



MECHANICAL LEGEND	
MARK	DESCRIPTION
AFB	ABOVE FINISHED FLOOR
BDD	BACKDRIFT DAMPER
120 400 CFM	DIFFUSER TYPE "S" BALANCED FOR 400 CFM
DB	DRY BULB (°F)
14x12"	DUCT SIZE IN INCHES (RECTANGULAR)
8"Ø	DUCT SIZE IN INCHES (ROUND)
14x12"Ø	DUCT SIZE IN INCHES (DOUBLE WALL FLAT OVAL)
EH	ELECTRIC HEATER
EAT	ENTERING AIR TEMPERATURE (°F)
EA	EXHAUST AIR
EF	EXHAUST FAN
ESP	EXTERNAL STATIC PRESSURE (IN. W.C.)
FD	FIRE DAMPER
FD (EX)	EXISTING FIRE DAMPER
FSD	COMBINATION FIRE / SMOKE DAMPER
N. W. C.	NICHES WATER COLUMN
L.A.T.	LEAVING AIR TEMPERATURE (°F)
MVD	MANUAL VOLUME DAMPER
ØBD	OPPOSED BLADE DAMPER
O.A.	OUTSIDE AIR (°F)
R.A.	RETURN AIR
☒	RETURN OR EXHAUST DUCT OR OUTLET
10"x10"	EXISTING LOW-PRESSURE SUPPLY, RETURN OR EXHAUST DUCT
10"x10"	NEW LOW-PRESSURE SUPPLY, RETURN OR EXHAUST DUCT
18"Ø	EXISTING MEDIUM PRESSURE SUPPLY DUCT AT A VELOCITY OF 1800 FPM
18"Ø	NEW MEDIUM PRESSURE SUPPLY DUCT AT A VELOCITY OF 1800 FPM
☒	DUCT TRANSITION
S.A.	SUPPLY AIR
S.F.	SUPPLY FAN
☒	SUPPLY OR OUTSIDE AIR DUCT OR OUTLET
T (S) (SD)	TERMOSTAT, HUMIDISTAT, SENSOR OR SMOKE DETECTOR
W.C.	WATER COLUMN
W.B.	WET BULB (°F)
M.C.	MECHANICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
E.C.	ELECTRICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
S.P.C.	SPRINKLER CONTRACTOR

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT METHOD OF COMPLIANCE:			
Prescriptive	Performance	Energy Cost Budget	
Thermal Zone:		6A	☐
Exterior design conditions			
Winter Dry Bulb:	-3°F		
Summer Dry Bulb:	85°F		
Interior design conditions			
Winter dry bulb:	70°F		
Summer dry bulb:	79°F		
Relative humidity:	50% (UN-CONTROLLED)		
Building Heating Load: EXISTING SYSTEM			
Building Cooling Load: EXISTING SYSTEM			
Mechanical Spacing Conditioning System			
Unitary	Description of Unit:	EXISTING VAV SYSTEM - WITH NEW UNITS	
	Heating Efficiency:	REFER TO SCHEDULE	
	Cooling Efficiency:	REFER TO SCHEDULE	
	Heat Output of Unit:	REFER TO SCHEDULE	
	Cooling Output of Unit:	REFER TO SCHEDULE	
Boiler	Total Boiler Output:	If oversized, state reason.	N/A
Chiller	Total Chiller Capacity:	If oversized, state reason.	N/A
List equipment Efficiencies: N/A			
Equipment Schedules with Motors (Mechanical Systems)			
	Motor Horsepower:	REFER TO SCHEDULE	
	Number of Phases:	REFER TO SCHEDULE	
	Minimum Efficiency:	REFER TO SCHEDULE	
	Motor Type:	REFER TO SCHEDULE	
	Number (#) of Poles:	REFER TO SCHEDULE	
DESIGNER STATEMENT:			
To the best of my knowledge and belief, the design of this building complies with the Mechanical Systems, Service Systems and Equipment Requirements of the 2012 North Carolina Building Code.			
SKNED:	Sud Fan Tang, P.E.		
NAME:			
TITLE:	MECHANICAL ENGINEER		

HVAC NOTES & SPECIFICATIONS	
1.	ALL MECHANICAL EQUIPMENT AND INSTALLATIONS SHALL CONFORM WITH THE REQUIREMENTS OF THE 2009 INTERNATIONAL MECHANICAL CODE, THE 2009 INTERNATIONAL BUILDING CODE, THE 2009 INTERNATIONAL ENERGY CONSERVATION CODE, MAINE STATE AND LOCAL AMENDMENTS, NFPA 95A, 951, UNDERWRITERS LABORATORIES (OR ETL) AND ALL APPLICABLE LOCAL CODES AND ORDINANCES.
2.	THE LOCATIONS, ARRANGEMENT AND EXTENT OF EQUIPMENT, PIPING, SUPPORTS, DEVICES, CONDUT, AND OTHER APPURTENANCES RELATED TO THE INSTALLATION OF THE MECHANICAL AND ELECTRICAL WORK SHOWN ARE APPROXIMATE. THE DRAWINGS ARE DIAGRAMMATIC. DO NOT SCALE THE DRAWINGS, BUT REFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT DIMENSIONS OF BUILDING COMPONENTS SHOULD A CONFLICT EXIST BETWEEN THE ARCHITECTURAL AND ENGINEERING DRAWINGS REGARDING DIMENSIONS, SCALE, ETC.. NOTIFY THE ARCHITECT IMMEDIATELY.
3.	MATERIALS, EQUIPMENT OR LABOR NOT INDICATED, BUT WHICH CAN BE REASONABLY INFERRED TO BE NECESSARY FOR A COMPLETE INSTALLATION SHALL BE PROVIDED. THE DRAWINGS AND SPECIFICATIONS DO NOT UNDERTAKE TO INDICATE EVERY ITEM OF MATERIAL, EQUIPMENT OR LABOR REQUIRED TO PRODUCE A SAFE, COMPLETE AND PROPERLY OPERATING SYSTEM.
4.	PRIOR TO PURCHASING ANY MATERIALS OR STARTING ANY WORK, CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, DUCTWORK SIZES AND LOCATIONS, EQUIPMENT, ETC. SHOWN ON THE DRAWINGS OR AFFECTING THIS WORK AND SHALL REPORT ANY DEVIATIONS TO THE ARCHITECT.
5.	SHOP DRAWINGS SHALL BE SUBMITTED TO AND APPROVED BY THE ARCHITECT PRIOR TO ORDERING, PURCHASING, OR FABRICATING ANY MECHANICAL EQUIPMENT. SHOP DRAWINGS SHALL INCLUDE: ALL EQUIPMENT SCHEDULED OR SPECIFIED ON THE DRAWINGS; DUCTWORK DRAWN TO 1/4" SCALE OR THE SCALE SHOWN ON THE DRAWINGS; PARKING GARAGE CONDO MONITORING AND CONTROL SYSTEM LAYOUT INCLUDING SENSOR LOCATIONS, SEQUENCE OF OPERATION AND PRODUCT DATA; MECHANICAL VENTILATION REFRIGERANT PIPING AND CONTROL WIRING SCHEMATICS CERTIFIED BY THE AIR CONDITIONING EQUIPMENT MANUFACTURER. FAILURE TO SUBMIT REFRIGERANT PIPING DRAWINGS SHALL BE CAUSE FOR REJECTION OF THE ENTIRE SUBMITTAL. LONG LINE REFRIGERANT PIPING APPLICATIONS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S CURRENT SPLIT SYSTEM LONG LINE APPLICATION GUIDELINE. SHOP DRAWINGS SHALL BE SUBMITTED SIMULTANEOUSLY IN ONE PACKAGE WITH EACH ITEM CLEARLY NOTED BY THE TAG USED ON THE DRAWINGS.
6.	ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS AND INSTALLATION INSTRUCTIONS.
7.	ALL MECHANICAL EQUIPMENT AND SYSTEMS SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE BY OWNER.
8.	PORTIONS OF DUCTWORK AND PIPE INSULATION THROUGH AIR DISTRIBUTION DEVICES IN FINISHED AREAS SHALL BE PAINTED FLAT BLACK.
9.	MOUNT TOP OF THERMOSTATS 46" AFF UNLESS NOTED OTHERWISE. PROVIDE CLEAR LOCKING GUARD ASSEMBLIES FOR ALL PUBLIC AREA THERMOSTATS. COORDINATE THERMOSTAT LOCATIONS WITH OTHER TRADES. ALL THERMOSTATS SHALL BE ADA COMPLIANT.
10.	UNLESS OTHERWISE NOTED, ALL EXISTING EQUIPMENT, DUCTWORK, DIFFUSERS, ETC. SHOWN AS BEING REMOVED AS PART OF THIS CONTRACT, SHALL BECOME THE PROPERTY OF THE HVAC CONTRACTOR AND SHALL BE REMOVED FROM THE PROJECT SITE PRIOR TO PROJECT COMPLETION.
11.	ALL WORK SHALL BE COORDINATED AND PERFORMED WITH PRIOR APPROVAL FROM THE OWNER TO SUIT HIS OPERATING CONDITIONS.
12.	ANY EXISTING WALL, FLOOR, OR CEILING SURFACE THAT IS DISTURBED DURING THE COURSE OF THE HVAC WORK SHALL BE REPAIRED TO MATCH NEW AND/OR EXISTING CONDITIONS.
13.	COORDINATE ALL PENETRATIONS THROUGH EXTERIOR WALLS WITH ARCHITECTURAL DRAWINGS AND FINISHES. THE PENETRATIONS SHALL NOT BE LOCATED WHERE THEY WILL CONFLICT WITH ARCHITECTURAL FEATURES, TRANSITIONS IN MATERIALS OR COLOR CHANGES IN MATERIALS. HORIZONTAL ALIGNMENT PENETRATIONS WHEREVER POSSIBLE UNLESS NOTED OTHERWISE. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO ANY WORK BEING DONE.
14.	CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL MECHANICAL EQUIPMENT, DUCTWORK, PIPING, ETC. TO FIT WITHIN THE SPACE ALLOWED BY THE ARCHITECTURAL AND STRUCTURAL CONDITIONS. CUTTING OR OTHERWISE ALTERING ANY STRUCTURAL MEMBERS SHALL NOT BE PERMITTED WITHOUT WRITTEN PERMISSION FROM THE ARCHITECT.
15.	ALL PIPE AND DUCT PENETRATIONS OF FIRE AND/OR SMOKE-RATED ASSEMBLIES SHALL BE FIRE-STOPPED AS REQUIRED TO RESTORE THE ASSEMBLY TO ITS ORIGINAL INTEGRITY. FIRE BARRIER PRODUCTS SHALL BE AS MANUFACTURED BY TREMCO, HILT, 3M, STI, NELSON OR APPROVED EQUAL.
16.	MANUAL OVER-RIDE CONTROL (EMERGENCY SHUT-DOWN) SWITCHES FOR ALL HVAC UNITS SHALL BE LOCATED IN A LOCKING COVER ADJACENT TO FIRE ALARM ANNUNCIATOR PANEL OR OTHER LOCATION APPROVED BY LOCAL AUTHORITY HAVING JURISDICTION AND PER NFPA 92A.
17.	ACCESS PANELS IN NON-ACCESSIBLE CEILINGS AND IN WALL STRUCTURE TO ALLOW ADEQUATE ROOM FOR MAINTENANCE OF EQUIPMENT AND BALANCING OF SYSTEMS SHALL BE INSTALLED UNDER THE ARCHITECTURAL DIVISION. ACCESS PANELS IN CEILING AND WALLS SHALL BE PROVIDED WHERE SHOWN ON THE DRAWINGS OR NECESSARY TO ACCESS DAMPERS, VALVES, ETC. COORDINATE EXACT LOCATION OF ALL ACCESS PANELS WITH THE ARCHITECT DURING THE SHOP DRAWING PROCESS.
18.	ACCESS DOORS SHALL BE INSTALLED AT ALL FIRE DAMPERS, COMBINATION FIRE/SMOKE DAMPERS AND SMOKE DAMPERS TO FACILITATE INSPECTION AND MAINTENANCE. PERMANENTLY IDENTIFY THE ACCESS DOOR BY A DIE-CUT LABEL WITH 1/2" HIGH RED BLOCK LETTERS ON A WHITE BACKGROUND. LABEL SHALL READ "FIRE DAMPER", "COMBINATION FIRE/SMOKE DAMPER" OR "SMOKE DAMPER".
19.	ALL MECHANICAL EQUIPMENT SHALL BE LABELED WITH A 2" HIGH SEMI-RIGID PLASTIC LAMINATE NAMEPLATE WITH 1" HIGH WHITE LETTERS ON A BLACK BACKGROUND SECURELY AFFIXED TO THE EQUIPMENT. THE NAMEPLATE SHALL SHOW THE EQUIPMENT TAG USED ON THESE DRAWINGS.
20.	PANCAKE STYLE AIR HANDLERS LOCATED ABOVE DROPPED CEILING AREAS SHALL BE INSTALLED IN A MINIMUM 14-INCH DEEP INSIDE CLEAR FURDOWN RETURN AIR PLENUM. REFERENCE ARCHITECTURAL PLANS.
21.	REFER TO ARCHITECTURAL PLANS FOR FLOOR AND CEILING ASSEMBLY U.L. RATINGS AND NOTES.
22.	ALL MATERIALS EXPOSED WITHIN HVAC PLENUMS SHALL HAVE A FLAME-SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE-DEVELOPED RATING INDEX OF NOT MORE THAN 50 UNLESS OTHERWISE ALLOWED BY CODE.
23.	THE FIRE SPRINKLER CONTRACTOR SHALL INSTALL AND LOCATE ALL FIRE SPRINKLER PIPING TO PREVENT PIPING FROM THE POTENTIAL OF FREEZING. THE FIRE SPRINKLER CONTRACTOR IS REQUIRED TO NOTIFY THE ARCHITECT AND COORDINATE WITH THE MECHANICAL AND ELECTRICAL CONTRACTORS IF HEATING IS REQUIRED.
TESTING, ADJUSTING AND BALANCING (COMMERCIAL PROJECTS)	
1.	AFTER CONSTRUCTION, THE ENTIRE HVAC SYSTEM SHALL BE TESTED, ADJUSTED, AND BALANCED TO DELIVER THE AIR QUANTITIES SHOWN ON THE DRAWINGS. SUBMIT THE CERTIFIED (AABC OR NEBB) TEST AND BALANCE REPORT TO THE ARCHITECT FOR APPROVAL.
2.	VENTILATION AIR DISTRIBUTION SYSTEMS (OUTDOOR AIR AND EXHAUST AIR) SHALL BE BALANCED TO ACHIEVE THE AIRFLOW RATES INDICATED ON THE DRAWINGS. THESE AIRFLOW RATES SHALL BE CONSIDERED MINIMUM RATES. THE MEASURED AIR BALANCE TOLERANCE FOR BOTH OUTDOOR AIR AND EXHAUST AIR RATES SHALL BE 0% TO +10%.
MECHANICAL / ELECTRICAL COORDINATION:	
1.	CONTRACTOR SHALL COORDINATE ELECTRICAL CHARACTERISTICS AND REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH ELECTRICAL DRAWINGS PRIOR TO ORDERING EQUIPMENT OR SUBMITTING SHOP DRAWINGS, AND SHALL FURNISH EQUIPMENT WIRED FOR THE VOLTAGES SHOWN THEREIN. SHOP DRAWING SUBMITTALS SHALL CLEARLY STATE THAT THE ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT HAS BEEN COORDINATED WITH THE ELECTRICAL CONTRACT DOCUMENTS AND THE ELECTRICAL CONTRACTOR.
2.	ALL MECHANICAL EQUIPMENT REQUIRING ELECTRICAL POWER SHALL BE INSTALLED WITH DISCONNECT SWITCHES AT EACH PIECE OF EQUIPMENT. COORDINATE SWITCH TYPE (FUSED OR NON-FUSED) WITH EQUIPMENT CHARACTERISTICS, MANUFACTURER'S RECOMMENDATIONS AND THE ELECTRICAL DRAWINGS.
3.	PROVIDE ALL SYSTEM CONTROLS AND ASSOCIATED CONTROL AND INTERLOCK WIRING FOR COMPLETE AND OPERABLE SYSTEMS. 120 VOLT AND HIGHER WIRING SHALL BE MC CABLE OR IN CONDUIT IN ACCORDANCE WITH LOCAL CODES AND THE MATERIALS AND INSTALLATION REQUIREMENTS OF DIVISION 26 - ELECTRICAL.
4.	COORDINATE POWER AND FIRE ALARM REQUIREMENTS OF ALL COMBINATION FIRE / SMOKE DAMPERS AND SMOKE DAMPERS WITH THE ELECTRICAL CONTRACTOR.
5.	ALL REQUIRED CONTROL WIRING INCLUDING POWER WIRING REQUIRED FOR CONTROL PANELS, DEVICES, ETC) NOT INDICATED ON THE ELECTRICAL DRAWINGS SHALL BE INCLUDED AS PART OF THE MECHANICAL WORK. WIRING IN HVAC PLENUM SPACES SHALL BE INSTALLED ACCORDING TO CODE REQUIREMENTS.
6.	UNLESS NOTED OTHERWISE, TRANSFORMERS, CONTROLS AND CONTROL WIRING REQUIRED FOR ALL MECHANICAL SYSTEMS SHALL BE FURNISHED WITH THE EQUIPMENT IT SERVES AND INSTALLED BY THE MECHANICAL CONTRACTOR. MOTOR STARTERS FOR HVAC EQUIPMENT SHALL BE FURNISHED WITH THE MOTOR OR APPARATUS WHICH IT OPERATES. MOTOR STARTER INSTALLATION SHALL BE BY THE DIVISION 26 CONTRACTOR.
AIR DISTRIBUTION:	
1.	SUPPLY, RETURN AND O.A. DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED SHEETMETAL IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARDS, LATEST EDITION. SNAP-LOCK LONGITUDINAL SEAMS ARE NOT ALLOWED UNLESS SECURED WITH SHEET METAL FASTENING SCREWS AS RECOMMENDED BY SMACNA.
2.	ALL JOINTS AND SEAMS IN ALL SHEETMETAL DUCTWORK SHALL BE SEALED WITH DUCT SEALER.
3.	SEAL, INSPECT AND TEST SHEETMETAL DUCTWORK PRIOR TO INSULATING OR CONCEALING. SEAL ALL DUCTWORK AND PLENUMS TO MEET SMACNA SEAL CLASS A.
4.	SEAL ALL TRANSVERSE JOINT, LONGITUDINAL SEAMS, AND DUCT WALL PENETRATIONS.
5.	PRESSURE-SENSITIVE TAPE SHALL NOT BE USED AS THE PRIMARY SEALANT, UNLESS IT HAS BEEN CERTIFIED TO COMPLY WITH UL-181A OR UL-181B BY AN INDEPENDENT TESTING LABORATORY AND THE TAPE IS USED IN ACCORDANCE WITH THAT CERTIFICATION.
6.	ALL CONNECTIONS SHALL BE SEALED, INCLUDING BUT NOT LIMITED TO SPIN-IN FITTINGS, TAPS, OTHER BRANCH CONNECTIONS, ACCESS DOORS, AND DUCT CONNECTIONS TO EQUIPMENT.
7.	SEALING THAT WOULD VOID PRODUCT LISTINGS IS NOT REQUIRED.
8.	SPIRAL LOCK SEAMS NEED NOT BE SEALED.
9.	ALL OPEN ENDED DUCTS AND FAN OUTLETS SHALL HAVE 1/2" x 1/2" HARDWARE CLOTH AFFIXED TO THE OPENING.
10.	ALL DUCTWORK SHALL BE SUPPORTED BY THE BUILDING STRUCTURE AND SHALL NOT REST ON CEILING TILES OR CEILING STRUCTURE. DUCT SUPPORTS AND ATTACHMENT TO STRUCTURE SHALL BE PER SMACNA STANDARDS.
11.	FLEXIBLE DUCTWORK SHALL BE TERMAFLEX M KE (U.L. 181 LISTED, CLASS 1 FLEXIBLE AIR DUCT) OR EQUAL. PROVIDE MINIMUM INSULATION VALUE OF R-4-R-8 WHEN LOCATED OUTSIDE THE THERMAL ENVELOPE OF THE BUILDING, OR GREATER WHERE REQUIRED BY APPLICABLE ENERGY CODE. AIR CONNECTORS ARE NOT ACCEPTABLE. FLEX DUCT DIAMETER SHALL MATCH DUCT NECK DIAMETER. PROVIDE ROUND GALVANIZED STEEL DUCT RUNOUTS TO MAINTAIN A MAXIMUM FLEXIBLE DUCT LENGTH OF 8' 0". IF FLEXIBLE DUCTWORK SHALL BE INSTALLED AS STRAIGHT AS POSSIBLE AND SHALL BE ROLLED AND SUPPORTED WITHOUT FORMING CRIMPS OR OTHER AIR FLOW RESTRICTIONS. PROVIDE SQUARE TO ROUND ADAPTERS OR BOOTS TO CONNECT TO AIR DUCT NECK WHEN REQUIRED.
12.	ROUND AND FLEXIBLE SUPPLY AIR DUCTWORK SHALL BE CONNECTED TO MAIN DUCTS WITH A CONICAL TYPE SPIN-IN FITTING WITH MANUAL VOLUME DAMPER (EXCEPT WHERE INSTALLED ABOVE INACCESSIBLE CEILINGS, THE DAMPER SHALL BE OMITTED AND PROVIDED IN THE AIR DUCT NECK).
13.	TAPE, BED AND SEAL AIR TIGHT ALL PENETRATIONS FROM RETURN AIR PLENUMS TO NON-RETURN AIR PLENUMS THAT ARE REQUIRED DUE TO DUCTWORK, PIPING OR OTHER ITEMS.
14.	DUCTWORK DIMENSIONS SHOWN ON THE DRAWINGS ARE INSIDE CLEAR DIMENSIONS.
15.	EXTERNAL STATIC PRESSURE (ESP) DOES NOT INCLUDE COIL, CASING OR FILTER PRESSURE DROP.
16.	INSTALL FIRE DAMPERS IN ALL RATED WALLS AND FLOOR PENETRATIONS. FIRE DAMPERS SHALL BE THE DYNAMIC TYPE WITH BLADES OUT OF THE AIRSTREAM WHERE POSSIBLE. ALL FIRE DAMPERS SHALL COMPLY WITH THE REQUIREMENTS OF U.L. 555.
17.	INSTALL SMOKE DAMPERS IN ALL DUCT PENETRATIONS THROUGH SMOKE RATED WALLS, WHERE DUCTS PENETRATE WALLS AND ARCHITECTURAL SHAFTS THAT CARRY BOTH FIRE AND SMOKE RATINGS. THE DAMPERS INSTALLED SHALL BE COMBINATION FIRE AND SMOKE DAMPERS. ALL SMOKE DAMPERS SHALL COMPLY WITH THE REQUIREMENTS OF U.L. 555S. ALL COMBINATION FIRE AND SMOKE DAMPERS SHALL COMPLY WITH THE REQUIREMENTS OF U.L. 555 AND U.L. 555S.
18.	DUCT ACCESS DOORS: PROVIDE ACCESS DOORS IN DUCTWORK AT EACH FIRE, COMBINATION FIRE/SMOKE AND SMOKE DAMPER LOCATION.
19.	PROVIDE ALL OUTDOOR AIR INTAKES AND EXHAUST OPENINGS WITH MOTORIZED OR GRAVITY DAMPERS IN ACCORDANCE WITH THE LOCAL ENERGY CODE. DAMPERS SHALL CLOSE WHEN THE VENTILATION SYSTEM IS NOT OPERATING.
20.	LOCATIONS OF GRILLES, REGISTERS, AND DIFFUSERS SHOWN ON THE DRAWINGS ARE APPROXIMATE. COORDINATE EXACT LOCATIONS WITH LIGHTS, CEILING GRID, ETC. AND ARCHITECTURAL REFLECTED CEILING PLAN.
21.	WHERE BALANCING DAMPERS CANNOT BE ACCESSED FROM BELOW THE CEILING, PROVIDE A REMOTE OPERATED DAMPER, YOUNG REGULATOR OR EQUAL.
22.	DUCTWORK INSTALLED WITHIN OPEN ATTIC SPACES SHALL BE GALVANIZED STEEL. DUCTBOARD AND FLEX DUCT IS ALLOWABLE WHERE SERVING DWELLING UNIT SUPPLY AIR SYSTEMS.
23.	FLEXIBLE DUCT CONNECTORS SHALL BE USED TO CONNECT DUCTWORK AND PLENUMS TO FAN-ROTATING EQUIPMENT; DURODYNE EXCELON OR APPROVED EQUAL. FLEXIBLE CONNECTORS EXPOSED TO THE WEATHER SHALL BE UV AND OZONE RESISTANT. FABRICS, COATINGS AND ADHESIVES SHALL BE TESTED IN ACCORDANCE WITH UL 701 AND HAVE A FLAME SPREAD/ SMOKE DEVELOPED RATING OF 25/50. FLEXIBLE DUCT CONNECTORS SHALL ALSO BE PROVIDED WHERE DUCTWORK CROSSES BUILDING EXPANSION JOINTS.
INSULATION:	
1.	DUCT INSULATION:
2.	DUCT WRAP SHALL BE UL LISTED FIBERGLASS BLANKET INSULATION WITH FOIL VAPOR BARRIER, JOHNS MANVILLE MICROLOE EQ FSK OR APPROVED EQUAL. PUNCTURES AND TEARS IN THE FOIL JACKET SHALL BE PATCHED WITH FOIL TAPE TO MAINTAIN THE INTEGRITY OF THE VAPOR BARRIER. INSULATE SHEET METAL DUCTWORK IN THE THICKNESSES AND DENSITIES AS LISTED BELOW:
3.	SHEET METAL SUPPLY AND OUTSIDE AIR DUCTWORK: 2" THICK, 1 LB/FT DENSITY, R-8 MINIMUM INSTALLED.
4.	SHEET METAL RETURN DUCTWORK IN NON-AIR CONDITIONED AREAS (SUCH AS INTERSTITIAL SPACES AND FLOOR/CEILING ASSEMBLIES): 2" THICK, 1 LB/FT DENSITY, R-8 MINIMUM INSTALLED.
5.	ALL SHEET METAL DUCTWORK LOCATED OUTSIDE OF THE THERMAL ENVELOPE OF THE BUILDING (INCLUDING CRAWL SPACES AND ATTIC SPACES): 3" THICK, 1/2 LB/FT DENSITY, R-8 MINIMUM INSTALLED.
6.	DUCT LINER FOR ACOUSTICS: LINE ALL SHEETMETAL DUCTWORK A MINIMUM OF 15' 0" (OR AS INDICATED) UPSTREAM AND DOWNSTREAM OF ALL TERMINAL UNITS. DUCT LINER FOR RECTANGULAR DUCTS SHALL BE 1/2" THICK (MINIMUM R-8 OR GREATER WHERE REQUIRED BY APPLICABLE ENERGY CODE). JOHNS MANVILLE MICROACOUSTIC RC OR EQUAL. THE LEAKING EDGE OF THE DUCT LINER SHALL HAVE A SHEETMETAL NOSING. LINED DUCTWORK DOES NOT REQUIRE ADDITIONAL EXTERIOR INSULATION WHERE LINER MEETS REQUIRED R-VALUES.
HVAC GENERAL NOTES - DEMOLITION, ADDITIONS & RENOVATIONS	
1.	FURNISH ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO REMOVE AND/OR MAKE-SAFE THE EXISTING EQUIPMENT, PIPE, FITTINGS, VALVES AND APPURTENANCES INDICATED ON THE DRAWINGS, AND NOT REQUIRED FOR THE PROPER OPERATION OF THE NEW HVAC SYSTEM. REMOVAL WILL BE CONSISTENT WITH THE FINAL CONFIGURATION OF THE NEW SYSTEMS AS INDICATED AND AS REQUIRED BY THE OWNER/ARCHITECT. THE EQUIPMENT AND PIPING IDENTIFIED SHALL BE REMOVED FROM THEIR PRESENT LOCATIONS AND SHALL BE REMOVED FROM THE SITE OR STORED AS SPECIFIED HEREINAFTER.
2.	PERFORM ALL WORK REQUIRED TO TIE-IN THE NEW WORK TO THE EXISTING SYSTEMS AND TO ADAPT THE EXISTING SYSTEMS TO THE NEW WORK. WORK SHOWN IS INTENDED TO SHOW THE FINAL HVAC SYSTEM CONFIGURATION.
3.	BEFORE REMOVAL OF ANY ELECTRICALLY OPERATED EQUIPMENT, COORDINATE CAREFULLY TO ASSURE THAT POWER AND CONTROL WIRING HAS BEEN DISCONNECTED AND/OR LOCKED OUT, TAGGED OUT AND MADE SAFE.
4.	IT SHOULD BE NOTED THAT SOME HVAC SYSTEMS ARE TO REMAIN. IF ANY OF THESE SYSTEMS ARE DAMAGED DURING THE PROCESS OF CONSTRUCTION OR DEMOLITION, THEY SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE ARCHITECT WITHOUT INCURRING ADDITIONS TO THE CONTRACT.
5.	PRIOR TO THE ORDERING OR PURCHASING OF ANY EQUIPMENT OR MATERIALS, OR THE LAYOUT OR INSTALLATION OF ANY NEW WORK, THE CONTRACTOR SHALL EXAMINE THE PREMISES AND VERIFY ANY AND ALL OF THE EXISTING CONDITIONS UNDER WHICH HE WILL BE OBLIGED TO OPERATE, OR THAT WILL IN ANY MANNER AFFECT THE WORK UNDER THIS CONTRACT.
6.	UNLESS SPECIFICALLY NOTED TO BE REMOVED, EXISTING EQUIPMENT, PIPING, DUCTWORK, ETC. IS TO REMAIN. ANY EQUIPMENT, PIPING OR APPURTENANCES REMOVED WHICH ARE NECESSARY FOR THE OPERATION OF THE EXISTING SYSTEM SHALL BE REPLACED TO THE SATISFACTION OF THE ARCHITECT WITHOUT INCURRING ADDITIONS TO THE CONTRACT.
7.	WHEN ENCOUNTERED IN THE COURSE OF THE WORK, PROTECT, BRACE, AND SUPPORT EXISTING ACTIVE SERVICES AS NECESSARY FOR PROPER EXECUTION OF THE WORK. RELOCATE EXISTING ACTIVE SERVICES ENCOUNTERED AS NECESSARY OR AS SHOWN ON THE CONTRACT DOCUMENTS. DO NOT PREVENT OR DISTURB OPERATION OF ACTIVE SERVICES THAT ARE TO REMAIN. NOTIFY ALL UTILITY COMPANIES OR MUNICIPAL AGENCIES HAVING JURISDICTION PRIOR TO MODIFYING SERVICES.
8.	WHERE WORK MAKES TEMPORARY SHUTDOWN OF SERVICES UNAVOIDABLE, SHUT DOWN AT NIGHT OR AT SUCH TIMES AS APPROVED BY THE OWNER WHICH WILL CAUSE THE LEAST INTERFERENCE WITH SCHEDULED OPERATIONS. ARRANGE WORK TO ASSURE THAT SERVICES WILL BE SHUT DOWN ONLY DURING THE TIME ACTUALLY REQUIRED TO MAKE THE CONNECTION TO THE EXISTING WORK.
9.	ALL DUCTWORK, PIPE, FITTINGS, TUBING, INSULATION, HANGERS AND SUPPORTS, ETC. THAT ARE DEMOLISHED OR DAMAGED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UPON REMOVAL. THE MATERIALS SHALL BE REMOVED IMMEDIATELY FROM THE SITE AND SHALL NOT BE REUSED.
10.	ANY EXISTING PROPERTY DAMAGED BY THE CONTRACTOR WHILE PERFORMING ANY WORK SHALL BE REPLACED WITH NEW MATERIALS TO MATCH EXISTING CONDITIONS; HOWEVER, ANY EXISTING INSULATION THAT IS DAMAGED SHALL BE REPLACED AS SPECIFIED FOR NEW INSULATION.
11.	WHEREVER PIPING IS REMOVED FOR DISPOSITION, ADJACENT PIPE AND HEADERS THAT ARE TO REMAIN IN SERVICE SHALL BE BLANKED OFF OR PLUGGED AND THEN ANCHORED IN AN APPROVED MANNER. PIPING PASSING THROUGH FLOORS THAT IS TO BE REMOVED SHALL BE CUT OR GROUND FLUSH WITH THE FLOOR AND FILLED WITH GROUT FLUSH WITH ADJACENT FLOOR.
12.	EQUIPMENT TO BE RETAINED BY THE OWNER SHALL BE CAREFULLY REMOVED FROM THE PRESENT LOCATION, CLEANED, PACKAGED AND IMMEDIATELY STORED AT A PLACE ON-SITE AS DESIGNATED BY THE OWNER.
13.	THE CONTRACTOR SHALL REPAIR ALL DAMAGE RESULTING FROM HIS OPERATIONS AS DIRECTED BY AND TO THE SATISFACTION OF THE ARCHITECT. ITEMIZED LISTS OF MATERIALS REMOVED AND STORED SHALL BE RECORDED AND SUBMITTED TO THE OWNER AT THE COMPLETION OF CONSTRUCTION. THE LIST SHALL INCLUDE A PHYSICAL DESCRIPTION OF ALL ITEMS, HOW THEY ARE PACKAGED AND WHERE THEY ARE STORED.
14.	WHERE WORK UNDER THIS PROJECT REQUIRES EXTENSION, RELOCATION, RECONNECTION OR MODIFICATIONS TO EXISTING EQUIPMENT OR SYSTEMS, THE EXISTING EQUIPMENT OR SYSTEMS SHALL BE RESTORED TO THEIR ORIGINAL AND OPERATING CONDITION.
15.	WHERE PIPES, CONTROL DEVICES AND WIRING WHICH ARE TO REMAIN IN SERVICE, BUT ARE DISCONNECTED FOR THE REMOVAL OR RELOCATION OF EQUIPMENT OR BECAUSE OF BUILDING ALTERATIONS, THEY SHALL BE RECONNECTED.
16.	ALL THERMOSTATS AND TEMPERATURE SENSORS THAT ARE TO REMAIN IN SERVICE SHALL BE REMOVED AND STORED IN A SAFE PLACE OR COVERED IN PLASTIC AND PROTECTED FROM CONSTRUCTION DEMOLITION. PRIOR TO CONSTRUCTION, CATALOG ALL EXISTING THERMOSTATS TO BE REUSED AND VERIFY PROPER OPERATION. NOTIFY THE ARCHITECT AT THIS TIME OF ANY INOPERABLE THERMOSTATS. ANY THERMOSTATS DAMAGED OR FOUND TO BE INOPERABLE AT TURNOVER SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST.

GRILLE, REGISTERS & DIFFUSERS

TAG	SERIES	CFM	DUTY	NECK SIZE	FACE SIZE	DAMPER	MATERIAL	TYPE	NOTES/ACCESSORIES
A	TDC	SEE DWGS	SUPPLY	SEE DWGS	24x24	NO	STEEL	LOUVERED FACE DIFFUSER	ACCESSORY 1, 2
B	BAR	SEE DWGS	RETURN/DR	SEE DWGS	24x24	NO	STEEL	PERFORATED FACE RETURN GRILLE	1
C	TBD-10	SEE DWGS	SUPPLY	SEE DWGS	VARIES	NO	STEEL	PLENUM SLOT DIFFUSER	NOTE: 1 ACCESSORY 2, 3

NOTES (APPLY TO ALL DEVICES UNO):

- REFER TO ARCHITECTURAL DRAWINGS FOR TYPE OF CEILING, SUSPENSION SYSTEM AND FINISHES WHERE DEVICE WILL BE MOUNTED. FRAME AND BORDER TYPE SHALL BE COMPATIBLE WITH ADJACENT SURFACES AND FINISHES.
- FINISH SHALL BE MANUFACTURER'S STANDARD. REFER TO ACCESSORIES NOTES FOR CUSTOM FINISHES. IF ANY, SUBMIT COLOR CHART WITH SHOP DRAWINGS.
- WHEN A DAMPER IS CALLED FOR ABOVE AND THE DEVICE IS TO BE MOUNTED IN AN INACCESSIBLE CEILING, EITHER A FACE ADJUSTABLE OR REMOTE CALIBRATE OPERATED BALANCING DAMPER SHALL BE INCLUDED.
- TWO 1.5" SLOT, 4" LONG, 8"Ø INLET, FACTORY INSULATED PLENUM.

ACCESSORIES:

- MOLDED INSULATION (R-8) BLANKET ON BACK PAN
- BALANCING DAMPER IN INLET
- MANUFACTURER'S STANDARD INSULATED PLENUM

SELECTIONS ARE BASED ON PRODUCTS BY: TITUS.

EQUAL PRODUCTS: KRUEGER, CARNES, ANEMOSTAT, TUTTLE & BAILEY, PRICE, METALAIR.

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