ALL WORK, EQUIPMENT AND MATERIALS SHALL CONFORM TO THE LATEST APPLICABLE CODES OF THE AUTHORITY HAVING JURISDICTION, AND ALL APPLICABLE RULES, REGULATIONS, LAWS, AND ORDINANCES OF FEDERAL AND LOCAL AUTHORITIES. THEY INCLUDE THE FOLLOWING:

LATEST ISSUE OF THE INTERNATIONAL MECHANICAL CODE AND THE PLUMBING CODE

LATEST EDITION OF NFPA-13

### OWNERS INSURANCE UNDERWRITER

THE SCOPE OF WORK INDICATED ON THESE DRAWINGS SHALL INCLUDE MECHANICAL AND FIRE PROTECTION SYSTEMS, FULLY TESTED AND READY FOR USE. CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY COMPONENTS, FITTINGS, HANGERS, SUPPORTS, AND ACCESSORIES NECESSARY FOR COMPLETE AND SAFE INSTALLATION AND USE OF ALL SYSTEMS INDICATED ON THE

#### EXISTING CONDITIONS AND SITE EXAMINATIONS:

PRIOR TO SUBMITTING A BID, CONTRACTOR SHALL VISIT THE SITE AND ACQUAINT HIMSELF WITH THE SITE CONDITIONS.

LAYOUT SHOWN ON THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT FOR WORK AND SYSTEMS. PRIOR TO THE INSTALLATION, FABRICATION, REMOVAL OR RELOCATION OF ANY WORK, THE CONTRACTORS SHALL VERIFY ALL DIMENSIONS AND INVERTS IN THE FIELD AND COORDINATE WITH ALL OTHER TRADES, ARCHITECTURAL PLANS AND BUILDING STRUCTURE. WHERE CONFLICTS OCCUR, OR IF THE CONNECTIONS CANNOT BE MADE, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO ANY INSTALLATION AND FABRICATION. COORDINATE ALL EQUIPMENT LOCATION WITH THE ARCHITECTURAL DRAWINGS. DO NOT SCALE THESE DRAWINGS.

WAIVER OF RESPONSIBILITY OR REQUESTS FOR ADDITIONAL PAYMENT BASED ON LACK OF KNOWLEDGE OF CONDITIONS AT THE SITE WILL NOT BE ACCEPTED.

CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD AND REPORT EACH DISCREPANCY BEFORE

. QUALITY OF MATERIALS: NEW, BEST OF THEIR KIND, FREE FROM DEFECTS.

EQUIPMENT, PRIOR TO ORDER, BUILT, OR INSTALLED.

- SHOP DRAWINGS: SUBMIT FOUR (4) COPIES OF SHOP DRAWINGS TO ENGINEERS FOR ALL MECHANICAL
- CLEARANCES: CONTRACTOR SHALL COORDINATE EQUIPMENT LOCATION AS REQUIRED TO PROVIDE PROPER CLEARANCES FOR SERVICE AND OPERATION OF THE EQUIPMENT.
- WIRING: CONTRACTOR SHALL VERIFY ALL VOLTAGE AND POWER REQUIREMENTS AND COORDINATE WITH ELECTRICAL CONTRACTOR AS REQUIRED. SEE ELECTRICAL DRAWINGS FOR EQUIPMENT POWER REQUIREMENTS. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY WIRING, TRANSFORMERS, CONTROLS, HARDWARE, SAFETY DEVICES, AND ACCESSORIES FOR PROPER INSTALLATION AND OPERATION OF ALL SYSTEMS IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS AND LOCAL CODE REQUIREMENTS.
- SLAB PENETRATIONS: ALL PENETRATIONS REQUIRED FOR NEW WORK: SLAB PENETRATIONS SHALL BE X-RAYED AND APPROVED BY MANAGEMENT. NO GROUND PENETRATING RADAR ALLOWED UNLESS APPROVED BY MANAGMENT, XRAY TO LOCATE REINFORCING BARS, POST TENSIONING CABLES, PIPING CONDUITS, ETC. ALL SUCH COMPONENTS SHALL BE CLEARLY MARKED ON SLAB SURFACE PRIOR TO DRILLING, CONTRACTOR SHALL NOT CUT BARS, CABLES, ETC. WITHOUT PRIOR WRITTEN AUTHORIZATION BY OWNER, AND SHALL REPAIR ANY DAMAGE CAUSED BY CORE DRILLING. NOTIFY THE OWNER PRIOR TO DRILLING TO ALLOW A FIELD INSPECTION OF CORE LOCATIONS. IN ADDITION ALL PENETRATIONS THROUGH FLOOR SLABS SHALL BE PROPERLY FIRE STOPPED. COORDINATE WITH STRUCTURAL ENGINEER AND BUILDING MANAGEMENT.
- PROVIDE ALL NECESSARY HANGERS FOR SUPPORT OF HORIZONTAL AND VERTICAL PIPING AND DUCTWORK IN ACCORDANCE WITH THE IMC SECTION 305 AND MANUFACTURERS' RECOMMENDATIONS. PROVIDE SLEEVES AND ESCUTCHEONS FOR ALL PIPING PASSING THROUGH WALLS OR FLOORS. PIPING AND DUCTWORK IS TO BE SUPPORTED INDEPENDENTLY SO NO WEIGHT IS SUPPORTED BY THE
- ACCESS PANELS: CONTRACTOR SHALL FURNISH AND INSTALL ACCESS PANELS AS REQUIRED PER FIELD CONDITIONS AND EQUIPMENT REQUIREMENTS. LOCATIONS SHALL BE APPROVED BY THE ARCHITECT.
- CONTRACTOR SHALL COORDINATE LOCATION OF CONTROLS, GAGES, THERMOMETERS, VALVES, AND SYSTEM COMPONENTS WITH FIELD CONDITIONS TO PROVIDE PROPER CLEARANCES FOR SERVICE AND OPERATION OF EQUIPMENT
- PROVIDE DIELECTRIC FITTINGS, COUPLINGS, OR FLANGE UNIONS ISOLATING JOINTS ON ALL FERROUS TO NONFERROUS PIPE CONNECTIONS TO PREVENT AN ELECTROLYTIC ACTION BETWEEN DISSIMILAR
- CONTRACTOR SHALL SEAL ALL UNUSED PENETRATIONS TO MATCH EXISTING FINISH. PROVIDE FIRE STOP WHERE REQUIRED. ALL LARGE PENETRATIONS THROUGH STRUCTURAL COMPONENTS SHALL BE SEALED PER THE ARCHITECTS AND STRUCTURAL ENGINEERS INSTRUCTIONS
- ENGINEER OR ARCHITECT HAS NOT CONSIDERED THE POTENTIAL PRESENCE OF HAZARDOUS MATERIALS IN THE DESIGN. SHOULD THE CONTRACTOR DISCOVER ANY POTENTIALLY HAZARDOUS MATERIALS DURING THE PROCESS OF THE WORK, DO NOT DISTURB IT AND IMMEDIATELY NOTIFY THE OWNER.
- ALL MOTOR DRIVEN EQUIPMENT SHALL BE INSTALLED WITH VIBRATION ISOLATORS UNLESS OTHERWISE NOTED. FOLLOW MANUFACTURER'S RECOMMENDED INSTRUCTIONS. PIPING CONNECTED TO VIBRATING EQUIPMENT SHALL BE ISOLATED BY RESILIENT HANGERS OR FLEXIBLE CONNECTORS. CONNECT MECHANICAL EQUIPMENT TO DUCTWORK USING RUBBERIZED CANVAS FLEXIBLE CONNECTIONS.
- UPON THE COMPLETION OF THE INSTALLATION OF EACH SYSTEM, DEMONSTRATE THAT THE SYSTEM OPERATES PROPERLY IN EACH MODE OF OPERATION. PROVIDE MAINTENANCE AND INSTRUCTION MANUALS TO THE USER.
- PIPING SYSTEM IDENTIFICATION: FOR ALL PIPING SYSTEMS WITHIN THE SCOPE OF WORK, IDENTIFY ALL NEW PIPING (CONCEALED OR EXPOSED) WITH PIPE MARKERS THAT LABEL THE DIRECTION OF FLOW AND SYSTEM TYPE. ON INSULATED PIPE, INSTALL LABELS OVER INSULATION, PROVIDE A LABEL @ A MINIMUM OF EVERY 20' AND AT EACH FITTING (BRANCH, VALVE, TEE, ETC).
- 18. UNLESS OTHERWISE NOTED, INSTALL ALL NEW PIPING AND DUCTWORK AS HIGH AS POSSIBLE (TIGHT TO
- 19. IN A PLENUM RETURN SYSTEM, CONTRACTOR TO VERIFY NO PVC PIPING IS LOCATED WITHIN THE PLENUM, IF PVC IS LOCATED, CONTRACTOR TO NOTIFY CLIENT PROJECT MANAGER AND REPLACE WITH
- 20. PROVIDE COMPLETE AND PROPERLY FUNCTIONING MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION SYSTEMS AS INTENDED IN THESE DESIGN DOCUMENTS. ALL COMPONENTS AND EQUIPMENT MUST BE FULLY TESTED, POWERED, INTERLOCKED, ADJUSTED, AND BALANCED BY THE CONTRACTOR TO ENSURE ALL EQUIPMENT FUNCTIONS THROUGH THEIR FULL OPERATING RANGE IN COMPLIANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND CONSTRUCTION DOCUMENTS.
- MAINTAIN ALL ARCHITECTURAL PARAMETERS INCLUDING CEILING HEIGHT, CHASE WALLS, EQUIPMENT SCREENS, ROOM SIZES, PARTITION TYPES, INSULATION, ETC. UNLESS PRIOR WRITTEN AUTHORIZATION IS
- 22. COORDINATE THE INSTALLATION OF ALL EQUIPMENT AND TRADES TO MAINTAIN ALL MANUFACTURER REQUIRED SERVICE CLEARANCES AND CLEARANCES REQUIRED BY THE NEC (NATIONAL ELECTRIC
- 23. PROVIDE FIRE AND SMOKE DAMPERS WHERE DUCTWORK PENETRATES FIRE AND SMOKE PARTITIONS AS NOTED ON DRAWINGS AND REQUIRED PER LOCAL JURISDICTION. DAMPERS SHALL BE UL LISTED.
- 4. FIRE AND SMOKE DAMPERS: FIRE AND SMOKE DAMPERS SHALL BE PROVIDED WITH AN APPROVED MEANS OF ACCESS, LARGE ENOUGH TO PERMIT INSPECTION AND MAINTENANCE OF THE DAMPER AND ITS OPERATING PARTS. THE ACCESS SHALL NOT AFFECT THE INTEGRITY OF FIRE-RESISTANCE-RATED ASSEMBLIES. ACCESS POINTS SHALL BE PERMANENTLY IDENTIFIED ON THE EXTERIOR BY A LABEL HAVING LETTERS NOT LESS THAN 0.5 INCH.
- 5. MANUFACTURERS AND MODEL NUMBERS INDICATED ON THE CONTRACT DRAWINGS SHALL BE FOR REFERENCE AND BASIS OF DESIGN ONLY. VERIFY ALL EQUIPMENT REQUIREMENTS, PERFORMANCE, AND ACCESSORIES PRIOR TO ORDERING OF EQUIPMENT. ENGINEER SHALL TAKE NO RESPONSIBILITY FOR EQUIPMENT THAT IS IMPROPERLY ORDERED OR INSTALLED OR FOR SUBSTITUTED EQUIPMENT WITHOUT REVIEWING SUBMITTED SHOP DRAWINGS.

- 26. CONTRACTOR SHALL INSTALL CONSTRUCTION FILTERS ON ALL RETURN AIR INLETS DURING ALL CONSTRUCTION ACTIVITY, COORDINATE W/BUILDING MANAGEMENT.
- 27. PROVIDE ROOF PAVERS TO MATCH BUILDING STANDARD (WHERE APPLICABLE) IN ALL SERVICE AND MAINTENANCE AREAS FOR NEW ROOF EQUIPMENT AND PIPING.
- 28. FOR ALL NEW AND RELOCATED EQUIPMENT COORDINATE THE INSTALLATION, MOUNTING REQUIREMENTS, AND STRUCTURAL MODIFICATIONS REQUIRED WITH A STRUCTURAL ENGINEER LICENSED IN THE LOCAL JURISDICTION.
- 29. CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF THE EQUIPMENT AS NOTED ON THE DRAWINGS, WHEN REQUIRED, CONTRACTOR MUST RELOCATE ANY EXISTING EQUIPMENT, WIRING, DUCTWORK, CONTROLS, CIRCUITS, PIPING, COMPONENTS, ETC AS NEEDED TO INSTALL NEW EQUIPMENT AND COMPONENTS. THE DESIGN INTENT OF THE DRAWINGS MUST BE FOLLOWED.
- 30. ALL NEW MECHANICAL EQUIPMENT AND PIPING SHALL BE PROVIDED WITH A PERMANENT IDENTIFICATION TAG. COORDINATE IDENTIFICATION W/BUILDING ENGINEER, IF BUILDING ENGINEER HAS NO PREFERENCE OR IS NOT PRESENT. TAG SHALL BE A MINIMUM OF 2" HIGH, CLEARLY LEGIBLE WITH EQUIPMENT OR PIPE ID AND FLOW DIRECTION INDICATED. ALL NEW MECHANICAL EQUIPMENT (AHU, VAV, ETC) TO BE PROVIDED WITH CEILING MARKER, COORDINATE WITH BUILDING MANAGEMENT AND TENANT, MATCH ANY EXISTING BUILDING STANDARDS.
- ALL EXISTING EQUIPMENT TO REMAIN SHALL BE TESTED AND BALANCED PRIOR TO ANY CONSTRUCTION WORK BEING DONE. ANY DEFICIENCIES SHALL BE REPORTED AND A COPY OF THE BALANCING REPORT SHALL BE GIVEN TO OWNER / MANAGEMENT AND ENGINEER IMMEDIATELY. ALL EXISTING EQUIPMENT TO REMAIN SHALL BE IN PROPER WORKING ORDER WHEN RETURNED OVER TO OWNER / MANAGEMENT.
- 32. ANY NEW ROOF OPENINGS UNDER ROOFTOP UNITS SHALL ONLY BE AS LARGE AS REQUIRED TO BRING THE INDIVIDUAL DUCT (SUPPLY VS RETURN) DOWN THROUGH THE ROOF. CAULK OPENING WITH ACOUSTICAL SEALANT AT ROOF PENETRATION. REFER TO DETAILS ON PLANS.

#### INSULATION:

- TEST RATINGS: SHALL BE IN ACCORDANCE WITH ASTM E84. NFPA # 225 OR UL 723.
- DUCT AND PLENUM INSULATION (PER IECC): INSULATE ALL NEW SUPPLY AIR DUCTWORK AND PLENUMS WITH 2" THICK 11/2 LB (R-8 MINIMUM). ALL OTHER DUCTWORK (INCLUDING EXISTING DUCTS) SHALL BE INSULATED WITH 2" THICK 11/4 LB (R-6 MINIMUM), DENSITY FIBERGLASS BLANKET WITH VAPOR BARRIER JACKET. SEAL ALL VABOR BARRIER SEAMS WITH A FLEXIBLE SEALANT. ALL DUCTWORK IN OPEN CEILINGS (EXPOSED) SHALL BE INTERNALLY INSULATED (INCLUDING SUPPLY TAPS). WHERE IT IS NOT POSSIBLE TO INTERNALLY SEAL DUCTWORK IN EXPOSED CEILINGS, IF SEALANT MUST BE APPLIED ON THE EXTERIOR OF THE DUCT, IT SHALL BE TAPED AND APPLIED NEATLY. THE TAPE SHALL BE REMOVED AFTER SEALANT APPLICATION. DUCTWORK THAT IS INTERNALLY LINED DOES NOT REQUIRED EXTERNAL INSULATION.
- 3. DUCT LINING (SOUND LINING): PROVIDE 1" THICK LINING WITH AN AVERAGE DENSITY OF NOT LESS THAN 2 LB/CU. FT. WHERE SHOWN ON THE DRAWINGS. INSULATION SHOULD BE TREATED WITH AN EPA-REGISTERED ANTI-MICROBIAL AGENT. PROVIDE SOUND LINING A MINIMUM OF 20' DOWNSTREAM OF ANY FAN-POWERED
- ALL PIPING EXPOSED TO THE OUTSIDE SHALL BE PROVIDED WITH AN ALUMINUM JACKET SEALED WATER
- HANGERS FOR INSULATED PIPING SHALL BE PROVIDED WITH INSULATION PROTECTIVE SHEET METAL SHIELD.
- INSULATE ALL CONDENSATE PIPING WITH 1/2" THICK FLEXIBLE PIPING INSULATION FOR PIPING LESS THAN 1". FOR CONDENSATE PIPING GREATER THAN 1", INSULATE WITH 1" THICK FLEXIBLE PIPING INSULATION.
- INSULATE ALL INDOOR HVAC SYSTEM PIPING (OPERATING TEMPERATURE RANGE 40-140F) WITH 1/2" THICK FIBERGLASS PIPE INSULATION W/SERVICE JACKET. INSULATE ALL OUTDOOR HVAC SYSTEM PIPING (OPERATING TEMPERATURE RANGE 40-140F) WITH 3" THICK FIBERGLASS PIPE INSULATION W/SERVICE
- INSULATE ALL REFRIGERANT PIPING WITH 3/4" THICK FLEXIBLE PIPING INSULATION.

### HVAC EQUIPMENT

DUCTWORK

ALL DUCTWORK SHALL CONFORM TO THE LATEST ASHRAE AND SMACNA REQUIREMENTS

TYPE: LOW PRESSURE MEDIUM PRESSURE RETURN	PRESSURE CLASS 2" 4" 2"	SEAL CLASS B A C
OUTSIDE	2"	A
EXHAUST	1"	B
TRANSFER	1"	C

FLEXIBLE DUCTWORK:

SHALL BE THE SAME SIZE AS THE DIFFUSER INLET. FLEXIBLE DUCTWORK AND CONNECTIONS SHALL BE UL CLASS 1 AND NOT BE OVER 8' IN LENGTH. FLEXIBLE DUCTWORK SHALL BE PRE-INSULATED WITH 1" THICK FIBERGLASS INSULATION. FLEXIBLE DUCT SHALL CONFORM TO NFPA 90A AND 90B.

VOLUME DAMPERS:

PROVIDE ADJUSTABLE DAMPERS AT ALL LOW PRESSURE DUCTWORK JUNCTIONS AND TAPS ON SUPPLY, RETURN, AND EXHAUST DUCTWORK.

TESTING, ADJUSTING AND BALANCING:

AFTER COMPLETION OF THE HVAC SYSTEM AND PRIOR TO THE ACCEPTANCE BY THE OWNER, ALL SYSTEMS SHALL BE ADJUSTED AND BALANCED TO DELIVER THE AIR AND WATER QUANTITIES AS SPECIFIED, INDICATED ON THE DRAWINGS, OR AS DIRECTED. TESTING AGENCY SHALL BE CERTIFIED BY THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB).

AIR QUANTITY MEASUREMENTS IN MAIN AND BRANCH DUCTS SHALL BE PERFORMED BY PITOT TUBE TRAVERSE OF THE ENTIRE CROSS SECTIONAL AREA OF THE DUCT.

FOR AIR-HANDLERS (BASE AND SUPPLEMENTAL) IN SCOPE OF WORK, CONTRACTOR SHALL PROVIDE THE SUPPLY AIR DISCHARGE TEMPERATURE AND WEATHER CONDITIONS (DB/WB) AT TIME OF SYSTEM THE CONTRACTOR SHALL RECORD AND SUBMIT A REPORT TO THE ENGINEER FOR THEIR EVALUATION

AND APPROVAL OF THE COMPLETE AIR BALANCE REPORT CERTIFIED BY A PROFESSIONAL ENGINEER.

DUCT SMOKE DETECTORS:

FURNISH AND INSTALL DUCT MOUNTED SMOKE DETECTORS AS SHOWN ON DRAWINGS AND AS REQUIRED PER CODE, SMOKE DETECTORS IN THE SUPPLY AIR STREAM SHALL BE LOCATED DOWNSTREAM OF ANY FILTERS AND UPSTREAM OF ANY BRANCH CONNECTIONS OR VAV TAPS AND WHERE APPROPRIATE FOR ACCURATE AIRFLOW SAMPLING / TESTING. SMOKE DETECTORS IN THE RETURN AIR STREAM SHALL BE LOCATED UPSTREAM OF ANY FILTERS, EXHAUST AIR CONNECTIONS OUTDOOR AIR CONNECTIONS, OR DECONTAMINATION EQUIPMENT AND APPLIANCES AND WHERE APPROPRIATE FOR ACCURATE AIRFLOW SAMPLING / TESTING, LOCATIONS OF SUPPLY / RETURN SMOKE DETECTORS SHOWN ON THE PLANS ARE FOR CODE COMPLIANCE ONLY AND FINAL INSTALLATION LOCATION SHALL BE DETERMINED BY THE CONTRACTOR. ANY DETECTORS SHOWN ON THE PLAN ARE SHOWN FOR CODE COMPLIANCE. IT IS THE CONTRACTOR'S RESPONSIBILITY DURING BIDDING TO DETERMINE IF DUCT SMOKE CAN BE USED OR IF PLENUM SMOKE DETECTORS MUST BE USED. IF PLENUM SMOKE DETECTORS MUST BE USED, CONTRACTOR'S BID SHALL INCLUDE PRICING FOR PROPER NUMBER OF PLENUM SMOKE DETECTORS REQUIRED TO MEET THE CODE OF THE AHJ. DETECTORS SHALL BE PROVIDED BY THE ELECTRICAL/FIRE ALARM CONTRACTOR, INSTALLED BY THE MECHANICAL CONTRACTOR, AND WIRED BY THE ELECTRICAL/FIRE ALARM CONTRACTOR. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL ASSOCIATED WORK. DETECTORS SHALL SHUT DOWN RESPECTIVE UNIT UPON ACTIVATION AND BE WIRED INTO THE BUILDING FIRE ALARM SYSTEM WHERE APPLICABLE.

PROVIDE ANNUNCIATOR AND STATUS/RESET STATION AS REQUIRED PER NFPA 90A IN A LOCATION APPROVED BY THE LOCAL FIRE MARSHAL AND ARCHITECT. STATION SHALL BE CEILING MOUNTED CENTERED IN A CEILING TILE (PREFERRED) OR WALL MOUNTED.

CONTROLS:

EQUIPMENT VENDOR SHALL PROVIDE ALL CONTROLS AND ACCESSORIES NECESSARY TO MEET REQUIREMENTS AND SEQUENCES. BMS SEQUENCING (IF APPLICABLE) SHALL BE COORDINATED WITH BUILDING PROJECT MANAGER, CONTRACTOR SHALL UPDATE THE BMS GRAPHICS FOR ALL NEW AND MODIFIED VAVS AS APPLICABLE

CONTROL WIRING SHALL BE CONCEALED AND RUN IN CONDUIT. CONDUIT AND FITTINGS EXPOSED TO THE WEATHER SHALL BE WEATHERPROOF. INSTALL THERMOSTATS @ 48" AFF WHERE ANY OPERABLE PARTS OF THE THERMOSTAT DO NOT EXCEED 48" AFF, UNLESS OTHERWISE NOTED. THERMOSTAT LOCATIONS PROVIDED FOR REFERENCE ONLY. THERMOSTATS SHALL NOT BE LOCATED BEHIND CUBES, FURNITURE, OR DOORS WHEN OPEN. COORDINATE FINAL LOCATIONS WITH FURNITURE AND ARCHITECTURAL PLANS. LOCATE THERMOSTATS ADJACENT TO SWITCHES IF ON THE SAME WALL. PROVIDE AN INSULATED SUB-BASE FOR ANY THERMOSTAT MOUNTED ON AN EXTERIOR WALL/PARTITION. ALL CONTROLS TO BE COMPATIBLE WITH ANY EXISTING BUILDING MANAGEMENI/CONTROLS SYSTEMS, COORDINATE WITH BUILDING ENGINEER.

IF EXISTING THERMOSTATS ARE NOT BEING REUSED, CONTRACTOR SHALL PROVIDE A NEW WALL MOUNTED PROGRAMMABLE THERMOSTAT, WITH HEATING AND COOLING OPTION (AS REQUIRED), 24/ PROGRAMMABLE CLOCK, & TEMPERATURE DISPLAY. EXTENDING WIRING TO EXISTING, NEW, OR RELOCATED THERMOSTATS SHALL BE INCLUDED IN THE BID. COORDINATE THERMOSTAT CONTROL REQUIREMENTS WITH FINAL EQUIPMENT SELECTION. THERMOSTATS SHALL BE CAPABLE OF HAVING A MINIMUM 5 °F DEADBAND BETWEEN HEATING AND COOLING AND NIGHTTIME SET BACK.

7. CEILING DIFFUSERS/REGISTERS:

BASIS OF DESIGN:

CD-8

ALL DIFFUSERS MUST MEET A MAXIMUM OF NC-30. PROVIDE APPROPRIATE MOUNTING HARDWARE/FRAME PER CEILING TYPE. PROVIDE VOLUME DAMPERS ON ALL SUPPLY, RETURN, AND EXHAUST TAPS. IF VOLUME DAMPERS WILL BE INACCESSIBLE AT DUCT TAPS, PROVIDE VOLUME DAMPER AT DIFFUSER NECK OR PROVIDE CABLE LINKAGE FOR OPENING AND CLOSING THE VOLUME DAMPER AT THE FACE OF THE DIFFUSER. DIFFUSERS SHALL MATCH BUILDING STANDARD, FINISH TO MATCH OR PROVIDED BY ARCHITECT. WHERE FACTORY SUPPLY PLENUMS ARE UTILIZED FOR SLOT / FLOWBAR TYPE DIFFUSERS, PLENUM SHALL BE FACTORY INTERNALLY INSULATED AND SHALL INCLUDE FACTORY INSULATED END CAPS.

(RG) RETURN GRILLE, TITUS MODEL: PAR (UNLESS OTHERWISE NOTED). (AC) IF / WHERE ACOUSTICAPS ARE CALLED FOR ON THE PLANS. PROVIDE ACOUSTIC DOME W/1" COTTON BASED LINER AND ACOUSTIC LINEAR STRIPS (REFER TO DETAIL). SQUARE LOUVERED 24"x24"

121-225 SQUARE LOUVERED

226-425 SQUARE LOUVERED

SQUARE PERFORATED

24"x24"

24"x24"

(CD) SUPPLY DIFFUSER, TITUS MODEL: OMNI (UNLESS OTHERWISE NOTED).

8. REFER TO MECHANICAL SCHEDULES AND DETAILS FOR ADDITIONAL EQUIPMENT AND SPECIFICATIONS.

0-1,800

# **HVAC SEQUENCE OF OPERATION:**

- EXISTING RESTROOM EXHAUST FAN SHALL OPERATE DURING OCCUPIED HOURS.
- 2. ROOFTOP UNIT SYSTEMS

SYSTEMS SHALL OPERATE 24/7 TO MAINTAIN SPACE SET POINTS. SYSTEMS SHALL AUTOMATICALLY CHANGEOVER FROM HEATING TO COOLING MODES AS NEEDED.

ON A CALL FOR COOLING, THE UNIT MOUNTED CONTROLS SHALL OPEN/CYCLE THE UNIT'S ECONOMIZER. IF THE OUTSIDE CONDITIONS EXCEED THE SETTINGS OF THE ECONOMIZER CYCLE. THEN THE UNIT'S COMPRESSOR (MECHANICAL COOLING) SHALL BE ENERGIZED. THE UNIT COOLING CYCLE SHALL RUN UNTIL THE SET POINT IS SATISFIED

SUPPLY FANS SHALL OPERATE CONTINUOUSLY DURING OCCUPIED HOURS. SUPPLY FANS SHALL CYCLE WHEN FACILITY IS NOT OCCUPIED.

SYSTEMS SHALL BE CONTROLLED BY WALL MOUNTED SENSOR AND A THERMOSTAT MOUNTED IN MANAGER'S OFFICE.

EXHAUST FANS

CEILING MOUNTED EXHAUST FAN(S) SHALL BE CONTROLLED BY A WALL MOUNTED ON/OFF SWITCH. UPON ENERGIZING WALL SWITCH FAN SHALL RUN. UPON DE-ENERGIZING WALL SWITCH FAN SHALL BE

CEILING MOUNTED EXHAUST FAN(S) SHALL BE CONTROLLED WITH A WALL MOUNTED THERMOSTAT. UPON A RISE IN SPACE TEMPERATURE ABOVE (80°F ADJUSTABLE) FAN SHALL BE ENERGIZED. FAN SHALL RUN UNTIL SET POINT IS SATISFIED. UPON SATISFYING THERMOSTAT SET POINT FAN SHALL BE

## FIRE PROTECTION / SPRINKLER

- THIS BUILDING HAS AN EXISTING WET PIPE SPRINKLER SYSTEM. EXISTING SYSTEM SHALL BE MODIFIED TO ACCOMMODATE THE NEW PARTITION AND LIGHTING LAYOUT, AS WELL AS BRINGING THE EXISTING SYSTEM INTO COMPLIANCE WITH CURRENT CODES AND REGULATIONS.
- THE SPRINKLER PIPING ENTERING A BUILDING SHALL BE PROPERLY GROUNDED TO MEET ALL NEC
- THE ENTIRE SPACE MUST BE PROTECTED WITH AN AUTOMATIC WET PIPE, SPRINKLER SYSTEM. MODIFICATIONS TO THE SPRINKLER SYSTEM SHALL BE DESIGNED, INSTALLED, AND TESTED IN ACCORDANCE WITH THE LATEST APPLICABLE NFPA 13 STANDARDS, AND IN ACCORDANCE WITH ALL APPLICABLE CODES OF THE AUTHORITY HAVING JURISDICTION.
- THE SPRINKLER CONTRACTOR SHALL BE RESPONSIBLE FOR THE FINAL DESIGN OF THE NEW SPRINKLER WORK. THE CONTRACTOR SHALL VERIFY ALL LOCATIONS AND QUANTITIES OF SPRINKLER HEADS IN THE FIELD AND RELOCATE AND/OR ADD SPRINKLER HEADS WHERE REQUIRED TO PROVIDE
- THE SPRINKLER CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY PIPING. FITTINGS SPRINKLER HEADS, VALVES, CONTROLS, HARDWARE, AND ACCESSORIES REQUIRED FOR THE PROPER INSTALLATION AND OPERATION OF THE SPRINKLER SYSTEM. THE SPRINKLER CONTRACTOR SHALL SUBMIT HYDRAULIC CALCULATIONS AND SHOP DRAWINGS
- SHOWING THE INTENDED MODIFICATION TO THE OWNER AND TO THE LOCAL FIRE MARSHAL FOR APPROVAL BEFORE PROCEEDING WITH THE WORK. PROVISIONS FOR DRAINAGE AND TESTING THE SYSTEM SHALL BE MADE IN ACCORDANCE WITH NFPA
- 13 AND THE LOCAL FIRE MARSHALS REGULATIONS. PIPING AND FITTINGS: SHALL MATCH BUILDING STANDARDS. ALL FITTINGS AND PIPING SHALL
- CONFORM TO THE LATEST NFPA REGULATIONS AND CONFORM TO UL REQUIREMENTS.
- 9. VALVES: DRAIN AND TEST VALVES SHALL BE BRONZE BODY, SCREW END, GLOBE VALVES.
- 10. CONTRACTOR SHALL COORDINATE AND MODIFY SPRINKLER SYSTEM (PIPING AND HEADS) TO ALLOW INSTALLATION OF NEW AND RELOCATED MECHANICAL, ELECTRICAL, AND ARCHITECTURAL COMPONENTS AND SYSTEMS. PIPING SHALL BE RELOCATED AND INSTALLED TO ALLOW REQUIRED NEC CLEARANCES AND MAINTENANCE ACCESS TO ALL EQUIPMENT. THE COST OF THE RESOLUTION OF CONFLICTS SHALL BE RESOLVED AT NO COST TO THE OWNER.
- 11. IN TILED CEILINGS, SPRINKLER HEADS SHALL BE LOCATED IN THE CENTER OF THE CEILING TILE. IF THE CEILING TILE IS 2x4 SCORED TO LOOK LIKE 2x2. SPRINKLER HEADS SHALL BE LOCATED IN CENTER OF 2x2 PORTION OF CEILING TILE. SPRINKLER HEADS IN CORRIDOR AND LARGE OPEN AREAS SHALL ALIGN. IN EXPOSED CEILINGS, SPRINKLER HEADS SHALL BE TURNED UP. WHERE CEILINGS ARE REMOVED AND EXPOSED, RAISE SPRINKLER PIPING AS REQUIRED.
- 12. ALL SPRINKLER PIPING MUST BE A MINIMUM OF 6" ABOVE THE FINISHED CEILING TO ALLOW FOR LIGHT FIXTURE INSTALLATIONS.
- 13. SPRINKLER HEADS SHALL MATCH EXISTING BUILDING STANDARDS

## SUPPLY DIFFUSER/REGISTER NEW DUCTWORK

NOTE: SYMBOLS ARE FOR REFERENCE ONLY. NOT ALL ARE USED IN THIS PROJECT.

EXISTING TO REMAIN ITEM DUCT WITH CAPPED END RETURN/EXHAUST GRILLE DEMOLISH OR RELOCATE ITEM LINEAR SLOT DIFFUSER DUCTWORK W/ SOUND LINNING (DIMENSIONS **14/4/4/4/4/** SHOWN = INSIDE CLEAR AREA) NEW ITEM DIRECTION OF AIR FLOW MITERED ELBOW W/TURNING VANES NEW TO EXISTING CONNECTION CONDENSATE DRAIN (CD) PUMPED COND. DRAIN (PCD) FIRE DAMPER ST ---- STORM DRAIN (ST) VOLUME DAMPER SMOKE DAMPER BACK DRAFT DAMPER (BDD) ------ GS ----- GLYCOL SUPPLY (GS) GLYCOL RETURN (GR) MOTOR OPERATED DAMPER (MOD) FLEXIBLE DUCT BACKFLOW PREVENTER  $\sim\sim$ AIR TIGHT FITTING / SPIN-IN FITTING PIPE TURNING UP AIR TIGHT FITTING WITH ROUND HARD DUCT PIPE TURNING DOWN CEILING FAN UNDERCUT THERMOSTAT DOOR LOUVER HUMIDISTAT

DUCT RISE

REGULATOR OR PRESSURE REDUCING VALVE

# ABBREVIATIONS LIST

TIME CLOCK

ZONE SENSOR

SWITCH (VARIABLE SPEED)

DUCT MTD SMOKE DETECTOR

**CLG MTD SMOKE DETECTOR** 

CARBON DIOXIDE SENSOR

NOTE DESIGNATION

**SWITCH** 

SYMBOLS LIST

NOTE: ABBREVIATIONS ARE FOR REFERENCE ONLY. NOT ALL ARE USED IN THIS PROJECT.

ABV	- ABOVE	EDB	- ENTERING DRY BULB TEMPERATURE	MFS	- MAXIMUM FUSE SIZE	тс	- TIME CLOCK
AC	- ACOUSTICAP			MHP	- MOTOR HORSEPOWER	TSP	- TOTAL STATIC PRESSURE
AD	- ACCESS DOOR	EER	- ENERGY EFFICIENCY RATIO	MOCP	- MAXIMUM OVER CURRENT	TYP	- TYPICAL
AFF	- ABOVE FINISHED FLOOR	EF	- EXHAUST FAN	1100	PROTECTION DEVICE	UH	- UNIT HEATER
AHJ	- AUTHORITY HAVING JURISDICTION	EG	- EXHAUST AIR GRILLE	MOD	- MOTOR OPERATED DAMPER	VAV	- VARIABLE AIR VOLUME
AHU	- AIR HANDLING UNIT	EH	- ELECTRIC HEATER	MIN.	- MINIMUM	VB	- VACUUM BREAKER
AUTO-D	- AUTO DAMPER	ESP	- EXTERNAL STATIC PRESSURE	N	- NEW	VD	- VOLUME DAMPER
ATPV	- AUTOMATIC TRAP PRIMER VALVE	EWB	- ENTERING WET BULB TEMPERATURE	OA	- OUTDOOR AIR	VEL	- VELOCITY
BDD	- BACK DRAFT DAMPER	EWT	- ENTERING WATER TEMPERATURE	OED	- OPEN END DUCT	VLT	- VOLTAGE
BFP	- BACKFLOW PREVENTER	EX	- EXISTING	OPD	- OVERLOAD PROTECTION DEVICE	W/D	- WASHER/DRYER
	- BRAKE HORSEPOWER	FA	- FREE AREA	ows	- OPERATOR WORKSTATION	WB	- WET BULB
BHP		FC	- FLEXIBLE CONNECTION	PD	- PRESSURE DROP	WMS	- WIRE MESH SCREEN
BMS	- BUILDING MANAGEMENT SYSTEM	FD	- FIRE DAMPER / FLOOR DRAIN	PH	- PHASE	· · · · · · · · · · · · · · · · · · ·	VIII LIII LOI VOI LELI
BP	- BYPASS DAMPER	FLA	- FULL LOAD AMPS				
BTUH	- BRITISH THERMAL UNITS PER HOUR	FPM	- FEET PER MINUTE	PSI	- POUNDS PER SQUARE INCH		
BWV	- BACK WATER VALVE	FPVAV	- FAN POWERED VARIABLE AIR	R	- RELOCATED		
CFM / €	- CUBIC FEET PER MINUTE		VOLUME	RA	- RETURN AIR		
CLG	- CEILING	GPM	- GALLONS PER MINUTE	RG	- RETURN AIR GRILLE		
CD	- CEILING DIFFUSER/CONDENSATE DRAIN	HEX	- HEAT EXCHANGER	RH	- RELATIVE HUMIDITY		
CG	- CEILING GRILLE	HP	- HEAT PUMP/HORSEPOWER	RPM	- REVOLUTIONS PER MINUTE		
CHWR	- CHILLED WATER RETURN	HWS	- HOT WATER SUPPLY	RTU	- ROOFTOP UNIT		
CHWS	- CHILLED WATER SUPPLY	HWR	- HOT WATER RETURN	SA	- SUPPLY AIR		
CO	- CLEAN OUT	HZ	- HERTZ (CYCLES PER SECOND)	SD	- SMOKE DAMPER / SLOT DIFFUSER		
	- CONDENSING UNIT	KW	- KILOWATTS	SFU	- SUPPLY FIXTURE UNITS		
CU		LBS	- POUNDS	SP	- STATIC PRESSURE		
D	- DOWN	LRA	- LOCKED ROTOR AMPS	TA	- TRANSFER AIR		
DB	- DRY BULB	LT	- LIGHT TROFFER DIFFUSER	TAD	- TRANSFER AIR DUCT	, i	WOF MARY
DI	- INDIRECT WASTE RECEPTOR	MAX.	- MAXIMUM			IIIIII	
EA	- EACH	мвн	- 1000 BTUH	TAO	- TRANSFER AIR OPENING		3
EAT	- ENTERING AIR TEMPERATURE	MCA	- MINIMUM CIRCUIT AMPS	TBV	- TEMPERATURE BLENDING VALVE		
EBB	- ELECTRIC BASEBOARD HEATER						3153 EN 2
						L	William IIII

# DRAWING INDEX

- COVER SHEET MECHANICAL FLOOR PLANS - MECHANICAL
- ROOF PLAN MECHANICAL **DETAILS - MECHANICAL** SCHEDULES - MECHANICAL

Scott H Scott H Walthour

Walthour

Digitally signed by Scott H Walthour

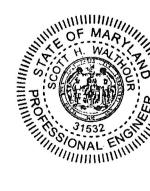
Date: 2021.03.03

22:11:44 -05'00'



STAMP

AIR FLOW QUANTITY



CERTIFY THAT THESE DOCUMENTS WERE PREPARED APPROVED BY ME. AND THAT I AM A DULY LICENSE! ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND,

DIVISION

RECEIVED APR 0 9 2021 LICENSES & PERMITS

REVIEWED FOR CODE COMPLIANCE Department of Inspections, Licenses and Permits Howard County Date: 03/16/21

SE

BEHAVIORAL