



# MIDLANDS TECHNICAL COLLEGE - NORTHEAST CAMPUS CET BUILDING CHILLER REPLACEMENT

COLUMBIA, SC  
**H59-N991-FW**

A/E Project #17098.01  
MARCH 7, 2018  
ISSUED FOR CONSTRUCTION

Prepared by:



1201 Main Street  
Columbia, South Carolina 29201-3299  
tel. 803-256-0000 fax 803-255-7243



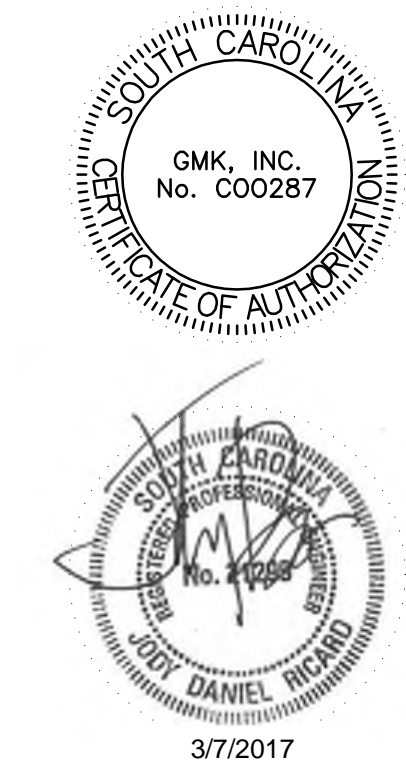
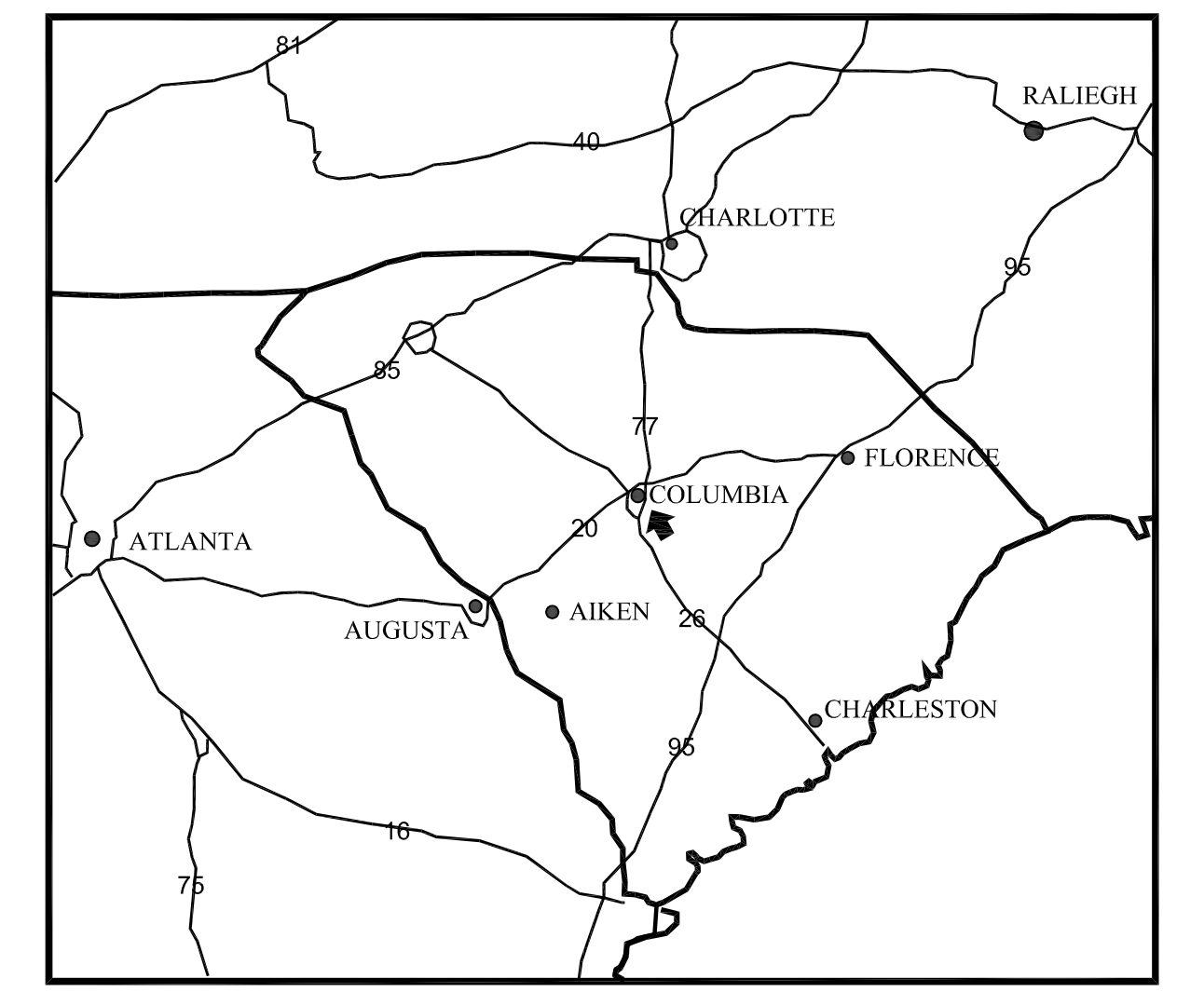
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## KEY PLAN



SET NO. \_\_\_\_\_

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MIDLANDS TECHNICAL COLLEGE  
NORTHEAST CAMPUS

project name  
**CET BUILDING  
CHILLER REPLACEMENT  
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project number  
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scale/signature

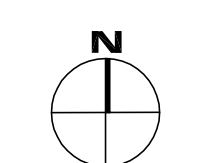
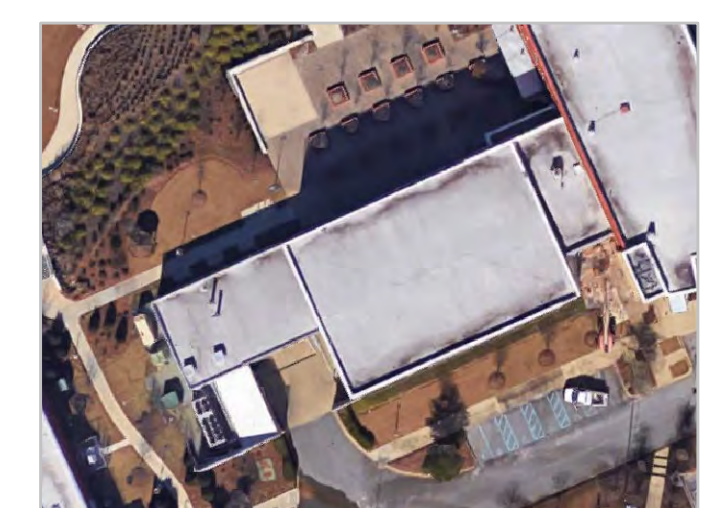


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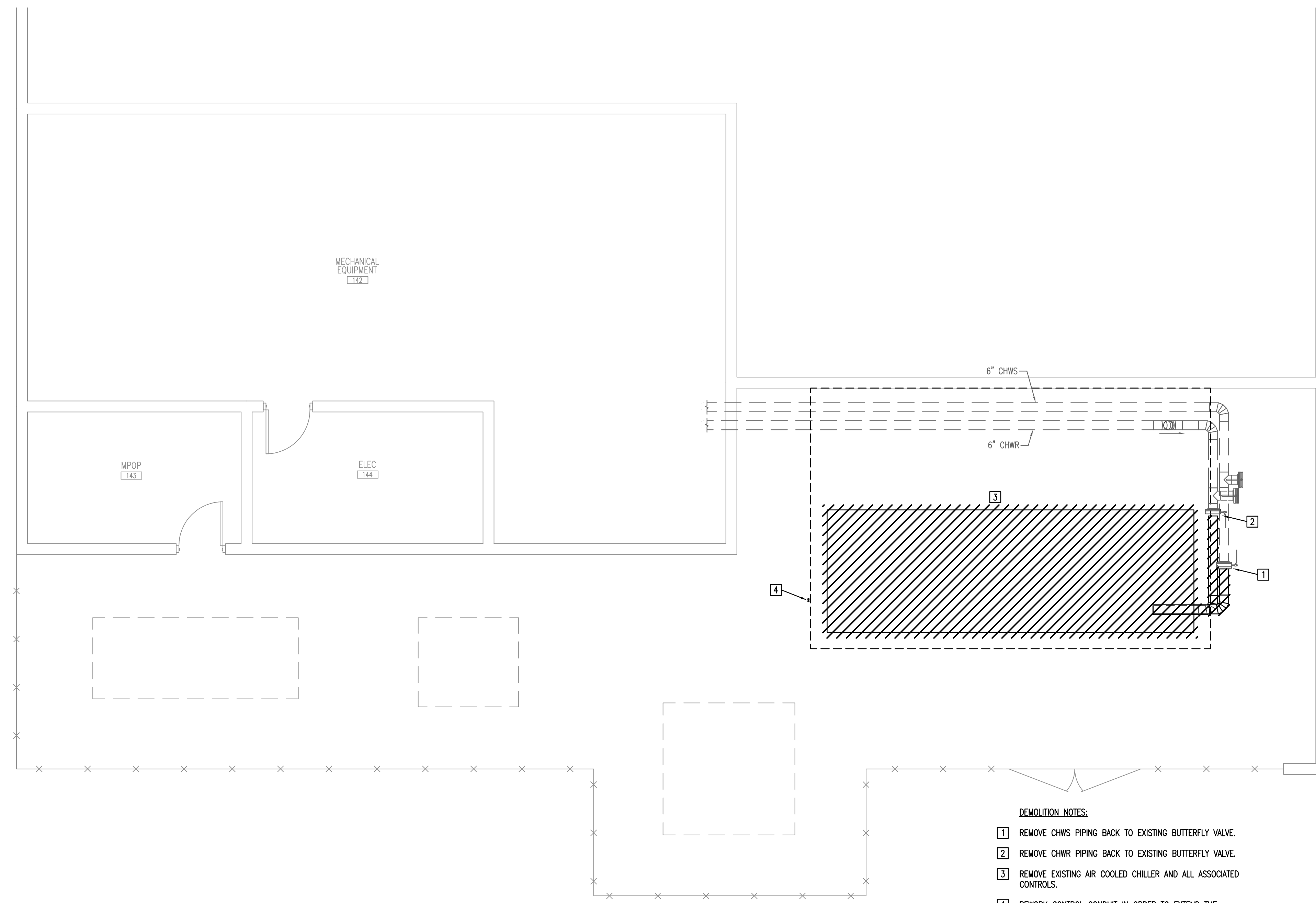


sheet title  
**PARTIAL FIRST FLOOR PLAN  
HVAC DEMOLITION**

sheet number

**M1.1**

drawn by **JDR**  
checked by **JWB**

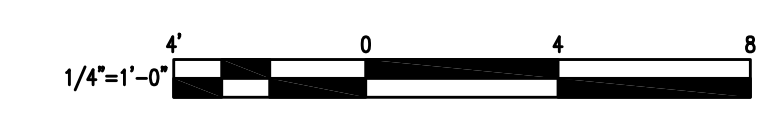


- DEMOLITION NOTES:
- REMOVE CHWS PIPING BACK TO EXISTING BUTTERFLY VALVE.
  - REMOVE CHWR PIPING BACK TO EXISTING BUTTERFLY VALVE.
  - REMOVE EXISTING AIR COOLED CHILLER AND ALL ASSOCIATED CONTROLS.
  - REWORK CONTROL CONDUIT IN ORDER TO EXTEND THE HOUSEKEEPING PAD. RECONNECT CONTROLS TO NEW CHILLER. SEE PHOTO.

① PARTIAL FIRST FLOOR PLAN – HVAC DEMOLITION  
1/4"=1'-0"



② PHOTO OF EXISTING CONTROL CIRCUITS  
NTS





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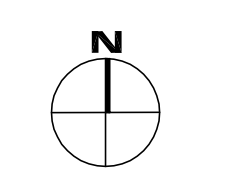


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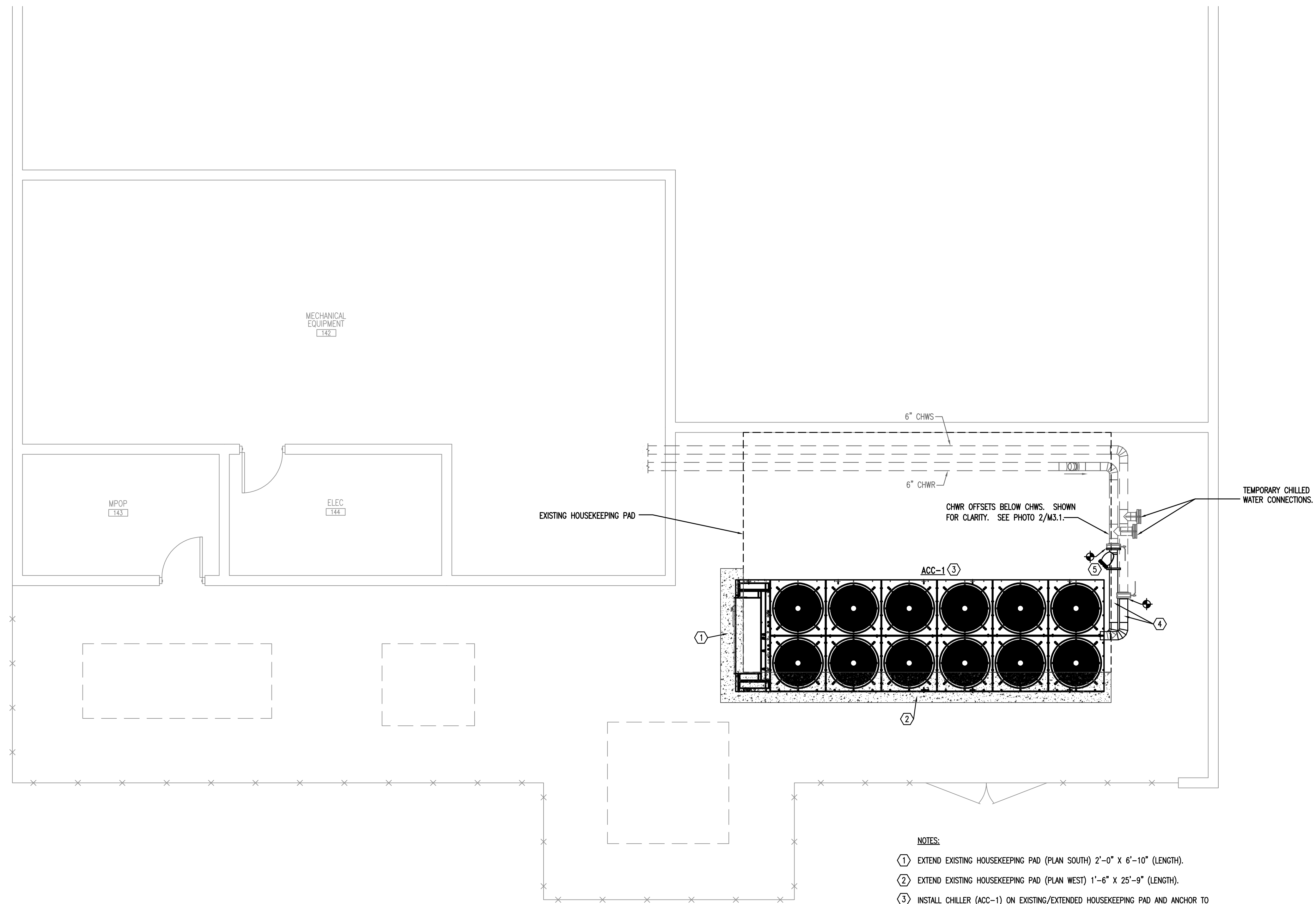


sheet title  
PARTIAL FIRST FLOOR PLAN  
HVAC RENOVATION

sheet number

**M3.1**

drawn by JDR  
checked by JWB



- NOTES:
- ① EXTEND EXISTING HOUSEKEEPING PAD (PLAN SOUTH) 2'-0" X 6'-10" (LENGTH).
  - ② EXTEND EXISTING HOUSEKEEPING PAD (PLAN WEST) 1'-6" X 25'-9" (LENGTH).
  - ③ INSTALL CHILLER (ACC-1) ON EXISTING/EXTENDED HOUSEKEEPING PAD AND ANCHOR ACC-1 IN ACCORDANCE WITH SEISMIC ENGINEER'S RECOMMENDATIONS.
  - ④ EXTEND HEAT TRACING TO NEW CHILLED WATER SUPPLY AND RETURN PIPING.
  - ⑤ PROVIDE NEW STRAINER IN CHWR AT EXISTING BUTTERFLY VALVE. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

① PARTIAL FIRST FLOOR PLAN – HVAC RENOVATION  
1/4"=1'-0"

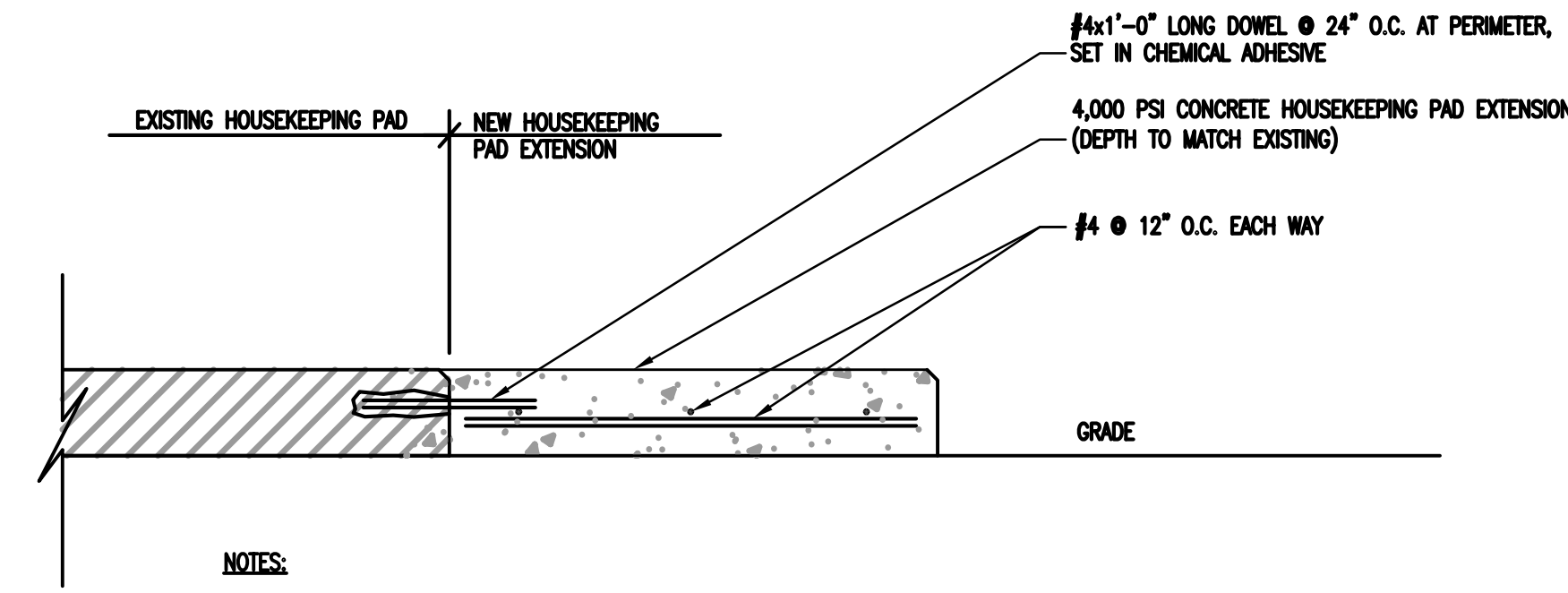


② PHOTO OF EXISTING CHILLED WATER PIPING  
NTS



AIR COOLED CHILLER SCHEDULE																								
CHILLER #	ACTUAL TONS	FULL LOAD EER AT AHRI	IPLV AT AHRI	FANS		COMPRESSOR		OUTDOOR DB T				CHILLED WATER				SYSTEM			MAX. DIMENSIONS			MANUFACTURER	MODEL	REMARKS
				FLA (EACH)	NO	RA (EACH)	NO	DB T	GPM	MAX PD(T)	ENT T	LWG T	KW	MCA	VOLT/PH	LENGTH	WIDTH	HEIGHT						
ACC-1	236.0	10.56	17.11	3.3	12	205	2	95	739	22.2	52.64	44	263.9	505	480/3	296"	89"	100"	YORK	YMA0270DUF46BWNX0	1,2,3,4,5,6,7			
	236.0	10.22	17.68	3.3	14	1 @ 218 1 @ 131	2	95	739	22.3	51.6	44.0	277.0	460	480/3	296"	89"	100"	DAIKIN	AWV014	1,2,3,4,5,6,8			

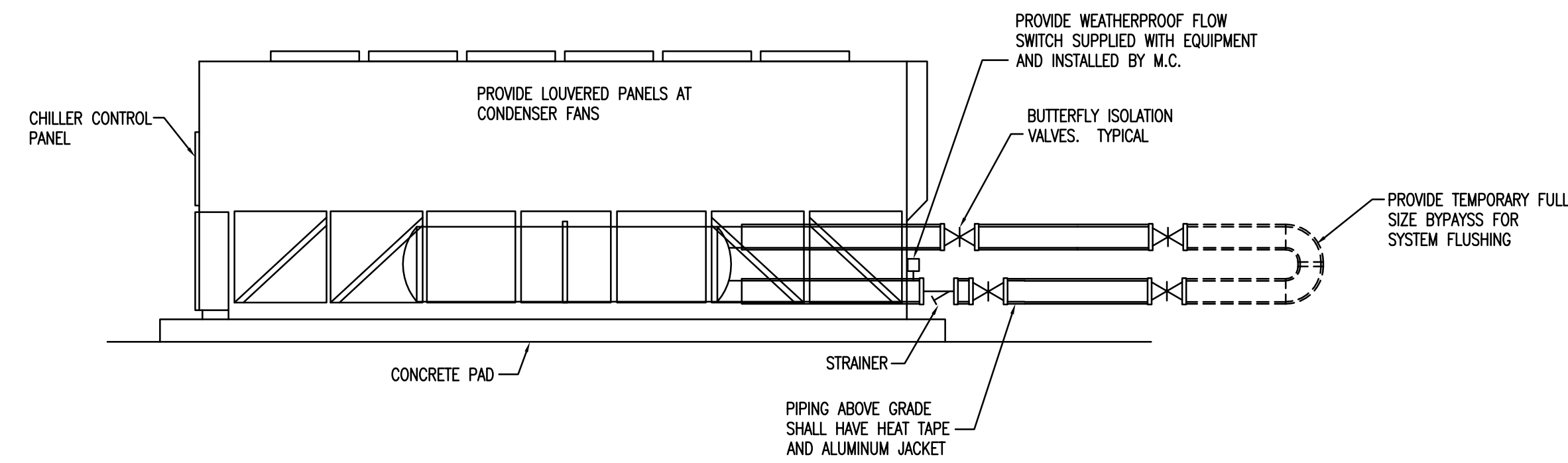
1. FAN SPEED CONTROL      3. 0.0001 SCALE FACTOR      5. FACTORY MOUNTED DISCONNECT AND STARTER      7. BASIS OF DESIGN  
2. DISCHARGE DAMPER CONTROL      4. VARIABLE SPEED COMPRESSOR      6. CHILLER CONTROLS SHALL INTERFACE WITH EMS      8. EQUAL MANUFACTURER PERFORMANCE



NOTES:

1. REMOVE ALL DETERIORATED CONCRETE, DIRT, OIL, GREASE, AND ALL BOND-INHIBITING MATERIALS FROM SURFACE. PREPARATION WORK SHOULD BE DONE BY SCABBLER, OR OTHER APPROPRIATE MECHANICAL MEANS TO OBTAIN AN EXPOSED AGGREGATE SURFACE WITH A MINIMUM SURFACE PROFILE OF 1/8 IN. (CSP-7). SATURATE SURFACE WITH CLEAN WATER. SUBSTRATE SHOULD BE SATURATED SURFACE DRY (SSD) WITH NO STANDING WATER DURING APPLICATION.

1 EXTENDING EXISTING HOUSEKEEPING PAD DETAIL  
NTS



9 AIR-COOLED CHILLER  
NTS

HVAC LEGEND			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	CONNECT TO EXISTING		ECCENTRIC REDUCER FLAT ON TOP
	CHILLED WATER SUPPLY		TEE OUTLET UP
	CHILLED WATER RETURN		TEE OUTLET DOWN
	UNION		GATE VALVE
	STRAINER		CONTROL VALVE, TWO WAY
	STRAINER WITH BLOW OFF		END CAP
	CONCENTRIC REDUCER		ELBOW TURNED DOWN
	PRESSURE INDICATOR		ELBOW TURNED UP
	TEMPERATURE INDICATOR		ECCENTRIC REDUCER FLAT ON BOTTOM
			BUTTERFLY VALVE

ABBREVIATIONS

ACC-#	Air Cooled Chiller - No.	MBH	Thousand BTU/hr (thousands)
AFF	Above Finished Floor	MIN	Minimum
BHP	Brake Horsepower	N/A	Not Applicable
CFM	Cubic Feet Per Minute	NI	Not in Contract
CHWS	Chilled Water Supply	NTS	Not to Scale
CHWR	Chilled Water Return	PD	Pressure Drop
DD	Duct Smoke Detector	RH	Relative Humidity
DT	Dry Bulb Temperature	SA	Supply Air
DB	Dry Bulb Temperature	SH	Sheet
EAT	Entering Air Temperature	SP	Static Pressure
ELEC	Electric or Electrical	SPEC	Specifications
EWB	Entering Air Wet Bulb	SPL	Supply
FL	Floor	T	Thermostat
FWS	Hot Water Supply	TEMP	Temperature
FWR	Hot Water Return	TSTAT	Thermostat
HP	Horsepower	TYP	Typical
LAT	Leaving Air Temperature	VFD	Variable Frequency Drive
LWB	Leaving Air Wet Bulb	WB	Wet Bulb Temperature
LWT	Leaving Water Temperature	WPD	Water Pressure Drop (in. w.g.)
MAX	Maximum		

MECHANICAL GENERAL NOTES

1. DO NOT SCALE DRAWINGS; SEE ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF DOORS, WINDOWS, CEILING DIFFUSERS, ETC.
2. ALL PIPING SHALL PITCH DOWN IN DIRECTION OF FLOW OR AS INDICATED ON DRAWINGS: 1" PER 40 FEET WITH MANUAL AIR VENTS AT ALL HIGH POINTS, AND 3/4" DRAIN VALVES AT ALL LOW POINTS.
3. ALL PIPING AND DUCTWORK INSULATION SHALL BE RUN CONTINUOUSLY THROUGH FLOORS, ROOFS AND PARTITIONS EXCEPT WHERE PROHIBITED BY FIRE CODES.
4. ALL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE SPECIFICATIONS AND FURTHER SUPPORTS OR HANGERS SHALL BE ADJACENT TO ELBOWS TO PREVENT WEIGHT OF PIPING BEING PLACED ON THE EQUIPMENT. SUPPORT DETAILS SHALL BE SUBMITTED TO THE MECHANICAL ENGINEER.
5. ALL PIPING LOCATIONS SHALL BE COORDINATED WITH THE WORK UNDER OTHER DIVISIONS OF THE SPECIFICATIONS TO AVOID INTERFERENCE.
6. CORRECT SETTINGS ON ALL BALANCING FITTINGS SHALL BE PERMANENTLY MARKED.
7. COORDINATE ORIENTATION OF SUPPLY AND RETURN PIPING BEFORE FABRICATION.
8. PROVIDE DIELECTRIC FITTINGS AT ALL LOCATIONS WHERE DISSIMILAR METALS ARE JOINED IN PIPING AND DUCT SYSTEMS.

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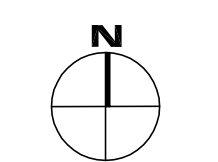


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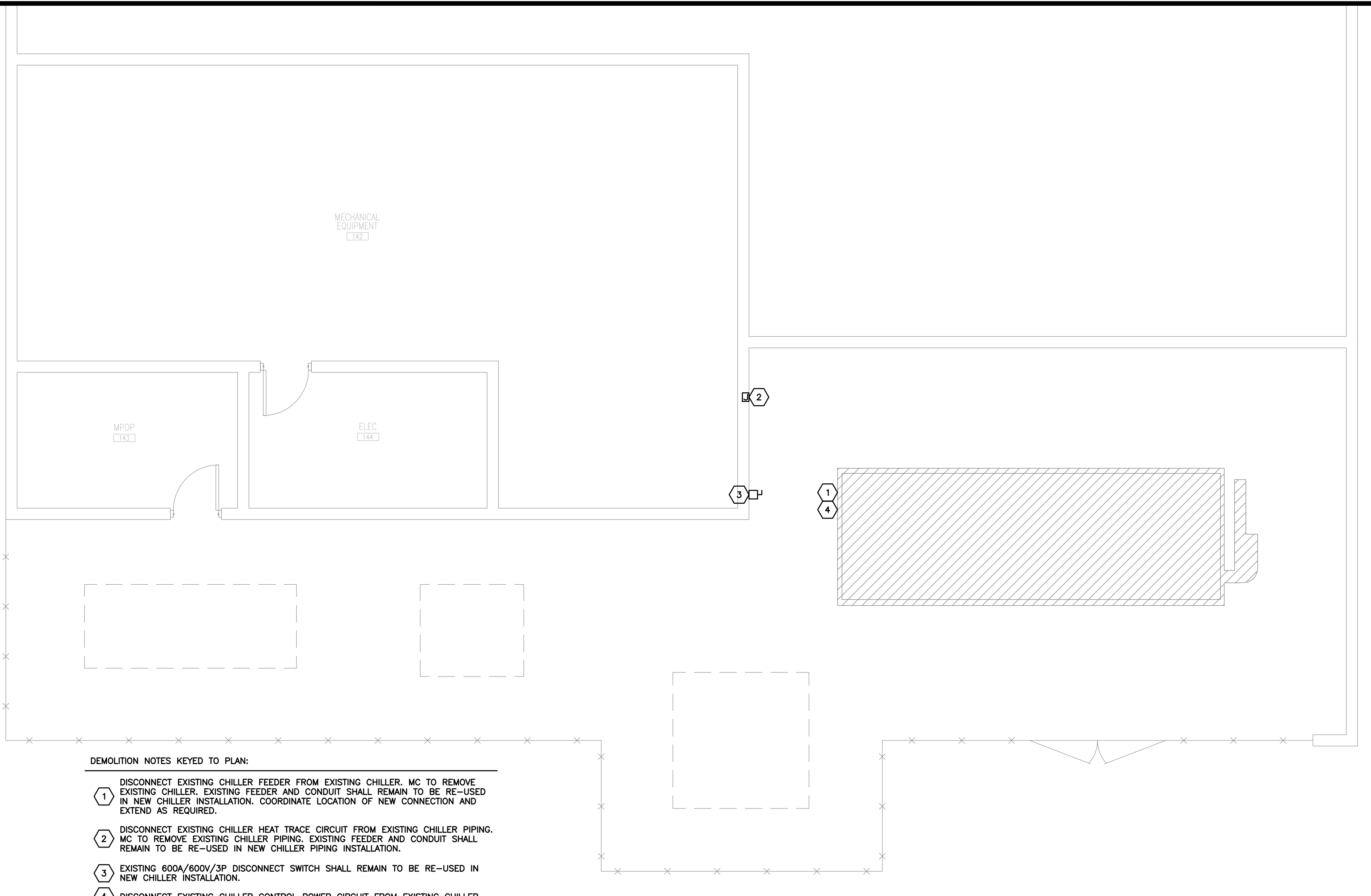
key plan



sheet number

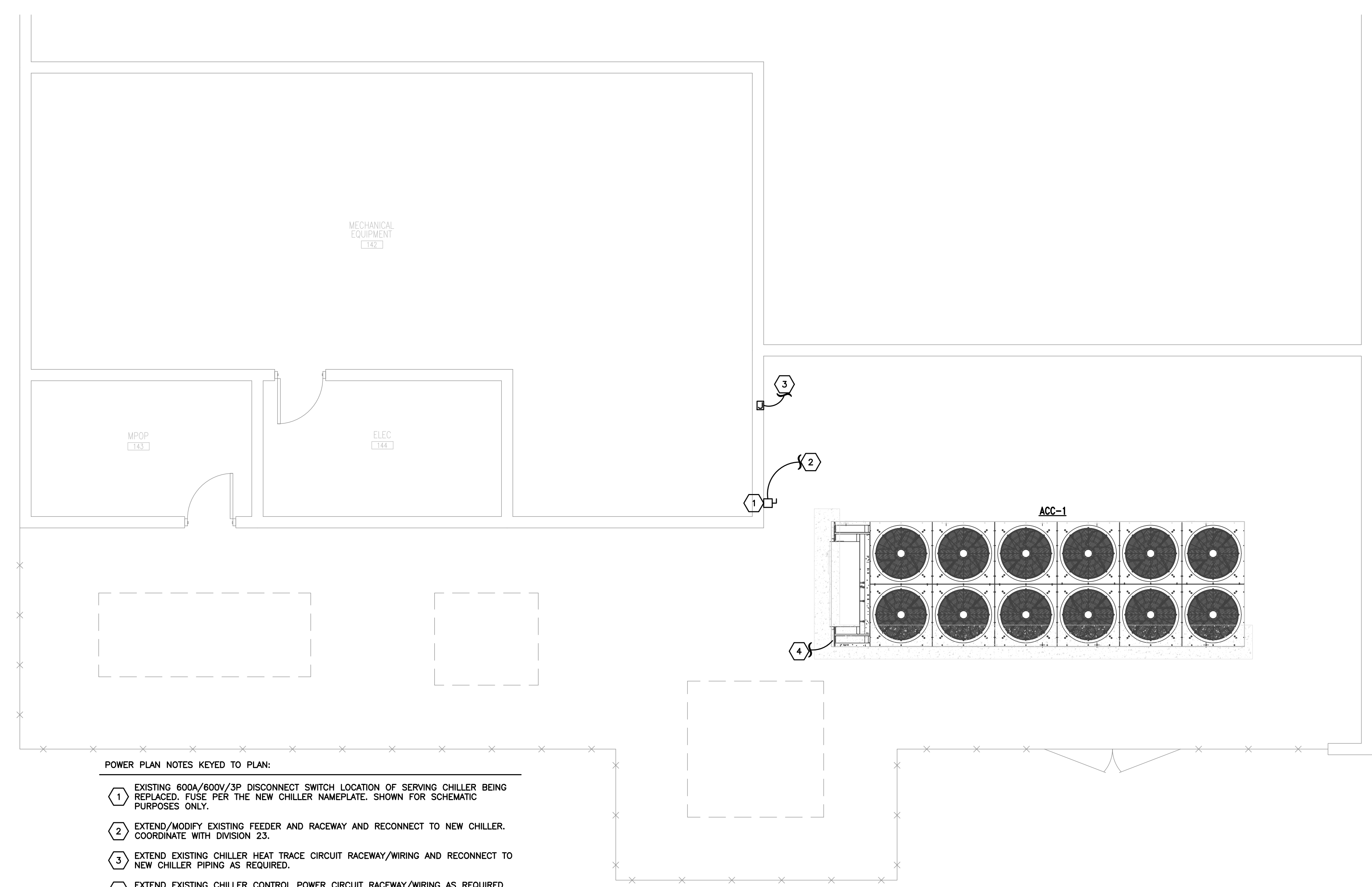
- GENERAL NOTES ALL DRAWINGS:**
- DO NOT SCALE DRAWINGS. LOCATE EQUIPMENT AND OTHER ELECTRICAL DEVICES AS INDICATED AND COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS. COORDINATE EXACT LIGHTING FIXTURE LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLAN.
  - MINIMUM SIZE CONDUCTOR FOR POWER SHALL BE #12 AWG. PROVIDE DEDICATED NEUTRAL FOR EACH MULTI-WIRE BRANCH CIRCUIT IN COMPLIANCE WITH NEC.
  - ALL FUSES SHALL BE DUAL-ELEMENT TYPE, "FUSETRON" BY BUSSMAN, "ECON" BY ECONOMY, OR FERRAZ SHAMMUT.
  - ALL BRANCH CIRCUIT LOADS SHALL BE BALANCED ACROSS PANELBOARD BUSES TO OBTAIN MINIMUM NEUTRAL CURRENT.
  - ALL FLEXIBLE CONDUIT SHALL CONTAIN A GREEN WIRE BONDED TO RIGID RACEWAY, BOX OR FIXTURE AT EACH END OF FLEX. SIZE GROUND PER NEC TABLE 250-122.
  - PROVIDE PULL STRING IN ALL EMPTY RACEWAYS.
  - WHERE NOT INDICATED OTHERWISE, EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED PER NEC TABLE 250-122.
  - ALL METAL CONDUITS 1" AND LARGER SHALL HAVE A GROUNDING BUSHING BONDING CONDUIT TO ENCLOSURE.
  - REMOVE DRYWALL DUST AND MUD FROM THE INTERIOR OF BOXES BEFORE INSTALLING DEVICES.
  - CLEAN ALL DEVICES IN THE CONSTRUCTION AREAS. REPLACE DAMAGED DEVICES AND DEVICE PLATES AS NEEDED.
  - VERIFY ALL MECHANICAL EQUIPMENT LOCATIONS AND ELECTRICAL REQUIREMENTS WITH MECHANICAL PLANS, IF MECHANICAL EQUIPMENT BEING PROVIDED DOES NOT MATCH DESIGN NOTIFY ENGINEER IMMEDIATELY.
  - ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING WORK WITH POWER & TELECOMMUNICATIONS UTILITIES. ELECTRICAL CONTRACTOR TO PROVIDE ALL MATERIALS AND WORK FOR AS REQUIRED BY EACH UTILITY FOR A COMPLETE AND OPERABLE SYSTEM. PROVIDE RACEWAY(S) TO UTILITY CONNECTION POINT.
  - CONCEAL ALL CONDUIT AND RACEWAY. IF CONDITIONS REQUIRE CONDUIT OR RACEWAY TO BE RUN EXPOSED COORDINATE ROUTING WITH ARCHITECT AND PAINT AS REQUIRED BY ARCHITECT.
  - ELECTRICAL WORK SHALL COMPLY WITH ALL NATIONAL, STATE AND LOCAL CODES, REQUIREMENTS AND ORDINANCES.
  - ALL BACKBOXES SHALL BE MINIMUM 4" SQUARE.
  - ALL EMT FITTINGS SHALL BE STEEL COMPRESSION TYPE WITH INSULATED THROAT.
  - COORDINATE WITH GENERAL CONTRACTOR TO PROVIDE BLOCKING AT ALL WALL MOUNTED DEVICES WHERE APPLICABLE.
  - PROVIDE PLASTIC ENGRAVED NAMETAGS FOR ALL ELECTRICAL GEAR. INDICATE EQUIPMENT NAME, EQUIPMENT SERVED (WHERE APPLICABLE), FEEDER SOURCE AND CIRCUIT, VOLTAGE. LETTERING SHALL BE 3/8" IN HEIGHT, WHITE ON BLACK BACKGROUND.
  - PROVIDE LABELS INDICATING CIRCUIT NUMBER AND SOURCE FOR ALL 120V AND GREATER DEVICES. LABELS SHALL BE THERMAL TRANSFER TYPE, 3/8" WITH 1/4" LETTERING. WHITE BACKGROUND FOR BLACK DEVICES, CLEAR BACKGROUND OTHERWISE.
  - PROVIDE ALL EQUIPMENT WITH 75°C OR 90°C TERMINATIONS, ALL WIRE SIZING INDICATED ON PLANS IS BASED ON 75°C TERMINATIONS. WHERE EQUIPMENT IS PROVIDED BY OTHERS AND IS NOT SPECIFICALLY LISTED AND MARKED WITH 75°C TERMINATIONS INCREASE CONDUCTOR SIZE BASED ON 2014 NEC TABLE 310.15(B)(16) 60°C COLUMN FOR CIRCUITS 100 AMPERES AND LESS IN SIZE.
  - EQUIPMENT ROUGH IN DRAWINGS ARE SCHEMATIC IN NATURE AND INTENDED TO PROVIDE THE GENERAL SCOPE OF WORK AND POWER CONNECTIONS TO BE INSTALLED BY THE CONTRACTOR. VERIFY ALL INSTALLATION REQUIREMENTS WITH VENDOR INSTALLATION DRAWINGS AND MANUALS PRIOR TO PLACING BID. CONTRACTOR SHALL BE RESPONSIBLE FOR INTERCONNECTIONS AND ALL RACEWAYS AND WIRING AS REQUIRED BY VENDOR INSTALLATION DRAWINGS. WHERE DISCREPANCIES OCCUR BETWEEN INFORMATION INCLUDED ON THESE DRAWINGS AND THAT WHICH IS PUBLISHED IN THE MANUFACTURER INSTALLATION MANUAL, THE MANUFACTURER PUBLICATION SHALL TAKE PRECEDENCE AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR INCLUDING ALL WORK AND MATERIALS AS REQUIRED TO A COMPLETE SYSTEM IN ACCORDANCE WITH MANUFACTURER INSTALLATION INSTRUCTIONS.
  - SUPPLEMENTAL GROUNDING SHALL BE REQUIRED BETWEEN PULL BOXES AND EQUIPMENT LOCATIONS PER EQUIPMENT MANUFACTURER INSTALLATION REQUIREMENTS. THE CONTRACTOR SHALL BE REQUIRED TO REVIEW THE VENDOR/MANUFACTURER INSTALLATION MANUAL PRIOR TO PLACING BID AND IS RESPONSIBLE FOR PROVIDING ALL SUPPLEMENTAL GROUNDING CONNECTIONS, WIRING, RACEWAYS, AND SUPPORT MATERIALS FOR A COMPLETE INSTALLATION IN ACCORDANCE WITH THE MANUFACTURER INSTALLATION MANUAL.
  - THE SCOPE OF WORK REQUIRES PARTIAL ELECTRICAL DEMOLITION IN AN AREA OF THE FACILITY WHICH WILL BE IN-USE DURING THE RENOVATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING CIRCUITS AND CONNECTIONS AND SHALL NOT TURN POWER OFF TO ANY CIRCUIT BREAKER OR PORTION OF THE ELECTRICAL DISTRIBUTION SYSTEM WITHOUT PERMISSION OF THE OWNER.
  - THE DEMOLITION NOTES INCLUDED IN THESE DRAWINGS ARE INTENDED TO REPRESENT A GENERAL DIRECTION FOR DISCONNECTION AND REMOVAL OF EXISTING EQUIPMENT AND PREPARATION OF EXISTING ROOMS OR AREAS SCHEDULED FOR RENOVATION. THE CONTRACTOR SHALL COORDINATE WITH THE ARCHITECTURAL DRAWINGS AND THE OWNER PRIOR TO DISCONNECTION OR MODIFICATION OF ANY ELECTRICAL SYSTEM ELEMENT OR DEVICE.

ABBREVIATIONS	
A	AMPERE
AF	ABOVE FINISHED FLOOR
AFO	ABOVE FINISHED GRADE
AF	ARC FAULT CIRCUIT INTERRUPTER
BKR	BREAKER
C	CONDUIT
CATV	CABLE TELEVISION
CCT	CIRCUIT
EC	ELECTRICAL CONTRACTOR, DIVISION 16 (DIV 16)
EF	EXHAUST FAN
EMT	ELECTRICAL METALLIC TUBING
FCU	FAN COIL UNIT
GC	GENERAL CONTRACTOR, DIVISION 00 THROUGH 14
GF	GROUND FAULT CIRCUIT INTERRUPTER
GRS	GALVANIZED RIGID STEEL CONDUIT
HID	HIGH INTENSITY DISCHARGE
IG	DEVICE SHALL HAVE ISOLATED GROUND - SEE SPECIFICATIONS
IMC	INTERMEDIATE METALLIC CONDUIT
JB or J-BOX	JUNCTION BOX
KVA	KILOVOLT AMPERES
KW	KILOWATT
MAC	MACQUIM
MCP	MECHANICAL CONTRACTOR, DIVISION 15 (DIV 15)
MC	MAIN DISTRIBUTION PANEL
MFR	MINIMUM
MFR	MANUFACTURER
NMC	NONMETALLIC-SHEATHED CABLE
V	VOLT
VFD	VARIABLE FREQUENCY DRIVE
NEC	2014 NATIONAL ELECTRICAL CODE, (NFPA 70)
SWBD	SWITCHBOARD
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
XTMR	TRANSFORMER

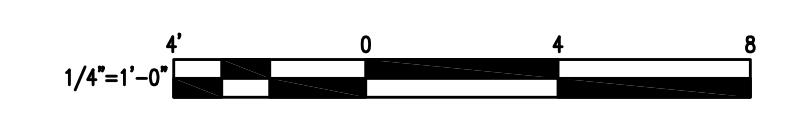


1 PARTIAL FIRST FLOOR PLAN – ELEC DEMOLITION  
1/4"=1'-0"

ELECTRICAL SYMBOL SCHEDULE - GENERAL	
<b>GENERAL</b>	
	BRANCH CIRCUIT RACEWAY. RUN CONCEALED IN CEILING OR WALLS. ARROWHEAD DENOTES HOMERUN TO PANEL. CROSSLINES DENOTE NUMBER OF PHASE AND NEUTRAL CONDUCTORS WHEN MORE THAN TWO ARE TO BE INSTALLED. TEXT DENOTES PANEL NAME AND CIRCUIT NUMBERS FOR HOMERUN. INSTALL GROUND WIRE IN ALL RACEWAYS. #12 AWG MINIMUM AND AS PER CODE.
	BRANCH CIRCUIT RACEWAY. RUN IN OR UNDER SLAB OR FLOOR. ARROWHEAD DENOTES HOMERUN TO PANEL. CROSSLINES DENOTE NUMBER OF PHASE AND NEUTRAL CONDUCTORS WHEN MORE THAN TWO ARE TO BE INSTALLED. TEXT DENOTES PANEL NAME AND CIRCUIT NUMBERS FOR HOMERUN. INSTALL GROUND WIRE IN ALL RACEWAYS. #12 AWG MINIMUM AND AS PER CODE.
	ELECTRICAL DISTRIBUTION OR BRANCH CIRCUIT PANELBOARD. TEXT DENOTES NAME. REFER TO DRAWINGS FOR LOCATION. SEE POWER RISER DIAGRAM AND PANEL SCHEDULES. SURFACE OR FLUSH MOUNTED AS INDICATED ON PANEL SCHEDULE.
	JUNCTION BOX, FLUSH WALL MOUNTED IN FINISHED WALLS, SURFACE MOUNTED WHERE INDICATED ON DRAWINGS. MINIMUM 4" SQUARE WITH APPROPRIATE REDUCING RING FOR DEVICE BEING INSTALLED. REFER TO TYPICAL MOUNTING HEIGHTS DETAIL WHERE MOUNTING HEIGHT IS NOT INDICATED ON DRAWINGS. SIZE PER NEC.
	EXISTING HEAVY DUTY DISCONNECT SWITCH.
	PLAN KEYNOTE, REFER TO KEYNOTE ON EACH DRAWING.



2 PARTIAL FIRST FLOOR PLAN – ELEC RENOVATION  
1/4"=1'-0"



**GMK ENGINEERING**  
1201 Main Street, Suite 2100  
Columbia, S.C. 29201  
tel: 803-256-0000  
fax: 803-255-7243

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**ELECTRICAL DEMOLITION  
AND RENOVATION  
FLOOR PLAN**

sheet number

**E3.1**

drawn by TLK  
checked by EMI