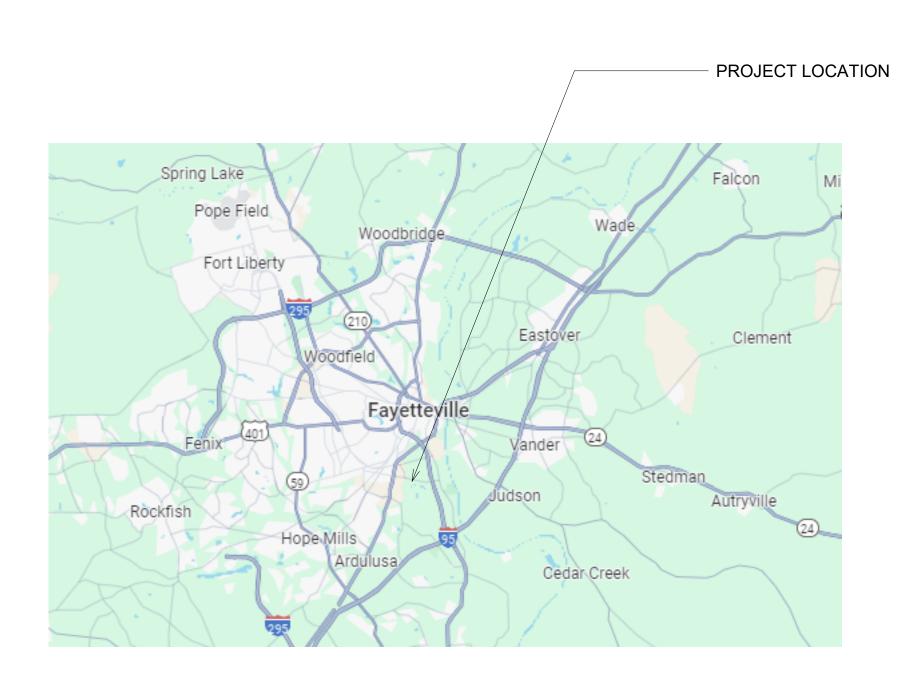
CUMBERLAND COUNTY CENTER 2788-S FAYETTVILLE, NORTH CAROLINA CHILLER REPLACEMENT NOVEMBER 2024



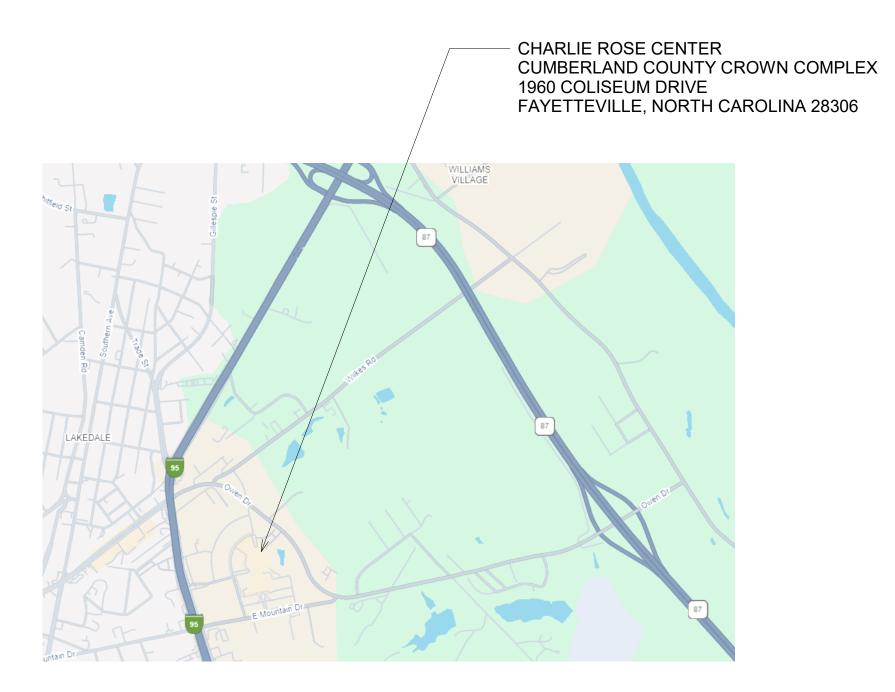


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License Number: F-0115



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MECHAN	IICAL SYMBOL LEGEND
HHWS	HEATING WATER SUPPLY PIPING (ENLARGED PLAN)
= = HHWR= =	HEATING WATER RETURN PIPING (ENLARGED PLAN)
CHWS	CHILLED WATER SUPPLY PIPING (ENLARGED PLAN)
= =CHWR = =	CHILLED WATER RETURN PIPING (ENLARGED PLAN)
D	CONDENSATE DRAIN PIPING (ENLARGED PLAN)
—— HHWS——	HEATING WATER SUPPLY PIPING
— — HHWR— —	HEATING WATER RETURN PIPING
——CHWS ——	CHILLED WATER SUPPLY PIPING
— — CHWR — —	CHILLED WATER RETURN PIPING
D	CONDENSATE DRAIN PIPING
	DIRECTION OF SLOPE FOR PIPE OR DUCT
—— CWS ——	CONDENSER WATER SUPPLY
—— CWR ——	CONDENSER WATER RETURN
	SUPPLY DIFFUSER
	RETURN GRILLE OR REGISTER
	EXHAUST GRILLE OR REGISTER
	TEMPERATURE SENSOR - EQUIPMENT NUMBER
(H)	HUMIDISTAT
FD	FIRE DAMPER
SD	SMOKE DAMPER
<u> </u>	SMOKE DETECTOR
	DUCT DOWN
	DUCT UP
↑	MANUAL VOLUME DAMPER
\bowtie	BUTTERFLY VALVE
+>	PIPE TURN DOWN
+0	PIPE TURN UP
N	PIPE REDUCER
	FLEXIBLE DUCT
(C)	CARBON DIOXIDE SENSOR
(TT) XX-XX	TWIST TIMER - EQUIPMENT NUMBER
T VAV-XX-XX	VAV TEMPERTURE SENSOR
(SP)	DUCT STATIC PRESSURE SENSOR
M	MOTOR OPERATED DAMPER
	MOTOR STARTER/DISCONNECT
s XX-XX	WALL SWITCH - EQUIPMENT NUMBER
IV	ISOLATION VALVES
lacksquare	POINT OF CONNECTION
	POINT OF DISCONNECTION

ENERGY CODE COMPLIANCE **STATEMENT**

MECHANICAL SYSTEM, SERVICE SYSTEMS, AND EQUIPMENT METHOD OF COMPLIANCE

PRESCRIPTIVE ENERGY COST BUDGET

THERMAL ZONE: 3A EXTERIOR DESIGN CONDITIONS:

WINTER DRY BULB: 22.2°F SUMMER DRY BULB: 96.4°F

INTERIOR DESIGN CONDITIONS:

WINTER DRY BULB: 70° F SUMMER DRY BULB: 75° F RELATIVE HUMIDITY: 50%

BUILDING HEATING LOAD: SEE SCHEDULES

BUILDING COOLING LOAD: SEE SHEDULES

MECHANICAL SPACING CONDITIONING SYSTEM: UNITARY - SEE SCHEDULES ON THIS DRAWING BOILER - SEE SCHEDULES CHILLER - SEE SCHEDULES

EQUIPMENT SCHEDULES WITH MOTORS:

EQUIPMENT EFFICIENCIES: SEE SCHEDULES

SEE SCHEDULES DESIGNER STATEMENT: TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE DESIGN OF THIS BUILDING COMPLIES WITH THE MECHANICAL SYSTEM AND EQUIPMENT

REQUIREMENTS OF THE 2012 INTERNATIONAL MECHANICAL CODE.

SCOTT LAWRENCE ENNIS, PE

AN ONSITE SYSTEM INSTALLATION COMPLIANCE REVIEW ALL BE CONDUCTED BY A DESIGN PROFESSIONAL PRIOR TO FINAL INSPECTION AND ISSUANCE OF CERTIFICATION OR OCCUPANCY. THE MECHANICAL CONTRACTOR SHALL MAKE APPROPRIATE PERSONNEL AVAILABLE DURING DESIGN PROFESSIONAL'S ONSITE INSPECTION TO ASSIST WITH REVIEW AND ADDITIONAL EQUIPMENT AND CONTROLS TESTING. CONTRACTOR SHALL SCHEDULE ONSITE INSPECTION WITH DESIGN PROFESSIONAL. A MINIMUM ONE WEEK PRIOR TO VISIT. AT THE TIME OF THE VISIT THE MECHANICAL CONTRACTOR SHALL PROVIDE THE FOLLOWING FOR REVIEW BY THE LOCAL AHJ AND DESIGN PROFESSIONAL:

- A COMPLETED TEST AND BALANCE REPORT - A COPY OF ALL OPERATION AND MAINTENANCE MANUALS - DOCUMENTATION THAT EQUIPMENT INSTALLER HAS FOLLOWED THE MANUFACTURER'S RECOMMENDATIONS FOR STARTUP AND TESTING OF ALL EQUIPMENT.

THE CONTRACT DOCUMENTS ARE COMPLIMENTARY AND WHAT IS REQUIRED BY ONE SHALL BE AS BINDING AS IF REQUIRED BY ALL. IN THE CASE OF A CONFLICT, DISAGREEMENT, OR AMBIGUITY, PROVIDE THE BETTER QUALITY. IN THE CASE OF A CONFLICT, DISAGREEMENT, OR AMBIGUITY, PROVIDE THE GREATER QUANTITY OF WORK.

COORDINATE ALL WORK WITH THAT OF THE OTHER DISCIPLINES PRIOR TO THE INSTALLATION OF ANY PIPING, OR EQUIPMENT.

PERFORM A COMPLETE REVIEW OF THE CONTRACT DOCUMENTS PRIOR TO INSTALLATION OF THE MECHANICAL SYSTEMS AND REVIEW ANY CONFLICTS WITH THE ENGINEER. DURING THE CONSTRUCTION PROCESS PROTECT ALL MECHANICAL EQUIPMENT, DEVICES, PIPING AND APPURTENANCES FROM DIRT AND DEBRIS. STORE IN A COVERED LOCATION

ENSURE THAT ITEMS TO BE FURNISHED OR PROVIDED WILL FIT IN THE SPACE AVAILABLE. MAKE NECESSARY FIELD MEASUREMENTS TO ASCERTAIN SPACE REQUIREMENTS, INCLUDING THOSE FOR CONNECTIONS, AND PROVIDE SUCH SIZES AND SHAPES OF EQUIPMENT THAT ARE THE TRUE INTENT AND MEANING OF THE CONTRACT DOCUMENTS. PROVIDE THE ENGINEER WITH SCALED COORDINATION DRAWINGS OF ALL MECHANICAL SPACES AND ABOVE CEILING INSTALLATIONS.

LOCATE ALL EQUIPMENT TO PROVIDE MAXIMUM SPACE FOR MAINTENANCE AND SERVICE. INSTALLATION OF PIPING AND DUCTWORK SHALL NOT INTERFERE WITH WALKWAYS, PATHS,

PROVIDE ALL ELECTRICAL AND CONTROL CONNECTIONS TO THE EQUIPMENT PROVIDED. REFER TO THE ELECTRICAL DRAWINGS FOR LOCATIONS OF JUNCTION BOXES, DISCONNECTS, CIRCUIT BREAKERS (PANELBOARDS). TYPE, SIZE, AND NUMBER OF CONDUCTORS AND CONDUITS TO EQUIPMENT SHALL BE EQUIVALENT TO THE CONDUCTORS AND CONDUITS PROVIDED BY DIVISION 26. IN CASE OF MECHANICAL EQUIPMENT CONNECTION TO A CIRCUIT BREAKER, THE NUMBER AND SIZE OF THE CONDUCTORS AND CONDUITS SHALL CONFORM TO THE LATEST NATIONAL ELECTRICAL CODE REGULATIONS. ALL MOTOR STARTERS, SWITCHES, CONTROL DEVICES, ETC., PROVIDED BY DIVISION 23 SHALL BE RECESSED IN THE WALLS, EXCEPT WHEN THESE ITEMS ARE LOCATED IN MECHANICAL SPACES. PROVIDE A NAMEPLATE FOR ALL EQUIPMENT, SWITCHES, CONTROL DEVICES, ETC. REFER TO THE GENERAL PROVISIONS SECTION OF THE DIVISION 23 SPECIFICATIONS.

PROVIDE ALL SUPPORT DEVICES NECESSARY FOR THE WORK. COORDINATE ALL LOCATIONS WITH OTHER DISCIPLINES PRIOR TO INSTALLATION.

REFER TO THE ARCHITECTURAL DRAWINGS FOR FLOOR PLAN DIMENSIONS AND ELEVATIONS. DO NOT SCALE THESE DRAWINGS.

PROVIDE ALL PENETRATIONS PERTAINING TO THE WORK THROUGH THE ROOF, WALLS, AND FLOORS. PROVIDE THE WATERPROOFING AROUND THE OPENINGS

COORDINATE THE SIZE AND LOCATION OF ALL PENETRATIONS THROUGH THE ROOF WITH DIVISION 07 AND OTHER DISCIPLINES.

ALL WALL AND FLOOR PENETRATIONS SHALL BE SEALED. SEAL ALL RATED FLOOR AND WALL PENETRATIONS WITH A UL APPROVED METHOD. FOR NON-RATED WALLS AND FLOORS HE ANNULAR SPACE SHALL BE PACKED WITH MINERAL WOOL, OR ANOTHER SUITABLE NON-COMBUSTIBLE MATERIAL, AND CAULKED AIR TIGHT.

PROVIDE ALL CUTTING AND PATCHING OF FLOORS AND WALLS FOR THE WORK UNLESS OTHERWISE INDICATED.

CONDENSATE DRAINS SHALL BE A MINIMUM OF 1" COPPER, INSULATED WITH A 25/50 RATED CLOSED CELL RUBBER TUBING HAVING A NOMINAL WALL THICKNESS OF 1". PROVIDE A P-TRAP WITH VENT AND CLEANOUT PLUG AT THE UNIT. ALL CONDENSATE LINES SHALL BE ROUTED TO A FLOOR DRAIN OR AS INDICATED ON THE DRAWINGS. PIPE ROUTING SHALL NOT CREATE A TRIP HAZARD.

15. WHERE EXISTING DUCTWORK, PIPING, OR EQUIPMENT HAS BEEN REMOVED, COMPLETELY REMOVE ALL EXISTING ABANDONED HANGERS AND APPURTENANCES.

PROVIDE FIRE DAMPERS AT DUCT PENETRATIONS THROUGH THE FIRE RATED PARTITIONS, BARRIERS, AND WALLS AS INDICATED ON THE DRAWINGS. INSTALL PER MANUFACTURER'S INSTRUCTIONS. PENETRATIONS THROUGH FIRE RATED WALLS OF 3 HOURS OR MORE SHALL BE PROTECTED BY A LISTED FIRE DOOR, SATISFACTORY FOR CLASS A OPENINGS, ON BOTH SIDES OF THE WALL.

INSTALL THERMOSTATS, SENSORS, AND OTHER CONTROLS 48" ABOVE FINISHED FLOOR OR AS INDICATED ON THE DRAWINGS. COORDINATE WITH OTHER DISCIPLINES TO ALIGN EXACTLY WITH ADJACENT DEVICES SUCH AS LIGHT SWITCHES AND CONTROLS.

18. PROVIDE ALL THERMOSTATS, SENSORS, CONTROLS, WIRING, AND CONDUIT.

OFF OF THE FLOOR AND OUT OF STANDING WATER.

WHERE DUCTWORK CONNECTS TO EXTERIOR LOUVERS, PRIME AND PAINT DUCTWORK BLACK TO PREVENT DUCTWORK FROM BEING VISIBLE THROUGH THE LOUVER.

FRESH AIR INTAKES SHALL BE A MINIMUM OF 10 (30) FEET FROM ALL EXHAUST AIR TERMINATIONS AND PLUMBING VENT THRU ROOF TERMINATIONS.

ALL DUCT LAYOUT AND LOCATIONS INDICATED ARE DIAGRAMMATIC. VISIT THE SITE, BECOME FAMILIAR WITH THE EXISTING CONDITIONS, AND COORDINATE THE DUCT LAYOUT WITH ALL DISCIPLINES PRIOR TO INSTALLATION.

SUPPORT ALL DUCTWORK, PIPING, EQUIPMENT, AND APPURTENANCES FROM THE BUILDING STRUCTURE AND NOT THE ROOF DECK.

ALL HANGER RODS SHALL BE CUT TO WITHIN 1" OF THE BOTTOM NUT. IN MECHANICAL ROOMS, ALL HANGERS BELOW 7'-0" SHALL BE WRAPPED WITH FOAM INSULATION FOR PERSONNEL PROTECTION.

INSULATE ALL SUPPLY DIFFUSERS AND DUCTED RETURN DIFFUSERS WITH 2" - 1# R.6 DUCT WRAP. CUT DIFFUSERS SO THERE IS A FOLDED 2" LAP ON ALL FOUR SIDES. TAPE WITH FSK TAPE WHERE INSULATED FLEX MEETS DUCT INSULATION, AND SO THERE ARE NO RAW EDGES OF FIBERGLASS.

EQUIPMENT SHALL MEET OR EXCEED ALL REQUIREMENTS IN THE LATEST VERSION OF ASHRAE STANDARD 90.1 AND THE INTERNATIONAL ENERGY CONSERVATION CODE WITH NORTH

COORDINATE THE ROUGH-IN OF HYDRONIC PIPING WITH THE GENERAL CONTRACTOR AND OTHER TRADES. ALL UNDERGROUND PIPING SHALL BE COORDINATED WITH STRUCTURAL FOOTINGS PRIOR TO INSTALLATION.

ALL HYDRONIC PIPING SHALL BE PERMANENTLY IDENTIFIED BY CONTENT, FUNCTION, AND DIRECTION OF FLOW (I.E., HOT WATER SUPPLY →). ALL IDENTIFICATION MARKERS SHALL BE PERMANENTLY STENCILED ON THE PIPING IN A LEGIBLE MANNER AT NO GREATER DISTANCE THAN 10'-0" ON CENTER. WHERE COLOR CODED PVC INSULATION JACKETING IS NOT SPECIFIED, ALL PIPING IN MECHANICAL ROOMS AND FINISHED AREAS ARE TO BE PAINTED AS FOLLOWS:

BLUE WITH WHITE BACKGROUND AND BLUE LETTERS RED WITH WHITE BACKGROUND AND RED LETTERS DOMESTIC WATER GREEN WITH WHITE BACKGROUND AND GREEN LETTERS REFRIGERANT GREEN WITH BLACK BACKGROUND AND YELLOW LETTERS

28. PROVIDE FLEXIBLE PIPE CONNECTIONS AT ALL HYDRONIC PIPING CONNECTIONS AT CHILLERS, PUMPS, AIR HANDLING UNITS, FAN BOXES, AND OTHER ROTATING EQUIPMENT.

INSTALL ALL UNDERGROUND WATER PIPING A MINIMUM OF 24" BELOW FINISHED GRADE TO PIPE CROWN. COORDINATE WITH ALL DISCIPLINES PRIOR TO INSTALLING UNDERGROUND

WRAP ALL EXTERIOR ABOVE GROUND HYDRONIC PIPING WITH ELECTRIC TRACE LINE PRIOR TO INSULATING. WRAP INSULATION WITH ALUMINUM JACKET AND SEAL ALL JOINTS.

ALL EQUIPMENT REMOVED FROM THE BUILDING DURING DEMOLITION SHALL REMAIN THE PROPERTY OF THE OWNER AND SHALL BE TURNED OVER TO THE OWNER FOR DISPOSAL. CARE SHOULD BE TAKEN IN REMOVAL OF ITEMS TO MINIMIZE DAMAGE. ANY ITEM NOT WANTED BY THE OWNER SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE PREMISES.

DO NOT INSTALL PIPING OVER ANY ELECTRICAL PANEL OR SWITCHGEAR.

PROVIDE EQUIPMENT SUPPORT PAD FOR ALL BASE MOUNTED EQUIPMENT. PAD SHALL BE 6" HIGH FOR CHILLERS AND BOILERS AND 4" HIGH FOR ALL OTHER MECHANICAL EQUIPMENT. INCLUDING AIR HANDLING UNITS AND PUMPS. PROVIDE 8" MINIMUM FROM EQUIPMENT TO END OF PAD ON ALL SIDES.

WHERE MECHANICAL ROOMS HAVE GYPSUM BOARD CEILINGS, INSTALL HANGER RODS BEFORE THE CEILING IS INSTALLED; COMPLETE PIPING INSTALLATION AFTER THE CEILING HAS BEEN INSTALLED.

ZIP TIES WILL NOT BE PERMITTED FOR USE AS CABLE SUPPORTS. WHERE NOT REQUIRED TO BE IN CONDUIT BY THE SPECIFICATIONS, PROVIDE J-HOOK SUPPORTS AND BRIDLE RINGS. CABLE SHALL BE INDEPENDENTLY SUPPORTED AND SHALL NOT BE SUPPORTED OFF THE WORK OF OTHER TRADES.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETELY CLEANING THE FIREPROOFING FROM ALL MATERIALS AND EQUIPMENT INSTALLED AS PART OF THIS CONTRACT. THIS INCLUDES, BUT IS NOT LIMITED TO, DUCTWORK, PIPING, CONDUIT, EQUIPMENT, FACEPLATES, BOXES, DISCONNECTS, CONTROL PANELS, AND CABLING.

S	HEET INDEX - MECH	IANIC	AL
Sheet Number	Sheet Name	Current Revision	Current Revision Date
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M-102	DIFFERENTIAL PRESSURE TRANSMITTER PLAN		
M-401	CONTROL DIAGRAMS		
M-601	DETAILS AND SCHEDULES		

ABBREVIATIONS LAV AREA DRAIN ADJUSTABLE ABOVE FINISHED FLOOR AFG ABOVE FINISHED GRADE AGGR AGGREGATE LOUV ALUMINUM ACCESS PANEL APPD APPROVED APPROX APPROXIMATE ARCH ARCHITECT MACH BAS BUILDING AUTOMATION SYSTEM BLK BLOCK BLKG BLOCKING BEAM BOT BOTTOM BRICK BRACKET MISC BRITISH THERMAL UNIT CATCH BASIN CUBIC FEET PER MINUTE MTD CHILLED WATER SUPPL' CHILLED WATER RETURI CAST IRON CIRCUIT CENTERLINE CLG CEILING CLKG CAULKING CLR CLEAR NTS CONCRETE MASONRY UNIT **CLEAN OUT** COLUMN COMMON CONC CONCRETE CONN CONNECTION CONST CONSTRUCTION CONT CONTINUOUS CONTR CONTRACTOR CENTER CTRL CONTROL PLUMB CU FT CUBIC FOOT COLD WATER DEPTH. DRAIN P SL DOUBLE DIRECT DIGITAL CONTROL DIAMETER DIAGONAL DIMENSION DISTANCE DIVISION DOWN DITTO DRAWING EACH, EXHAUST AIR ENTERING AIR TEMPERATURE ELEC **FLECTRICAL** ELEVATION ENCL ENCLOSURE ELECTRICAL PANELBOARD EQUAL **EQUIPMENT** EQUIP ELECTRIC WATER COOLER EXIST EXISTING **EXPANSION** EXTERIOR **FAHRENHEIT** FIRE ALARM FAN COIL UNIT FIRE DAMPER. FLOOR DRAIN FIRE EXTINGUISHER FIRE EXTINGUISHER CABINET FINISH FLOOR FIRE HOUSE CABINET FIGURE **FINISH** FIXTURE **FLOOR** FLASHING FLUOR FLUORESCENT FACE OF CONCRETI FOF FACE OF FINISH FOS FACE OF STUD **FIREPROOF** FIRE PULL STATION FOOT, FEET FTG **FOOTING** FURR **FURRING** GAUGE GENERAL CONTRACTOR GND GROUND **GALLONS PER MINUTE** GRADE GYPSUM WALL BOARD

WATER

HEIGHT

HOUR

INCH

INCLUDE INFORMATION

INSULATION

INTERIOR INVERT

JANITOR

KITCHEN

LENGTH/LONG

LABORATORY

HORIZ

INCL

HOSE BIBB

HORIZONTAL

HIGH POINT

HOT WATER

HOT WATER SUPPLY

INSIDE DIAMETER

HOT WATER RETURN

QUANTITY RADIUS **RETURN AIR** ROOF DRAIN RECESSED RECEPTACLE RECTANGI F REFERENCE REGISTER REINFORCED REQUIRED REV REVISED RIGHT HAND ROOM ROUGH OPENING SOUTH SUPPLY AIR SMOKE BARRIER SCHED SCHEDULE SCUP SCUPPER SECOND SECTION SHWR SHOWER SHEET SIMII AR SUMP PUMP SPEC SPECIFICATION SQUARE SQUARE FEET STAINLESS STEEL STREET STATION STA STANDARD STEEL STRUCT STRUCTURAL SUB SUBSTITUTE SUSPEND SUSP SYMMETRICAL TOP OF CURB TELEPHONE **TEMPERATURE** THICK TOP OF STEEL TOP OF PAVEMENT TELEVISION TOP OF WALL TYPICAL UNFINISHED UNLESS NOTED OTHERWISE VARIES, VARIABLE VERT VERTICAL VOLUME VENT THRU ROOF VTR WEST, WIDTH, WIDE WITH WITHOUT HEATING, VENTILATION AND AIR CONDITIONING WATERCLOSET WFT BULB

MISCELLANEOUS MASONRY OPENING MOUNTED MAKE UP NORTH NORMALLY CLOSED NATURAL GAS NOT IN CONTRACT NUMBER, NORMALLY OPEN NOT TO SCALE **OUTSIDE AIR** ON CENTER OUTSIDE DIAMETER **OFFICE** OPENING OPPOSITE OVERHEAD PARTIAL, PARTITION PRESSURE DROP PERPENDICULAR PLUMBING POSITION PREFABRICATED PIPE SADDLE POLYVINYL CHLORIDE RAIN WATER CONDUCTOR SMOKE DAMPER, SMOKE DETECTOR

LEAVING AIR TEMPERATURE

LINE VOLTAGE THERMOSTAT

I AVATORY

LINEAR FOOT LEFT HAND

LOCKER ROOM

LOUVER

LIGHT LIGHTING

MACHINE

MASONRY MATERIAL

MAXIMUM MECHANICAL

MANUFACTURER

MANHOLE

MINIMUM

METAL

LOW POINT

CARO/ //////**111/19/20**24

> DESIGNED BY: DRAWN BY: CHECKED BY: PROJECT NO.: 15 NOVEMBER 202

SCALE:

- 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

FINAL DRAWING FOR REVIEW PURPOSES ONLY NOT RELEASED FOR CONSTRUCTION

NORTH CAROLINA

WEIGHT

YARD

YEAR

WATERLINE

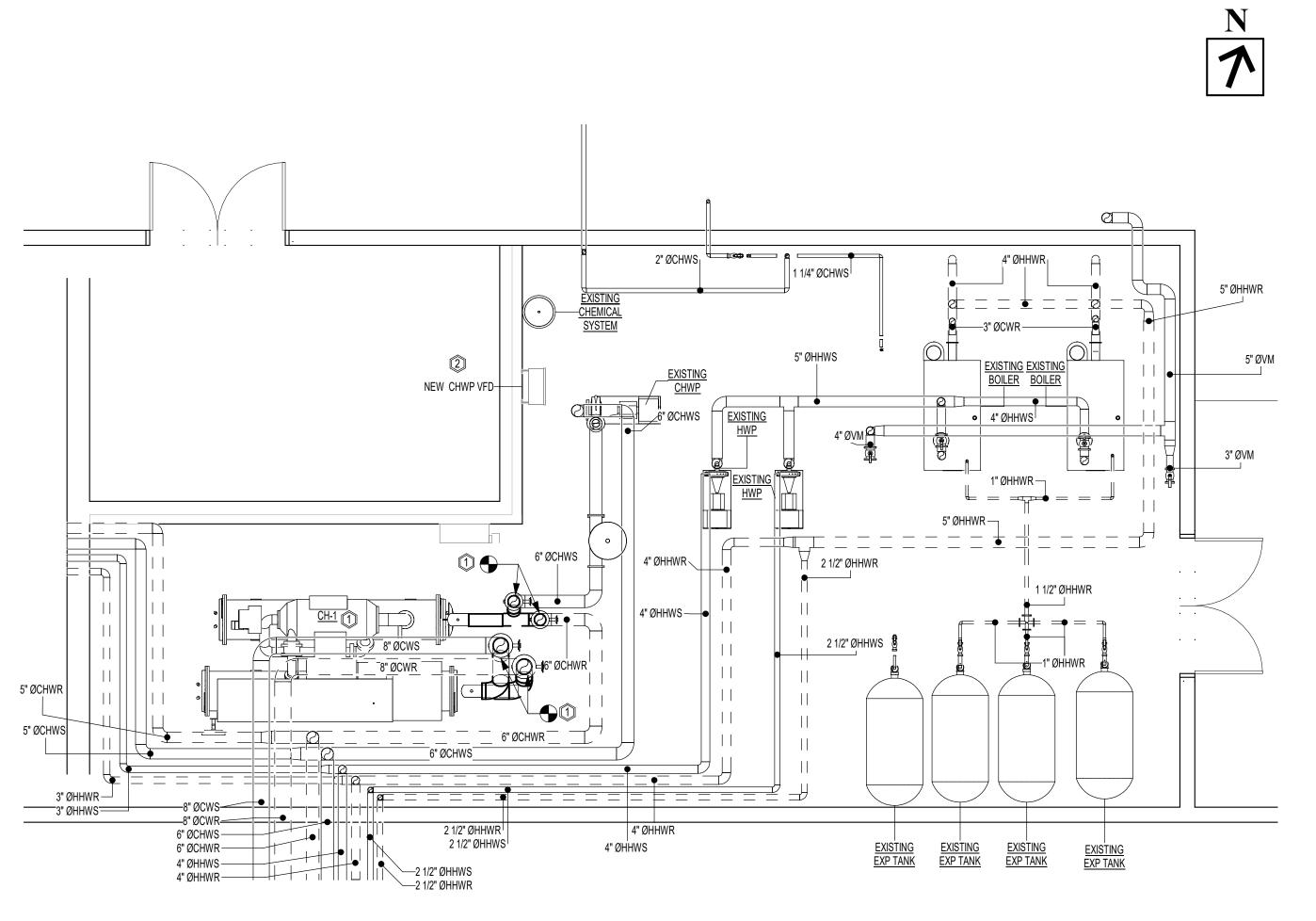
WATERPROOF

M - 00



KEY NOTES

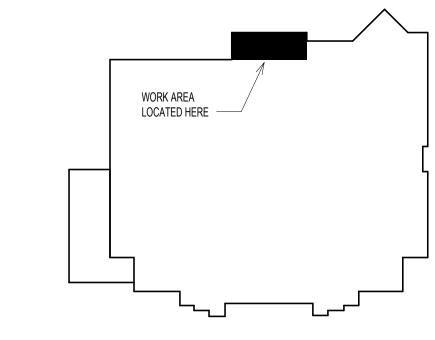
CHILLER AND CONNECTIONS TO BE DEMOLISHED AS INDICATED. TESTING AND BALANCING REQUIRED PRIOR TO COMENCMENT OF WORK.
 COORDINATE WITH ELECTRICAL CONTRACTOR THE REMOVAL OF THE EXISTING STARTER / DISCONNECT.



ENLARGED PIPING PLANS - NEW WORK 1/4" = 1'-0"

KEY NOTES

TO CHILLER AND CONNECTIONS TO BE REPLACED AS INDICATED
 PROVIDE NEW VFD FOR EXISTING 15 HP CHWP. PROVIDE DDC CONNECTIONS AS SHOWN ON M-401.





FINAL DRAWING
FOR REVIEW PURPOSES ONLY
NOT RELEASED FOR CONSTRUCTION

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

15 NOVEMBER 2024

2877-F

DESIGNED BY:

DRAWN BY:

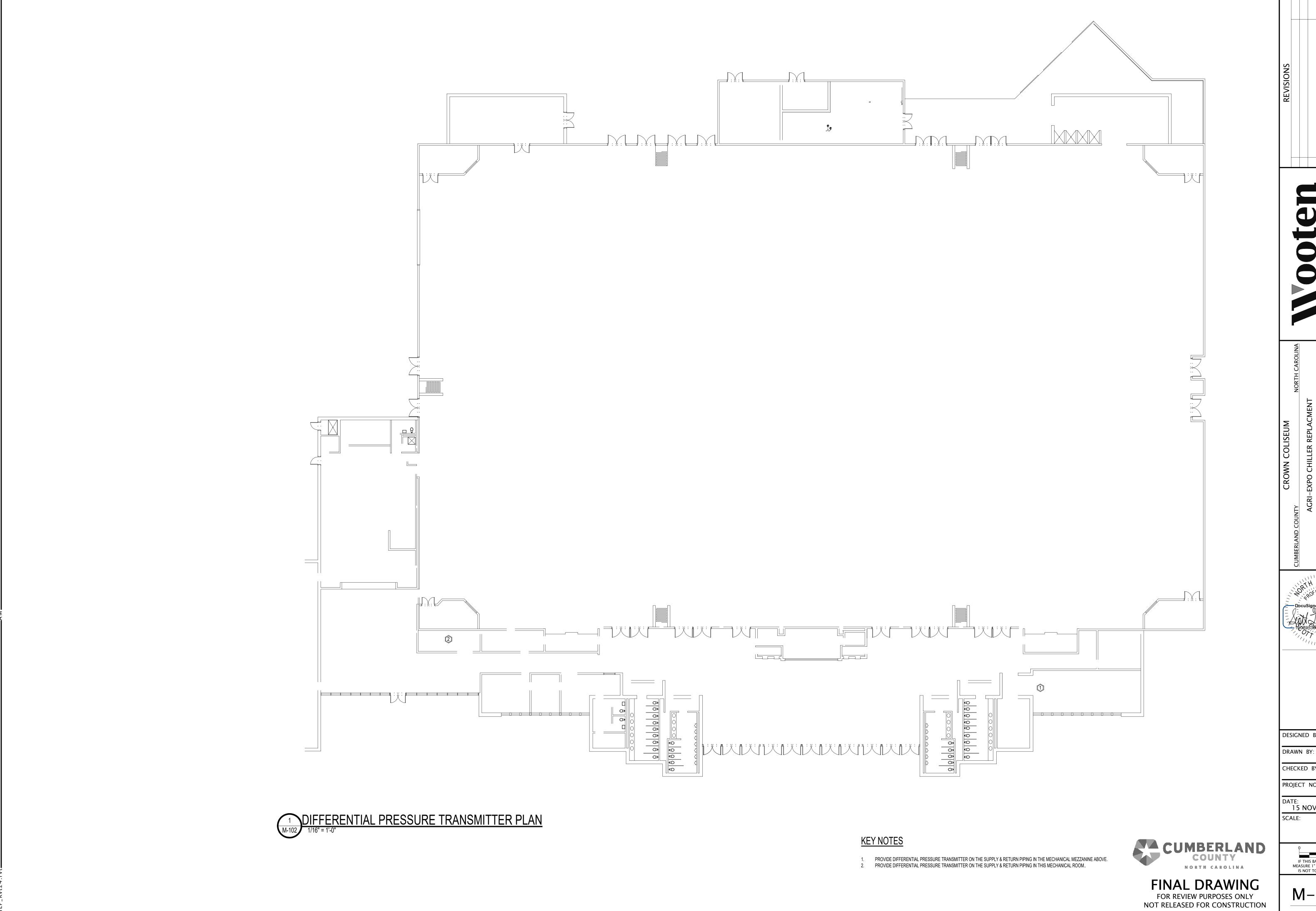
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PROJECT NO.:

SCALE:

DEMOLITION

k Docs://2877-R Agri-Expo Chiller Replacement/2877-R Agri_Expo Chi**JHF** Repl:11/19/2024 9:02:45 24 rvt



DIFFERENTIAL PRESSURE TRANSMITTER PLAN

DESIGNED BY:

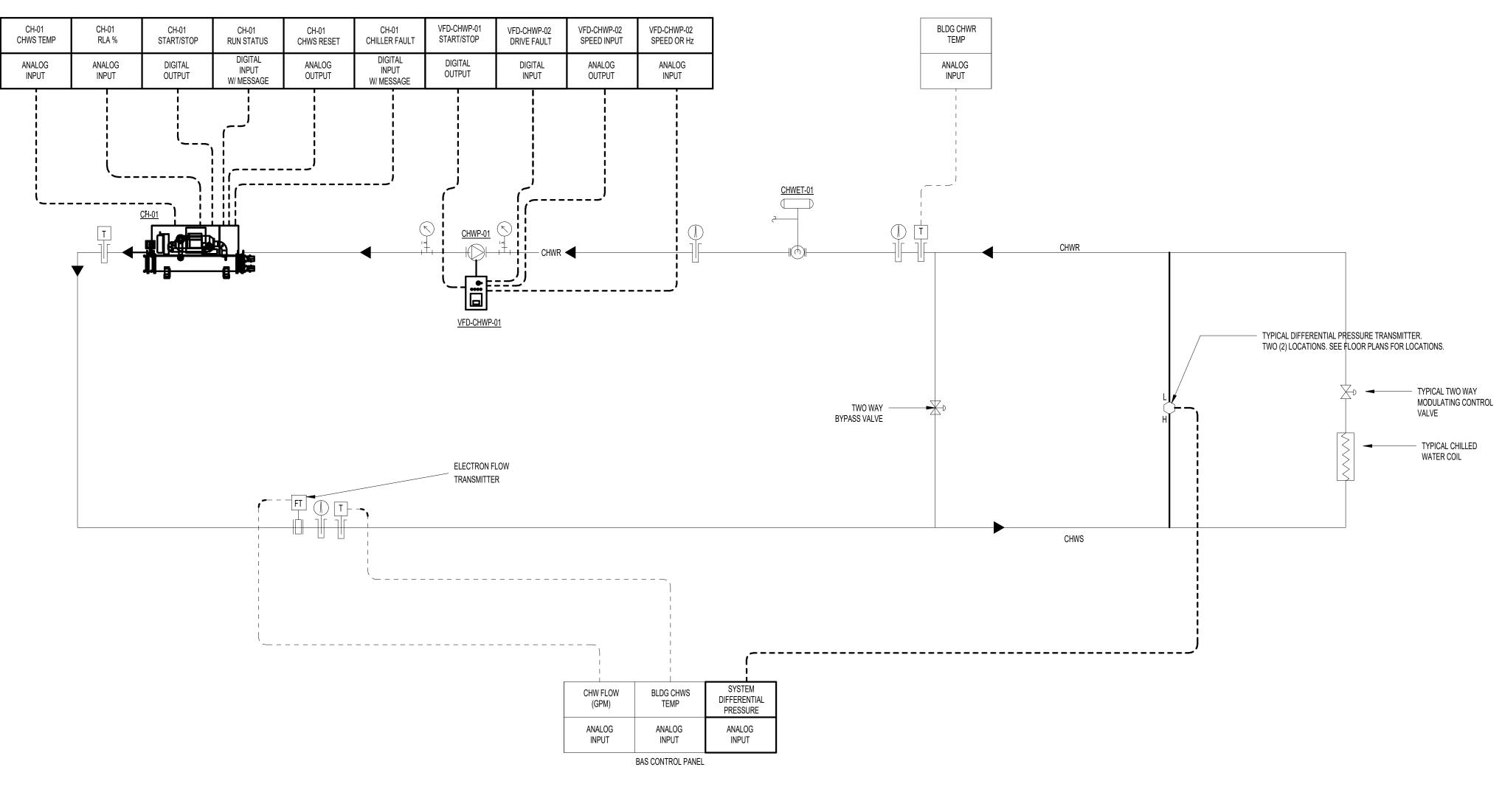
CHECKED BY:

PROJECT NO.: 2877-F

DATE: 15 NOVEMBER 2024 SCALE:

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

M - 102



WATER COOLED CHILLER WITH PRIMARY PUMP

A. General: BAS shall fully control the chilled water system and equipment and provide monitoring and diagnostic information for management purposes. BAS shall interface directly with the chiller and all available points shall be monitored and displayed via the operator interface. Refer to the control diagram for additional information.

1. Cooling Enable: Cooling shall be enabled when any chilled water valve opens more than 20% continuously for 5 min. (adj.) and the outside air temperature is above 55°F (adj.), OR an AHU is calling for dehumidification. Once enabled the chilled water system will operate for a minimum of 30 minutes. The chilled water system shall also be enabled whenever manually enabled by the operator at the operator interface.

2. Cooling Disable: Cooling shall be disabled when all chilled water valves are less than 5% open continuously for 10 minutes (adjustable) or the outside air temperature is below 55°F. The chilled water system shall also be disabled whenever manually disabled by the operator at the operator interface.

3. Differential Pressure Setpoint:

a) Setpoint shall be initially seta at 15 psi (adjustable) b) Setpoint shall be adjusted by the TAB contractor for optimized building and energy performance.

C. Primary CHW Pump

1. The primary pump shall be started via an output from the chiller controller whenever the associated chiller is enabled.

2. BAS shall monitor the pump status.

3. Freeze Safety for Primary Pumps: The primary chilled water pumps shall be enabled for backup freeze potection if the chiller should fail to enable the primary pump.

a) The BAS shall monitor the primary chilled water pump status.

b) if the OAT drops below 26°F AND the primary chilled water pump is not enabled (via onboard chiller control) the BAS shall enable the chiller primary pump.

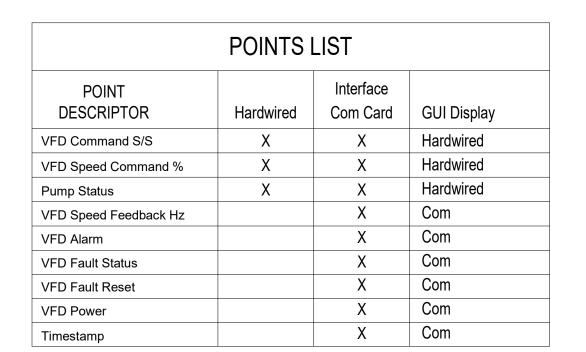
4. VSD Control: Whenever the pump is energized and status is proven, the BAS shall control the speed of the VSD to maintain the (lowest) differential pressure reading at setpoint. On start and stop, the VSD shall ramp to speed and slow down within adjustable acceleration and deceleration limits.

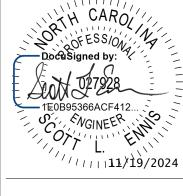
5. VFD Interface: BAS shall monitor the VFD via direct interface. All available information shall be accessible via the interface for display on the VFD graphic. The VFD alarm point shall be displayed on the main graphic and shall be alarmed via the BAS. All other points may be displayed on a separate graphic that is selected from the system's graphic. Reference the VFD chart on project plans for additional information on points that should be hardwired versus integrated through a direct

6. Differential Pressure Setpoint:

a) Setpoint shall be initially seta at 15 psi (adjustable) b) Setpoint shall be adjusted by the TAB contractor for optimized building and energy performance.

CHILLED WATER CONTROL DIAGRAM





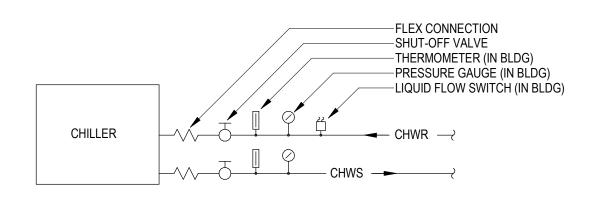
DESIGNED BY: DRAWN BY: CHECKED BY: PROJECT NO.: 15 NOVEMBER 2024 SCALE:

> 0 1/2 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

M - 401NOT RELEASED FOR CONSTRUCTION

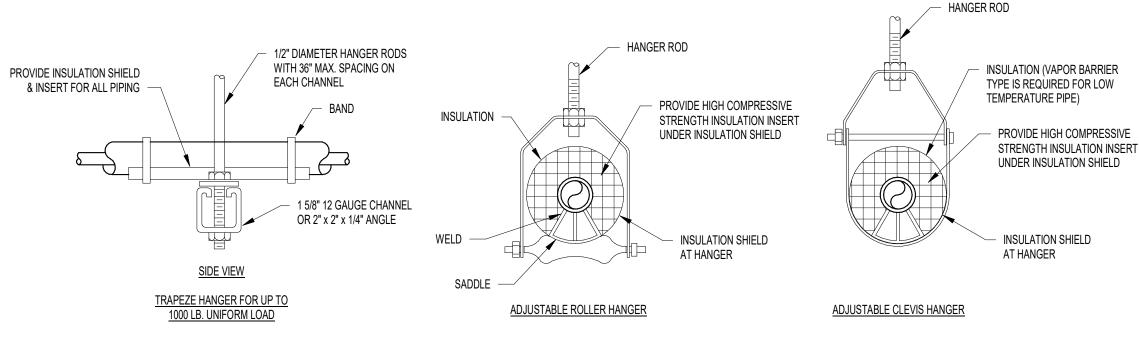
NORTH CAROLINA

FINAL DRAWING



WATER COOLED CHILLER PIPING DETAIL

NOT TO SCALE



PIPE HANGER DETAIL

NOT TO SCALE

BASIS OF DESIGN													
		COMPRESSOR	DESIGN	EFFICIENCY		EVAPOR	RATOR		EL	.ECTRICA	L		WEIGHT
BRAND	MODEL	TYPE	CAP. (TONS)	IPLV (100%)	EWT (°F)	LWT (°F)	GPM ΔP (FT)	KW	MCA	RLA	V	Р	(TONS)

AIR-COOLED CHILLER SCHEDULE (ALTERNATIVE 1)															
MARK	BRAND	MODEL	COMPRESSOR TYPE	DESIGN CAP. (TONS)	EFFICIENCY IPLV (100%)	EWT (°F)	EVAPO LWT (°F)	RATOR GPM	ΔP (FT)	KW	MCA EL	ECTRICA FLA	L V	Р	WEIGHT (TONS)
CH-1	YORK	YZ_MA024AN022P033HA	CENTRIFUGAL	250	0.6084	54	44	598.1	14.2	152.1	450	201	460	3	7.181

CHILLER SCHEDULE (CH-1)

YORK AIR COOLED SCROLL CHILLER, MODEL YZ_MA024AN022P033HA HIGH EFFICIECY, REFRIGERANT R-134A, 250.0 FULL LOAD TONS, AND MCA OF 450 AT 95°F AMBIENT PER AHRI 550/590. IPLV OF 0.6084. PROVIDE NEOPRENE VIBRATION ISOLATORS. PROVIDE ARCHITECTURAL LOUVERED PANELS AROUND COMPLETE UNIT. PROVIDE SUPERIOR SOUND PACKAGE WITH NOISE REDUCTION, LOW NOISE CONDENSER FANS, INSULATING MATERIAL ON THE SUCTION AND DISCHARGE LINES OF EACH REFRIGERANT CIRCUIT, AND A REDUCED MAXIMUM SPEED FOR EACH CONDENSER FAN. THE OVERALL A-WEIGHTED SOUND POWER LEVEL SHALL NOT EXCEED 98 DB AFTER ATTENUATION, AS MEASURED PER ARI STANDARD 370. PROVIDE WIDE AMBIENT OPTION REQUIRED FOR 0-125°F OPERATION. PROVIDE EVAPORATOR WITH SUCTION AND DISCHARGE SERVICE VALVE FOR EACH COMPRESSOR. PROVIDE 1-1/4" INSULATION ON EVAPORATOR. PROVIDE SINGLE POINT 480 VOLT POWER CONNECTION THAT FEEDS CHILLER, AND PROVIDE AN ADDITIONAL 120 VOLT POWER CONNECTION FOR THE EVAPORATOR HEAT TAPE. HEAT TAPE SHALL BE PROVIDED WITH A LIGHT INDICATOR. PROVIDE FACTORY MOUNTED AND WIRED CONTROL TRANSFORMER. FACTORY MOUNTED AND WIRED EVAPORATOR HEATER FOR FREEZE PROTECTION TO -20°F. PROVIDE CONTROL PANEL THAT PROVIDES CHILLED WATER SETPOINT ADJUSTMENT AND DEMAND LIMITING VIA A 4-20MA INPUT. PROVIDE HIGH SHORT CIRCUIT CURRENT RATED CONTROL PANEL. CONTROL PANEL SCCR RATING SHALL BE MINIMUM 65 KA. 460/3/60. MCA = 450, GPM = 750 AT 14.2 FT PRESSURE DROP AT 54°F EWT AND 44°F LWT, WEIGHT = 6.575 TONS. PROVIDE BACNET INTERFACE. PROVIDE INVISISOUND SUPERIOR PACKAGE.

EQUIVALENTS BY JCI, DAIKIN, AND CARRIER, OR AS LISTED IN SPECIFICATIONS. FREEZE PROTECTION DOWN TO AN AMBIENT OF -20°F SHALL BE PROVIDED. MAINTAIN MINIMUM CLEARANCES AND UNIT TO UNIT CLEARANCES AS REQUIRED BY MANUFACTURER. MANUFACTURER SHALL PROVIDE FACTORY INSTALLED FLOW SWITCH AND ANY CONTROLS AND ACCESSORIES REQUIRED.

CHILLER ACOUSTICS

THE CHILLER MANUFACTURER SHALL PROVIDE A NOISE REDUCTION SYSTEM TO LIMIT THE CHILLER NOISE TO NC25 ON THE OTHER SIDE OF THE SOUTH WALL OF MECH ROOM IN THE EXPO SPACE.

THE NOISE REDUCTION SYSTEM SHALL BE SPECIFICALLY ENGINEERED AND INCLUDE, BUT NOT LIMITED TO, HUSH COVER™ REMOVABLE INSULATION COVERS FOR THE CHILLER COMPRESSORS, DISCHARGE/SUCTION LINES AND OIL SEPARATORS, HUSH QUILT™ ACOUSTICAL INSULATION BLANKETS MANUFACTURED WITH TANERA GORE™ THREAD AND VINYL COATED POLYESTER MATERIALS. THE NOISE REDUCTION SYSTEM SHALL BE MANUFACTURED BY A COMPANY SPECIALIZING IN THE MANUFACTURE OF ACOUSTICAL SYSTEMS AND RELATED ACCESSORIES WITH NOT LESS THAN 10 YEARS DOCUMENTED SUCCESSFUL EXPERIENCE WITH WORK COMPARABLE TO WORK OF THIS PROJECT. ALL NOISE CONTROL MATERIALS MANUFACTURERS SHALL DELIVER A COMPLETE SUBMITTAL INCLUDING A COPY OF AN ACOUSTICAL REPORT IN COMPLIANCE WITH THE ACOUSTICAL PERFORMANCE AS PER THIS SPECIFICATION AND THE COMPLETED SYSTEM SHALL RESULT IN A CHILLER DEGRADATION OF NO MORE THAN 2.5%.

THE COMPLETE NOISE REDUCTION SYSTEM SHALL BE INSTALLED BY THE NOISE MATERIALS MANUFACTURER TO ENSURE GUARANTEED FIT AND MEET THE ACOUSTICAL PEFORMANCE AS PER THIS SPECIFICATION. CHILLER MANUFACTURERS' FACTORY ATTENAUTION PACKAGES ARE NOT ACCEPTABLE. CHILLER MANUFACTURERS' LOW NOISE FANS ARE ACCEPTABLE. BRD NOISE AND VIBRATION CONTROL, INC., LOTEC AND KINETICS ARE CONSIDERED AN ACCEPTABLE SUPPLIER OF THESE PRODUCTS AND SERVICES. THE CONTRACTOR SHALL RETAIN THE SERVICES OF A THIRD PARTY TO PERFORM SOUND MEASUREMENTS ON THE COMPLETE SYSTEM TO VERIFY COMPLIANCE WITH REQIUIREMENTS OF THIS SPECIFICATION.

IF OVERALL NC LEVEL TEST RESULTS DO NOT MEET THE REQUIREMENTS OF THIS SPECIFICATION, THEN THE CHILLER MANUFACTURER/VENDOR SHALL SUPPLY ADDITIONAL SOUND ATTENUATION AND/OR FACILITY MODIFICATIONS TO MEET THIS REQUIREMENT AT NO ADDITIONAL COST TO THE OWNER.

PUMP SCHEDULE									
MARK	MANUFACTURER	MODEL	GPM	HEAD (FT)	HP	RPM	V	PH	
	EXISTING	EXISTING	600	60	15	1750	480	3	
EXISTING CHWP	EXISTING	EXISTING	600	60	15	1750	480	3	

GENERAL NOTES:

- A. PROVIDE AEGIS SHAFT GROUNDING RING FOR EXISTING PUMP.
- B. CONTROLS CONTRACTOR TO PROVIDE VFD FOR PUMP.

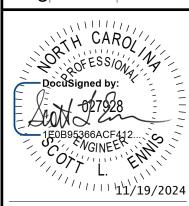
REVISIONS

120 North Boylan Avenue • Raleigh, NC 27603-1423 (919) 828-0531 • thewootencompany.com

LACMENT

RI-EXPO CHILLER REPLACME

AGRI-EXP



DESIGNED BY:

SLE

DRAWN BY:

CHECKED BY:

SLE

PROJECT NO.:

2877-1

DATE: 15 NOVEMBER 2024 SCALE:

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

M-601

NOT RELEASED FOR CONSTRUCTION

DEMOLITION GENERAL NOTES:

- A. NOTIFY THE OWNER, IN WRITING, AT LEAST 7 DAYS IN ADVANCE OF ALL REQUIRED SHUTDOWNS ELECTRICAL UTILITIES. UPON WRITTEN RECEIPT OF APPROVAL FROM OWNER, SHUTDOWNS SHALL BE PERFORMED AS DIRECTED BY THE OWNER AND SHALL BE CONDUCTED AT NO ADDITIONAL CONTRACT COST. AT THE COMPLETION OF EACH SHUT DOWN, ALL SERVICES SHALL BE RESTORED SO THAT NORMAL OPERATION OF ALL UTILITIES CAN RESUME.
- B. WHEN WORKING IN AND AROUND THE EXISTING BUILDING, EXTREME CARE SHALL BE EXERCISED IN REGARDS TO PROTECTION OF THE EXISTING STRUCTURE, MECHANICAL AND ELECTRICAL SERVICES WHICH WILL REMAIN. REPAIR, REPLACE OR RESTORE TO THE SATISFACTION OF THE OWNER/ARCHITECT/ENGINEER ALL EXISTING WORK DAMAGED IN THE PERFORMANCE OF DEMOLITION AND/OR NEW WORK.
- ALL EXISTING WIRING, EQUIPMENT, CONDUITS AND MATERIALS NOT REQUIRED FOR RE-USE OR RE-INSTALLATION (SHOWN OR OTHERWISE) SHALL BE REMOVED. ALL EXISTING MATERIALS AND EQUIPMENT WHICH ARE REMOVED AND DESIRED BY THE OWNER, OR ARE INDICATED TO REMAIN AS THE PROPERTY OF THE OWNER, SHALL BE DELIVERED TO THE OWNER ON THE PREMISES BY THE CONTRACTOR WHERE DIRECTED BY THE ARCHITECT. ALL OTHER MATERIALS AND EQUIPMENT WHICH ARE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED BY THE CONTRACTOR FROM THE PREMISES.
- D. EXISTING CONDITIONS (PRESENCE AND LOCATION OF PANELBOARDS, LIGHTING FIXTURES, RECEPTACLES, EQUIPMENT, MATERIALS AND CIRCUITING) INDICATED ARE BASED ON INFORMATION OBTAINED FROM AVAILABLE RECORD DRAWINGS AND FIELD SURVEYS AND ARE NOT WARRANTED TO BE COMPLETE OR CORRECT. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION OF ALL CONDUITS, EQUIPMENT AND MATERIALS IN THE FIELD PRIOR TO STARTING ALL WORK.
- E. EXISTING EQUIPMENT SIZES NOTED ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND ARE NOT WARRANTED TO BE CORRECT. CONTRACTOR SHALL VERIFY ALL SIZES IN THE FIELD IF EQUIPMENT IS IN PROJECT SCOPE.
- WHEN EXISTING MECHANICAL AND ELECTRICAL WORK IS REMOVED, ALL CONDUITS, WIRING AND MATERIALS SHALL BE REMOVED TO A POINT BELOW FINISHED FLOORS OR BEHIND FINISHED WALLS AND CAPPED. SUCH POINTS SHALL BE FAR ENOUGH BEHIND FINISHED SURFACES TO ALLOW FOR THE INSTALLATION OF THE NORMAL THICKNESS OF FINISHED MATERIAL.
- G. EXISTING MECHANICAL AND ELECTRICAL EQUIPMENT, CONDUIT, WIRING, DEVICES, AND MATERIALS AFFECTED BY DEMOLITION OR NEW WORK INSTALLATION AND REQUIRED TO REMAIN IN SERVICE SHALL BE REINSTALLED OR SUPPORTED AS REQUIRED IN ACCORDANCE WITH NEW WORK SPECIFICATIONS. ALL WORK SHALL BE COMPLETED TO THE SATISFACTION OF THE OWNER.
- H. IN GENERAL ALL EQUIPMENT AND MATERIALS SHOWN "LIGHT" IS EXISTING TO REMAIN AND ALL EQUIPMENT AND MATERIALS SHOWN AS "HEAVY AND DASHED" IS EXISTING AND SHALL BE DEMOLISHED.
- I. ENSURE THAT ALL ELECTRICAL WORK IS DONE DE-ENERGIZED. SPECIFICALLY WHERE ELECTRICAL EQUIPMENT IS OPENED EXPOSING LIVE PARTS, BREAKERS ARE REMOVED OR INSTALLED OR WHERE ELECTRICAL CONNECTIONS ARE MODIFIED, ALL POWER AT THE PANEL OR ENCLOSURE SHALL BE DE-ENERGIZED AT ITS SOURCE, PRIOR TO WORK BEING DONE.
- ALL TESTING. TROUBLESHOOTING AND VERIFICATION OF DEENERGIZATION IS TO BE DONE IN ACCORDANCE WITH NFPA 70E INCLUDING ESTABLISHING, ISOLATING IF REQUIRED, SHOCK PROTECTIVE AND ARC FLASH PROTECTIVE APPROACH BOUNDARIES AND WEARING PERSONAL PROTECTIVE EQUIPMENT APPROPRIATE FOR THE HAZARD.
- PRIOR TO THE REMOVAL OF A CIRCUIT FROM A PANELBOARD, THE CONTRACTOR SHALL VERIFY THAT NO EXISTING LOADS REMAIN ON THAT CIRCUIT. IF UNEXPECTED LOADS REMAIN ON THE CIRCUIT, NOTIFY EOR FOR DIRECTIONS TO PROCEED. ONCE CIRCUITS HAVE BEEN VERIFIED TO BE UNDER NO LOAD. BREAKERS IN THE CORRESPONDING PANELBOARD SHALL BE FLIPPED TO THE 'OFF' POSITION AND MARKED AS SPARE AND READY FOR FUTURE WORK. ALL CONDUIT AND WIRING SHALL BE REMOVED BACK TO SOURCE.
- L. UPDATE PANEL SCHEDULES TO REFLECT NEW AND CHANGED LOAD. ALL PANEL SCHEDULES SHALL BE COMPUTER GENERATED.
- M. EXISTING FIRE ALARM SYSTEM SHALL BE MAINTAINED AND OPERABLE DURING DEMOLITION. CONTRACTOR SHALL TEMP EXISTING DEVICES TO ALLOW DEMOLITION OF EXISTING CONDUIT AND WIRING.

GENERAL NOTES

- THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR FLOOR PLAN DIMENSIONS. DO NOT SCALE FROM THESE DRAWINGS.
- 2. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ANY AND ALL WORK WITH ALL OTHER TRADES INVOLVED IN THE PROJECT PRIOR TO THE INSTALLATION OF HIS EQUIPMENT TO AVOID CONFLICTS DURING CONSTRUCTION AND ALLOW FOR OPTIMUM MAINTENANCE AND WORKING SPACE.
- 3. ALL LIGHT FIXTURES SHALL BE SUPPORTED FROM BUILDING STRUCTURE AND IS NOT ALLOWED TO BE ANCHORED OR SUPPORTED BY ANY PART OF THE SUSPENDED CEILING SYSTEM. REFER TO SPECIFICATIONS FOR MORE DETAILED INFORMATION.
- 4. THE USE OF THE CONDUIT SYSTEM FOR EQUIPMENT GROUNDING SHALL NOT BE ACCEPTABLE. A SEPARATE INSULATED, GREEN COLORED COPPER WIRE SHALL RUN WITH THE CIRCUIT CONDUCTORS IN EACH CIRCUIT CONDUIT.
- 5. IN ALL AREAS WHERE FIRE RATED WALLS, FLOORS AND CEILINGS ARE INSTALLED, ALL PENETRATIONS OF ELECTRICAL CONDUITS OR OTHER RELATED ELECTRICAL MATERIAL SHALL BE PROPERLY SEALED WITH APPROVED FIRE RATED MATERIALS TO MAINTAIN TH RATINGS OF THE BUILDING CONSTRUCTION.
- 6. ALL FUSES, DISCONNECT SWITCHES AND BREAKER SIZES SHOWN FOR MECHANICAL/PLUMBING/FIRE PROTECTION EQUIPMENT SHALL BE VERIFIED PRIOR TO THE PURCHASE OR INSTALLATION OF SAID EQUIPMENT, WITH THE EQUIPMENT SUPPLIES AND MECHANICAL/PLUMBING CONTRACTOR.
- 7. $\,$ ALL WORK AND MATERIAL SHALL BE PROVIDED IN ACCORDANCE WITH STATE, LOCAL AN NATIONAL CODES AND ORDINANCES.
- 8. EACH CONTRACTOR SHALL PROVIDE THEIR OWN SUPPORTS FOR ALL DEVICES AND EQUIPMENT PROVIDED BY THE CONTRACTOR AND SHALL SUPPORT SUCH EQUIPMENT PER APPROVED GOVERNING CODES OR PER APPROVAL OF THE ENGINEER. UNACCEPTABLE WORKMANSHIP OF MATERIALS SHALL BE REPLACED AT THE REQUEST OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
- 9. ALL JUNCTION BOXES AND CONDUIT RUNS (WITH OR WITHOUT WIRES) SHALL BE COLOR CODED WITH PAINT IN ACCORDANCE WITH ELECTRICAL GENERAL PROVISIONS.
- 10. THE MOUNTING HEIGHTS AND LOCATIONS OF ALL WALL MOUNTED OUTLETS AND JUNCTION BOXES SHALL BE REVIEWED AND COORDINATED WITH THE ARCHITECT AND OWNER PRIOR TO INSTALLATION.
- 11. ALL WIRE AND CONDUIT SIZES ARE BASED ON 75 DEGREE CELSIUS THHN OR THWN WIRI UNLESS OTHERWISE NOTED.
- 12. THE NEW FIRE ALARM EQUIPMENT SHOWN SHALL BE PROVIDED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS. PROVIDE ALL WIRING AS REQUIRED FOR A COMPLETE SYSTEM.
- 13. THE ELECTRICAL CONTRACTOR SHALL VERIFY ALL CEILING TYPES AND FINISHES BEFOR PURCHASING ANY LIGHT FIXTURES SO THAT THE PROPER TRIM WILL BE PROVIDED FOR THE CEILING TO BE INSTALLED. ANY CHANGES REQUIRED DUE TO INCORRECT LIGHTING FIXTURE MOUNTING HARDWARE SHALL BE CORRECTED AT THE CONTRACTOR'S
- 14. ALL BRANCH BREAKERS SERVING EMERGENCY LIGHTS SHALL BE PROVIDED WITH COVERS TO PREVENT BREAKERS FROM BEING TURNED OFF ACCIDENTALLY.
- 15. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE UTILITY POWER COMPAN FOR THE WORK REQUIRED FOR THE CONNECTION OF THE UTILITY'S NEW TRANSFORME METERING, ETC. THE ELECTRICAL CONTRACTOR SHALL PAY ALL NECESSARY CHARGES FOR THE INSTALLATION OF THE UNDERGROUND ELECTRICAL SERVICE AS SHOWN ON
- 16. WHERE MULTIPLE SWITCHES ARE SHOWN IN THE SAME LOCATION, THEY SHALL BE GANGED TOGETHER IN ONE MULTIPLE GANG BOX WITH MATCHING COVER AND PARTITION (IF REQUIRED). THE ELECTRICAL CONTRACTOR SHALL LOOK AT BOTH POWE AND LIGHTING PLAN TO DETERMINE WHICH SWITCH IS APPLICABLE.
- 17. WHERE ELECTRICAL EQUIPMENT PENETRATES EXTERIOR WALLS OR THE ROOF, THEY SHALL BE PROPERLY SEALED WITH METHODS APPROVED BY THE ENGINEER. SUBMIT DETAIL OF PROPOSED SEALING METHODS.
- 18. ALL EXTERIOR BUILDING LIGHTS AND EMERGENCY LIGHTING SHALL BE WIRED WITH A MINIMUM #10 AWG OR AS NOTED OTHERWISE.
- 19. THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL CHAIN HUNC FIXTURES LOCATED IN MECHANICAL OR OTHER SPACES WITH OTHER TRADES, SO AS NOT TO CONFLICT WITH OTHER EQUIPMENT.
- 20. ALL EMERGENCY LIGHTING, EXIT SIGNS AND NIGHT LIGHTS SHALL BE WIRED AHEAD OF ANY SWITCH AND/OR BUILDING AUTOMATION SYSTEM.
- 21. WHERE CONDUIT OR OUTLET BOXES CANNOT BE INSTALLED IN EXISTING WALLS FOR NEW DEVICES, NOTIFY EOR/ARCHITECT FOR AN ACCEPTABLE INSTALLATION SOLUTION PRIOR TO PROCEEDING.
- 22. OUTLET BOXES ON OPPOSITE SIDES OF A FIRE RESISTANT WALL OR SHAFT ENCLOSURE RATED TWO (2) HOURS OR LESS SHALL BE SEPARATED BY A HORIZONTAL DISTANCE OF NOT LESS THAN 24" AS REQUIRED BY NCSBC VOL 1 PARAGRAPH 705.4.3. 23. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL ACCESS PANELS AS REQUIRED FOR
- ELECTRICAL CODE COMPLIANCE AND TO ACCESS ANY INSTALLATION THAT WILL REQUIR FUTURE MAINTENANCE. THESE DOORS SHALL BE 20"X20". EACH ROOM WITH A DRYWALL CEILING SHALL HAVE A MINIMUM OF ONE ACCESS DOOR PROVIDED BY THE ELECTRICAL CONTRACTOR. THE DRYWALL SUBCONTRACTOR WILL PROVIDE THE REQUIRED FRAMED OPENING AND INSTALL THE ACCESS DOORS.
- 24. ALL UNDERGROUND CONDUITS SHALL BE IDENTIFIED ON ASBUILT PLANS WITH DIMENSIONS LOCATING THE CONDUITS AND THEIR RESPECTIVE BURIAL DEPTHS.
- 25. REFER TO FIRE ALARM PLANS FOR: FIRE ALARM WORK.
- 26. REFER TO SPECIAL SYSTEMS PLANS FOR: SECURITY/COMMUNICATIONS/CONDUIT SLEEVES.
- 27. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL CONDUIT AND RACEWAY REQUIRED FOR AV AND THEATRICAL LIGHTING SYSTEMS. ADDITIONALLY ALL 120V AND GREATER BRANCH CIRCUITS SHALL BE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. AV BACK BOXES SHALL BE FURNISHED BY AV CONTRACTOR AND INSTALLED BY ELECTRICAL CONTRACTOR. REFER TO AND CLOSELY REVIEW AV DRAWINGS.

Sheet Number

E-100

Sheet Name

MECHANICAL ROOM POWER PLAN

COVER SHEET

- 28. CONDUCTORS FOR BRANCH CIRCUITS SHALL BE SIZED TO PREVENT VOLTAGE DROP EXCEEDING 3% AT THE FARTHEST OUTLET OF POWER, HEATING AND LIGHTING LOADS OR ANY COMBINATION OF SUCH LOADS. THE MAXIMUM TOTAL VOLTAGE DROP ON BOTH FEEDER AND BRANCH CIRCUITS TO THE FARTHEST CONNECTION SHALL NOT EXCEED 5%.
- A. WHERE THE CONDUCTOR LENGTH FROM THE PANEL TO THE FIRST OUTLET ON A 120V CIRCUIT EXCEEDS 50'-0", THE BRANCH CIRCUIT CONDUCTORS FROM THE PANEL TO THE FIRST OUTLET SHALL NOT BE SMALL THAN #10 AWG. INCREASE THE BRANCH CIRCUIT CONDUCTOR SIZE AN ADDITIONAL WIRE SIZE FOR EACH ADDITIONAL 125' FOR THE ENTIRE CIRCUIT. THE GROUND CONDUCTOR SIZE SHALL BE INCREASE PROPORTIONALLY TO THE INCREASED PHASE CONDUCTORS AS PER NEC 2020 250.122(B).

CAMBOL LECEND (CONTINUED)

SYMBOL

 WPS_M

FACP

RACP

TP

FS

WALL MOUNTED FIRE ALARM STROBE ONLY - #CD INDICATES CANDELA

CEILING MOUNTED FIRE ALARM SMOKE DETECTOR

CEILING MOUNTED FIRE ALARM HEAT DETECTOR

CARBON MONOXIDE DETECTOR

REMOTE FIRE ALARM CONTROL PANEL

REMOTE ALARM INDICATOR - MOUNT 88" AFF.

FIRE ALARM CONTROL PANEL

FIRE ALARM TAMPER SWITCH

FIRE ALARM WATER FLOW SWITCH

FIRE ALARM NAC PANEL

FIRE ALARM DUCT SMOKE DETECTOR AND SAMPLING TUBE

DATA RACK PROVIDED AND INSTALLED BY OWNER/OTHERS

Current Revision Current Revision Date

		SYMBOL LEGEND (CONTINUE	<u>D)</u>
1	SYMBOL	DESCRIPTION	REMARKS
	MH	MANHOLE - REFER TO SITE PLAN.	
	J(MD)	MOTORIZED DAMPER - INSTALLED BY MECHANICAL CONTRACTOR AND WIRED BY THE ELECTRICAL CONTRACTOR.	
		4' X 4' X 3/4" FIRE RETARDANT PLYWOOD EQUIPMENT BACKBOARD COORDINATE LOCATION, PLACEMENT WITH OWNER.	
	•	CONDUIT UP OR DOWN AS INDICATED ON PLANS	
	O PT	RECESS ACTIVATED FIRE RATED POKE-THROUGH FLOOR BOX	
	•	OVERHEAD PROJECTOR	
≣	S _{SCRN}	PROJECTION SCREEN SWITCH FURNISHED BY SCREEN PROVIDER AND INSTALLED BY ELECTRICAL CONTRACTOR	
	S_{DW}	DISHWASHER TOGGLE ON/OFF SWITCH MOUNTED AT +42" AFF.	
	RCS	REMOTE STATION FOR ELEVATOR EMERGENCY TWO-WAY COMMUNICATION SYSTEM	
	MCS	MAIN STATION FOR ELEVATOR EMERGENCY TWO-WAY COMMUNICATION SYSTEM	
	BAT	BACK-UP BATTERY FOR ELEVATOR EMERGENCY TWO-WAY COMMUNICATION SYSTEM	
	•	FACELESS GFI FOR UNDERCOUNTER REFRIGERATOR - MOUNT AT +42" AFF.	
	DDC	DIGITAL DIRECT CONTROLS FOR HVAC BY HVAC CONTRACTOR	
	Θ	SIMPLEX RECEPTACLE FOR SUMP PUMP	
	AV2	AUDIO/VISUAL OUTLET BOX AT PROJECTION SCREEN	
	AV1	AUDIO/VISUAL OUTLET BOX AT INSTRUCTOR LOCATION	
	GAP	GENERATOR ANNUNCIATOR PANEL	
	S _{ES}	SCIENCE ROOM EMERGENCY SHUT-OFF MUSHROOM HEAD KEYED PUSH BUTTON WITH LEXAN COVER - REFER TO DETAILS E005-4 & E005-5	
Ξ	VFD	VARIABLE FREQUENCY DRIVE FOR HVAC EQUIPMENT FURNISHED BY MECHANICAL CONTRACTOR AND WIRED BY THE ELECTRICAL CONTRACTOR.	
		CONDUIT SLEEVES - SIZE AND QUANTITY AS SHOWN ON PLANS	
	J	JUNCTION BOX WITH REMOVABLE COVER - SIZE PER NATIONAL ELECTRICAL CODE	
Y R	TS	FIRE ALARM TEMPERATURE SENSOR FOR FIRELINE BACK FLOW PREVENTER	
		VIDEO SURVEILLANCE CAMERA	
	TMGB	MDF ROOM MAIN GROUND BAR. REFER TO SPECIFICATIONS AND REFER TO DETAILS.	
	TGB	IDF ROOM GROUND BAR. REFER TO SPECIFICATIONS AND REFER TO DETAILS.	
	MGB	MAIN GROUND BAR. REFER TO SPECIFICATIONS AND REFER TO DETAILS.	
	KP	NUMERICAL REMOTE SECURITY KEYPAD. LOCATE AT 60" AFF.	
	CR	SECURITY CARD READER. LOCATE +48" TO TOP OF OUTLET.	
		277/480 VOLT SWITCHBOARD WITH MAIN BREAKER, NEUTRAL, AND GROUND BUS BAR ACCESSORIES.	
	_	120/208 VOLT PANELBOARD WITH NEUTRAL AND GROUND BUS ACCESSORIES.	
		277/480 VOLT PANELBOARD WITH NEUTRAL, AND GROUND BUS ACCESSORIES.	
	SPD	SURGE PROTECTIVE DEVICE	
	TX	DRY TYPE STEP DOWN TRANSFORMER 480-120/208 3 PHASE.	
	П	DISCONNECT SWITCH, HEAVY DUTY	
Ξ		WIRING AND CONDUIT INSTALLED CONCEALED IN WALL SPACE OR ABOVE FINISHED CEILING	
		UNSWITCHED WIRING AND CONDUIT LEG ON LIGHTING PLANS. UNDER FLOOR WIRING AND CONDUIT ON POWER PLANS. UNDER GROUND WIRING AND CONDUIT ON SITE PLANS.	
		HOME RUN CIRCUIT TO PANELBOARD	
		SHEET INDEX - ELECTRICAL	

	SYMBOL LEGEND		A	BBREVIATIONS
SYMBOL	DESCRIPTION	REMARKS	ABBREV.	DEFINITION
OR	LUMINAIRE - LETTER DESIGNATES TYPE		A AC	AMPS, AMPERE, AMPERAGE ABOVE COUNTER
OR	NIGHT LIGHT / EMERGENCY LIGHT FIXTURE - LETTER DESIGNATES TYPE		A/C ADA AFF	ALTERNATING CURRENT AMERICANS WITH DISABILITIES ACT ABOVE FINISHED FLOOR
\bigcirc	LIGHT FIXTURE - LETTER DESIGNATES TYPE		AFG AHJ AIC	ABOVE FINISHED GRADE AUTHORITY HAVING JURISDICTION AMPERE INTERRUPTING CURRENT
•	EMERGENCY LIGHT FIXTURE - LETTER DESIGNATES TYPE		AL ANSI ATSC	ALUMINUM AMERICAN NATIONAL STANDARD INSTITUTE AUTOMATIC TRANSFER SWITCH CONTROL
	BATTERY POWERED EMERGENCY FIXTURE - WALL MOUNTED		ATS A/V	AUTOMATIC TRANSFER SWITCH AUDIO/VISUAL
igotimes	EXIT LIGHT - ARROW INDICATES DIRECTION & SHADING INDICATES ILLUMINATED FACE(S).		AWG BAS BFC	AMERICAN WIRE GAUGE BUILDING AUOTMATION SYSTEM BELOW FINISHED CEILING
LC#	MECHANICALLY HELD LIGHTING CONTACTOR. # INDICATES CONTACTOR NUMBER. PROVIDE NUMBER OF CONTACTS AS REQUIRED. PROVIDE HAND OFF AUTO SWITCH FOR EACH LIGHTING CONTACTOR.		C CB CCTV CKT	CONDUIT CIRCUIT BREAKER CLOSED CIRCUIT TELEVISION CIRCUIT
⊢ ((OS)	WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR WITH ISOLATED RELAY AND WIDE ANGLE LENS. TIME DELAYS OF NO LESS THAN 15 MINUTES. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.		CT CU D	CURRENT TRANSFORMER COPPER DIMMING OR DIMMER
(OS)	CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR WITH ISOLATED RELAY AND WIDE ANGLE LENS. TIME DELAYS OF NO LESS THAN 15 MINUTES. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.		DC DL DISC	DISTRIBUTION BOARD DIRECT CURRENT DAY-LIGHTING DISCONNECT SWITCH
OS)	CEILING MOUNTED ULTRASONIC OCCUPANCY SENSOR WITH 1100 SQ. FT., 360°, TWO SIDED COVERAGE. IN GANG TOILETS, MOUNT CENTRAL TO THE STALL AREA WITH RECEIVER AIMED TOWARD THE ENTRANCE. TIME DELAYS OF NO LESS THAN 15 MINUTES. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.		E ECB EOR EWC EX FUT	EMERGENCY ENCLOSED CIRCUIT BREAKER ENGINEER OF RECORD ELECTRIC WATER COOLER EXISTING FUTURE
Sos	DUAL TECHNOLOGY WALL SWITCH SENSOR - COVERAGE: MAJOR MOTION 35'x30', MINOR MOTION 20'x15'. TIME DELAYS OF NO LESS THAN 15 MINUTES. MOUNT AT +48" TO TOP OF OUTLET BOX. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.		FA FACP FATC FDR	FIRE ALARM FIRE ALARM CONTROL PANEL FIRE ALARM TERMINAL CABINET FEEDER
S	SINGLE POLE TOGGLE SWITCH - 48" ABOVE FINISHED FLOOR TO TOP OF OUTLET, UNLESS OTHERWISE NOTED.		FPMR GAA	FUSE PER MANUFACTURER RECOMMENDATIONS GENERATOR ALARM ANNUNCIATOR
S_3	3-WAY SWITCH - INSTALL AT 48" ABOVE FINISHED FLOOR TO TOP OF OUTLET. SWITCH COLOR SELECTED BY ARCHITECT.		GAP GEN GEC	GENERATOR ALARM PANEL GENERATOR GROUNDING ELECTRODE CONDUCTOR
S ₄	4-WAY SWITCH - INSTALL AT 48" ABOVE FINISHED FLOOR TO TOP OF OUTLET SWITCH COLOR SELECTED BY ARCHITECT.		GFI GFCI GFEP GFP	GROUND FAULT INTERRUPTER GROUND FAULT CIRCUIT INTERRUPTER GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT PROTECTION
S_{D}	SLIDE TYPE DIMMER SWITCH FOR 0-10V LED AS NEEDED. VERIFY WITH FIXTURE PROVIDER FOR COMPATIBLE SWITCH TYPES.		GND GRS HH HOA	GROUND GALVANIZED RIGID STEEL HAND HOLE HAND-OFF AUTOMATIC
S_{OR}	LOW VOLTAGE LIGHTING OVERIDE SWITCH. INTEGRATED WITH BAS SYSTEM. SWITCH PROVIDED BY BAS CONTRACTOR.		HP IEEE	HORSEPOWER INSTITUE OF ELECTRICAL AND
S_{T}	DIGITAL TIMER SWITCH WITH AUDIO/VISUAL CAPABILITY TO MEET 2018 NCSBC ENERGY CODE		IG KCMIL	ELECTRONICS ENGINEERS ISOLATED GROUND THOUSAND CIRCULAR MILS
WP S _M	120 VOLT MOTOR RATED TOGGLE DISCONNECT SWITCH WITH JUNCTION BOX. WP INDICATES TO PROVIDE NEMA-3R SWITCH.		KV KVA KW KWH	KILOVOLT KILOVOLT AMPS KILOWATT KILOWATT HOURS
#	DUPLEX GROUNDING TYPE RECEPTACLE - AT 16" ABOVE FINISHED FLOOR TO BOTTOM OF OUTLET, UNLESS OTHERWISE NOTED		LC LS LSIG	LIGHTING CONTACTOR LOUD SPEAKER LONG TIME, SHORT TIME, INSTANTANEOUS AND GROUND FAULT PROTECTION
⊕ GFI	DUPLEX RECEPTACLE - GROUND FAULT INTERRUPTION TYPE - INSTALL AT 16" ABOVE FINISHED FLOOR TO BOTTOM OF OUTLET, UNLESS OTHERWISE NOTED.		MAX MCB MCC MDP	MAXIMUM MAIN CIRCUIT BREAKER MOTOR CONTROL CENTER MAIN DISTRIBUTION PANEL
⇒GFI WP	WEATHERPROOF DUPLEX GROUNDING TYPE RECEPTACLE - +16" ABOVE GRADE TO BOTTOM OF OUTLET BOX, UNLESS OTHERWISE NOTED.		MIN MH MLO	MINIMUM MAN HOLE MAIN LUGS ONLY
-	QUADRUPLEX GROUNDING TYPE RECEPTACLES IN A DOUBLE GANG BOX. MOUNT AT 16" AFF TO BOTTOM OF OUTLET UNLESS OTHERWISE NOTED.		MTS N/A NC NEC	MANUAL TRANSFER SWITCH NOT APPLICABLE NORMALLY CLOSED NATIONAL ELECTRIC CODE
#	SPECIAL PURPOSE RECEPTACLE - SIZE TO MATCH EQUIPMENT FURNISHED - NEMA CONFIGURATION TO MATCH EQUIPMENT FURNISHED - REFER TO PLANS - VERIFY WITH EQUIPMENT MANUFACTURER. MOUNT AT 16" ABOVE FINISHED FLOOR TO BOTTOM OF OUTLET UNLESS OTHERWISE NOTED.		NEMA N or NEUT NFPA NIC	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
TV	TELEVISION OUTLET AND DUPLEX RECEPTACLE - REFER TO DETAIL E003-07. CONFIRM LOCATION AND MOUNTING HEIGHT WITH OWNER AND ARCHITECT PRIOR TO ROUGH-IN.		NO O/H P PA	NORMALLY OPEN OVER HEAD POLE PUBLIC ADDRESS
< #	DATA OUTLET - TWO GANG OUTLET WITH SINGLE GANG PLASTER FLANGE WITH 1 1/4" CONDUIT TO ABOVE ACCESSIBLE CEILING.		PB PC	PULL BOX PHOTOCELL
RFB8	EIGHT GANG RECESS ACTICATED FLOOR BOX WITH (8) DUPLEX OUTLETS AS PER PLANS. PROVIDE CARPET FLANGES AND ROUND COVERS. ARCHITECT TO SELECT COLOR AND STYLE OF COVERS.		PH PT RC RSC	PHASE POTENTIAL TRANSFORMER POTENTIAL TRANSFORMER RECEPTACLE CONTACTOR RIGIDIAN STEEL CONDUIT
FB	SIX GANG RECESS ACTICATED FLOOR BOX WITH THREE DUPLEX OUTLETS AND DATA OUTLETS AS PER PLANS. PROVIDE CARPET FLANGES AND ROUND COVERS. ARCHITECT TO SELECT COLOR AND STYLE OF COVERS.		SEC SPD SW SWBD	SECURITY SURGE PROTECTIVE DEVICE SWITCH SWITCHBOARD
	EIGHT GANG RECESS ACTICATED FLOOR BOX WITH TWO DUPLEX RECEPTACLES AND TWO DATA OUTLETS AS PER PLANS. PROVIDE CARPET FLANGES AND ROUND COVERS. ARCHITECT TO SELECT COLOR AND STYLE OF COVERS.		SWGR TC TEMP TGB TGMB	SWITCHGEAR TIME CLOCK TEMPORARY TECHNOLOGY GROUND BAR TECHNOLOGY MAIN GROUND BAR
R	FIRE ALARM RELAY FOR HVAC EQUIPMENT SHUTDOWN		TTB TV TYP.	TELEPHONE TERMINAL BOARD TELEVISION
H < #CD	WALL MOUNTED FIRE ALARM HORN/STROBE - #CD INDICATES CANDELA RATING OF STROBE		U/C U/G	TYPICAL UNDER COUNTER UNDERGROUND
H #CD	CEILING MOUNTED FIRE ALARM HORN/STROBE - #CD INDICATES CANDELA RATING OF STROBE		UGE UL UON	UNDERGROUND ELECTRIC UNDERWRITERS' LABORATORIES UNLESS OTHERWISE NOTED
F	WALL MOUNTED FIRE ALARM PULL STATION - MOUNT AT +4'-0" TO TOP OF OUTLET BOX. PROVIDE LEXAN STOPPER II COVER.		UPS V VFD	UNINTERRUPTABLE POWER SUPPLY VOLTS, VOLTAGE VARIABLE FREQUENCY DRIVE
RM	FIRE ALARM RELAY MODULE		WG WP	WIRE GUARD WEATHERPROOF
MM	FIRE ALARM MONITOR MODULE		XFER XFMR	TRANSFER TRANSFORMER
S #CD	CEILING MOUNTED FIRE ALARM STROBE ONLY - #CD INDICATES CANDELA RATING OF STROBE			

NORTH CAROLINA

FINAL DRAWING FOR REVIEW PURPOSES ONLY NOT RELEASED FOR CONSTRUCTION

CARO!

0 1/2

15 NOVEMBER 2024

SCALE:

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

E - 001

ROOM

DRAWN BY:

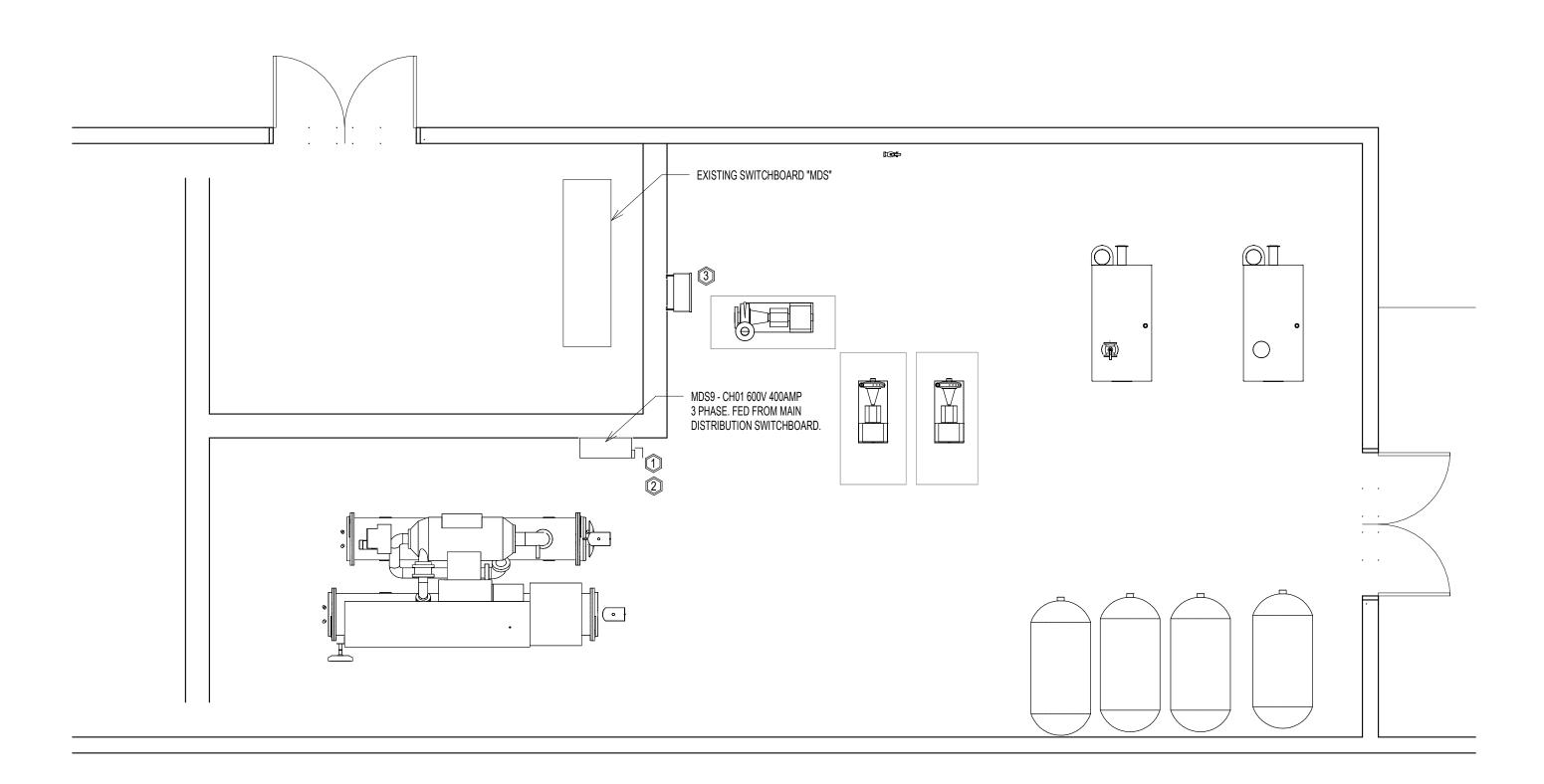
PROJECT NO.: 2877-R

CHECKED BY:

15 NOVEMBER 2024 SCALE:

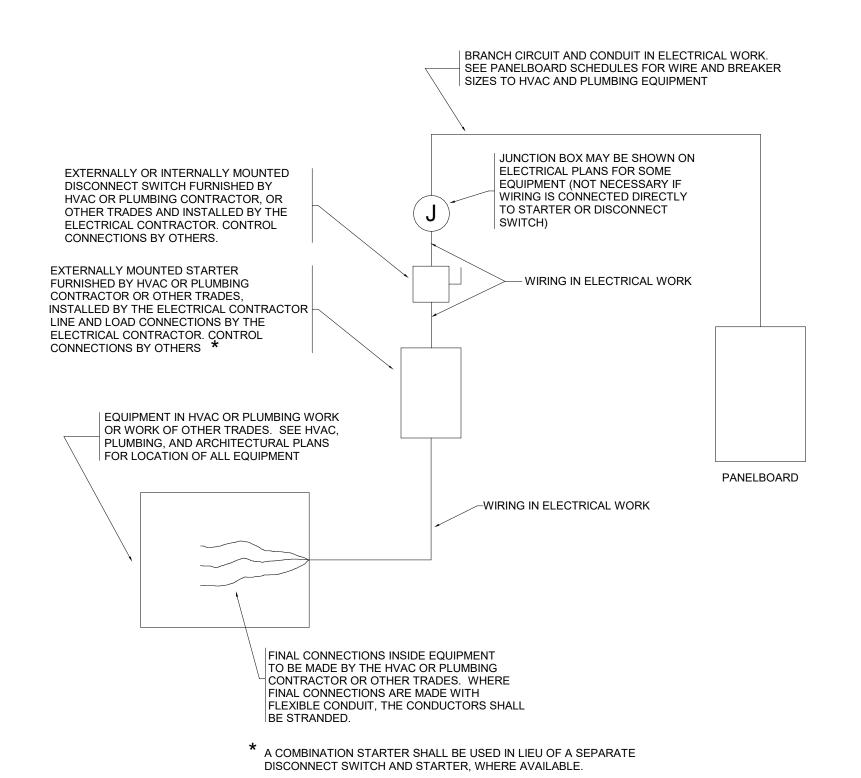
> 0 1/2 IF THIS BAR DOES NOT
> MEASURE 1" THEN DRAWING
> IS NOT TO FULL SCALE

E - 100



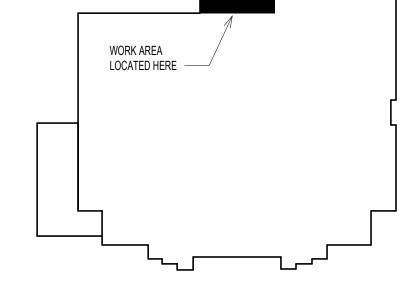
MECHANICAL ROOM ELECTRICAL POWER PLAN

- DISCONNECT AND REMOVE EXISTING 400 AMP DISCONNECT.
 PROVIDE NEW 600V 400 AMP THREE PHASE HEAVY DUTY FUSED DISCONNECT. PROVIDE 400 AMP CLASS J FUSES WITH 65KAIC INTERRUPTING RATING.
- DISCONNECT AND REMOVE EXISTING CHILLER WIRING FROM DISCONNECT TO CHILLER. PROVIDE (3) 300 KCMIL, #4G, 2.5"C FROM NEW DISCONNECT TO
- DISCONNECT AND REMOVE EXISTING VFD AND LOAD SIDE WIRING.
 INSTALL NEW VFD PROVIDED BY MECHANICAL CONTRACTOR. PROVIDE (3) #10, #10G, 3/4"C FROM NEW VFD TO



3 DETAIL - TYPICAL EQUIPMENT CONNECTIONS

NOT TO SCALE



2 SITE KEY PLAN ELECTRICAL NOT TO SCALE



FINAL DRAWING FOR REVIEW PURPOSES ONLY NOT RELEASED FOR CONSTRUCTION