MECHANICAL LEGEND

SYMBOL	DESCRIPTION	ABBR.
D	CONDENSATE DRAIN	D
T	THERMOSTAT / TEMP SENSOR (4'-0" AFF TO TOP)	
SD	DUCT MOUNTED SMOKE DETECTOR W/ ACCESS DOOR	
CP	BUILDING AUTOMATION CONTROL PANEL	
SP	STATIC-PRESSURE SENSOR	
	SUPPLY AIR DIFFUSER (4-WAY)	
	RETURN AIR GRILLE	
	EXHAUST AIR GRILLE	
FD	FIRE DAMPER W/ ACCESS DOOR (SEE DETAIL)	
FS/D	COMBINATION FIRE/SMOKE DAMPER W/ ACCESS DOOR (SEE DETAIL)	
	DOUBLE LINE DUCTWORK	
	SINGLE LINE DUCTWORK	
D	DOOR GRILLE (BY G.C.)	
20x14	20"x14" RECTANGULAR DUCT	
8"ø	8" DIAMETER ROUND DUCT	
M.C.	MECHANICAL CONTRACTOR	
E.C.	ELECTRICAL CONTRACTOR	
P.C.	PLUMBING CONTRACTOR	
EX	EXISTING	
AFF	ABOVE FINISHED FLOOR	
DN	DOWN	
UP	UP	

MECHANICAL GENERAL NOTES

1. DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATION OF DOORS, WINDOWS, CEILING DIFFUSERS, ETC.
2. 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 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 SUPPLY, RETURN AND EXHAUST DUCTWORK SHALL BE GALVANIZED SHEET METAL CONSTRUCTED IN ACCORDANCE WITH THE LATEST SMACNA STANDARDS. ALL SUPPLY AND RETURN AIR DUCTWORK SHALL BE WRAPPED WITH 2" THICK DUCT WRAP WITH VAPOR BARRIER. ALL TRANSFER AIR DUCTS SHALL BE LINED WITH 1" ELASTOMERIC DUCT LINER FOR ACOUSTICAL PURPOSES. INSULATION (INCLUDING FLEXIBLE DUCT INSULATION) SHALL HAVE A MINIMUM INSTALLED R-VALUE OF 5.0. DUCT DIMENSIONS ON PLANS ARE FREE AREA SIZE. ALL EXPOSED SPIRAL DUCTWORK SHALL BE A SINGLE WALL (WHEN LOW PRESSURE) OR DOUBLE WALL WITH 1" INNER LINER (WHEN MEDIUM PRESSURE). SPIRAL DUCT SHALL BE EQUIVALENT TO LINDAB SPIROSAFE SELF-SEALING DUCT SYSTEM. EXPOSED DUCTWORK SHALL BE PAINT-GRIP GALVANIZED METAL CONSTRUCTION. PAINT BY GC.
4. 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 12. SEAL LOW PRESSURE SUPPLY, RETURN AND EXHAUST DUCTWORK FOR POSITIVE/NEGATIVE 2" PRESSURE CLASS, SMACNA SEAL CLASS A, SMACNA LEAKAGE CLASS 12.
5. ALL PIPING, DUCTS, VENTS, ETC., EXTENDING THROUGH WALLS AND ROOF 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 CONTRACTOR SHALL PERFORM TESTING, ADJUSTING AND BALANCING OF THE HVAC SYSTEM. THE TEST AND BALANCE CONTRACTOR SHALL NOT BE A SUB-CONTRACTOR OF THE MECHANICAL CONTRACTOR AND SHALL BALANCE ALL MECHANICAL SYSTEMS TO THE PERFORMANCE SPECIFICATIONS INDICATED ON PLANS. 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 REQUEST) AFTER REVIEW OF THE INITIAL REPORT SHALL BE PROVIDED AT NO ADDITIONAL COST. BALANCING SHALL NOT BEGIN UNTIL SYSTEMS HAVE BEEN COMPLETED AND ARE IN FULL WORKING ORDER. BALANCING REPORT TO BE FURNISHED WITH THE O&M MANUALS. 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 INSTALLATION INFORMATION INCLUDING RECORD SUBMITTALS (WITH ANY FINAL 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, FULL CONTROL SYSTEM O&M AND CALIBRATION INFORMATION INCLUDING WIRING DIAGRAMS, SCHEMATICS, FULL SEQUENCE OF OPERATION AND PROGRAMMED SETPOINTS. IN ADDITION, THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE TO HIRE A SEALED NC MECHANICAL ENGINEER TO INSPECT THE INSTALLED SYSTEM AND PROVIDE THE OWNER AND CODE REVIEWER A SEALED STATEMENT OF COMPLIANCE (PER 2012 NCECC APPENDIX 5).
9. PROVIDE A ONE YEAR WARRANTY FOR ALL WORK PERFORMED BEGINNING ON THE DAY THE SYSTEM IS COMPLETELY OPERATIONAL AND ACCEPTABLE BY THE OWNER.
10. PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE AND FILTER REMOVAL.
11. CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 PVC PIPE AND FITTINGS. DRAINS FROM AIR HANDLING UNITS SHALL BE TRAPPED. INDOOR CONDENSATE DRAIN PIPING SHALL BE INSULATED WITH ½" THICK ARMAFLEX INSULATION. MINIMUM DRAIN SIZE SHALL BE ¾". TERMINATE ROOFTOP UNIT DRAINS ON A CONCRETE SPLASHBLOCK.
12. ALL REFRIGERANT PIPE SHALL BE NITROGENIZED ACR COPPER TUBE. SIZE, INSULATE, AND INSTALL REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS. REFRIGERANT PIPING INSULATION EXPOSED OUTDOORS SHALL BE COVERED WITH AN OUTER ALUMINUM JACKET.
13. ANY DEVICE REQUIRING A THERMOSTAT FOR CONTROL SHALL BE FURNISHED WITH A THERMOSTAT WHETHER INDICATED ON THE DRAWINGS OR NOT.
14. 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. ALL THERMOSTATS SHALL MATCH BASE-BUILDING STANDARD.
15. PROVIDE UNIONS, FLANGES OR COUPLINGS AT CONNECTION TO ALL VALVES AND EQUIPMENT. DO NOT USE DIRECT WELDED OR THREADED CONNECTIONS TO VALVES, EQUIPMENT OR OTHER APPARATUS.
16. PROVIDE NON-CONDUCTING DIELECTRIC UNIONS WHENEVER CONNECTING DISSIMILAR METALS.
17. EQUIPMENT OPERATED 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. MECHANICAL CONTRACTOR SHALL LOCATE EXHAUST FANS, OUTLETS, AND GAS FLUES A MINIMUM OF 15'-0" FROM ANY OUTSIDE AIR INTAKE.
19. PROVIDE COMBINATION FIRE/SMOKE DAMPERS WITH AN IONIZATION TYPE DUCT MOUNTED SMOKE DETECTOR (WITHIN 5'-0" OF THE DAMPER WITH NO AIR OUTLETS OR INLETS BETWEEN DETECTOR AND DAMPER), INSTALLED IN THE DUCT WIRED TO CLOSE THE DAMPER UPON ACTIVATION. DUCT MOUNTED SMOKE DETECTOR SHALL BE SUPPLIED, WIRED FOR INTERFACE WITH FIRE ALARM SYSTEM AND UNIT SHUTDOWN BY THE ELECTRICAL CONTRACTOR. DUCT MOUNTED SMOKE DETECTOR SHALL BE INSTALLED IN THE DUCT BY THE MECHANICAL CONTRACTOR.
20. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING RESTRAINTS TO RESIST THE EARTHQUAKE EFFECTS ON THE MECHANICAL SYSTEMS. THE REQUIREMENTS FOR THOSE RESTRAINTS ARE FOUND IN THE LOCAL BUILDING CODE AND ASCE 7. THE ANCHORAGE OF THE MECHANICAL SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE LOCAL BUILDING CODE AND ASCE 7.

2012 NORTH CAROLINA ENERGY CONSERVATION CODE

COMMERCIAL ENERGY EFFICIENCY – MECHANICAL SUMMARY

501.1 METHOD OF COMPLIANCE

- ■ 2012 NCECC CHAPTER 5
- ☐ ASHRAE 90.1-2010 PRESCRIPTIVE
- ☐ ASHRAE 90.1-2010 PERFORMANCE
- ☐ COMCHECK PROVIDED (2012 NCECC)
- ■ COMCHECK PROVIDED (90.1-2010)
- ☐ ENERGY MODELING DATA PROVIDED
- ☐ N/A (EXISTING LIGHTING, HVAC, AND DOM. WATER HEATING SYSTEMS TO REMAIN)

501.2 APPLICATION COMPLIANCE

- ☐ 506.2.1 EFFICIENT MECH EQUIPMENT
- ■ 506.2.2 REDUCED LTG DENSITY
- ☐ 506.2.3 ENERGY RECOVERY SYSTEMS
- ☐ 506.2.4 HI EFFICIENCY DOMESTIC H/W
- ☐ 506.2.5 ONSITE RENEWABLE ENERGY
- ☐ 506.2.6 DAYLIGHTING CONTROLS

301.1 CLIMATE ZONE

4A – DURHAM COUNTY, NORTH CAROLINA

DESIGN CONDITIONS

EXTERIOR (ASHRAE 90.1-2007 TABLE 1-1)

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

INTERIOR (2012 NCECC SECTION 302.1)

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

503.2 HEATING & COOLING LOADS AND EQUIPMENT & SYSTEM SIZING

BUILDING HEATING LOAD	1,149,200 BTUH (PEAK)
BUILDING COOLING LOAD	1,958,600 BTUH (PEAK)
INSTALLED HEATING CAPACITY	1,200,000 BTUH
INSTALLED COOLING CAPACITY	2,275,560 BTUH

503.2.3 & 506.2.1 – REQUIRED & INCREASED HVAC EQUIPMENT PERFORMANCE

SYSTEM DESCRIPTION – VAV AHU (RTU); FPVAV AND SINGLE-DUCT VAV UNITS WITH ELECTRIC REHEAT.

- ■ MINIMUM HVAC EQUIPMENT EFFICIENCY COMPLIANCE – TABLE 503.2.3
- ☐ INCREASED HVAC EQUIPMENT EFFICIENCY COMPLIANCE – TABLE 506.2.1

EQUIP. TYPE	SIZE CATEGORY (BTUH)	SUBCATEGORY	503.2.3 MINIMUM EFFICIENCY (b)	506.2.1 INCREASED EFFICIENCY	DESIGN EFFIC.
TABLE 5.3.2.3(1) – UNITARY AIR CONDITIONERS AND CONDENSING UNITS					
AIR COND, AIR COOLED	< 65,000 (<= 5 TONS)	SPLIT SYSTEM & SINGLE PACKAGE	13.0 SEER	15.0 SEER 12.5 EER	SEE SCHEDULE
AIR COND, AIR COOLED	>= 240,000 & < 760,000	SPLIT SYSTEM & SINGLE PACKAGE	10.0 EER (c) 9.7 IPLV (c)	10.8 EER 11.0 IPLV	SEE SCHEDULE

c. DEDUCT 0.2 FROM THE REQUIRED EERS AND IPLVS FOR UNITS WITH A HEATING SECTION OTHER THAN ELECTRIC RESISTANCE HEAT.

503.2.4 THRU 503.2.9

- ■ 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 COMPLETION.

503.2.10 – AIR SYSTEM DESIGN AND CONTROL

- ■ ALL FANS INSTALLED ON THE PROJECT ARE 5 HP OR LESS AND ARE EXEMPT FROM THESE REQUIREMENTS.
- ☐ FANS ABOVE 5 HP MEET THE CFM LIMITATIONS SHOWN BELOW:

OPTION 1 – FAN SYSTEM MOTOR NAMEPLATE HP – TABLE 503.2.10.1(1)

ALLOWABLE NAMEPLATE MOTOR HP	CONSTANT VOLUME MINIMUM CFM	VARIABLE VOLUME MINIMUM CFM	DESIGN CFM
7.5	6,818 CFM	5,000 CFM	SEE SCHEDULE
10	9,091 CFM	6,667 CFM	SEE SCHEDULE
15	13,636 CFM	10,000 CFM	SEE SCHEDULE
20	18,182 CFM	13,333 CFM	SEE SCHEDULE
25	22,727 CFM	16,667 CFM	SEE SCHEDULE
30	27,272 CFM	20,000 CFM	SEE SCHEDULE
40	36,364 CFM	26,667 CFM	SEE SCHEDULE
50	45,455 CFM	33,333 CFM	SEE SCHEDULE

503.4 – COMPLEX HVAC SYSTEMS AND EQUIPMENT (PRESCRIPTIVE)

- ■ PROJECT CONSISTS OF HVAC SYSTEMS FULLY COMPLIANT WITH THE COMPLEX PRESCRIPTIVE REQUIREMENTS OF 503.4.

MECHANICAL SHEET INDEX

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11/11/16

WESTPOINT 2
DURHAM, NC

REVISIONS

PROJECT: 1342
DATE: 11/11/16
DRAWN BY: ECC
CHECKED BY: GPK

MECHANICAL NOTES, LEGEND, AND INDEX

M0.1
1 OF 14

OPTIMA #: 16-0194