ABBREVIATIONS

A/E ARCHITECT / ENGINEER
AB AIR BLENDER
AAV AUTOMATIC AIR VENT
ACD AUTOMATIC CONTROL DAMPER,MODULATING
ACD-TP AUTOMATIC CONTROL DAMPER,TWO POSITION
AD ACCESS DOOR
AF AFTER FILTER
AFF ABOVE FINISHED FLOOR
AFMD AIR FLOW MEASURING DEVICE
AHU AIR-HANDLING UNIT
AMP AMPERGE
AP ACCESS PANEL
APD AIR PRESSURE DROP
ARI AIR CONDITIONING AND REFRIGERATION INSTITUTE
ASME AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AXF AXIAL FLOW
BD BUTTERFLY DAMPER
BDD BACKDRAFT DAMPER
BFP BACKFLOW PREVENTER
BHP BRAKE HORSEPOWER
BTU BRITISH THERMAL UNIT
BTUH BRITISH THERMAL UNIT PER HOUR
C CENTIGRADE (CELCIUS)
CC COOLING COIL
CCD COOLING COIL CONDENSATE DRAIN
EA EXHAUST AIR
EAT ENTERING AIR TEMPERATURE
ECC ENGINEERING CONTROL CENTER
EER ENERGY EFFICIENCY RATIO
EF EXHAUST FAN
ENT ENTERING
ESP EXTERNAL STATIC PRESSURE
EWT ENTERING WATER TEMPERATURE
EX. EXISTING
F FAHRENHEIT
F&T FLOAT AND THERMOSTATIC
F/SDPR COMBINATION FIRE SMOKE DAMPER
FA FREE AREA
FC FLEXIBLE CONNECTION
FD FLOOR DRAIN
FD FIRE DAMPER
FF FINAL FILTER
FM FLOW METER
FPM FEET PER MINUTE
FPS FEET PER SECOND
FRP FIBER REINFORCED POLYESTER
FS FLOW SWITCH
FSTAT FREEZESTAT
I/O INPUT/OUTPUT
IAQ INDOOR AIR QUALITY
ID INSIDE DIAMETER
IN INCHES
IN HG INCHES OF MERCURY
IN WC INCH WATER COLUMN
IN WG INCH WATER GAUGE
IN-LB INCH-POUND
IS INSECT SCREEN
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)
LH LATENT HEAT
LPR LOW PRESSURE RETURN (STEAM CONDENSATE)
LPS LOW PRESSURE STEAM
LTCP LOCAL TEMPERATURE CONTROL PANEL
LVG LEAVING
LVR LOUVER
LWT LEAVING WATER TEMPERATURE
P PUMP
PA PASCAL
PCF POUNDS PER CUBIC FOOT (FEET)
PD PRESSURE DROP
PF PRE-FILTER
PG PRESSURE GAGE
PPM PARTS PER MILLION
PRV PRESSURE REGULATING VALVE
PSI POUNDS PER SQUARE INCH
PSIA POUNDS PER SQUARE INCH
PSIG POUNDS PER SQUARE INCH
R/E RETURN OR EXHAUST
RA RETURN AIR
RAT RETURN AIR TEMPERATURE
REA RELIEF AIR
RF RETURN FAN
RH RELATIVE HUMIDITY
RLA RUN LOAD AMPERE
RPM REVOLUTIONS PER MINUTE
RV RELIEF VALVE
UL UNDERWRITERS LABORATORY
V VALVE
VAV VARIABLE AIR VOLUME
VD VOLUME DAMPER (MANUAL OPPOSED BLADE)
VFD VARIABLE FREQUENCY DRIVE
VHA VETERANS HEALTH ADMINISTRATION
VI VIBRATION ISOLATOR
VSD VARIABLE SPEED DRIVE
CENT CENTRIFICAL
CFH CUBIC FEET PER HOUR
CFM CUBIC FEET PER MINUTE
CFT CUBIC FEET
CH CHILLER
CHP CHILLED WATER PUMP
CHW CHILLER WATER
CHR CHILLED WATER RETURN
CHS CHILLED WATER SUPPLY
CM CUBIC METER
CM/S CUBIC METER PER SECOND
CO CLEAN OUT
COP COEFFICIENT OF PERFORMANCE
CWCC CHILLED WATER COOLING COIL
D DAMPER - AUTOMATIC
D-1 OUTDOOR AIR DAMPER
D-2 RETURN AIR DAMPER
D-3 RELIEF AIR DAMPER
DB DECIBELS
Db DRY-BULB TEMPERATURE
DDC DIRECT DIGITAL CONTROLS
DEG DEGREE
DIA DIAMETER
DP DEW POINT TEMPERATURE
DP DIFFUSER PLATE
DPS DIFFERENTIAL PRESSURE SENSOR
FT FEET
FT-LB FOOT-POUND
FV FACE VELOCITY
GA GAUGE
GAL GALLONS
GPM GALLONS PER MINUTE
GS GALVANIZED STEEL
H HUMIDIFIER
HB HOSE BIBB
HC HEATING COIL
HD HEAD
HOA HAND/OFF/AUTOMATIC
HP HORSEPOWER
HSTAT HUMIDISTAT
HUM HUMIDIFIER UNIT MOUNTED
HW HOT WATER
HWHC HOT WATER HEATING COIL
HWP HEATING HOT WATER PUMP
HWR HEATING HOT WATER RETURN
HWS HEATING HOT WATER SUPPLY
HZ HERTZ
M METER, SI UNIT
M/s METERS PER SECOND (OR METERS/SECOND)
MA MIXED AIR
MAT MIXED AIR TEMPERATURE
MAX MAXIMUM
MB MIXING BOX
MBH 1000 BTUH
MCA MINIMUM BRANCH CIRCUIT AMPACITY
MER MECHANICAL EQUIPMENT ROOM
MERV MINIMUM EFFICIENCY REPORTING VALUE
MHP MOTOR HORSEPOWER
MIN MINIMUM
MM MILLIMETER
MOV MOTOR OPERATED VALVE
MVD MANUAL VOLUME DAMPER
NA NOT APPLICABLE
NC NOISE CRITERIA
NC NORMALLY CLOSED
NO NORMALLY OPEN
NOM NOMINAL
NPSH NET POSITIVE SUCTION HEAD
NTS NOT TO SCALE
OA OUTSIDE AIR
OAG OUTSIDE AIR GRILLE
OAI OUTSIDE AIR INTAKE
OD OUTSIDE DIAMETER
SA SUPPLY AIR
SAD SOUND ATTENUATING DEVICE
SAT SUPPLY AIR TEMPERATURE
SCFM STANDARD CUBIC FEET PER MINUTE
SCR SILICON CONTROLLED RECTIFIER
SD SMOKE DETECTOR
SDPR SMOKE DAMPER
SDR SMOKE DAMPER (RETURN)
SDS SMOKE DAMPER (SUPPLY)
SEN SENSIBLE HEAT
SF SUPPLY FAN
SH STEAM HUMIDIFIER
SI SQUARE INCHES
SP STATIC PRESSURE
SP GR SPECIFIC GRAVITY
SPRV STEAM PRESSURE REDUCING VALVE
SPS STATIC PRESSURE SENSOR
SQ FT SQUARE FOOT (FEET)
SS STAINLESS STEEL
ST STEAM TRAP
SV STEAM PRESSURE REDUCING VALVE
TAB TESTING, ADJUSTING, BALANCE
TD TEMPERATURE DIFFERENCE
TDH TOTAL DYNAMIC HEAD
TP TRAP
TSP TOTAL STATIC PRESSURE
TSTAT THERMOSTAT
W WATTS
Wb WET-BULB (TEMPERATURE)
WFCV WATER FLOW CONTROL VALVE
WFM WATER FLOWMETER
WFMD WATER FLOW MEASURING DEVICE
WG WATER GAGE
WPD WATER SIDE PRESSURE DROP
YR YEAR

DRAWING SYMBOLS

2 / H4 — DETAIL NUMBER / DRAWING NUMBER WHERE DRAWN
A / H7 — SECTION LETTER / DRAWING NUMBER WHERE SHOWN
26-SF 3 — BUILDING NO. WHERE EQUIPMENT IS LOCATED. / EQUIPMENT ABBREVIATION (SUPPLY FAN) / SUPPLY FAN NO. 3 IN BUILDING NO. 26 / TYPICAL UNIT NO.
26-TU-1-1 — BUILDING NO. WHERE EQUIPMENT IS LOCATED / ITEM (TERMINAL UNIT SHOWN) / ITEM NUMBER (TERMINAL UNIT NO. 1) / SERVED BY AIR HANDLER UNIT NO. 1

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
AUTOMATIC BALANCING CONTROL VALVE
WATER BALANCE DEVICE
CIRCUIT SETTER VALVE
PLUG VALVE
CONTROL VALVE (CV) - FLOAT-OPERATED
PRESSURE REDUCING VALVE (PRV)
FLOW METER

DUCTWORK SYMBOLS

UP / DN — SUPPLY DUCT (UP & DOWN)
UP / DN — EXHAUST DUCT (UP & DOWN)
UP / DN — RETURN DUCT (UP & DOWN)
VANED ELBOW & AIR SPLIT TYPE DUCT TAKE-OFF
CONNECT NEW DUCT TO EXISTING DUCT
R — INCLINED RISE, IN DIRECTION OF AIR FLOW
D — INCLINED DROP, IN DIRECTION OF AIR FLOW
LIMIT OF DEMOLITION
FC — FLEXIBLE CONNECTION, EQUIPMENT, VIBRATION, OR SEISMIC
VANED ELBOW (PROVIDE ALL SQUARE OR RECTANGULAR ELBOWS WITH VANES EVEN IF SYMBOL IS MISSING)
VANED ELBOW (SHORT RADIUS)
STANDARD RADIUS ELBOW (LONG RADIUS)
10x8 — NEW DUCT (INSIDE DIMENSIONS: WIDTH x DEPTH)
EXISTING DUCT TO REMAIN
EXISTING DUCT TO BE REMOVED
LOUVER (LOUVER SPECIFIED IN ARCHITECTURAL SECTION.)
VD — MANUAL VOLUME DAMPER
FD — FIRE DAMPER
BDD — BACK DRAFT DAMPER
F/S DPR — COMBINATION FIRE/SMOKE DAMPER
N — AUTOMATIC CONTROL DAMPER MODULATING
AUTOMATIC CONTROL DAMPER TWO POSITION
MANUAL SPLITTER DAMPER
45° SUPPLY / 45° RETURN — STANDARD BRANCH SUPPLY OR RETURN, NO SPLITTER (45° TAP)

AIR HANDLING UNIT SCHEDULE

MARK	MANUFACTURER	FAN: DESIGN CFM	MIN. OA CFM	TYPE	RPM	S.P. TOTAL IN. W.G.	S.P. EXTERNAL IN. W.G.	MOTOR: H.P./QTY	RPM	COOLING COIL: TOTAL MBH	MIN. FACE AREA SQ.FT.	EAT DB °F	EAT WB °F	LAT DB °F	LAT WB °F	ROWS	GPM AT 44° F EWT	PRESSURE DROP FT.W.G.	AIR FRICTION IN W.G.	HEATING COIL: TOTAL MBH	MIN. FACE AREA SQ.FT.	EAT °F	LAT °F	ROWS	GPM AT 180° EWT	PRESSURE DROP FT. W.G.	AIR FRICTION IN. W.G.	RETURN FAN: MARK	SEE FAN SCHEDULE	HUMIDIFIER: CAPACITY (LBS/HR) @ 30 PSI		SOUND POWER DATA RE 10 WATTS OCTIVE BAND CENTER FREQUENCY HZ: 63	125	250	500	1000	2000	4000	8000	REMARKS
AHU-17	TEMTROL OR APPROVED EQUAL	31000	6300	16" AXIAL	3500	7.5	4.5	10/6	3500	1238	56.2	82.5	68.1	53.6	53.2	8	206	5.0	1.25	670	48.0	40	55	1	67	1.0	0.25	RF-17	-	375	INLET	98	93	91	98	94	93	92	89	1)
																															OUTLET	91	88	92	86	86	83	82	77	
AHU-18	TEMTROL OR APPROVED EQUAL	28800	5800	16" AXIAL	3500	7.5	4.0	10/6	3500	1127	56.2	82.4	68.0	53.6	53.2	8	188	5.0	1.25	615	48.0	40	55	1	62	1.0	0.25	RF-18	-	375	INLET	98	93	91	98	94	93	92	89	1)
																															OUTLET	91	88	92	86	86	83	82	77	

REMARKS:
1) FURNISH WITH INVERTER-DUTY MOTOR AND WITH ABB ULTRA LOW HARMONICS VARIABLE FREQUENCY DRIVE.

PIPING SYMBOLS

LPS — LOW PRESSURE STEAM (15 PSIG AND BELOW)
LPR — LOW PRESSURE STEAM CONDENSATE RETURN
HWS — HOT WATER HEATING SUPPLY
HWR — HOT WATER HEATING RETURN
CHS — CHILLED WATER SUPPLY
CHR — CHILLED WATER RETURN
D — DRAIN LINE
V — VENT LINE
X — EXISTING PIPE TO BE REMOVED
RH — ROLLER-TYPE HANGER
SH — VARIABLE SPRING-TYPE HANGER (TYPE 51)*
SCH — SPRING CUSHION-TYPE HANGER (TYPE 48 OR 49)*
CH — CLEVIS-TYPE HANGER
TH — TRAPEZE HANGER (PROVIDE U-BOLT PIPE ATTACHMENT TO TRAPEZE EXCEPT WHERE RH ARE INDICATED)
PS — FLOOR-SUPPORTED PIPE STAND
RC — RISER CLAMP (TYPE 42)*
WB — WALL BRACKET (TYPE 31, 32, 33)*
CSH — CONSTANT SUPPORT HANGER (TYPE 54, 55, 56)*

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

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
FLOAT & THERMOSTATIC TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL
THERMOSTATIC TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL
THERMOMETER
PRESSURE GAGE
FE — FLOW ELEMENT
TEST PLUG (PRESSURE/TEMPERATURE)
AV — AUTOMATIC AIR VENT
C — QUICK-COUPLE HOSE CONNECTOR

GENERAL NOTES

1. ALL PIPING AND DUCTS IN FINISHED ROOMS OR SPACES SHALL BE CONCEALED IN A FURRED CHASE OR ABOVE THE HARD 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 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. WATER PIPE CONNECTIONS TO AIR HEATING AND COOLING COILS SHALL BE MADE TO PROVIDE COUNTER FLOW BETWEEN WATER AND AIR.
7. SEISMIC PROVISIONS NOT REQUIRED.

VARIABLE FREQUENCY CONTROLLER SCHEDULE

EQUIPMENT NO.	MANUFACTURER/ MODEL NO.	SERVICE	ELECTRICAL: DISCONNECT	BYPASS CONTACTOR	DRIVEN MOTOR DATA: HP	VOLTS/PH./HZ.	ENCLOSURE	OUTPUT TYPE	REMARKS
VFD-AHU-17	ABB-ULH	AHU-17	INTEGRAL	INTEGRAL	10	480/3/60	NEMA 1	PWM	1)
VFD-AHU-18	ABB-ULH	AHU-18	INTEGRAL	INTEGRAL	10	480/3/60	NEMA 1	PWM	1)
VFD-RF-17	ABB-ULH	RF-17	INTEGRAL	INTEGRAL	15	480/3/60	NEMA 1	PWM	1)
VFD-RF-18	ABB-ULH	RF-18	INTEGRAL	INTEGRAL	15	480/3/60	NEMA 1	PWM	1)
VFD-CHWP-6A	ABB-ULH	CHWP-6A	INTEGRAL	INTEGRAL	15	480/3/60	NEMA 1	PWM	1)
VFD-CHWP-6B	ABB-ULH	CHWP-6B	INTEGRAL	INTEGRAL	15	480/3/60	NEMA 1	PWM	1)
VFD-HWP-6A	ABB-ULH	HWP-6A	INTEGRAL	INTEGRAL	10	480/3/60	NEMA 1	PWM	1)
VFD-HWP-6B	ABB-ULH	HWP-6B	INTEGRAL	INTEGRAL	10	480/3/60	NEMA 1	PWM	1)

REMARKS:
1) COORDINATE WITH ELECTRICAL PLANS AND SPECIFICATIONS.

AIR FILTER

FILTER NUMBER	MANUFACTURER	TYPE	C.F.M.	SIZE	EFFICIENCY - % ASHRAE STANDARD 52-76	CLEAN AIR FRICTION IN W.G.	SERVICE	REMARKS
PF-17	FARR OR APPROVED EQUAL	MERV 6	34500	24"x24"x4"	25	0.25	AHU-17	.
PF-18	FARR OR APPROVED EQUAL	MERV 6	32200	24"x24"x4"	25	0.25	AHU-18	.

FANS

MARK	MANUFACTURER	AXIAL	CFM: MAX	S.P.: INCHES W.G.	MOTOR: HP/QTY	RPM	DRV: DIRECT	REMARKS		SOUND POWER DATA RE 10 WATTS OCTIVE BAND CENTER FREQUENCY HZ: 63	125	250	500	1000	2000	4000	8000	REMARKS
RF-17	TWIN CITY OR APPROVED EQUAL	X	24700	1.5	15/1	1200	X	1)	INLET	100	104	106	103	100	96	91	84	1)
RF-18	TWIN CITY OR APPROVED EQUAL	X	23000	1.5	15/1	1200	X	1)	INLET	101	102	100	95	92	89	85	79	1)

REMARKS:
1) FURNISH WITH INVERTER-DUTY MOTOR AND WITH ABB ULTRA LOW HARMONICS VARIABLE FREQUENCY DRIVE.

PUMPS

MARK	MANUFACTURER	MODEL	CAPACITY GPM	WATER HEAD FT.	MAX. MOTOR HP	FLUID	REMARKS
CHWP-6A	GRUNDFOS OR APPROVED EQUAL	CR 90-1-1	400	80	15	CHILLED WATER	1)
CHWP-6B	GRUNDFOS OR APPROVED EQUAL	CR 90-1-1	400	80	15	CHILLED WATER	1)
HWP-6A	GRUNDFOS OR APPROVED EQUAL	CR 64-1-1	265	60	10	HOT WATER	1)
HWP-6B	GRUNDFOS OR APPROVED EQUAL	CR 64-1-1	265	60	10	HOT WATER	1)

REMARKS:
1) FURNISH WITH INVERTER-DUTY MOTOR AND WITH ABB ULTRA LOW HARMONICS VARIABLE FREQUENCY DRIVE.

DUCT SOUND ATTENUATOR SCHEDULE

EQUIPMENT NO.	MANUFACTURER/ MODEL NO.	SYSTEM	AIR FLOW (CFM)	DIMENSION (INCHES): LENGTH	WIDTH	HEIGHT	MINIMUM DYNAMIC INSERTION LOSS, (db): 63	125	250	500	1K	2K	4K	8K	DIRECTION OF SOUND FLOW	PRESSURE DROP MIX (IN W.C.)	REMARKS
SA-17A	VIBRO ACOUSTICS CD-HV-F1	RETURN	24700	126	42	58	13	21	32	43	37	39	27	22	NEGATIVE	0.28	-
SA-18A	VIBRO ACOUSTICS CD-HV-F1	RETURN	23000	126	42	58	13	21	32	43	37	39	27	22	NEGATIVE	0.27	-

CONSTRUCTION DOCUMENTS

Revisions | Date

T V H S NASHVILLE CAMPUS

Tennessee Valley Healthcare System

T V H S MURFREESBORO CAMPUS

TENNESSEE VALLEY HEALTHCARE SYSTEM
MURFREESBORO CAMPUS

Approved: --
Approved: --

Drawing Title: MECHANICAL SCHEDULES, LEGEND & ABBREVIATIONS

Approved: Facility Manager
Approved: Director

Project Title: REPLACE ATTIC AHU'S BUILDING 6

Building Number: 6
Checked: TCT
Drawn: SVP
Location: TVHS - YORK CAMPUS

Date: 01/20/2012
Project No. 626A4-11-204
DRAWING NO. 6 - M 1
FILE NAME 11027D01

Veterans Administration