

GENERAL PIPING SYMBOLS

	TOP CONNECTION, 45° OR 90°
	BOTTOM CONNECTION, 45° OR 90°
	SIDE CONNECTION
	CAPPED OUTLET
	RISE OR DROP IN PIPE
	UNION
	PIPE UP
	PIPE DOWN
	INVERTED BUCKET TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL
	FLOAT & THERMOSTATIC TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL
	THERMOSTATIC TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL

PIPING SYMBOLS

	LOW PRESSURE STEAM (15 PSIG AND BELOW)
	LOW PRESSURE STEAM CONDENSATE RETURN
	CONDENSATE PUMP DISCHARGE
	HOT WATER HEATING SUPPLY
	HOT WATER HEATING RETURN
	REFRIGERANT LIQUID
	REFRIGERANT SUCTION
	DRAIN LINE

CONTROLS SYMBOLS

	HAND SWITCH (HAND-OFF-AUTO)
	CURRENT TRANSMITTER
	PRESSURE DIFFERENTIAL TRANSMITTER
	PRESSURE DIFFERENTIAL SWITCH
	PRESSURE SENSOR, HIGH
	SMOKE DETECTOR
	ROOM THERMOSTAT/TRANSMITTER - WALL MOUNT
	TEMPERATURE SENSOR
	TEMPERATURE SENSOR, LOW (FREEZE/ESTAT)
	MOISTURE (HUMIDITY) TRANSMITTER
	TEMPERATURE TRANSMITTER
	TEMPERATURE TRANSMITTER, AVERAGING ELEMENT
	VALVE OR DAMPER POSITION CONTROLLER
	INTEGRATE CONTROL POINT ON REMOTE GRAPHICS WORKSTATION AT ENERGY CONTROL CENTER
	LOCAL TEMPERATURE CONTROL PANEL
	HVAC CONTROL PANEL
	VARIABLE SPEED MOTOR CONTROLLER
	ELECTRIC OPERATED CONTROL DAMPER/OR VALVE

DUCTWORK SYMBOLS

	SUPPLY DUCT (UP & DOWN)
	EXHAUST DUCT (UP & DOWN)
	RETURN DUCT (UP & DOWN)
	SUPPLY TOP REGISTER OR GRILLE (WALL TYPE)
	EXHAUST OR RETURN CEILING REGISTER OR GRILLE
	EXHAUST OR RETURN BOTTOM REGISTER OR GRILLE (WALL TYPE)
	EXHAUST OR RETURN REGISTER OR TOP GRILLE (WALL TYPE)
	CONNECT NEW DUCT TO EXISTING DUCT
	INCLINED RISE, IN DIRECTION OF AIR FLOW
	INCLINED DROP, IN DIRECTION OF AIR FLOW
	LIMIT OF DEMOLITION
	STANDARD RADIUS ELBOW (LONG RADIUS)
	NEW DUCT (INSIDE DIMENSIONS: WIDTH x DEPTH)
	EXISTING DUCT TO REMAIN
	EXISTING DUCT TO BE REMOVED
	MANUAL VOLUME DAMPER
	AUTOMATIC CONTROL DAMPER MODULATING
	AUTOMATIC CONTROL DAMPER TWO POSITION

ABBREVIATIONS

A/E	ARCHITECT / ENGINEER
AD	ACCESS DOOR
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AHU	AIR-HANDLING UNIT
AMP	AMPERE
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
ARI	AIR CONDITIONING AND REFRIGERATION INSTITUTE
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
BDD	BACKDRAFT DAMPER
BHP	BRAKE HORSEPOWER
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
C	CENTIGRADE (CELCIUS)
CC	COOLING COIL
CFM	CUBIC FEET PER MINUTE
CM	CUBIC METER
CMIS	CUBIC METER PER SECOND
COP	COEFFICIENT OF PERFORMANCE
CP	CONDENSATE PUMP
Db	DRY-BULB TEMPERATURE
DDC	DIRECT DIGITAL CONTROLS
DEG	DEGREE
DIA	DIAMETER
DP	DEW POINT TEMPERATURE
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
EG	EXHAUST GRILLE
END	END OF MAIN DRIP (STEAM)
ENT	ENTERING
ESP	EXTERNAL STATIC PRESSURE
F	FAHRENHEIT
F&T	FLOAT AND THERMOSTATIC
F/SDPR	COMBINATION FIRE SMOKE DAMPER
FD	FIRE DAMPER
FFM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FEET
FT-LB	FOOT-POUND
GA	GAUGE
GAL	GALLONS
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
H&CW	HOT & COLD WATER
HOA	HAND/OFF/AUTOMATIC
HP	HORSEPOWER
HW	HOT WATER
HWR	HEATING HOT WATER RETURN
HWS	HEATING HOT WATER SUPPLY
HZ	HERTZ
IO	INPUT/OUTPUT
IN	INCHES
IN WC	INCH WATER COLUMN
J	INTENTIONALLY LEFT BLANK
kg	KILOGRAM
kg/hr	KILOGRAM PER HOUR
kPa	KILOPASCAL
kW	KILOWATT
kWh	KILOWATT HOUR
L	LITER
L/h	LITERS PER HOUR (OR LITERS/HOUR)
L/m	LITERS PER MINUTE (OR LITERS/MINUTE)
L/s	LITERS PER SECOND (OR LITERS/SECOND)
LAT	LEAVING AIR TEMPERATURE
LB/HR	POUNDS PER HOUR
LPR	LOW PRESSURE RETURN (STEAM CONDENSATE)
LPS	LOW PRESSURE STEAM
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
M	METER, SI UNIT
M/s	METERS PER SECOND (OR METERS/SECOND)
MA	MIXED AIR
MAT	MIXED AIR TEMPERATURE
MAX	MAXIMUM
MBH	1000 BTUH
MCA	MINIMUM BRANCH CIRCUIT AMPACITY
MIN	MINIMUM
MM	MILLIMETER
MVD	MANUAL VOLUME DAMPER
NA	NOT APPLICABLE
NC	NOISE CRITERIA
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OUTSIDE AIR
P	PUMP
PC	PUMPED CONDENSATE
PD	PRESSURE DROP
PG	PRESSURE GAGE
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH - GAGE
Q	INTENTIONALLY LEFT BLANK
R/E	RETURN OR EXHAUST
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SAT	SUPPLY AIR TEMPERATURE
SD	SMOKE DETECTOR
SEN	SENSIBLE HEAT
SI	SQUARE INCHES
SP	STATIC PRESSURE
SQ FT	SQUARE FOOT (FEET)
SS	STAINLESS STEEL
TAB	TESTING, ADJUSTING, BALANCE
TD	TEMPERATURE DIFFERENCE
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
UCD	UNDER CUT DOOR
UL	UNDERWRITERS LABORATORY
V	VALVE
VD	VOLUME DAMPER (MANUAL OPPOSED BLADE)
VHA	VETERANS HEALTH ADMINISTRATION
VSMC	VARIABLE SPEED MOTOR CONTROLLER
W	WATTS
Wb	WET-BULB (TEMPERATURE)
Y	INTENTIONALLY LEFT BLANK
Z	INTENTIONALLY LEFT BLANK

DRAWING SYMBOLS

	DETAIL NUMBER
	DRAWING NUMBER WHERE DRAWN
	SECTION LETTER
	DRAWING NUMBER WHERE SHOWN
	EQUIPMENT ABBREVIATION (EXHAUST FAN)
	EXHAUST FAN NUMBER IS ROOM SERVING
	TYPICAL EQUIPMENT TAG

GENERAL NOTES

- FIELD VERIFY EXISTING CONDITIONS PRIOR TO BEGINNING WORK.
- SEE PLAN G1102 AND SPECIFICATION SECTION 01 00 00 FOR PROJECT SEQUENCING OF WORK. COORDINATE ANY SHUTDOWNS WITH OWNER. FIELD VERIFY CONDITIONS FOR RELOCATION/RECONNECTION OF WORK AND COORDINATE SCHEDULE WITH OWNER.
- VERIFY THE PRESENCE OF EXISTING CONDUIT IN THE EXISTING FLOOR SLABS PRIOR TO BEGINNING WORK. SCAN FLOORS TO VERIFY THE PRESENCE OF EXISTING CONDUITS IN THE EXISTING FLOOR SLABS PRIOR TO ANY CUTTING OR CREATING ANY PENETRATIONS.
- SEISMIC PROVISIONS NOT REQUIRED.
- SEE PROJECT MANUAL FOR SPECIFICATIONS AND OTHER CONTRACT REQUIREMENTS.
- SEE PIPING AND DUCTWORK DETAILS FOR LOCATIONS OF BALANCE AND SHUTOFF VALVES AND AIR BALANCING DAMPERS.
- ALL REMOVED GRILLES, DUCTWORK, EQUIPMENT, ACCESSORIES, ETC., THAT ARE NOT TURNED OVER TO THE OWNER, BECOME THE PROPERTY OF THIS CONTRACTOR AND SHALL BE RESPONSIBLE FOR JOBSITE REMOVAL.
- IF ROOMS REQUIRE CEILING DEMOLITION FOR HVAC WORK, THE HVAC CONTRACTOR SHALL REMOVE THE CEILINGS NECESSARY TO PERFORM HVAC WORK AND RESTORE THE CEILINGS TO NEW CONDITION WHEN THE WORK IS COMPLETED. COORDINATE WORK WITH OTHER SUCH THAT WORK IS MINIMIZED AND PREFORMED IN AN ORDERLY MANNER.
- THE HVAC CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES, SIZES, CAPACITIES, ACCESSORIES, SEQUENCES, MATERIALS, MEANS AND METHODS, SPACE REQUIREMENTS, ACCESSIBILITY, CODE CLEARANCES, PERFORMANCE, FABRICATION PROCESSES, AND TECHNIQUES OF CONSTRUCTION FOR THE HVAC WORK. THE HVAC CONTRACTOR SHALL COORDINATE ALL HVAC WORK WITH THAT OF ALL OTHER TRADES, AND PERFORM ALL WORK IN A SAFE MANNER. THE HVAC CONTRACTOR IS SOLELY RESPONSIBLE FOR EQUIPMENT SUBSTITUTIONS AND CHANGES PERFORMED BY THE CONTRACTOR.
- SEAL ALL PIPING AND DUCTWORK PENETRATIONS AIR TIGHT THRU WALLS, FLOORS, OR PARTITIONS IDENTIFIED AS SOUND WALLS, SMOKE TIGHT WALLS, FIRE BARRIERS, SMOKE BARRIERS, SHAFTS OR FIRE RATED CONSTRUCTION INDICATED ON THE ARCHITECTURAL DRAWINGS. MAINTAIN ALL DESIGNATED FIRE RATINGS, SMOKE RATINGS AND UL LISTINGS.
- ALL PIPING AND DUCTS IN FINISHED ROOMS OR SPACES SHALL BE CONCEALED IN A FURRED CHASE OR ABOVE THE HARD SUSPENDED CEILING.
- PROVIDE ACCESS DOORS IN DUCTWORK AND ACCESS PANELS IN WALLS AND CEILINGS FOR ACCESS TO ALL CONCEALED EQUIPMENT INCLUDING BUT NOT LIMITED TO FIRE, SMOKE, & FIRE/SMOKE DAMPERS, TURNING VANES, CONTROL DAMPERS, BACKDRAFT DAMPERS, SMOKE DETECTORS, CONTROLS, CONTROL VALVES, SHUT-OFF VALVES, AIR VENTS, TRAPS, CLEANOUTS, AIR TERMINALS, EXPANSION COMPENSATING DEVICES, HEATING COILS, COOLING COILS, FILTERS, FANS, PROVIDE DUCT ACCESS DOORS AT ALL TURNING VANES LOCATED IN SUPPLY, RETURN AND EXHAUST DUCTWORK. ACCESS PANELS SHALL BE FURNISHED AND INSTALLED UNDER THE ARCHITECTURAL SPECIFICATIONS.
- DESIGN OF ALL HVAC SUPPORTS, EQUIPMENT PADS AND DUCT LINTELS IS THE RESPONSIBILITY OF THE HVAC CONTRACTOR UNLESS SPECIFICALLY NOTED OR DETAILED OTHERWISE IN THESE PLANS.
- ALL DUCTWORK AND PIPING INSULATION DAMAGED DURING CONSTRUCTION OR OTHERWISE SHALL BE PATCHED TO MATCH EXISTING AND MAINTAIN INSULATION VAPOR BARRIER.
- INSTALL ALL DUCTWORK AND PIPING TO BEST SUIT FIELD CONDITIONS. DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED TO DETERMINE EXACT LOCATION. CERTAIN OFFSETS ARE SHOWN IN THE DUCTWORK AND PIPING TO INDICATE THE GENERAL POSITION AND RELATIONSHIP OF THE SYSTEMS. PROVIDE ADDITIONAL OFFSETS, SIMILAR TO THOSE SHOWN, AS REQUIRED BY FIELD CONDITIONS.
- ALL DUCTWORK SHALL BE CONSTRUCTED OF SHEETMETAL. THE FIRST FIGURE OF DUCT SIZE INDICATES DIMENSION OF FACE SHOWN OR INDICATED. DUCT SIZES ARE NET INSIDE DIMENSIONS. ALL RECTANGULAR DUCTWORK DIMENSIONS ARE INTERIOR DIMENSIONS. USE OF DUCT LINING IS PROHIBITED.
- ALL BRANCH DUCTWORK TAKEOFFS SHALL BE EXPANDED AT 45° ANGLE. REFER TO DUCT CONNECTION AND BRANCH DETAILS ON MM550.
- BALANCE/REBALANCE GRILLES AND DIFFUSERS TO AIR QUANTITIES SHOWN DRAWINGS. COORDINATE WORK WITH TESTING & BALANCING CONTRACTOR.
- WHEN THERE ARE CONFLICTING STATEMENTS OR CONFLICTING INFORMATION IN BIDDING DOCUMENTS, THE BIDDER SHALL BASE HIS BID ON THE CONFLICT, WHICH WILL RESULT IN THE HIGHEST COST. IN THE CASE OF CONFLICTS OR DISCREPANCIES WITHIN OR AMONG THE CONTRACT DRAWINGS, THE BETTER QUALITY, MORE STRINGENT REQUIREMENTS OR GREATER QUANTITY OF WORK, AS DETERMINED BY THE GOVERNMENT, SHALL BE PROVIDED.

PROPOSED PHASING OF HVAC WORK

- PERFORM ALL HVAC WORK AS INDICATED IN DRAWINGS AND SPECIFICATIONS.
- INSTALL NEW INTAKE DUCTWORK FOR EXISTING AHU-135-1 BY REMOVING EXISTING OUTSIDE AIR INTAKE HOOD WITH UPPER ELBOW AND INSTALLING NEW INTAKE DUCT CONNECTION.
- REMOVE EXISTING ROOF EXHAUST FAN.
- INSTALL CURBING AND PERFORM ROOF REPAIRS FOR INSTALLATION OF NEW AHU-135-2.
- INSTALL ALL NEW DUCTWORK ON ROOF.
- LIFT NEW AHU-135-2 ONTO ROOF, SET AND TEST.
- REMOVE EXISTING ROOFTOP AC UNIT FROM HIGH ROOF AND COMPLETE INSTALLATION OF SUPPLY AND RETURN DUCTWORK TO SERVE RECEIVING AREA. CONTRACTOR TO COORDINATE SCHEDULE OF THIS EVENT WITH COR TO MINIMIZE SHUTDOWN TIME OF RECEIVING AREA FOR NO MORE THAN 24 HOURS.
- TESTING OF NEW AHU-135-2 HAS TO OCCUR AFTER NEW TRANSFORMER HAS BEEN INSTALLED. SEE ELECTRICAL SEQUENCING.

		<div>CONSULTANT</div> <div>Consultant: RING & DuCHATEAU LLP 17400 W. CAPITOL DRIVE BROOKFIELD, WI 53045 (414) 778-1700</div> <div> RING & DUCHATEAU</div>		<div>ARCHITECT/ENGINEER OF RECORD</div> <div>A/E: PROJECT LEAD Architect, Structural Engineer, Civil Engineer</div> <div> GUIDON DESIGN GUIDON DESIGN INC. 905 N CAPITOL AVE. SUITE 100 INDIANAPOLIS, IN 46204 317.800.0388 WWW.GUIDONDESIGN.COM SUSTAINABLE ARCHITECTURE + ENGINEERING</div>		<div>STAMP</div> <div> MICHAEL J. JUSHKA E-35472 MILWAUKEE, WI Professional Engineer 7.24.2017</div>		<div>Office of Construction and Facilities Management</div> <div> U.S. Department of Veterans Affairs</div>		<div>Drawing Title</div> <div>MECHANICAL GENERAL NOTES, ABBREVIATIONS AND SYMBOLS</div> <div>Approved: VA MILWAUKEE</div>		<div>Phase</div> <div>100% BID SET</div> <div>NON-SPRINKLERED</div>		<div>Project Title</div> <div>INSTALL EMS BUILDING 102</div> <div>Location MILWAUKEE VAMC</div>		<div>Project Number</div> <div>695-17-108</div> <div>Building Number</div> <div>BLDG 102</div>		<div>Drawing Number</div> <div>MI000</div>	
Revisions:		Date:																	