Ν	IECHANICAL GENERAL NOTES		
	E SPECIFICATIONS FOR ADDITIONAL PROJECT REQUIREMENTS. THESE GENERAL NOTES ARE INTENDED TO SUPPLEMENT ON TRADICTS THE REQUIREMENTS LISTED HERE, THE QUESTION SHALL BE ASKED PRIOR TO BIDDING OR THE MORE STI		
1.	DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATION OF DOORS, WINDOWS, CEILING DIFFUSERS, ETC.	14.	CONTRACTOR SHALL VERIFY LOCATION OF ALL ROOF PENETRATIONS WIT INSTALLATION. NEW ROOF PENETRATIONS MADE THROUGH EXISTING RO WITH THE OWNER'S EXISTING ROOF WARRANTY PRIOR TO INSTALLATION
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.		CONTRACTOR SHALL LOCATE EXHAUST FANS, OUTLETS, AND GAS FLUES A OUTSIDE AIR INTAKE. ALL ISOLATION VALVES, TERMINAL UNITS, CONTROLS, ETC. REQUIRING AC INSTALLED WITHIN 18" OF THE CEILING FOR SERVICE ACCESSIBILITY. LOCA CEILING GRID PER THE SPECIFICATIONS.
3.	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. ROOFTOP UNIT RETURN DUCTWORK AND TRANSFER DUCTS SHALL BE LINED WITH 1" THICK FIBERGLASS DUCT LINER FOR ACOUSTICAL PURPOSES. DUCT DIMENSIONS ON PLANS ARE FREE AREA SIZE.		DUCTWORK AND PIPING PASSING THROUGH/ABOVE ELECTRICAL ROOMS S WITH THE ELECTRICAL CONTRACTOR. DUCTWORK OR PIPING SHALL NOT PANELS. EQUIPMENT OPERATED DURING CONSTRUCTION SHALL USE FILTERED ME DEBRIS FROM ENTERING COILS, DUCTWORK SYSTEMS, AIR TERMINALS ETG CONSTRUCTION, MECHANICAL CONTRACTOR SHALL CLEAN ALL SYSTEMS
4.	ALL DUCTWORK SHALL BE SEALED PER THE REQUIREMENTS OF THE NORTH CAROLINA INTERNATIONAL MECHANICAL CODE. SEAL LOW PRESSURE SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST DUCTWORK FOR POSITIVE/NEGATIVE 2" PRESSURE CLASS, SMACNA SEAL CLASS A, SMACNA LEAKAGE CLASS 4.		OPEN AND REMOVE ANY REMAINING DEBRIS PRIOR TO TEST AND BALAN SHALL REPLACE ALL FILTRATION WITH NEW FILTERS AT COMPLETION OF C AIR TERMINALS, AND/OR OTHER EQUIPMENT UPSTREAM OF FILTRATION S OF CONSTRUCTION DEBRIS BEFORE HANDING OVER TO OWNER.
5.	ALL PIPING, DUCTS, VENTS, ETC., EXTENDING THROUGH WALLS AND ROOF SHALL BE FLASHED AND COUNTERFLASHED IN A WATERPROOF MANNER.	19.	THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING
6.	ALL PIPING AND DUCTWORK LOCATIONS SHALL BE COORDINATED WITH THE WORK UNDER OTHER DIVISIONS OF THE SPECIFICATIONS, TO AVOID INTERFERENCE.		EARTHQUAKE EFFECTS ON THE MECHANICAL SYSTEMS. THE REQUIREMEN FOUND IN THE LOCAL BUILDING CODE AND ASCE 7. THE ANCHORAGE OF COMPLY WITH THE REQUIREMENTS OF THE LOCAL BUILDING CODE AND A
7.	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 REQUEST) AFTER 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. TEST AND BALANCE REPORT TO BE COMPLETED BY AN INDEPENDENT, CERTIFIED TEST AND BALANCE CONTRACTOR.	20.	ALL MECHANICAL EQUIPMENT SHALL BE U.L. LISTED AND LABELED AS A C INDIVIDUAL COMPONENTS OR PARTS. PROVIDE REQUIRED 3RD PARTY FIL REQUIRED TO COMPLY.
8.	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. IN ADDITION, THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE TO HIRE A REGISTERED DESIGN PROFESSIONAL TO COMMISSION THE INSTALLED SYSTEM AND PROVIDE THE OWNER AND CODE REVIEWER A SEALED STATEMENT OF COMMISSIONING (PER 20128 NCECC APPENDIX C1).		
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. CONDENSATE DRAINS SHALL BE INSULATED WITH 1" THICK ARMAFLEX INSULATION. MINIMUM DRAIN SIZE SHALL BE ¾". TERMINATE ROOFTOP UNIT DRAINS ON A CONCRETE SPLASHBLOCK.		
12	ANY DEVICE REQUIRING A THERMOSTAT FOR CONTROL SHALL BE FURNISHED WITH A THERMOSTAT WHETHER INDICATED ON THE DRAWINGS OR NOT.		
13	. 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.		

VENTILATION CAL	CULATIONS (NCM	C 2018, SEC	(403): DOAS	5-1					
OCCUPANCY CLASSIFICATION	PEOPLE O/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 O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
CLASSROOM (AGES 5-8)	7.5	0	25	-	5124	129	968	0	0
CORRIDOR	-	0.06	-	-	1198	0	0	72	0
				TOTAL OA RE	QUIRED (PEOPLE -	+ AREA, CFM)/0.8	13	00	
				тс	TAL OUTSIDE AIR	PROVIDED (CFM)	14	00	
						TOT	AL EXHAUST AIR F	EQUIRED (CFM)	-
						тот	AL EXHAUST AIR P	ROVIDED (CFM)	-

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): DOAS-2

OCCUPANCY CLASSIFICATION	PEOPLE O/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 O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
CLASSROOM (AGES 5-8)	7.5	0	25	-	3374	85	638	0	0
CORRIDOR	-	0.06	-	-	1747	0	0	105	0
OFFICE	5	0.06	5	-	682	4	20	41	0
TOILET	-	-	-	70 CFM/FIXTURE	14 FIXTURES	0	0	0	980
				TOTAL OUTSIDE AIR I	REQUIRED (PEOPL	.e + Area, CFM)	10	05	
				TOT	AL OUTSIDE AIR P	ROVIDED (CFM)	11	00	
						тоти	AL EXHAUST AIR R	EQUIRED (CFM)	980
						TOTA	L EXHAUST AIR P	ROVIDED (CFM)	1050

ADA and other laws.

. CONTRACTOR SHALL VERIFY LOCATION OF ALL ROOF PENETRATIONS WITH ARCHITECT & OWNER PRIOR TO INSTALLATION. NEW ROOF PENETRATIONS MADE THROUGH EXISTING ROOF SYSTEMS SHALL BE VERIFIED

WITH THE OWNER'S EXISTING ROOF WARRANTY PRIOR TO INSTALLATION. . CONTRACTOR SHALL LOCATE EXHAUST FANS, OUTLETS, AND GAS FLUES A MINIMUM OF 10'-0" FROM ANY

. ALL ISOLATION VALVES, TERMINAL UNITS, CONTROLS, ETC. REQUIRING ACCESS AND SERVICE SHALL BE INSTALLED WITHIN 18" OF THE CEILING FOR SERVICE ACCESSIBILITY. LOCATIONS SHALL BE INDICATED ON THE CEILING GRID PER THE SPECIFICATIONS.

. DUCTWORK AND PIPING PASSING THROUGH/ABOVE ELECTRICAL ROOMS SHALL BE CLOSELY COORDINATED WITH THE ELECTRICAL CONTRACTOR. DUCTWORK OR PIPING SHALL NOT BE LOCATED ABOVE ELECTRICAL PANELS.

. 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.

. 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.

20. ALL MECHANICAL EQUIPMENT SHALL BE U.L. LISTED AND LABELED AS A COMPLETE PACKAGE, NOT THOUGH INDIVIDUAL COMPONENTS OR PARTS. PROVIDE REQUIRED 3RD PARTY FIELD UL LISTING SERVICES AS REQUIRED TO COMPLY.

MECHANICAL DEMOLITION NOTES

. 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.

2. 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.

EQUIPMENT ABBREVIATIONS

AC	AIR CONDITIONING UNIT	EWH	ELECTRIC WATER HEATER
ACC	AIR COOLED CONDENSER	FCU	FAN COIL UNIT
ACCU	AIR COOLING CONDENSING UNIT	FP	FIRE PUMP
AHU	AIR HANDLING UNIT	GI	GREASE INTERCEPTOR
AS	AIR SEPARATOR	GRV	GRAVITY ROOF VENTILATO
В	BOILER	HWP	HEATING WATER PUMP
СН	CHILLER	HX	HEAT EXCHANGER
СТ	COOLING TOWER	HRU	HEAT RECOVERY UNIT
CUH	CABINET UNIT HEATER	PRV	POWER ROOF VENTILATO
CWP	CONDENSER WATER PUMP	RE	RETURN/EXHAUST FAN
CHWP	CHILLED WATER PUMP	RTU	ROOFTOP UNIT
DBP	DOMESTIC WATER BOOSTER PUMP	SEP	SEWAGE EJECTOR PUMP
DC	DUCT MOUNTED COIL	SF	SUPPLY FAN
DCP	DOMESTIC WATER CIRCULATING PUMP	SP	SUMP PUMP
EF	EXHAUST FAN	UH	UNIT HEATER
EDC	ELECTRIC DUCT COIL	WH	WATER HEATER
ET	EXPANSION TANK		

AC AIR CONDITIONING M/A MIXED AIR AD AREA DRAIN MAX MAXIMUM MAXIMUM AD ADDENDUM MH ONE THOUSAND ETU I AFF ARNUAL FUEL UTULZATION EFFICIENCY MD MOTORIZED DAMPER ATUE ANNUAL FUEL UTULZATION EFFICIENCY MD MOTORIZED DAMPER AP ACCESS PANEL MFR MANUFACTURER ARCH ARCHITECT/ARCHITECTURAL MIN MINIMUM BFT BELOW FINISHED FLOOR MISCE LAINEOUS BIW BELOW MITS MU/A MAKE-UP/AIR BTUH BRITISH THERMAL UNITS MU/A MAKE-UP/AIR BTUH BRITISH THERMAL UNITS MU/A MAKE-UP/AIR CAPCH PASIN NIC NOTRACT NO CAPACITY NC NORMALLY CLOSED NO CB CATCH BASIN NIC NOT TO SCALE CW COLID WATER NO NUMBER NO CIG CLAN OUT NTS NOT TO SCALE		ABBREVIATIONS						
AC AIR CONDITIONING MAX MIXED AIR AD AREA DRAIN MAX MAXIMUM ADD ADDENDUM MEH ONE THOUSAND ETU I AFF ABOVE FINISHED FLOOR MCF ONE THOUSAND ETU I AFE ANNUAL FUEL UTULZATION EFFICIENCY MD MOTORIZED DAMPER ALT ALTERNATE MECH MECH ANUFACTURER ARCH ARCHITECT/ARCHITECTURAL MIN MINIMUM BFF BELOW FINISHED FLOOR MISC MISCELANECOUS BWW BELOW MITS MU/A MAKE-UP/AIR BTUH BRITISH THERMAL UNITS MU/A MAKE-UP/AIR CB CATCH BASIN NIC NOTIN CONTRACT CB CATCH BASIN NIC NOTIN CONTRACT CGE CATCH BASIN NIC NOTIN CONTRACT	Ø	ROUND	LVR	LOUVER				
AD AREA DBAIN MAX MAXIMUM ADD ADDENDUM MBH ORE THOUSAND BTU J AFF ABVEY FINISHED FLOOR MCF ORE THOUSAND CUB AFF ABVEY FINISHED FLOOR MCF ORE THOUSAND CUB ATL ALTRENATE MECH MECHANICAL AF ABVEY FINISHED FLOOR MISC MISCELLANEOUS BEW BELOW FINISHED FLOOR MISC MISCELLANEOUS BUW BELOW FINISHED FLOOR MISC MISCELLANEOUS BUW BELOW FINISHED FLOOR MIC NOTER BUS BTUW BRITISH THERMAL UNITS PER HOUR NC NORMALLY CLOSED CB CATCH BASIN NIC NOT IN CONTRACT CFM CUBIC FEET PER MINUTE NO NORMALLY OPEN CG CLEAN OUT NTS NOT TO SCALE CW COL WATER O OXYGEN DA DEGREE O/A OUTSIDEAIR DA DAWINS PIV POST INDICATOR VALL DW	ABV	ABOVE	LWT	LEAVING WATER TEMPERATU				
ADD ADDENDUM MBH ONE THOUSAND BTU I AFF ABOVE FINISHED FLOOR MCF ONE THOUSAND CUB AFUE ANNUAL FUEL UTILIZATION EFFICIENCY MD MOTORIZED DAMPER ALT ALTERNATE MECH MECHANICAL AP ACCESS PANEL MFR MANUFACTUBER ARCH ARCHITECT/ARCHITECTURAL MIN MINIMUM BFT BELOW HINSHED FLOOR MISC MISCLALAPEOUS BIW BELOW MITS MU/A MAKE-UP/AIR BTUH BRITISH THERMAL UNITS MU/A MAKE-UP/AIR CAP CAPACITY NC NOBIS CETTERIA CAP CAPACITY NC NORIALLY CLOSED CB CATCH BASIN NIC NOTIN CONTRACT CM COLIENTO NTS NO NOMALLY CLOSED CG CLEIN OUT NTS NO NOMALLY CLOSED CH COLO WATER O OXOTOR CALE DB DEGREE O/A OUTSIDE AIR DB DEGREE POEND	AC	AIR CONDITIONING	M/A	MIXED AIR				
AFFABOVE FINISHED FLOORMCFONE THOUSAND CUBAFUEANNUAL FUEL UTILIZATION EFFICIENCYMDMOTORIZED DAMPERALTALTERNATEMECHMECHARARCHARCHTECT/ARCHITECTURALMFRMANUPACTURERARCHARCHTECT/ARCHITECTURALMINMINIMUMBFFBELOW FINISHED FLOORMISCMISCELLANEOUSBLWBELOWMTRMOTORBTUBRITISH THERMAL UNITSMU/AMAKE-UP/AIRBTUHBRITISH THERMAL UNITS PER HOURNCNOSRALLY CLOSEDCBCATCH BASINNICNOTMACTUSEDCGCELINGNONUMMERCLGCELINGNONORMALLY CLOSEDCBCATCH BASINNICNOT NORMALLY CLOSEDCGCLEAN OUTNTSNOT O SCALECWCOLD WATEROOXYGENDDEGREEO/AOUTSIDE AIRDIADIAMETERPIDPRESSURE DROPDNDOWNPIVPOST INDICATOR VALLDWDISTLED WATERPIBGPULMBINGEATEATCHPRESSPRESSURE REDUCING 'AELCT ERICALPSIPOUNDS PER SQUAREEQUIP EQUIPMENTPSIGPOUNDS PER SQUAREEQUIP EQUIPMENTPSIGPOUNDS PER SQUAREEQUIP EQUIPMENTPSIGPOUNDS PER SQUAREEQUIP ELCTRICALPSIPOUNDS PER SQUAREEQUIP ELCTRICALPSIPOUNDS PER SQUAREEVCELCTRICALPSIPOUNDS PER SQUARE	AD	AREA DRAIN	MAX	MAXIMUM				
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ALT ALTERNATE MECH MECHANICAL AP ACCESS PANEL MFR MANUPACTURER ARCH ARCHARCHITECT/ARCHITECTURAL MIN MINIMUM BFF BELOW FINSHED FLOOR MISC MISCELLANEOUS BIW BELOW MIST MISC MISCELLANEOUS BTU BRITISH THERMAL UNITS MU/A MAKE-UP/AIR BTUH BRITISH THERMAL UNITS PER HOUR NC NOBRALLY CLOSED CAP CAPCAPCITY NC NORMALLY CLOSED CB CATCH BASIN NC NOTRACT CFM CUBIC FEET PER MINUTE NO NOMRMALLY OPEN CO CLEAN OUT NTS NOT TO SCALE CW COLD WATER O OXYGEN D DEGREE O/A OUTSIDE AIR DW DISTILED WATER PD PRESSURE DROP DN DOWN PIV POST INDICATOR VALI DW DOTTLED WATER PILMBING BEA EAA EACH PRESS PRESSURE DROP DN DOWN PIV POST INDICATOR VALI DW DISTILED WATER PILMBING BEA EAA EACH PRESSURE EDOVAD PRESSURE REDUCING 'S	AFF	ABOVE FINISHED FLOOR	MCF	ONE THOUSAND CUBIC FEET				
AP ACCESS PANEL MFR MANUFACTURER ARCH TECT/ARCHITECTURAL MIN MINIMUM BFF BELOW MISCELLANEOUS BIW BELOW MTR MOTOR BTU BRITISH THERMAL UNITS MU/A MAKE-UP/AIR BTUH BRITISH THERMAL UNITS MU/A MAKE-UP/AIR BTUH BRITISH THERMAL UNITS MU/A MAKE-UP/AIR CAPACITY NC NORMALLY CLOSED CB CATCH BASIN NIC NOTIN CONTRACT CG CLEAN OUT NTS NOT NO SCREAL CG CLEAN OUT NTS NOT TO SCALE CW COLD WATER O OXYGEN D DEGREE O/A OUTSIDE AIR DA DAMETER PD PRESSURE ROP DN DOWN PIV POST INDICATOR VALL DW DISTILLED WATER PIBG PLUMBING EA EACH PRESS PRESSURE ROP DN DOWN DISTILLED WATER PISG POUNDS PER SQUARE EQUIP EQUIPMENT PSIG POUNDS PER SQUARE EQUIP EQUIPMENT EVC ELECTRICAL PSI POUNDS PER SQUARE EVT ENTERING WATER TEMPERATUR	AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	MD	MOTORIZED DAMPER				
ARCHARCHITECT/ARCHITECTURALMINMINIMUMBFBELOWFLOORMISCMISCLLANEOUSBIWBELOWMUNSHED FLOORMITRMOTORBTUBRITISH THERMAL UNITS PER HOURNCNOISE CEITERIACAPCAPACITYNCNORMALLY CLOSEDCBCATCH BASINNICNOTIN CONTRACTCCMCUBC FEET PER MINUTENONUMBERCLGCEILINGNONORMALLY OPENCGCILING FEET PER MINUTENONO MORMALLY OPENCGCUD WATEROOXYGENDDEGREEO/AOUTSIDE AIRDDEGREEO/AOUTSIDE AIRDDIAMETERPIDPRESSURE DROPDNDOWNPIVPOST INDICATOR VALLDWDISTILED WATERPIBGPULMBINGEATEACHPRESSPRESSURE REDUCING 'EELCELECTRICVATER COOLERPWRPRESSURE REDUCING 'EEUVEELECTRIC WATER COOLERPWRPOWEREVVEELECTRIC WATER COOLERPWRPOWEREVVTENTERING WATER TEMPERATURER/ARETURN AIREVTENTERING AIR TEMPERATURER/ARETURN AIREVTENTERING WATER TEMPERATURER/ARETURN AIREVTENTERING WATER TEMPERATURER/ARETURN AIRFOFUECOR CEAN OUTRECRECOT TOS FAILFOFUECOR CEAN OUTRECRECOT TOS FAILFOFUEOR CEAN OUTRECSEGDO <t< td=""><td>ALT</td><td>ALTERNATE</td><td>MECH</td><td>MECHANICAL</td></t<>	ALT	ALTERNATE	MECH	MECHANICAL				
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BLW BELOW MTR MOTOR BTU BRITISH THERMAL UNITS MU/A MAKE-UP/AIR BTUH BRITISH THERMAL UNITS PER HOUR NC NORMALLY CLOSED CAP CAPACITY NC NORMALLY CLOSED CB CATCH BASIN NIC NOT IN CONTRACT CFM CUBIC FEET PER MINUTE NO NO MMALLY OPEN CO CLEAN OUT NTS NOT TO SCALE CW COLD WATER O OXYGEN D DEGREE O/A OUTSIDE AIR DW DOWN PIP PRESSURE DROP DN DOWN PIV POST INDICATOR VALX DW DISTILED WATER PLBG PLUMBING EA EACH PRESSURE REDUCING'S ELEC ELECTRICAL PSI POUNDS PER SQUARE EWC ELECTRICAL PSI POUNDS PER SQUARE EWC ELECTRICAL PSI POUNDS PER SQUARE EWC ELECTRICAL RCO RADIANT CELING AIX EVA	ARCH	ARCHITECT/ARCHITECTURAL	MIN	MINIMUM				
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FDFLOOR DRAINREDREDUCERFDFIRE DAMPERRHRELATIVE HUMIDITYFDVFIRE DEPARTMENT VALVERL/ARELIEF AIRFLFLOORRMROOMFOFUEL OILRPMREVOLUTIONS PER MIDFOVFUEL OILRTMREVOLUTIONS PER MIDFOVFUEL OIL VENTRWRAIN WATERFORFUEL OIL RETURNSFSQUARE FOOTFOSFUEL OIL SUPPLYS/ASUPPLY AIRFPMFEET PER MINUTESANSANITARYFSFLOOR SINKSFSQUARE FOOTFTFOOT/FEETSDSMOKE DAMPERFTRFIN TUBE RADIATIONSMSURFACE MOUNTGALGALLONSPSTANDPIPEGCGENERAL CONTRACTORSPSTATIC PRESSUREGPMGALLONS PER MINUTESTMSTEAMGWGREASE WASTETTHERMOSTATHBHOSE BIBTDTEMPERATURE DROPHPHORSE POWERTDRTRENCH DRAINHTGHEATINGTEMPTEMPERATURE DROPHTRHEATERTYPTYPICALHWHOT WATERUGUNDERGROUNDHYDHYDRANTVACVACUUMIDINDIRECTVVENTININCHVAVVARIBLE AIR VOLUMIININVERTVENTVENT THRUGH ROOFLB/HRPOUNDVTRVENT THRUGH ROOFLB/HRPOUND SPER HOURWWASTELAT <t< td=""><td>F</td><td>DEGREES FAHRENHEIT</td><td>RD</td><td>ROOF DRAIN</td></t<>	F	DEGREES FAHRENHEIT	RD	ROOF DRAIN				
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FORFUEL OIL RETURNSFSQUARE FOOTFOSFUEL OIL SUPPLYS/ASUPPLY AIRFPMFEET PER MINUTESANSANITARYFSFLOOR SINKSFSQUARE FOOTFTFOOT/FEETSDSMOKE DAMPERFTRFIN TUBE RADIATIONSMSURFACE MOUNTGALGALLONSPSTANDPIPEGCGENERAL CONTRACTORSPSTANDPIPEGWGREASE WASTETTHERMOSTATHBHOSE BIBTDTEMPERATURE DROPHPHORSE POWERTDRTRENCH DRAINHTRHEATINGTEMPTEMPERATURE DROPHVHOT WATERUGUNDERGROUNDHYDHYDRANTVACVACUUMIDINDIRECTVVENTININCHVAVVARIABLE AIR VOLUMIINVINVERTVENTVENT THROUGH ROOFLBPOUNDVTRVENT THROUGH ROOFLB/HRPOUNDS PER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	FO	FUEL OIL	RPM	REVOLUTIONS PER MINUTE				
FOSFUEL OIL SUPPLYS/ASUPPLY AIRFPMFEET PER MINUTESANSANITARYFSFLOOR SINKSFSQUARE FOOTFTFOOT/FEETSDSMOKE DAMPERFTRFIN TUBE RADIATIONSMSURFACE MOUNTGALGALLONSPSTANDPIPEGCGENERAL CONTRACTORSPSTATIC PRESSUREGPMGALLONS PER MINUTESTMSTEAMGWGREASE WASTETTHERMOSTATHBHOSE BIBTDTEMPERATURE DROPHPHORSE POWERTDRTRENCH DRAINHTGHEATINGTEMPTEMPERATUREHTRHEATERTYPTYPICALHWHOT WATERUGUNDERGROUNDHYDHYDRANTVACVACUUMIDINDIRECTVVENTININCHVAVVARIABLE AIR VOLUMIINVINVERTVENTVENT THROUGH ROOFLBHRPOUNDVTRVENT THROUGH ROOFLATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	FOV	FUEL OIL VENT	RW	RAIN WATER				
FPMFEET PER MINUTESANSANITARYFSFLOOR SINKSFSQUARE FOOTFTFOOT/FEETSDSMOKE DAMPERFTRFIN TUBE RADIATIONSMSURFACE MOUNTGALGALLONSPSTANDPIPEGCGENERAL CONTRACTORSPSTATIC PRESSUREGPMGALLONS PER MINUTESTMSTEAMGWGREASE WASTETTHERMOSTATHBHOSE BIBTDTEMPERATURE DROPHPHORSE POWERTDRTRENCH DRAINHTGHEATINGTEMPTEMPERATUREHTRHEATERTYPTYPICALHWHOT WATERUGUNDERGROUNDHYDHYDRANTVACVACUUMIDINDIRECTVVENTININCHVAVVARIABLE AIR VOLUMIINVINVERTVENTVENT THROUGH ROOFLB/HRPOUNDVTRVENT THROUGH ROOFLATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	FOR	FUEL OIL RETURN	SF	SQUARE FOOT				
FSFLOOR SINKSFSQUARE FOOTFTFOOT/FEETSDSMOKE DAMPERFTRFIN TUBE RADIATIONSMSURFACE MOUNTGALGALLONSPSTANDPIPEGCGENERAL CONTRACTORSPSTATIC PRESSUREGPMGALLONS PER MINUTESTMSTEAMGWGREASE WASTETTHERMOSTATHBHOSE BIBTDTEMPERATURE DROPHPHORSE POWERTDRTRENCH DRAINHTGHEATINGTEMPTEMPERATUREHTRHEATERTYPTYPICALHWHOT WATERUGUNDERGROUNDHYDHYDRANTVACVACUUMIDINDIRECTVVENTININCHVAVVARIABLE AIR VOLUMIINVINVERTVENTVENT THROUGH ROOFLB/HRPOUNDVTRVENT THROUGH ROOFLATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	FOS	FUEL OIL SUPPLY	S/A	SUPPLY AIR				
FTFOOT/FEETSDSMOKE DAMPERFTRFIN TUBE RADIATIONSMSURFACE MOUNTGALGALLONSPSTANDPIPEGCGENERAL CONTRACTORSPSTATIC PRESSUREGPMGALLONS PER MINUTESTMSTEAMGWGREASE WASTETTHERMOSTATHBHOSE BIBTDTEMPERATURE DROPHPHORSE POWERTDRTRENCH DRAINHTGHEATINGTEMPTEMPERATUREHTRHEATERTYPTYPICALHWHOT WATERUGUNDERGROUNDHYDHYDRANTVACVACUUMIDINDIRECTVVENTININCHVAVVARIABLE AIR VOLUMIINVINVERTVENTVENT THROUGH ROOFLB/HRPOUNDPER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	FPM	FEET PER MINUTE	SAN	SANITARY				
FTRFIN TUBE RADIATIONSMSURFACE MOUNTGALGALLONSPSTANDPIPEGCGENERAL CONTRACTORSPSTATIC PRESSUREGPMGALLONS PER MINUTESTMSTEAMGWGREASE WASTETTHERMOSTATHBHOSE BIBTDTEMPERATURE DROPHPHORSE POWERTDRTRENCH DRAINHTGHEATINGTEMPTEMPERATUREHTRHEATERTYPTYPICALHWHOT WATERUGUNDERGROUNDHVDHYDRANTVACVACUUMIDINDIRECTVVENTININCHVAVVARIABLE AIR VOLUMIINVINVERTVENTVENT THROUGH ROOFLB/HRPOUNDVTRVENT THROUGH ROOFLB/HRPOUNDS PER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	FS	FLOOR SINK	SF					
GALGALLONSPSTANDPIPEGCGENERAL CONTRACTORSPSTATIC PRESSUREGPMGALLONS PER MINUTESTMSTEAMGWGREASE WASTETTHERMOSTATHBHOSE BIBTDTEMPERATURE DROPHPHORSE POWERTDRTRENCH DRAINHTGHEATINGTEMPTEMPERATUREHTRHEATERTYPTYPICALHWHOT WATERUGUNDERGROUNDHYDHYDRANTVACVACUUMIDINDIRECTVVENTININCHVAVVARIABLE AIR VOLUMIINVINVERTVENTVENT THROUGH ROOFLB/HRPOUNDS PER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	FT	FOOT/FEET	SD	SMOKE DAMPER				
GCGENERAL CONTRACTORSPSTATIC PRESSUREGPMGALLONS PER MINUTESTMSTEAMGWGREASE WASTETTHERMOSTATHBHOSE BIBTDTEMPERATURE DROPHPHORSE POWERTDRTRENCH DRAINHTGHEATINGTEMPTEMPERATUREHTRHEATERTYPTYPICALHWHOT WATERUGUNDERGROUNDHYDHYDRANTVACVACUUMIDINDIRECTVVENTININCHVAVVARIABLE AIR VOLUMIINVINVERTVENTVENT THROUGH ROOFLB/HRPOUNDS PER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	FTR	FIN TUBE RADIATION	SM	SURFACE MOUNT				
GPMGALLONS PER MINUTESTMSTEAMGWGREASE WASTETTTHERMOSTATHBHOSE BIBTDTEMPERATURE DROPHPHORSE POWERTDRTRENCH DRAINHTGHEATINGTEMPTEMPERATUREHTRHEATERTYPTYPICALHWHOT WATERUGUNDERGROUNDHYDHYDRANTVACVACUUMIDINDIRECTVVENTININCHVAVVARIABLE AIR VOLUMIINVINVERTVENTVENT THROUGH ROOFLB/HRPOUNDS PER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	GAL	GALLON	SP	STANDPIPE				
GWGREASE WASTETTHERMOSTATHBHOSE BIBTDTEMPERATURE DROPHPHORSE POWERTDRTRENCH DRAINHTGHEATINGTEMPTEMPERATUREHTRHEATERTYPTYPICALHWHOT WATERUGUNDERGROUNDHYDHYDRANTVACVACUUMIDINDIRECTVVENTININCHVAVVARIABLE AIR VOLUMIINVINVERTVENTVENT THROUGH ROOFLB/HRPOUNDS PER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	GC	GENERAL CONTRACTOR	SP	STATIC PRESSURE				
HBHOSE BIBTDTEMPERATURE DROPHPHORSE POWERTDRTRENCH DRAINHTGHEATINGTEMPTEMPERATUREHTRHEATERTYPTYPICALHWHOT WATERUGUNDERGROUNDHYDHYDRANTVACVACUUMIDINDIRECTVVENTININCHVAVVARIABLE AIR VOLUMIINVINVERTVENTVENTILATIONLBPOUNDVTRVENT THROUGH ROOFLB/HRPOUNDS PER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	GPM	GALLONS PER MINUTE	STM	STEAM				
HPHORSE POWERTDRTRENCH DRAINHTGHEATINGTEMPTEMPERATUREHTRHEATERTYPTYPICALHWHOT WATERUGUNDERGROUNDHYDHYDRANTVACVACUUMIDINDIRECTVVENTININCHVAVVARIABLE AIR VOLUMIINVINVERTVENTVENTILATIONLBPOUNDVTRVENT THROUGH ROOFLB/HRPOUNDS PER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	GW	GREASE WASTE	Т	THERMOSTAT				
HTGHEATINGTEMPTEMPERATUREHTRHEATERTYPTYPICALHWHOT WATERUGUNDERGROUNDHYDHYDRANTVACVACUUMIDINDIRECTVVENTININCHVAVVARIABLE AIR VOLUMIINVINVERTVENTVENTLBPOUNDVTRVENT THROUGH ROOFLB/HRPOUNDS PER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	HB	HOSE BIB	TD	TEMPERATURE DROP				
HTRHEATERTYPTYPICALHWHOT WATERUGUNDERGROUNDHYDHYDRANTVACVACUUMIDINDIRECTVVENTININCHVAVVARIABLE AIR VOLUMIINVINVERTVENTVENTLBPOUNDVTRVENT THROUGH ROOFLB/HRPOUNDS PER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	HP	HORSE POWER	TDR	TRENCH DRAIN				
HWHOT WATERUGUNDERGROUNDHYDHYDRANTVACVACUUMIDINDIRECTVVENTININCHVAVVARIABLE AIR VOLUMIINVINVERTVENTVENTLBPOUNDVTRVENT THROUGH ROOFLB/HRPOUNDS PER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	HTG	HEATING	TEMP	TEMPERATURE				
HYDHYDRANTVACVACUUMIDINDIRECTVVENTININCHVAVVARIABLE AIR VOLUMEINVINVERTVENTVENTILATIONLBPOUNDVTRVENT THROUGH ROOFLB/HRPOUNDS PER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	HTR	HEATER	TYP	TYPICAL				
IDINDIRECTVVENTININCHVAVVARIABLE AIR VOLUMEINVINVERTVENTVENTILATIONLBPOUNDVTRVENT THROUGH ROOFLB/HRPOUNDS PER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	HW	HOT WATER	UG	UNDERGROUND				
ININCHVAVVARIABLE AIR VOLUMIINVINVERTVENTVENTILATIONLBPOUNDVTRVENT THROUGH ROOFLB/HRPOUNDS PER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	HYD	HYDRANT	VAC	VACUUM				
INVINVERTVENTVENTILATIONLBPOUNDVTRVENT THROUGH ROOFLB/HRPOUNDS PER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	ID	INDIRECT	V	VENT				
LBPOUNDVTRVENT THROUGH ROOFLB/HRPOUNDS PER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	IN	INCH	VAV	VARIABLE AIR VOLUME				
LB/HRPOUNDS PER HOURWWASTELATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	INV	INVERT	VENT	VENTILATION				
LATLEAVING AIR TEMPERATUREWBWET BULBLPLOW PRESSUREWCOWALL CLEAN OUT	LB	POUND	VTR	VENT THROUGH ROOF				
LP LOW PRESSURE WCO WALL CLEAN OUT	LB/HR	POUNDS PER HOUR	W	WASTE				
	LAT	LEAVING AIR TEMPERATURE	WB	WET BULB				
	LP	LOW PRESSURE	WCO	WALL CLEAN OUT				
	LPG	LIQUEFIED PETROLEUM GAS	WH	WALL HYDRANT				

ADA AND LEGAL DISCLAIMER: This document is intended to comply with the requirements of the Americans with Disabilities Act (ADA). However architects and engineers are not licensed to interpret laws or give advice concerning laws. The owner should have this document reviewed by his attorney to determine if it complies with

	MECHANICAL DUCT SYMBOLS
ER	SYMBOL DESCRIPTION
	16x8 SQUARE DUCT SIZE TAG (WIDTH x HEIGHT)
ATOR	0VAL DUCT SIZE TAG (WIDTH / HEIGHT)
	16"Ø ROUND DUCT SIZE TAG (DIAMETER)
TOR	(E) EXISTING DUCT TAG
P	S/A SUPPLY AIR
	O/A OUTDOOR AIR
	R/A RETURN AIR
	E/A EXHAUST AIR
	SUPPLY AIR DIFFUSER (4-WAY)
	RETURN AIR GRILLE
	RETURN AIR GRILLE WITH SOUND BOOT
TURE	EXHAUST AIR GRILLE
HOUR	POINT OF EXISTING TO NEW CONNECTION
ET	POINT OF EXISTING TO NEW CONNECTION POINT OF DISCONNECT TO EXISTING CONNECTION
	M C MECHANICAL CONTRACTOR
	F.C.
	N.I.C. NOT IN CONTRACT
	(EX) EXISTING
	AFF ABOVE FINISHED FLOOR
	DOWN DOWN
	UP UP
/E	X SECTION CUT REFERRING DETAIL NUMBER REFERRING SHEET NUMBER
H H GAUGE	MECHANICAL ACCESSORIES SYMBOL LEGEND SYMBOL DESCRIPTION ROUND DUCT MOUNTED SMOKE DETECTOR. FURNISHED AND CONNECTED BY ELECTRICAL
	CONTRACTOR, INSTALLED BY MECHANICAL CONTRACTOR. CUTTING OF DUCT, INSTALLATION OF DETECTOR. AND DETERMINATION OF SAMPLING TUBE LENGTH SHALL BE THE MECHANICAL CONTRACTOR. PROVIDE REMOTE INDICATING LIGHT WITH EACH DETECTOR. RECTANGULAR DUCT MOUNTED DUCT DETECTOR. FURNISHED AND CONNECTED BY ELECTRIC CONTRACTOR, INSTALLED BY MECHANICAL CONTRACTOR. CUTTING OF DUCT, INSTALLATION
E	CONTRACTOR, INSTALLED BY MECHANICAL CONTRACTOR. COTTING OF DUCT, INSTALLATION OF DETECTOR. AND DETERMINATION OF SAMPLING TUBE LENGTH SHALL BE THE MECHANICAL CONTRACTOR. PROVIDE REMOTE INDICATING LIGHT WITH EACH DETECTOR. RECTANGULAR DUCT MOUNTED MOTOR OPERATED DAMPER, INTERLOCK WITH FAN AS
	INDICATED. (DAMPER BY M.C.) UNDERCUT DOOR (BY G.C.)
	MECHANICAL PIPING SYSTEMS LEGEND
	CONDENSATE DRAINAGE
	REFRIGERANT
	R

	ENERGY	CON	ISERV	AROLIN ATION (MECHANICAL SU	COD		
C401 METHOD C							
	CHAPTER 4			COMCHECK PRO			
	1-2013 PRESCRIPTIVI	E		COMCHECK PRO			
	1-2013 PERFORMAN			ENERGY MODEL			
	NG LIGHTING, HVAC	-					
	AL EFFICIENCY PACK						
				C406.5 ON-SITE	RENEWA		
	UCED LTG DENSITY			C406.6 DEDICATI			
C406.4 ENH	ANCED LTG CONTRO	OLS		C406.7 SERVICE			
C301 CLIMATE Z							
	TT COUNTY, NORTH	CAROLINA					
DESIGN	CONDITIONS						
	DR (ASHRAE 90.1-201	3 TABLE D-1)	10º F			
su	nter dry bulb mmer dry bulb			18° F. 91° F.			
	mmer wet bulb			74° F.			
	DR (2018 NCECC SECT nter dry bulb	FION C302.1)	72° F.			
	mmer dry bulb			72°F.			
C403.2 HEATING	G & COOLING LOADS	AND EQUIF	PMENT & SY	STEM SIZING			
BUILDING H	HEATING LOAD		2	63,900 BTUH (pe	eak)		
BUILDING C	COOLING LOAD		2	17,800 BTUH (pe	ak)		
	HEATING CAPACITY		2	30,290 BTUH			
	COOLING CAPACITY			64,540 BTUH			
C402 2 2 8 C406	5.2 - REQUIRED & ING						
SYSTEM DESCR							
	I HVAC EQUIP EFFIC	IENCY COM	PLIANCE - T	ABLE C403.2.3			
	D HVAC EQUIP EFFI		IPLIANCE -	10% OVER TABLE	C403.2.		
EQUIP TYPE	SIZE CATEGORY (BTUH)	SUBCA	TEGORY	C403.2.3 MINIMUM EFFICIENCY (a	лі ((
TABLE C403.2.3	(2) - ELECTRICALLY (OPERATED L	INITARY AN	D APPLIED HEAT	PUMPS		
AIR COOLED COOL MODE	< 65,000 (<= 5 TONS)		/STEM & PACKAGE	14.0 SEER	15		
C403.2.4 THRU (HVAC SYS		ERGY RECOV	ERY, DUCT	AND PLENUM IN			
	SYSTEM DESIGN ANI			LIION.			
	SINSTALLED ON THE						
FANS ABO	OVE 5 HP MEET THE	CFM LIMITA	TIONS SHO	WN BELOW:			
OPTION 1 - FAN	N SYSTEM MOTOR N	AMEPLATE I	HP - TABLE (2403.2.12.1(1)			
ALLOWABLE NAMEPLATE MOTOR HP		ΛE	V	RIABLE DLUME IIMUM CFM			
7.5	6,818 CF	M	5,0	000 CFM			
10	9,091 CF			667 CFM			
15 20	13,636 CI 18,182 CF			0,000 CFM 3,333 CFM			
25	22,727 C			567 CFM			
30	27,272 C			000 CFM			
40	36,364 C	FIVI	26,	667 CFM			

C405.8 - ELECTRICAL MOTORS (MANDATORY REQUIREMENTS).

45,455 CFM

ELECTRICAL MOTORS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMNTS PER C405.8, EXCEPT WHERE EXEMPT.

33,333 CFM

NOT APPLICABLE.

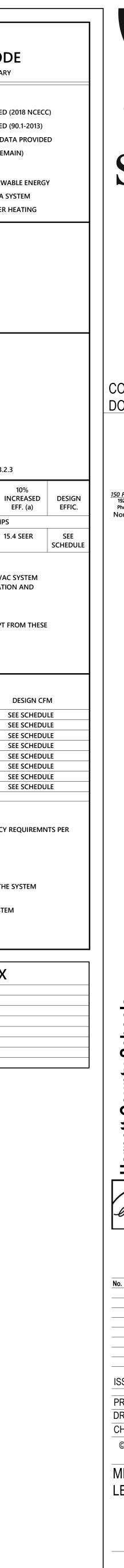
50

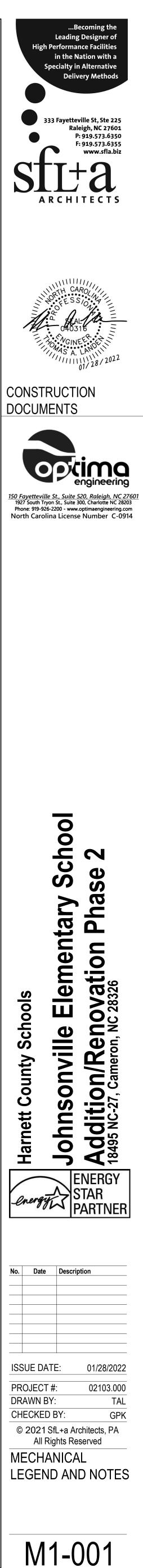
C408 - SYSTEM COMMISSIONING

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

PROJECT AREA IS GREATER THAN 10,000 SQUARE FEET AND REQUIRES SYSTEM COMMISSIONING PER SECTION C408.

	MECHANICAL SHEET INDEX
SHEET NUMBER	SHEET NAME
M1-001	MECHANICAL LEGEND AND NOTES
M1-002	MECHANICAL SCHEDULES
M1-003	MECHANICAL CONTROLS SEQUENCE OF OPERATION
M1-101	MECHANICAL DEMOLITION PLAN
M1-102	FIRST FLOOR MECHANICAL PLAN - NEW WORK
M1-103	MECHANICAL LOFT MECHANICAL PLAN - NEW WORK
M1-501	MECHANICAL DETAILS





Sheet No. 1 of 7

OPTIMA # 21-0266R

								IN	IDOO	R UN	IT SC	HEDU	LE																HEA1	⁻ PUN	1P SC	HED	ULE (AIF	R CC	OLED)				
					COOLIN	G CAPACITY	HEATING		ELECT	TRIC HEAT		FAN		ELECRIC	AL DATA									COOL	ING COIL	EFFICIEN	CY	HEATNG	EFFIC	ENCY	COMPR	ESSOR	FAN	ELEC	FRICAL DATA				
		NOMINAL	-				CAPACITY					MOTOR								REFRIGERANT	MATCHING		NOMINAL					CAPACITY									MANUFACTURE	R	
SYMBOL	CFM	TONNAGE	O.A. CFM	E.S.P.	TC (BTUH)	SHC (BTUH)	(BTUH)	KW	STAGES	VOLTAGE	PH	FLA	MCA	MOCP	VOLTAGE	PH	MANUFACTURER	MODEL	WEIGHT	TYPE	OUTDOOR UNIT	SYMBOL	TONNAGE	TC (BTUH)	SHC (BTUH) EER S	EER	(BTUH)	COP	HSPF	LRA	RLA	FLA MCA	FUS	E VOLTAGE	PH REFRIG. TYPE	TRANE MODEL	. WEIGHT	MATCHIN
IDU-1	1,200	3.0	205	0.4 in-wg	37,800	28,200	34,800	14.4	1	480	3	0.6	23.8	25.0	480 V	3	TRANE	TAM9A0C36	146 lb	R-410A	HP-1	HP-1	3.0	37,800	28,200	13	17.0	34,800	3.9	9.5	38.0	5.7	0.6 8.0	15.	0 480 V	3 R-410A	4TWA7036A4	257 lb	
IDU-2	1,200	3.0	215	0.4 in-wg	37,800	28,200	34,800	14.4	1	480	3	0.6	23.8	25.0	480 V	3	TRANE	TAM9A0C36	146 lb	R-410A	HP-2	HP-2	3.0	37,800	28,200	13	17.0	34,800	3.9	9.5	38.0	5.7	0.6 8.0	15.) 480 V	3 R-410A	4TWA7036A4	257 lb	
IDU-3	1,200	3.0	215	0.4 in-wg	37,800	28,200	34,800	14.4	1	480	3	0.6	23.8	25.0	480 V	3	TRANE	TAM9A0C36	146 lb	R-410A	HP-3	HP-3	3.0	37,800	28,200	13	17.0	34,800	3.9	9.5	38.0	5.7	0.6 8.0	15.) 480 V	3 R-410A	4TWA7036A4	257 lb	
IDU-4	1,500	4.0	270	0.4 in-wg	47,500	36,200	46,500	14.4	1	480	3	0.9	24.8	25.0	480 V	3	TRANE	TAM9A0C48	174 lb	R-410A	HP-4	HP-4	4.0	47,500	36,200	13	17.0	46,500	4.1	10	41.0	6.4	0.6 9.0	15.) 480 V	3 R-410A	4TWA7048A4	286 lb	
IDU-5	1,200	3.0	215	0.4 in-wg	37,800	28,200	34,800	14.4	1	480	3	0.6	23.8	25.0	480 V	3	TRANE	TAM9A0C36	146 lb	R-410A	HP-5	HP-5	3.0	37,800	28,200	13	17.0	34,800	3.9	9.5	38.0	5.7	0.6 8.0	15.) 480 V	3 R-410A	4TWA7036A4	257 lb	
IDU-6	1,500	4.0	270	0.4 in-wg	47,500	36,200	46,500	14.4	1	480	3	0.9	24.8	25.0	480 V	3	TRANE	TAM9A0C48	174 lb	R-410A	HP-6	HP-6	4.0	47,500	36,200	13	17.0	46,500	4.1	10	41.0	6.4	0.6 9.0	15.) 480 V	3 R-410A	4TWA7048A4	286 lb	
IDU-7	1,200	3.0	215	0.4 in-wg	37,800	28,200	34,800	14.4	1	480	3	0.6	23.8	25.0	480 V	3	TRANE	TAM9A0C36	146 lb	R-410A	HP-7	HP-7	3.0	37,800	28,200	13	17.0	34,800	3.9	9.5	38.0	5.7	0.6 8.0	15.) 480 V	3 R-410A	4TWA7036A4	257 lb	
IDU-8	1,200	3.0	215	0.4 in-wg	37,800	28,200	34,800	14.4	1	480	3	0.6	23.8	25.0	480 V	3	TRANE	TAM9A0C36	146 lb	R-410A	HP-8	HP-8	3.0	37,800	28,200	13	17.0	34,800	3.9	9.5	38.0	5.7	0.6 8.0	15.) 480 V	3 R-410A	4TWA7036A4	257 lb	
IDU-9	1,200	3.0	210	0.4 in-wg	37,800	28,200	34,800	14.4	1	480	3	0.6	23.8	25.0	480 V	3	TRANE	TAM9A0C36	146 lb	R-410A	HP-9	HP-9	3.0	37,800	28,200	13	17.0	34,800	3.9	9.5	38.0	5.7	0.6 8.0	15.) 480 V	3 R-410A	4TWA7036A4	257 lb	
IDU-10	1,200	3.0	210	0.4 in-wg	37,800	28,200	34,800	14.4	1	480	3	0.6	23.8	25.0	480 V	3	TRANE	TAM9A0C36	146 lb	R-410A	HP-10	HP-10	3.0	37,800	28,200	13	17.0	34,800	3.9	9.5	38.0	5.7	0.6 8.0	15.) 480 V	3 R-410A	4TWA7036A4	257 lb	I
IDU-11	1,000	2.5	140	0.4 in-wg	29,600	22,800	28,800	7.2	1	208	1	3.5	48.0	50.0	208 V	1	TRANE	TAM9A0B30	138 lb	R-410A	HP-11	HP-11	2.5	28,600	22,500	13	16.0	27,800	3.8	9	67.8	12.8	0.7 17.0	25.	0 208 V	1 R-410A	4TWR6030H	198 lb	I
IDU-12	1,200	3.0	120	0.4 in-wa	37.800	28,200	34.800	14.4	1	480	3	0.6	23.8	25.0	480 V	3	TRANE	TAM9A0C36	146 lb	R-410A	HP-12	HP-12	3.0	37,800	28,200	13	17.0	34.800	3.9	9.5	38.0	5.7	0.6 8.0	15.) 480 V	3 R-410A	4TWA7036A4		

NOTES:

COOLING CAPACITY BASED ON 80°/67° ENTERING AIR.

2. PROVIDE UNITS WITH: ELECTRONIC 7-DAY PROGRAMMABLE THERMOSTAT, 1" THICK DISPOSABLE FILTER (MERV 8 MINIMUM), FIELD INSTALLED HEATER, U.L. LABEL, SINGLE POINT ELECTRICAL CONNECTION, 1-INCH INSULATION. . SEQUENCE OF OPERATION: UNIT SHALL BE CONTROLLED BY ITS ELECTRONIC 7-DAY PROGRAMMABLE THERMOSTAT. UNIT SUPPLY FAN SHALL RUN CONTINUOUSLY IN THE OCCUPIED MODE, CYCLE WITH HEATING AND COOLING WHILE UNOCCUPIED. UPON A RISE IN SPACE TEMPERATURE, UNIT COMPRESSOR AND CONDENSER FAN SHALL ACTIVATE TO SATISFY SPACE. UPON A DROP IN SPACE TEMPERATURE, UNIT COMPRESSOR SHALL ACTIVATE IN REVERSE CYCLE FOR HEATING. UPON A FURTHER DROP IN SPACE TEMPERATURE, ELECTRIC HEAT SHALL BE ENERGIZED TO SATISFY SPACE TEMPERATURE. THERMOSTATS SHALL PROVIDE A DEADBAND OF 5°, WITHIN WHICH THE SUPPLY OF HEATING OR COOLING ENERGY TO THE ZONE CAN BE REDUCED TO THE MINIMUM. OCCUPANCY SCHEDULES SHALL BE SET TO OCCUPIED MONDAY THRU FRIDAY, 7 AM TO 7 PM, UNOCCUPIED NIGHTS AND WEEKENDS. THERMOSTATS SHALL BE SET FOR OCCUPIED COOLING 75°, OCCUPIED HEATING 70°, UNOCCUPIED COOLING 85°, UNOCCUPIED HEATING 55°. ALL TIME AND TEMPERATURE SETPOINTS SHALL BE VERIFIED BY THE OWNER PRIOR TO PROGRAMMING. THERMOSTATS SHALL BE PROGRAMMED BY MECHANICAL CONTRACTOR IN THE PRESENCE OF OWNER'S REPRESENTATIVE PRIOR TO PROJECT COMPLETION. PROVIDE EACH UNIT WITH A IONIZATION TYPE SMOKE DETECTOR, INSTALLED IN THE RETURN DUCT WIRED TO SHUT DOWN THE UNIT UPON ACTIVATION. SMOKE DETECTOR SHALL BE SUPPLIED, WIRED FOR INTERFACE WITH FIRE ALARM SYSTEM AND UNIT SHUTDOWN BY THE ELECTRICAL CONTRACTOR. SMOKE DETECTOR SHALL BE INSTALLED IN THE RETURN DUCT BY THE MECHANICAL CONTRACTOR.

DOAS INDOOR UNIT SCHEDUL	E							ενμλιιςτ ελ	N SCHEDULE		
COOLING CAPACITY HEATING REHEAT ELECTRIC HEAT EL								APPROX.		ELECTRICAL DATA	
SYMBOL CFM O.A. CFM E.S.P. TC (BTUH) SHC (BTUH) CAPACITY (BTUH) CAPACITY (BTUH) CAPACITY (BTUH) KW STAGES FLA VOLTAGE PH FLA MCA DOAS-1 1,400 1400 1.00 in-wg 117,550 61,560 98,800 28,000 30.0 4 36.1 460 3 37.7 47.0 DOAS-2 1,100 1100 in-wg 86,450 45,860 67,200 19,000 22.5 3 27.1 460 3 28.7 36.0	50.0 460 V 3 AAO	DN V3-BRB-3-0-162C-5T4 702	lb R-410A CU	UNIT F-1 F-2	LOCATION UTILITY 318 UTILITY 318		DEL NO.TYPEQ-120INLINEA1050CEILING	CFM ESP 1050 1.00 800 0.25	DIRECT 1050	ATTS HP VOLTAGE PH 1127 0.50 hp 115 V 1 438 0.00 hp 115 V 1	ACCESSORIES A,B,F,G A,B,F,G
NOTES: 1. COOLING CAPACITY BASED ON 95°/78° ENTERING AIR. 2. PROVIDE UNITS WITH: 1" THICK DISPOSABLE FILTER (MERV 8 MINIMUM), U.L. LABEL, SINGLE POINT ELECTRICAL CONNECTION, 1-INCH INSULATION. 3. SEQUENCE OF OPERATION: UNIT SHALL BE CONTROLLED BY BAS ON OCCUPIED/UNOCCUPIED BUILDING SCHEDULE. UPON A RISE IN SPACE TEMPERATURE, UNIT COMPRESSOR AN TEMPERATURE, UNIT COMPRESSOR SHALL ACTIVATE IN REVERSE CYCLE FOR HEATING. UPON A FURTHER DROP IN SPACE TEMPERATURE, ELECTRIC HEAT SHALL BE ENERGIZED TO WHICH THE SUPPLY OF HEATING OR COOLING ENERGY TO THE ZONE CAN BE REDUCED TO THE MINIMUM. OCCUPANCY SCHEDULES SHALL BE SET TO OCCUPIED MONDAY THRU FOR OCCUPIED COOLING 75°, OCCUPIED HEATING 70°, UNOCCUPIED COOLING 85°, UNOCCUPIED HEATING 55°. ALL TIME AND TEMPERATURE SETPOINTS SHALL BE VERIFIED BY TH MECHANICAL CONTRACTOR IN THE PRESENCE OF OWNER'S REPRESENTATIVE PRIOR TO PROJECT COMPLETION.	EXHAUST FA A. DISCO B. GRAV C. MOTO D. PREFA E. BIRDS F. ACOU G. HANG H. WL, W I. RCC C RJ RC J. WALL	FAN SCHEDULE ACCESSORIES: CONNECT SWITCH WITY BACKDRAFT DAMPER TORIZED BACKDRAFT DAMPER FAB, ROOF CURB DSCREEN OUSTICAL LINING NGING BRACKETS WITH VIBRAT WALL LOUVER DISCHARGE COR GRS ROOF CAP (FLAT ROO ROOF CAP (PITCHED ROOF) LL MOUNTING COLLAR ET GAURD	M. N. P. Q. R. NTION ISOLATION S. T. OF) OR U.	2" WASHABLE ALUMIN MOTORSIDE FAN GUA EXHAUST GRILLE U.L. 762 VENTED ROOF CURB E COMBINATION KITCHI INTERLOCK WITH FUM PROVIDE DRAIN PLUG ROOF SUPPORT RAILS HINGED BRACKET KIT	RD EXTENSION EN HOOD FAN CURB IE HOOD	 INTERLOCK W SERVED BY FA WALL MOUNT WALL MOUNT CONTROLLED CONTROLLED CONTROLLED COMMAND RO CONTROL FAN 	ED THERMOSTAT (REVERSE ACTING TH ROOM LIGHT SWITCH (FAN SHA N) ED ON/OFF SWITCH WITH IDENTIFIC ED MUSHROOM PUSH BUTTON SWI BY BUILDING AUTOMATION SYSTEM OPERATION BY THE FACP AND FIREMAN'S MAN DOM. NO MECHANICAL CONTROL F	LL OPERATE WHEN LIGHT IS ON CATION LABEL ITCH/STARTER WITH IDENTIFIC/ / UAL OVER-RIDE CONTROL PAN			
COOLING COIL HEATNG CAPACITY EFFICIENCY COMPRESSOR SYMBOL TC (BTUH) SHC (BTUH) (BTUH) EER COP QTY RLA-1 RL CU-1 117,550 61,560 98,800 9.9 2.44 2 9.7 14 CU-2 86,450 45,860 67,200 11.6 2.82 2 7.8 64	I. ALL FAUST	FAN SCHEDULE NOTES:	ET SONE LEVEL. ONE MANUFACTURER UNL LL PROVIDE MAGNETIC STA	LESS NOTED OTHERWIS ARTER WITH AUXILIARY	E.		BOVE, OR ADJACENT TO OCCUPIED	O SPACES			
 COOLING CAPACITY @ 95 AMBIENT. ALL UNITS SHALL BE U.L. LISTED AND HAVE A MINIMUM SEER OF 13. HEAT PUMP SUPPLEMENTARY ELECTRIC RESISTANCE HEAT SHALL BE PROVIDED WITH CONTRO HEAT SHALL BE ALLOWED TO OPERATE DURING HEAT PUMP DEFROST CYCLE. SUPPLEMENTAL INDOOR TEMPERATURE SETPOINT IS INCREASED. MOUNT UNITS ON A 4" THICK CONCRETE PAD AND PROVIDE MANUFACTURER'S RECOMMEND 5. PROVIDE UNITS WITH CONDENSER COIL HAIL GUARDS AND LOW AMBIENT CONTROLS. FOR REFRIGERANT LINE APPLICATIONS WITH A TOTAL EQUIVALENT LENGTH BETWEEN 50'-0" A THE FOLLOWING ACCESSORIES SHALL BE PROVIDED; -COMPRESSOR CRANKCASE HEATER -FOR HORIZONTAL CONFIGURATION: PROVIDE LIQUID LINE SOLENOID WITHIN 2'-0" OUTD FLOW ARROW POINTING TOWARD OUTDOOR UNIT. VAPOR LINE SHOULD SLOPE TOWAR -MECHANICAL CONTRACTOR & UNIT MANUFACTURER ARE TO REVIEW INSTALLATION, AN RECOMMENDATIONS FOR LONG REFRIGERANT LINE APPLICATIONS (AS DEFINED BY UNIT 	ELECTRIC HEAT SHALL BE LOCKED OUT WHEN T DED CLEARANCES AROUND UNITS. AND 175'-0". DOOR UNIT WITH RD INDOOR UNIT. ID FOLLOW MANUFACTURER'S					IDU-1 1.5 14 DU-2 1.5 14 ID MANU	EER SEER COP 4.4 24.6 2.47 4.4 24.6 2.47	SUMMER WIN AMBIENT AME HSPF DBT D 11 95.0 °F 0.0 11 95.0 °F 0.0	ITER ELECTRICAL IENT MCA MOCP V 0°F 11.0 28.0 0°F 11.0 28.0	OLTAGE PH REFRIG. TYPE 208 V 1 R410A 208 V 1 R410A ONTT SCHEDULE COOLING CAPACI I NOMINAL TOTAL (BTUH) I 1.5 ton 18000	MANUFACTURER MODE MITSUBISHI PUZ-A18M MITSUBISHI PUZ-A18M
	C. C. C. SOSCALI DE AL SAMELY AND YOUR AND YO						L. LISTED AND HAVE A ARE BASED ON 95° AMI ARE BASED ON 17°F AM IIT ON EQUIPMENT SUP IRER'S RECOMMENDED MANUFACTURER'S LOW ANUFACTURER'S LOW AND INTEGRAL MAN ERED BY THE CONDENS NIT WITH 6 YEAR EXTEN RIGERANT PIPING PER I DESCRI LOUVERED FA LOUVERED FA DESCRI LOUVERED FA PERFORATE DESCRI LOUVERED FA DESCRI LOUVERED FA DI LOUVERED FA DI LOCATION DESCRI DESCRI ENAMEL FINISH, COLOI BIRDSCREEN. DAMPER AS NOTED IN S DI DEP INSULATED PLEI TYPE REQUIRED FOR M	MINIMUM SEER OF 15. BIENT, 80° ENTERING AIR PORT RAILS. CLEARANCES AROUND O V AMBIENT CONTROLS FO IUFACTURER NON-LOCKIN ING UNIT. NDED COMPRESSOR WARI MANUFACTURER'S RECOM COMPRESSOR WARI MANUFACTURER'S RECOM ACE DIFFUSER ACE DIFFUSER D DIF	DRY BULB, 67° ENTERING AIR R. UTDOOR UNIT. R OPERATION DOWN TO 0°F, IG DISCONNECT SWITCH FOR RANTY. MENDATIONS. EGGISTERS ANI MANUF. MODEL TITUS TDC TITUS TDC TITUS TDC TITUS PAR TITUS PAR TITUS 4FL PRICE 4FL TITUS TDC ITITUS TDC TITUS TDC TITUS DAR TITUS PAR TITUS 4FL PRICE 4FL TITUS TDC BE FURNISHED WITH AN EN SUITABLE FOR THE TYPE OF II BE FURNISHED WITH INTEGRAL AVE DAMPER BLADES ADJUS DULLE - MECH FREE AREA VELOCITY PD 547 FPM 0.02 in-w 560 FPM 0.02 in-w 560 FPM 0.02 in-w	WET BULB. AIRFLOWS INDICATED A INVERTER, 120V INTEGRAL CONDEN INDOOR UNIT. DIFFUSERS SCH MATERIAL SIZE SIZE STEEL 24x24 6 STEEL 24x24 6 STEEL 24x24 10 STEEL 24x24 16 STEEL 24x24 16 STEEL 24x24 12 ALUMINUM 12x12 6 STEEL 12x12 6 AMEL BRIGHT WHITE FINISH UNLESS ISTALLATION REQUIRED. PS. ALL LINEAR DIFFUSERS IN HARE AIRFLOW PATTERN ADJUSTMENT E TED TO PROVIDE AIRFLOW PATTERI RWISE ON PLANS. MONE 42" NONE 30" NONE 30" NONE 30" NONE 30" NONE 30"	ARE AT 'HIGH' SPEED (DRY ARE AT 'HIGH' SPEED (
						SYMB EWH <u>NO</u>	H-1 UTILITY 318 DTES: 1. 1. HEATING CAPAC 2. SEE PLANS FOR T	175 13800 CITY BASED ON 65° F E.A.T. TYPE OF THERMOSTAT REG UT THERMOSTAT INDICAT	4.0 600 QUIRED (WALL MOUNTED OR	H.P. VOLT PH (N	MARKEL) ACCE

NOTES:

1. COOLING CAPACITY @ 95 AMBIENT.

THE FOLLOWING ACCESSORIES SHALL BE PROVIDED;

					RECOM	MMENDA
		DOAS INDOOR	UNIT SCHEDULE			
HEATING	REHEAT	ELECTRIC HEAT	ELECTRICAL DATA			

ADA and other laws.

DOAS INDOOR UNIT SCHEDULE	EXHAUST FAN SCHEDULE
HEATING REHEAT ELECTRIC HEAT ELECTRICAL DATA	APPROX. ELECTRICAL DATA
CAPACITY (BTUH) CAPACITY (BTUH) KW STAGES FLA VOLTAGE MCA MOCP VOLTAGE PH MANUFACTURER MODEL REFRIGERANT MATCHING TYPE OUTDOOR UNIT 98,800 28,000 30.0 4 36.1 460 3 37.7 47.0 50.0 460 V 3 AAON V3-BRB-3-0-162C-5T4 702 lb R-410A CU-1	SYMBOL LOCATION MANUFACTURER MODEL NO. TYPE CFM ESP DRIVE TYPE FAN RPM WATTS HP VOLTAGE PH ACCESSORIES F-1 UTILITY 318 GREENHECK SQ-120 INLINE 1050 1.00 DIRECT 1050 1127 0.50 hp 115 V 1 A,B,F,G
50,000 22,000 30.0 4 30.1 400 3 31.0 41.0 30.0 400 V 3 AAON V35BR5-0-102C-514 702 lb R-410A CO-1 67,200 19,000 22.5 3 27.1 460 3 28.7 36.0 40.0 460 V 3 AAON V3-BRB-3-0-162C-554 702 lb R-410A CU-2	F-2 UTILITY 318 GREENHECK SP-A1050 CEILING 800 0.25 DIRECT 1138 438 0.00 hp 115 V 1 A,B,F,G
U.L. LABEL, SINGLE POINT ELECTRICAL CONNECTION, 1-INCH INSULATION. IPIED/UNOCCUPIED BUILDING SCHEDULE. UPON A RISE IN SPACE TEMPERATURE, UNIT COMPRESSOR AND CONDENSER FAN SHALL ACTIVATE TO SATISFY SPACE. UPON A DROP IN SPACE IPIED/UNOCCUPIED BUILDING SCHEDULE. UPON A RISE IN SPACE TEMPERATURE, UNIT COMPRESSOR AND CONDENSER FAN SHALL ACTIVATE TO SATISFY SPACE. UPON A DROP IN SPACE IPIED/UNOCCUPIED NOT A FURTHER DROP IN SPACE TEMPERATURE, ELECTRIC HEAT SHALL BE ENERGIZED TO SATISFY SPACE TEMPERATURE. THERMOSTATS SHALL PROVIDE A DEADBAND OF 5°, WITHIN BE REDUCED TO THE MINIMUM. OCCUPANCY SCHEDULES SHALL BE SET TO OCCUPIED MONDAY THRU FRIDAY, 7 AM TO 7 PM, UNOCCUPIED NIGHTS AND WEEKENDS. THERMOSTATS SHALL BE SET LING 85°, UNOCCUPIED HEATING 55°. ALL TIME AND TEMPERATURE SETPOINTS SHALL BE VERIFIED BY THE OWNER PRIOR TO PROGRAMMING. THERMOSTATS SHALL BE PROGRAMMED BY IVE PRIOR TO PROJECT COMPLETION.	EXHAUST FAN SCHEDULE ACCESSORIES: EXHAUST FAN SCHEDULE CONTROLS: A. DISCONNECT SWITCH M. 2" WASHABLE ALUMINUM FILTERS B. GRAVITY BACKDRAFT DAMPER N. MOTORSIDE FAN GUARD C. MOTORIZED BACKDRAFT DAMPER O. EXHAUST GRILLE D. PREFAB, ROOF CURB P. U.L. 762 E. BIRDSCREEN Q. VENTED ROOF CURB EXTENSION F. ACOUSTICAL LINING R. COMBINATION KITCHEN HOOD FAN CURB G. HANGING BRACKETS WITH VIBRATION ISOLATION S. INTERLOCK WITH FUME HOOD H. WL, WALL LOUVER DISCHARGE T. PROVIDE DRAIN PLUG ACCESSORY I. RCC OR GRS ROOF CAP (FLAT ROOF) OR U. ROOF SUPPORT RAILS J. WALL MOUNTING COLLAR K. INLET GAURD
DOAS CONDENSING UNIT SCHEDULE	EXHAUST FAN SCHEDULE NOTES:
DOAS CONDENSING ONT SCHEDOLE Manufacturer Manufacturer Matching SYMBOL TC (BTUH) SHC (BTUH) EFFICIENCY COMPRESSOR ELECTRICAL DATA MANUFACTURER MATCHING SYMBOL TC (BTUH) SHC (BTUH) (BTUH) EER COP QTY RLA-1 RLA-2 FLA MCA FUSE VOLTAGE PH REFRIG. TYPE AAON MODEL WEIGHT INDOOR UNIT CU-1 117,550 61,560 98,800 9.9 2.44 2 9.7 10.6 24.0 27.0 35.0 460 V 3 R-410A CFA-013-B-A-3-DJ00K 1123 lb DOAS-1 CU-2 86,450 45,860 67,200 11.6 2.82 2 7.8 6.2 17.0 19.0 25.0 460 V 3 R-410A CFA-009-B-A-3-DJ00K 1060 lb DOAS-2 NOTES: 1. COOLING CAPACITY	 ALL FANS SHALL BE U.L. LISTED AND LABELED AND SHALL BE AMCA CERTIFIED FOR SOUND AND AIR FLOW. ALL FANS INSTALLED INSIDE, ABOVE, OR ADJACENT TO OCCUPIED SPACES SHALL HAVE A MAXIMUM 9.0 INLET SONE LEVEL. ALL FANS SHALL BE SUPPLIED BY ONE MANUFACTURER UNLESS NOTED OTHERWISE. MECHANICAL CONTRACTOR SHALL PROVIDE MAGNETIC STARTER WITH AUXILIARY CONTACTS AS REQUIRED. PROVIDE ALL DIRECT DRIVE FANS WITH SPEED CONTROLLERS.
 ALL UNITS SHALL BE U.L. LISTED AND HAVE A MINIMUM SEER OF 13. HEAT PUMP SUPPLEMENTARY ELECTRIC RESISTANCE HEAT SHALL BE PROVIDED WITH CONTROLS TO PREVENT OPERATION WHEN THE REVERSE CYCLE HEAT CAN MEET HEATING LOAD. SUPPLEMENTAL ELECTRIC 	DUCTLESS A/C CONDENSING UNIT SCHEDULE
 HEAT SHALL BE ALLOWED TO OPERATE DURING HEAT PUMP DEFROST CYCLE. SUPPLEMENTAL ELECTRIC HEAT SHALL BE LOCKED OUT WHEN THE OUTDOOR TEMPERATURE IS BETWEEN 35°F AND 40°F AND THE INDOOR TEMPERATURE SETPOINT IS INCREASED. MOUNT UNITS ON A 4" THICK CONCRETE PAD AND PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND UNITS. PROVIDE UNITS WITH CONDENSER COIL HAIL GUARDS AND LOW AMBIENT CONTROLS. FOR REFRIGERANT LINE APPLICATIONS WITH A TOTAL EQUIVALENT LENGTH BETWEEN 50'-0" AND 175'-0". THE FOLLOWING ACCESSORIES SHALL BE PROVIDED; 	ID NOMINAL EER SEER COP HSPF MUNTER ELECTRICAL DATA MANUFACTURER MANUFACTURER MOU ODU-1 1.5 14.4 24.6 2.47 11 95.0 °F 0.0 °F 11.0 28.0 208 V 1 R410A MITSUBISHI PUZ-A1
-COMPRESSOR CRANKCASE HEATER -FOR HORIZONTAL CONFIGURATION: PROVIDE LIQUID LINE SOLENOID WITHIN 2'-0" OUTDOOR UNIT WITH FLOW ARROW POINTING TOWARD OUTDOOR UNIT. VAPOR LINE SHOULD SLOPE TOWARD INDOOR UNIT.	DUCTLESS A/C INDOOR UNIT SCHEDULE
-MECHANICAL CONTRACTOR & UNIT MANUFACTURER ARE TO REVIEW INSTALLATION, AND FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR LONG REFRIGERANT LINE APPLICATIONS (AS DEFINED BY UNIT MFGR).	OUTSIDE DUTSIDE DESIGN SENSIBLE HEATING CAPACITY
	ID MANUFACTURER MODEL NO. AIRFLOW AIRFLOW NOMINAL TOTAL (BTUH) (BTUH) (BTUH) A/C-1 MITSUBISHI PLA-A18EA7 0 CFM 600 CFM 1.5 ton 18000 15300 19000
EQUIVALENT MANUFACTURERS LISTING	A/C-2 MITSUBISHI PLA-A18EA7 0 CFM 600 CFM 1.5 ton 18000 15300 19000 NOTES: 1. ALL UNITS SHALL BE U.L. LISTED AND HAVE A MINIMUM SEER OF 15. 2. COOLING CAPACITIES ARE BASED ON 95° AMBIENT, 80° ENTERING AIR DRY BULB, 67° ENTERING AIR WET BULB. AIRFLOWS INDICATED ARE AT 'HIGH' SPEED (DRY
OR EXCEED QUALITY AND CAPACITIES OF SPECIFIED EQUIPMENT. FINAL APPROVAL WILL BE BASED ON EQUIPMENT SUBMITTALS. ANY MANUFACTURER NOT LISTED BUT WISHING TO BID THIS PROJECT SHALL SUBMIT A WRITTEN REQUEST A MINIMUM OF 7 DAYS PRIOR TO BID DATE OR AS INDICATED IN THE SPECIFICATIONS, PRIOR APPROVAL IS REQUIRED FOR ALL MANUFACTURERS NOT LISTED. (ALPHABETICAL ORDER) <u>DUCTED SPLIT SYSTEMS:</u> CARRIER, TRANE, YORK <u>FANS:</u> COOK, GREENHECK, PENN, TWIN CITY, <u>AIR DISTRIBUTION:</u> CARRIES, METAL*AIRE, NAILOR, PRICE, TITUS, TUTTLE & BAILEY, KRUEGER	 COIL). 3. HEATING CAPACITIES ARE BASED ON 17°F AMBIENT, 65°F ENTERING AIR. 4. MOUNT OUTDOOR UNIT ON EQUIPMENT SUPPORT RAILS. 5. PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND OUTDOOR UNIT. 6. PROVIDE UNITS WITH MANUFACTURER'S LOW AMBIENT CONTROLS FOR OPERATION DOWN TO 0°F, INVERTER, 120V INTEGRAL CONDENSATE PUMP, COMPRESSOR, FACTORY THERMOSTAT, AND INTEGRAL MANUFACTURER NON-LOCKING DISCONNECT SWITCH FOR INDOOR UNIT. 7. INDOOR UNIT IS POWERED BY THE CONDENSING UNIT. 8. PROVIDE OUTDOOR UNIT WITH 6 YEAR EXTENDED COMPRESSOR WARRANTY. 9. SIZE AND INSTALL REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS.
<u>FIRE DAMPERS:</u> GREENHECK, NAILOR, RUSKIN, POTTORFF, NCA, SAFE-AIRE <u>LOUVER:</u> GREENHECK, RUSKIN, SAFE-AIR, POTTORFF <u>DUCTLESS SPLIT SYSTEMS:</u> DAIKIN, MITSUBISHI, TRANE <u>ELECTRIC WALL/UNIT HEATERS:</u> MARKEL, MODINE, RAYWALL, BERKO, QMARK	GRILLES, REGISTERS AND DIFFUSERS SCHEDULE
DDC CONTROLS: RELIABLE CONTROLS CORPORATION (MACH-SYSTEM BY BUILDING AUTOMATION SERVICES), AUTOMATED LOGIC CONTROLS, JOHNSON CONTROLS INC. <u>100% OUTSIDE AIR MAKE-UP UNITS:</u> AAON, ENGINEERED AIR, DESERT AIRE	SYMBOL DESCRIPTION MANUF. MODEL MATERIAL SIZE SIZE WIDTH HEIGHT A LOUVERED FACE DIFFUSER TITUS TDC STEEL 24x24 6
NOTE:	BLOUVERED FACE DIFFUSERTITUSTDCSTEEL24x248CLOUVERED FACE DIFFUSERTITUSTDCSTEEL24x2410
ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, PIPING, SHEET METAL, ELECTRICAL, REPLACEMENT OF SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL	D PERFORATED DIFFUSER TITUS PAR STEEL 24x24 16 Control F PERFORATED DIFFUSER TITUS PAR STEEL 24x24 12 Control Contro Control Control <t< td=""></t<>
COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT WILL BE APPROVED DURING CONSTRUCTION AND ALL COST WILL BE THE RESPONSIBILITY OF TH MECHANICAL CONTRACTOR.	GLOUVERED GRILLETITUS4FLALUMINUM24x2412HLOUVERED GRILLEPRICE4FLALUMINUM12x1266
	J LOUVERED FACE DIFFUSER TITUS TDC STEEL 12x12 6 AIR DISTRIBUTION SCHEDULE NOTES: 1. ALL CEILING AND WALL MOUNTED DEVICES SHALL BE FURNISHED WITH AN ENAMEL BRIGHT WHITE FINISH UNLESS NOTED OTHERWISE. 2. ALL DEVICES SHALL BE FURNISHED WITH FRAMES SUITABLE FOR THE TYPE OF INSTALLATION REQUIRED. 3. ALL LINEAR DIFFUSERS IN LAY-IN CEILINGS SHALL BE FURNISHED WITH END CAPS. ALL LINEAR DIFFUSERS IN HARD CEILINGS SHALL BE FURNISHED WITH INTEGRAL AIRFLOW PATTERN ADJUSTMENT BARS FOR HORIZONTAL/VERT ADJUSTMENT AT EACH SLOT. 4. ALL DOUBLE DEFLECTION SUPPLY GRILLES SHALL HAVE DAMPER BLADES ADJUSTED TO PROVIDE AIRFLOW PATTERN INDICATED BY FLOW ARROY DAMPERS SHALL BE ADJUSTED TO A 30 DEGREE POSITION UNLESS NOTED OTHERWISE ON PLANS.
	LOUVER SCHEDULE - MECHANICAL EQUIPMENT
	SYMBOL MANUFACTURER MODEL NO. AIRFLOW AREA VELOCITY PD DAMPER TYPE WIDTH HEIGHT RI
	L-1 GREENHECK ELF-375DX 1950 CFM 3.5 SF 557 FPM 0.02 in-wg NONE 42" 24" L-2 GREENHECK ELF-375DX 1100 CFM 2.5 SF 440 FPM 0.02 in-wg NONE 30" 24" L-3 GREENHECK ELF-375DX 1400 CFM 2.5 SF 560 FPM 0.02 in-wg NONE 30" 24"
	 LOUVER SCHEDULE NOTES: PROVIDE BAKED ENAMEL FINISH, COLOR BY ARCHITECT. PROVIDE WITH BIRDSCREEN. PROVIDE WITH DAMPER AS NOTED IN SCHEDULE INSTALL WITH 18" DEEP INSULATED PLENUM. PROVIDE FRAME TYPE REQUIRED FOR MOUNTING LOCATION.
	ELECTRIC WALL HEATER SCHEDULE
	LLLCTNC VALLTILATLE SCILDULL MANUFACTURER SYMBOL LOCATION CFM BTUH KW RPM H.P. VOLT PH (MARKEL) ACC EWH-1 UTILITY 318 175 13800 4.0 600 0.00 208 V 1 F3326TD-RP ACC
	NOTES: ELECTRIC UNIT HEATERS 1. HEATING CAPACITY BASED ON 65° F E.A.T. A. DISCONNECT S 2. SEE PLANS FOR TYPE OF THERMOSTAT REQUIRED (WALL MOUNTED OR UNIT MOUNTED). UNIT HEATERS SHOWN WITHOUT THERMOSTAT INDICATED SHALL BE PROVIDED WITH A UNIT MOUNTED THERMOSTAT. B. BUILT IN THER 3. SET TO MAINTAIN 45°F. D. WALL MOUNTED C. WALL MOUNTED G. PENCIL PROOF G. PROVIDED G. PENCIL PROOF

2. ALL UNITS SHALL BE U.L. LISTED AND HAVE A MINIMUM SEER OF 13.

3. HEAT PUMP SUPPLEMENTARY ELECTRIC RESISTANCE HEAT SHALL BE PROVIDED WITH CONTROLS TO PREVENT OPERATION WHEN THE REVERSE CYCLE HEAT CAN MEET HEATING LOAD. SUPPLEMENTAL ELECTRIC HEAT SHALL BE ALLOWED TO C HEAT PUMP DEFROST CYCLE. SUPPLEMENTAL ELECTRIC HEAT SHALL BE LOCKED OUT WHEN THE OUTDOOR TEMPERATURE IS BETWEEN 35°F AND 40°F AND THE INDOOR TEMPERATURE SETPOINT IS INCREASED. 4. MOUNT UNITS ON A 4" THICK CONCRETE PAD AND PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND UNITS.

5. PROVIDE UNITS WITH CONDENSER COIL HAIL GUARDS AND LOW AMBIENT CONTROLS. 6. FOR REFRIGERANT LINE APPLICATIONS WITH A TOTAL EQUIVALENT LENGTH BETWEEN 50'-0" AND 175'-0".

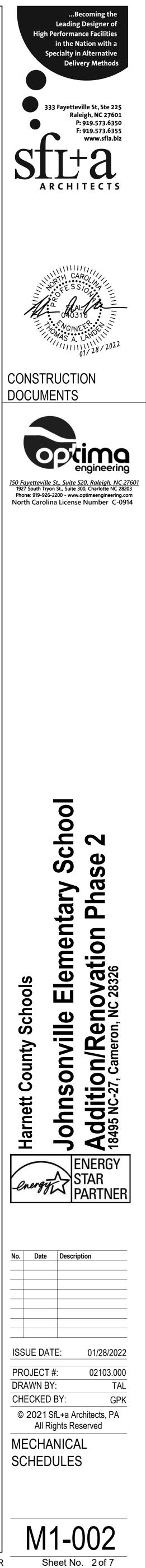
-COMPRESSOR CRANKCASE HEATER

-FOR HORIZONTAL CONFIGURATION: PROVIDE LIQUID LINE SOLENOID WITHIN 2'-0" OUTDOOR UNIT WITH

FLOW ARROW POINTING TOWARD OUTDOOR UNIT. VAPOR LINE SHOULD SLOPE TOWARD INDOOR UNIT. -MECHANICAL CONTRACTOR & UNIT MANUFACTURER ARE TO REVIEW INSTALLATION, AND FOLLOW MANUFACTURER'S

IDATIONS FOR LONG REFRIGERANT LINE APPLICATIONS (AS DEFINED BY UNIT MFGR).

AT MATCHING INDOOR UNIT D IDU-1 D IDU-2 D IDU-3 D IDU-4 D IDU-5 D IDU-6 D IDU-7 D IDU-8 D IDU-9 D IDU-10 D IDU-11 D IDU-12 BE ALLOWED TO OPERATE DURING									
ACCESSORIES CONTROL TYPE A,B,F,G 5 A,B,F,G 1									
R 80°) ATE WHEN LIGHT IS ON IF ANY ROOM IS LABEL ARTER WITH IDENTIFICATION LABEL R-RIDE CONTROL PANEL IN FIRE REQUIRED BY M.C. FOR SMOKE									
ACTURER MODEL WEIGHT UBISHI PUZ-A18NKA7 100 lb UBISHI PUZ-A18NKA7 100 lb									
IBLE HEATING CAPACITY (BTUH) UNIT WEIGHT 00 19000 46 lb 00 19000 46 lb									
JMP, COMPRESSOR,									
JLE HEIGHT NOTES									
OTHERWISE. GS SHALL BE FURNISHED WITH END R HORIZONTAL/VERTICAL PATTERN ATED BY FLOW ARROWS ON PLANS.									
REMARKS									
RER ACCESSORIES									
P A,B,G,H ECTRIC UNIT HEATER ACCESSORIES: A. DISCONNECT SWITCH B. BUILT IN THERMOSTAT C. WALL MOUNTED THERMOSTAT D. WALL MOUNTING BRACKETS E. CEILING MOUNTED BRACKETS F. ADJUSTABLE DISCHARGE LOUVERS G. PENCIL PROOF LOUVERS H. CABINET FOR SURFACE MOUNTING									



SEQUENCE OF OPERATION

SYSTEM INTEGRATION.

TWO MINUTE DELAY.

INDEXED "ON". OUTLINED BELOW).

SYSTEM TO INDICATE WHETHER ITS STATUS IS HEAT, COOL, OR SATISFIED.

CONDITIONED/NEUTRAL AIR UTILIZE REVERSE HEAT PUMP CYCLE TO HEAT OUTSIDE AIR TO 95° AND

REHEAT AS REQUIRED. THE DEHUMIDIFICATION SEQUENCE.

PHASE.

A COMPLETE AND OPERATIONAL DDC CONTROL SYSTEM (BAS) SHALL BE INSTALLED IN ACCORDANCE WITH THE SPECIFICATIONS (SECTION 230900) AND AS INTENDED ON THESE PLANS. ALL CONTROL POINTS AND EQUIPMENT SEQUENCES OF OPERATION LISTED IN SPECIFICATIONS SECTION 230900 SHALL BE CONSIDERED IN ADDITION TO THOSE LISTED HERE. IN THE EVENT THAT THE VERBIAGE IS IN CONFLICT OR CONTRADICTS THE REQUIREMENTS LISTED HERE, THE QUESTION SHALL BE ASKED PRIOR TO BIDDING OR THE MORE STRINGENT SHALL APPLY. MECHANICAL CONTRACTOR SHALL COORDINATE ALL BAS INTEGRATION REQUIREMENTS WITH EQUIPMENT VENDORS AND CONTRACTOR PRIOR TO PURCHASING EQUIPMENT AND PROVIDE ALL EQUIPMENT WITH COMMUNICATION/INTERFACE CARDS AS REQUIRED FOR

SINGLE ZONE CLASSROOM HEAT PUMPS

ON A CALL FOR HEATING OR COOLING, UNIT SHALL ENERGIZE AND THE UNIT AND HEAT PUMP HEATING/COOLING SYSTEM SHALL START ON A

WHEN PLACED IN THE OCCUPIED MODE BY THE BAS, THE UNITS SHALL BE (SHALL BE STARTED TO PROVIDE CONSTANT VENTILATION WHILE IN THE OCCUPIED MODE AND PROVIDE FIRST STAGE OF HEATING AND COOLING AS

SINGLE ZONE UNITS SHALL BE PROVIDED WITH A WALL MOUNTED DDC SENSOR FOR SPACE TEMPERATURE CONTROL. WHILE IN THE OCCUPIED MODE THE SUPPLY FAN AND HEAT PUMP HEATING/COOLING SYSTEM SHALL CYCLE ON UPON A CALL FOR HEATING OR COOLING AS REQUIRED TO MAINTAIN SPACE TEMPERATURE. SENSOR SHALL ALSO SEND A SIGNAL TO ITS ZONE DEDICATED OUTSIDE AIR

WHILE IN THE UNOCCUPIED MODE. THE UNIT SHALL CYCLE AS NOTED ABOVE TO MAINTAIN SETBACK TEMPERATURES. IF ACTIVATED DURING THE UNOCCUPIED MODE, THE UNIT SHALL RUN FOR A MINIMUM OF 20 MINUTES AND SHALL NOT BE ALLOWED TO RESTART FOR A MINIMUM OF FIVE MINUTES FOLLOWING SHUT-DOWN.

UNITS PROVIDED WITH DUCT SMOKE DETECTORS (SEE PLANS) SHALL HAVE DUCT DETECTOR INSTALLED IN THE RETURN DUCT PRIOR TO THE O.A. DUCT CONNECTION. DUCT DETECTOR SHALL SHUT-DOWN UNIT AND ACTIVATE FIRE ALARM UPON DETECTION OF SMOKE.

FOR UNITS WITH HUMIDITY CONTROLS (SHOWN WITH HOT GAS REHEAT IN WSHP SCHEDULE, AND HUMIDISTATS INSTALLED IN THEIR ZONES), WITH SYSTEM IN OCCUPIED OR UNOCCUPIED MODE, HUMIDITY CONTROL SYSTEM SHALL BE CAPABLE OF BEING ACTIVATED. UNDER NORMAL OPERATION, UNIT SHALL BE CONTROLLED AS OUTLINED ABOVE. IF SPACE HUMIDITY REACHES 60% R.H. IN THE OCCUPIED MODE OR 65% IN THE UNOCCUPIED MODE (ADJUSTABLE), HUMIDITY CONTROL SEQUENCE SHALL BE ENERGIZED THROUGH THE DDC SYSTEM. UNIT OUTSIDE AIR DAMPER SHALL CLOSE TO MINIMUM POSITION. CONDENSER WATER CONTROL VALVE SHALL OPEN AND UNIT COMPRESSORS SHALL BE ACTIVATED IN COOLING (DEHUMIDIFICATION) MODE. HOT GAS REHEAT VALVE SHALL BE MODULATED TO REHEAT AIR TO MAINTAIN SPACE CONDITIONS, IF REQUIRED. WHEN SPACE HUMIDITY DROPS BELOW 55% R.H. IN THE OCCUPIED MODE OR 60% IN THE UNOCCUPIED MODE, BAS SHALL DEACTIVATE HUMIDITY CONTROL SEQUENCE, AND CONTROL OF UNITS SHALL REVERT BACK TO NORMAL OPERATION. IF SPACE HUMIDITY REACHES 65% IN THE OCCUPIED MODE OR 70% IN THE UNOCCUPIED MODE, AN ALARM SHALL BE SENT TO CENTRAL BAS.

CLASSROOM WING DEDICATED OUTSIDE AIR UNITS: WHEN PLACED IN THE OCCUPIED MODE, DEDICATED OUTSIDE AIR UNIT (DOAS) SHALL BE INDEXED "ON". UNITS SHALL START TO SUPPLY

UNIT COMPRESSORS SHALL OPERATE IN HEATING OR COOLING MODE TO SUPPLY AIR AT NEUTRAL CONDITIONS (67-73° AND

45-55% RH). IF ALL SENSORS ON THE ZONE ARE CALLING FOR COOLING, DOAS COMPRESSOR SHALL OPERATE IN COOLING MODE WITHOUT ANY HOT GAS REHEAT, TO DISCHARGE AIR AT 55° AND SHALL FUNCTION AS THE FIRST STAGE OF COOLING FOR THE CLASSROOMS. WHEN ALL CLASSROOMS ARE CALLING FOR HEAT, COMPRESSOR SHALL OPERATE IN THE HEATING MODE,

SERVE AS FIRST STAGE OF HEATING FOR THE CLASSROOMS. IF ALL SENSORS ARE SATISFIED, OR THERE IS A MIX OF CALLS FOR HEATING AND COOLING, DOAS UNIT SHALL OPERATE TO MAINTAIN NEUTRAL DISCHARGE CONDITIONS (67-73° AND 45-55% RH), UTILIZING COOLING, HEATING,

IN THE UNOCCUPIED MODE, UNIT SHALL REMAIN OFF UNLESS THE ZONE IS SCHEDULED ON VIA THE DDC SYSTEM OVERRIDE PANEL, OR ACTIVATED BY

NOTE: COORDINATE EXACT SEQUENCE OF OPERATION FOR ENERGY RECOVERY UNITS WITH MANUFACTURER, MANUFACTURER AND ENGINEER TO APPROVE FINAL SEQUENCE PRIOR TO PROGRAMMING. BAS VENDOR SHALL VERIFY ALL OPERATION/MONITORING POINTS COMPATIBILITY AT SUBMITTAL

THERMOSTATS & TEMPERATURE SENSORS

THERMOSTATS AND TEMPERATURE SENSORS SHALL BE PROVIDED WHERE INDICATED ON THE DRAWINGS, AND PER THE SPECIFICATIONS. THERMOSTATS TO 70°. THERMOSTATS SHALL HAVE A 3° RANGE IN WHICH THEY ARE SATISFIED (IF SET TO 70°, SATISFIED ANYWHERE BETWEEN 68.5° AND 71.5°). SLIDE BAR SHALL HAVE THE CAPABILITY TO ADJUST THE HEATING AND COOLING SETPOINTS BY 3° IN EITHER DIRECTION, BUT MAINTAIN A MINIMUM 4° SPREAD BETWEEN THE HEATING AND COOLING SETPOINT. UNOCCUPIED SETTINGS SHALL BE 85° COOLING AND 60° HEATING. ALL SETPOINTS SHALL BE VERIFIED WITH THE OWNER BEFORE PROGRAMMING, AND FULLY ADJUSTABLE THROUGH THE BAS.

WALL/UNIT HEATERS

A BUILT-IN THERMOSTAT SHALL OPERATE WALL/UNIT HEATER AND FAN TO MAINTAIN A SETPOINT OF 49° (ADJ). ONCE THE UNIT HEATER IS ENERGIZED, IT WILL RUN FOR AT LEAST FIVE MINUTES TO AVOID SHORT CYCLING. BAS DOES NOT INTERFACE WITH UNIT HEATERS.

MISC. EXHAUST FANS

PROVIDE WALL SWITCHES, WALL THERMOSTATS, INTERLOCKS, ETC. AS INDICATED ON THE FAN SCHEDULE TO CONTROL FANS AS INDICATED ON PLANS. UTILITY ROOM AND ELECTRICAL ROOM THERMOSTATS SHALL BE SET AT 85° F. (USER ADJUSTABLE, BAS REMOTE).

TOILET EXHAUST FANS

CENTRAL BAS SHALL OPERATE EXHAUST FANS ON A PROGRAMMED SCHEDULE. FANS SHALL RUN WHEN ASSOCATED ZONE IS IN THE OCCUPIED MODE, AND BE OFF WHEN ASSOCIATED ZONE IS IN THE UNOCCUPIED MODE.

SYSTEM, APPARATI AREA POI

INPUT/OUTPUT SUMMARY

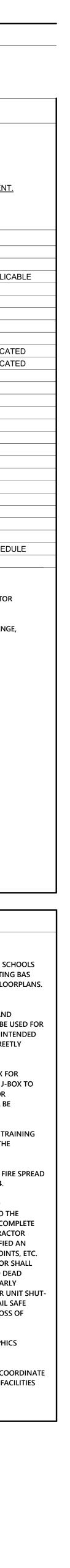
		INPUTS			OUTPUTS		SI	STEM FEATURES		
	ANALOG		BINARY	DIGITAL	ANALOG ALA	ALARMS	PROGRAMS	GENERAL		
SYSTEM, APPARATUS, OR AREA POINT DESCRIPTION	TEMPERATURE	RH KW KW AIR FLOW WATER FLOW CO2 HERTZ HERTZ HERTZ HERTZ	CAFC. AMPS AMPS ENTHALPY RUN TIME EFFICIENCY	STATUS FILTER SMOKE FREEZE AIR FLOW METER OVER-RIDE	OFF-ON OFF-AUTO-ON OFE-HI-LO OPEN-CLOSE	DMPR. POS. VALVE POS. SETPOINT ADJ. STEP CONTROL	HI ANALOG LO ANALOG HI BINARY LO BINARY PROOF	TIME SCHEDULING DEMAND LIMITING DUTY CYCLE START/STOP OPT. ENTHALPY OPT. SMOKE CNT. TREND ALARM INSTRUCT MAIN. WK. ORD.	COLOR GRAPHIC	<u>SUPPLMENT</u> <u>NOTES</u>
WSHP								x	X	
Supply Fan				X	X		X			
Compressor #1				X	X		X			
Compressor #2				X	X		X			WHERE APPLIC
Space Temp	X									
Space RH		X								
Supply Temp	X									
Over-ride				x						
Setpoint Adjust						X				
Return Air Smoke (by elec. contr.)				X				X		WHERE INDICA
Hot Gas Reheat Valve						X				WHERE INDICA
Filter Status				X						
DOAS								X	X	
Supply Fan				X	X		X			
Compressor #1				X	X		X			
Compressor #2				X	X		X			
Entering Supply Air Temp	X									
Leaving Supply Air Temp										
Leaving Supply Air RH		X								
Override				x						
Setpoint Adjust						X				
Supply Filter Status				X						
Fans									X	
Misc. Fans					X					SEE FAN SCHED

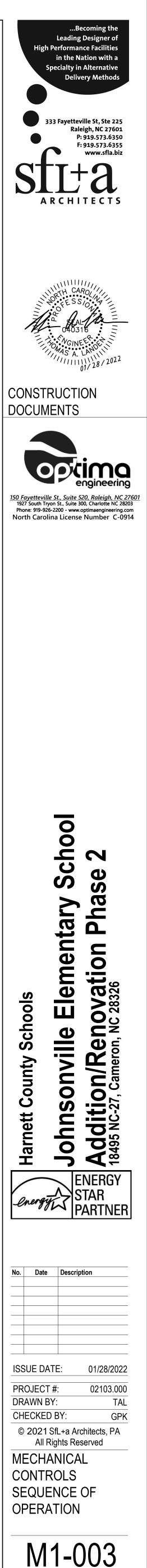
GENERAL NOTE:

THE POINTS LIST PROVIDED IS INTENDED TO COMMUNICATE THE GENERAL DESIGN INTENT TO THE CONTROLS SUBCONTRACTOR AND IS NOT INTENDED TO BE COMPLETE. IN THE CONTROLS SUBMITTAL, THE SUBCONTRACTOR SHALL FULLY DEVELOP THE POINTS LIST FOR ALL SYSTEMS IDENTIFIED AND SHALL PRESENT ALL SETPOINTS, CONTROL PARAMETERS, AND ALARM POINTS. THE CONTROLS SUBCONTRACTOR SHALL INCORPORATE STANDARD FEATURES SUCH AS MINIMUM RUN TIME DELAYS AND DEAD BANDS FROM SETPOINTS TO PREVENT EQUIPMENT FROM SHORT CYCLING WHEN NEAR SETPOINTS. ALL MONITORED POINTS SHALL INCLUDE EARLY HIGH/LOW ALARM NOTIFICATIONS PRIOR TO HAVING TO TAKE CORRECTIVE ACTIONS OR EQUIPMENT SHUTDOWNS. TRANSMITTERS SHALL INCLUDE OUT-OF-RANGE, FAIL-SAFE POSITIONING FOR OPEN CIRCUITS OR LOSS OF COMMUNICATION. CONTROL CONTRACTOR SHALL SPECIFY TO FAIL DE-ENERGIZER, HOLD LAST STATE, OR DEFAULT TO A PREDETERMINED SETPOINT. THESE BASIC FEATURES THAT ARE NECESSARY AND ARE PART OF A COMPLETE CONTROLS INSTALLATION SHALL BE INCLUDED IN THE SCOPE OF SERVICES FOR DELIVERABLES AT NO ADDITIONAL COSTS TO THE OWNER.

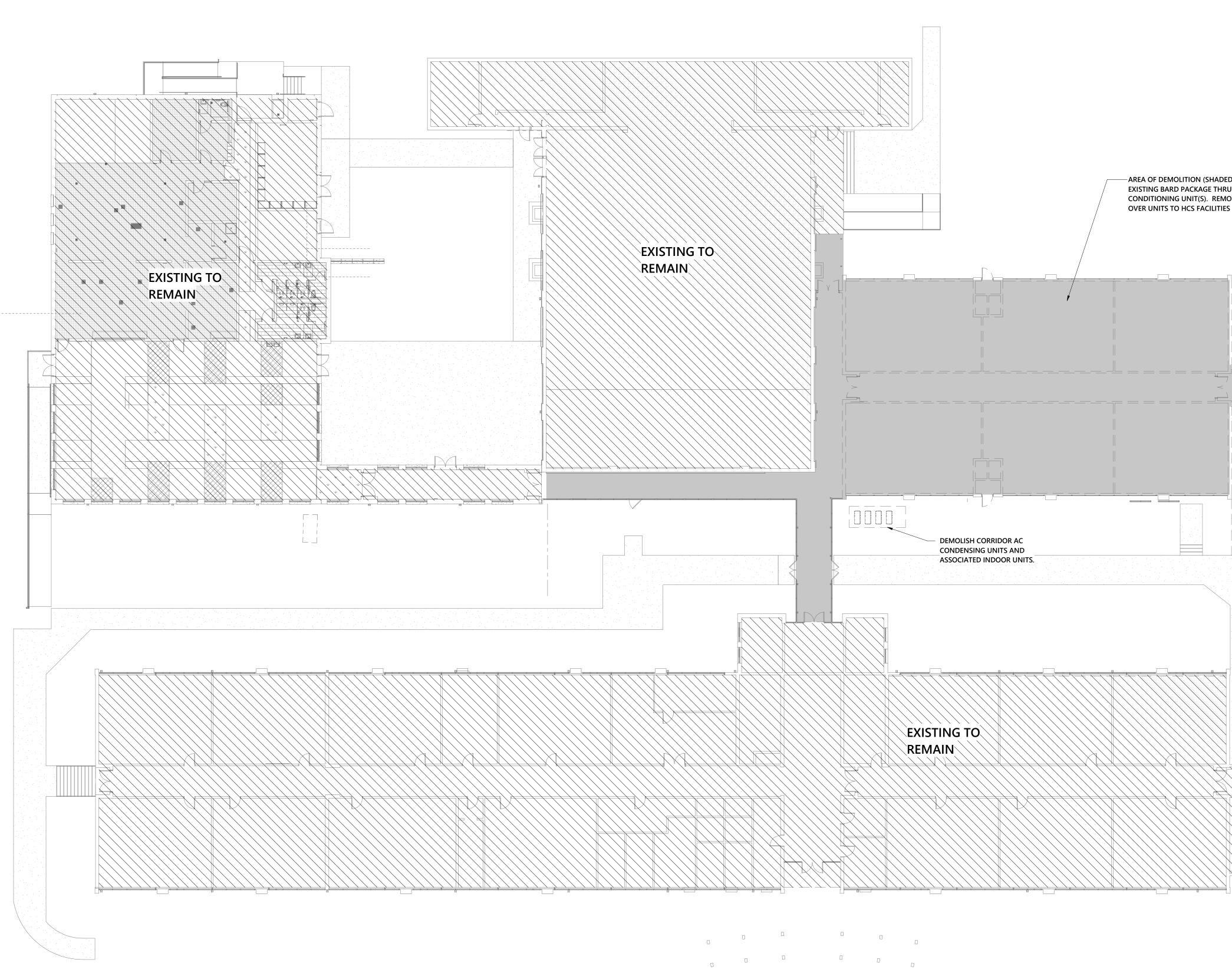
CONTROL SYSTEM NOTES

- 1. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- 2. HVAC CONTROLS FOR CLASSROOM ADDITION PROJECT TO BE INTEGRATED IN TO SCHOOLS EXISTING BAS. ALL POINTS AND EQUIPEMENT TO BE ACCESSIBLE FROM THE EXISTING BAS FRONT END AS INDICATED WITH ADDITIONAL GRAPHICS FOR EQUIPMENT AND FLOORPLANS. EXISTING CONTROLS BY RELIABLE CONTROLS CORPORATION.
- 3. 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.
- 4. 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.
- CONTROLS CONTRACTOR SHALL PROVIDE A MINIMUM OF 24 HOURS OF OWNER TRAINING PROVIDED BY A FACTORY CERTIFIED REPRESENTATIVE. COORDINATE THROUGH THE MECHANICAL CONTRACTOR AND CONSTRUCTION MANAGEMENT FIRM.
- 6. 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.
- 7. THE SEQUENCE OF OPERATION OF OPERATION AND POINTS LIST IS INTENDED TO COMMUNICATE THE MINIMUM REQUIREMENTS AND GENERAL DESIGN INTENT TO THE CONTROLS CONTRACTOR AND IS NOT INTENDED TO BE A FULLY DEVELOPED OR COMPLETE SEQUENCE OF OPEARTION. IN THE CONTROLS SUBMITTAL THE CONTROLS CONTRACTOR SHALL FULLY DEVELOP THE SEQUENCE OF OPERATIONS FOR ALL SYSTEMS IDENTIFIED AN SHALL PRESENT ALL SETPOINTS, CONTROL PARAMETERS, TIME DELAYS, ALARM POINTS, ETC. AS REQUIRED TO COMPLY WITH THE DESIGN INTENT. THE CONTROLS CONTRACTOR SHALL INCORPORATE STANDARD FEATURES SUCH AS MINIMUM RUN TIME DELAYS AND DEAD BANDS TO PREVENT SHORT CYCLING. ALL MONITORED POINTS SHALL INCLUDE EARLY HIGH/LOW ALARM NOTIFICATIONS PRIOR TO REQUIRED CORRECTIVE ACTIONS OR UNIT SHUT-DOWNS. CONTROL CONTRACTOR SHALL SPECIFY IN THE CONTROL SUBMITTAL FAIL SAFE POSITION FOR OUT OF RANGE, FAIL SAFE POSITIONING FOR OPEN CIRCUITS OR LOSS OF COMMUNICATION.
- 8. ALARMS THROUGH THE BAS SYSTEM SHALL BE VISIBLE ON THE INDIVIDUAL GRAPHICS THEMSELVES, NOT ONLY ON THE SUMMARY PAGE.
- 9. LOCATE MAIN CONTROL HUBS FOR ADDITION CONTROLS IN ELECTRICAL ROOM. COORDINATE EXACT LOCATION OF PANELS WITH ALL OTHER TRADES AND BUILDING OWNER'S FACILITIES DEPARTMENT PRIOR TO INSTALLATION.





Sheet No. 3 of 7



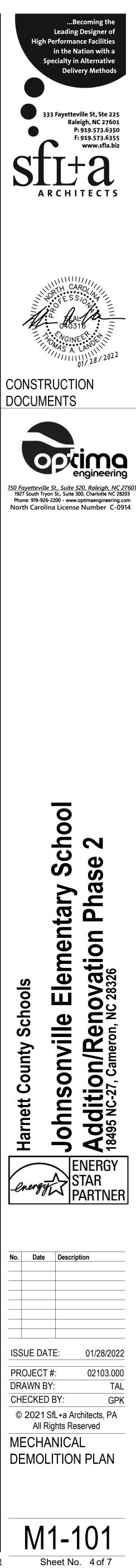
ADA and other laws.

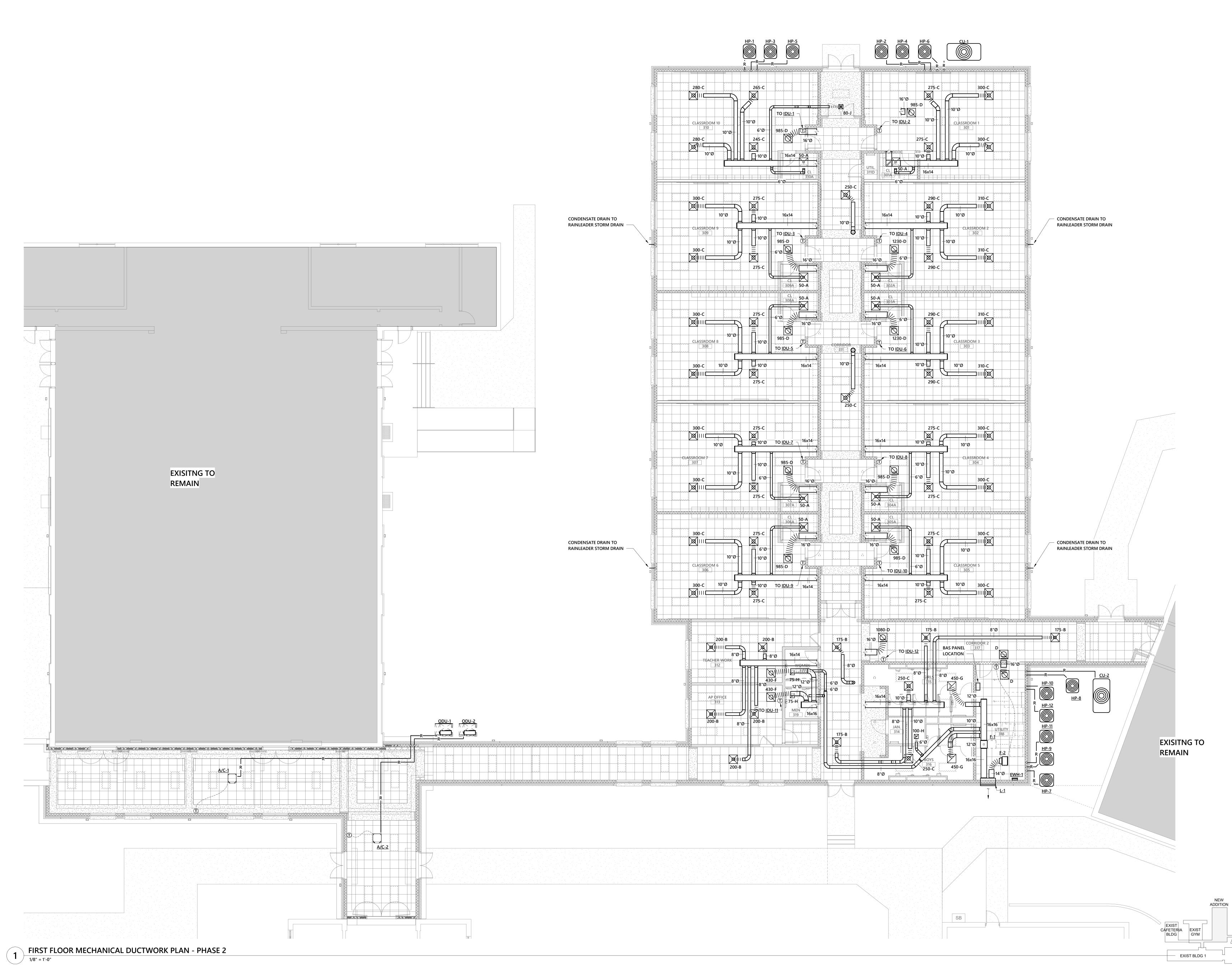
1 OVERALL MECHANICAL PLAN - DEMOLITION - PHASE 2

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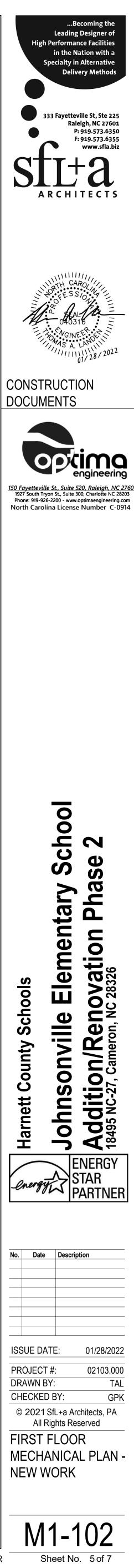
AREA OF DEMOLITION (SHADED). REMOVE EXISTING BARD PACKAGE THRU WALL AIR CONDITIONING UNIT(S). REMOVE AND TURN OVER UNITS TO HCS FACILITIES REMAIN _____



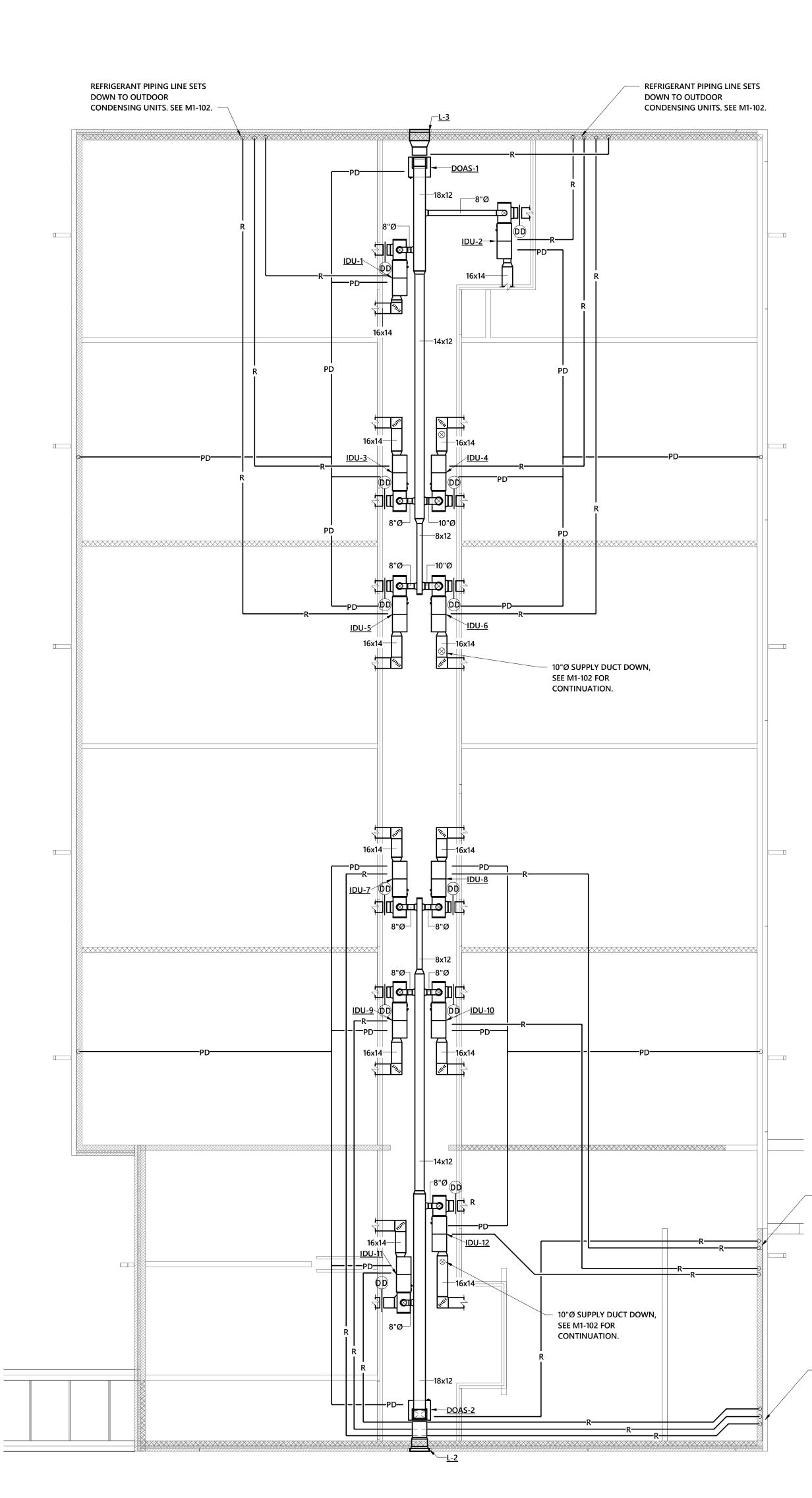


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EXIST CLASSROOM BLDG



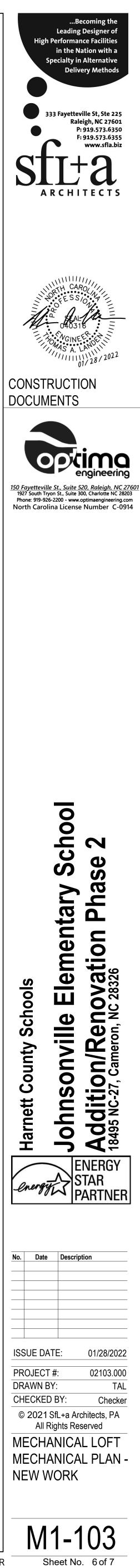
ADA and other laws.

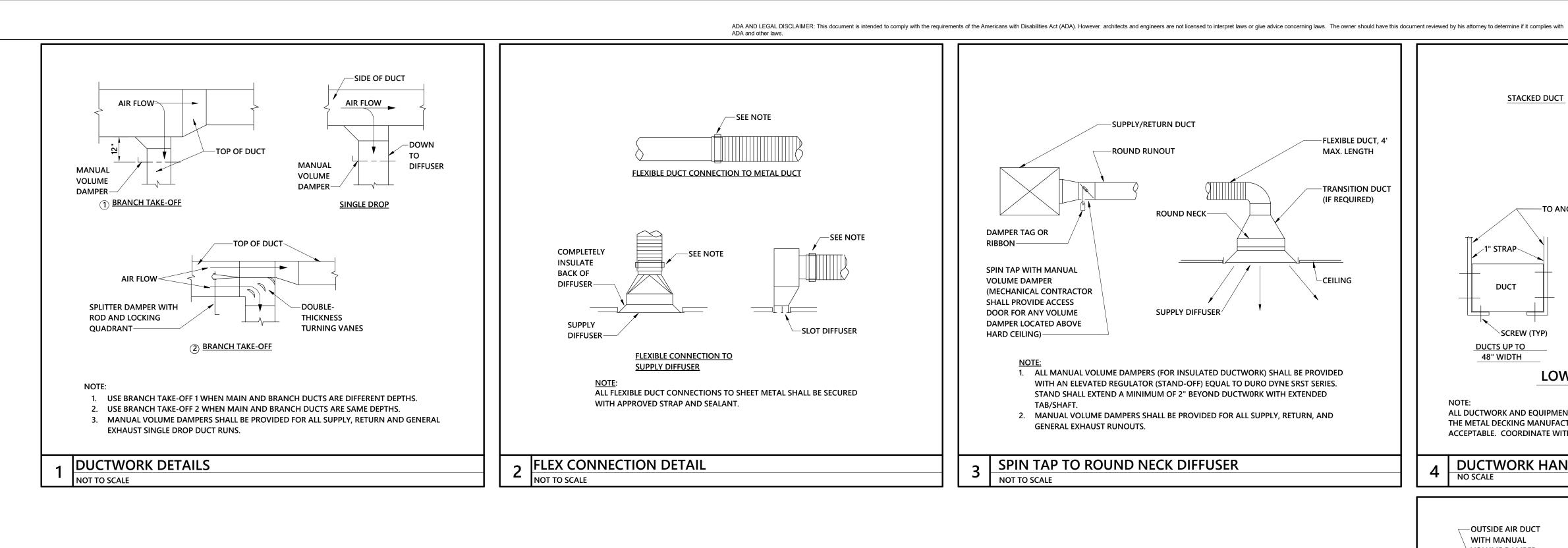
1 MECHANICAL LOFT MECHANICAL PLAN - PHASE 2

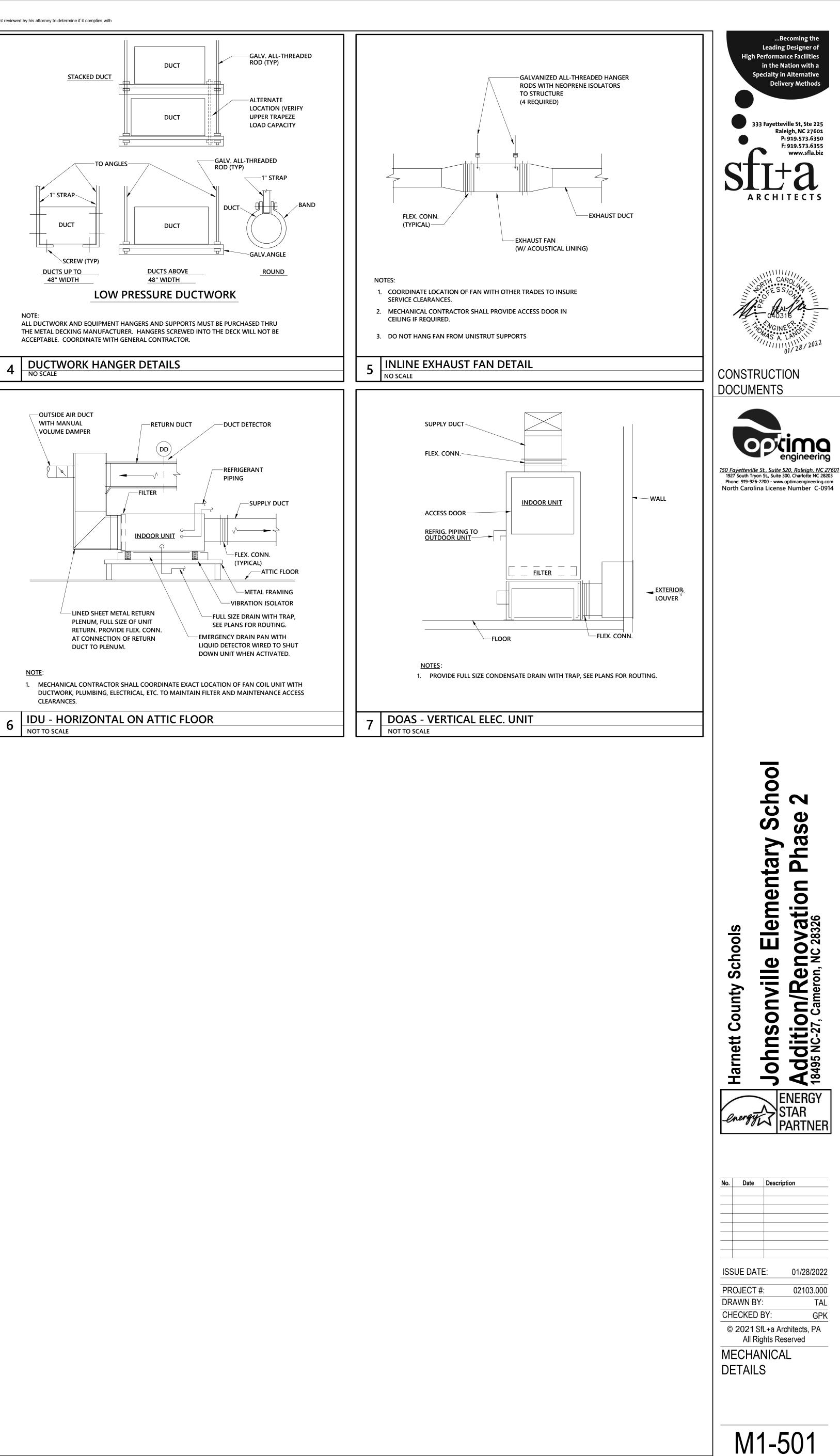
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REFRIGERANT PIPING LINE SETS
 DOWN TO OUTDOOR
 CONDENSING UNITS. SEE M1-102.

REFRIGERANT PIPING LINE SETS
 DOWN TO OUTDOOR
 CONDENSING UNITS. SEE M1-102.







Sheet No. 7 of 7