

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

one quarter inch = one foot

three eighths inch = one foot

one eighth inch = one foot

one sixteenth inch = one foot

ABBREVIATIONS

AD
AFF
AFR
AHU
ALWCO
AMP
APD
ARI
ASME
ASTM

ACCESS DOOR
ABOVE FINISHED FLOOR
AIR-HANDLING UNIT
ALTERNATE LOW WATER CUT-OFF
AMPERGE
AIR PRESSURE DROP
AIR CONDITIONING AND REFRIGERATION INSTITUTE
AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AMERICAN SOCIETY FOR TESTING AND MATERIALS

B
BHP
BW
BLDG
BO
BTU
BTUH

BOILER
BRAKE HORSEPOWER
BACKWARD INCLINED WHEEL (FAN)
BUILDING
BLOWOFF
BRITISH THERMAL UNIT
BRITISH THERMAL UNIT PER HOUR

CFH
CFM
CFT
CFP
CI
CM
COND
COTR

CUBIC FEET PER HOUR
CUBIC FEET PER MINUTE
CUBIC FEET
CHEMICAL FEED PUMP
CAST IRON
CARBON MONOXIDE
CONDENSATE
CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE
CONDENSATE PUMP
CONDENSATE STORAGE TANK
CONSTANT VOLUME
COLD WATER (POTABLE)

DB
Db
DDC
DEG
DIA
DP

DECIBELS
DRY-BULB TEMPERATURE
DIRECT DIGITAL CONTROLS
DEGREE
DIAMETER
DEW POINT TEMPERATURE

EAT
EER
EF
ESP
EUH
EWT
EX

ENTERING AIR TEMPERATURE
ENERGY EFFICIENCY RATIO
EXHAUST FAN
EXTERNAL STATIC PRESSURE
ELECTRIC UNIT HEATER
ENTERING WATER TEMPERATURE
EXISTING

F
FD

FAHRENHEIT
FLOOR DRAIN

GAL
GPM

GALLONS PER MINUTE

HD
HP
HP
HPDA
HPR

HEAD
HEAT PUMP
HORSEPOWER
HIGH PRESSURE DRIP ASSEMBLY
HIGH PRESSURE RETURN (STEAM CONDENSATE)
HIGH PRESSURE SUPPLY (STEAM)

HZ

HERTZ

I/O
IBC
IH
IN
IN HG
IN WG

INPUT/OUTPUT
INTERNATIONAL BUILDING COUNCIL INTAKE HOOD
INCHES
INCHES OF MERCURY
INCH WATER GAUGE

KH
kW

KITCHEN HOOD
KILOWATT

LAT
LBS/HR
LPDA
LPR

LEAVING AIR TEMPERATURE
POUNDS PER HOUR
LOW PRESSURE DRIP ASSEMBLY
LOW PRESSURE RETURN (STEAM C)

OA
OFL
OSD

OUTSIDE AIR
OVERFLOW
OPEN SIGHT DRAIN

P
PC
PCF
PD
PRS
PRV
PSI
PSIG
PSV
PVC

PUMP
PUMPED CONDENSATE
POUNDS PER CUBIC FOOT (FEET)
PRESSURE DROP
PRESSURE REGULATING (VALVE) STATION
PRESSURE REGULATING VALVE
POUNDS PER SQUARE INCH
POUNDS PER SQUARE INCH - GAGE
PRESSURE SAFETY VALVE
POLYVINYL CHLORIDE

RA
RH
RPM
RTU

RETURN AIR
RELATIVE HUMIDITY
REVOLUTIONS PER MINUTE
ROOF TOP UNIT

SA
SAT
SCFM
SD
SEN
SF
SG
SI
SP
SMACNA
SS
SP GR
SPRV
SPS
SQ FT
SR
SS
SSAH
SSHP

SUPPLY AIR
SUPPLY AIR TEMPERATURE
STANDARD CUBIC FEET PER MINUTE
SMOKE DETECTOR
SENSIBLE HEAT
SUPPLY FAN
SUPPLY AIR GRILLE
SQUARE INCHES
STATIC PRESSURE
SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION
SPECIFIC GRAVITY
STEAM PRESSURE REDUCING VALVE
STATIC PRESSURE SENSOR
SQUARE FOOT (FEET)
SUPPLY AIR REGISTER
STAINLESS STEEL
SPRIT-SYSTEM AIR HANDLER
SPRIT-SYSTEM HEAT PUMP

TAB
TDH
THK
TSP
TYP

TESTING, ADJUSTING, BALANCE
TOTAL DYNAMIC HEAD
THICK
TOTAL STATIC PRESSURE
TYPICAL

UC
UL

UNDER CUT
UNDERWRITERS LABORATORY

V
VA
VD
VFD
VHA
VTR

VALVE
VETERANS ADMINISTRATION
VOLUME DAMPER (MANUAL OPPOSED BLADE)
VARIABLE FREQUENCY DRIVE
VETERANS HEALTH ADMINISTRATION
VENT THRU ROOF

W
Wb
WG

WATTS
WET-BULB (TEMPERATURE)
WATER GAGE

FWPC
FWPS
CTPD
CTPS
BO
CBD
BWS
FWS
CF
OFL
A
G
G(I)
FOS
FOR
CW
SW
HW

FEEDWATER PUMP DISCHARGE
FEEDWATER PUMP SUCTION
CONDENSATE TRANSFER PUMP DISCHARGE
CONDENSATE TRANSFER PUMP SUCTION
BOILER BLOWOFF
CONTINUOUS BLOWDOWN
BOILER WATER SAMPLE
FEEDWATER SAMPLE (FROM DEAERATOR)
CHEMICAL FEED
OVERFLOW
COMPRESSED AIR
NATURAL GAS MAIN FUEL
NATURAL GAS IGNITER FUEL
FUEL OIL SUPPLY
FUEL OIL RETURN
COLD WATER (CITY WATER)
SOFTENED WATER
HOT WATER

TYPE NUMBERS REFER TO MANUFACTURER'S STANDARDIZATION SOCIETY STANDARD PRACTICE SP-58

GENERAL PIPING SYMBOLS

DIRECTION OF PIPE PITCH (DOWN)

DIRECTION OF FLOW

ANCHOR

REDUCER OR INCREASER

ECCENTRIC REDUCER

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

THERMOMETER

PRESSURE GAGE

TEST PLUG (PRESSURE/TEMPERATURE)

AUTOMATIC AIR VENT

MANUAL AIR VENT

QUICK-COUPLE HOSE CONNECTOR

FUTURE PIPING

VALVE SYMBOLS

GATE VALVE - THREADED/FLANGED

GLOBE VALVE - THREADED/FLANGED

GATE VALVE WITH 3/4" HOSE ADAPTER

CHECK VALVE

WYE STRAINER (WITH BALL VALVE & HOSE CONNECTION)

WYE STRAINER WITH VALVED DRAIN AND QUICK-COUPLE HOSE CONNECTOR

FLEXIBLE CONNECTION

ANGLE GLOBE VALVE

BUTTERFLY VALVE

BALL VALVE

MODULATING CONTROL VALVE

MODULATING CONTROL BUTTERFLY VALVE

TWO POSITION CONTROL VALVE

THREE-WAY MODULATING CONTROL VALVE

THREE-WAY TWO POSITION CONTROL VALVE

PRESSURE REGULATING VALVE

PRESSURE SAFETY VALVE

AUTOMATIC BALANCING CONTROL VALVE

WATER BALANCE DEVICE

CIRCUIT SETTER VALVE

GATE VALVE WITH GLOBE-VALVED BYPASS

PLUG VALVE

CONTROL VALVE (CV) - FLOAT-OPERATED

PRESSURE REDUCING VALVE (PRV)

WATER LEVEL CONTROLLER

FLOW METER

NORMALLY CLOSED VALVE

CONTROLS SYMBOLS

PSH

PSL

EPT

AT

CO

AT

FO

AT

OC

G

NG

LTC

HVAC

VSMC

ECC

TC

PC

SC

FC

FSH

FSL

VFM

M

G

T

ES

S

D

H

K

PRESSURE SWITCH HIGH

PRESSURE SWITCH LOW

ELECTRONIC TO PNEUMATIC TRANSDUCER

CARBON MONOXIDE TRANSMITTER

FUEL OIL VAPOR SENSOR

OCCUPANCY SENSOR

NATURAL GAS SENSOR

LOCAL TEMPERATURE CONTROL PANEL

HVAC CONTROL PANEL

VARIABLE SPEED MOTOR CONTROLLER

INTEGRATE CONTROL POINT ON REMOTE GRAPHICS WORKSTATION AT ENERGY CONTROL CENTER

TEMPERATURE CONTROLLER

PRESSURE CONTROLLER

SPEED CONTROLLER

FLOW CONTROLLER

FLOW SWITCH HIGH

FLOW SWITCH LOW

VORTEX FLOWMETER

ELECTRIC OPERATED CONTROL DAMPER/OR VALVE

ON OFF MANUAL SET CONTROL TIMER

ROOM CONTROL: THERMOSTAT (ROOM ADJUSTABLE)

ROOM CONTROL: TEMPERATURE SENSOR (NON-ADJUSTABLE TYPE)

EMERGENCY STOP SWITCH

SWITCH (SEE DRAWINGS FOR TYPE)

DIGITAL INPUT

ALARM STROBE/HORN

DUCTWORK SYMBOLS

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

FLEXIBLE CONNECTION (EQUIPMENT)

VANED ELBOW (PROVIDE ALL SQUARE OR RECTANGULAR ELBOWS WITH AEROFIL TYPE TURNING VANES EVEN IF SYMBOL IS MISSING)

VANED ELBOW (SHORT RADIUS)

STANDARD RADIUS ELBOW

NEW DUCT (WIDTH x DEPTH)

EXISTING DUCT TO BE REMOVED

EXISTING DUCT AND/OR EQUIPMENT TO REMAIN

LOUVER (LOUVER SPECIFIED IN ARCHITECTURAL SECTION.)

FLEXIBLE DUCTWORK (INSULATED)

STANDARD BRANCH SUPPLY OR RETURN, NO SPLITTER (45° TAP)

INDICATES AIR DISTRIBUTION DEVICE TYPE (SEE SCHEDULE)

FRAME SIZE (SEE SCHEDULE)

NECK SIZE (SEE SCHEDULE)

CFM

UNDERCUT DOOR BY GENERAL CONTRACTOR

SUPPLY DIFFUSER (4-WAY)

SUPPLY DIFFUSER (3-WAY)

SUPPLY DIFFUSER (2-WAY ADJACENT)

SUPPLY DIFFUSER (2-WAY OPPOSITE)

SUPPLY DIFFUSER (1-WAY)

RETURN/TRANSFER GRILLE

EXHAUST GRILLE

SIDEWALL SUPPLY

SIDEWALL RETURN/EXHAUST

MANUAL VOLUME DAMPER

MOTOR OPERATED DAMPER W/ACCESS DOOR

DUCT MOUNTED SMOKE DETECTOR

ACCESS DEVICE - SEE SPECIFICATIONS

SUPPLY DUCT TURNING UP THROUGH FLOOR

RETURN DUCT TURNING UP THROUGH FLOOR

EXHAUST DUCT TURNING UP THROUGH FLOOR

SUPPLY DUCT TURNING DOWN THROUGH FLOOR

RETURN DUCT TURNING DOWN THROUGH FLOOR

EXHAUST DUCT TURNING DOWN THROUGH FLOOR

FLEXIBLE DUCT (RUNOUTS)

ELBOW WITH TURNING VANES

SECTION LETTER

SHEET ON WHICH DETAIL OR SECTION APPEARS

GENERAL NOTES

1. ALL PIPING AND DUCTS IN FINISHED ROOMS OR SPACES SHALL BE CONCEALED IN A FURRED CHASE OR ABOVE THE HARD OR SUSPENDED 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 IN CEILING 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. SEE SCHEDULE FOR DIFFUSER, REGISTER AND GRILLE SIZES.

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

8. STEAM HEADER SET PRESSURE: 100 PSIG NORMAL, 100 PSIG LOW DEMAND PERIODS. EXISTING HIGH PRESSURE STEAM OPERATES AT 100 PSIG.

9. ALTITUDE-BOILER ROOM FLOOR: 226 FT. ABOVE SEA LEVEL.

10. SEISMIC PROVISIONS REQUIRED - SEE TABLE BELOW AND SPECIFICATIONS.

11. ALL PRESSURES LISTED ARE GAUGE PRESSURE UNLESS OTHERWISE NOTED.

12. MECHANICAL CONTRACTOR SHALL COORDINATE WITH GENERAL CONTRACTOR FOR NEW/EXISTING FIRE PROTECTION DURING AND AFTER CONSTRUCTION.

13. ALL STEAM PIPING SHALL BE PITCHED DOWN IN THE DIRECTION OF FLOW, AT A SLOPE OF ONE INCH PER FORTY FEET, UNLESS NOTED OTHERWISE.

14. PRIOR TO DIGGING UNDERGROUND, CONTRACTOR SHALL HAVE A UTILITY LOCATOR SERVICE MARK ALL UTILITIES.

15. EXISTING CONDITIONS AS SHOWN ON THE DRAWINGS ARE TAKEN FROM EXISTING DRAWINGS AND ABOVE GROUND FIELD SURVEY. MECHANICAL CONTRACTOR SHALL FIELD VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO BEGINNING WORK.

16. LAY-DOWN AREAS SHOULD BE AS CLOSE TO THE AREA OF WORK AS POSSIBLE AND SHOULD NOT IMPED VEHICULAR OR PEDESTRIAN TRAFFIC OR CREATE ANY OTHER NUISANCE TO THE OWNER. COORDINATE ALL LAY-DOWN AREAS WITH CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE PRIOR TO UTILIZATION.

17. ALL PIPING OPENINGS IN RATED PARTITIONS AND FLOORS SHALL BE SEALED PER THE MECHANICAL SPECIFICATIONS.

18. WHERE A SINGLE PRODUCT IS SPECIFIED OR INDICATED ON THE DRAWINGS OR IN THE SPECIFICATIONS BY MANUFACTURER AND MODEL NUMBER, IT IS DONE SO TO ESTABLISH THE STANDARD OF QUALITY OF THE PRODUCTS INTENDED AND IS NOT INTENDED TO LIMIT SIMILAR MANUFACTURERS OR COMPETITION. WHERE 3 MANUFACTURER'S PRODUCTS ARE LISTED, THE CONTRACTOR SHALL PROVIDE ONLY ONE OF THOSE PRODUCTS UNLESS A SUBSTITUTION HAS BEEN APPROVED PRIOR TO RECEIPT OF BIDS.

19. WHERE STEAM PIPING MUST RISE VERTICALLY PROVIDE A DRIP POCKET AND STEAM TRAP. PROVIDE DRIPS AND TRAPS IN ACCESSIBLE LOCATIONS.

20. CONTRACTOR SHALL COORDINATE ALL PHASING WITH THE OWNER TO MINIMIZE SYSTEM DOWNTIME. SYSTEM SHUTDOWNS SHALL OCCUR DURING NIGHTS AND WEEKENDS, AS DIRECTED BY THE CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE.

21. CONTRACTOR SHALL COORDINATE ANY AND ALL SHUTDOWNS OF STREETS AND OR UTILITIES WITH CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE.

22. BEFORE SUBMITTING SHOP DRAWINGS, VERIFY VOLTAGES AVAILABLE FOR MECHANICAL EQUIPMENT WITH ELECTRICAL CONTRACTOR. VERIFY PROVISION OF ALL STARTERS AND DISCONNECT SWITCHES.

23. ALL ELECTRICAL EQUIPMENT SHALL BE U.L. LISTED. ALL PACKAGED EQUIPMENT SHALL BE U.L. LISTED AS A PACKAGE.

24. ALL SUPPORTS SHALL MEET SEISMIC PERFORMANCE CRITERIA.

AIR TERMINAL UNIT INSTALLATION DETAIL

F2

SCALE: NONE

NO OBSTRUCTIONS SHALL BE INSTALLED IN THIS AREA

CONTROL PANEL

CONTRACTOR SHALL ATTACH MINIMUM 3'-0" LONG x 2" WIDE ORANGE PLASTIC STREAMER TO EACH "CORNER" OF DESIGNATED TERMINAL UNIT MAINTENANCE ACCESS LOCATED ABOVE CEILING. THE STREAMER SHALL EXTEND TO 8'-0" ABOVE FINISHED FLOOR. NO PIPING, DUCTWORK, CONDUIT, OR SIMILAR EQUIPMENT SHALL BE MOUNTED UNDER OR OTHERWISE OBSTRUCT ACCESS TO MAINTENANCE AREA. STREAMER SHALL REMAIN IN PLACE UNTIL ABOVE CEILING INSPECTION IS COMPLETED AND CONTRACTOR IS DIRECTED TO REMOVE STREAMER BY COTR.

COIL PULL SHALL BE ON SAME SIDE AS CONTROL PANEL

AIR TERMINAL UNIT

DESIGNATED MAINTENANCE ACCESS

CEILING

NO OBSTRUCTIONS SHALL BE INSTALLED IN THIS AREA

CONTROL PANEL

CONTRACTOR SHALL ATTACH MINIMUM 3'-0" LONG x 2" WIDE ORANGE PLASTIC STREAMER TO EACH "CORNER" OF DESIGNATED TERMINAL UNIT MAINTENANCE ACCESS LOCATED ABOVE CEILING. THE STREAMER SHALL EXTEND TO 8'-0" ABOVE FINISHED FLOOR. NO PIPING, DUCTWORK, CONDUIT, OR SIMILAR EQUIPMENT SHALL BE MOUNTED UNDER OR OTHERWISE OBSTRUCT ACCESS TO MAINTENANCE AREA. STREAMER SHALL REMAIN IN PLACE UNTIL ABOVE CEILING INSPECTION IS COMPLETED AND CONTRACTOR IS DIRECTED TO REMOVE STREAMER BY COTR.

AIR TERMINAL UNIT

DESIGNATED MAINTENANCE ACCESS

CEILING

100% CONSTRUCTION DOCUMENTS

REVISION NO.

REVISION DESCRIPTION

Revisions

By

Date

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HSR PROJECT # 11015

Recommended Approvals:

1. MEDICAL DIRECTOR

2. ASSOCIATE DIRECTOR

3. CHIEF OF STAFF

4. ASSOC. DIRECTOR

5. SERVICE LINE MGRS.

6. OPERATIONS SERVICE LINE MANAGER

7. INFECTION CONTROL MANAGER

8. SAFETY MANAGER

9. GENERAL ENGINEER

10. COTR

Drawing Title

MECHANICAL LEGEND AND GENERAL NOTES

★BUILDING IS FULLY SPRINKLERED★

Project Title

REPLACE BOILER PLANT/ COGEN/CHP

Drawn

DWS

Building Number

21

AutoCAD File Name

DRAWING No.

MP001

Date

APRIL 10, 2012

Project Number

544-11-101

Checked

Reviewed

Const. Contract No.

Veterans Affairs