

Order Plans @

HVAC SYMBOLS

SYMBOL	DESCRIPTION
16x8	SQUARE DUCT SIZE TAG (WIDTH X HEIGHT)
15"Ø	ROUND DUCT SIZE TAG (DIAMETER)
16x16	EXISTING DUCT TAG
16x16	DUCT BEING DEMOLISHED
16x16	EXISTING FIRE DAMPER (WITH ACCESS DOOR)
S/A	SUPPLY AIR
R/A	RETURN AIR
E/A	EXHAUST AIR
◇	SUPPLY AIR DIFFUSER (4-WAY)
◇	RETURN AIR GRILLE
◇	RETURN AIR GRILLE WITH SOUND BOOT
◇	EXHAUST AIR GRILLE
◇	DOOR GRILLE (BY G.C.)
⊕	POINT OF EXISTING TO NEW CONNECTION
⊖	THERMOSTAT / TEMP SENSOR (4'-0" OFF TO TOP)
M.C.	MECHANICAL CONTRACTOR
E.C.	ELECTRICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
N.I.C.	NOT IN CONTRACT
(EX)	EXISTING
AF	ABOVE FINISHED FLOOR
DN	DOWN
UP	UP
X X	SECTION CUP REFERRING DETAIL NUMBER REFERRING SHEET NUMBER

ABBREVIATIONS

Ø	ROUND
ABV	ABOVE
AC	AIR CONDITIONING
ADD	ADDENDUM
AFF	ABOVE FINISHED FLOOR
ALT	ALTERNATE
ARCH	ARCHITECT/ARCHITECTURAL
BLF	BELOW FINISHED FLOOR
BB	BELOW
BTU/H	BRITISH THERMAL UNITS PER HOUR
CAP	CAPACITY
CFM	CUBIC FEET PER MINUTE
CLG	CEILING
CW	COLD WATER
D	DEGREE
DB	DRY BULB
DIA	DIAMETER
DN	DOWN
EA	EACH
EAT	ENTERING AIR TEMPERATURE
ELEC	ELECTRICAL
EQUIP	EQUIPMENT
ENT	ENTERING WATER TEMPERATURE
EX	EXHAUST
EXH	EXISTING
F	FEET
FL	FLOOR
FPM	FEET PER MINUTE
FT	FOOT/FEET
GAL	GALLON
GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE
HP	HORSE POWER
HTG	HEATING
HTR	HEATER
HW	HOT WATER
IN	INCH
LB	POUNDS PER HOUR
LB/HR	POUNDS PER HOUR
LAT	LEAVING AIR TEMPERATURE
LP	LOW PRESSURE
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	ONE THOUSAND BTU PER HOUR
MCT	MOTORIZED CONTROL TAP
MD	MOTORIZED DAMPER
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MTR	METRIC
NC	NORMAL
NO	NORMALLY OPEN
NOT	NOT TO SCALE
OUTSIDE AIR	OUTSIDE AIR
PSI	PRESSURE DROP
PLB	PLUMBING
PRESS	PRESSURE
PSI	POUNDS PER SQUARE INCH
R	RELATIVE HUMIDITY
R/A	RETURN AIR
REC	RECESSED
RED	REDUCER
RH	RELATIVE HUMIDITY
RLA	RELIEF AIR
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
SF	SQUARE FOOT
S/A	SUPPLY AIR
SF	SQUARE FOOT
SD	SMOKE DAMPER
SM	SURFACE MOUNT
SP	STATIC PRESSURE
TST	THERMOSTAT
TD	TEMPERATURE DROP
TEMP	TEMPERATURE
TYP	TYPICAL
VAV	VARIABLE AIR VOLUME
VENT	VENTILATION
WB	WET BULB

EQUIPMENT ABBREVIATIONS

AC	AIR CONDITIONING UNIT
ACC	AIR COOLED CONDENSER
ACCU	AIR COOLING CONDENSING UNIT
AHU	AIR HANDLING UNIT
AS	AIR SEPARATOR
B	BOILER
CH	CHILLER
CT	COOLING TOWER
CUH	CABINET UNIT HEATER
CWP	CONDENSER WATER PUMP
CHWP	CHILLED WATER PUMP
DBP	DOMESTIC WATER BOOSTER PUMP
DC	DUCT MOUNTED COIL
DCP	DOMESTIC WATER CIRCULATING PUMP
EF	EXHAUST FAN
EDC	ELECTRIC DUCT COIL
ET	EXPANSION TANK
EW	ELECTRIC WATER HEATER
FCU	FAN COIL UNIT
FP	FIRE PUMP
GI	GRADE INTERCEPTOR
GRV	GRAVITY ROOF VENTILATOR
HWP	HEATING WATER PUMP
HX	HEAT EXCHANGER
HRU	HEAT RECOVERY UNIT
PRV	POWER ROOF VENTILATOR
RE	RETURN/EXHAUST FAN
RTU	ROOFTOP UNIT
SEP	SEWAGE EJECTOR PUMP
SF	SUPPLY FAN
SP	SUMP PUMP
UH	UNIT HEATER
WH	WATER HEATER

2018 NORTH CAROLINA ENERGY CONSERVATION CODE

COMMERCIAL ENERGY EFFICIENCY - MECHANICAL SUMMARY

C401 METHOD OF COMPLIANCE

<input type="checkbox"/> 2018 NCECC CHAPTER 4	<input type="checkbox"/> COMCHECK PROVIDED (2018 NCECC)
<input type="checkbox"/> ASHRAE 90.1-2013 PRESCRIPTIVE	<input type="checkbox"/> COMCHECK PROVIDED (90.1-2013)
<input type="checkbox"/> ASHRAE 90.1-2013 PERFORMANCE	<input type="checkbox"/> ENERGY MODELING DATA PROVIDED

C406 ADDITIONAL EFFICIENCY PACKAGE OPTIONS

<input type="checkbox"/> C406.2 EFFICIENT MECH EQUIPMENT	<input type="checkbox"/> C406.5 ON-SITE RENEWABLE ENERGY
<input type="checkbox"/> C406.3 REDUCED LTG DENSITY	<input type="checkbox"/> C406.6 DEDICATED OIL SYSTEM
<input type="checkbox"/> C406.4 ENHANCED LTG CONTROLS	<input type="checkbox"/> C406.7 SERVICE WATER HEATING

C301 CLIMATE ZONE

4A - WAKE COUNTY, NORTH CAROLINA. DESIGN CONDITIONS

DESIGN CONDITIONS	WINTER DRY BULB	WINTER WET BULB	WINTER PEAK DRY BULB	WINTER PEAK WET BULB	WINTER PEAK WIND SPEED	WINTER PEAK WIND DIRECTION	WINTER PEAK WIND RELATIVE HUMIDITY	WINTER PEAK WIND DENSITY	WINTER PEAK WIND PRESSURE	WINTER PEAK WIND TEMPERATURE	WINTER PEAK WIND VELOCITY
EXTERIOR (ASHRAE 90.1-2013 TABLE D-1)	18° F	14° F	31° F	24° F	12 mph	N	30%	0.075	0.014	40° F	12 mph
INTERIOR (2018 NCECC SECTION C302.1)	72° F	73° F	72° F	73° F							

C403.2 HEATING & COOLING LOADS AND EQUIPMENT & SYSTEM SIZING

BUILDING HEATING LOAD	NA - EXISTING SYSTEM TO REMAIN
BUILDING COOLING LOAD	NA - EXISTING SYSTEM TO REMAIN
INSTALLED HEATING CAPACITY	NA - EXISTING SYSTEM TO REMAIN
INSTALLED COOLING CAPACITY	NA - EXISTING SYSTEM TO REMAIN

C403.2.3 & C406.2 - REQUIRED & INCREASED HVAC EQUIPMENT PERFORMANCE

C403.2.3 SYSTEM DESCRIPTION - CENTRAL VAV AIR HANDLER SERVING DUAL DUCT TERMINAL UNITS.

C408 - SYSTEM COMMISSIONING

PROJECT AREA IS LESS THAN 10,000 SQUARE FEET AND IS EXEMPT FROM THE SYSTEM COMMISSIONING REQUIREMENTS OF SECTION C408.2.3.

PROJECT AREA IS GREATER THAN 10,000 SQUARE FEET AND REQUIRES SYSTEM COMMISSIONING PER SECTION C408.2.3.

MECHANICAL DEMOLITION NOTES

1. THE MECHANICAL CONTRACTOR SHALL VISIT THE PROJECT PRIOR TO BEGINNING WORK TO DETERMINE THE LOCATION OF EXISTING MECHANICAL EQUIPMENT AND PIPING. THE MECHANICAL CONTRACTOR SHALL INCLUDE ALL NECESSARY PRICING IN THEIR BID.
2. IT IS THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING DUCTWORK AND PIPING. DISCREPANCIES BETWEEN EXISTING CONDITIONS AND MECHANICAL GENERAL NOTES SHOULD BE BROUGHT TO THE ATTENTION OF THE MECHANICAL ENGINEER.
3. THE MECHANICAL CONTRACTOR SHALL FIELD VERIFY ALL EXISTING FIRE DAMPERS ARE LOCATED WHERE INDICATED ON DRAWINGS. ALL NEW AND EXISTING DUCTWORK PENETRATING NEW WALLS SHALL BE PROVIDED WITH A 1 1/2" HOUR (TYPE-B) FIRE DAMPER WHETHER INDICATED ON PLANS OR NOT.
4. M.C. SHALL VERIFY ALL EXISTING SUPPLY AND RETURN AIR DUCT TO REMAIN IS INSULATED WITH VAPOR BARRIER. IF EXISTING DUCT IS NOT INSULATED WITH EITHER DUCT LINER OR WRAP, M.C. SHALL PROVIDE 2" THICK DUCT WRAP WITH VAPOR BARRIER (MIN. R-VALUE OF 6.0).
5. M.C. SHALL VERIFY ALL EXISTING PIPING SYSTEMS TO REMAIN ARE INSULATED WITH VAPOR BARRIER. IF ANY PORTION OF THE PIPING SYSTEM IS MISSING INSULATION OR DETERMINED DURING ANY PHASE OF THE PROJECT AS DEFECTIVE, THAT PORTION SHALL BE PROVIDED WITH NEW INSULATION. MINOR TEARS ON EXISTING PIPING MAY BE REPAIRED WITH TAPE, ADHESIVE, OR SEALANT. EXISTING PIPING SYSTEMS SHALL INCLUDE CHILLED WATER, CONDENSER WATER, HOT WATER, STEAM & STEAM CONDENSATE, REFRIGERANT, AND A/C CONDENSATE DRAIN PIPING. THE MECHANICAL CONTRACTOR SHALL MAKE PROVISIONS IN THEIR BASE BID TO COVER ALL COSTS NECESSARY TO ACHIEVE A CONTINUOUS VAPOR BARRIER THROUGHOUT THESE EXISTING SYSTEMS. REFER TO SPECIFICATIONS SECTION 230700 MECHANICAL GENERAL NOTES FOR INSULATION MATERIAL REQUIREMENTS.
6. FOR ALL EXISTING HVAC EQUIPMENT AND DUCTWORK NOTED TO REMAIN AND SERVING AREA OF RENOVATION, MECHANICAL CONTRACTOR SHALL INSPECT EQUIPMENT (AND ANY ASSOCIATED CONTROLS, VALVES, DAMPERS, ETC) TO VERIFY PROPER WORKING ORDER. MECHANICAL CONTRACTOR TO SERVICE AND CLEAN EXISTING HVAC UNITS TO ENSURE DESIGN AIRFLOW AND COOLING/HEATING CAPACITIES ARE OBTAINED. ANY EQUIPMENT FOUND TO BE INOPERABLE OR SHORT OF DESIGN CAPACITIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PROJECT COMPLETION. PROVIDE CLEAN FILTERS IN ALL UNITS AT COMPLETION OF PROJECT. DAMAGED DUCTWORK SHALL BE REPAIRED.

CONTROLS SCOPE

1. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH EXISTING BUILDING CONTROLS MANUFACTURER (SCHNEIDER ELECTRIC) TO COORDINATE REQUIRED CONTROLS WORK TO REPROGRAM EXISTING RELOCATED AND REMAINING VAV DUAL AND SINGLE-DUCT UNITS.
2. THE CONTRACTOR SHALL COORDINATE WITH NCSU FACILITY STAFF FOR UPDATE OF ALL AREA-OF-WORK BUILDING AUTOMATION SYSTEM EQUIPMENT LOCATIONS, THERMOSTAT LOCATIONS AND EQUIPMENT NUMBERING INCLUDING UPDATE OF ASSOCIATED BUILDING AUTOMATION SYSTEM GRAPHICS. NUMBER INDICATED ON THESE PLANS IS FOR CONSTRUCTION REFERENCE OF EQUIPMENT ONLY AND DOES NOT INDICATE FINAL EQUIPMENT LABELING REQUIRED.
3. THE CONTRACTOR SHALL CONFIRM ALL OCCUPIED/UNOCCUPIED TEMPERATURE SETPOINTS, DEADBANDS, AND SCHEDULING SETPOINTS WITH FACILITIES STAFF PRIOR TO OCCUPANCY.
4. ALL RELOCATED VAV BOX SEQUENCES OF OPERATION SHALL MATCH EXISTING BUILDING STANDARD.

MECHANICAL GENERAL NOTES

SEE SPECIFICATIONS FOR ADDITIONAL PROJECT REQUIREMENTS. THESE GENERAL NOTES ARE INTENDED TO SUPPLEMENT THE SPECIFICATIONS. IN THE EVENT THAT THE REQUIREMENTS IN CONFLICT OR CONTRADICT THE REQUIREMENTS LISTED HERE, THE QUESTION SHALL BE ASKED PRIOR TO BIDDING OR THE MORE STRINGENT SHALL APPLY AT THE ENGINEER'S DISCRETION.

1. DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATION OF DOORS, WINDOW, CEILING DIFFUSERS, ETC.
2. ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, PRINGS, SHEET METAL, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT WILL BE APPROVED DURING CONSTRUCTION AND ALL COST WILL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR. THIS INCLUDES ANY MODIFICATIONS TO ANY ASSOCIATED MECHANICAL, PLUMBING, OR ELECTRICAL SYSTEMS REQUIRED BY THIS SPECIFIC MANUFACTURER'S INSTALLATION INSTRUCTIONS.
3. ALL DUCTWORK SHALL BE GALVANIZED SHEET METAL CONSTRUCTED IN ACCORDANCE WITH THE LATEST SMACNA STANDARDS. ALL SUPPLY, RETURN AND OUTSIDE AIR DUCTWORK SHALL BE WRAPPED WITH 2" THICK DUCT WRAP WITH VAPOR BARRIER. INSULATION (INCLUDING FLEXIBLE DUCT INSULATION) SHALL HAVE A MINIMUM INSTALLED R-VALUE OF 6.0. DUCT DIMENSIONS ON PLANS ARE FINAL UNLESS NOTED OTHERWISE.
4. ALL DUCTWORK SHALL BE SEALED PER THE REQUIREMENTS OF THE NORTH CAROLINA MECHANICAL MODEL SEAL MEDIUM PRESSURE SUPPLY DUCTWORK FOR POSITIVE 3" PRESSURE CLASS, SMACNA CLASS A, LEAKAGE CLASS 4. SEAL LOW PRESSURE SUPPLY, RETURN, OUTSIDE AIR, EXHAUST & DUCTWORK FOR POSITIVE/NEGATIVE 2" PRESSURE CLASS, SMACNA CLASS A, LEAKAGE CLASS 4.
5. ALL PIPING, DUCTS, VENTS, ETC., EXTENDING THROUGH WALLS SHALL BE FLASHED AND COUNTERFLASHED IN A WATERPROOF MANNER.
6. ALL PIPING AND DUCTWORK LOCATIONS SHALL BE COORDINATED WITH THE WORK UNDER OTHER DIVISIONS OF THE SPECIFICATIONS, TO AVOID INTERFERENCE.
7. THE MECHANICAL CONTRACTOR SHALL BALANCE ALL MECHANICAL SYSTEMS TO THE PERFORMANCE SPECIFICATIONS NOTED ON PLANS AND SUBMIT THE ENGINEER WITH ELECTRONIC COPIES OF A COMPLETE TEST AND BALANCE REPORT. THE REPORT SHALL BE SUBMITTED A MINIMUM OF TWO WEEKS PRIOR TO PROJECT COMPLETION. THE TEST AND BALANCE REPORT WILL BE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER. ANY ADDITIONAL TESTING, DUCTWORK, AND BALANCING REQUIRED (AT ENGINEER'S REQUEST) AFTER REVIEW OF INITIAL REPORT SHALL BE AT NO ADDITIONAL COST. TESTING AND BALANCING CONTRACTOR TO CLEAN FILTERS ARE CLEAN AND FREE OF DEBRIS PRIOR TO BEGINNING WORK. THE MECHANICAL CONTRACTOR SHALL REPLACE ANY DIRTY FILTERS, AS NEEDED. TEST AND BALANCE REPORT TO BE COMPLETED BY AN INDEPENDENT, CERTIFIED TEST AND BALANCE CONTRACTOR.
8. UPON PROJECT COMPLETION, THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE OWNER WITH INSTALLATION INFORMATION INCLUDING RECORD SUBMITTALS (WITH ANY SUBMITTAL REVIEW COMMENTS ASSESSED) AND O&M MANUALS FOR EACH PIECE OF EQUIPMENT INCLUDING ALL SELECTED OPTIONS, THE NAME AND ADDRESS OF AT LEAST ONE SERVICE AGENCY, FULL CONTROL SYSTEM O&M AND CALIBRATION INFORMATION INCLUDING WIRING DIAGRAMS, SCHEMATICS, FULL SEQUENCE OF OPERATION, AND PROGRAMMING SETPOINTS. IN ADDITION, THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE TO HIRE A REGISTERED DESIGN PROFESSIONAL TO COMMISSION THE INSTALLED SYSTEM AND PROVIDE THE OWNER AND CODE REVIEWER A SEALED STATEMENT OF COMMISSIONING (PER 2018 NCECC APPENDIX C1).
9. THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH NCSU FACILITY STAFF FOR UPDATE OF ALL AREA-OF-WORK BUILDING AUTOMATION SYSTEM GRAPHICS AND FOR UPDATE OF ALL EQUIPMENT IDENTIFICATION LABELING AT CEILING MAINTENANCE ACCESS LOCATIONS, VAV UNITS, AND THERMOSTATS. NUMBERING INDICATED ON THESE PLANS IS FOR CONSTRUCTION REFERENCE OF EQUIPMENT ONLY AND DOES NOT INDICATE FINAL EQUIPMENT LABELING REQUIREMENTS. LABELING AND IDENTIFICATION SHALL MATCH EXISTING BUILDING STANDARDS.
10. PROVIDE A ONE YEAR WARRANTY FOR ALL WORK PERFORMED BEGINNING ON THE DAY THE SYSTEM IS COMPLETELY OPERATIONAL AND ACCEPTABLE BY THE OWNER.
11. PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE AND FILTER REMOVAL.
12. ANY DEVICE REQUIRING A THERMOSTAT FOR CONTROL SHALL BE FURNISHED WITH A THERMOSTAT WHETHER INDICATED ON THE DRAWINGS OR NOT.
13. INSTALL THE TOP OF ALL THERMOSTATS, SENSORS, AND SWITCHES AT 4'-0" (MAXIMUM) ABOVE FINISH FLOOR. COORDINATE EXACT THERMOSTAT LOCATION WITH OWNER PRIOR TO INSTALLATION. ANY DEVICE ON A PERIMETER WALL SHALL BE MOUNTED ON A FOAM-FILLED ELECTRICAL BOX WITH ALL GAPS BETWEEN BOX AND WALL SEALED TO PREVENT INFILTRATION.
14. PROVIDE NON-CONDUCTING DIELECTRIC UNIONS WHENEVER CONNECTING DISSIMILAR METALS.
15. ALL ISOLATION VALVES, TERMINAL UNITS, CONTROLS, ETC. REQUIRING ACCESS AND SERVICE SHALL BE INSTALLED WITHIN BY OF THE CEILING FOR SERVICE ACCESSIBILITY. LOCATIONS SHALL BE INDICATED ON THE CEILING GRID PER THE SPECIFICATIONS.
16. DUCTWORK AND PIPING PASSING THROUGH/ABOVE ELECTRICAL ROOMS SHALL BE CLOSELY COORDINATED WITH THE ELECTRICAL CONTRACTOR. DUCTWORK OR PIPING SHALL NOT BE LOCATED ABOVE ELECTRICAL PANELS.
17. EQUIPMENT OPERATING DURING CONSTRUCTION SHALL USE FILTERED MEDIA TO PREVENT CONSTRUCTION DEBRIS FROM ENTERING COILS, DUCTWORK SYSTEMS, AIR TERMINALS ETC. AT COMPLETION OF CONSTRUCTION, MECHANICAL CONTRACTOR SHALL CLEAN ALL SYSTEMS WITH ALL CONTROL DEVICES WIDE OPEN AND REMOVE ANY REMAINING DEBRIS PRIOR TO TEST AND BALANCING. MECHANICAL CONTRACTOR SHALL REPLACE ALL FILTRATION WITH NEW FILTERS AT COMPLETION OF CONSTRUCTION. ANY DUCTWORK, AIR TERMINALS, AND/OR OTHER EQUIPMENT UPSTREAM OF FILTRATION SHALL BE CLEANED THOROUGHLY OF CONSTRUCTION DEBRIS BEFORE HANDING OVER TO OWNER.
18. ALL MECHANICAL EQUIPMENT SHALL BE U.L. LISTED AND LABELED AS A COMPLETE PACKAGE, NOT THOUGH INDIVIDUAL COMPONENTS OR PARTS. PROVIDE REQUIRED 3RD PARTY FIELD UL LISTING SERVICES AS REQUIRED TO COMPLY.

MECHANICAL SHEET INDEX

SHEET NUMBER	SHEET NAME
MB.01	MECHANICAL LEGEND AND NOTES
MB.02	MECHANICAL SCHEDULES
MD.01	DEMOLITION MECHANICAL PLAN - LEVEL 01
MB.01	MECHANICAL PLAN - LEVEL 01
MS.01	DUCTWORK DETAILS



ISSUE DATE	08.24.2020	
PHASE	Bid Set	
#	DATE	REVISION