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MECHANICAL GENERAL NOTES

- DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATION OF DOORS, WINDOWS, CEILING DIFFUSERS, ETC.
- ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROMISING 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.
- ALL DUCTWORK SHALL BE GALVANIZED SHEET METAL CONSTRUCTED IN ACCORDANCE WITH THE LATEST SMACNA STANDARDS. ALL SUPPLY, RETURN AND OUTSIDE AIR DUCTWORK SHALL BE INSULATED AS PER SPECIFICATIONS. DUCT DIMENSIONS ON PLANS ARE FREE AREA SIZE.
- ALL DUCTWORK SHALL BE SEALED PER THE REQUIREMENTS OF THE NORTH CAROLINA INTERNATIONAL MECHANICAL CODE, REFER TO SPECIFICATIONS.
- 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.
- 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, FULL CONTROL SYSTEM O&M AND CALIBRATION INFORMATION INCLUDING WIRING DIAGRAMS, SCHEMATICS, FULL SEQUENCE OF OPERATION, AND PROGRAMMED SETPOINTS.
- PROVIDE A ONE YEAR WARRANTY FOR ALL WORK PERFORMED BEGINNING ON THE DAY THE SYSTEM IS COMPLETELY OPERATIONAL AND ACCEPTABLE BY THE OWNER.
- PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE AND FILTER REMOVAL.
- CONDENSATE DRAIN PIPING SHALL BE TYPE-L HARD DRAWN COPPER PIPE AND FITTINGS. DRAINS FROM AIR HANDLING UNITS SHALL BE WRAPPED. CONDENSATE DRAINS SHALL BE INSULATED WITH 1/2" THICK PERMAFLEX INSULATION. MINIMUM DRAIN SIZE SHALL BE 3/4". TERMINAL ROOFTOP UNIT DRAINS ON A CONCRETE SPLASHPAD.
- ALL REFRIGERANT PIPE SHALL BE NITROGENATED COPPER PIPE. SIZE, INSULATE, AND INSTALL REFRIGERANT PIPING PER CONTRACTOR'S RECOMMENDATIONS. REFRIGERANT PIPING INSULATED EXPOSED IN DOORS SHALL BE COVERED WITH AN OUTDOOR RUM JACKET.
- ANY DEVICE REQUIRING A THERMOSTAT FOR CONTROL SHALL BE FLASHED WITH A THERMOSTAT COVER 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.
- MECHANICAL CONTRACTOR SHALL VERIFY LOCATION OF ROOF PENETRATIONS FOR DUCTS AND PIPING WITH ARCHITECT & OWNER PRIOR TO INSTALLATION.
- ALL ROOF CURBS SHALL EXTEND A MINIMUM OF 8" ABOVE ROOF INSULATION OR AS INDICATED ON THE DRAWINGS, WHICHEVER IS GREATER. IN ADDITION, ALL ROOF CURBS SHALL BE EQUIPPED WITH SUPPORT RAILS THAT SUPPORT EQUIPMENT, PIPING, DUCTS, ETC. EXPOSED ON THE ROOF SHALL HAVE SUFFICIENT HEIGHT TO MAINTAIN A MINIMUM OF 18" CLEARANCE BELOW SUPPORTING EQUIPMENT FOR ROOF MAINTENANCE.

MECHANICAL CONTRACTOR SHALL LOCATE EXHAUST FANS, OUTLETS, AND GAS FLUES A MINIMUM OF 15'-0" FROM ANY OUTSIDE AIR INTAKE.

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 REFRAGLACE 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.

THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROMISING 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.

MECHANICAL DEMOLITION NOTES

- THE MECHANICAL CONTRACTOR SHALL VISIT SITE PRIOR TO BEGINNING WORK TO DETERMINE THE LEVEL OF DEMOLITION REQUIRED AND INCLUDE ALL NECESSARY PIPING IN THEIR BID.
- IT IS THE MECHANICAL CONTRACTORS 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.
- M.C. SHALL VERIFY ALL EXISTING SUPPLY AND RETURN AIR DUCT TO REMAIN IS INSULATED WITH VAPOR BARRIER INTACT. 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 5.0).
- 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.

VENTILATION CALCULATIONS (NCMC 2018, SECT 403):

OCCUPANCY CLASSIFICATION	PEOPLE	Q/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE Q/A (CFM)	CALCULATED AREA Q/A (CFM)	CALCULATED AREA E/A (CFM)
CONFERENCE ROOMS	5	0.060000	0.060000	50	0.000000	900	45	225	54	0
OFFICE SPACES	5	0.060000	0.060000	5	0.000000	7,500	38	188	450	0
RECEPTION AREAS	5	0.060000	0.060000	30	0.000000	230	7	35	14	0
MARK ENTRY LOBBIES	5	0.060000	0.060000	10	0.000000	1,300	13	65	78	0
CORRIDORS	0	0.060000	0.060000	0	0.000000	4,350	0	0	281	0
TOILET ROOMS - PUBLIC	0	0.000000	0.000000	0	70.000000	6 (FIXTURES)	0	0	0	420
STORAGE ROOMS	0	0.120000	0.120000	0	0.000000	450	0	0	54	0
COMPUTER (WITHOUT PRINTING)	5	0.060000	0.060000	4	0.000000	2,050	8	41	123	0
BLDG TOTAL OUTSIDE AIR REQ'D (E=0.8, CFM)									1,984	
BUILDING TOTAL OUTSIDE AIR PROVIDED (CFM)									5,350	
BUILDING TOTAL EXHAUST AIR REQUIRED (CFM)									420	
BUILDING TOTAL EXHAUST AIR PROVIDED (CFM)									450	

MECHANICAL LEGEND

SYMBOL	DESCRIPTION	ABBR.
G	NATURAL GAS PIPING	G
D	CONDENSATE DRAIN	D
PD	PUMPED CONDENSATE DRAIN	PD
RV	PRESSURE REDUCING/REGULATING VALVE	
GC	GAS COOK	
T	THERMOSTAT / TEMP SENSOR (4'-0" AFF TO TOP)	
TS	TEMP SENSOR INTERFACE W/BAS (4'-0" AFF)	
SD	SUPPLY AIR DIFFUSER (4-WAY)	
RA	RETURN AIR GRILLE	
EA	EXHAUST AIR GRILLE	
DL	DOUBLE LINE DUCTWORK	
SL	SINGLE LINE DUCTWORK	
FD	FIRE DAMPER W/ ACCESS DOOR (SEE DETAIL)	
EDL	EXISTING DOUBLE LINE DUCTWORK	
ESL	EXISTING SINGLE LINE DUCTWORK	
EDL	EXISTING DOUBLE LINE DUCTWORK TO BE REMOVED	
ESL	EXISTING SINGLE LINE DUCTWORK TO BE REMOVED	
20x14 8" #	20"x14" CIRCULAR DUCT 8" DIAMETER ROUND DUCT	
DS	DOWN MOUNTED SMOKE DETECTOR W/ ACCESS DOOR	
ME	MECHANICAL CONTRACTOR	
E.C.	ELECTRICAL CONTRACTOR	
P.C.	PLUMBING CONTRACTOR	
N.C.	NOT IN CONTRACT	
EX	EXISTING	
AF	ABOVE FINISHED FLOOR	
DN	DOWN	
UP	UP	
MVD	MANUAL VOLUME DAMPER	

2018 NORTH CAROLINA ENERGY CONSERVATION CODE
COMMERCIAL ENERGY EFFICIENCY - MECHANICAL SUMMARY

- C401 METHOD OF COMPLIANCE**
- 2018 NCECC CHAPTER 4
 - ASHRAE 90.1-2013 PRESCRIPTIVE
 - ASHRAE 90.1-2013 PERFORMANCE
 - N/A (EXISTING LIGHTING, HVAC, AND DOM. WATER HEATING SYSTEMS TO REMAIN)
 - COMCHECK PROVIDED (2018 NCECC)
 - COMCHECK PROVIDED (90.1-2013)
 - ENERGY MODELING DATA PROVIDED
- C408 ADDITIONAL EFFICIENCY PACKAGE OPTIONS**
- C406.2 EFFICIENT MECH EQUIPMENT
 - C406.3 REDUCED LTG DENSITY
 - C406.4 ENHANCED LTG CONTROLS
 - C406.5 ON-SITE RENEWABLE ENERGY
 - C406.6 DEDICATED OA SYSTEM
 - C406.7 SERVICE WATER HEATING

C301 CLIMATE ZONE

JA - RICHMOND 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 C302.1)

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

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

BUILDING HEATING LOAD	220,600 BTUH (peak)
BUILDING COOLING LOAD	216,500 BTUH (peak)
INSTALLED HEATING CAPACITY	267,400 BTUH
INSTALLED COOLING CAPACITY	233,930 BTUH

- C403.2.3 & C406.2 - REQUIRED & INCREASED HVAC EQUIPMENT PERFORMANCE**
- SYSTEM DESCRIPTION - SINGLE ZONE DX ROOFTOP UNITS AND SPLIT SYSTEM HEAT PUMPS
- MINIMUM HVAC EQUIP EFFICIENCY COMPLIANCE - TABLE C403.2.3
 - INCREASED HVAC EQUIP EFFICIENCY COMPLIANCE - 10% OVER TABLE C403.2.3

TABLE C403.2.3(1) - UNITARY AIR CONDITIONERS AND CONDENSING UNITS

EQUIP. TYPE	SIZE CATEGORY (BTUH)	SUBCATEGORY	C403.2.3 MINIMUM EFFICIENCY (e)	10% INCREASED EFF. (e)	DESIGN EFFIC.
AIR COND. AIR COOLED	< 65,000 (<= 5 TONS)	SPLIT SYSTEM & SINGLE PACKAGE	13.0 SEER	14.3 SEER	SEE SCHEDULE
AIR COND. AIR COOLED	>= 65,000 & < 135,000	SPLIT SYSTEM & SINGLE PACKAGE	11.2 EER	12.3 EER	SEE SCHEDULE

a. DEDUCT 0.2 FROM THE REQUIRED EERS AND IEERS FOR UNITS WITH A HEATING SECTION OTHER THAN ELECTRIC RESISTANCE HEAT OR NO HEAT.

- 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 COMPLETION.
- 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.
- C403.3 - ECONOMIZERS (PRESCRIPTIVE)**
- PROJECT INCLUDES AN AIR OR WATER ECONOMIZER COMPLIANT WITH C403.3
 - PROJECT MEETS AN ECONOMIZER EXCEPTION LISTED IN C403.3
- C403.4 - HYDRONIC AND MULTIPLE-ZONE HVAC SYSTEMS CONTROL AND EQUIPMENT (PRESCRIPTIVE)**
- PROJECT CONSISTS OF ONLY SINGLE-ZONE DX SYSTEMS, EXEMPT FROM THE PRESCRIPTIVE REQUIREMENTS OF C403.4.
 - PROJECT CONSISTS OF HVAC SYSTEMS FULLY COMPLIANT WITH THE PRESCRIPTIVE REQUIREMENTS OF C403.4.

- C405.8 - ELECTRICAL MOTORS (MANDATORY REQUIREMENTS).**
- ELECTRICAL MOTORS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMENTS PER C405.8, EXCEPT WHERE EXEMPT.
 - NOT APPLICABLE.
- C408 - SYSTEM COMMISSIONING**
- BUILDING IS LESS THAN 10,000 SQUARE FEET AND IS EXEMPT FROM THE SYSTEM COMMISSIONING REQUIREMENTS OF SECTION C408.
 - BUILDING IS GREATER THAN 10,000 SQUARE FEET AND REQUIRES SYSTEM COMMISSIONING PER SECTION C408.

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BID DOCUMENTS

MECHANICAL SCHEDULES, NOTES AND LEGEND

DATE 4-5-2019
PROJECT NO 16063

REVISIONS

NO	DATE	DESCRIPTION:

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SHEET NUMBER 1 OF 7
OPTIMA # 17-0017

M001