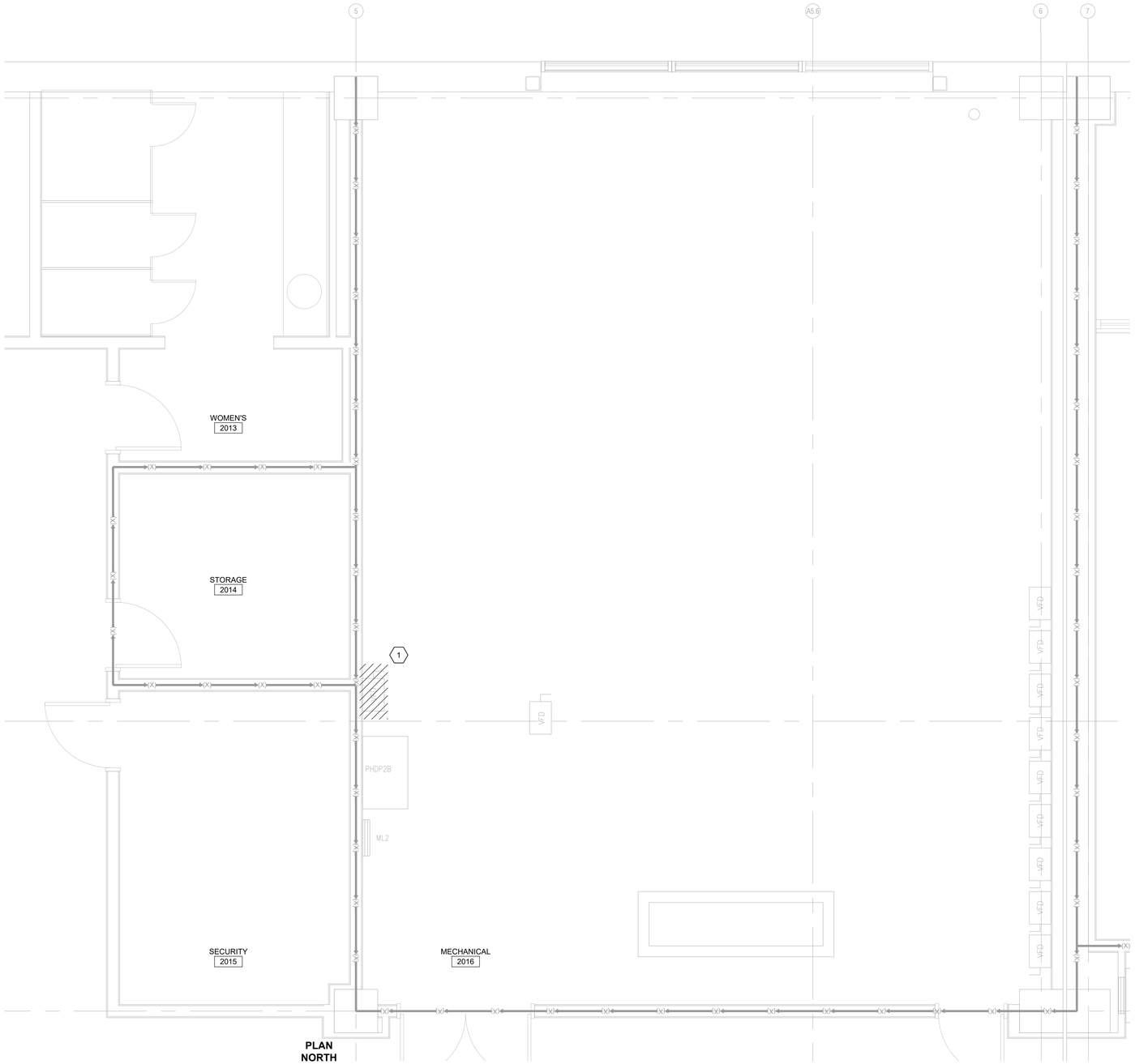
UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

ELECTRICAL
GENERAL NOTES & DETAILS

JOB NO.:	CBHF: 23260
DRAWN:	AJC
DESIGNED:	AJC
CHECKED:	JPF

DRAWING NO:
E-002

REVISION:
0



A1 **PARTIAL SECOND FLOOR PLAN**
3/8" = 1'-0"
0 2' 4' 6'

PLAN NORTH

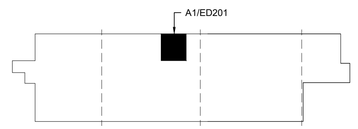
GENERAL NOTES

1. DRAWINGS ARE DEVELOPED FROM LIMITED FIELD OBSERVATIONS. THE ELECTRICAL CONTRACTOR IS REQUIRED TO CONFIRM ALL WORK THROUGH FIELD VERIFICATION PRIOR TO COMMENCING ANY WORK.
2. THE CONTRACTOR MUST MAINTAIN THE FIRE RATING OF ALL FLOORS AND WALLS AS PART OF THIS PROJECT. SEAL ALL PENETRATIONS WITH A UL. APPROVED FIRE-STOPPING METHOD.

WALL LEGEND	
(X)	1 HOUR RATED WALL - EXISTING

KEYED NOTES

1. THE CONTRACTOR MUST DISCONNECT POWER TO THE EQUIPMENT AND REMOVE THE DISCONNECT, FEED CONDUIT, CONDUCTORS, BOXES, STRAPS, ETC. TO PANEL IN ENTIRETY. LABEL BREAKER AS SPARE IN PANEL.



A5 **KEYPLAN**
NOT TO SCALE

PLAN NORTH

Revision No	DESCRIPTION:	Date:
0	ISSUED FOR CONSTRUCTION	03.21.24

REVISIONS

CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NC# P-0086

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35230 JASON P. FAMIGLIETTI
03/22/2024

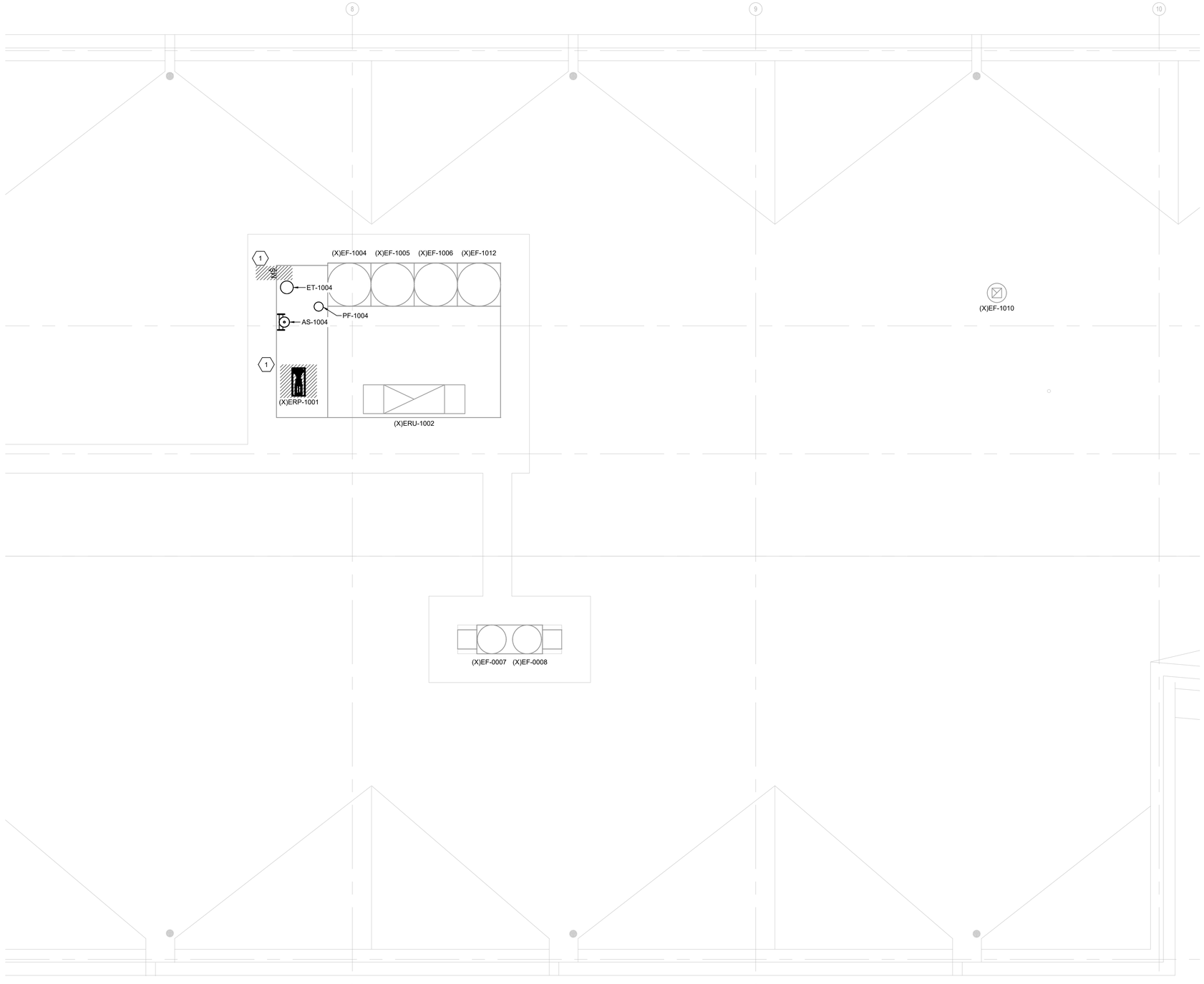
UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

ELECTRICAL DEMOLITION
PARTIAL SECOND FLOOR PLAN

JOB NO.:	CBHF: 23260
DRAWN:	AJC
DESIGNED:	AJC
CHECKED:	JPF

DRAWING NO:
ED201

REVISION:
0



GENERAL NOTES

1. DRAWINGS ARE DEVELOPED FROM LIMITED FIELD OBSERVATIONS. THE ELECTRICAL CONTRACTOR IS REQUIRED TO CONFIRM ALL WORK THROUGH FIELD VERIFICATION PRIOR TO COMMENCING ANY WORK.

WALL LEGEND	
—(X)—	1 HOUR RATED WALL - EXISTING

KEYED NOTES

1. THE CONTRACTOR MUST DISCONNECT POWER TO THE EQUIPMENT AND REMOVE THE DISCONNECT, FEED CONDUIT, CONDUCTORS, BOXES, STRAPS, ETC. TO PANEL IN ENTIRETY. LABEL BREAKER AS SPARE IN PANEL.

A5 KEYPLAN
NOT TO SCALE

PLAN NORTH

A1 PARTIAL ROOF PLAN
3/16" = 1'-0"
0 4' 8' 12'

PLAN NORTH

Revision No	DESCRIPTION:	Date:
0	ISSUED FOR CONSTRUCTION	03.21.24

REVISIONS

CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NCBF P-0068

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35230 JASON P. FAMIGLIETTI
03/22/2024

UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

ELECTRICAL DEMOLITION
PARTIAL ROOF PLAN

JOB NO.:	CBHF: 23260
DRAWN:	AJC
DESIGNED:	AJC
CHECKED:	JPF

DRAWING NO:
ED301

REVISION:
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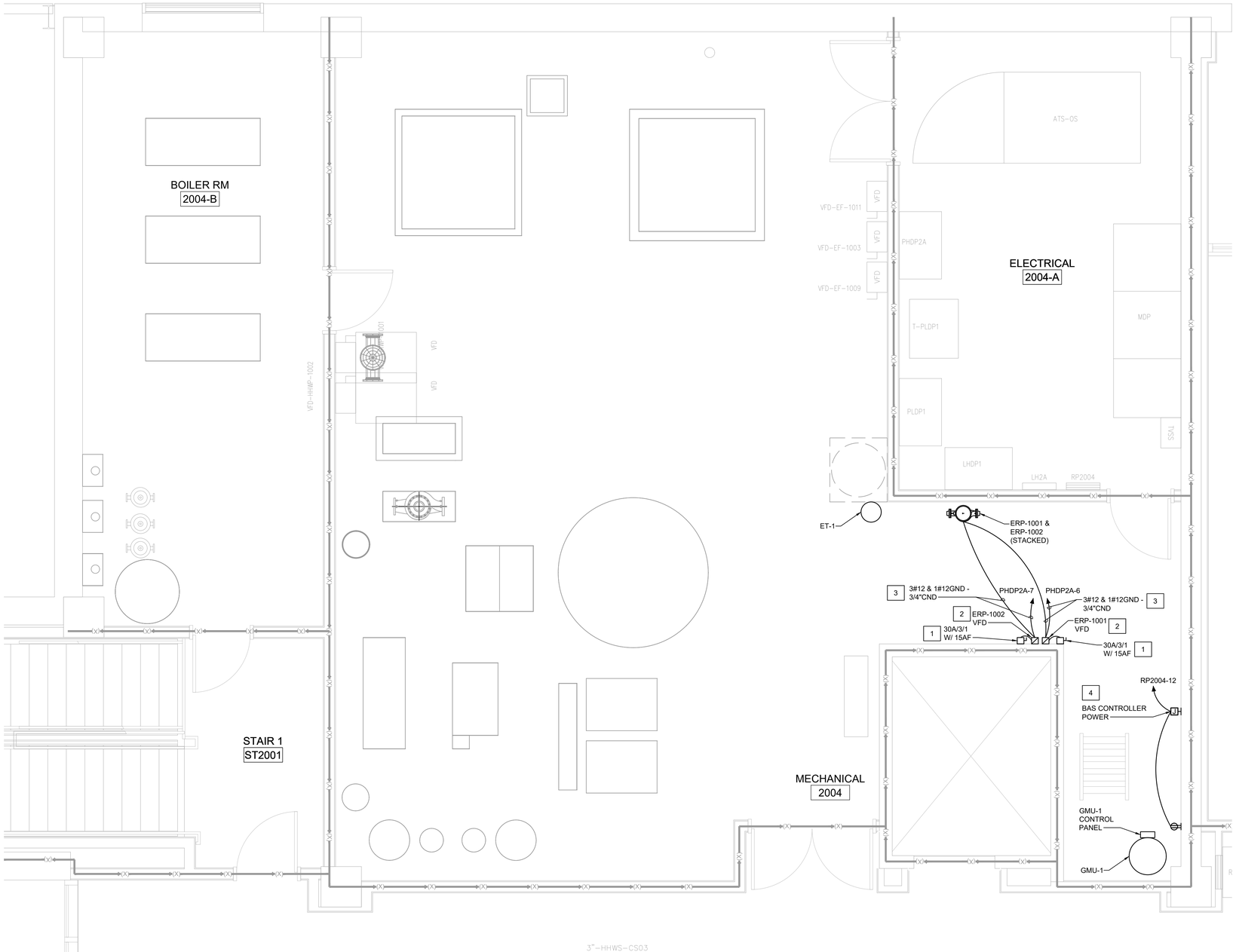


B1 PARTIAL SECOND FLOOR PLAN

3/8" = 1'-0"

0 2' 4' 6'

PLAN NORTH

GENERAL NOTES

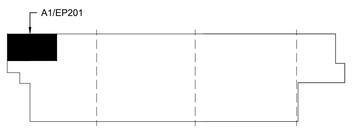
1. DRAWINGS ARE DEVELOPED FROM LIMITED FIELD OBSERVATIONS. THE ELECTRICAL CONTRACTOR IS REQUIRED TO CONFIRM ALL WORK THROUGH FIELD VERIFICATION PRIOR TO COMMENCING ANY WORK.
2. THE CONTRACTOR MUST MAINTAIN THE FIRE RATING OF ALL FLOORS AND WALLS AS PART OF THIS PROJECT. SEAL ALL PENETRATIONS WITH A UL APPROVED FIRE-STOPPING METHOD.

WALL LEGEND

—(X)—	1 HOUR RATED WALL - EXISTING

KEYED NOTES

1. ERP-1001 D.S. & ERP-1002 D.S.: COORDINATE EXACT LOCATION WITH VFD.
2. ERP-1001 VFD & ERP-1002 VFD: COORDINATE PLACEMENT OF VFD WITH DISCONNECT SWITCH AND PUMPS. VFD PROVIDED BY OTHERS AND INSTALLED BY ELECTRICAL CONTRACTOR.
3. LOAD SIDE WIRING: WIRING FROM VFD TO PUMP MUST BE VFC CABLE IN ACCORDANCE WITH SPECIFICATIONS. THE CABLE FROM THE LOAD SIDE OF THE VFD TO THE DRIVEN EQUIPMENT SHALL COMPLY WITH THE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
4. BUILDING AUTOMATION SYSTEM CONTROLLER FOR GLYCOL MAKEUP UNIT AND ENERGY RECOVERY PUMP VFD'S. COORDINATE EXACT LOCATION, CONTROL WIRING, AND CONDUIT WITH CONTROLS CONTRACTOR.



A5 KEYPLAN

NOT TO SCALE

PLAN NORTH

Revision No	DESCRIPTION:	Date:
0	ISSUED FOR CONSTRUCTION	03.21.24

CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NC# P-0586

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35230 JASON C. FAMIGLIETTI
03/22/2024

UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K.MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

ELECTRICAL POWER
PARTIAL SECOND FLOOR PLAN

JOB NO.:	CBHF: 23260
DRAWN:	AJC
DESIGNED:	AJC
CHECKED:	JPF

DRAWING NO:
EP201

REVISION:
0

(X)PANEL PHDP2A

TYPE: NEMA 1 | 480 V, | 3 PH, | 4 WIRE | PROVIDE IF CHECKED: XX XX | EQUIP. GND BUS
BOLT-ON | MOUNT: WALL | NEUTRAL BUS
EATON PRL3A | FEED: BOTTOM | GUTTER TAPS
SUB-FEED LUGS

LOAD SERVED	LOAD VA	CKT BKR	CKT #	LOAD VA A	LOAD VA B	LOAD VA C	CKT #	CKT BKR	LOAD VA	LOAD SERVED
(X)LA-SKID-1001	7,760	40/3	1	13,579			2	30/3	3,919	(X)VAC-SKID-1001
"	7,760	|			13,579			|	5,819	"
"	7,760	|				13,579		|	5,819	"
(X)DVRO-1001	2,110	20/3	3	2,390			4	15/3	280	(X)FCU-ST2001
"	2,110	|			2,390			|	280	"
"	2,110	|				2,390		|	280	"
(X)FCU-2004	1,330	20/3	5	3,436			6	**15/3**	**2,106**	**ERP-1002 (NOTE 1)**
"	1,330	|			3,436			|	**2,106**	**"**
"	1,330	|				3,436		|	**2,106**	**"**
ERP-1001 (NOTE 1)	**2,106**	**15/3**	7	2,386			8	15/3	280	(X)EF-1003
"	**2,106**	**|**			2,386			|	280	"
"	**2,106**	**|**				2,386		|	280	"
(X)EF-1009	3,000	15/3	9	4,390			10	20/3	1,390	(X)B-1001
"	3,000	|			4,390			|	1,390	"
"	3,000	|				4,390		|	1,390	"
(X)B-1002	1,390	20/3	11	2,780			12	20/3	1,390	(X)B-1003
"	1,390	|			2,780			|	1,390	"
"	1,390	|				2,780		|	1,390	"
(X)FCU-2004A	390	15/3	13	780			14	15/3	390	(X)EF-1011
"	390	|			780			|	390	"
"	390	|				780		|	390	"
(X)ACOMP-1	2,522	20/3	15	5,044			16	20/3	2,522	(X)ACOMP-2
"	2,522	|			5,044			|	2,522	"
"	2,522	|				5,044		|	2,522	"
				34,785	34,785	34,785				TOTAL V. AMPS
				126	126	126				CONN. AMPS

NOTE:
1. PROVIDE NEW BREAKER IN PLACE OF EXISTING

(X) INDICATES EXISTING LOAD

400 A. BUS (COPPER)
400 A. MAIN LUGS
65 KAIC MIN.

(X)PANEL RP2004

TYPE: NEMA 1 | 208 V, | 3 PH, | 4 WIRE | PROVIDE IF CHECKED: XX XX | EQUIP. GND BUS
BOLT-ON | MOUNT: SURFACE | NEUTRAL BUS
EATON PRL1A | FEED: TOP | GUTTER TAPS
SUB-FEED LUGS

LOAD SERVED	LOAD VA	CKT BKR	CKT #	LOAD VA A	LOAD VA B	LOAD VA C	CKT #	CKT BKR	LOAD VA	LOAD SERVED
(X)REC. CORRIDOR	1,260	20/1	1	2,520			2	20/1	1,260	(X)REC. CONV. RM 2010
(X)REC. RM 2004	1,620	20/1	3		2,620		4	20/1	1,000	(X)REC. DED. RM 2010
(X)REC. RM 2002,11-15	1,080	20/1	5			2,080	6	20/1	1,000	(X)REC. DED. RM 2010
(X)REC. RM 2016	1,260	20/1	7	1,260			8	20/2		(X)208V RM 2010
(X)REC. OFFICE 2001-E	1,440	20/1	9		1,440		10	|		(X) "
(X)REC. OFFICE 2001-D	1,440	20/1	11			2,504	12	**20/1**	**1,064**	**REC. GMU-1 & BAS CONTROL (NOTE 1)**
(X)REC. OFFICE 2001-C	1,440	20/1	13	1,440			14	**20/1**		**SPARE (NOTE 1)**
(X)REC. OFFICE 2001-B	1,440	20/1	15		2,440		16	20/1	1,000	(X)REC. DED. SECURITY RM 2015
(X)REC. OFFICE 2001-A	1,440	20/1	17			2,440	18	20/1	1,000	(X)REC. DED. SECURITY RM 2015
(X)REC. RM 2000, 2001	720	20/1	19	1,720			20	20/1	1,000	(X)REC. DED. SECURITY RM 2015
(X)EWC CORRIDOR	500	20/1	21		1,500		22	20/1	1,000	(X)REC. DED. SECURITY RM 2015
(X)REC. WIRELESS ROUTER	500	20/1	23			1,500	24	20/1	1,000	(X)REC. DED. SECURITY RM
(X)REC. WIRELESS ROUTER	500	20/1	25	980			26	20/1	480	(X)WH-1001
(X)REC. RM 2001G	360	20/1	27		840		28	20/1	480	(X)WH-1002
(X)REC. COPIER/PRINTER RM 2001G	1,000	20/1	29			1,480	30	20/1	480	(X)WH-1003
(X)REC. CONFERENCE RM 2001	1,440	20/1	31	1,728			32	20/1	288	(X)ACOMP-1 DRYER
(X)PROJECTOR RM 2001	500	20/1	33		788		34	20/1	288	(X)ACOMP-2 DRYER
(X)PROJECTOR SCREEN RM 2001	500	20/1	35			788	36	20/1	288	(X)N2- GEN 1+2 CONTROLS
(X)HEAT TRACE FIRE PUMP RM	1,000	20/1	37	1,100			38	20/1	100	(X)DHWP-1003
(X)REC. LAB AIR COMPRESSOR 1001	1,920	20/1	39		2,020		40	20/1	100	(X)DHWP-1003
(X)LTSREC, ELEV, MACH. RM	350	20/1	41			450	42	20/1	100	(X)DHWP-100
				10,748	11,648	11,242				TOTAL V. AMPS
				90	97	94				CONN. AMPS

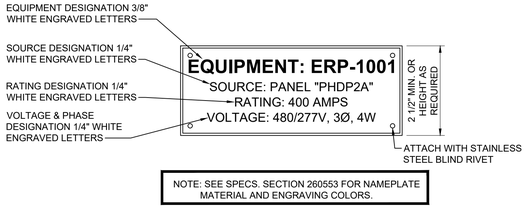
NOTES:
1. PROVIDE NEW BREAKER IN PLACE OF EXISTING

(X) INDICATES EXISTING LOAD

150 A. BUS (COPPER)
150 A. MAIN CIRCUIT BREAKER
10 KAIC MIN.

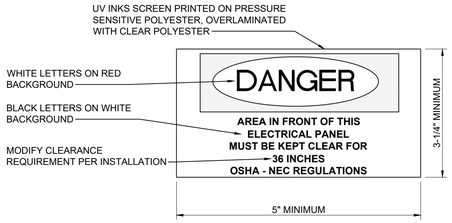
LOAD SUMMARY STATEMENT

MINIMAL LOADS ARE BEING ADDED TO EXISTING PANELBOARDS IN THE MARBIONC BUILDING AS A RESULT OF THIS PROJECT. THERE IS SUFFICIENT CAPACITY IN THE EXISTING SERVICE CONDUCTORS AND EQUIPMENT TO ADD THE PUMPS AND THE GLYCOL MAKEUP UNIT BASED ON OUR RECORD DRAWING REVIEW AND SITE VISIT. THE PANEL SCHEDULES ON THIS SHEET SHOW THAT UPDATED LOAD DEMANDS ARE WELL BELOW PANEL RATINGS.

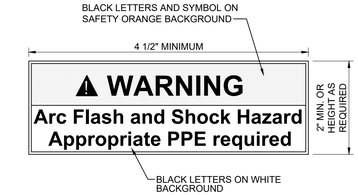


NOTE: SEE SPECS. SECTION 260553 FOR NAMEPLATE MATERIAL AND ENGRAVING COLORS.

C1 TYPICAL EQUIPMENT NAMEPLATE DETAIL
NOT TO SCALE



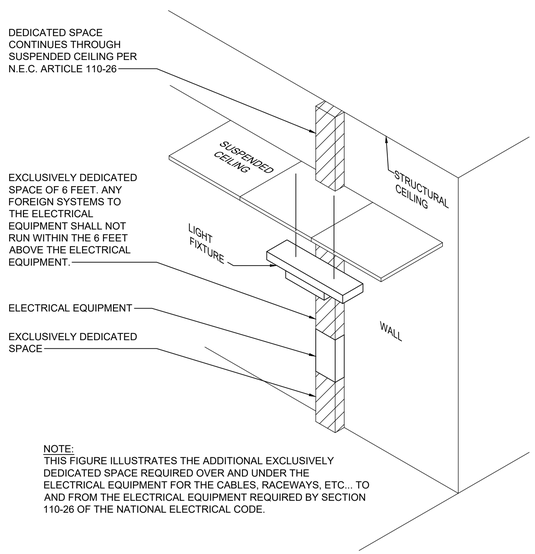
C2 NEC WORKING SPACE LABEL DETAIL
NOT TO SCALE



NOTES:
1. LABEL SHOWN CAN BE SOURCED FROM SAFETYSIGN.COM, OTHER SUPPLIERS ARE COMPLIANTSIGNS.COM & SETON.COM

2. THIS WARNING LABEL MINIMALLY COMPLIES WITH NEC, HOWEVER IF ELECTRICAL EQUIPMENT IS LIKELY TO REQUIRE EXAMINATION OR MAINTENANCE WHILE ENERGIZED A DETAILED SHORT CIRCUIT AND ARC FLASH HAZARD ANALYSIS IS RECOMMENDED.

C4 ELECTRICAL EQUIPMENT WARNING LABEL DETAIL
NOT TO SCALE



NOTE:
THIS FIGURE ILLUSTRATES THE ADDITIONAL EXCLUSIVELY DEDICATED SPACE REQUIRED OVER AND UNDER THE ELECTRICAL EQUIPMENT FOR THE CABLES, RACEWAYS, ETC... TO AND FROM THE ELECTRICAL EQUIPMENT REQUIRED BY SECTION 110-26 OF THE NATIONAL ELECTRICAL CODE.

A1 DEDICATED SPACE FOR ELECTRICAL
NOT TO SCALE

TABLE 110.26(A)(1) - WORKING SPACES

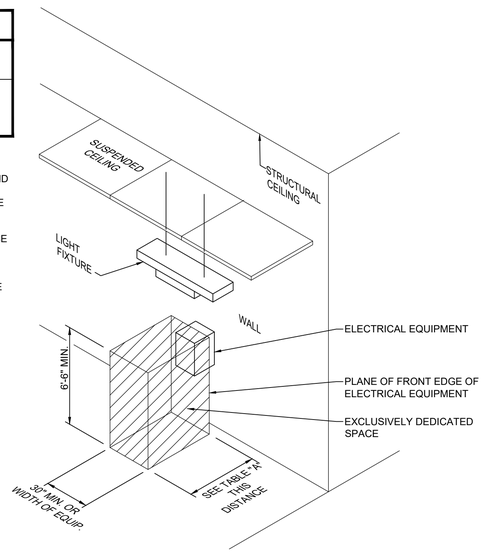
NOMINAL VOLTAGE TO GROUND	MINIMUM CLEAR DISTANCE (FEET)		
	CONDITION 1	CONDITION 2	CONDITION 3
0 - 150	900mm (3 ft)	900mm (3 ft)	900mm (3 ft)
151 - 600	900mm (3 ft)	1.0m (3 ft 6 in.)	1.2 m (4 ft.)
601 - 1000	900mm (3 ft)	1.2 m (4 ft.)	1.5 m (5 ft.)

NOTE: WHERE THE "CONDITIONS" ARE AS FOLLOWS:

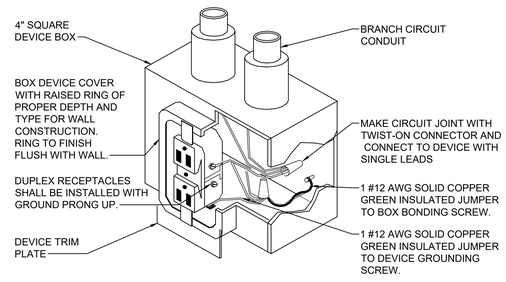
CONDITION 1 - EXPOSED LIVE PARTS ON ONE SIDE OF WORKING SPACE AND NO LIVE OR GROUNDED PARTS ON THE OTHER SIDE OF THE WORKING SPACE, OR EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORKING SPACE THAT ARE EFFECTIVELY GUARDED BY INSULATING MATERIALS.

CONDITION 2 - EXPOSED LIVE PARTS ON ONE SIDE OF THE WORKING SPACE AND GROUNDED PARTS ON THE OTHER SIDE OF WORKING SPACE. CONCRETE BRICK, OR TILE WALLS SHALL BE CONSIDERED GROUNDED.

CONDITION 3 - EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORK SPACE



A2 WORKING CLEARANCE FOR ELECTRICAL
NOT TO SCALE



A4 RECEPTACLE GROUNDING DETAIL
NOT TO SCALE

Revision No	DESCRIPTION:	Date:
0	ISSUED FOR CONSTRUCTION	03.21.24

CBHF Engineers, PLLC
2246 Yaupon Drive
Wilmington, NC 28401
Phone: 910.791.4000
Fax: 910.791.5266
www.cbhfengineers.com
NCP-P-4086

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35230 JASON P. FAMIGLIETTI
03/22/2024

UNCW MARBIONC CENTER FOR MARINE SCIENCE
HEAT RECOVERY SYSTEM REPAIR
5598 MARVIN K MOSS LANE, WILMINGTON, NC 28409
STATE ID #: 23-27454-01A

ELECTRICAL
PANEL SCHEDULES & DETAILS

JOB NO.:	CBHF: 23260
DRAWN:	AJC
DESIGNED:	AJC
CHECKED:	JPF

DRAWING NO:
E-601

REVISION:
0