

PIPING SYMBOLS

Table listing piping symbols and their corresponding descriptions, including High Pressure Steam (HPS), Medium Pressure Steam (MPS), and various condensate and heating lines.

PIPING SYMBOLS

Table listing piping symbols and their corresponding descriptions, including Feedwater Pump (FWPD), Condensate Transfer Pump (CTPD), and various boiler and water supply lines.

GENERAL PIPING SYMBOLS

Table listing general piping symbols and their corresponding descriptions, including direction of pipe pitch, anchors, reducers, and various connection types.

VALVE SYMBOLS

Table listing valve symbols and their corresponding descriptions, including Gate Valve, Globe Valve, Check Valve, and various control valves.

CONTROLS SYMBOLS

Table listing control symbols and their corresponding descriptions, including Room Thermostat, Room Humidistat, Temperature Transmitter, and various sensors.

CONTROLS SYMBOLS

Table listing control symbols and their corresponding descriptions, including Pressure Switch, Electronic Transducer, Carbon Dioxide Transmitter, and various control panels.

CONTROLS SYMBOLS

Table listing control symbols and their corresponding descriptions, including Temperature Sensing Element, Motor Starter, and Electric Operated Control Damper/Valve.

AIR TERMINAL SYMBOLS

Table listing air terminal symbols and their corresponding descriptions, including Terminal Unit with Reheat Coil, Double Duct Mixing Box, and Fan Powered Variable Volume Terminal Unit.

TERMINAL UNIT SYMBOLS

Table listing terminal unit symbols and their corresponding descriptions, including Convectors, Radiators, Fan Coil Units (FCU), and various air conditioning units.

DUCTWORK SYMBOLS

Table listing ductwork symbols and their corresponding descriptions, including Combination Fire/Smoke Damper, Point of Change in Duct Construction, and various duct types.

DUCTWORK SYMBOLS

Table listing ductwork symbols and their corresponding descriptions, including Flexible Connection, Vaned Elbow, Standard Radius Elbow, and various duct fittings.

DUCTWORK SYMBOLS

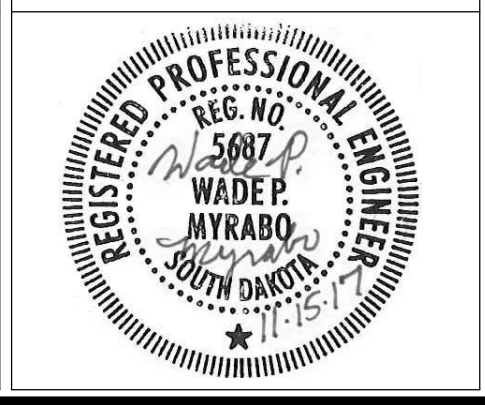
Table listing ductwork symbols and their corresponding descriptions, including Supply Duct, Exhaust Duct, Return Duct, and various ceiling diffusers.

DRAWING SYMBOLS

Table listing drawing symbols and their corresponding descriptions, including Detail Number, Section Letter, Building No., and Item Number.

CONSULTANTS: WPE WEST PLAINS ENGINEERING, INC. 4609 SOUTH TECHLINK CIRCLE • SIOUX FALLS, SD 57106

RISE STRUCTURAL ASSOCIATES, INC. 101 Railroad Ave. - PO Box 39 Hamburg, SD 57032



ARCHITECTS/ ENGINEERS: MSH ARCHITECTS 625 S. MINNESOTA AVENUE, SUITE 204 SIOUX FALLS, SOUTH DAKOTA 57104-4873

Drawing Title: MECHANICAL SYMBOLS SHEET Approved: Project Director

Project Title: V.A. HEALTH CARE SYSTEM RENOVATE 5TH FLOOR SURGERY Project Number: 438-15-201 Building Number: 5 Drawing Number: 5-MH001

Office of Construction and Facilities Management

100% CONSTRUCTION DRAWINGS

Vertical scale markings on the left margin: three inches = one foot, one and one half inches = one foot, one inch = one foot, three quarters inch = one foot, one half inch = one foot, three eighths inch = one foot, one quarter inch = one foot, one eighth inch = one foot.

ABBREVIATIONS

AE ARCHITECT / ENGINEER
AAHX AIR TO AIR HEAT EXCHANGER
AB AIR BLENDER
AAV AUTOMATIC AIR VENT
ACC AIR COOLED CONDENSER
ACCH AIR COOLED CHILLER
ACCU AIR-COOLED CONDENSING UNIT (SUBMISSION1)
ACU AIR CONDITIONING UNIT
ACD AUTOMATIC CONTROL DAMPER,MODULATING
ACD-TP AUTOMATIC CONTROL DAMPER TWO POSITION
AD ACCESS DOOR
AF AFTER FILTER
AFCV AIR FLOW CONTROL VALVE
AFF ABOVE FINISHED FLOOR
AFMD AIR FLOW MEASURING DEVICE
AFW AIR FOIL WHEEL (FAN)
AHU AIR HANDLING UNIT
AMP AMPERE
AP ACCESS PANEL
APD AIR PRESSURE DROP
ARI AIR CONDITIONING AND REFRIGERATION INSTITUTE
AS AIR SEPARATOR
ASME AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AW AIR WASHER
AXF AXIAL FLOW
B BOILER
BD BUTTERFLY DAMPER
BDO BACKDRAFT DAMPER
BDR BASE BOARD RADIATOR
BFF BACKFLOW PREVENTER
BFT BOILER PLANT FIRE TUBE
BG BOTTOM GRILLE
BHP BRAKE HORSEPOWER
BHW HOT WATER HEATING BOILER
BHX BOILER BLOWDOWN HEAT EXCHANGER
BIW BACKWARD INCLINED WHEEL (FAN)
BMT BONE MARROW TRANSPLANT
BR BOTTOM REGISTER
BSC BIOLOGICAL SAFETY CABINETS
BT BLOWOFF TANK
BTC BLOWOFF TANK CONTROL VALVE
BTU BRITISH THERMAL UNIT
BTUH BRITISH THERMAL UNIT PER HOUR
BWT BOILER PLANT WATER TUBE
C CENTIGRADE (CELCIUS)
CC COOLING COIL
CCD COOLING COIL CONDENSATE DRAIN
CD CEILING DIFFUSER
CD-1 CONSTRUCTION DOCUMENTS (SUBMISSION1)
CD-2 CONSTRUCTION DOCUMENTS (SUBMISSION2)
CENT CENTRIFICAL
CPH CUBIC FEET PER HOUR
CPM CUBIC FEET PER MINUTE
CFT CUBIC FEET
CFP CHEMICAL FEED PUMP
CG CEILING GRILLE
CH CHILLER
CHP CHILLED WATER PUMP
CHW CHILLER WATER
CHR CHILLED WATER RETURN
CHS CHILLED WATER SUPPLY
CI CAST IRON
CM CARBON MONOXIDE
CM CUBIC METER
CMS CUBIC METER PER SECOND
CO CLEAN OUTF
CO2 CARBON DIOXIDE
COMP COMPRESSOR UNIT
COP COEFFICIENT OF PERFORMANCE
CP CONDENSATE PUMP
CR CEILING REGISTER
CS CONDENSATE STORAGE TANK
CSS CLEAN STEAM GENERATOR
CT COOLING TOWER
CU CONDENSING UNIT
CUH CABINET UNIT HEATER
CV CONSTANT VOLUME
CW COLD WATER (POTABLE)
CWCC CHILLED WATER COOLING COIL
CWP CONDENSER WATER PUMP
CWR CONDENSER WATER RETURN (TO COOLING TOWER)
CWS CONDENSER WATER SUPPLY (FROM COOLING TOWER)

D DAMPER - AUTOMATIC
D-1 OUTDOOR AIR DAMPER
D-2 RETURN AIR DAMPER
D-3 RELIEF AIR DAMPER
DB DECIBELS
Db DRY-BULB TEMPERATURE
DD-1 DESIGN DEVELOPMENT (SUBMISSION1)
DD-2 DESIGN DEVELOPMENT (SUBMISSION2)
DDC DIRECT DIGITAL CONTROLS DEG DEGREE
DF DIFFUSER
DA DIAMETER
DIW DEIONIZED WATER
DP DEW POINT TEMPERATURE
DP DIFFUSER PLATE
DPA DIFFERENTIAL PRESSURE ASSEMBLY
DPS DIFFERENTIAL PRESSURE SENSOR
DX DIRECT EXPANSION
DXCC DIRECT EXPANSION COOLING COIL
EA EXHAUST AIR
EAT ENTERING AIR TEMPERATURE
EC EVAPORATIVE COOLER
ECC ENGINEERING CONTROL CENTER
ECU EVAPORATIVE CONDENSER UNIT
EDU ELECTRIC DUCT HEATER
EER ENERGY EFFICIENCY RATIO
EF EXHAUST FAN
EG EXHAUST GRILLE
EGS EMERGENCY GAS SHUTOFF
EGT ENTERING GLYCOL TEMPERATURE
EH EXHAUST HOOD
EJ EXPANSION JOINT
EMD END OF MAIN DRIP (STEAM)
ENT ENTERING
ER EXHAUST REGISTER
ERC ELECTRIC REHEAT COIL
ERP ELECTRIC RADIANT PANEL
ESU INTENSIVE STATIC PRESSURE
ET EXPANSION TANK
ETO ETHYLENE OXIDE
EUN ELECTRIC UNIT HEATER
EWC EVAPORATIVE WATER COOLER
EWT ENTERING WATER TEMPERATURE
EX EXISTING
F FAHRENHEIT
F&T FLOAT AND THERMOSTATIC DAMPER
FA FREE AREA
FC FLEXIBLE CONNECTION
FCU FAN COIL UNIT (4 PIPE)
FCUH FAN COIL UNIT HEATING ONLY
FCW FORWARD CURVED WHEEL (FAN)
FD FLOOR DRAIN
FD FIRE DAMPER
FF FINAL FILTER
FHx FLUE GAS/FEEDWATER HEAT EXCHANGER
FM FLOW METER
FOP FUEL OIL PUMP
FOT FUEL OIL TANK
FOHX FUEL OIL HEAT EXCHANGER
FPM FEET PER MINUTE
FPS FEET PER SECOND
FPTU FAN POWERED TERMINAL UNIT
FR FLOOR REGISTER
FRP FIBER REINFORCED POLYESTER
FS FLOW SWITCH
FSTAT FREEZESTAT
FT FEET
FT-LB FOOT-POUND
FTR FIN TUBE RADIATION
FV FACE VELOCITY
GA GAUGE
GAL GALLONS
GH GRAVITY HOOD
GPD GALLONS PER DAY
GPH GALLONS PER HOUR
GPM GALLONS PER MINUTE
GPR GAS PRESSURE REGULATOR
GS GALVANIZED STEEL

H HUMIDIFIER
H&CW HOT & COLD WATER
HAC HOUSEKEEPING AID CLOSET
HB HOSE BIBB
HC HEATING COIL
HD HEAD
HD HOOD
HOA HANDOFF/AUTOMATIC
HP HEAT PUMP
HP HORSEPOWER
HPDT HIGH PRESSURE DRIP TRAP
HPR HIGH PRESSURE RETURN (STEAM CONDENSATE)
HPS HIGH PRESSURE SUPPLY (STEAM)
HRC HEAT RECOVERY COIL
HRD HEAT RECOVERY DEVICE
HRP HYDRONIC RADIANT (CEILING) PANEL
HRW HEAT RECOVERY WHEEL
HSTAT HUMIDISTAT
HTM HUMIDIFIER TERMINAL
HUM HUMIDIFIER UNIT MOUNTED
HVU HEATING AND VENTILATING UNIT
HW HOT WATER
HWC HOT WATER COIL
HWHC HOT WATER HEATING COIL
HWP HEATING HOT WATER PUMP
HWR HEATING HOT WATER RETURN
HWS HEATING HOT WATER SUPPLY
HWUH HOT WATER UNIT HEATER
HVD HOISTWAY VENT DAMPER
HX HEAT EXCHANGER
HZ HERTZ
IO INPUT/OUTPUT
IAQ INDOOR AIR QUALITY
IBT INVERTED BUCKET TRAP
ICF IN-LINE CENTRIFUGAL FAN
ICU INTENSIVE CARE UNIT
ID INSIDE DIAMETER
IFB INTEGRAL FACE AND BYPASS
IN INCHES
IN HG INCHES OF MERCURY
IN WC INCH WATER COLUMN
IN WG INCH WATER GAUGE
INLS INCH-POUND
IPLV INTEGRATED PART LOAD VALUE
IRH INFRARED HEATER
IS INSECT SCREEN
IU INDUCTION UNIT
IV INLET VANES
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
LBS/HR POUNDS PER HOUR
LF LINEAR FOOT (FEET)
LGT LEAVING GLYCOL TEMPERATURE
LH LATENT HEAT
LPG LIQUID PROPANE GAS
LPR LOW PRESSURE RETURN (STEAM CONDENSATE)
LPRC LOW PRESSURE STEAM RETURN (CLEAN)
LLHX LIQUID TO LIQUID HEAT EXCHANGER
LPS LOW PRESSURE STEAM
LPRC LOW PRESSURE STEAM (CLEAN)
LSD LINEAR SLOT DIFFUSER
LTOP LOCAL TEMPERATURE CONTROL PANEL
LVG LEAVING
LVR LOUVER
LWT LEAVING WATER TEMPERATURE

M METER, SI UNIT
M/s METERS PER SECOND (OR METERS/SECOND)
MA MIXED AIR
M&M MAXIMUM MAKE-UP AIR UNIT
MAV MANUAL AIR VENT
MAX MAXIMUM
MB MIXING BOX
MBH 1000 BTUH
MCA MINIMUM BRANCH CIRCUIT AMPACITY
MER MECHANICAL EQUIPMENT ROOM
MERV MINIMUM EFFICIENCY REPORTING VALUE
MH HANDLE
MHP MOTOR HORSEPOWER
MIN MINIMUM
MM MILLIMETER
MOV MOTOR OPERATED VALVE
MPR MEDIUM PRESSURE RETURN (STEAM CONDENSATE)
MPS MEDIUM PRESSURE STEAM
MRI MAGNETIC RESONANCE IMAGING
MTD MEAN TEMPERATURE DIFFERENCE
MVD MANUAL VOLUME DAMPER
MZ MULTI-ZONE
NA NOT APPLICABLE
NC NOISE CRITERIA
NC NORMALLY CLOSED
NG NATURAL GAS
NGFM NATURAL GAS FLOWMETER
NO NORMALLY OPEN
NOAA NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION
NOM NOMINAL
NPLV NON-STANDARD PART LOAD VALUE
NPSH NET POSITIVE SUCTION HEAD
NTS NOT TO SCALE
OA OUTSIDE AIR
OAG OUTSIDE AIR GRILLE
OAO OUTSIDE AIR INTAKE
OD OUTSIDE DIAMETER
OFM OIL FLOWMETER
OR OPERATING ROOM
P PUMP
PA PASCAL
PC PUMPED CONDENSATE
POF POUNDS PER CUBIC FOOT (FEET)
PD PRESSURE DROP
PEF PROPELLER (TYPE) EXHAUST FAN
PF PRE-FILTER
PG PRESSURE GAGE
PGW PROPYLENE GLYCOL-WATER (SOLUTION)
PHC PREHEAT COIL
PPM PARTS PER MILLION
PRS PRESSURE REGULATING (VALVE) STATION
PRV PRESSURE REGULATING VALVE
PSI POUNDS PER SQUARE INCH
PSIA POUNDS PER SQUARE INCH - ABSOLUTE
PSIG POUNDS PER SQUARE INCH - GAGE
PSS PRIMARY SECONDARY SYSTEM
PSV PRESSURE SAFETY VALVE
PTAC PACKAGED TERMINAL AIR CONDITIONER
R/E RETURN OR EXHAUST
RA RETURN AIR
RAD REFRIGERANT AIR DRYER
RAF RADIO FREQUENCY
RAHX ROTARY AIR HEAT EXCHANGER
RAT RETURN AIR TEMPERATURE
ROCH REMOTE CONDENSER CHILLER
RCU RECIPROCATING CHILLER UNIT
RD REFRIGERANT DISCHARGE
RDS ROOM DATA SHEETS
REA RELIEF AIR
RF RETURN FAN
RG RETURN GRILLE
RH RELATIVE HUMIDITY
RHC REHEAT COIL
RHG REFRIGERANT HOT GAS
RL REFRIGERANT LIQUID LINE
RLA RUN LOAD AMPERE
RO REVERSE OSMOSIS
RPM REVOLUTIONS PER MINUTE
RR RETURN REGISTER
RS REFRIGERANT SUCTION
RTU ROOF TOP UNIT
RV RELIEF VALVE

SA SUPPLY AIR
SAD SOUND ATTENUATING DEVICE
SAT SUPPLY AIR TEMPERATURE
SC SHADING COEFFICIENT
SCFM STANDARD CUBIC FEET PER MINUTE
SCI SCENIC CODE INJURY
SCR SILICON CONTROLLED RECTIFIER
SD SMOKE DETECTOR
SD SUPPLY AIR DIFFUSER
SD-1 SCHEMATIC DESIGN (SUBMISSION1)
SD-2 SCHEMATIC DESIGN (SUBMISSION2)
SDRP SMOKE DAMPER
SDR SMOKE DAMPER (RETURN)
SDS SMOKE DAMPER (SUPPLY)
SEN SENSIBLE HEAT
SF SUPPLY FAN
SG SUPPLY AIR GRILLE
SH STEAM HUMIDIFIER
SHC STEAM HEATING COIL
SI SQUARE INCHES
SP STATIC PRESSURE
SP GR SPECIFIC GRAVITY
SPD SUPPLY PROCESS AND DISTRIBUTION
SPRV STEAM PRESSURE REDUCING VALVE
SPS STATIC PRESSURE SENSOR
SQ FT SQUARE FOOT (FEET)
SR SUPPLY AIR REGISTER
SS STAINLESS STEEL
SSHX STEAM TO STEAM HEAT EXCHANGER
SSR SOLID SEPARATOR
ST STEAM TRAP
SUH STEAM UNIT HEATER
SV STEAM PRESSURE REDUCING VALVE
SVS STEAM VENT SILENCER
SWHX STEAM TO WATER HEAT EXCHANGER
T & PCV TEMPERATURE AND PRESSURE CONTROL VALVE
TAB TESTING, ADJUSTING, BALANCE
TD TEMPERATURE DIFFERENCE
TDH TOTAL DYNAMIC HEAD
TDS TOTAL DISSOLVED SOLIDS
TG TRANSFER GRILLE
TP TRAP
TR TOP REGISTER
TSP TOTAL STATIC PRESSURE
TSTAT THERMOSTAT
TU TERMINAL UNIT
TWU THRU-WALL UNIT
UC UNDER CUT
UC UNIT COOLER
UH UNIT HEATER
UL UNDERWRITERS LABORATORY
URV UPBLAST UNIT VENTILATOR
V VALVE
VAV VANE-AXIAL FAN
VAV VARIABLE AIR VOLUME
VD VOLUME DAMPER (MANUAL OPPOSED BLADE)
VFD VARIABLE FREQUENCY DRIVE
VHA VETERANS HEALTH ADMINISTRATION
VI VIBRATION ISOLATOR
VIV VARIABLE INLET VANES
VP VACUUM PUMP
VPS VARIABLE PRIMARY SYSTEM
VR VACUUM (STEAM CONDENSATE) RETURN
VSD VARIABLE SPEED DRIVE
VUH VERTICAL UNIT HEATER
W WATTS
WAG WASTE ANESTHESIA GAS
WB WET-BULB (TEMPERATURE)
WC WATER COOLED
WCH WATER COOLED CHILLER
WCCU WATER COOLED CONDENSING UNIT
WCHP WATER COOLED HEAT PUMPS
WCPU WATER COOLED PACKAGED UNIT
WEF WALL EXHAUST FAN
WF WATER FILTER
WFCV WATER FLOW CONTROL VALVE
WFM WATER FLOWMETER
WFMD WATER FLOW MEASURING DEVICE
WG WATER GAGE
WPD WATER SIDE PRESSURE DROP
YR YEAR

UC UNDER CUT
UC UNIT COOLER
UH UNIT HEATER
UL UNDERWRITERS LABORATORY
URV UPBLAST UNIT VENTILATOR
V VALVE
VAV VANE-AXIAL FAN
VAV VARIABLE AIR VOLUME
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WB WET-BULB (TEMPERATURE)
WC WATER COOLED
WCH WATER COOLED CHILLER
WCCU WATER COOLED CONDENSING UNIT
WCHP WATER COOLED HEAT PUMPS
WCPU WATER COOLED PACKAGED UNIT
WEF WALL EXHAUST FAN
WF WATER FILTER
WFCV WATER FLOW CONTROL VALVE
WFM WATER FLOWMETER
WFMD WATER FLOW MEASURING DEVICE
WG WATER GAGE
WPD WATER SIDE PRESSURE DROP
YR YEAR

GENERAL NOTES

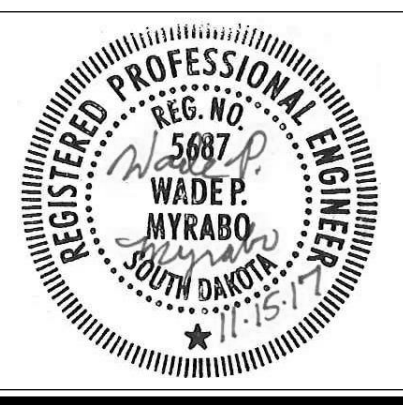
- 1. ALL PIPING AND DUCTS IN FINISHED ROOMS OR SPACES SHALL BE CONCEALED IN A FURRED CHASE OR ABOVE GYPSUM BOARD OR ACOUSTIC CEILING
2. THE FIRST FIGURE OF DUCT SIZE INDICATES DIMENSION OF FACE SHOWN OR INDICATED. DUCT SIZES ARE NET INSIDE DIMENSIONS.
3. ACCESS PANELS IN HARD SUSPENDED CEILINGS ARE REQUIRED FOR ALL VALVES, TRAPS, DAMPERS, CLEANOUTS, CONTROLS, ETC. ACCESS PANELS SHALL BE FURNISHED AND INSTALLED UNDER THE ARCHITECTURAL SPECIFICATIONS.
4. TOTAL STATIC PRESSURE NOTED IN THE SCHEDULES INCLUDES DUCT SYSTEM, TERMINAL UNITS, FILTERS, COILS, ETC.
5. FOR TYPICAL STEAM AND WATER PIPING CONNECTIONS TO EQUIPMENT, SEE STANDARD EQUIPMENT DETAILS.
6. DIFFUSER, REGISTER AND GRILLE SIZES SHOWN ON FLOOR PLANS ARE NECK SIZES.
7. WATER PIPE CONNECTIONS TO AIR HEATING AND COOLING COILS SHALL BE MADE TO PROVIDE COUNTER FLOW BETWEEN WATER AND AIR.
8. WALL TYPE EXHAUST REGISTERS NOTED AS "BR" ON DRAWINGS ARE TO BE INSTALLED WITH BOTTOM ELEVATION OF REGISTER AT 4" (101mm) ABOVE FINISHED FLOOR.
9. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF CEILING DIFFUSERS, REGISTERS, AND GRILLES.

Scale bars for 1 inch, 1/2 inch, 3/4 inch, 1/4 inch, 1/8 inch, 1/16 inch.

100% CONSTRUCTION DRAWINGS

CONSULTANTS: WEST PLAINS ENGINEERING, INC. WPE #S: BS15052
4609 SOUTH TECHLINK CIRCLE • SIOUX FALLS, SD 57106
PHONE: (605) 362-3753 • FAX: (605) 362-3759
WWW.WESTPLAINSENGINEERING.COM

RISE STRUCTURAL ASSOCIATES, INC.
101 Railroad Ave. - PO Box 39
Harrisburg, SD 57032
(605) 743-2510
fax(605) 743-2513



ARCHITECTS/ ENGINEERS: MSH ARCHITECTS
625 S. MINNESOTA AVENUE, SUITE 204
SIOUX FALLS, SOUTH DAKOTA 57104-4873
TELE: (605) 332-7850 FAX: (605) 332-3539

Drawing Title: MECHANICAL ABBREVIATIONS AND GENERAL NOTES
Approved: Project Director

Project Title: V.A. HEALTH CARE SYSTEM RENOVATE 5TH FLOOR SURGERY
Project Number: 438-15-201
Building Number: 5
Drawing Number: 5-MH002
Date: OCTOBER 17, 2017
Checked: WM
Drawn: DNT
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Office of Construction and Facilities Management

A  
 three inches = one foot  
 B  
 one and one half inches = one foot  
 C  
 one inch = one foot  
 D  
 three quarters inch = one foot  
 E  
 one half inch = one foot  
 F  
 three eighths inch = one foot  
 G  
 one quarter inch = one foot  
 H  
 one eighth inch = one foot  
 I  
 one eighth inch = one foot



**KEYNOTES:**

**MECHANICAL SPECIFIC NOTES**

M401 EA UP. SEE HVAC VENTILATION PLAN - FIFTH FLOOR FOR CONTINUATION.

M438 EXHAUST AIR DUCT UP THRU FLOOR. SEE HVAC VENTILATION PLAN - FIFTH FLOOR FOR CONTINUATION. COORDINATE ALL WALL, CEILING, AND FLOOR CUTTING AND PATCHING WITH GENERAL CONTRACTOR. VERIFY EXACT SIZE AND LOCATION OF EXISTING.

M439 EXHAUST AIR DUCT CONNECTED TO EXISTING EXHAUST GRILLE. VERIFY EXACT SIZE AND LOCATION.

M441 CONNECT NEW EXHAUST DUCT TO EXISTING EXHAUST DUCT IN CHASE. VERIFY EXACT SIZE AND LOCATION. CONTRACTOR SHALL FIELD VERIFY EXACT SIZE AND LOCATION OF EXISTING PRIOR TO CONNECTION. PATCH WALL TO MATCH EXISTING. COORDINATE WITH GENERAL CONTRACTOR.

**GENERAL NOTES:**

A ALL PIPING AND DUCTS IN FINISHED ROOMS OR SPACES SHALL BE CONCEALED IN A FURRED CHASE OR ABOVE THE HARD SUSPENDED CEILING.

B THE FIRST FIGURE OF DUCT SIZE INDICATES DIMENSION OF FACE SHOWN OR INDICATED.

C DUCT SIZES ARE NET INSIDE DIMENSIONS.

D ACCESS PANELS IN HARD SUSPENDED CEILINGS ARE REQUIRED FOR ALL VALVES, TRAPS, DAMPERS, CLEANOUTS, CONTROLS, ETC. ACCESS PANELS SHALL BE FURNISHED AND INSTALLED UNDER THE ARCHITECTURAL SPECIFICATIONS.

E TOTAL STATIC PRESSURE NOTED IN THE SCHEDULES INCLUDES DUCT SYSTEM, TERMINAL UNITS, FILTERS, COILS, ETC.

F FOR TYPICAL STEAM AND WATER PIPING CONNECTIONS TO EQUIPMENT, SEE STANDARD EQUIPMENT DETAILS.

G DIFFUSER, REGISTER AND GRILLE SIZES SHOWN ON FLOOR PLANS ARE NECK SIZES.

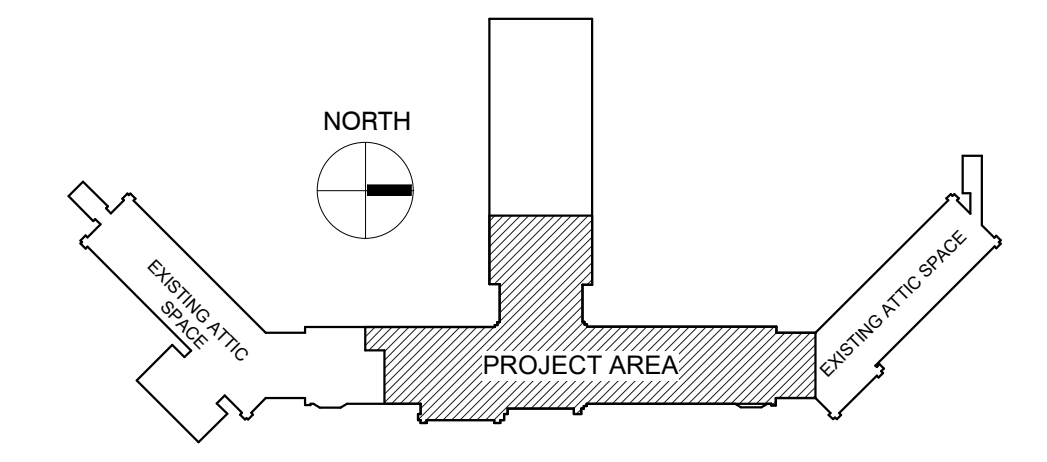
H WATER PIPE CONNECTIONS TO AIR HEATING AND COOLING COILS SHALL BE MADE TO PROVIDE COUNTER FLOW BETWEEN WATER AND AIR.

I WALL TYPE EXHAUST REGISTERS NOTED AS "BR" ON DRAWINGS ARE TO BE INSTALLED WITH BOTTOM ELEVATION OF REGISTER AT 7" (175MM) ABOVE FINISHED FLOOR.

J REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF CEILING DIFFUSERS, REGISTERS, AND GRILLES.

K ALL PRESSURES LISTED ARE GAGE PRESSURE UNLESS OTHERWISE NOTED.

**KEY PLAN:**



**HVAC VENTILATION PLAN - FOURTH FLOOR**  
SCALE: 1/8" = 1'-0"

**PHASING PLAN NOTE:**  
SEE ARCHITECTURAL PLANS FOR PHASING OF PROJECT

**100% CONSTRUCTION DRAWINGS**

<b>CONSULTANTS:</b>  WPE #: BS15052 4609 SOUTH TECHLINK CIRCLE • SIOUX FALLS, SD 57106 PHONE: (605) 362-3753 • FAX: (605) 362-3759 WWW.WESTPLAINSENGINEERING.COM RAPID CITY, SD • SIOUX FALLS, SD • CASPER, WY • CEDAR RAPIDS, IA • BISMARCK, ND		 101 Railroad Ave. - PO Box 39 Harrisburg, SD 57032 (605) 743-2510 fax(605) 743-2513		<b>ARCHITECTS/ ENGINEERS:</b>  625 S. MINNESOTA AVENUE, SUITE 204 SIOUX FALLS, SOUTH DAKOTA 57104-4873 TELE: (605) 332-7850 FAX: (605) 332-3539		Drawing Title <b>HVAC VENTILATION PLAN - FOURTH FLOOR</b> Approved: Project Director		Project Title <b>V.A. HEALTH CARE SYSTEM RENOVATE 5TH FLOOR SURGERY</b> Project Number <b>438-15-201</b> Building Number <b>5</b> Location <b>SIOUX FALLS, SOUTH DAKOTA</b> Date <b>OCTOBER 17, 2017</b> Checked <b>WM</b> Drawn <b>DNT</b>		Drawing Number <b>5-MH101</b> Dwg. 43 of 60 Office of Construction and Facilities Management	
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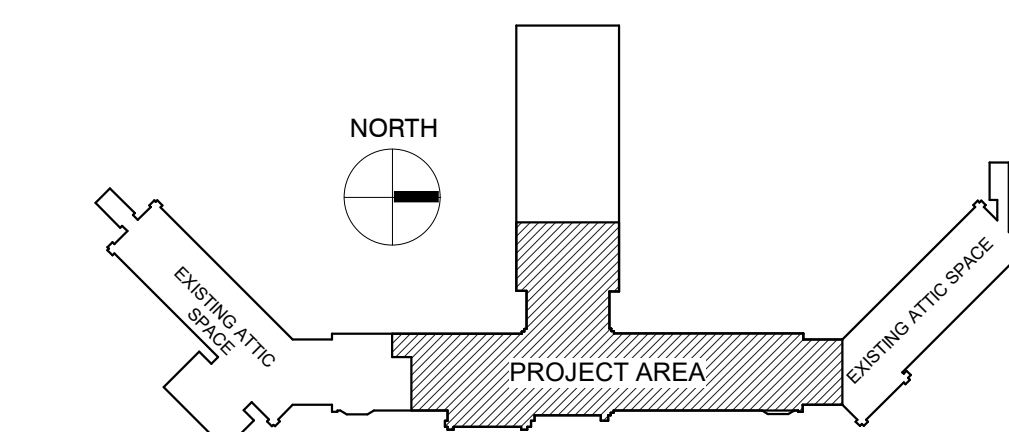
**KEYNOTES:**

- MECHANICAL SPECIFIC NOTES**
- M404 RETURN AIR DUCT UP THRU FLOOR. SEE HVAC VENTILATION PLAN - PENTHOUSE FOR CONTINUATION.
  - M405 MOUNT VAV BOX IN ACCESSIBLE LOCATION. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCE. PROVIDE DUCT ACCESS DOOR FOR ACCESS TO REHEAT COIL. ACCESS DOOR SHALL BE LOCATED TO ALLOW FOR MAXIMUM ACCESSIBILITY. SEE DUCT CONNECTIONS - AIR TERMINAL UNITS DETAIL 1/1MH501. SUPPLY DUCT TAKEOFF - AIR TERMINAL UNIT 3MH502. ALTERNATE SUPPLY DUCT TAKEOFF - AIR TERMINAL UNIT 2MH501.
  - M406 SUPPLY AIR DUCT UP THRU FLOOR. SEE HVAC VENTILATION PLAN - PENTHOUSE FOR CONTINUATION. COORDINATE ALL WALL, CEILING AND FLOOR CUTTING AND PATCHING WITH GENERAL CONTRACTOR. VERIFY EXACT SIZE AND LOCATION OF EXISTING.
  - M407 EXHAUST AIR DUCT UP THRU FLOOR. SEE HVAC VENTILATION PLAN - PENTHOUSE FOR CONTINUATION. COORDINATE ALL WALL, CEILING AND FLOOR CUTTING AND PATCHING WITH GENERAL CONTRACTOR. VERIFY EXACT SIZE AND LOCATION OF EXISTING.
  - M408 CONNECT NEW SUPPLY AIR DUCT TO EXISTING SUPPLY AIR DUCT IN THIS LOCATION. VERIFY EXACT SIZE AND LOCATION OF EXISTING. PROVIDE FIRE DAMPER AT FLOOR. SEE VERTICAL DUCT FIRE DAMPER DETAIL 1/1MH501 AND SECTION THRU FIRE DAMPER INSTALLATION DETAIL 1/1MH502. COORDINATE ALL WALL, CEILING AND FLOOR CUTTING AND PATCHING WITH GENERAL CONTRACTOR. VERIFY EXACT SIZE AND LOCATION OF EXISTING.
  - M409 CONNECT NEW RETURN AIR DUCT TO EXISTING RETURN AIR DUCT IN THIS LOCATION. VERIFY EXACT SIZE AND LOCATION OF EXISTING.
  - M410 VOLUME DAMPER. TYPICAL.
  - M411 EXHAUST AIR DUCT UP THRU CEILING LID. SEE HVAC VENTILATION PLAN - PENTHOUSE FOR CONTINUATION. COORDINATE ALL WALL, CEILING AND FLOOR CUTTING AND PATCHING WITH GENERAL CONTRACTOR. VERIFY EXACT SIZE AND LOCATION OF EXISTING.
  - M412 SUPPLY AIR DUCT UP THRU CEILING LID. SEE HVAC VENTILATION PLAN - PENTHOUSE FOR CONTINUATION. COORDINATE ALL WALL, CEILING AND FLOOR CUTTING AND PATCHING WITH GENERAL CONTRACTOR. VERIFY EXACT SIZE AND LOCATION OF EXISTING.
  - M413 RETURN AIR DUCT UP THRU CEILING LID. SEE HVAC VENTILATION PLAN - PENTHOUSE FOR CONTINUATION. COORDINATE ALL WALL, CEILING AND FLOOR CUTTING AND PATCHING WITH GENERAL CONTRACTOR. VERIFY EXACT SIZE AND LOCATION OF EXISTING.
  - M414 EXHAUST AIR DUCT DN THRU FLOOR. SEE HVAC VENTILATION PLAN - FOURTH FLOOR FOR CONTINUATION. PROVIDE FIRE DAMPER AT FLOOR. SEE VERTICAL DUCT FIRE DAMPER DETAIL 1/1MH501 AND SECTION THRU FIRE DAMPER INSTALLATION DETAIL 1/1MH502. COORDINATE ALL WALL, CEILING AND FLOOR CUTTING AND PATCHING WITH GENERAL CONTRACTOR. VERIFY EXACT SIZE AND LOCATION OF EXISTING.
  - M415 PROVIDE FIRE DAMPER AT WALL. SECTION THRU FIRE DAMPER INSTALLATION DETAIL 1/1MH501.
  - M418 PROVIDE TRANSFER DUCT AS HIGH AS POSSIBLE ABOVE CEILING. SEE RETURN AIR TRANSFER DUCT DETAIL 6MH502.
  - M419 SUPPLY AIR DUCT, RETURN AIR DUCT, AND EXHAUST AIR DUCT THRU WALL INTO PENTHOUSE ABOVE. SEE HVAC VENTILATION PLAN - PENTHOUSE FOR CONTINUATION. COORDINATE ALL WALL, CEILING AND FLOOR CUTTING AND PATCHING WITH GENERAL CONTRACTOR. VERIFY EXACT SIZE AND LOCATION OF EXISTING.
  - M433 DDC THERMOSTAT BY TO CONTRACTOR. TYPICAL.
  - M434 PROVIDE SMOKE DAMPER AT WALL. SEE SMOKE DAMPER CONTROL DIAGRAM DETAIL 12/MH501.
  - M435 PROVIDE COMBINATION FIRE-SMOKE DAMPER AT WALL. SEE FIRE AND SMOKE DAMPER DETAIL 7/MH502.
  - M436 ROUTE DUCT AS SHOWN TO AVOID STRUCTURE REQUIRED FOR BOOM LIGHT IN THIS ROOM. COORDINATE EXACT LOCATION WITH GENERAL CONTRACTOR.
  - M437 ACCESS PANEL TO BE INSTALLED IN HARD CEILING FOR ACCESS TO DAMPER. SEE ARCHITECTURAL PLANS FOR LOCATION OF ACCESS PANEL.
  - M440 EXISTING EXHAUST DUCT REROUTED AT CEILING LEVEL TO WALL AND DOWN THRU FLOOR TO FOURTH FLOOR CEILING. COORDINATE ALL WALL, CEILING AND FLOOR CUTTING AND PATCHING WITH GENERAL CONTRACTOR. VERIFY EXACT SIZE AND LOCATION OF EXISTING.
- TEMPERATURE CONTROL NOTE:**  
PROVIDE ROOM DIFFERENTIAL PRESSURE MONITORS THAT READ BACK TO THE METASYS BAS SYSTEM.
- FOR ROOMS:**  
POSITIVE PRESSURE - STERILE STORAGE 516, CLEAN ROOM 517, MEDICATION ROOM 518  
NEGATIVE PRESSURE - SOILED ROOM 513  
PROVIDE CRITICAL CONTROLS PANEL FOR MINOR PROCEDURE 511 AND MINOR PROCEDURE 512.

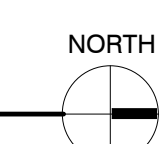
**GENERAL NOTES:**

- A ALL PIPING AND DUCTS IN FINISHED ROOMS OR SPACES SHALL BE CONCEALED IN A FURRED CHASE OR ABOVE THE HARD SUSPENDED CEILING.
- B THE FIRST FIGURE OF DUCT SIZE INDICATES DIMENSION OF FACE SHOWN OR INDICATED.
- C DUCT SIZES ARE NET INSIDE DIMENSIONS.
- D ACCESS PANELS IN HARD SUSPENDED CEILINGS ARE REQUIRED FOR ALL VALVES, TRAPS, DAMPERS, CLEANOUTS, CONTROLS, ETC. ACCESS PANELS SHALL BE FURNISHED AND INSTALLED UNDER THE ARCHITECTURAL SPECIFICATIONS.
- E TOTAL STATIC PRESSURE NOTED IN THE SCHEDULES INCLUDES DUCT SYSTEM, TERMINAL UNITS, FILTERS, COILS, ETC.
- F FOR TYPICAL STEAM AND WATER PIPING CONNECTIONS TO EQUIPMENT, SEE STANDARD EQUIPMENT DETAILS.
- G DIFFUSER, REGISTER AND GRILLE SIZES SHOWN ON FLOOR PLANS ARE NECK SIZES.
- H WATER PIPE CONNECTIONS TO AIR HEATING AND COOLING COILS SHALL BE MADE TO PROVIDE COUNTER FLOW BETWEEN WATER AND AIR.
- I WALL TYPE EXHAUST REGISTERS NOTED AS "BR" ON DRAWINGS ARE TO BE INSTALLED WITH BOTTOM ELEVATION OF REGISTER AT 7" (175MM) ABOVE FINISHED FLOOR.
- J REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF CEILING DIFFUSERS, REGISTERS, AND GRILLES.
- K ALL PRESSURES LISTED ARE GAGE PRESSURE UNLESS OTHERWISE NOTED.

**KEY PLAN:**



**HVAC VENTILATION PLAN - FIFTH FLOOR**  
SCALE: 1/8" = 1'-0"



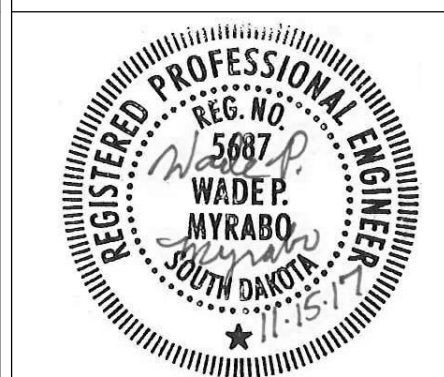
**PHASING PLAN NOTE:**  
SEE ARCHITECTURAL PLANS FOR PHASING OF PROJECT

**100% CONSTRUCTION DRAWINGS**

**CONSULTANTS:**

**WPE WEST PLAINS ENGINEERING, INC.**  
WPE #: BS15052  
4609 SOUTH TECHLINK CIRCLE • SIOUX FALLS, SD 57106  
PHONE: (605) 362-3753 • FAX: (605) 362-3759  
WWW.WESTPLAINSENGINEERING.COM  
RAPID CITY, SD • SIOUX FALLS, SD • CASPER, WY • CEDAR RAPIDS, IA • BISMARCK, ND

**RISE STRUCTURAL ASSOCIATES, INC.**  
101 Railroad Ave. - PO Box 39  
Hamburg, SD 57032  
(605) 743-2510  
fax(605) 743-2513



**ARCHITECTS/ ENGINEERS:**

**MSH ARCHITECTS**  
625 S. MINNESOTA AVENUE, SUITE 204  
SIOUX FALLS, SOUTH DAKOTA 57104-4873  
TELE: (605) 332-7850 FAX: (605) 332-3539

Drawing Title  
**HVAC VENTILATION PLAN - FIFTH FLOOR**

Approved: Project Director

Project Title  
**V.A. HEALTH CARE SYSTEM RENOVATE 5TH FLOOR SURGERY**

Project Number  
**438-15-201**

Building Number  
**5**

Drawing Number  
**5-MH102**

Date  
**OCTOBER 17, 2017**

Checked  
**WM**

Drawn  
**DNT**

Dwg. 44 of 60

Office of Construction and Facilities Management

one eighth inch = one foot  
one quarter inch = one foot  
three eighths inch = one foot  
one half inch = one foot  
three quarters inch = one foot  
one inch = one foot  
one and one half inches = one foot  
two inches = one foot  
three inches = one foot  
four inches = one foot  
five inches = one foot  
six inches = one foot  
seven inches = one foot  
eight inches = one foot  
nine inches = one foot  
ten inches = one foot  
eleven inches = one foot  
twelve inches = one foot