

STATIC PRESSURE CLASSIFICATION FOR DUCT CONSTRUCTION					
DUCT SYSTEM	LOCATION		PRESSURE CLASSIFICATION (INCH WATER GAUGE)	DUCTWORK SEAL / LEAKAGE CLASS	REMARKS
	FROM	TO			
AHU-1, 2, 3, 4					
SUPPLY	AHU	TERMINAL UNITS	4	A	
	TERMINAL UNITS	DIFFUSERS	3	A	
LABORATORY EXHAUST					
	ERU & FANS	TERMINAL UNITS	-6	A	
	TERMINAL EXH UNITS	FUME HOODS	-6	A	
	TERMINAL EXH UNITS	POINT EXHAUST	-6	A	
	TERMINAL EXH UNITS	GENERAL EXHAUST	-3	A	
OUTSIDE AIR INTAKE	LOUVER	AHU	3	A	
REFRIGERANT EXH					
	FAN	LOUVER	3	A	
	INTAKE	FAN	3	A	

NOTES:  
A. ALL DUCTWORK WITH PRESSURE CLASSIFICATIONS IN EXCESS OF NEGATIVE 3 INCH WATER GAUGE (I.E. -6) SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA INDUSTRIAL DUCT STANDARDS (ROUND & RECTANGULAR)  
B. ALL DUCTWORK SERVING POINT OR FUME HOOD EXHAUST (LABORATORY EXHAUST) SHALL BE CONSTRUCTED WITH MINIMUM THICKNESS AS REQUIRED BY TABLE 510.9 (2018 NCMC) FOR NON-ABRASIVE MATERIALS.

EQUIPMENT IDENTIFICATION	
AHU	AIR HANDLING UNIT
AS	AIR SEPARATOR
B	BOILER
BCU	BLOWER COIL UNIT
CH	CHILLER
CHWP	CHILLED WATER PUMP
CT	COOLING TOWER
CUH	CABINET UNIT HEATER
CWP	CONDENSER WATER PUMP
DSS	DUCTLESS SPLIT SYSTEM
ECH	ELECTRIC CEILING HEATER
ERP	ENERGY RECOVERY PUMP
ERU	ENERGY RECOVERY UNIT
ET	EXPANSION TANK
EUH	ELECTRIC UNIT HEATER
EV	EXHAUST VALVE
EWH	ELECTRIC WALL HEATER
F	FAN
FCU	FAN COIL UNIT
FF	FILTER FEEDER
HP	HEAT PUMP
HWP	HOT WATER PUMP
HX	HEAT EXCHANGER
IV	INTAKE GRAVITY VENTILATOR
LEF	LABORATORY EXHAUST FAN
LTU	LABORATORY TERMINAL UNIT
OAU	OUTDOOR AIR UNIT
P	PUMP
RTU	ROOFTOP UNIT
SSI	SPLIT-SYSTEM INDOOR UNIT
SSO	SPLIT-SYSTEM OUTDOOR UNIT
TU	TERMINAL UNIT
UH	UNIT HEATER
VFD	VARIABLE FREQUENCY DRIVE

CONTROLS ABBREVIATIONS	
AI	ANALOG INPUT TO CONTROLLER
ALM	ALARM
AMS	AIRFLOW MEASURING STATION
AO	ANALOG OUTPUT FROM CONTROLLER
ATS	AVERAGING TEMPERATURE SENSOR
BAS	BUILDING AUTOMATION SYSTEM
BI	BINARY INPUT TO CONTROLLER
BO	BINARY OUTPUT FROM CONTROLLER
CO2	CARBON DIOXIDE SENSOR
CSR	CURRENT-SENSING RELAY
DM	DAMPER MOTOR
DP	DIFFERENTIAL PRESSURE
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
FM	FLOW METER
FZ	FREEZESTAT
HS	HUMIDITY SENSOR
M	MOTOR STARTER
POS	POSITION
R	RELAY
SD	SMOKE DETECTOR
SPD	SPEED
SS	START/STOP
STS	STATUS
TS	TEMPERATURE SENSOR
VFD	VARIABLE-FREQUENCY DRIVE

CONTROL SYSTEM SYMBOLS			
	CIRCULATOR OR PUMP		NORMALLY OPEN CONTACT
	MOTORIZED 2-WAY VALVE		NORMALLY CLOSED CONTACT
	MOTORIZED 3-WAY VALVE		WIRING OR DEVICE NOT PROVIDED UNDER DIVISION 23
	VARIABLE FREQUENCY DRIVE		WIRING CONNECTION BY DIVISION 23
	DIRECT DIGITAL CONTROLLER		WIRING CONNECTION BY OTHERS
	THERMOSTAT		NUMBER OF CONDUCTORS INDICATED BY SLASH MARKS
	FREEZESTAT		MOTORIZED PARALLEL BLADE DAMPER
	CONTACTOR		MOTORIZED OPPOSED BLADE DAMPER
	RELAY		MOTORIZED BUTTERFLY BLADE DAMPER
	SPACE TEMPERATURE SENSOR		SUPPLY, RETURN, OR EXHAUST FAN
	LINE VOLTAGE THERMOSTAT		AIRFLOW DIRECTION
	HAND-OFF-AUTOMATIC SWITCH		CONTROL POINT INDICATOR INPUT OR OUTPUT (ANALOG INPUT)
	DUCT-MOUNTED SMOKE DETECTOR		CONTROL POINT INDICATOR DEVICE TYPE (AIR TEMPERATURE SENSOR WITH AVERAGING ELEMENT)
	TRANSFORMER		CONTROL POINT INDICATOR INPUT OR OUTPUT (ANALOG INPUT)
	FUSE		CONTROL POINT INDICATOR DEVICE TYPE (WATER TEMPERATURE SENSOR WITH BULB TYPE ELEMENT IN PIPING WELL)
			CONTROL POINT INDICATOR INPUT OR OUTPUT (ANALOG INPUT)
			CONTROL POINT INDICATOR DEVICE TYPE (CURRENT SENSING RELAY)

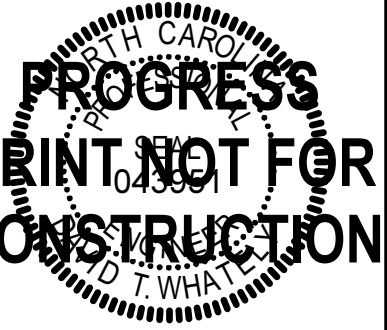
ABBREVIATIONS	
A	AMPERE(S)
AD	ACCESS DOOR
AF	ABOVE FINISHED FLOOR
ALT	ALTERNATE
APD	AIR PRESSURE DROP
BHP	BRAKE HORSEPOWER
BTUH	BRITISH THERMAL UNITS PER HOUR
CFM	CUBIC FEET PER MINUTE
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CLO	COOLING
COM	COMMON
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
D	DRAIN
DB	DRY BULB TEMPERATURE
dBA	A-WEIGHTED DECIBELS
DCW	DOMESTIC COLD WATER
DIA	DIAMETER
DN	DOWN
DWG	DRAWING
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EER	ENERGY EFFICIENCY RATIO
EQ	EQUAL
ESP	EXTERNAL STATIC PRESSURE
EWI	ENTERING WATER TEMPERATURE
EX	EXISTING
F	DEGREES FAHRENHEIT
FC	FAIL CLOSED
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FO	FAIL OPEN
FPM	FEET PER MINUTE
FT	FOOT, FEET
GA	GAUGE
GAL	GALLON(S)
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GWR	GLYCOL WATER RETURN
GWS	GLYCOL WATER SUPPLY
HP	HORSEPOWER
HPWR	HEAT PUMP WATER RETURN
HPWS	HEAT PUMP WATER SUPPLY
HTG	HEATING
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HX	HEAT EXCHANGER
HZ	HERTZ
IN	INCH
IPLV	INTEGRATED PART-LOAD VALUE
KW	KILOWATT(S)
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	ONE THOUSAND BTUH
MCA	MINIMUM CIRCUIT AMPACITY
MFR	MANUFACTURER
MIN	MINIMUM
MOC	MAXIMUM OVERCURRENT PROTECTION
MOD	MOTOR-OPERATED DAMPER
NC	NORMALLY CLOSED (FOR PLANS, DETAILS)
NC	NOISE CRITERIA (FOR SCHEDULES)
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
OA	OUTSIDE AIR
OC	ON CENTER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
PH	PHASE
PSIG	POUNDS PER SQUARE INCH GAUGE
RA	RETURN AIR
RD	REFRIGERANT DISCHARGE
RH	RELATIVE HUMIDITY
RL	REFRIGERANT LIQUID
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
SA	SUPPLY AIR
SEER	SEASONAL ENERGY EFFICIENCY RATIO
TD	TRANSFER DUCT
TYP	TYPICAL
UNO	UNLESS NOTED (INDICATED) OTHERWISE
V	VOLTAGE, VOLTS
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
W	WATT(S)
W	WITH
W/O	WITHOUT
WB	WET BULB TEMPERATURE
WC	WATER COLUMN
WPD	WATER PRESSURE DROP
WWM	WELDED WIRE MESH

GRAPHICS SYMBOLS LEGEND	
	<b>SPACE IDENTIFICATION TAG</b> SPACE NUMBER BUILDING AREA (WHEN USED)
	<b>EQUIPMENT IDENTIFICATION TAG</b> EQUIPMENT NUMBER UNIT DESIGNATION
	<b>DIFFUSER, GRILLE OR REGISTER TAG</b> TAG, REFER TO DIFFUSER, GRILLE AND REGISTER SCHEDULE
	<b>DETAIL TAG</b> DETAIL NUMBER DRAWING WHERE DETAIL IS INDICATED
	KEYNOTE
	STRUCTURAL GRID LINE WITH DESIGNATION
	EXISTING TO BE REMOVED
	<b>DETAIL TITLE</b> DETAIL NUMBER DRAWING WHERE DETAIL IS INDICATED DRAWING WHERE DETAIL IS REFERENCED ADDITIONAL DRAWING REFERENCES
	<b>SECTION TITLE</b> SECTION NUMBER DRAWING WHERE SECTION IS INDICATED DRAWING WHERE SECTION IS REFERENCED ADDITIONAL DRAWING REFERENCES
	<b>SECTION CALLOUT</b> SECTION NUMBER DRAWING WHERE SECTION IS INDICATED
	<b>ENLARGED PLAN CALLOUT</b> ENLARGED PLAN NUMBER DRAWING WHERE ENLARGED PLAN IS INDICATED
	MECHANICAL EQUIPMENT WITH REQUIRED SERVICE CLEARANCE INDICATED

DUCTWORK LEGEND	
	RECTANGULAR DUCT (FIRST DIMENSION REFERS TO SIDE VIEWED)
	ROUND DUCT SIZE
	FLAT OVAL DUCT SIZE
	DOUBLE WALL, EXPOSED DUCT
	FABRIC DUCT
	FLEXIBLE DUCTWORK
	FLEXIBLE CONNECTOR
	DUCT-MOUNTED SMOKE DETECTOR
	DUCT WITH DUCT LINER
	DUCT ACCESS DOOR
	DUCT WITH END CAP
	LINEAR SLOT DIFFUSER, LENGTH AS INDICATED
	LINEAR BAR GRILLE, LENGTH AS INDICATED
	SUPPLY DIFFUSER
	RETURN OR EXHAUST GRILLE
	SUPPLY DIFFUSER WITH DIRECTIONAL BLOW, SOLID HATCH INDICATES BLANK OFF PANEL
	POINT OF CONNECTION TO EXISTING
	LIMIT OF DEMOLITION
	SUPPLY AIRFLOW ARROW
	RETURN OR EXHAUST AIRFLOW ARROW
	MANUAL BALANCING DAMPER IN DUCT
	FIRE DAMPER IN DUCT
	SMOKE DAMPER IN DUCT
	COMBINATION FIRE/SMOKE DAMPER IN DUCT
	MOTORIZED DAMPER IN DUCT
	SMOKE CONTROL MANUAL BALANCING DAMPER IN DUCT
	SMOKE CONTROL MOTORIZED DAMPER IN DUCT
	SECURITY BARS IN DUCT
	DUCT WITH ACCESS PANEL
	SUPPLY/MAKEUP AIR DUCT SECTIONS
	RETURN AIR DUCT SECTIONS
	EXHAUST AIR DUCT SECTIONS
	SMOKE DETECTOR
	HUMIDITY SENSOR
	THERMOSTAT, LINE VOLTAGE
	THERMOSTAT, LOW VOLTAGE
	TEMPERATURE SENSOR
	CARBON DIOXIDE SENSOR
	CARBON MONOXIDE SENSOR
	SENSOR WELL
	DOOR UNDERCUT
	DOOR LOUVER

PIPING LEGEND	
	PIPE CAP
	PIPE TURNED DOWN
	PIPE TURNED UP
	PIPE TEE UP
	PIPE TEE DOWN
	END OF LINE CLEANOUT PLUG
	CLEANOUT PLUG
	PRESSURE GAUGE WITH GAUGE COCK
	LIQUID FILLED THERMOMETER
	UNION
	STRAINER WITH BLOWDOWN VALVE AND 3/4" HOSE END CONNECTION
	FLEXIBLE PIPE CONNECTOR
	MANUAL AIR VENT
	VALVE
	VALVE IN RISER
	MANUAL BALANCING VALVE WITH FLOW TAPS
	AUTOMATIC BALANCING VALVE WITH FLOW TAPS
	SWING CHECK VALVE
	PRESSURE REDUCING VALVE
	TRIPLE DUTY VALVE
	GAS COCK
	PRESSURE-RELIEF VALVE
	TWO-WAY CONTROL VALVE
	THREE-WAY CONTROL VALVE
	DIRECTION OF FLOW
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER

GENERAL NOTES	
A. THE CONTRACT DOCUMENTS ARE COMPLEMENTARY AND WHAT IS REQUIRED BY ONE SHALL BE AS BINDING AS IF REQUIRED BY ALL. IN THE CASE OF A CONFLICT, DISAGREEMENT, OR AMBIGUITY, PROVIDE THE BETTER QUALITY. IN THE CASE OF A CONFLICT, DISAGREEMENT, OR AMBIGUITY, PROVIDE THE GREATER QUANTITY OF WORK.	F. COORDINATE LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS WITH ALL OTHER TRADES. COORDINATE ALL PIPING AND EQUIPMENT SUPPORTED FROM STRUCTURE WITH GENERAL CONSTRUCTION WORK.
B. DRAWINGS ARE DIAGRAMMATIC AND INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY. DO NOT SCALE DRAWINGS. LOCATIONS OF ALL ITEMS INDICATED ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE. COORDINATE CONTRACT DOCUMENTS PROJECT REQUIREMENTS, WORK OF OTHERS, AND EQUIPMENT AND MATERIALS PURCHASED WITH FIELD DIMENSIONS. MANUFACTURER'S REQUIREMENTS FOR INSTALLATION, OPERATION, AND MAINTENANCE. CONTRACTOR'S INTENDED MEANS AND METHODS OF INSTALLATION, AND CONTRACTOR'S FABRICATED ITEMS TO ENSURE A PROPER FIT AND INSTALLATION.	G. PROVIDE TRAPPED DRAIN PIPING FROM DRAIN PANS OF ALL COOLING COILS, FANS AND OTHER ACTIVE DRAINS EXPOSED TO SYSTEM AIRSTREAM. PROVIDE TRAP AT CONNECTION WITH WATER SEAL DEPTH ONE INCH GREATER THAN UNIT OPERATING PRESSURE. DIRECT DRAINS TO NEAREST FLOOR DRAIN, MOP SINK, OR OTHER LOCATION APPROVED BY THE ARCHITECT.
C. MAINTAIN MAXIMUM HEADROOM AND SPACE CONDITIONS AT ALL POINTS, WHERE HEADROOM AND SPACE CONDITIONS APPEAR INADEQUATE, NOTIFY THE ARCHITECTS PRIOR TO PROCEEDING WITH INSTALLATION. MAINTAIN A MINIMUM OF 7'-0" CLEARANCE ABOVE FINISHED FLOOR TO UNDERSIDE OF PIPES, DUCTS, CONDUTS, SUSPENDED EQUIPMENT, ETC., THROUGHOUT ACCESS ROUTES IN MECHANICAL ROOMS.	H. INSTALL PIPING, DUCTWORK, AND CONDUT CONCEALED IN AREAS HAVING CEILINGS AND/OR FURRED SPACES UNLESS OTHERWISE INDICATED.
D. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION. MAKE MODIFICATIONS IN THE LAYOUT AS NEEDED TO PREVENT CONFLICT WITH WORK OF OTHER TRADES OR FOR PROPER EXECUTION OF THE WORK.	I. ALL EQUIPMENT, VALVES, DAMPERS, DAMPER AND VALVE OPERATORS SHALL BE PROVIDED WITH ADEQUATE ACCESS FOR SERVICING, MAINTENANCE, AND REPLACEMENT.
E. INSTALL ALL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.	J. SIZE ALL SPLIT-SYSTEM REFRIGERANT PIPING IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
	K. DUCT DIMENSIONS MAY BE MODIFIED ONLY WITH PRIOR APPROVAL FROM ARCHITECT. DUCT DIMENSIONS ARE IN INCHES AND INSIDE CLEAR.
	L. FOR LOCATION OF REGISTERS, GRILLES AND DIFFUSERS WITHIN CEILING GRID, REFER TO ARCHITECTURAL REFLECTED CEILING PLANS.
	M. ELEVATION INDICATED FOR RECTANGULAR DUCT, GRILLE AND LOUVER OPENINGS IS TO THE TOP OF ROUGH OPENING UNLESS OTHERWISE INDICATED. ELEVATION INDICATED FOR ROUND DUCTWORK AND PIPING IS TO CENTERLINE.
	N. BRANCH PIPING RUNOUTS TO TERMINAL UNITS SHALL BE 3/4" DIAMETER UNLESS INDICATED OTHERWISE.



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REVISIONS	
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