

HVAC SYMBOLS

SYMBOL	DESCRIPTION
	SQUARE DUCT SIZE TAG (WIDTH x HEIGHT)
	ROUND DUCT SIZE TAG (DIAMETER)
	EXISTING DUCT TAG
	DUCT BEING DEMOLISHED
	SUPPLY AIR
	RETURN AIR
	EXHAUST AIR
	SUPPLY AIR DIFFUSER (4-WAY)
	RETURN AIR GRILLE
	RETURN AIR GRILLE WITH SOUND BOOT
	EXHAUST AIR GRILLE
	UNDERCUT DOOR (BY G.C.)
	DOOR GRILLE (BY G.C.)
	POINT OF EXISTING TO NEW CONNECTION
	THERMOSTAT / TEMP SENSOR (4'-0" AFF 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
	SECTION CUT REFERRING DETAIL NUMBER REFERRING SHEET NUMBER

PIPING SYMBOLS

SYMBOL	DESCRIPTION
	CHILLED WATER RETURN
	CHILLED WATER SUPPLY
	HOT WATER RETURN
	HOT WATER SUPPLY
	BUTTERFLY VALVE
	3-PIECE BALL VALVE
	CHECK VALVE
	STRAINER WITH DOWN VALVE WITH HOSE CONN.
	BALANCING VALVE
	B/C CIRCUIT SEPARATOR
	ISOLATION
	THERMOSTAT
	PRESSURE GAGE & COCK
	GAGE COCK
	FLOW SWITCH
	ECCENTRIC REDUCER
	CONCENTRIC REDUCER
	CONTROL VALVE
	PRESSURE REDUCING/REGULATING VALVE
	SOLENOID VALVE

2018 NORTH CAROLINA ENERGY CONSERVATION CODE

COMMERCIAL ENERGY EFFICIENCY - MECHANICAL SUMMARY

C401.2 METHOD OF COMPLIANCE:

<input checked="" 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

C406.1 APPLICATION COMPLIANCE:

<input type="checkbox"/> C406.2 EFFICIENT MECH EQUIPMENT	<input type="checkbox"/> C406.5 RENEWABLE ENERGY
<input checked="" type="checkbox"/> C406.3 REDUCED LTG DENSITY	<input type="checkbox"/> C406.6 DEDICATED OA SYSTEM
<input type="checkbox"/> C406.4 ENHANCED LIGHTING CONTROLS	<input type="checkbox"/> C406.7 HIGH EFF. SERVICE WATER

C301 CLIMATE ZONE

4A - WAKE COUNTY, NORTH CAROLINA DESIGN CONDITIONS EXTERIOR (ASHRAE 90.1-2013 TABLE D-1)

winter dry bulb	18° F.
summer dry bulb	91° F.
summer wet bulb	74° F.

INTERIOR (2018 NCECC SECTION 302.1)

winter dry bulb	72° F.
summer dry bulb	75° F.

C403.2.1 & C403.2.2 HEATING & COOLING LOADS AND EQUIPMENT & SYSTEM SIZING

BUILDING HEATING LOAD	NO CHANGE TO EXISTING SYSTEM
BUILDING COOLING LOAD	NO CHANGE TO EXISTING SYSTEM
INSTALLED HEATING CAPACITY	5,176 BTUH ADDED TO EXISTING SYSTEM
INSTALLED COOLING CAPACITY	NO CHANGE TO EXISTING SYSTEM

C403.2.3 - REQUIRED & INCREASED HVAC EQUIPMENT PERFORMANCE

SYSTEM DESCRIPTION - EXISTING 4-PIPE VAV AIR HANDLER WITH FAN POWERED AND SINGLE DUCT TERMINAL BOXES WITH HOT WATER REHEAT COILS.

MINIMUM HVAC EQUIPMENT EFFICIENCY COMPLIANCE - TABLE C403.2.3

INCREASED HVAC EQUIPMENT EFFICIENCY COMPLIANCE - TABLE C406.2

C403.2.4 THRU C403.2.11

HVAC SYSTEMS ARE FULLY COMPLIANT WITH THE REQUIREMENTS FOR HVAC SYSTEM CONTROL, VENTILATION, ENERGY RECOVERY, DUCT AND PLENUM INSULATION AND SEALING, PIPING INSULATION, AND SYSTEM CONTROL.

C403.2.12 - AIR SYSTEM DESIGN AND CONTROL

ALL FANS INSTALLED ON THE PROJECT ARE 5 HP OR LESS AND ARE EXEMPT FROM THESE REQUIREMENTS.

C408 - SYSTEM COMMISSIONING

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

ABBREVIATIONS

Ø	ROUND	LVR	LEAVING AIR TEMPERATURE
ABV	ABOVE	LWT	LEAVING WATER TEMPERATURE
AC	AIR CONDITIONING	MAX	MAXIMUM
ADD	ADDENDUM	MBH	THOUSAND BTU PER HOUR
AF	ABOVE FINISHED FLOOR	MCF	THOUSAND CUBIC FEET
ALT	ALTERNATE	M	MOTOR
AP	ACCESS PANEL	MECH	MECHANICAL
ARCH	ARCHITECT/ARCHITECTURAL	MFR	MANUFACTURER
BFF	BELOW FINISHED FLOOR	MIN	MINIMUM
BLW	BELOW	MISC	MISCELLANEOUS
BTU	BRITISH THERMAL UNIT	MTH	MOTOR
BTUH	BRITISH THERMAL UNIT PER HOUR	NC	NOT IN CONTRACT
CAP	CAPACITY	NF	NUMBER
CFM	CUBIC FEET PER MINUTE	NO	NOT TO SCALE
CLG	CEILING	PD	PRESSURE DROP
CHW	CHILLED WATER	PLBG	PLUMBING
D	DEGREE	PRESS	PRESSURE
DB	DRY BULB	PSI	POUNDS PER SQUARE INCH
DIA	DIAMETER	PSIG	POUNDS PER SQUARE INCH GAUGE
DN	DOWN	PWR	POWER
E	ENTERING AIR TEMPERATURE	RE	RELOCATED
ELE	ELECTRICAL	R/A	RETURN AIR
EQUIP	EQUIPMENT	RH	RELATIVE HUMIDITY
EWT	ENTERING WATER TEMPERATURE	RM	REMOVE
E/A	EXHAUST AIR	RPM	REVOLUTIONS PER MINUTE
EXIST	EXISTING	SF	SQUARE FOOT
F	DEGREES FAHRENHEIT	S/A	SUPPLY AIR
FD	FIRE DAMPER	SF	SQUARE FOOT
FL	FLOOR	SD	SMOKE DAMPER
FFM	FEET PER MINUTE	SP	STATIC PRESSURE
FT	FOOT/FEET	T	THERMOSTAT
GAL	GALLON	TD	TEMPERATURE DROP
GC	GENERAL CONTRACTOR	TEMP	TEMPERATURE
GPM	GALLONS PER MINUTE	TYP	TYPICAL
HP	HORSE POWER	VAV	VARIABLE AIR VOLUME
HTG	HEATING	VENT	VENTILATION
HW	HOT WATER	WB	WET BULB
IN	INCH		
LB	POUND		
LB/HR	POUNDS PER HOUR		
LAT	LEAVING AIR TEMPERATURE		
LP	LOW PRESSURE		

MECHANICAL GENERAL NOTES

- DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATION OF DOORS, WINDOWS, CEILING DIFFUSERS, ETC.
- THE MECHANICAL CONTRACTOR SHALL VISIT SITE PRIOR TO BEGINNING WORK TO DETERMINE THE LEVEL OF DEMOLITION REQUIRED AND INCLUDE ALL NECESSARY PRICING IN THEIR BID.
- IT IS THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING DUCTWORK AND PIPING. ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND MECHANICAL PLANS SHOULD BE BROUGHT TO THE ATTENTION OF THE MECHANICAL ENGINEER.
- THE MECHANICAL CONTRACTOR SHALL FIELD VERIFY ALL EXISTING FIRE DAMPERS ARE LOCATED WHERE INDICATED ON DRAWINGS. ALL NEW AND EXISTING DUCTWORK PENETRATING NEW RATED WALLS SHALL BE PROVIDED WITH A 1-1/2-HOUR (TYPE-B) FIRE DAMPER WHETHER INDICATED ON PLANS OR NOT.
- ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, PIPING, SHEET METAL, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASIS 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.
- 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. TRANSFER DUCTS SHALL BE LINED WITH 1" THICK ELASTOMER DUCT LINER FOR ACOUSTICAL PURPOSES. DUCT DIMENSIONS ON PLANS ARE FREE AREA SIZE.
- ALL DUCTWORK SHALL BE SEALED PER THE REQUIREMENTS OF THE NORTH CAROLINA INTERNATIONAL MECHANICAL CODE. SEAL MEDIUM PRESSURE SUPPLY DUCTWORK FOR POSITIVE 3" PRESSURE CLASS, SMACNA SEAL CLASS A, SMACNA LEAKAGE CLASS 4. SEAL LOW PRESSURE SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST DUCTWORK FOR POSITIVE/NEGATIVE 2" PRESSURE CLASS, SMACNA SEAL CLASS A, SMACNA LEAKAGE CLASS 4.
- ALL PIPING, DUCTS, VENTS, ETC., EXTENDING THROUGH WALLS AND ROOF SHALL BE FLASHED AND COUNTERFLASHED IN A WATERPROOF MANNER.
- ALL PIPING AND DUCTWORK LOCATIONS SHALL BE COORDINATED WITH THE WORK UNDER OTHER DIVISIONS OF THE SPECIFICATIONS, TO AVOID INTERFERENCE.
- THE MECHANICAL CONTRACTOR SHALL BALANCE ALL MECHANICAL SYSTEMS TO THE PERFORMANCE SPECIFICATIONS INDICATED ON PLANS AND PROVIDE THE ENGINEER WITH THREE COPIES OF A COMPLETE TEST AND BALANCE REPORT. THE REPORT IS TO BE ISSUED 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, ADJUSTING AND BALANCING REQUIRED AT ENGINEER'S DISCRETION. REVIEW OF THE INITIAL REPORT SHALL BE PROVIDED AT NO ADDITIONAL COST. TESTING AND BALANCING CONTRACTOR TO CONFIRM FILTERS ARE CLEAN, AND FREE OF DEBRIS PRIOR TO BEGINNING WORK. THE MECHANICAL CONTRACTOR SHALL REPLACE ANY DIRTY FILTERS, AS NEEDED.
- UPON PROJECT COMPLETION, THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE OWNER INSTALLATION INFORMATION, INCLUDING RECORD SUBMITTALS WITH ANY SUBMITTAL REVIEW COMMENTS ADDRESSED; AND O&M MANUALS FOR EACH PIECE OF EQUIPMENT INCLUDING ALL SELECTED OPTIONS, THE NAME AND ADDRESS OF AT LEAST ONE SERVICE AGENCY. THE CONTROL SYSTEM O&M AND CALIBRATION INFORMATION INCLUDING WIRING DIAGRAMS, SCHEDULES, FULL SEQUENCE OF OPERATION, AND PROGRAMMED SETTINGS.
- PROVIDE ONE YEAR WARRANTY FOR ALL WORK PERFORMED BEGINNING ON THE DAY THE SYSTEM IS COMPLETELY OPERATIONAL AND ACCEPTABLE BY THE OWNER.
- PROVIDE MAINTENANCE RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE AND FILTER REMOVAL.
- ANY DEVICE REQUIRING A THERMOSTAT FOR CONTROL SHALL BE FURNISHED WITH A THERMOSTAT WHETHER INDICATED ON THE DRAWINGS OR NOT.
- 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.
- CONTRACTOR SHALL LOCATE EXHAUST FANS, OUTLETS, AND GAS FLUES A MINIMUM OF 3'-0" FROM ANY OUTSIDE AIR INTAKE.

CONTROL SYSTEM NOTES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH EXISTING BUILDING CONTROLS MANUFACTURER (JOHNSON CONTROLS) TO COORDINATE REQUIRED CONTROLS WORK TO PROGRAM NEW VAV(S) AND VAV FPB UNITS.

THE CONTRACTOR SHALL COORDINATE WITH THE BUILDING OWNER'S FACILITY STAFF TO PROVIDE ALL AREA-OF-WORK BUILDING AUTOMATION SYSTEM EQUIPMENT LOCATIONS, THERMOSTAT LOCATIONS AND EQUIPMENT NUMBERING INCLUDING UPDATE OF ASSOCIATED BUILDING AUTOMATION SYSTEM GRAPHICS. EQUIPMENT IDENTIFICATION INDICATED ON THESE PLANS IS FOR CONSTRUCTION REFERENCE OF EQUIPMENT ONLY AND DOES NOT INDICATE FINAL EQUIPMENT LABELING REQUIRED. MECHANICAL CONTRACTOR SHALL CONFIRM ALL OCCUPIED/UNOCCUPIED TEMPERATURE SETPOINTS, DEADBANDS AND SCHEDULING SETPOINTS WITH TENANT AND FACILITIES MANAGEMENT PRIOR TO OCCUPANCY.

ALL NEW FAN POWERED AND VAV BOX SEQUENCE OF OPERATIONS AND DEMAND CONTROL VENTILATION SEQUENCE OF OPERATION SHALL MATCH EXISTING BUILDING STANDARD FOR SIMILAR APPLICATION (FAN POWERED; SHUT OFF; HOT WATER REHEAT).

ALL CONTROL SETPOINTS SHALL BE ADJUSTABLE AND TRENDABLE BY THE USER AND MAINTENANCE DEPARTMENT. INDICATED SCHEDULES AND SETPOINTS SHOULD BE USED FOR ORIGINAL SYSTEM SET-UP. ANY CHANGES IN SETPOINT SETTINGS REQUIRED FOR INTENDED SYSTEM OPERATION SHALL BE APPROVED BY THE ENGINEER AND SHALL BE DISCREETLY INDICATED ON THE AS-BUILT DRAWINGS.

ELECTRICAL CONTRACTOR SHALL PROVIDE A DEDICATED 120V CIRCUIT IN A J-BOX FOR CONTROL POWER. CONTROLS CONTRACTOR SHALL EXTEND 120V POWER FROM J-BOX TO CONTROL PANELS, DAMPER ACTUATORS, TRANSFORMERS, ETC. AS REQUIRED FOR INSTALLATION OF THE CONTROL SYSTEM. ALL CONTROL TRANSFORMERS SHALL BE SEPARATELY INTERNALLY FUSED OR HAVE MANUAL RESETS.

ALL CONTROL AND POWER WIRING SHALL BE PLENUM-RATED WITH A MINIMUM FIRE SPREAD RATING OF 25 AND A MINIMUM SMOKE DEVELOPED RATING OF 50 PER ASTM E84.

MECHANICAL SHEET INDEX

SHEET NUMBER	SHEET NAME
M001	MECHANICAL LEGEND AND NOTES
M002	MECHANICAL SCHEDULES
M100	OVERALL MECHANICAL FLOOR PLAN
M101	ENLARGED MECHANICAL DUCT PLAN - EAST
M102	ENLARGED MECHANICAL DUCT PLAN - WEST
M201	ENLARGED MECHANICAL PIPING FLOOR PLAN - EAST
M202	ENLARGED MECHANICAL PIPING FLOOR PLAN - WEST
M501	MECHANICAL DETAILS

NO.	PERMIT/BID SET	DATE
1	PERMIT/BID SET	11/08/19
NO.	SUBMISSION	DATE


CHECKED BY: **GP**

DRAWN BY: **TAL**

PROJECT NUMBER: **1908**


SHEET NAME: **MECHANICAL LEGEND AND NOTES**

SHEET NUMBER: **M001**



INNOVATIVE DESIGN


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PERMIT/BID SET



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