ABBREVIATIONS:

AAV	AUTOMATIC AIR VENT
ABV	ABOVE
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
APPROX	APPROXIMATELY
ASSOC	ASSOCIATED
ATC	AUTOMATIC TEMPERATURE CONTROL
AUTO	AUTOMATIC
AUX	AUXILIARY
AVG	AVERAGE
AWT	AVERAGE WATER TEMPERATURE
BC	BALANCING COCK
BD	BLOW DOWN
BDD	BACKDRAFT DAMPER
BHP	BRAKE HORSEPOWER/BOILER HORSEPOWER
BLDG	BUILDING
BLW	BELOW
BTM	BOTTOM
BTUH	BRITISH THERMAL UNIT PER HOUR
CAP	CAPACITY
CCW	COUNTER CLOCKWISE
CFM	CUBIC FEET PER MINUTE
CHAR	CHARACTERISTIC
CLG	CEILING
CO	CLEANOUT
COL	COLUMN
COMB	COMBINATION
COND	CONDENSATE
CONN	CONNECTION
CONT	CONTINUATION
CONTR	CONTRACTOR
CONST	CONSTRUCTION
COP	COEFFICIENT OF PERFORMANCE
CUH	CABINET UNIT HEATER
CV	CONSTANT VOLUME
Cv	COEFFICIENT, VALVE FLOW
CW	COLD WATER/CLOCKWISE
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
CWS&R	CHILLED WATER SYPPLY AND RETURN
Db	DRY BULB TEMPERATURE, °F
DIFF	DIFFUSER
DISCH	DISCHARGE
DHW	DOMESTIC HOT WATER
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DX	DIRECT EXPANSION
EA	EACH/EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE, °F
EC	ELECTRICAL CONTRACTOR
EER	ENERGY EFFICIENCY RATING
EF	EXHAUST FAN
EFF	EFFICIENCY
EL	EXPANSION LOOP
ELECT	ELECTRIC
ELEV	ELEVATION
ENCL	ENCLOSURE
ENT	ENTERING
EP	END PANEL/EXPLOSION PROOF
EQUIP	EQUIPMENT
ER	ECCENTRIC REDUCER (BOTTOMS FLAT)
ERC	EXHAUST REGISTER CEILING
ERW	EXHAUST REGISTER WALL
ESP	EXTERNAL STATIC PRESSURE
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION
EWT	ENTERING WATER TEMPERATURE, °F
°F	FAHRENHEIT
FA	FREE AREA
FC	FLEXIBLE CONNECTION
FCD	FLOW CONTROL DEVICE
FCU	FAN COIL UNIT
FD	FIRE DAMPER/FLOOR DRAIN
FLA	FULL LOAD AMPS
FLR	FLOOR
FNL	FUNNEL
FPM	FEET PER MINUTE
FR	FROM
FT	FIN-TUBE/FEET
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GWR	GLYCOL WATER RETURN
GWS	GLYCOL WATER SUPPLY
GLV	GLOBE VALVE
GPM	GALLONS PER MINUTE
GV	GATE VALVE
HC	HEATING CONTRACTOR
HD	HEAD
HORIZ	HORIZONTAL
HP	HORSEPOWER/HEAT PUMP
HR	HOUR
HTG	HEATING
HUH	HORIZONTAL UNIT HEATER
HVAC	HEATING VENTILATION AND AIR CONDITIONING
HW	HOT WATER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HWS&R	HOT WATER SUPPLY AND RETURN
HZ	HERTZ
IER	INVERTED ECCENTRIC REDUCER (TOPS FLAT)
IN	INCHES
IVS	ISOLATION VALVE STATION
JB	JUNCTION BOX
KEM	KITCHEN EQUIPMENT MANUFACTURER
KHE	KITCHEN HOOD EXHAUST
KHS	KITCHEN HOOD UNIT
KW	KILOWATT
KWH	KILOWATT HOUR
LAT	LEAVING AIR TEMPERATURE, °F
LBS	POUNDS
LF	LINEAR FEET
LTG	LIGHTING
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE, °F
MAV	MANUAL AIR VENT
MBH	THOUSAND BTUH
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MER	MECHANICAL EQUIPMENT ROOM
MFG	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MOD	MOTOR OPERATED DAMPER
MTD	MOUNTED
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED/NOISE CRITERIA
NO	NORMALLY OPEN
No	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OPNG	OPENING
P	PUMP
PC	PLUMBING CONTRACTOR
PNL	PANEL
PRESS	PRESSURE
PSIG	POUNDS PER SQUARE INCH GAGE
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
QTY	QUANTITY
RA	RELIEF/RETURN AIR
RADP	RADIANT PANEL
REFRIG	REFRIGERANT
REQD	REQUIRED
REV	REVISION
RF	RETURN/RELIEF FAN
RGC	RELIEF/RETURN GRILLE CEILING
RGCP	RELIEF/RETURN GRILLE CEILING PREFORATED
RGW	RELIEF/RETURN GRILLE WALL
RH	RELATIVE HUMIDITY
RLA	RUNNING LOAD AMPS
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RRC	RETURN REGISTER CEILING
RRCP	RETURN REGISTER CEILING PERFORATED
RRW	RETURN REGISTER WALL
RV	RELIEF VALVE
SA	SUPPLY AIR
SD	SMOKE DETECTOR
SDCL	SUPPLY DIFFUSER CEILING LINEAR
SDC-()	SUPPLY DIFFUSER CEILING - (THROW)
SDCP-()	SUPPLY DIFFUSER CEILING PERFORATED - (THROW)
SDCR	SUPPLY DIFFUSER CEILING ROUND
SF	SUPPLY FAN/SQUARE FEET
SP	STATIC PRESSURE (INCHES OF WATER)
SPEC	SPECIFICATION
SQ	SQUARE
SQFT	SQUARE FOOT
STD	STANDARD
STR	STRAINER
SV	SAFETY VALVE
TCV	TEMPERATURE CONTROL VALVE
TD	TEMPERATURE DIFFERENCE
TDV	TRIPLE DUTY VALVE
TEMP	TEMPERATURE
TOT	TOTAL
TRANS	TRANSITION
TS	TIP SPEED
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TYP	TYPICAL
UG	UNDERGROUND
V	VOLTAGE, VALVE
VCD	VOLUME CONTROL DAMPER, (MANUAL)
VEL	VELOCITY
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
VTR	VENT THROUGH ROOF
W	WIDTH
W/	WITH
W/O	WITHOUT
Wb	WET BULB TEMPERATURE, °F
WC	WATER COLUMN
WG	WATER GAUGE
WTD	WATER TEMPERATURE DROP, °F
ZCV	ZONE CONTROL VALVE

GENERAL NOTES

1. THE HEATING CONTRACTOR SHALL COORDINATE WITH OTHER CONTRACTORS IN THE LOCATION OF DUCTWORK, PIPING, ETC.
2. ALL DUCTWORK AND PIPING SHALL BE INSTALLED AS HIGH AS POSSIBLE UNLESS NOTED OTHERWISE.
3. DO NOT SCALE DRAWINGS - ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE. NOTIFY ARCHITECT OF ANY DEVIATIONS FROM THE DRAWINGS.
4. THE DRAWINGS ARE DIAGRAMMATIC AND SHOW ONLY THE GENERAL ARRANGEMENTS OF ALL PIPING AND EQUIPMENT. BECAUSE OF SMALL SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO SHOW OR INDICATE ALL OFFSETS, FITTINGS, AND ACCESSORIES WHICH MAY BE REQUIRED TO AVOID EXISTING PIPING OR STRUCTURAL FEATURES.
5. ALL PIPING, CONDUIT, DUCTWORK, ETC., SHALL BE INSTALLED IN A MANNER WHICH WILL NOT DEFACE OR ALTER ANY AREAS. ROUTING OF THE ABOVE EQUIPMENT SHALL BE APPROVED BY THE ARCHITECT PRIOR TO INSTALLATION.
6. ALL WORK PERFORMED ON THIS BUILDING SHALL BE IN COMPLIANCE WITH ALL PERTIENT CODES, RULES, ORDINANCES, AND REGULATIONS OF THE LOCAL, STATE, AND NATIONAL GOVERNING AUTHORITIES.
7. ALL WORK PERFORMED UNDER AND IN CONECTION WITH THESE DRAWINGS AND SPECIFICATIONS SHALL BE IN STRICT COMPLIANCE WITH THE LATEST SAFETY AND HEALTH STANDARDS.
8. REPORT ANY DISCREPANCIES FOUND IN THE DRAWINGS AND/OR IN THE SPECIFICAIONS DURING THE BIDDING PROCESS FOR CLARIFICATION BY THE ARCHITECT.
9. HEATING CONTRACTOR SHALL PROVIDE AND INSTALL ACCESS PANELS AS REQUIRED FOR ACCESS TO VALVES, TRAPS, CLEAN OUTS, CONTROLS, FIRE DAMPERS, ETC. THE CONTRACTOR SHALL COORDINATE INSTALLATION OF ACCESS PANELS WITH FINISH WORK AND ALL OTHER TRADES.
10. THE HEATING CONTRACTOR SHALL FURNISH SHOP DRAWINGS OF ANY RELOCATED PIPING, DUCTWORK, EQUIPMENT, ETC., FOR APPROVAL PRIOR TO RELOCATION OF ITEM.
11. ALL PIPING AND DUCTWORK TO BE LOCATED AND COORDINATED WITH ARCHITECTURAL PLANS. ALL PIPING AND DUCTWORK SHALL BE CONCEALED IN FINISHED AREAS.
12. ALL PIPE PENETRATIONS THROUGH CHASES, WALLS, OR FLOORS WHICH ARE FIRE-RATED, SHALL BE PROPERLY SEALED TO MAINTAIN FIRE PROTECTION. HEATING CONTRACTOR SHALL SUBMIT PROPOSED UL SYSTEM FOR REVIEW.
13. ALL DUCTS THAT PENETRATE CHASES, WALLS, OR FLOORS WHICH ARE FIRE-RATED, SHALL BE INSTALLED WITH FIRE DAMPERS IN ACCORDANCE WITH NFPA 90A. THIS APPLIES EVEN IF THEY ARE NOT SPECIFICALLY SHOWN ON THE DRAWING.
14. ANY PHYSICAL INSTALLATION MODIFICATIONS, DUE TO FIELD CONDITIONS, SHALL BE RESOLVED BY THE HEATING CONTRACTOR IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MECHANICAL ENGINEER.
15. THE HEATING CONTRACTOR SHALL PAY FOR ALL FEES AND PERMITS AS NECESSARY TO COMPLETE THE INSTALLATION.
16. THE HEATING CONTRACTOR SHALL COORDINATE THE LOCATION OF DUCTWORK WITH ALL NEW PIPING BEING INSTALLED.
17. ALL PIPING AND DUCTS IN FINISHED ROOMS OR SPACES SHALL BE CONCEALED IN FURRED CHASES OR ABOVE SUSPENDED CEILING.
18. FIRST FIGURE OF DUCT SIZE INDICATES DIMENSION OF FACE SHOWN OR INDICATED.

MECHANICAL LEGEND - MISC.

SYMBOL	DESCRIPTION
	SUPPLY DIFFUSER; 4-WAY THROW UNLESS NOTED OTHERWISE
	VAV BOX WITH REHEAT COIL
	AIR FLOW ARROW
DP	DIFFERENTIAL PRESSURE SENSOR
UC	DOOR UNDERCUT 1" ABOVE FINISHED FLOOR
S D	DUCT MOUNTED STATIC PRESSURE SENSOR
FM	FLOW METER, DDC
H	HUMIDISTAT, ELECTRIC
P S	PRESSURE SENSOR
R	REFRIGERANT SENSOR
SD	SMOKE DETECTOR
SP	STATIC PRESSURE SENSOR
T	THERMOSTAT, ELECTRIC
T	THERMOSTAT, ELECTRONIC
1	INDICATES NOTES ELSEWHERE ON DRAWING
	CONNECTION BETWEEN NEW AND EXISTING
	DISCONNECTION POINT
1	REVISION NUMBER
1 / M-501	DETAIL NUMBER OR SECTION LETTER DRAWING NUMBER WHERE DETAIL IS DRAWN
1 / M101 M501	DETAIL NUMBER OR SECTION LETTER DRAWING NUMBER WHERE DETAIL IS DRAWN DRAWING NUMBER WHERE SYMBOL IS USED
A / M-301	SECTION LETTER DRAWING NUMBER WHERE SHOWN
A / M101 M301	SECTION LETTER DRAWING NUMBER WHERE SECTION IS DRAWN DRAWING NUMBER WHERE SECTION IS CUT

DUCTWORK LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FLEXIBLE DUCTWORK		SUPPLY/OUTDOOR/MAKE-UP AIR RECTANGULAR DUCT SECTION
12x8	DUCT (SHOWN x HIDDEN)		RETURN/TRANSFER/RELIEF AIR RECTANGULAR DUCT SECTION
12ø	ROUND DUCT (DIAMETER)		EXHAUST AIR RECTANGULAR DUCT SECTION
12/8	FLAT OVAL (SHOWN x HIDDEN)		SUPPLY/OUTDOOR/MAKE-UP AIR OVAL DUCT SECTION
FC	FLEXIBLE CONNECTION		RETURN/TRANSFER/RELIEF AIR OVAL DUCT SECTION
	ACOUSTIC DUCT LINING		EXHAUST AIR OVAL DUCT SECTION
VCD	VOLUME CONTROL DAMPER		SUPPLY/OUTDOOR/MAKE-UP AIR ROUND DUCT SECTION
	DUCT TRANSITION		RETURN/TRANSFER/RELIEF AIR ROUND DUCT SECTION
M	MOTOR OPERATED DAMPER		EXHAUST AIR ROUND DUCT SECTION
F	FIRE DAMPER		LOUVER IN WALL
S	SMOKE DAMPER		SQUARE ELBOW WITH TURNING VANES
C	COMBINATION FIRE / SMOKE DAMPER		RADIUS ELBOW
	CONICAL TAKEOFF CONNECTION		RECTANGULAR BOOT CONNECTION
	STRAIGHT ROUND TAKEOFF CONNECTION		BELLMOUTH TAKEOFF CONNECTION
	CONICAL "T" CONNECTION		CONICAL TAKEOFF CONNECTION
	STRAIGHT "T" CONNECTION		

MECHANICAL PIPING LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
M	3-WAY CONTROL VALVE, ELECTRIC		PRESSURE GAUGE WITH COCK, WATER
	AIR VENT WITH COCK		PRESSURE REDUCING VALVE, WATER
	ANCHOR		PRESSURE TEMPERATURE TAP
A	AQUA STAT		RELIEF VALVE, WATER
	AUTOMATIC AIR VENT		RISE IN PIPE
	BALANCING COCK		SIDE CONNECTION
	BOTTOM CONNECTION		STUB UP
	CONCENTRIC REDUCER		SUCTION DIFFUSER
M	CONTROL VALVE, ELECTRIC		TEMPERATURE CONTROL VALVE
	CHECK VALVE		THERMOMETER WITH SEPERABLE WELL
	CONDUCTIVITY SENSOR FOR CHEMICAL FEEDER		TRIPLE DUTY VALVE
DP	DIFFERENTIAL PRESSURE SENSOR		UNION
	DIRECTION OF FLOW		VALVE, SEE SPECIFICATIONS FOR TYPE
	DIRECTION OF PIPE PITCH, DOWN		VACUUM BREAKER
	DROP IN PIPE		VALVE WITH HOSE END
	ELBOW DOWN		FLOW CONTROL DEVICE
	ELBOW (TEE) UP	FM	FLOW CONTROL DEVICE WITH FLOW METER
	ECCENTRIC REDUCER		WELL
	END CAP		WYE STRAINER
	FLANGED CONNECTION		WYE STRAINER WITH BALL VALVE
	FLEXIBLE CONNECTION		PIPE SECTION
	FLOW CONTROL DEVICE		PIPE DOWN
	FLOW SWITCH		ISOLATION VALVE STATION
	GUIDE		PIPE CONNECTION
	INVERTED ECCENTRIC REDUCER		

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer: Dewberry — 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9683, Fax (973) 739-9710

Structural Engineer: WZG — 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.E. Lenz Company — 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9300, Fax (814) 269-9301

Environmental Consultant: SSM — 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc. — 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

ARCHITECT: ARRAY healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406

t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	AS INDICATED

Drawing Title: SYMBOLS AND ABBREVIATIONS

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date: 07/27/2012 | Checked: TME | Drawn: DJA

VA Project Number: 595-109

Building Number: 34

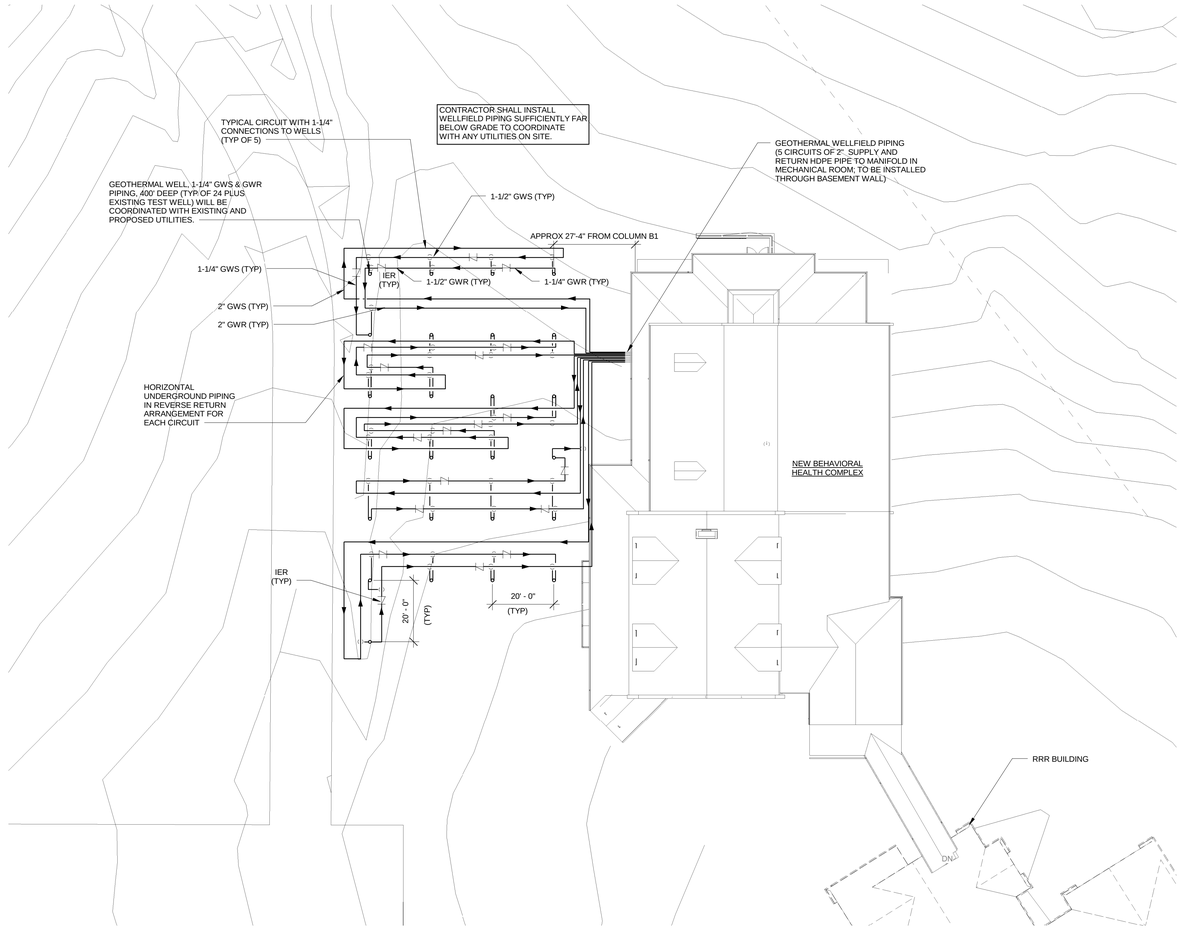
Drawing Number: MH001

Dwg. 71 of 123

Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



1 SITE PLAN - MECHANICAL
SCALE: 1" = 20'-0"

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer
Dewberry
600 Parsippany Road, Suite 301
Parsippany, NJ 07054-3715
Tel (973) 576-9683
Fax (973) 739-9710

Structural Engineer
WZG
180 W. Ridge Pike
Limerick, PA 19468
Tel (214) 329-5559

MEP Engineer
H.E. LENZ COMPANY
1407 Scalp Avenue
Johnstown, PA 15904
Tel (814) 269-9300
Fax (814) 269-9301

Environmental Consultant
SSM
1047 North Park Road, P.O. Box 6307
Reading, PA 19610
Tel (610) 621-2000

Cost Estimator
International Consultants, Inc.
221 Chestnut Street, Suite 200
Philadelphia, PA 19106
Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JACINT M. ZABRAUT ARCHITECT

ARCHITECT:
ARRAY
healthcare facilities solutions
2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406
t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	1" = 20'-0"

Drawing Title: SITE PLAN - MECHANICAL

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date	Checked	Drawn
07/27/2012	TME	DJA

VA Project Number: 595-109

Building Number: 34

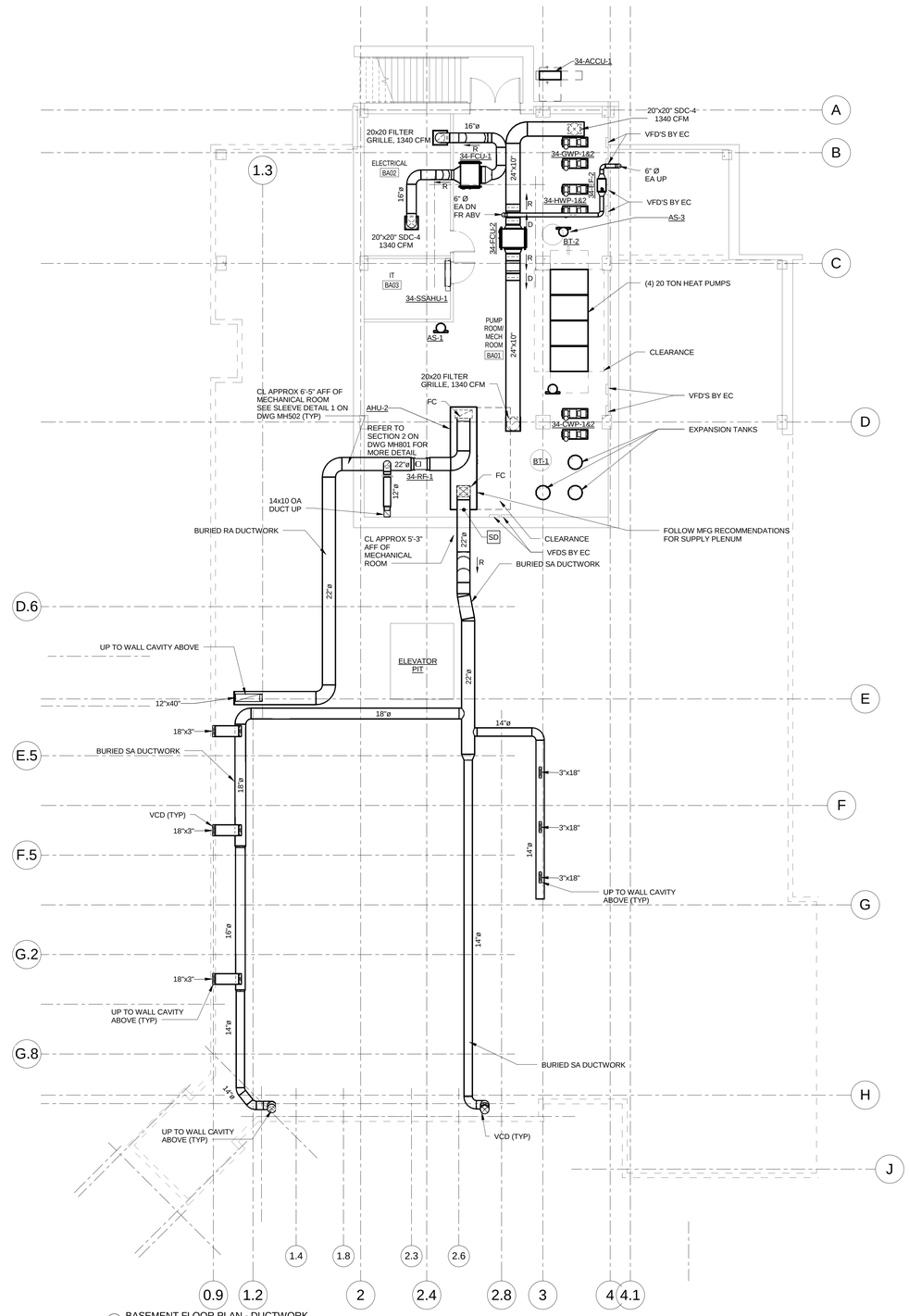
Drawing Number: MH101

Dwg. 72 of 123

Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



1 BASEMENT FLOOR PLAN - DUCTWORK
SCALE: 1/8" = 1'-0"

DUCTWORK NOTES

1. ALL DUCTWORK SIZES NOTED ARE FREE AREA SIZES.
2. RADIUS ELBOWS SHALL BE PROVIDED. TURNING VAINES SHALL NOT BE PROVIDED UNLESS APPROVED BY ENGINEER.
3. ALL DUCT JUNCTIONS SHALL BE CONSTRUCTED OF STANDARD 45 DEGREES ENTRY BRANCHES WITH BALANCING DAMPERS DOWNSTREAM OF DUCT BRANCH ENTRY.
4. MAXIMUM LENGTH OF FLEXIBLE DUCTWORK IN ANY ONE SUPPLY BRANCH SHALL BE THREE (8) FEET.
5. NO RUN OF FLEXIBLE DUCTWORK SHALL CONTAIN MORE THAN A TOTAL OF 90 DEGREES OF TURN. INSULATED RIGID SHALL BE USED WHERE MORE THAN 90 DEGREES IS REQUIRED.
6. TOTAL STATIC PRESSURE NOTED IN SCHEDULES INCLUDES DUCT SYSTEM, TERMINAL UNITS, FILTERS, COILS, ETC.
7. CEILING DIFFUSER SIZES SHOWN ON FLOOR PLANS ARE NECK SIZES.
8. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF CEILING DIFFUSERS, REGISTERS AND GRILLES.
9. PROVIDE FLEXIBLE DUCT CONNECTION BETWEEN AHU/EXH FAN AND DUCTWORK.
10. DUE TO THE SMALL SCALE OF THE DRAWINGS, RISERS, AND DROPS ARE NOT ALL SHOWN. PROVIDE RISERS AND DROPS FOR COORDINATION.
11. FIRST FIGURE OF DUCT SIZE INDICATES DIMENSION OF FACE SHOWN OR INDICATED.
12. THERMOSTAT LOCATIONS ONLY TO BE APPROVED AFTER FINAL FURNITURE LAYOUT IS APRROVED BY CONTRACTOR

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer: Dewberry — 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9683, Fax (973) 739-9710

Structural Engineer: WZG — 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.E. Lenz Company — 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9300, Fax (814) 269-9301

Environmental Consultant: SSM — 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc. — 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA, REGISTERED PROFESSIONAL ENGINEER, TIMOTHY M. DARRAH, 044512-E, NO. 044512-E

ARCHITECT:

ARRAY
healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406

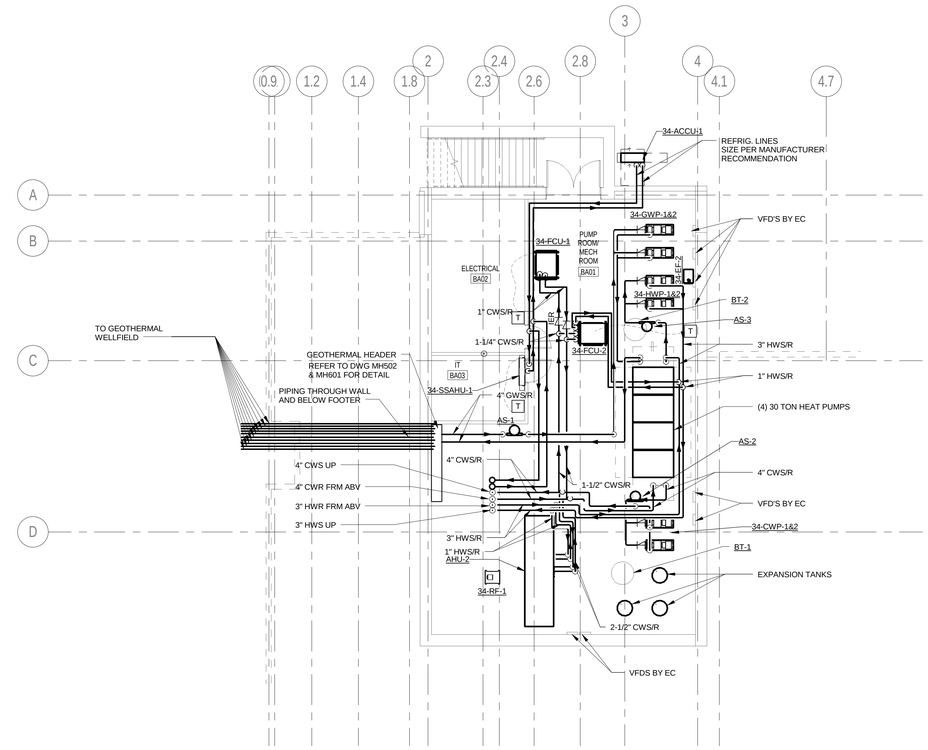
t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	3468
Scale	1/8" = 1'-0"
Drawing Title	BASEMENT FLOOR PLAN - DUCTWORK
Approved: Project Director	
Project Title	Behavioral Health Complex
Location	1700 South Lincoln Ave. Lebanon, PA 17042
Date	07/27/2012
Checked	TME
Drawn	DJA
VA Project Number	595-109
Building Number	34
Drawing Number	MH201
Dwg. 73 of 123	

Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



1 BASEMENT FLOOR PLAN - PIPING
SCALE: 1/8" = 1'-0"

MECHANICAL PIPING NOTED

1. ALL DOWNFEED BRANCHES AND EQUIPMENT SHALL HAVE DRAIN COCKS INSTALLED AT LOWEST POINT.
2. ALL HORIZONTAL LINES SHALL BE RUN LEVEL WITHOUT POCKETS. WHERE POCKETS OCCUR, AUTO AIR VENTS SHALL BE INSTALLED AT EACH VERTICAL RISE.
3. ALL UPFEED RISERS SHALL BE MADE WITH TOP CONNECTIONS AT MAIN. ALL DOWNFEED RISERS SHALL BE MADE WITH BOTTOM CONNECTIONS AT MAIN.
4. CHANGES OF PIPE SIZES ON HORIZONTAL RUNS SHALL BE MADE WITH INVERTED ECCENTRIC REDUCERS WITH TOP OF PIPE LEVEL.
5. ARROWS ON SUPPLY AND RETURN LINES INDICATE DIRECTION OF FLOW.
6. PROVIDE VALVE WITH HOSE END ON ALL LOW POINTS OF PIPING SYSTEM AND AUTO AIR VENTS AT ALL HIGH POINTS OF THE PIPING SYSTEM UNLESS NOTED OTHERWISE.
7. FOR TYPICAL WATER AND REFRIGERANT PIPING CONNECTIONS TO EQUIPMENT, SEE STANDARD DETAILS.
8. WATER PIPE CONNECTIONS TO AIR HEATING AND COOLING COILS SHALL BE MADE SO THERE WILL BE COUNTER FLOW BETWEEN WATER AND AIR.
9. DIELECTRIC UNIONS AND FLANGES SHALL BE USED ON ALL CONNECTIONS BETWEEN DISSIMILAR METALS.
10. ALL LINES NOTED "BELOW FLR." OR "ABV. CLG." SHALL BE CONCEALED IN JOIST SPACE, THROUGH JOISTS, OR BETWEEN JOISTS, UNLESS CEILING IS FURRED OR LINES ARE BELOW SLAB ON GRADE.
11. THERMOSTAT LOCATIONS ONLY APPROVED AFTER FINAL FURNITURE LAYOUT IS APPROVED BY CONTRACTOR

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer: Dewberry — 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9683, Fax (973) 739-9710

Structural Engineer: WZG — 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.F. Lenz Company — 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9300, Fax (814) 269-9301

Environmental Consultant: SSM — 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc. — 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL ENGINEER — TIMOTHY M. EARHART — PE-044818-E — NO. 044818-E

ARCHITECT:

ARRAY — healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406

t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	1/8" = 1'-0"

Drawing Title: BASEMENT FLOOR PLAN - PIPING

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date	Checked	Drawn
07/27/2012	TME	DJA

VA Project Number: 595-109

Building Number: 34

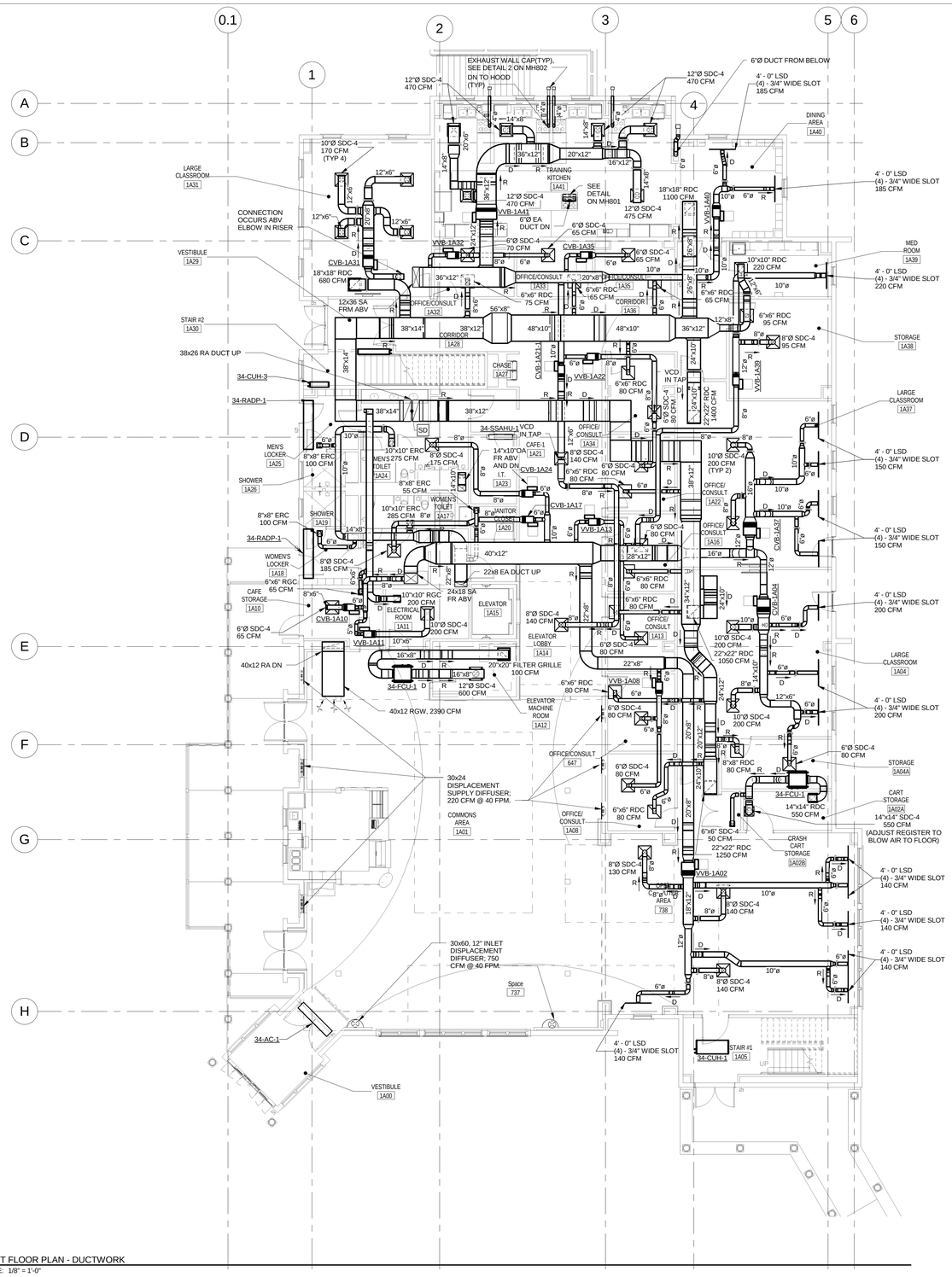
Drawing Number: MH202

Dwg. 74 of 123

Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



1 FIRST FLOOR PLAN - DUCTWORK
SCALE: 1/8" = 1'-0"

DUCTWORK NOTES

1. ALL DUCTWORK SIZES NOTED ARE FREE AREA SIZES.
2. RADIUS ELBOWS SHALL BE PROVIDED. TURNING VAINES SHALL NOT BE PROVIDED UNLESS APPROVED BY ENGINEER.
3. ALL DUCT JUNCTIONS SHALL BE CONSTRUCTED OF STANDARD 45 DEGREES ENTRY BRANCHES WITH BALANCING DAMPERS DOWNSTREAM OF DUCT BRANCH ENTRY.
4. MAXIMUM LENGTH OF FLEXIBLE DUCTWORK IN ANY ONE SUPPLY BRANCH SHALL BE THREE (8) FEET.
5. NO RUN OF FLEXIBLE DUCTWORK SHALL CONTAIN MORE THAN A TOTAL OF 90 DEGREES OF TURN. INSULATED RIGID SHALL BE USED WHERE MORE THAN 90 DEGREES IS REQUIRED.
6. TOTAL STATIC PRESSURE NOTED IN SCHEDULES INCLUDES DUCT SYSTEM, TERMINAL UNITS, FILTERS, COILS, ETC.
7. CEILING DIFFUSER SIZES SHOWN ON FLOOR PLANS ARE NECK SIZES.
8. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF CEILING DIFFUSERS, REGISTERS AND GRILLES.
9. PROVIDE FLEXIBLE DUCT CONNECTION BETWEEN AHU/EXH FAN AND DUCTWORK.
10. DUE TO THE SMALL SCALE OF THE DRAWINGS, RISERS, AND DROPS ARE NOT ALL SHOWN. PROVIDE RISERS AND DROPS FOR COORDINATION.
11. FIRST FIGURE OF DUCT SIZE INDICATES DIMENSION OF FACE SHOWN OR INDICATED.
12. THERMOSTAT LOCATIONS ONLY TO BE APPROVED AFTER FINAL FURNITURE LAYOUT IS APRROVED BY CONTRACTOR

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer: Dewberry — 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9683, Fax (973) 739-9710

Structural Engineer: WZG — 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.E. Lenz Company — 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9300, Fax (814) 269-9301

Environmental Consultant: SSM — 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc. — 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA, REGISTERED PROFESSIONAL ENGINEER, TIMOTHY M. EARHART, No. PE-059331-E

ARCHITECT:

ARRAY — healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406

t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	1/8" = 1'-0"

Drawing Title: FIRST FLOOR PLAN - DUCTWORK

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date	Checked	Drawn
07/27/2012	TME	DJA

VA Project Number: 595-109

Building Number: 34

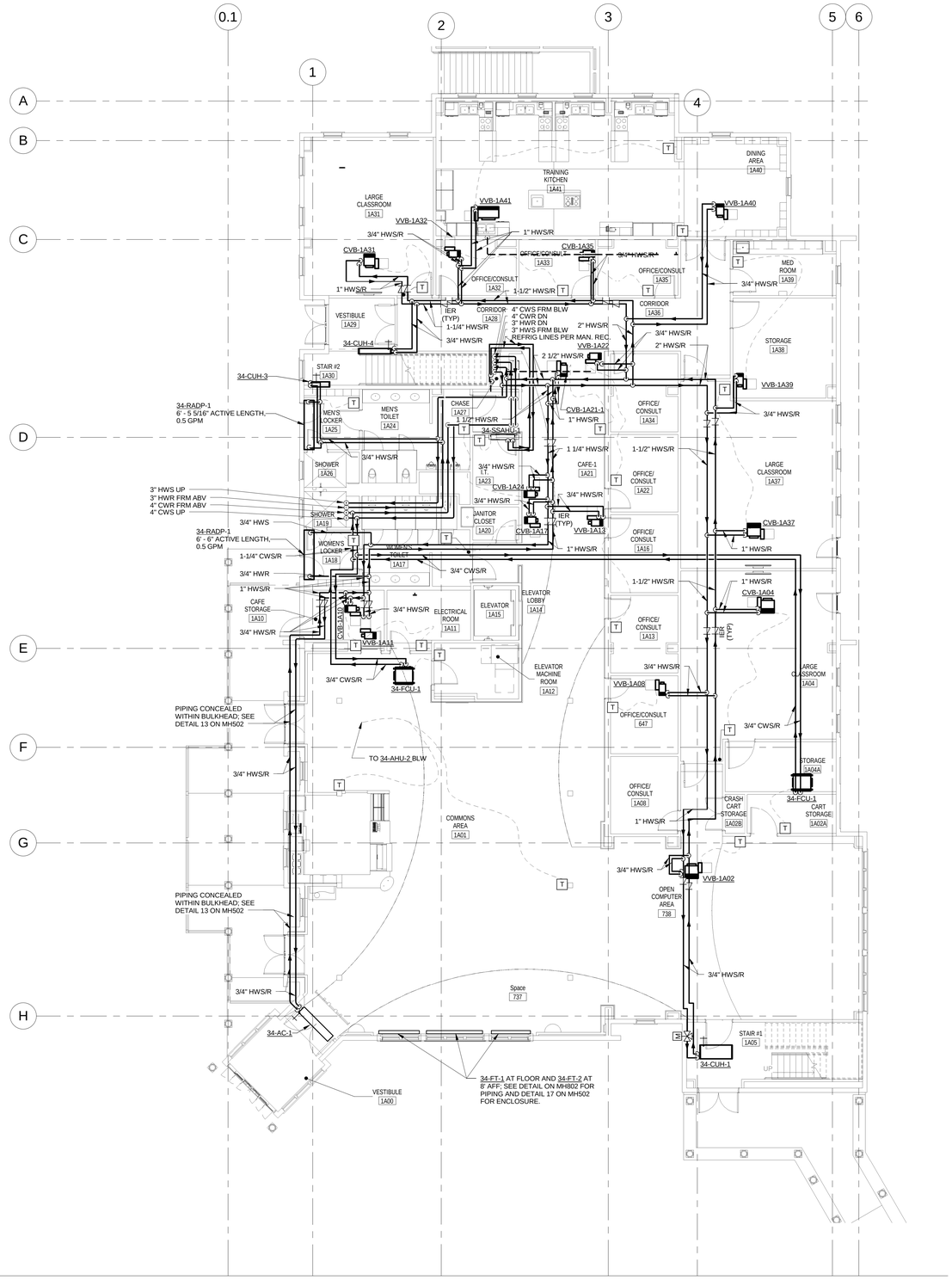
Drawing Number: MH203

Dwg. 75 of 123

Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



MECHANICAL PIPING NOTED

1. ALL DOWNFEED BRANCHES AND EQUIPMENT SHALL HAVE DRAIN COCKS INSTALLED AT LOWEST POINT.
2. ALL HORIZONTAL LINES SHALL BE RUN LEVEL WITHOUT POCKETS. WHERE POCKETS OCCUR, AUTO AIR VENTS SHALL BE INSTALLED AT EACH VERTICAL RISE.
3. ALL UPFEED RISERS SHALL BE MADE WITH TOP CONNECTIONS AT MAIN. ALL DOWNFEED RISERS SHALL BE MADE WITH BOTTOM CONNECTIONS AT MAIN.
4. CHANGES OF PIPE SIZES ON HORIZONTAL RUNS SHALL BE MADE WITH INVERTED ECCENTRIC REDUCERS WITH TOP OF PIPE LEVEL.
5. ARROWS ON SUPPLY AND RETURN LINES INDICATE DIRECTION OF FLOW.
6. PROVIDE VALVE WITH HOSE END ON ALL LOW POINTS OF PIPING SYSTEM AND AUTO AIR VENTS AT ALL HIGH POINTS OF THE PIPING SYSTEM UNLESS NOTED OTHERWISE.
7. FOR TYPICAL WATER AND REFRIGERANT PIPING CONNECTIONS TO EQUIPMENT, SEE STANDARD DETAILS.
8. WATER PIPE CONNECTIONS TO AIR HEATING AND COOLING COILS SHALL BE MADE SO THERE WILL BE COUNTER FLOW BETWEEN WATER AND AIR.
9. DIELECTRIC UNIONS AND FLANGES SHALL BE USED ON ALL CONNECTIONS BETWEEN DISSIMILAR METALS.
10. ALL LINES NOTED "BELOW FLR." OR "ABV. CLG." SHALL BE CONCEALED IN JOIST SPACE, THROUGH JOISTS, OR BETWEEN JOISTS, UNLESS CEILING IS FURRED OR LINES ARE BELOW SLAB ON GRADE.
11. THERMOSTAT LOCATIONS ONLY APPROVED AFTER FINAL FURNITURE LAYOUT IS APPROVED BY CONTRACTOR

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer: Dewberry — 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9683, Fax (973) 739-9710

Structural Engineer: WZG — 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.F. Lenz Company — 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9300, Fax (814) 269-9301

Environmental Consultant: SSM — 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc. — 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — TIMOTHY M. EARHART — ENGINEER — No. 044573-E

ARCHITECT:

ARRAY — healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406

t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	1/8" = 1'-0"

Drawing Title: FIRST FLOOR PLAN - PIPING

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date	Checked	Drawn
07/27/2012	TME	DJA

VA Project Number: 595-109

Building Number: 34

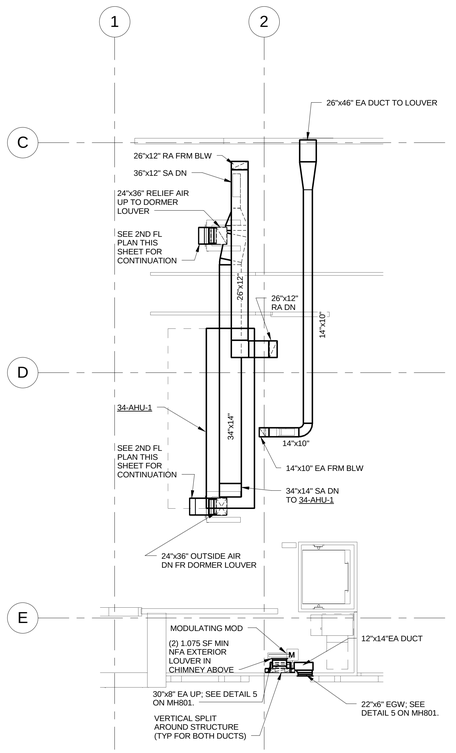
Drawing Number: MH204

Dwg. 76 of 123

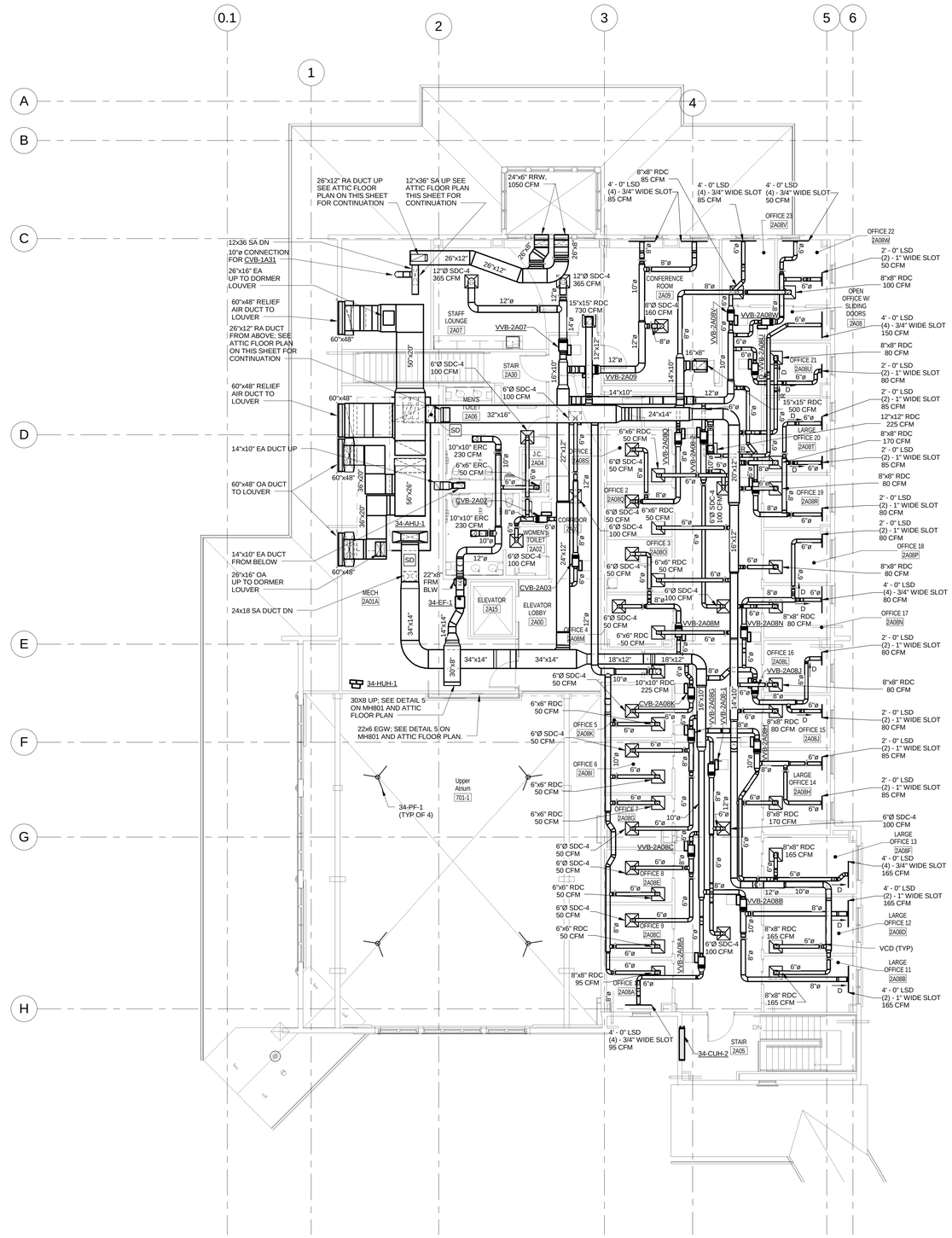
Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



2 ATTIC FLOOR PLAN - DUCTWORK
SCALE: 1/8" = 1'-0"



1 SECOND FLOOR PLAN - DUCTWORK
SCALE: 1/8" = 1'-0"

DUCTWORK NOTES

1. ALL DUCTWORK SIZES NOTED ARE FREE AREA SIZES.
2. RADIUS ELBOWS SHALL BE PROVIDED. TURNING VAINES SHALL NOT BE PROVIDED UNLESS APPROVED BY ENGINEER.
3. ALL DUCT JUNCTIONS SHALL BE CONSTRUCTED OF STANDARD 45 DEGREES ENTRY BRANCHES WITH BALANCING DAMPERS DOWNSTREAM OF DUCT BRANCH ENTRY.
4. MAXIMUM LENGTH OF FLEXIBLE DUCTWORK IN ANY ONE SUPPLY BRANCH SHALL BE THREE (8) FEET.
5. NO RUN OF FLEXIBLE DUCTWORK SHALL CONTAIN MORE THAN A TOTAL OF 90 DEGREES OF TURN. INSULATED RIGID SHALL BE USED WHERE MORE THAN 90 DEGREES IS REQUIRED.
6. TOTAL STATIC PRESSURE NOTED IN SCHEDULES INCLUDES DUCT SYSTEM, TERMINAL UNITS, FILTERS, COILS, ETC.
7. CEILING DIFFUSER SIZES SHOWN ON FLOOR PLANS ARE NECK SIZES.
8. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF CEILING DIFFUSERS, REGISTERS AND GRILLES.
9. PROVIDE FLEXIBLE DUCT CONNECTION BETWEEN AHU/EXH FAN AND DUCTWORK.
10. DUE TO THE SMALL SCALE OF THE DRAWINGS, RISERS, AND DROPS ARE NOT ALL SHOWN. PROVIDE RISERS AND DROPS FOR COORDINATION.
11. FIRST FIGURE OF DUCT SIZE INDICATES DIMENSION OF FACE SHOWN OR INDICATED.
12. THERMOSTAT LOCATIONS ONLY TO BE APPROVED AFTER FINAL FURNITURE LAYOUT IS APRROVED BY CONTRACTOR

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer: Dewberry — 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9683, Fax (973) 739-9710

Structural Engineer: WZG — 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.E. Lenz Company — 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9300, Fax (814) 269-9301

Environmental Consultant: SSM — 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc. — 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER TIMOTHY M. EARHART No. PE-061837-E

ARCHITECT: ARRAY — healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406
t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	1/8" = 1'-0"

Drawing Title: SECOND FLOOR PLAN - DUCTWORK

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date	Checked	Drawn
07/27/2012	TME	DJA

VA Project Number: 595-109

Building Number: 34

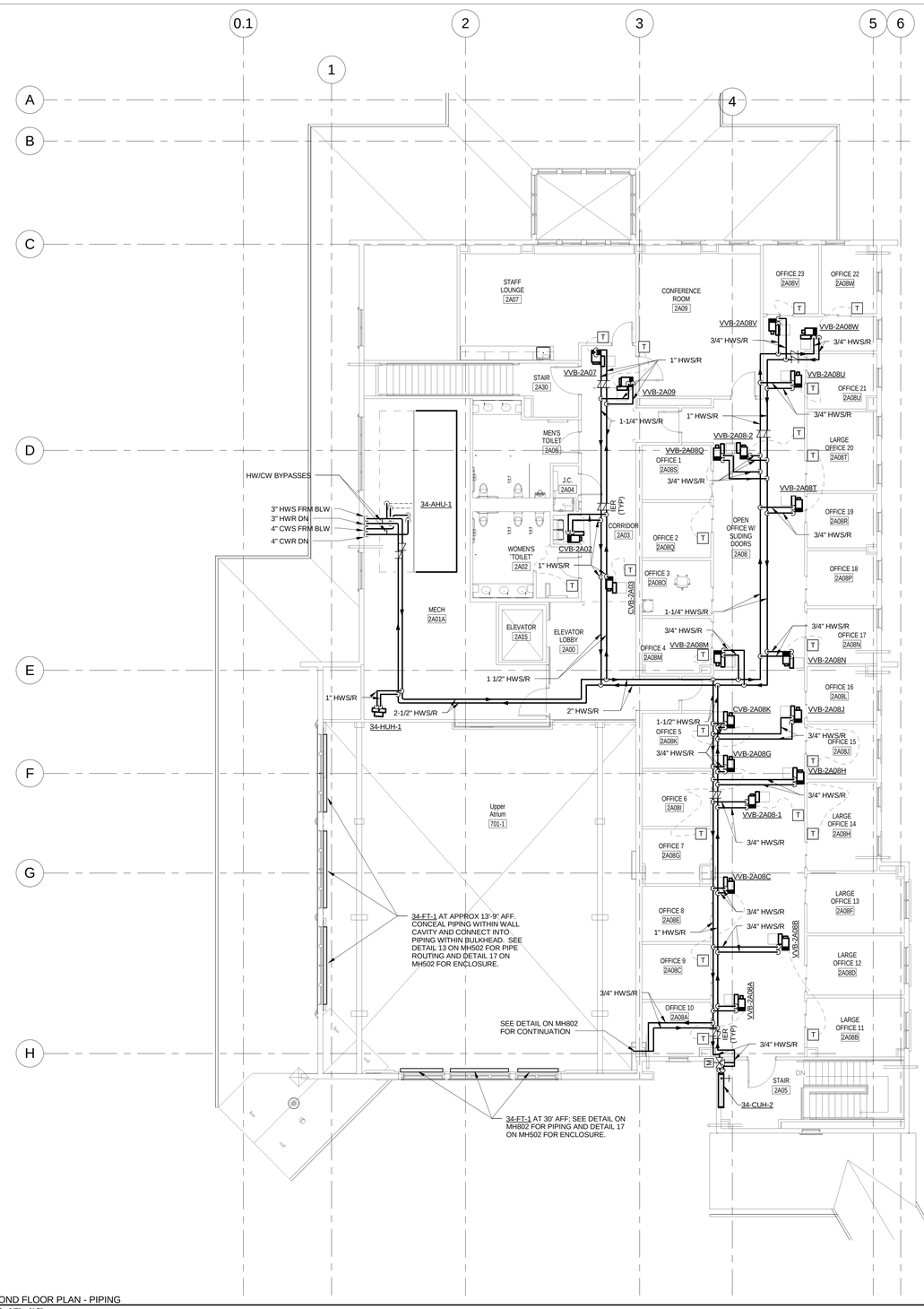
Drawing Number: MH205

Dwg. 77 of 123

Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



1 SECOND FLOOR PLAN - PIPING
SCALE: 1/8" = 1'-0"

MECHANICAL PIPING NOTED

1. ALL DOWNFEED BRANCHES AND EQUIPMENT SHALL HAVE DRAIN COCKS INSTALLED AT LOWEST POINT.
2. ALL HORIZONTAL LINES SHALL BE RUN LEVEL WITHOUT POCKETS. WHERE POCKETS OCCUR, AUTO AIR VENTS SHALL BE INSTALLED AT EACH VERTICAL RISE.
3. ALL UPFEED RISERS SHALL BE MADE WITH TOP CONNECTIONS AT MAIN. ALL DOWNFEED RISERS SHALL BE MADE WITH BOTTOM CONNECTIONS AT MAIN.
4. CHANGES OF PIPE SIZES ON HORIZONTAL RUNS SHALL BE MADE WITH INVERTED ECCENTRIC REDUCERS WITH TOP OF PIPE LEVEL.
5. ARROWS ON SUPPLY AND RETURN LINES INDICATE DIRECTION OF FLOW.
6. PROVIDE VALVE WITH HOSE END ON ALL LOW POINTS OF PIPING SYSTEM AND AUTO AIR VENTS AT ALL HIGH POINTS OF THE PIPING SYSTEM UNLESS NOTED OTHERWISE.
7. FOR TYPICAL WATER AND REFRIGERANT PIPING CONNECTIONS TO EQUIPMENT, SEE STANDARD DETAILS.
8. WATER PIPE CONNECTIONS TO AIR HEATING AND COOLING COILS SHALL BE MADE SO THERE WILL BE COUNTER FLOW BETWEEN WATER AND AIR.
9. DIELECTRIC UNIONS AND FLANGES SHALL BE USED ON ALL CONNECTIONS BETWEEN DISSIMILAR METALS.
10. ALL LINES NOTED "BELOW FLR." OR "ABV. CLG." SHALL BE CONCEALED IN JOIST SPACE, THROUGH JOISTS, OR BETWEEN JOISTS, UNLESS CEILING IS FURRED OR LINES ARE BELOW SLAB ON GRADE.
11. THERMOSTAT LOCATIONS ONLY APPROVED AFTER FINAL FURNITURE LAYOUT IS APPROVED BY CONTRACTOR

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer
Dewberry
600 Parsippany Road, Suite 301
Parsippany, NJ 07054-3715
Tel (973) 576-9683
Fax (973) 739-9710

Structural Engineer
WZG
180 W. Ridge Pike
Limerick, PA 19468
Tel (214) 329-5559

MEP Engineer
H.J. Heinz Company
1407 Scalp Avenue
Johnstown, PA 15904
Tel (814) 269-9300
Fax (814) 269-9301

Environmental Consultant
SSM
1047 North Park Road, P.O. Box 6307
Reading, PA 19610
Tel (610) 621-2000

Cost Estimator
International Consultants, Inc.
221 Chestnut Street, Suite 200
Philadelphia, PA 19106
Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
TIMOTHY M. EARHART
ENGINEER
No. PE-059811-E

ARCHITECT:
ARRAY
healthcare facilities solutions
2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406
t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	1/8" = 1'-0"

Drawing Title: SECOND FLOOR PLAN - PIPING

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date	Checked	Drawn
07/27/2012	TME	DJA

VA Project Number: 595-109

Building Number: 34

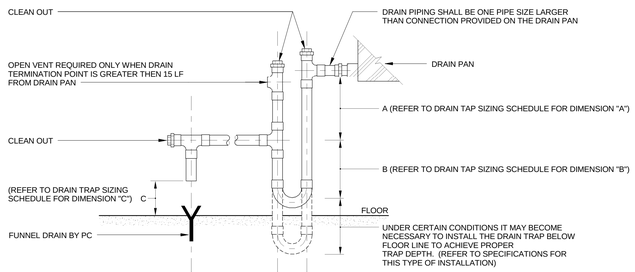
Drawing Number: MH206

Dwg. 78 of 123

Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



TRAP SIZING SCHEDULE		
DIMENSION	DRAIN TRAP LOCATION FOR NEGATIVE PRESSURE	DRAIN TRAP LOCATION FOR POSITIVE PRESSURE
A	4"	2"
B	4"	TOTAL AHU SP ± 1 (4" MINIMUM)
C	2" ABOVE FUNNEL DRAIN	2" ABOVE FUNNEL DRAIN

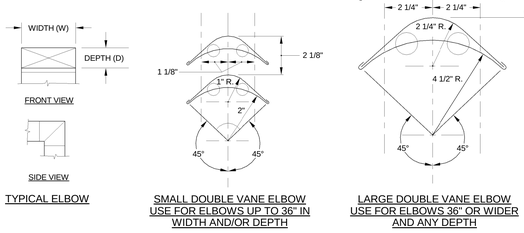
NOTE:

DRAIN PAN MAY BE LOCATED IN THE NEGATIVE OR POSITIVE PRESSURE AREA OF THE AIR STEAM. REFER TO DRAIN TRAP SIZING SCHEDULE FOR DIMENSIONAL DATA REQUIRED FOR SPECIFIC DRAIN LOCATION.

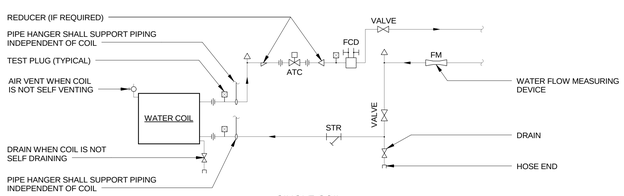
1 AIR HANDLING UNIT CONDENSATE DRAIN TRAP PIPING DETAIL
NOT TO SCALE

NOTES:

1. ALL SQUARE OR RECTANGULAR ELBOWS SHALL HAVE ONE OF THE TWO TYPES OF TURNING VANES SHOWN. SINGLE VANE ELBOWS WILL NOT BE PERMITTED.
2. VANES SHALL BE CONSTRUCTED, SUPPORTED AND FASTENED AS RECOMMENDED BY SMACNA.
3. ALL SQUARE OR RECTANGULAR ELBOWS SHOWN ON PLANS FOR EXHAUST OR RETURN DUCT MAY BE MADE RADIUS ELBOWS PROVIDED SPACE PERMITS RADIUS INSTALLATION.
4. ALL SQUARE OR RECTANGULAR ELBOWS SHOWN ON PLANS FOR SUPPLY DUCT MAY BE MADE RADIUS ELBOWS PROVIDED SPACE PERMITS RADIUS INSTALLATION AND/OR THERE ISNT AN OUTLET OR TAKE-OFF WITHING 5D ON THE DOWNSTREAM SIDE OF THE ELBOW.



2 SQUARE OR RECTANGULAR ELBOW DETAIL
NOT TO SCALE

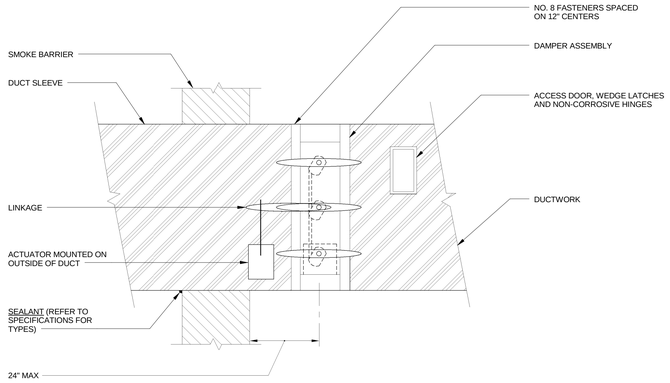


SINGLE COIL

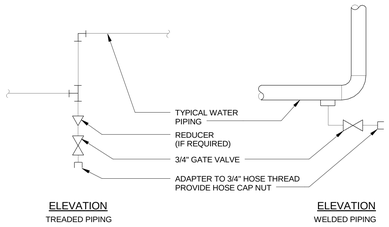
NOTES:

1. WHEN COIL IS INCLUDED IN CASING MOUNTED VIBRATION ISOLATORS THE FIRST TWO (2) HANGERS FOR EACH PIPE SHALL BE SPRING AND NEOPRENE TYPE. TYPE "H" FOR 4" DIAMETER PIPE AND SMALLER. TYPE "H-P" FOR 5" DIAMETER PIPE AND LARGER.
2. PIPE SHALL BE INSTALLED IN SUCH MANNER THAT IT WILL NOT BLOCK THE SWING OR USE OF ACCESS DOORS OR PANELS NEITHER SHALL IT BLOCK THE SERVICING OF FILTERS, VALVES, OR EQUIPMENT.

3 TYPICAL CONNECTIONS TO WATER COIL
NOT TO SCALE



4 SMOKE DAMPER DETAIL
NOT TO SCALE



NOTES:

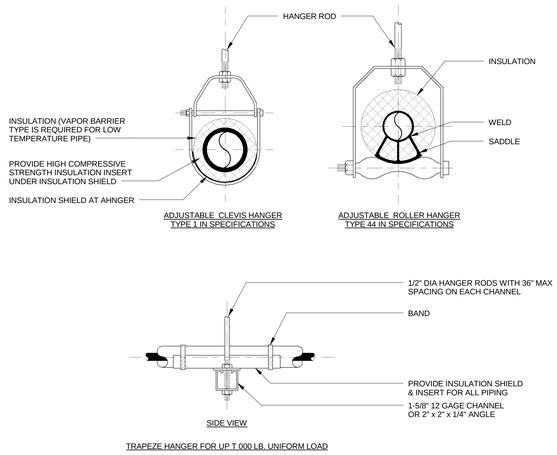
1. DRAIN ALL LOW POINTS AS INDICATED ABOVE.
2. WHERE SCALE POCKETS ARE SHOWN ON PIPE DIAGRAM'S AND/OR PLANS, LOCATE DRAIN AT THE BOTTOM OF SCALE POCKET.

5 TYPICAL DRAIN VALVE CONNECTION
NOT TO SCALE

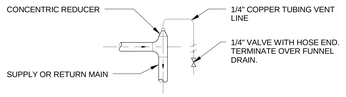
MAXIMUM PIPE/TUBING SUPPORT SPACING (FEET)											
NOM. SIZE	THRU 3/4"	1	1-1/4"	1-1/2"	2	2-1/2"	3	4	5	6	8	10
PIPE	7 FEET	7	7	9	10	11	12	14	16	17	19	22
TUBING	5 FEET	6	7	8	8	9	10	12	13	14	16	-

NOTE:

1. FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE.



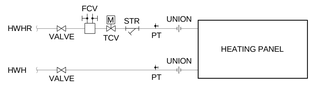
6 TYPICAL PIPE HANGER DETAIL
NOT TO SCALE



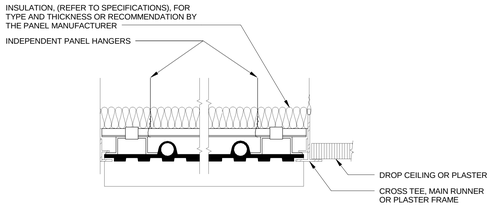
7 MANUAL AIR VENT
NOT TO SCALE

CONTROL VALVE NOTE:

1. CONTROL VALVE SHALL BE PROVIDED WITH ADJUSTACENT UNIONS TO FACILITATE REMOVAL.



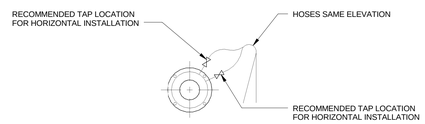
SCHEMATIC - HOT WATER - 2-WAY



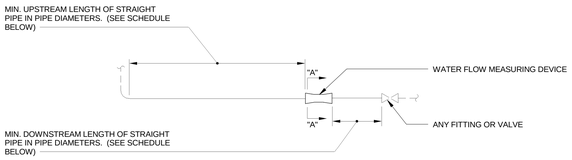
NOTES:

1. REFER TO FLOOR PLANS FOR PANEL WIDTH AND LOCATION. SEE PANEL MANUFACTURER'S SPECIFICATIONS FOR OPENING SIZE.
2. CROSS CHANNELS, CHANNEL CLIPS, INSULATION AND SADDLE BRACKETS BY PANEL MANUFACTURER.
3. THE PANEL OPENING SIZE, FRAMING REQUIREMENTS AND LOCATION ARE TO BE COORDINATED WITH THE CEILING CONTRACTOR.

8 HW RAD CEILING PANEL PIPING DETAIL
NOT TO SCALE



SECTION "A-A":

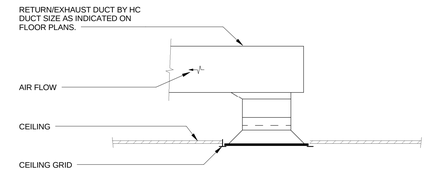


WATER FLOW MEASURING DEVICE INSTALLATION SCHEDULE			
TYPE	MIN UPSTREAM LENGTH OF PIPE - PIPE DIAMETERS		MIN DOWNSTREAM LENGTH - PIPE IN PIPE DIAMETERS
	FOR SIDE TEE	FOR VALVE or OTHER FITTING	
ORIFICE FLANGE or FLOATING BALL WITH IMPACT TUBE	20	10	5
FLOW CONTROL DEVICE, AUTOMATIC BALANCING CONTROL VALVE, or INSERTION VELOCITY AVERAGING AND MEASURING TUBE	10	5	2

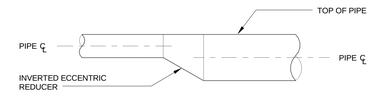
NOTES:

1. DIMENSIONS SHOWN IN SCHEDULE ARE MINIMUM REQURIED. IF MANUFACTURER OF FURNISHED WATER FLOW MEASURING DEVICE RECOMMENDS A GREATER DIMENSION, USE THEIR RECOMMENDATION.
2. INSTALL THE WATER FLOW MEASURING DEVICE SO THE FLOW ARROW IS IN THE SAME DIRECTION AS THE FLOW.
3. THE WATER FLOW MEASURING DEVICE MAY BE INSTALLED IN EITHER HORIZONTAL OR VERTICAL PIPE. UNITS REQUIRING REMOTE METERS SHALL HAVE THE METER CONNECTIONS LOCATED ON OR NEAR THE SIDE WHEN INSTALLED IN HORIZONTAL PIPE. SEE SECTION "A-A". THE METER CONNECTIONS CAN BE INSTALLED IN ANY POSITION WHEN INSTALLED IN VERTICAL PIPE.

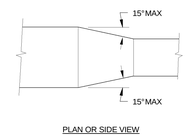
9 WATER FLOW MEASURING DEVICE INSTALLATION DETAIL
NOT TO SCALE



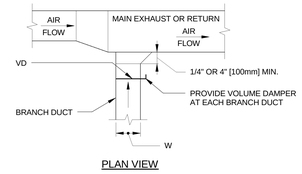
10 RETURN/EXHAUST GRILLE TYPICAL CONNECTION
NOT TO SCALE



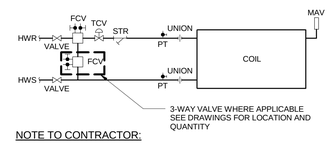
11 TYPICAL PIPE SIZE CHANGE FOR WATER
NOT TO SCALE



12 DUCT TRANSITION
NOT TO SCALE



13 EXHAUST OR RETURN BRANCH DUCTWORK
NOT TO SCALE



NOTE TO CONTRACTOR:

CONTROL VALVE SHALL BE PROVIDED WITH FLANGED ENDS OR SHALL BE PROVIDED WITH ADJACENT UNIONS TO FACILITATE REMOVAL.

14 AUXILIARY HEATING COIL PIPING SCHEMATIC - HOT WATER - 2-WAY
NOT TO SCALE

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer: Dewberry — 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9683, Fax (973) 739-9710

Structural Engineer: WZG — 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.F. Lenz Company — 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9300, Fax (814) 269-9301

Environmental Consultant: SSM — 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc. — 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA, REGISTERED PROFESSIONAL, TIMOTHY M. EARHART, ENGINEER, INDIVIDUAL

ARCHITECT: ARRAY — healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406

t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	As indicated

Drawing Title: MECHANICAL DETAILS

Project Title: Behavioral Health Complex

VA Project Number: 595-109

Building Number: 34

Approved: Project Director

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date: 07/27/2012 | Checked: TME | Drawn: DJA

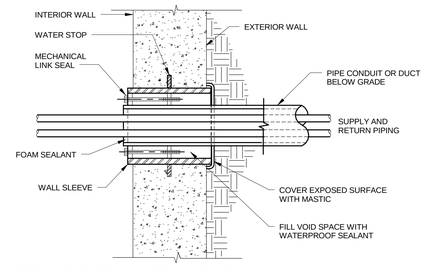
Drawing Number: MH501

Dwg. 79 of 123

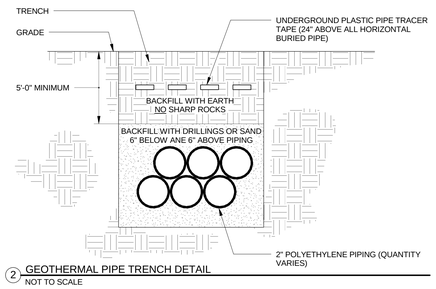
Office of Facilities Management

Department of Veterans Affairs

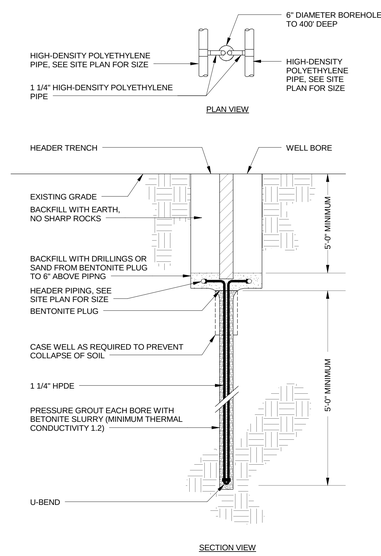
VA FORM 08-6231, OCT 1978



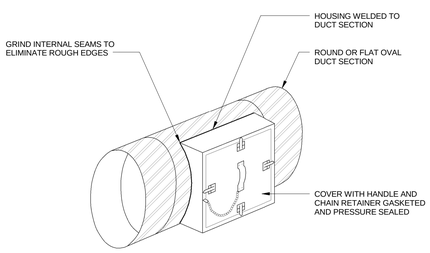
1 PIPE/DUCT PENETRATION BELOW GRADE
NOT TO SCALE



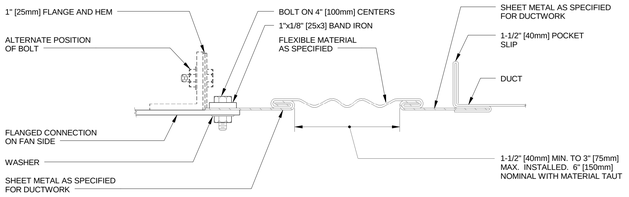
2 GEOTHERMAL PIPE TRENCH DETAIL
NOT TO SCALE



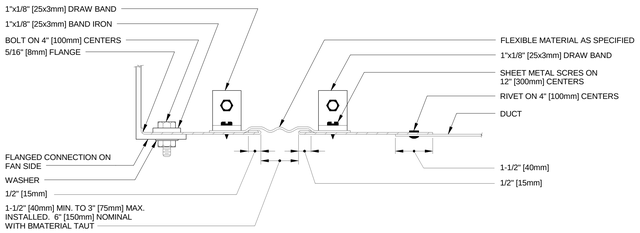
3 BORE HOLE DETAIL
NOT TO SCALE



4 ACCESS DOOR FOR ROUND OR OVAL DUCT
NOT TO SCALE

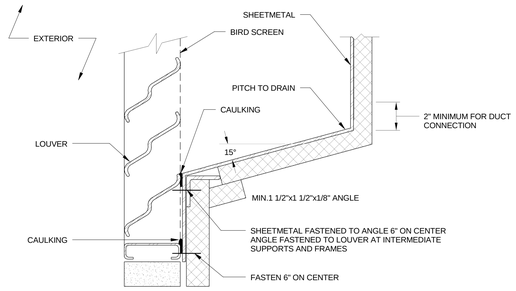


RECTANGULAR FLEXIBLE CONNECTION



ROUND FLEXIBLE CONNECTION

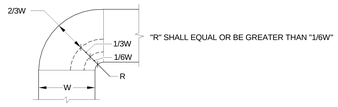
5 FLEXIBLE DUCT CONNECTIONS
NOT TO SCALE



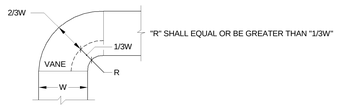
NOTES:

1. SUPPORT PLENUM FROM FLOOR OR STRUCTURE ABOVE WITH GALVANIZED STEEL ANGLES AND CHANNELS.

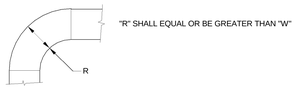
6 PLENUM LOUVER CONNECTION
NOT TO SCALE



SHORT RADIUS ELBOW WITH TWO VANES



SHORT RADIUS ELBOW WITH ONE VANE

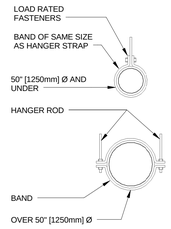


STANDARD RADIUS ELBOW

NOTES:

1. THE INTERIOR SURFACE OF ALL RADIUS ELBOWS SHALL BE MADE ROUND.
2. ALL STANDARD RADIUS ELBOWS SHOWN ON PLANS MAY BE MADE SHORT RADIUS ELBOWS. ALL SHORT RADIUS ELBOWS SHALL HAVE VANES. VANES SHALL BE CONSTRUCTED, SUPPORTED AND FASTENED AS RECOMMENDED BY SMACNA (SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION)

7 RADIUS ELBOWS DETAIL
NOT TO SCALE

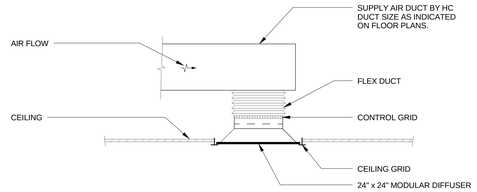


HANGER STRAPS OR RODS			
MAX. DUCT Ø IN. [mm]	QUANTITY/SIZE IN. [mm]	MAX. LOAD LBS. [kg]	MAX. SPACING IN. [mm]
26 [650]	ONE 1 [25] x 22 GA STRAP	260 [119]	144 [3600]
36 [900]	ONE 1 [25] x 18 GA STRAP	420 [190]	144 [3600]
50 [1250]	ONE 1 [25] x 16 GA STRAP	700 [317]	144 [3600]
60 [1500]	TWO 3/8 [10]Ø RODS	1320 [598]	144 [3600]
84 [2100]	TWO 1/2 [13]Ø RODS	2500 [1133]	144 [3600]

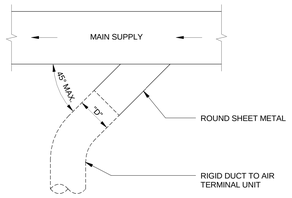
NOTES:

1. TABULATED DATA FROM SMACNA ALLOWS FOR DUCT REINFORCING AND INSULATION, BUT NO EXTERNAL LOAD.

8 ROUND DUCT HANGERS
NOT TO SCALE

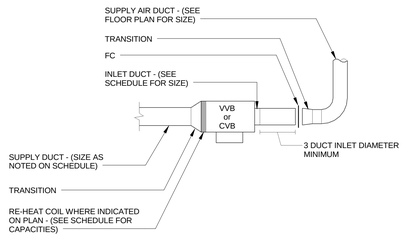


9 SUPPLY AIR DIFFUSER SQUARE TYPICAL CONNECTION
NOT TO SCALE

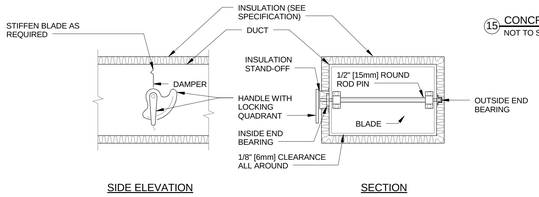


PLAN VIEW

10 SUPPLY DUCT TAKEOFF - AIR TERMINAL UNIT
NOT TO SCALE



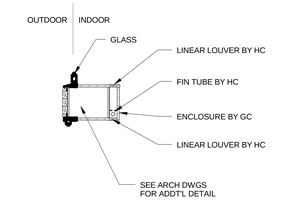
11 VARIABLE AND CONSTANT VOLUME BOX DETAIL
NOT TO SCALE



NOTES:

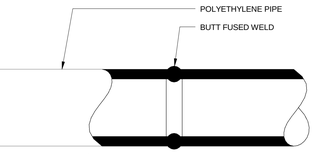
1. DELETE INSULATION STAND-OFF ON DUCTWORK WITHOUT EXTERIOR INSULATION.
2. DETAIL SHOWS SINGLE BLADE DAMPER. DAMPER INSTALLATION SHALL BE SIMILIAR FOR MULTI-BLADE DAMPERS AND ROUND DAMPERS.

12 VOLUME DAMPER DETAIL
NOT TO SCALE



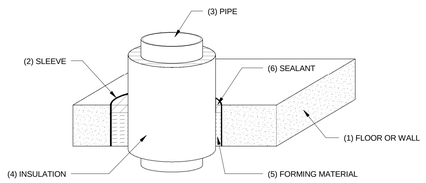
TYPICAL FOR FINTUBE IN COMMONS AREA ABOVE FLOOR LEVEL

17 FINTUBE ENCLOSURE
NOT TO SCALE



16 GEOTHERMAL PIPE JOINT DETAIL
NOT TO SCALE

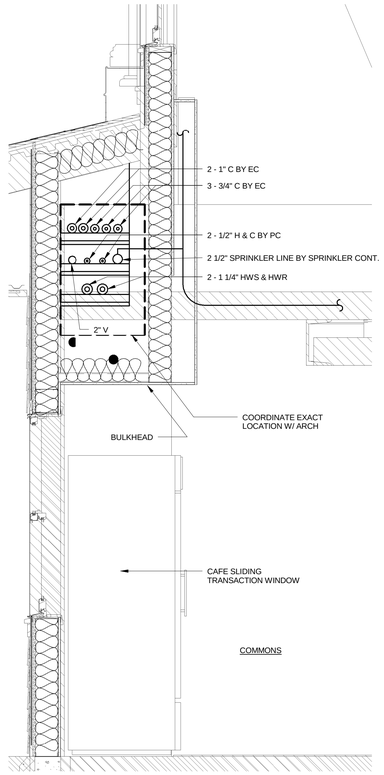
"F" RATING OF 3 HOURS "T" RATING OF 1, 1-1/2, 1-3/4 HOURS



TESTED IN ACCORDANCE WITH:
ASTM E - 814
ANSI/UL 1479

UL SYSTEM C-AJ-5288

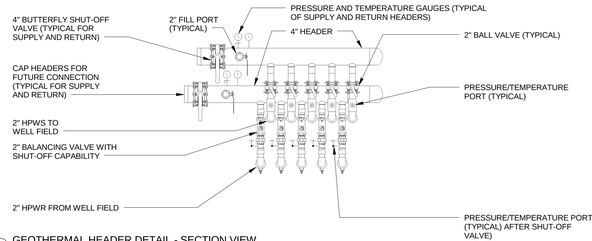
15 CONCRETE FLOOR OR WALL FIBERGLASS INSULATED METALLIC PIPE
NOT TO SCALE



13 MEP BULKHEAD DETAIL - COMMONS AREA
SCALE: 3/4" = 1'-0"

NOTES:

1. FLOOR OR WALL ASSEMBLY - MIN. 4-1/2" ,(114 mm), THICK LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR OR 5", (127 mm), THICK WALL OR CMU BLOCK WALL. FLOOR MAY ALSO BE CONSTRUCTED OF MIN. 6", (152 mm), THICK HOLLOW-CORE PRECAST CONCRETE UNITS. MAX. DIAMETER OF OPENING IS 30", (762 mm). MAX. DIAMETER OF OPENING IS 7", (178 mm), WHEN HOLLOW-CORE PRECAST CONCRETE UNITS ARE USED.
2. METALLIC SLEEVE, (OPTIONAL), - MAX. NOMINAL 30", (762 mm), DIAMETER, OR SMALLER, SCH. 10, OR HEAVIER STEEL SLEEVE CAST OR GROUTED INTO THE FLOOR OR WALL ASSEMBLY, FLUSH WITH BOTH SURFACES.
3. METALIC PIPE - THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, OR TUBING MAY BE USED:
   A. STEEL PIPE - NOM. 24", (610 mm), DIAMETER, (OR SMALLER), SCH. 20, (OR HEAVIER), STEEL PIPE.
   B. IRON PIPE - NOM. 24", (610 mm), DIAMETER, (OR SMALLER), CAST OR DUCTILE IRON PIPE.
   C. COPPER TUBING OR PIPE - NOM. 6", (152 mm), DIAMETER, (OR SMALLER), TYPE L, (OR HEAVIER), COPPER TUBING OR REGULAR, (OR HEAVIER), COPPER PIPE.
4. PIPE INSULATION - NOMINAL 2", (51 mm), THICK, OR THINNER, FIBERGLASS PIPE INSULATION. THE ANNULAR SPACE IS 5/16" TO 1-1/4", (8 mm TO 32 mm).
5. FORMING MATERIAL - TIGHTLY PACK MIN. 4", (102 mm), THICKNESS OF MIN. 4PCF, (64 KG/CUBIC METER), MINERAL WOOL BATT INSULATION TO FILL THE ANNULAR SPACE AND RECESSED 1/2", (13 mm), FROM THE TOP SURFACE OF THE FLOOR OR FROM BOTH SIDES OF THE WALL. WHEN THE FLOOR IS CONSTRUCTED OF HOLLOW-CORE PRECAST CONCRETE UNITS, FORMING MATERIAL SHALL BE RECESSED 1/2" FROM BOTH SURFACES OF FLOOR.
6. NELSON ES1399/LBS3 SEALANT - APPLY SEALANT OVER THE FORMING MATERIAL TO A MIN. 1/2", (13 mm), DEPTH, FLUSH WITH THE TOPSIDE OF THE FLOOR OR WITH BOTH SIDES OF THE WALL. WHEN THE FLOOR IS CONSTRUCTED OF HOLLOW-CORE PRECAST CONCRETE UNITS, SEALANT SHALL BE INSTALLED SYMMETRICALLY ON BOTH SIDES OF FLOOR, FLUSH WITH BOTH FLOOR SURFACES. "T" RATING IS 1 OR 1-1/2 HOURS WHEN LBS3 OR ES1399 IS USED RESPECTIVELY, WITH COPPER PENETRANTS. "T" RATING IS 1 OR 1-3/4" HOURS WHEN LBS3 OR ES1399 IS USED RESPECTIVELY, WITH STEEL/IRON PENETRANTS.



14 GEOTHERMAL HEADER DETAIL - SECTION VIEW
NOT TO SCALE

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer: Dewberry — 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9683, Fax (973) 739-9710

Structural Engineer: WZG — 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.F. Lenz Company — 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9300, Fax (814) 269-9301

Environmental Consultant: SSM — 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc. — 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA REGISTERED ARCHITECT TIMOTHY M. EARHART No. RA-021917 PENNSYLVANIA

ARCHITECT:

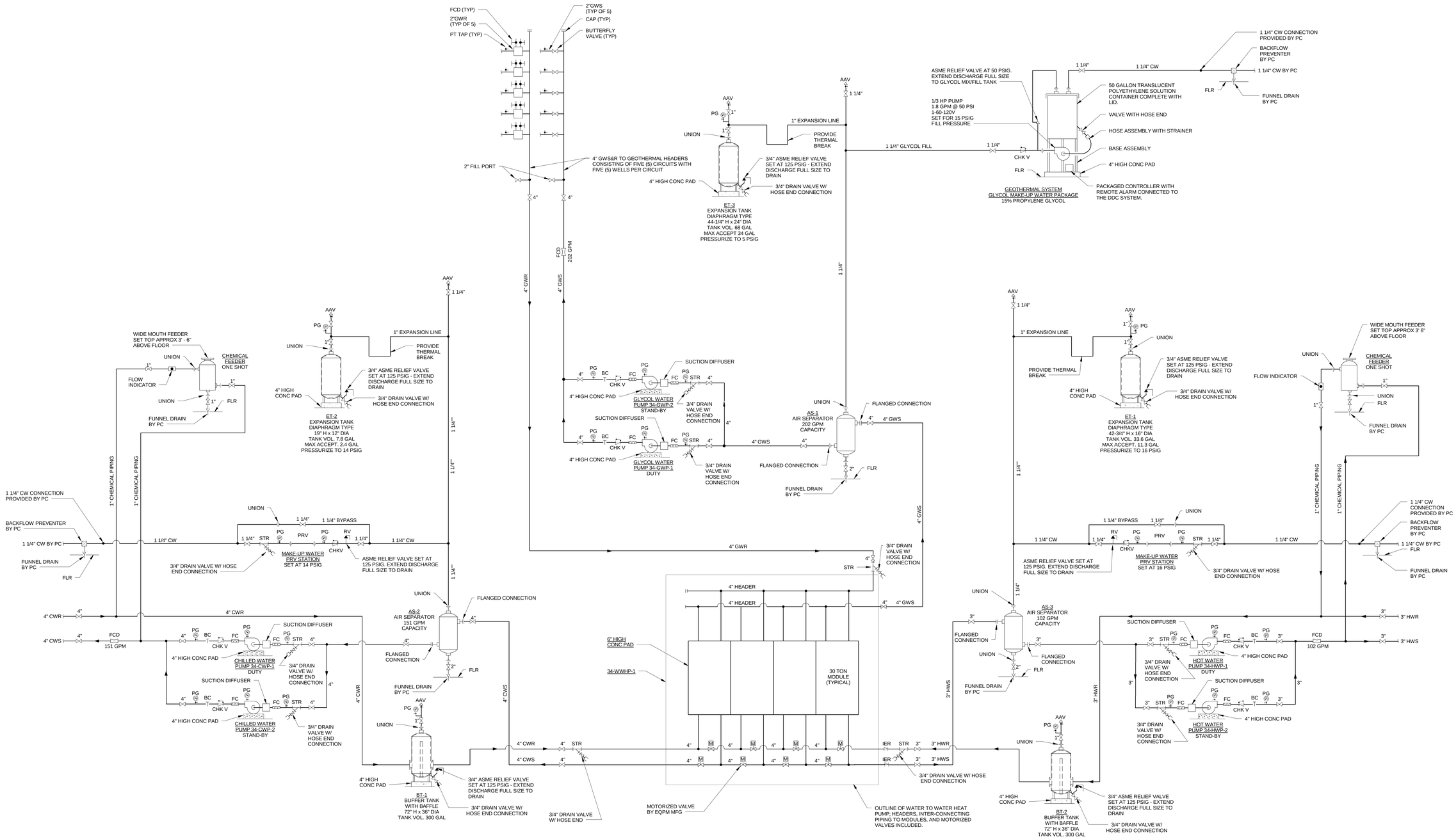
ARRAY
healthcare facilities solutions
2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406
t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	3468
Scale	As indicated
Drawing Title	MECHANICAL DETAILS
Approved: Project Director	
Project Title	Behavioral Health Complex
Location	1700 South Lincoln Ave. Lebanon, PA 17042
Date	07/27/2012
Checked	TME
Drawn	DJA
VA Project Number	595-109
Building Number	34
Drawing Number	MH502
Dwg. 80 of 123	

Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer
Dewberry
600 Parsippany Road, Suite 301
Parsippany, NJ 07054-3715
Tel (973) 576-9663
Fax (973) 739-9710

Structural Engineer
WZG
180 W. Ridge Pike
Limerick, PA 19468
Tel (214) 329-5559

MEP Engineer
H.F. LENZ COMPANY
1407 Scalp Avenue
Johnstown, PA 15904
Tel (814) 269-9200
Fax (814) 269-9301

Environmental Consultant
SSM
1047 North Park Road, P.O. Box 6307
Reading, PA 19610
Tel (610) 621-2000

Cost Estimator
INTERNATIONAL CONSULTANTS, INC.
221 Chestnut Street, Suite 200
Philadelphia, PA 19106
Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
TIMOTHY M. EARHART
No. PE-059811-E

ARCHITECT:

ARRAY
healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406

t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	1/8" = 1'-0"

Drawing Title: MECHANICAL FLOW DIAGRAM

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date	Checked	Drawn
07/27/2012	TME	DJA

VA Project Number: 595-109

Building Number: 34

Drawing Number: MH601

Dwg. 81 of 123

Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978

AIR HANDLING UNIT SCHEDULE (CW/HW)

SYMBOL	SERVES	CFM	OA CFM	SUPPLY FAN DATA: EXT SP	CFM	QUANTITY	FAN SIZE	DRIVE	TYPE	RPM	HP (EA)	TOT BHP	TOT SP	VFD	VOLTAGE	PHASE	HZ	CHILLED WATER COOLING COIL DATA: EAT °F DB	EAT °F WB	LAT °F DB	LAT °F WB	SP IN	TOT MBH	SENS MBH	GPM	EWT °F	LWT °F	WPD (FT)	FINS PER FT	ROWS	FACE VEL. (FPM)	HOT WATER HEATING COIL: EAT °F DB	LAT °F DB	SP IN	TOT MBH	GPM	EWT °F	LWT °F	WPD (FT)	FINS PER FT	ROWS	FACE VEL. (FPM)	FILTER DATA: FILTER	%	MERV	TYPE	SP (DIRTY)	LENGTH	HEIGHT	WIDTH	UNIT WEIGHT	BASIS OF DESIGN
34-AHU-1	1ST & 2ND FLOOR	14,700	4,000	3.00	14,700	1	32	BELT	PLENUM	1,800	25	20.59	6.34	YES (BY EC)	460	3	60	88.6	72.5	56.5	55.7	0.70	784.9	496.8	156.8	45.0	55.0	15.5	132	4	538	45.5	83.2	0.25	617.7	62.9	135.0	115.1	3.4	96	2	538	PRE	30	8	ANGLED	0.15	251"	85"	93"	7,042 LBS	JCI SOLUTION-XTI-75x75
																																										FINAL	95	14	CARTRIDGE	0.25					
34-AHU-2	1ST FLOOR PUBLIC SPACE	2820	430	1.50	2820	1	20"	BELT	PLENUM	1,800	3.0	2.54	3.38	YES (BY EC)	460	3	60	83.5	69.1	55.4	54.4	0.66	131.8	88.1	26.3	45.0	55.0	7.3	132	5	542	55.0	69.5	0.09	44.5	4.5	135.0	115.0	0.2	132	1	542	PRE	30	7	ANGLED	0.27	127"	33"	45"	1,859 LBS	JCI SOLUTION-XTI-33x45
																																										FINAL	95	14	CARTRIDGE	0.53					

NOTES:
1. 34-AHU-1 SHALL HAVE TOP AND BOTTOM RETURN AIR CONNECTION. INSTALL STEEL GRATING IN RETURN AIR FAN SECTION FOR SERVICING.

RETURN FAN DATA

SYMBOL	SERVES	EXT SP	CFM	QUANTITY	FAN SIZE	DRIVE	TYPE	RPM	HP (EA)	TOT BHP	TOT SP	VFD	VOLTAGE	PHASE	HZ	BASIS OF DESIGN
34-RF-1	AHU-2	1.3	2,390	1	-	BELT	INLINE	2,821	3	1.87	1.73	YES (BY EC)	460	3	60	GREENHECK TCB-2-12-30
34-RF-2	AHU-1	2.65	14,700	1	20-20	BELT	FC	1,800	20	14.96	1.73	YES (BY EC)	460	3	60	-

REHEAT COIL SCHEDULE (HW)

SYMBOL	SERVES	CFM	HOT WATER HEATING COIL: EAT °F DB	LAT °F DB	SP IN	TOT MBH	GPM	EWT °F	LWT °F	WPD (FT)	FINS PER FT	ROWS	FACE VEL. (FPM)
34-HC-2	AHU-2	7,000	55.0	74.5	0.12	149.0	15.1	135.0	115.0	3.3	96	1	511

WATER-WATER HEAT PUMP SCHEDULE

SYMBOL	LOCATION	HEAT PUMP MODULES	VALVE MODULES	SOURCE FLUID	LOAD FLUID	COOLING PERFORMANCE: EER	TONS	HEAT EXTRACTED (MBH)	SOURCE WATER: GPM	PD (FT)	EWT	LWT	LOAD WATER: GPM	PD (FT)	EWT	LWT	COP	MBH	HEAT EXTRACTED (MBH)	HEATING PERFORMANCE: SOURCE WATER: GPM	PD (FT)	EWT	LWT	LOAD WATER: GPM	PD (FT)	EWT	LWT	PHASE	HZ	VOLTAGE	MCA	MOP	LENGTH	WIDTH	HEIGHT	BASIS OF DESIGN
34-WWHP-1	PUMP ROOM/MECH ROOM BA01	4 @ 30 TON EACH	3	15% PROP. GLYCOL	WATER	14.8	63.1	931.3	202	5.9	80.0	99.0	151.3	6.9	55.0	45.0	2.5	1009	602.8	202	5.9	40.3	32	101.6	1.6	115.0	135.0	3	60	460	256	300	172"	78-1/4"	64"	MULTISTACK VME

CONSTANT / VARIABLE VOLUME BOX WITH AUXILIARY COIL SCHEDULE

SYMBOL	LOCATION	SERVES	CFM: MIN OCCUPIED	MIN UNOCCUPIED	MAX	BOX DIMENSIONS: L (IN)	W (IN)	H (IN)	INLET DUCT (IN)	NOM COIL SIZE OR DISCH DUCT: W (IN)	H (IN)	FV FPM	EAT °F	LAT °F	EWT °F	WTD °F	AUXILIARY HEATING COIL: WPD (FT)	APD (IN)	GPM	TOTAL MBH	ROWS	BASIS OF DESIGN: MANUFACTURER	MODEL
CVB-1A04	LARGE CLASSROOM 1A04	LARGE CLASSROOM 1A04	1050	580	1050	2' - 4"	2' - 7"	1' - 6"	16"	24"	18"	350	55.0	91.2	135.0	14.4	1.80	0.07	5.8	41.0	2	TITUS	DESV
CVB-1A10	COMMONS	CAFE STORAGE 1A10	65	65	65	2' - 4"	1' - 7"	1' - 0"	5"	12"	8"	98	55.0	99.2	135.0	4.0	1.30	0.01	1.6	3.1	1	TITUS	DESV
CVB-1A17	CORRIDOR 1A21-1	WOMENS TOILET 1A17	185	185	185	2' - 4"	1' - 7"	1' - 0"	6"	12"	8"	278	55.0	100.1	135.0	6.1	2.00	0.06	3.0	9.0	2	TITUS	DESV
CVB-1A21-1	CORRIDOR 1A21-1	CORRIDOR 1A21-1	275	275	140	2' - 4"	1' - 7"	1' - 0"	8"	12"	10"	168	55.0	99.8	135.0	5.1	7.20	0.07	5.3	13.3	2	TITUS	DESV
CVB-1A24	CORRIDOR 1A21-1	MENS TOILET 1A24	175	175	175	2' - 4"	1' - 7"	1' - 0"	6"	12"	8"	263	55.0	100.0	135.0	6.9	1.40	0.05	2.5	8.5	2	TITUS	DESV
CVB-1A31	LARGE CLASSROOM 1A31	LARGE CLASSROOM 1A31	925	450	925	2' - 2"	2' - 3"	1' - 6"	14"	20"	18"	381	55.0	90.7	135.0	15.1	3.00	0.07	4.8	35.6	2	TITUS	DESV
CVB-1A35	OFFICE 1A35	OFFICE 1A35	65	65	65	2' - 4"	1' - 7"	1' - 0"	5"	12"	8"	98	55.0	99.2	135.0	4.0	1.30	0.01	1.6	3.1	1	TITUS	DESV
CVB-1A37	LARGE CLASSROOM 1A37	LARGE CLASSROOM 1A37	1000	580	1000	2' - 4"	2' - 7"	1' - 6"	16"	24"	18"	333	55.0	91.1	135.0	15.6	1.40	0.06	5.1	38.9	2	TITUS	DESV
CVB-2A02	CORRIDOR 2A03	MENS/WOMENS TOILET 2A02/2A06	200	200	200	2' - 4"	1' - 7"	1' - 0"	6"	12"	8"	300	55.0	100.0	135.0	4.7	3.50	0.07	4.2	9.7	2	TITUS	DESV
CVB-2A03	ELEVATOR LOBBY 2A00	CORRIDOR 2A03	200	200	200	2' - 4"	1' - 7"	1' - 0"	6"	12"	8"	300	55.0	100.0	135.0	4.7	3.50	0.07	4.2	9.7	2	TITUS	DESV
CVB-2A08K	OPEN OFFICE 2A08	OFFICE 5 2A08K	65	65	65	2' - 4"	1' - 7"	1' - 0"	5"	12"	8"	98	55.0	99.2	135.0	4.0	1.30	0.01	1.6	3.1	1	TITUS	DESV
VVB-1A02	OPEN COMPUTER AREA 1A02	OPEN COMPUTER AREA 1A02	625	580	1250	2' - 4"	2' - 7"	1' - 6"	16"	24"	18"	417	55.0	100.1	135.0	15.5	0.90	0.17	4.0	30.4	2	TITUS	DESV
VVB-1A08	OFFICE/CONSULT 647	OFFICE 647/1A08	90	90	160	2' - 4"	1' - 7"	1' - 0"	6"	12"	8"	240	55.0	105.5	135.0	11.1	0.20	0.02	0.9	4.9	2	TITUS	DESV
VVB-1A11	COMMONS	ELECTRICAL ROOM 1A11	65	65	200	2' - 4"	1' - 7"	1' - 0"	5"	12"	8"	300	55.0	99.2	135.0	4.0	1.30	0.01	1.6	3.1	1	TITUS	DESV
VVB-1A13	CORRIDOR 1A21-1	OFFICE 1A16/1A13	70	70	160	2' - 4"	1' - 7"	1' - 0"	5"	12"	8"	240	55.0	100.0	135.0	2.5	3.50	0.01	2.8	3.4	1	TITUS	DESV
VVB-1A22	CORRIDOR 1A21-1	OFFICE 1A34/1A22	90	90	80	2' - 4"	1' - 7"	1' - 0"	6"	12"	8"	120	55.0	105.5	135.0	11.1	0.20	0.02	0.9	4.9	2	TITUS	DESV
VVB-1A32	OFFICE 1A32	OFFICE 1A32/1A33	80	80	135	2' - 4"	1' - 7"	1' - 0"	6"	12"	8"	203	55.0	108.3	135.0	10.4	0.20	0.02	0.9	4.6	2	TITUS	DESV
VVB-1A39	CORRIDOR 1A36	MED ROOM 1A39/STORAGE 1A38	160	160	315	2' - 4"	1' - 7"	1' - 0"	8"	12"	10"	378	55.0	100.2	135.0	15.9	0.40	0.09	1.0	7.8	2	TITUS	DESV
VVB-1A40	DINING AREA 1A40	DINING AREA 1A40	325	230	370	2' - 4"	1' - 9"	1' - 1"	10"	14"	13"	304	55.0	96.6	135.0	11.0	1.30	0.06	2.7	14.6	2	TITUS	DESV
VVB-1A41	DINING AREA 1A40	TRAINING KITCHEN 1A41	1400	1400	2825	2' - 1"	3' - 9"	1' - 6"	24" x 16"	38"	18"	595	55.0	95.1	135.0	20.2	2.20	0.20	6.1	60.5	2	TITUS	DESV
VVB-2A07	CORRIDOR 2A03	STAFF LOUNGE 2A07	450	325	730	2' - 4"	1' - 11"	1' - 3"	12"	16"	15"	438	55.0	99.9	135.0	10.8	3.30	0.12	4.1	21.8	2	TITUS	DESV
VVB-2A08-1	OPEN OFFICE 2A08	OPEN OFFICE 2A08	165	80	200	2' - 4"	1' - 7"	1' - 0"	6"	12"	8"	300	55.0	99.9	135.0	8.2	1.00	0.07	2.0	8.0	2	TITUS	DESV
VVB-2A08-2	OPEN OFFICE 2A08	OPEN OFFICE 2A08	165	80	350	2' - 4"	1' - 7"	1' - 0"	6"	12"	8"	525	55.0	99.9	135.0	8.2	1.00	0.07	2.0	8.0	2	TITUS	DESV
VVB-2A08A	OPEN OFFICE 2A08	OFFICE 2A08A	65	65	95	2' - 4"	1' - 7"	1' - 0"	5"	12"	8"	143	55.0	99.2	135.0	4.0	1.30	0.01	1.6	3.1	1	TITUS	DESV
VVB-2A08B	OPEN OFFICE 2A08	LARGE OFFICE 2A08B/2A08D	145	145	330	2' - 4"	1' - 7"	1' - 0"	8"	12"	10"	396	55.0	101.0	135.0	16.3	0.30	0.07	0.9	7.2	2	TITUS	DESV
VVB-2A08C	OPEN OFFICE 2A08	OFFICE 2A08C/2A08E	75	75	100	2' - 4"	1' - 7"	1' - 0"	5"	12"	8"	150	55.0	109.4	135.0	10.0	0.20	0.02	0.9	4.4	2	TITUS	DESV
VVB-2A08G	OPEN OFFICE 2A08	OFFICE 2A08G/2A08I	70	70	100	2' - 4"	1' - 7"	1' - 0"	5"	12"	8"	150	55.0	100.0	135.0	2.5	3.50	0.01	2.8	3.4	1	TITUS	DESV
VVB-2A08H	OPEN OFFICE 2A08	OFFICE 2A08F/2A08H	150	150	335	2' - 4"	1' - 7"	1' - 0"	8"	12"	10"	402	55.0	100.7	135.0	16.8	0.30	0.07	0.9	7.4	2	TITUS	DESV
VVB-2A08J	OPEN OFFICE 2A08	OFFICE 2A08J/2A08L	75	75	160	2' - 4"	1' - 7"	1' - 0"	5"	12"	8"	240	55.0	109.4	135.0	10.0	0.20	0.05	0.9	4.4	2	TITUS	DESV
VVB-2A08M	OPEN OFFICE 2A08	OFFICE 2A08M/2A08Q	70	70	100	2' - 4"	1' - 7"	1' - 0"	5"	12"	8"	150	55.0	100.0	135.0	2.5	3.50	0.01	2.8	3.4	1	TITUS	DESV
VVB-2A08N	OPEN OFFICE 2A08	OFFICE 2A08N/2A08P	100	80	160	2' - 4"	1' - 7"	1' - 0"	6"	12"	8"	240	55.0	104.1	135.0	12.0	0.20	0.05	0.9	5.3	2	TITUS	DESV
VVB-2A08Q	OPEN OFFICE 2A08	OFFICE 2A08Q/2A08S	75	75	100	2' - 4"	1' - 7"	1' - 0"	5"	12"	8"	150	55.0	109.4	135.0	10.0	0.20	0.02	0.9	4.4	2	TITUS	DESV
VVB-2A08T	OPEN OFFICE 2A08	OFFICE 2A08T/2A08R	80	80	90	2' - 4"	1' - 7"	1' - 0"	6"	12"	8"	135	55.0	108.3	135.0	10.4	0.20	0.08	0.9	4.6	2	TITUS	DESV
VVB-2A08U	OPEN OFFICE 2A08	OFFICE 2A08U	65	65	80	2' - 4"	1' - 7"	1' - 0"	5"	12"	8"	120	55.0	99.2	135.0	4.0	1.30	0.01	1.6	3.1	1	TITUS	DESV
VVB-2A08V	OPEN OFFICE 2A08	OFFICE 2A08V	65	65	85	2' - 4"	1' - 7"	1' - 0"	5"	12"	8"	128	55.0	99.2	135.0	4.0	1.30	0.01	1.6	3.1	1	TITUS	DESV
VVB-2A08W	OPEN OFFICE 2A08	OFFICE 2A08W	65	65	100	2' - 4"	1' - 7"	1' - 0"	5"	12"	8"	150	55.0	99.2	135.0	4.0	1.30	0.01	1.6	3.1	1	TITUS	DESV
VVB-2A09	CORRIDOR 2A03	CONFERENCE ROOM 2A09	450	325	330	2' - 4"	1' - 11"	1' - 3"	12"	16"	15"	198	55.0	99.9	135.0	10.8	3.30	0.06	4.1	21.8	2	TITUS	DESV

FAN COIL UNIT SCHEDULE (WATER)

SYMBOL	CFM	ESP	MOTOR DATA: SPEED	WATTS	AMPS	ELEC CHAR	CHILLED WATER COOLING COIL DATA (3 ROW): EAT °F DB	EAT °F WB	LAT °F DB	TOTAL MBH	SENS MBH	GPM	EWT °F	LWT °F	WPD FT	CHW PIPE BRANCH SIZE (INCHES)	HOT WATER HEATING COIL DATA (1 ROW): EAT °F DB	LAT °F DB	TOTAL MBH	GPM	EWT °F	LWT °F	WPD FT	HW PIPE BRANCH SIZE (INCHES)	BASIS OF DESIGN
34-FCU-1	600	0.62	LOW	466	2.8 FLA	208-1/60	75	63	53.4	18.83	14.29	3.8	45	54.9	8.51	1"	NO HEATING COIL								ENVIRO-TEC HPP-12
34-FCU-2	1338	0.50	LOW	914	4.4 FLA	208-1/60	75	63	56.7	33.98	27.08	6.7	45	55	9.65	1-1/4"	70	85.9	23.15	2.4	135	115.1	1.31	3/4"	ENVIRO-TEC HPP-16

NOTES:
1. FCU'S LOCATED ON FIRST FLOOR REQUIRE CONDENSATE PUMPS; SEE PLUMBING DWGS FOR CONDENSATE ROUTING
2. SEE DRAWINGS FOR QUANTITY

EXHAUST FAN SCHEDULE

SYMBOL	LOCATION	SERVES	TYPE	SYSTEM CFM	FAN CFM	RPM	STATIC PRESSURE	TIP SPEED	O.V. (FPM)	DRIVE	BHP	HP	VFD	PHASE	HZ	VOLTAGE	WEIGHT	CONTROL TYPE	BASIS OF DESIGN
34-EF-1	2ND FLOOR MECH ROOM	RESTROOMS	INLINE	1,325	1.325	1725	1.7"	6,973	-	BELT	0.9	1.0	NO	3	60	460	96 LBS	DDC	GREENHECK BSQ-100-10
34-EF-2	BASEMENT	KITCHEN	INLINE	150	150	2023	1.3"	5,926	-	BELT	0.27	1/3	NO	1	60	115	80 LBS	DDC	GREENHECK BSQ-70-3

NOTES:
1. ADJUST BELT DRIVEN FANS TO PROVIDE SYSTEM CFM.
2. PROVIDE SECOND SET OF SHEAVES AND BELTS AFTER INITIAL BALANCING.

CABINET UNIT HEATER SCHEDULE (WATER)

SYMBOL	CFM	MBH	GPM	WTD °F	PD FT	FAT °F	HP	PHASE	HZ	VOLTAGE	RECESS	MOUNTED	DISCHARGE	BASIS OF DESIGN
34-CUH-1	630	19.2	3.0	29.8	0.63	125	1/10	1	60	115	FULL	CEILING	FRONT	STERLING - RC06
34-CUH-2	630	19.2	3.0	29.8	0.63	125	1/10	1	60	115	PARTIAL	WALL	FRONT	STERLING - RW06
34-CUH-3	335	9.4	1.5	26.6	0.16	120	1/10	1	60	115	FULL	WALL	FRONT	STERLING - RW03
34-CUH-4	630	19.2	3.0	29.8	0.63	125	1/10	1	60	115	FULL	WALL	FRONT	STERLING - RW06

NOTES:
1. HEATING CAPACITIES BASED ON 125F EWT AND 60F EAT.
2. INTEGRAL THERMOSTAT ON EACH UNIT.
3. SEE DRAWINGS FOR QUANTITY.

PUMP SCHEDULE

PUMP No.	TYPE FLR MTD/IN-LINE	SYSTEM	OPERATION DUTY/STAND-BY	FLUID TYPE	GPM	FEET HD	EFF %	BHP	MOTOR HP	RPM	ELEC. CHAR	EMERGENCY POWER	VARIABLE FREQ DRIVE	OPERATING CONDITIONS		IMPELLER SIZE	BASIS OF DESIGN
34-HWP-1	FLR MTD END SUCTION	HOT WATER	DUTY	WATER	0	48	0	0	3	1750	3-60-480V	NO	YES (BY EC)	GPM	102	6.875	BELL & GOSSETT 1510 2 BC
					75	48	61	1.5						FT HD	43		
					150	36	66.5	2.1						EFF	67.09		
34-HWP-2	FLR MTD END SUCTION	HOT WATER	STAND-BY	WATER	0	48	0	0	3	1750	3-60-480V	NO	YES (BY EC)	GPM	102	6.875	BELL & GOSSETT 1510 2 BC
					75	48	61	1.5						FT HD	43		
					150	36	66.5	2.1						EFF	67.09		
34-CWP-1	FLR MTD END SUCTION	CHILLED WATER	DUTY	WATER	0	48	0	0	3	1150	3-60-480V	NO	YES (BY EC)	GPM	151	10.25	BELL & GOSSETT 1510 2E
					100	46	63	1.8						FT HD	40		
					200	33	62.5	2.7						EFF	68.29		
34-CWP-2	FLR MTD END SUCTION	CHILLED WATER	STAND-BY	WATER	0	48	0	0	3	1150	3-60-480V	NO	YES (BY EC)	GPM	151	10.25	BELL & GOSSETT 1510 2E
					100	46	63	1.8						FT HD	40		
					200	33	62.5	2.7						EFF	68.29		
34-GWP-1	FLR MTD END SUCTION	GEOTHERMAL WATER	DUTY	15% PROP. GLYCOL	0	75	0	0	7.5	1750	3-60-480V	NO	YES (BY EC)	GPM	202	8.5	BELL & GOSSETT 1510 2-1/2 BB
					150	74	68	4.1						FT HD	68		
					250	65	76	5.4						EFF	74.41		
34-GWP-2	FLR MTD END SUCTION	GEOTHERMAL WATER	STAND-BY	15% PROP. GLYCOL	0	75	0	0	7.5	1750	3-60-480V	NO	YES (BY EC)	GPM	202	8.5	BELL & GOSSETT 1510 2-1/2 BB
					150	74	68	4.1						FT HD	68		
					250	65	76	5.4						EFF	74.41		

SPLIT SYSTEM AIR HANDLING UNIT

SYMBOL	NOMINAL CFM	RLA	COOLING CAPACITY BTUH	ELECTRICAL CHAR	BASIS OF DESIGN
34-SSAHU-1	259	0.15	9,000	NOTE 2	SANYO KMS0972

NOTES:
1. REFRIGERANT LINES SHALL BE SIZED PER MANUFACTURER RECOMMENDATIONS
2. POWER SHALL BE VIA CONTROL WIRING FROM ACCU
3. EC TO PROVIDE DISCONNECT AT EACH UNIT
4. PROVIDE SSAHU WITH INTEGRAL CONDENSTATE PUMP
5. SEE DRAWINGS FOR QUANTITY

HORIZONTAL UNIT HEATER SCHEDULE (WATER)

SYMBOL	CFM	RPM	HP	ELECT CHAR	MBH	GPM	PD FT	FAT F	WTD F	MOUNTING HEIGHT	BASIS OF DESIGN
34-HUH-1	2000	1140	1/3	115/60/1	36.58	4.8	0.41	104	20	FULL	STERLING - HS-132

NOTES:
1. HEATING CAPACITIES BASED ON 125F EWT AND 60F EAT.
2. INSTALL ELECTRIC THERMOSTAT ON 0'-6" CONDUIT EXTENSION FROM BOTTOM OF UNIT HEATER.
3. SUPPLY ALL UNIT HEATERS W/ DOUBLE DEFLECTION LOUVERS.

AIR COOLED CONDENSING UNIT SCHEDULE

SYMBOL	CONDENSOR FANS: QTY	RPM	TOTAL CFM	FLA	COMPRESSOR: QTY	RLA EA	LRA EA	ELECT CHAR	SERVES	UNIT WEIGHT	BASIS OF DESIGN
34-ACCU-1	1	750	1,707	0.45	1	11.3	13	208/1/60	(2) SSAHU-1	143.3 LBS	SANYO CMH1972A

NOTES:
1. CAPACITIES BASED ON 95°F AMBIENT TEMPERATURE
2. CAPACITIES BASED ON R-410A REFRIGERANT
3. PROVIDE HOT GAS BYPASS ON ALL COMPRESSOR CIRCUITS
4. UNIT SHALL BE PROVIDED WITH LOW AMBIENT (0°F) CON TROL
5. INSTALL WIND BAFFLES AS RECOMMENDED BY MANUFACTURER

FINTUBE SCHEDULE (HYDRONIC)

SYMBOL	BTU/LF	AVG W TEMP	EAT	TUBE SIZE	FIN SIZE	FIN PER FT	ENCLOSURE	MOUNTING HEIGHT	BASIS OF DESIGN
34-FT-1	200	125 F	70 F	3/4"	2-1/2" x 2-1/4"	50	CUSTOM	SEE DWG	STERLING STYLE "K"
34-FT-2	315	125 F	70 F	1"	5" x 2-3/4"	50	CUSTOM	SEE DWG	STERLING STYLE "K"

NOTES:
1. SEE DRAWING FOR ACTIVE LENGTH.
2. MINIMUM FLOW RATE PER PIPING CIRCUIT (INCLUDES VVB BOX) SHALL BE 0.5 GPM.
3. MAXIMUM PRESSURE DROP PER PIPING CIRCUIT SHALL NOT EXCEED 6.0 FT.
4. HEATING CAPACITIES ARE BASED ON 70°F AIR TEMPERAT URE AND AN AVERAGE UNHEATED SURFACE TEMPERATURE OF 70°F NATURAL CONVECTION.

AIR CURTAIN SCHEDULE (WATER)

SYMBOL	CFM	ESP	MAX VELOCITY FPM	NOZZLE WIDTH (IN)	MOTOR DATA: No AT HP	ELEC CHAR	HOT WATER HEATING COIL: GPM	TOTAL MBH	EWT °F	LWT °F	WPD FT	AIR TEMP RISE °F	UNIT WEIGHT	BASIS OF DESIGN
34-AC-1	2193	0.08	3844	84	2 @ 1/2	208-1/60	3.0	54.7	135	98.4	0.2	22.9	203LBS	BERNER VSA2084W

NOTE:
1. PROVIDE AIR CURTAIN WITH 2 ROW COIL, 10 F.P.I.
2. UNIT SELECTED AT LOW FAN SPEED; UNIT SHALL BE SET AT LOW FAN SPEED IN FIELD FOR BOTH TEMPERATURE CONTROL AND DOOR INTERLOCK.
3. PROVIDE COMFORT PLUS PACKAGE FOR MULTI-SPEED AND TEMPERATURE CONTROL.

RADIANT CEILING PANEL SCHEDULE (HYDRONIC)

SYMBOL	PANEL WIDTH, IN	NO PASSES	TUBE SIZE OD	MEAN WATER TEMP °F	WTD °F	BTU/LF	GPM/LF	BASIS OF DESIGN
34-RADP-1	18	3	5/8"	125	20	128	NOTE 1	STERLING

NOTES:
1. SEE DRAWING FOR ACTIVE LENGTH AND GPM.
2. MINIMUM FLOW RATE PER PIPING CIRCUIT (INCLUDES VVB BOX) SHALL BE 0.5 GPM.
3. MAXIMUM PRESSURE DROP PER PIPING CIRCUIT SHALL NOT EXCEED 6.0 FT.
4. HEATING CAPACITIES ARE BASED ON 70°F AIR TEMPERAT URE AND AN AVERAGE UNHEATED SURFACE TEMPERATURE OF 70°F NATURAL CONVECTION.
5. ALL ACTIVE PANEL LENGTHS INDICATED ON PLANS DETERMINED BY ASSUMING SIX (6) INCHES OF INACTIVE PANEL ON EACH END UNLESS INDICATED OTHERWISE.

PADDLE FAN SCHEDULE

SYMBOL	LOCATION	SERVES	TYPE	SYSTEM CFM	FAN CFM	WATTS	VFD	PHASE	HZ	VOLTAGE	WEIGHT	CONTROL TYPE	BASIS OF DESIGN
34-PF-1	COMMONS CEILING	COMMONS	PADDLE	6,550 @ HIGH SPEED	6,550 @ HIGH SPEED	87	NO	1	60	208	119 LBS	DDC	MODERNFANCO - CIRRUS - 52"

NOTES:
1. FAN SHALL BE SUPPLIED WITH 12' DOWN ROD.
2. FAN SHALL ONLY HAVE THE ABILITY TO OPERATE WHEN 34-AHU-2 IS COMMANDED TO OFF.
3. FINISH, COLOR, AND ADDITIONAL OPTIONS PROVIDED BY ARCHITECT.

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions | Date

CONSULTANTS:

Civil Engineer: Dewberry — 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9683, Fax (973) 739-9710

Structural Engineer: WZG — 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.E. Lenz Company — 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9300, Fax (814) 269-9301

Environmental Consultant: SSM — 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc. — 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL ENGINEER — TIMOTHY M. EARHART — No. PE-073419-E — EXPIRES 01-31-2013

ARCHITECT: ARRAY healthcare facilities solutions
2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406
t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number: 3468
Scale: NO SCALE

Drawing Title: MECHANICAL SCHEDULES

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

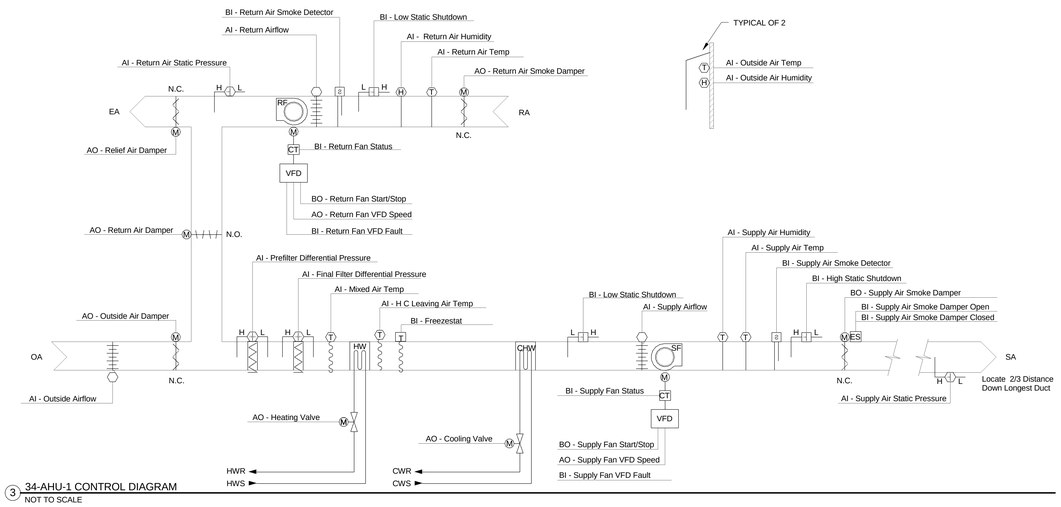
Date: 07/27/2012 | Checked: TME | Drawn: DJA

VA Project Number: 595-109
Building Number: 34
Drawing Number: MH602
Dwg. 82 of 123

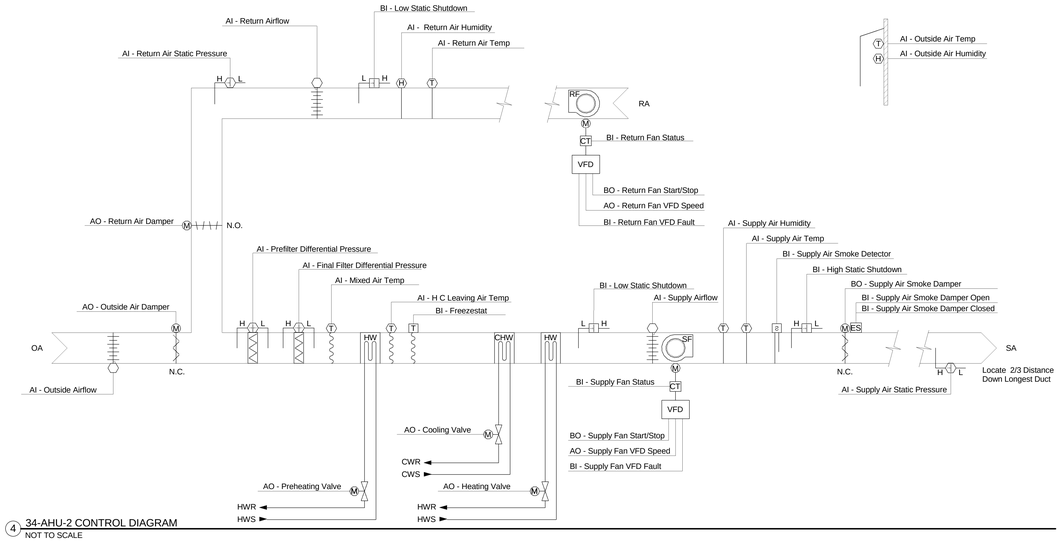
Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



3 34-AHU-1 CONTROL DIAGRAM
NOT TO SCALE



4 34-AHU-2 CONTROL DIAGRAM
NOT TO SCALE

34-AHU-1 SEQUENCE OF OPERATION

RUN CONDITIONS - SCHEDULED:
34-AHU-1 SHALL BE CAPABLE OF UTILIZING A TIME SCHEDULE, WARM-UP, COOL-DOWN, UNOCCUPIED, AND OPTIMAL START MODES, BUT WILL BE PROGRAMMED TO OPERATE CONTINUOUSLY IN THE OCCUPIED MODE. THE FOLLOWING MODES OF OPERATION SHALL APPLY TO ALL UNITS:

WARM-UP MODE:
WHEN INDEXED TO THE WARM-UP MODE BY THE BAS SYSTEM, THE UNIT SUPPLY AND RETURN AIR FANS SHALL RUN CONTINUOUSLY, THE OUTDOOR AIR DAMPER AND RELIEF AIR DAMPER SHALL BE CLOSED, THE RETURN AIR DAMPER SHALL BE OPENED, AND THE RETURN AIR SENSOR SHALL MODULATE THE HOT WATER COIL CONTROL VALVE OPEN TO THE COIL TO ACHIEVE ZONE SENSORS SETPOINT (ADJ.). MECHANICAL COOLING SHALL BE DISABLED.

COOL-DOWN MODE:
WHEN INDEXED TO THE COOL-DOWN MODE BY THE BAS SYSTEM, THE UNIT SUPPLY AND RETURN AIR FANS SHALL RUN CONTINUOUSLY. MECHANICAL COOL-DOWN: WHEN THE O.A.T. IS ABOVE 55 DEGF (ADJ.), THE OUTDOOR AIR DAMPER AND RELIEF AIR DAMPER SHALL BE CLOSED AND THE RETURN AIR DAMPER SHALL BE OPENED AND THE SUPPLY AIR TEMPERATURE SENSOR SHALL CONTROL CHILLED WATER VALVE TO ACHIEVE ZONE SENSOR SETPOINT. COOLING SHALL NOT BE ENABLED UNTIL THE OUTDOOR AIR TEMPERATURE RISES ABOVE 55 DEGREES F. (ADJ.). ECONOMIZER COOL-DOWN: WHEN THE O.A.T. IS BELOW 55 DEGF (ADJ.), THE OUTSIDE, RETURN AND RELIEF AIR DAMPERS SHALL BE MODULATED TO MAINTAIN A SUPPLY AIR TEMPERATURE OF 55 DEGF (ADJ.) UNTIL ZONE SENSOR SETPOINT IS REACHED. HEATING SHALL BE DISABLED.

OCCUPIED CYCLE:
WHEN INDEXED TO THE OCCUPIED MODE BY THE BAS SYSTEM, THE UNIT SUPPLY AND RETURN AIR FANS SHALL RUN CONTINUOUSLY AND THE MODULATING OUTDOOR AIR DAMPER AND RELIEF AIR DAMPER SHALL OPEN TO THEIR SCHEDULED MINIMUM POSITION. WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW 50 DEGF (ADJ.), AND THERE IS A CALL FOR HEAT, THE BAS SHALL OPEN THE HOT WATER HEATING COIL CONTROL VALVE TO THE HEATING COIL AND MODULATE THE VALVE TO MAINTAIN SUPPLY AIR TEMPERATURE. ONCE THE TEMPERATURE HAS BEEN SATISFIED AND THERE IS NO LONGER A CALL FOR HEAT, THE HEATING COIL VALVE SHALL CLOSE ON A RISE IN SUPPLY AIR TEMPERATURE ABOVE SETPOINT (ADJ.), THE OUTDOOR AIR DAMPER SHALL MODULATE OPEN FROM ITS MINIMUM SETTING TO 100% OPEN. THE RETURN AIR DAMPERS SHALL MODULATE CLOSED AND RELIEF AIR DAMPERS SHALL MODULATE OPEN ACCORDINGLY. WHENEVER THE OUTDOOR AIR TEMPERATURE RISES ABOVE 50 DEGF (ADJ.), THE CONTROL VALVE SHALL BE CLOSED TO THE HEATING COIL.

OAT	SAT (RANGE)	ZONE THERMOSTAT SETPOINT
20 DEGF & LOWER	65 DEGF - 85 DEGF	68 DEGF (ADJ)
65 DEGF & ABOVE	55 DEGF - 55 DEGF	75 DEGF (ADJ)

ON A RISE IN OUTDOOR AIR TEMPERATURE ABOVE ECONOMIZER ENABLE SETPOINT (ADJ.), THE O.A. DAMPER SHALL BE POSITIONED TO SCHEDULED MINIMUM O.A. POSITION, THE RETURN AIR DAMPERS AND RELIEF AIR DAMPERS SHALL POSITION ACCORDINGLY, AND THE CHILLED WATER VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN SUPPLY AIR TEMPERATURE SETPOINT

THE SUPPLY AIR TEMPERATURE SHALL BE RESET TO MAINTAIN THE ZONE TEMPERATURE SENSOR SETPOINT. THE ZONE TEMPERATURE SETPOINT SHALL BE SET BY THE BAS.

UNOCCUPIED CYCLE:
WHEN INDEXED TO THE UNOCCUPIED COOLING MODE BY THE BAS SYSTEM, THE OUTDOOR AIR DAMPER AND RELIEF AIR DAMPER SHALL BE CLOSED, THE RETURN AIR DAMPER SHALL BE OPEN AND THE UNIT FANS SHALL BE STOPPED. ON A NEED FOR UNOCCUPIED COOLING TO MAINTAIN ELEVATED TEMPERATURE SETPOINT OF 78 DEGREES F. (ADJ.), THE UNIT WILL BE PLACED INTO A "COOL DOWN" MODE OF OPERATION. THE HEATING COIL CONTROL VALVE SHALL BE FULLY CLOSED TO THE HEATING COIL. WHEN ALL AREAS ARE SATISFIED, THE UNIT SHALL BE DE-ENERGIZED. ON A NEED FOR UNOCCUPIED HEATING TO MAINTAIN REDUCED TEMPERATURE SETPOINT OF 65 DEGREES F. (ADJ.), THE UNIT WILL BE PLACED INTO A "WARM UP" MODE OF OPERATION. MECHANICAL COOLING SHALL BE DISABLED. WHEN ALL AREAS ARE SATISFIED, THE UNIT SHALL BE DE-ENERGIZED.

THE BAS SYSTEM SHALL PROVIDE OVERRIDE TO THE ZONE BY OPERATOR INITIATION OR INDIVIDUAL ZONE THERMOSTAT OVERIDES.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

ZONE OPTIMAL START:
THE UNIT SHALL USE AN OPTIMAL START ALGORITHM FOR MORNING START-UP. THIS ALGORITHM SHALL MINIMIZE THE UNOCCUPIED WARM-UP OR COOL-DOWN PERIOD WHILE STILL ACHIEVING COMFORT CONDITIONS BY THE START OF SCHEDULED OCCUPIED PERIOD.

FREEZE PROTECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON ACTIVATION OF A FREEZESTAT.

SUPPLY AIR SMOKE DETECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON ACTIVATION OF A SUPPLY AIR SMOKE DETECTOR.

RETURN AIR SMOKE DETECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON ACTIVATION OF ANY RETURN AIR SMOKE DETECTOR.

SUPPLY FAN:
THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME. THE SUPPLY FAN VFD SHALL RECEIVE A CONTROL SIGNAL FROM THE AHU DDC CONTROL PANEL TO START AFTER THE RETURN AIR DAMPER IS PROVEN OPEN BY THE END SWITCHES. UPON UNIT START UP, THE SUPPLY FAN WILL SOFT START TO MAINTAIN STATIC PRESSURE 2/3 OF THE WAY DOWN THE MEDIUM PRESSURE DUCTWORK (ACTUAL STATIC PRESSURE TO BE DETERMINED AT TIME OF BALANCING, BUT NO GREATER THAN 1.5"). THE DUCT STATIC PRESSURE WILL RESET THE VFD TO MAINTAIN SETPOINT.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.

SUPPLY FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

SUPPLY FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

RETURN FAN:
THE RETURN FAN SHALL RUN WHENEVER THE SUPPLY FAN RUNS AND SHALL TRACK THE SUPPLY FAN, TO MAINTAIN POSITIVE PRESSURE (5% TO 10% ADJ.) IN THE SPACE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

RETURN FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.

RETURN FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

RETURN FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

HEATING COIL VALVE:
THE HEATING SHALL BE ENABLED WHENEVER:

OUTSIDE AIR TEMPERATURE IS LESS THAN 50ºF (ADJ.).

AND THE ECONOMIZER IS DISABLED.

AND THE HEATING IS ACTIVE.

AND COOLING IS NOT ACTIVE.

AND THE SUPPLY FAN STATUS IS ON.
THE HEATING COIL VALVE SHALL OPEN FOR FREEZE PROTECTION WHENEVER:
MIXED AIR TEMPERATURE DROPS FROM 45ºF TO 40ºF (ADJ.)
OR THE FREEZESTAT IS ON.

CHILLED WATER COOLING SYSTEM:
THE COOLING SHALL BE ENABLED WHENEVER:

OUTSIDE AIR TEMPERATURE IS GREATER THAN 55ºF (ADJ.) .

AND THE ECONOMIZER IS DISABLED

AND THE ZONE TEMPERATURE IS ABOVE COOLING SETPOINT.

AND THE SUPPLY FAN STATUS IS ON.

AND THE HEATING IS NOT ACTIVE.

ECONOMIZER:
THE CONTROLLER SHALL MODULATE THE ECONOMIZER DAMPERS IN SEQUENCE TO MAINTAIN THE SUPPLY AIR TEMPERATURE SETPOINT. THE OUTSIDE AIR DAMPERS SHALL MAINTAIN THE MINIMUM OUTSIDE AIR POSITION WHENEVER OCCUPIED.

THE ECONOMIZER SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS LESS THAN 55ºF (ADJ.).
- AND THE OUTSIDE AIR ENTHALPY IS LESS THAN 25 BTU/LB (ADJ.).
- AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN THE RETURN AIR TEMPERATURE.
- AND THE OUTSIDE AIR ENTHALPY IS LESS THAN THE RETURN AIR ENTHALPY.
- AND THE SUPPLY FAN STATUS IS ON.

THE ECONOMIZER SHALL CLOSE WHENEVER:

- MIXED AIR TEMPERATURE DROPS FROM 55ºF TO 45ºF (ADJ .).
- OR ON LOSS OF SUPPLY FAN STATUS.
- OR FREEZESTAT IS ON.

THE OUTSIDE AND RELIEF AIR DAMPERS SHALL CLOSE AND THE RETURN AIR DAMPER SHALL OPEN WHEN THE UNIT IS OFF. IF OPTIMAL START UP IS AVAILABLE, THE MIXED AIR DAMPER SHALL OPERATE AS DESCRIBED IN THE OCCUPIED MODE EXCEPT THAT THE OUTSIDE AIR DAMPER SHALL MODULATE TO FULLY CLOSED.

DEHUMIDIFICATION:
THE CONTROLLER SHALL MEASURE THE RETURN AIR HUMIDITY AND OVERRIDE THE COOLING SEQUENCE WHEN RETURN AIR HUMIDITY IS ABOVE 65% RH (ADJ.). UPON ACTIVATION OF THE DEHUMIDIFICATION CYCLE, THE OUTSIDE AIR DAMPER SHALL BE REPOSITIONED TO ITS MINIMUM SCHEDULE POSITION AND THE CHILLED WATER VALVE AND COIL SHALL BE COMMANDED TO ITS FULL OPERATING POSITION. INDIVIDUAL SPACE TEMPERATURES SHALL BE MAINTAINED BY INDEPENDENT OPERATION OF THE ASSOCIATED VAV BOX AND COIL. THE DEHUMIDIFICATION MODE SHALL REMAIN IN OPERATION UNTIL THE RETURN AIR HUMIDITY IS AT OR BELOW 55% RH (ADJ) AT WHICH TIME THE DEHUMIDIFICATION MODE SHALL BE DEACTIVATED AND NORMAL OPERATION BE USED. DEHUMIDIFICATION SHALL BE ENABLED WHENEVER THE SUPPLY FAN STATUS IS ON. THE DDC CONTROLLER SHALL ENABLE THE HEATING HOT WATER PUMPS TO ALLOW THE INDIVIDUAL ROOM VAV BOX REHEAT COILS TO OPERATE AND MAINTAIN SPACE TEMPERATURE AND PREVENT OVER COOLING.

PRE/AFTER FILTER DIFFERENTIAL PRESSURE MONITOR:
ALARMS SHALL BE PROVIDED AS FOLLOWS:

- PRE/AFTER FILTER CHANGE REQUIRED: PREFILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

MIXED AIR TEMPERATURE:
ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS GREATER THAN 90ºF (ADJ.).
- LOW MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS LESS THAN 45ºF (ADJ.).

RETURN AIR HUMIDITY:

THE CONTROLLER SHALL MONITOR THE RETURN AIR HUMIDITY AND USE AS REQUIRED FOR ECONOMIZER CONTROL OR HUMIDITY CONTROL.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH RETURN AIR HUMIDITY: IF THE RETURN AIR HUMIDITY IS GREATER THAN 65% (ADJ.).

RETURN AIR TEMPERATURE:
ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS GREATER THAN 90ºF (ADJ.).
- LOW RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS LESS THAN 45ºF (ADJ.).

SUPPLY AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 120ºF (ADJ.).
- LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS LESS THAN 45ºF (ADJ.)

34-AHU-2 SEQUENCE OF OPERATION

RUN CONDITIONS - SCHEDULED:
34-AHU-2 SHALL BE CAPABLE OF UTILIZING A TIME SCHEDULE, WARM-UP, COOL-DOWN, UNOCCUPIED, AND OPTIMAL START MODES, BUT WILL BE PROGRAMMED TO OPERATE CONTINUOUSLY IN THE OCCUPIED MODE. THE FOLLOWING MODES OF OPERATION SHALL APPLY TO ALL UNITS:

WARM-UP MODE:
WHEN INDEXED TO THE WARM-UP MODE BY THE BAS SYSTEM, THE UNIT SUPPLY AIR FAN SHALL RUN CONTINUOUSLY, THE OUTDOOR AIR DAMPER SHALL BE CLOSED, THE RETURN AIR DAMPER SHALL BE OPENED, AND THE RETURN AIR SENSOR SHALL MODULATE THE HOT WATER COIL CONTROL VALVE OPEN TO THE COIL TO ACHIEVE ZONE SENSORS SETPOINT (ADJ.). MECHANICAL COOLING SHALL BE DISABLED.

COOL-DOWN MODE:
WHEN INDEXED TO THE COOL-DOWN MODE BY THE BAS SYSTEM, THE UNIT SUPPLY AIR FAN SHALL RUN CONTINUOUSLY. MECHANICAL COOL-DOWN: WHEN THE O.A.T. IS ABOVE 55 DEGF (ADJ.), THE OUTDOOR AIR DAMPER SHALL BE CLOSED AND THE RETURN AIR DAMPER SHALL BE OPENED AND THE SUPPLY AIR TEMPERATURE SENSOR SHALL CONTROL CHILLED WATER VALVE TO ACHIEVE ZONE SENSOR SETPOINT. COOLING SHALL NOT BE ENABLED UNTIL THE OUTDOOR AIR TEMPERATURE RISES ABOVE 55 DEGREES F. (ADJ.).

OCCUPIED CYCLE:
WHEN INDEXED TO THE OCCUPIED MODE BY THE BAS SYSTEM, THE UNIT SUPPLY FAN SHALL RUN CONTINUOUSLY AND THE MODULATING OUTDOOR AIR DAMPER SHALL OPEN TO THEIR SCHEDULED MINIMUM POSITION. WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW 50 DEGF (ADJ.), AND THERE IS A CALL FOR HEAT, THE BAS SHALL OPEN THE HOT WATER HEATING COIL CONTROL VALVE TO THE HEATING COIL AND TO MAINTAIN SUPPLY AIR TEMPERATURE. ONCE THE TEMPERATURE HAS BEEN SATISFIED AND THERE IS NO LONGER A CALL FOR HEAT, THE HEATING COIL VALVE SHALL CLOSE ON A RISE IN SUPPLY AIR TEMPERATURE ABOVE SETPOINT (ADJ.)

OAT	SAT (RANGE)	ZONE THERMOSTAT SETPOINT
20 DEGF & LOWER	67 DEGF (65 DEGF -70 DEGF)	68 DEGF (ADJ)
65 DEGF & ABOVE	67 DEGF (65 DEGF -70 DEGF)	75 DEGF (ADJ)

ON A RISE IN OUTDOOR AIR TEMPERATURE, THE O.A. DAMPER SHALL BE POSITIONED TO SCHEDULED MINIMUM O.A. POSITION, THE RETURN AIR DAMPERS SHALL POSITION ACCORDINGLY, AND THE CHILLED WATER VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN SUPPLY AIR TEMPERATURE SETPOINT

THE SUPPLY AIR TEMPERATURE SHALL BE RESET TO MAINTAIN THE ZONE TEMPERATURE SENSOR SETPOINT. THE ZONE TEMPERATURE SETPOINT SHALL BE SET BY THE BAS.

UNOCCUPIED CYCLE:
WHEN INDEXED TO THE UNOCCUPIED COOLING MODE BY THE BAS SYSTEM, THE OUTDOOR AIR DAMPER SHALL BE CLOSED, THE RETURN AIR DAMPER SHALL BE OPEN AND THE UNIT FANS SHALL BE STOPPED. ON A NEED FOR UNOCCUPIED COOLING TO MAINTAIN ELEVATED TEMPERATURE SETPOINT OF 78 DEGREES F. (ADJ.), THE UNIT WILL BE PLACED INTO A "COOL DOWN" MODE OF OPERATION. THE HEATING COIL CONTROL VALVE SHALL BE FULLY CLOSED TO THE HEATING COIL. WHEN ALL AREAS ARE SATISFIED, THE UNIT SHALL BE DE-ENERGIZED. ON A NEED FOR UNOCCUPIED HEATING TO MAINTAIN REDUCED TEMPERATURE SETPOINT OF 68 DEGREES F. (ADJ.), THE UNIT WILL BE PLACED INTO A "WARM UP" MODE OF OPERATION. MECHANICAL COOLING SHALL BE DISABLED. WHEN ALL AREAS ARE SATISFIED, THE UNIT SHALL BE DE-ENERGIZED.

THE BAS SYSTEM SHALL PROVIDE OVERRIDE TO THE ZONE BY OPERATOR INITIATION OR INDIVIDUAL ZONE THERMOSTAT OVERIDES.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

ZONE OPTIMAL START:
THE UNIT SHALL USE AN OPTIMAL START ALGORITHM FOR MORNING START-UP. THIS ALGORITHM SHALL MINIMIZE THE UNOCCUPIED WARM-UP OR COOL-DOWN PERIOD WHILE STILL ACHIEVING COMFORT CONDITIONS BY THE START OF SCHEDULED OCCUPIED PERIOD.

FREEZE PROTECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON ACTIVATION OF A FREEZESTAT.

SUPPLY AIR SMOKE DETECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON ACTIVATION OF A SUPPLY AIR SMOKE DETECTOR.

SUPPLY FAN:
THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME. THE SUPPLY FAN VFD SHALL RECEIVE A CONTROL SIGNAL FROM THE AHU DDC CONTROL PANEL TO START AFTER THE RETURN AIR DAMPER IS PROVEN OPEN BY THE END SWITCHES. UPON UNIT START UP, THE SUPPLY FAN WILL SOFT START TO MAINTAIN STATIC PRESSURE 2/3 OF THE WAY DOWN THE MEDIUM PRESSURE DUCTWORK (ACTUAL STATIC PRESSURE TO BE DETERMINED AT TIME OF BALANCING, BUT NO GREATER THAN 1.5"). THE DUCT STATIC PRESSURE WILL RESET THE VFD TO MAINTAIN SETPOINT.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.

SUPPLY FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

SUPPLY FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

RETURN FAN:
THE RETURN FAN SHALL RUN WHENEVER THE SUPPLY FAN RUNS AND SHALL TRACK THE SUPPLY FAN, TO MAINTAIN POSITVE PRESSURE (5% TO 10% ADJ.) IN THE SPACE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

RETURN FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.

RETURN FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

RETURN FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

PREHEATING COIL VALVE:
THE PREHEATING SHALL BE ENABLED WHENEVER:

OUTSIDE AIR TEMPERATURE IS LESS THAN 50ºF (ADJ.).

AND THE HEATING IS ACTIVE.

AND COOLING IS NOT ACTIVE.

AND THE SUPPLY FAN STATUS IS ON.
THE HEATING COIL VALVE SHALL OPEN FOR FREEZE PROTECTION WHENEVER:
MIXED AIR TEMPERATURE DROPS FROM 45ºF TO 40ºF (ADJ.)
OR THE FREEZESTAT IS ON.

CHILLED WATER COOLING SYSTEM:
THE COOLING SHALL BE ENABLED WHENEVER:

OUTSIDE AIR TEMPERATURE IS GREATER THAN 55ºF (ADJ.) .

AND THE ZONE TEMPERATURE IS ABOVE COOLING SETPOINT.

AND THE SUPPLY FAN STATUS IS ON.

AND THE HEATING IS NOT ACTIVE.

DEHUMIDIFICATION:
THE CONTROLLER SHALL MEASURE THE RETURN AIR HUMIDITY AND OVERRIDE THE COOLING SEQUENCE WHEN RETURN AIR HUMIDITY IS ABOVE 65% RH (ADJ.). UPON ACTIVATION OF THE DEHUMIDIFICATION CYCLE, THE OUTSIDE AIR DAMPER SHALL BE REPOSITIONED TO ITS MINIMUM SCHEDULE POSITION AND THE CHILLED WATER VALVE AND COIL SHALL BE COMMANDED TO ITS FULL OPERATING POSITION.
THE DEHUMIDIFICATION MODE SHALL REMAIN IN OPERATION UNTIL THE RETURN AIR HUMIDITY IS AT OR BELOW 55% RH (ADJ) AT WHICH TIME THE DEHUMIDIFICATION MODE SHALL BE DEACTIVATED AND NORMAL OPERATION REUSED.
DEHUMIDIFICATION SHALL BE ENABLED WHENEVER THE SUPPLY FAN STATUS IS ON. THE REHEAT COIL SHALL BE ENABLED TO MAINTAIN LEAVING AIR TEMPERATURE.

HEATING COIL VALVE:
THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE HEATING COIL VALVE TO MAINTAIN ITS HEAT/LAT SETPOINT.
THE HEATING SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS LESS THAN 65 DEGF (ADJ)
- AND THE ZONE TEMPERATURE IS BELOW SETPOINT
- AND THE SUPPLY FAN SATUS IS ON

PRE/AFTER FILTER DIFFERENTIAL PRESSURE MONITOR:
ALARMS SHALL BE PROVIDED AS FOLLOWS:

- PRE/AFTER FILTER CHANGE REQUIRED: PREFILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

MIXED AIR TEMPERATURE:
ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS GREATER THAN 90ºF (ADJ.).
- LOW MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS LESS THAN 45ºF (ADJ.).

RETURN AIR HUMIDITY:

THE CONTROLLER SHALL MONITOR THE RETURN AIR HUMIDITY AND USE AS REQUIRED FOR HUMIDITY CONTROL.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH RETURN AIR HUMIDITY: IF THE RETURN AIR HUMIDITY IS GREATER THAN 65% (ADJ.).

RETURN AIR TEMPERATURE:
ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS GREATER THAN 90ºF (ADJ.).
- LOW RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS LESS THAN 45ºF (ADJ.).

SUPPLY AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 120ºF (ADJ.).
- LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS LESS THAN 45ºF (ADJ.)

PADDLE FANS IN COMMONS AREA:
PADDLE FANS SHALL BE DISABLED WHEN AHU-2 IS IN OPERATION.

RELIEF AIR IN COMMONS AREA (ABOVE FIREPLACE):
THE MODULATING MOTOR OPERATED DAMPER SHALL BE CLOSED WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW 70 DEG F (ADJ.).

THE MODULATING MOTOR OPERATED DAMPER SHALL MODULATE OPEN WHEN THE OUTDOOR AIR TEMPERATURE IS ABOVE 70 DEG F (ADJ.).

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer: Dewberry — 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9683, Fax (973) 739-9710

Structural Engineer: WZG — 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.E. Lenz Company — 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9300, Fax (814) 269-9301

Environmental Consultant: SSM — 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc. — 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL TIMOTHY M. EARHART ENGINEER No. PE-073627-E

ARCHITECT:

ARRAY
healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406

t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	1/8" = 1'-0"

Drawing Title: MECHANICAL ATC DIAGRAMS

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date: 07/27/2012 | Checked: TME | Drawn: DJA

VA Project Number: 595-109

Building Number: 34

Drawing Number: MH701

Dwg. 83 of 123

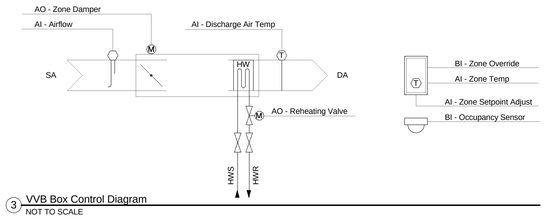
Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978

34-AHU-1&2	HARDWARE POINTS					SOFTWARE POINTS					
POINT NAME	AI	AO	DI	DO	SLK	AV	DV	SCHED	TREND	ALARM	SHOW ON GRAPHIC
SUPPLY AIR STATIC PRESSURE	●								●		●
SUPPLY AIRFLOW	●										●
RETURN AIRFLOW	●								●		●
MIXED AIR TEMP	●								●		●
RETURN AIR HUMIDITY	●								●		●
RETURN AIR TEMP	●								●		●
SUPPLY AIR TEMP	●								●		●
SUPPLY FAN VFD SPEED		●							●		●
RETURN FAN VFD SPEED		●							●		●
SUPPLY VFD ALARM			●							●	●
SUPPLY FAN STATUS			●						●		●
RETURN VFD ALARM			●							●	●
RETURN FAN STATUS			●						●		●
SUPPLY FAN START/STOP				●					●		●
RETURN FAN START/STOP				●					●		●
SUPPLY FAN VFD RUN STATUS			●						●		●
RETURN FAN VFD RUN STATUS			●						●		●
SUPPLY FAN VFD CURRENT	●								●		●
RETURN FAN VFD CURRENT	●								●		●
SUPPLY FAN VFD POWER	●								●		●
RETURN FAN VFD POWER	●								●		●
PREHEATING VALVE COMMAND		●							●		●
HEATING VALVE COMMAND		●							●		●
COOLING VALVE COMMAND		●							●		●
OUTSIDE AIR DAMPER COMMAND		●							●		●
RELIEF AIR DAMPER COMMAND		●							●		●
FREEZESTAT			●						●	●	●
SUPPLY FAN HIGH STATIC SHUTDOWN			●						●	●	●
RETURN FAN HIGH STATIC SHUTDOWN			●						●	●	●
SUPPLY AIR SMOKE DETECTOR			●						●	●	●
PREFILTER STATUS			●						●		●
SUPPLY FAN STATIC PRESSURE SETPOINT						●			●		●
RETURN AIRFLOW SETPOINT						●			●		●
MIXED AIR TEMP SETPOINT						●			●		●
OUTSIDE AIR TEMP SETPOINT						●			●		●
SUPPLY AIR TEMP SETPOINT						●			●		●
SCHEDULE								●			
SUPPLY AIR STATIC PRESSURE	●								●		●
HIGH SUPPLY AIR STATIC PRESSURE										●	
LOW SUPPLY AIR STATIC PRESSURE										●	
SUPPLY AIR DIFFERENTIAL PRESSURE										●	
SUPPLY FAN FAILURE										●	
SUPPLY FAN IN HAND										●	
RETURN FAN FAILURE										●	
RETURN FAN IN HAND										●	
HIGH RETURN AIRFLOW										●	
LOW RETURN AIRFLOW										●	
PRE/AFTER FILTER CHANGE REQUIRED										●	
LOW RETURN AIR TEMP										●	
HIGH SUPPLY AIR TEMP										●	
LOW SUPPLY AIR TEMP										●	
HIGH RETURN AIR HUMIDITY										●	
LOW RETURN AIR TEMP										●	
LOW MIXED AIR TEMP										●	
HIGH RETURN FAN STATIC PRESSURE										●	
LOW RETURN FAN STATIC PRESSURE										●	
RETURN AIR DIFFERENTIAL PRESSURE										●	
SUPPLY AIR HIGH HUMIDITY										●	

PROVIDE ADDITIONAL POINTS AS SHOWN IN DIAGRAM ABOVE OR AS NEEDED TO COMPLETE THE SEQUENCES OF OPERATION
NOT ALL POINTS LISTED ARE NECESSARY FOR AHU-2.



3 VVB Box Control Diagram
NOT TO SCALE

VARIABLE AIR VOLUME BOX W/ AND W/O RADIANT PANEL SEQUENCE OF OPERATION

NOTE: CONSTANT VOLUME BOXES SHALL BE CONTROLLED SIMILAR TO VVB'S EXCEPT THAT THE SUPPLY AIR VOLUME REMAINS CONSTANT AND NO ADJUSTMENT OF THE DAMPER IS PERFORMED. MAXIMUM AND MINIMUM AIR VOLUMES ARE THE SAME.

RUN CONDITIONS -OCCUPANCY SENSOR:
THE UNIT SHALL OPERATE IN AN UNOCCUPIED MODE WHEN ASSOCIATED OCCUPANCY SENSOR SENSES THE ROOM IS UNOCCUPIED, EXCEPT DURING SCHEDULED OCCUPIED PERIODS SUCH AS LUNCH. OTHERWISE THE UNIT SHALL OPERATE IN THE OCCUPIED MODE:
OCCUPIED MODE: THE UNIT SHALL MAINTAIN
A 75ºF (ADJ.) COOLING SETPOINT
A 68ºF (ADJ.) HEATING SETPOINT.
UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT SHALL MAINTAIN
A 85ºF (ADJ.) COOLING SETPOINT.
A 55ºF (ADJ.) HEATING SETPOINT.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).
LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

ZONE SETPOINT ADJUST:
THE OCCUPANT SHALL BE ABLE TO ADJUST THE ZONE TEMPERATURE HEATING AND COOLING SETPOINTS AT THE ZONE SENSOR WITHIN A USER DEFINABLE TEMPERATURE RANGE TO BE ADJ. THROUGH THE BAS.

ZONE UNOCCUPIED OVERRIDE:
A TIMED LOCAL OVERRIDE CONTROL SHALL ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE UNIT INTO AN OCCUPIED MODE FOR AN ADJUSTABLE PERIOD OF TIME. AT THE EXPIRATION OF THIS TIME, CONTROL OF THE UNIT SHALL AUTOMATICALLY RETURN TO THE SCHEDULE.

REVERSING VARIABLE VOLUME TERMINAL UNIT - FLOW CONTROL:
THE UNIT SHALL MAINTAIN ZONE SETPOINTS BY CONTROLLING THE AIRFLOW THROUGH ONE OF THE FOLLOWING. A 30 SECOND TIME DELAY SHALL BE PROVIDED TO PREVENT EXCESSIVE MODULATION CAUSED BY OPENING AND CLOSING THE DOOR TO THE ISOLATION ROOM:
OCCUPIED:
- WHEN ZONE TEMPERATURE IS GREATER THAN ITS COOLING SETPOINT, THE ZONE DAMPER SHALL MODULATE BETWEEN THE MINIMUM OCCUPIED AIRFLOW (ADJ.) AND THE MAXIMUM COOLING AIRFLOW (ADJ.) UNTIL THE ZONE IS SATISFIED.
- WHEN THE ZONE TEMPERATURE IS BETWEEN THE COOLING SETPOINT AND THE HEATING SETPOINT, THE ZONE DAMPER SHALL MAINTAIN THE MINIMUM REQUIRED ZONE VENTILATION (ADJ.).
- WHEN ZONE TEMPERATURE IS LESS THAN ITS HEATING SETPOINT, THE CONTROLLER SHALL ENABLE HEATING TO MAINTAIN THE ZONE TEMPERATURE AT ITS HEATING SETPOINT. ADDITIONALLY, IF WARM AIR IS AVAILABLE FROM THE AHU, THE ZONE DAMPER SHALL MODULATE BETWEEN THE MINIMUM OCCUPIED AIRFLOW (ADJ.) AND THE MAXIMUM HEATING AIRFLOW (ADJ.) UNTIL THE ZONE IS SATISFIED.

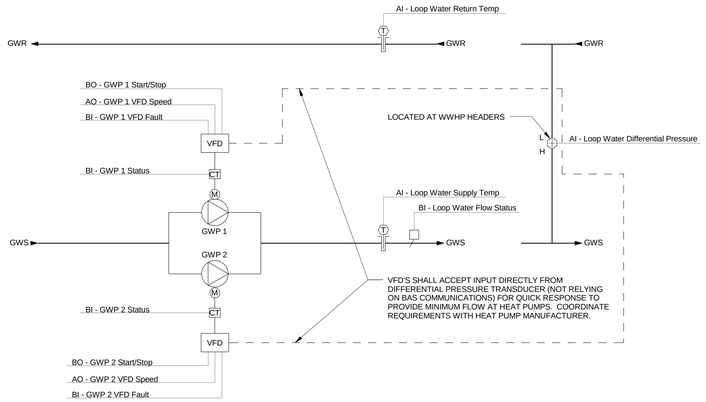
UNOCCUPIED:
- WHEN THE ZONE IS UNOCCUPIED THE ZONE DAMPER SHALL CONTROL TO ITS MINIMUM UNOCCUPIED AIRFLOW (ADJ.).
- WHEN THE ZONE TEMPERATURE IS GREATER THAN ITS COOLING SETPOINT, THE ZONE DAMPER SHALL MODULATE BETWEEN THE MINIMUM UNOCCUPIED AIRFLOW (ADJ.) AND THE MAXIMUM COOLING AIRFLOW (ADJ.) UNTIL THE ZONE IS SATISFIED.
- WHEN ZONE TEMPERATURE IS LESS THAN ITS UNOCCUPIED HEATING SETPOINT, THE CONTROLLER SHALL ENABLE HEATING TO MAINTAIN THE ZONE TEMPERATURE AT THE SETPOINT. ADDITIONALLY, IF WARM AIR IS AVAILABLE FROM THE AHU, THE ZONE DAMPER SHALL MODULATE BETWEEN THE MINIMUM UNOCCUPIED AIRFLOW (ADJ.) AND THE AUXILIARY HEATING AIRFLOW (ADJ.) UNTIL THE ZONE IS SATISFIED.

REHEATING COIL VALVE:
THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE REHEATING COIL VALVE OPEN ON DROPPING TEMPERATURE TO MAINTAIN ITS HEATING SETPOINT.

DISCHARGE AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE DISCHARGE AIR TEMPERATURE.
ALARMS SHALL BE PROVIDED AS FOLLOWS:
HIGH DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS GREATER THAN 120ºF (ADJ.).
LOW DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS LESS THAN 40ºF (ADJ.).

	HARDWARE POINTS				SOFTWARE POINTS					
POINT NAME	AI	AO	DI	DO	AV	DV	SCHED	TREND	ALARM	GRAPHIC
Zone Temp	●							●		●
Zone Setpoint Adjust	●									●
Airflow	●							●		●
Discharge Air Temp	●							●		●
Outdoor Air Temp	●									●
Zone Damper		●								●
Reheating Valve		●						●		●
Zone Override			●					●		●
Heating Setpoint								●		●
Cooling Setpoint								●		●
Airflow Setpoint					●			●		●
Heating Mode						●		●		
Schedule							●			
High Zone Temp									●	
Low Zone Temp									●	
High Discharge Air Temp									●	
Low Discharge Air Temp									●	
Occupancy Sensor Status			●							●

NOTE: PROVIDE ANY ADDITIONAL POINTS REQUIRED FOR SEQUENCES OF OPERATION



10 GWP - 1 & GWP - 2 CONTROL DIAGRAM
NOT TO SCALE

GLYCOL WATER PUMP DUTY/STAND-BY OPERATION:
THE TWO GLYCOL WATER PUMPS SHALL OPERATE IN A DUTY/STAND-BY FASHION.

- THE DUTY PUMP SHALL RUN FIRST.
- ON FAILURE OF THE DUTY PUMP, THE STAND-BY PUMP SHALL RUN AND THE DUTY PUMP SHALL TURN OFF.

THE DESIGNATED DUTY PUMP SHALL ROTATE UPON ONE OF THE FOLLOWING CONDITIONS (USER SELECTABLE):

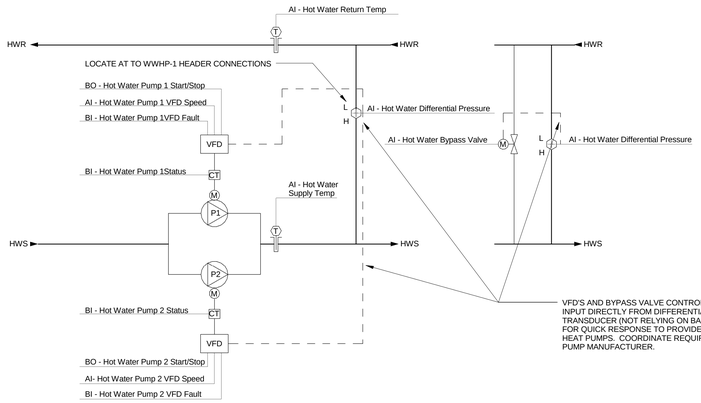
- MANUALLY THROUGH A SOFTWARE SWITCH
- IF PUMP RUNTIME (ADJ.) IS EXCEEDED
- DAILY
- WEEKLY
- MONTHLY

ALARMS SHALL BE PROVIDED AS FOLLOWS:

GLYCOL WATER PUMP

- FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

	HARDWARE VALUES				SOFTWARE VALUES		
POINT NAME	AI	AO	BI	BO	TREND	ALARM	SHOW ON GRAPHIC
GLYCOL WATER DIFFERENTIAL PRESSURE	●						●
GLYCOL WATER PUMP 1 VFD SPEED		●					●
GLYCOL WATER PUMP 2 VFD SPEED		●					●
GLYCOL WATER PUMP 1 VFD FAULT			●				●
GLYCOL WATER PUMP 2 VFD FAULT			●				●
GLYCOL WATER PUMP 1 STATUS			●				●
GLYCOL WATER PUMP 2 STATUS			●				●
GLYCOL WATER PUMP 1 START/STOP				●			●
GLYCOL WATER PUMP 2 START/STOP				●			●
PRIMARY GLYCOL WATER SUPPLY TEMP	●						●
PRIMARY GLYCOL WATER RETURN TEMP	●						●



15 HWP - 1 & HWP - 2 CONTROL DIAGRAM
NOT TO SCALE

HOT WATER PUMP DUTY/STAND-BY OPERATION:
THE TWO HOT WATER PUMPS SHALL OPERATE IN A DUTY/STAND-BY FASHION.

- THE DUTY PUMP SHALL RUN FIRST.
- ON FAILURE OF THE DUTY PUMP, THE STAND-BY PUMP SHALL RUN AND THE DUTY PUMP SHALL TURN OFF.

THE DESIGNATED DUTY PUMP SHALL ROTATE UPON ONE OF THE FOLLOWING CONDITIONS (USER SELECTABLE):

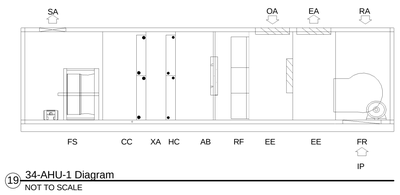
- MANUALLY THROUGH A SOFTWARE SWITCH
- IF PUMP RUNTIME (ADJ.) IS EXCEEDED
- DAILY
- WEEKLY
- MONTHLY

ALARMS SHALL BE PROVIDED AS FOLLOWS:

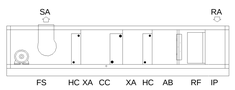
HOT WATER PUMP

- FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

	HARDWARE VALUES				SOFTWARE VALUES		
POINT NAME	AI	AO	BI	BO	TREND	ALARM	SHOW ON GRAPHIC
HOT WATER DIFFERENTIAL PRESSURE	●						●
HOT WATER PUMP 1 VFD SPEED		●					●
HOT WATER PUMP 2 VFD SPEED		●					●
HOT WATER PUMP 1 VFD FAULT			●				●
HOT WATER PUMP 2 VFD FAULT			●				●
HOT WATER PUMP 1 STATUS			●				●
HOT WATER PUMP 2 STATUS			●				●
HOT WATER PUMP 1 START/STOP				●			●
HOT WATER PUMP 2 START/STOP				●			●
PRIMARY HOT WATER SUPPLY TEMP	●						●
PRIMARY HOT WATER RETURN TEMP	●						●

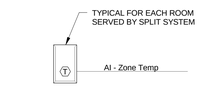


19 34-AHU-1 Diagram
NOT TO SCALE

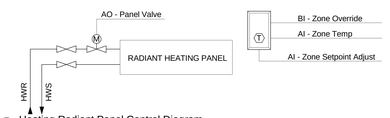


20 34-AHU-2 Diagram
NOT TO SCALE

LEGEND:
- FS: SUPPLY FAN
- HC: HEATING COIL
- XA: VARIABLE LENGTH ACCESS
- CC: COOLING COIL
- XA: VARIABLE ACCESS LENGTH
- AB: AIR BLENDER
- RF: HIGH EFFICIENCY FILTER
- IP: INLET PLENUM
- EE: ECONOMIZER
- RA: RETURN AIR
- SA: SUPPLY AIR
- OA: OUTDOOR AIR
- EA: EXHAUST AIR



9 SPLIT SYSTEM ROOM TEMPERATURE MONITORING DIAGRAM
NOT TO SCALE



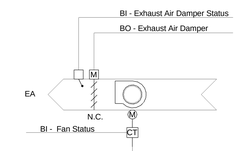
1 Heating Radiant Panel Control Diagram
NOT TO SCALE

HEATING PADIANT PANELS:

SEQUENCE OF CONTROL

OCCUPIED CYCLE:
THE ROOM THERMOSTAT SHALL MODULATE THE HEATING CONTROL VALVE V-1 TO MAINTAIN ROOM TEMPERATURE.

UNOCCUPIED CYCLE/NIGHT SETBACK:
THE ROOM THERMOSTAT SHALL MODULATE THE HEATING CONTROL VALVE V-1 TO MAINTAIN A REDUCED UNOCCUPIED ROOM TEMPERATURE.



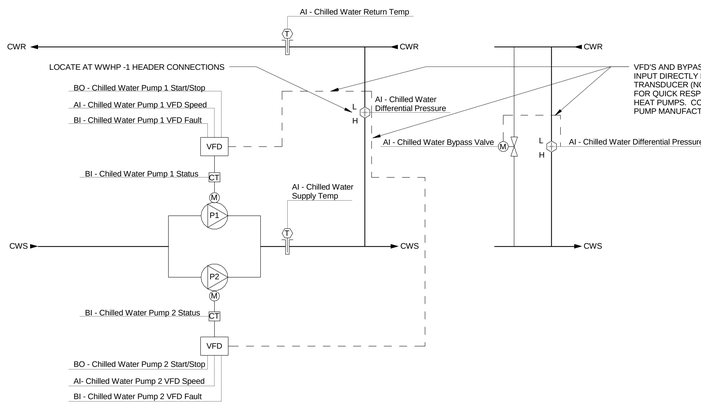
7 EF - 1 CONTROL DIAGRAM
NOT TO SCALE

GENERAL EXHAUST FANS (EF-1) SEQUENCES OF OPERATION

1. RUN CONDITIONS:
FAN SHALL RUN CONTINUOUSLY.

2. FAN STATUS:
THE CONTROLLER SHALL MONITOR THE FAN STATUS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
FAN FAILURE: COMMAND ON, BUT THE STATUS IS OFF.
FAN IN HAND: COMMAND OFF, BUT THE STATUS IS ON.



16 CWP - 1 & CWP - 2 CONTROL DIAGRAM
NOT TO SCALE

CHILLED WATER PUMP DUTY/STAND-BY OPERATION:
THE TWO CHILLED WATER PUMPS SHALL OPERATE IN A DUTY/STAND-BY FASHION.

- THE DUTY PUMP SHALL RUN FIRST.
- ON FAILURE OF THE DUTY PUMP, THE STAND-BY PUMP SHALL RUN AND THE DUTY PUMP SHALL TURN OFF.

THE DESIGNATED DUTY PUMP SHALL ROTATE UPON ONE OF THE FOLLOWING CONDITIONS (USER SELECTABLE):

- MANUALLY THROUGH A SOFTWARE SWITCH
- IF PUMP RUNTIME (ADJ.) IS EXCEEDED
- DAILY
- WEEKLY
- MONTHLY

ALARMS SHALL BE PROVIDED AS FOLLOWS:

CHILLED WATER PUMP

- FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

	HARDWARE VALUES				SOFTWARE VALUES		
POINT NAME	AI	AO	BI	BO	TREND	ALARM	SHOW ON GRAPHIC
CHILLED WATER DIFFERENTIAL PRESSURE	●						●
CHILLED WATER PUMP 1 VFD SPEED		●					●
CHILLED WATER PUMP 2 VFD SPEED		●					●
CHILLED WATER PUMP 1 VFD FAULT			●				●
CHILLED WATER PUMP 2 VFD FAULT			●				●
CHILLED WATER PUMP 1 STATUS			●				●
CHILLED WATER PUMP 2 STATUS			●				●
CHILLED WATER PUMP 1 START/STOP				●			●
CHILLED WATER PUMP 2 START/STOP				●			●
PRIMARY CHILLED WATER SUPPLY TEMP	●						●
PRIMARY CHILLED WATER RETURN TEMP	●						●

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer: Dewberry — 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9683, Fax (973) 739-9710

Structural Engineer: WZG — 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.E. Lenz Company — 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9300, Fax (814) 269-9301

Environmental Consultant: SSM — 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc. — 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

ARCHITECT:

ARRAY — healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406

t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	As indicated

Drawing Title: MECHANICAL ATC DIAGRAMS

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date: 07/27/2012 | Checked: SDA | Drawn: DJA

VA Project Number: 595-109

Building Number: 34

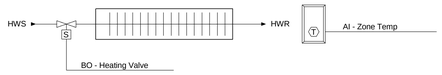
Drawing Number: MH702

Dwg. 84 of 123

Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



10 CONVECTIVE/FIN TUBE HEATER CONTROL DIAGRAM
NOT TO SCALE

CONVECTIVE / FIN TUBE HEATER

1. RUN CONDITIONS - CONTINUOUS:
   THE UNIT SHALL RUN CONTINUOUSLY AND SHALL MAINTAIN A HEATING SET POINT OF 70ºF (ADJ.).
   WHEN THE OA IS BELOW 55 DEGF (ADJ.)

   ALARMS SHALL BE PROVIDED AS FOLLOWS:

   - LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.)

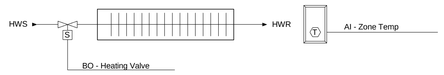
2. HEATING COIL VALVE:
   THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND OPEN THE HEATING COIL VALVE TO MAINTAIN ITS HEATING SETPOINT.

   THE HEATING SHALL BE ENABLED WHENEVER:

   - AND SUPPLY WATER TEMPERATURE IS GREATER THAN 100ºF
   - AND THE ZONE TEMPERATURE IS BELOW HEATING SETPOINT.
   - OUTSIDE AIR TEMPERATURE IS LESS THAN 55ºF (ADJ.).

POINT NAME	HARDWARE POINTS				SOFTWARE POINTS					
	AI	AO	BI	BO	AV	BV	SCHED	TREND	ALARM	GRAPHIC
ZONE TEMP	●							●		●
VALVE		●						●		●
HEATING SETPOINT								●		●
LOW ZONE TEMP									●	

NOTE: PROVIDE ANY ADDITIONAL POINTS REQUIRED FOR SEQUENCES OF OPERATION



13 AIR CURTAIN CONTROL DIAGRAM
NOT TO SCALE

AIR CURTAIN

1. RUN CONDITIONS - CONTINUOUS:
   THE UNIT SHALL RUN CONTINUOUSLY AND SHALL MAINTAIN A HEATING SET POINT OF 70ºF (ADJ.).
   WHEN THE OA IS BELOW 55 DEGF (ADJ.)

   THE UNIT SHALL RUN IN ADDITION TO ABOVE WHENEVER THE EXTERIOR DOOR IS COMMANDED OPEN, VIA DOOR SWITCH

   ALARMS SHALL BE PROVIDED AS FOLLOWS:

   - LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.)

2. HEATING COIL VALVE:
   THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND OPEN THE HEATING COIL VALVE TO MAINTAIN ITS HEATING SETPOINT.

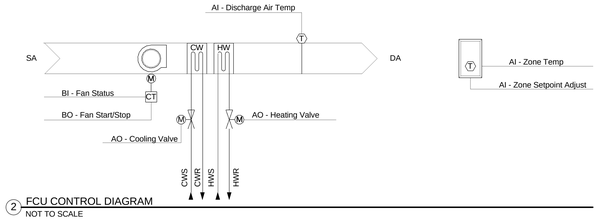
   THE HEATING SHALL BE ENABLED WHENEVER:

   - AND SUPPLY WATER TEMPERATURE IS GREATER THAN 100ºF
   - AND THE ZONE TEMPERATURE IS BELOW HEATING SETPOINT.
   - AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN 55ºF (ADJ.).
   - AND THE FAN IS ON

3. FAN:
   THE FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES.

POINT NAME	HARDWARE POINTS				SOFTWARE POINTS					
	AI	AO	BI	BO	AV	BV	SCHED	TREND	ALARM	GRAPHIC
ZONE TEMP	●							●		●
VALVE		●						●		●
HEATING SETPOINT								●		●
LOW ZONE TEMP									●	

NOTE: PROVIDE ANY ADDITIONAL POINTS REQUIRED FOR SEQUENCES OF OPERATION



2 FCU CONTROL DIAGRAM
NOT TO SCALE

FAN COIL UNIT

1. RUN CONDITIONS - SCHEDULED:
   THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:

   OCCUPIED MODE: THE UNIT SHALL MAINTAIN

   - A 75ºF (ADJ.) COOLING SETPOINT
   - A 68ºF (ADJ.) HEATING SETPOINT

   UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT SHALL MAINTAIN

   - A 85ºF (ADJ.) COOLING SETPOINT
   - A 55ºF (ADJ.) HEATING SETPOINT

   ALARMS SHALL BE PROVIDED AS FOLLOWS:

   - HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ)
   - LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ)

2. ZONE SETPOINT ADJUST:
   THE OCCUPANT SHALL BE ABLE TO ADJUST THE ZONE TEMPERATURE HEATING AND COOLING SETPOINTS AT THE ZONE SENSOR.

3. ZONE OPTIMAL START:
   THE UNIT SHALL USE AN OPTIMAL START ALGORITHM FOR MORNING START-UP. THIS ALGOTITHM SHALL MINIMIZE THE UNOCCUPIED WARM-UP OR COOL-DOWN PERIOD WHILE STILL ACHIEVING COMFORT CONDITIONS BY THE START OF SCHEDULED OCCUPIED PERIOD.

4. ZONE UNOCCUPIED OVERRIDE:
   A TIMED LOCAL OVERRIDE CONTROL SHALL ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE UNIT INTO AN OCCUPIED MODE FOR AN ADJUSTABLE PERIOD OF TIME. AT THE EXPIRATION OF THIS TIME, CONTROL OF THE UNIT SHALL AUTOMATICALLY RETURN TO THE SCHEDULE.

5. FAN:
   THE FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES.

6. COIL VALVE:
   THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE COIL VALVE TO MAINTAIN ITS SETPOINT.

   COOLING SHALL BE ENABLED WHENEVER:

   - AND THE ZONE TEMPERATURE IS ABOVE COOLING SETPOINT.
   - AND SUPPLY WATER TEMPERATURE IS LESS THAN 55ºF
   - AND THE FAN IS ON.

   HEATING SHALL BE ENABLED WHENEVER:

   - AND THE ZONE TEMPERATURE IS BELOW HEATING SETPOINT.
   - AND SUPPLY WATER TEMPERATURE IS GREATER THAN 100ºF
   - AND THE FAN IS ON.

7. FILTER DIFFERENTIAL PRESSURE MONITOR:
   THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER.

   ALARMS SHALL BE PROVIDED AS FOLLOWS:

   - FILTER CHANGE REQUIRED: FILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

8. DISCHARGE AIR TEMPERATURE:
   THE CONTROLLER SHALL MONITOR THE DISCHARGE AIR TEMPERATURE.

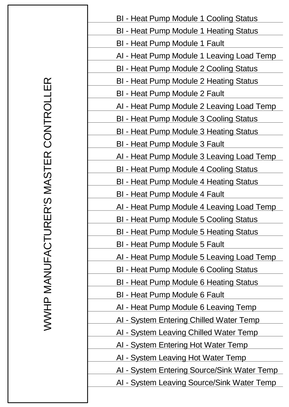
   ALARMS SHALL BE PROVIDED AS FOLLOWS:

   - HIGH DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS GREATER THAN 120ºF (ADJ.).
   - LOW DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS LESS THAN 40ºF (ADJ.).

9. FAN STATUS:
   THE CONTROLLER SHALL MONITOR THE FAN STATUS.

   ALARMS SHALL BE PROVIDED AS FOLLOWS:

   - FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
   - FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.



ELEVATOR SUMP PIT:

THE DDC SYSTEM SHALL MONITOR THE WATER LEVEL IN THE SUMP PIT AND SHALL ISSUE AN ALARM WHENEVER THE WATER LEVEL REACHES IT'S HIGH LIMIT.

GLYCOL MAKE-UP TANK AND PUMP PACKAGE:

- NON-DDC CONTROLS: THE PACKAGE CONTROLS SHALL ENERGIZE THE PUMP UPON A FALL IN SYSTEM STATIC FILL PRESSURE BELOW SETPOINT. SEE FLOW DIAGRAM.
- DDC SHALL MONITOR THE PUMP STATUS AND SHALL ISSUE AN ALARM WHENEVER THE PUMP IS ENERGIZED.

SANITARY SUMP PIT:

THE DDC SYSTEM SHALL MONITOR THE WATER LEVEL IN THE SUMP PIT AND SHALL ISSUE AN ALARM WHENEVER THE WATER LEVEL REACHES IT'S HIGH LIMIT.

TERMINAL HEATERS (CUH'S AND HUH'S):

NON DDC CONTROLS: ON A FALL IN SPACE TEMPERATURE BELOW SETPOINT (68 DEGREES F, ADJ), THE THERMOSTAT (UNIT OR WALL MOUNTED - REFER TO SCHEDULES AND DRAWINGS FOR WHICH KIND IS REQUIRED) SHALL ENERGIZE THE UNIT FAN AND OPEN THE UNIT HOT WATER VALVE. ON A RISE IN SPACE TEMPERATURE, THE THERMOSTAT SHALL DE-ENERGIZE THE FAN AND CLOSE THE HOT WATER VALVE.

POINT NAME	HARDWARE POINTS				SOFTWARE POINTS					
	AI	AO	BI	BO	AV	BV	SCHED	TREND	ALARM	GRAPHIC
ZONE TEMP	●							●		●
ZONE SETPOINT ADJUST	●									●
FILTER DIFF PRESSURE	●							●		●
DISCHARGE AIR TEMP	●							●		●
SUPPLY WATER TEMP	●							●		●
VALVE		●						●		●
ZONE OVERRIDE			●					●		●
FAN STATUS			●					●		●
FAN START/STOP				●				●		●
SCHEDULE							●			
HEATING SETPOINT								●		●
COOLING SETPOINT								●		●
HIGH ZONE TEMP									●	
LOW ZONE TEMP									●	
FILTER CHANGE REQUIRED									●	
HIGH DISCHARGE AIR TEMP									●	
LOW DISCHARGE AIR TEMP									●	
FAN FAILURE									●	
FAN IN HAND									●	

NOTE: PROVIDE ANY ADDITIONAL POINTS REQUIRED FOR SEQUENCES OF OPERATION

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions | Date

CONSULTANTS:

Civil Engineer
Dewberry
600 Parsippany Road, Suite 301
Parsippany, NJ 07054-3715
Tel (973) 576-9683
Fax (973) 739-9710

Structural Engineer
WZG
180 W. Ridge Pike
Limerick, PA 19468
Tel (214) 329-5559

MEP Engineer
H.E. LENZ COMPANY
1407 Scalp Avenue
Johnstown, PA 15904
Tel (814) 269-9300
Fax (814) 269-9301

Environmental Consultant
SSM
1047 North Park Road, P.O. Box 6307
Reading, PA 19610
Tel (610) 621-2000

Cost Estimator
International Consultants, Inc.
221 Chestnut Street, Suite 200
Philadelphia, PA 19106
Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA
Registered Professional
TIMOTHY M. EARHART
PE-044818-E
Mechanical
COMMONWEALTH OF PENNSYLVANIA

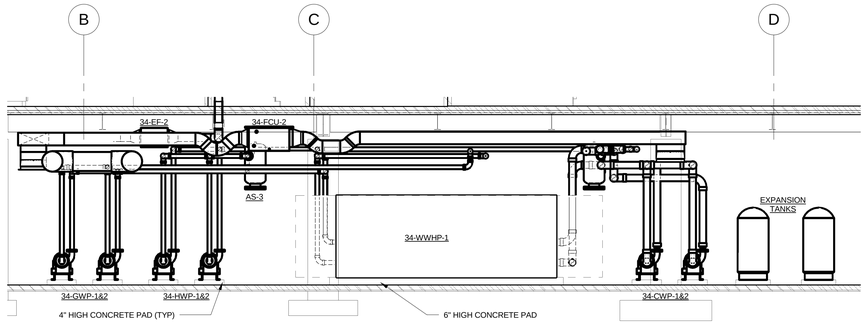
ARCHITECT:
ARRAY
healthcare facilities solutions
2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406
t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	3468
Scale	1/8" = 1'-0"
Drawing Title	MECHANICAL ATC DIAGRAMS
Approved: Project Director	
Project Title	Behavioral Health Complex
Location	1700 South Lincoln Ave. Lebanon, PA 17042
Date	07/27/2012
Checked	SDA
Drawn	DJA
VA Project Number	595-109
Building Number	34
Drawing Number	MH703
Dwg. 85 of 123	

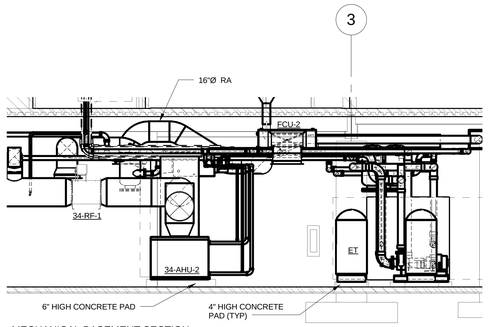
Office of Facilities Management

Department of Veterans Affairs

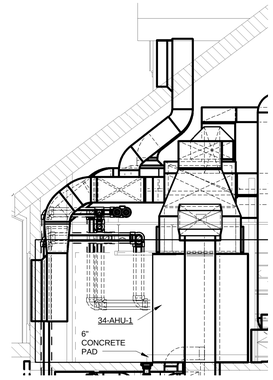
VA FORM 08-6231, OCT 1978



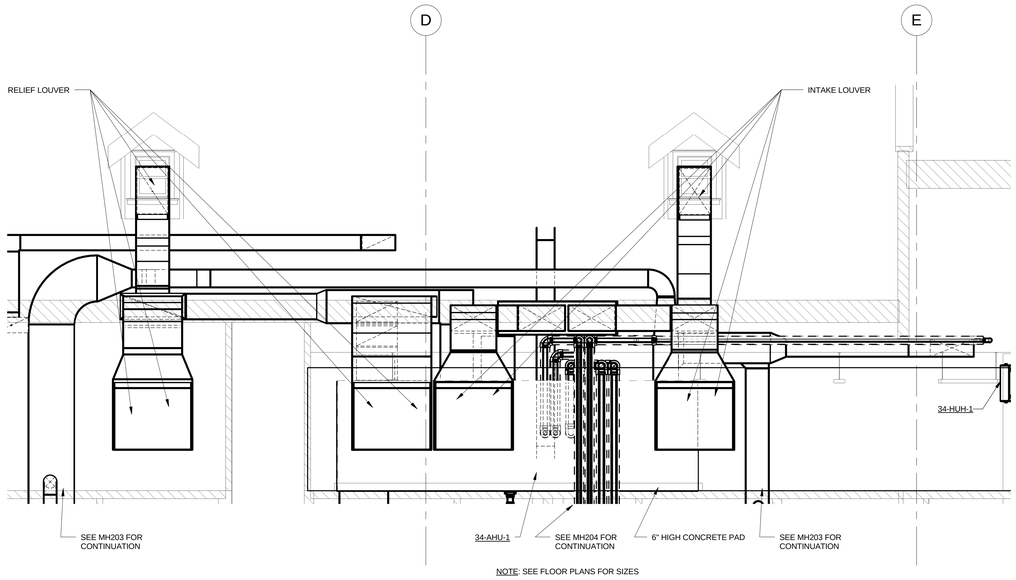
1 MECHANICAL BASEMENT
SCALE: 1/4" = 1'-0"



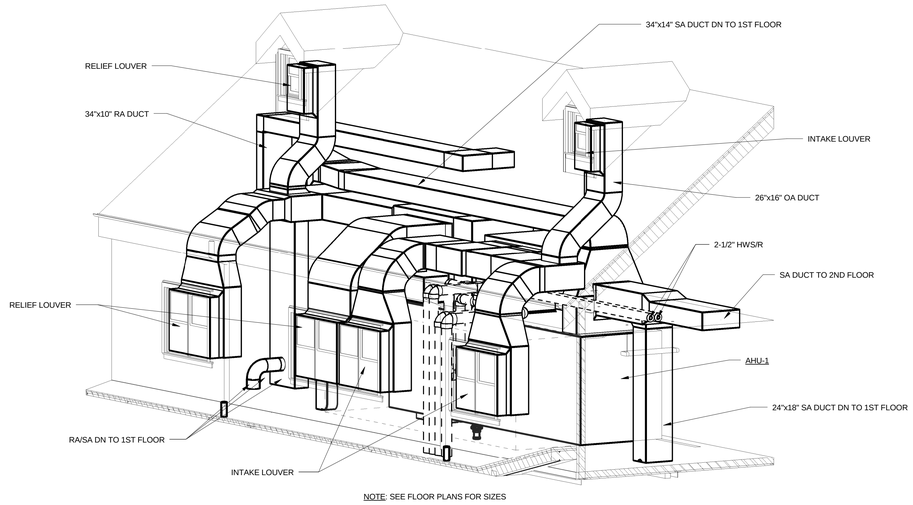
2 MECHANICAL BASEMENT SECTION
SCALE: 1/4" = 1'-0"



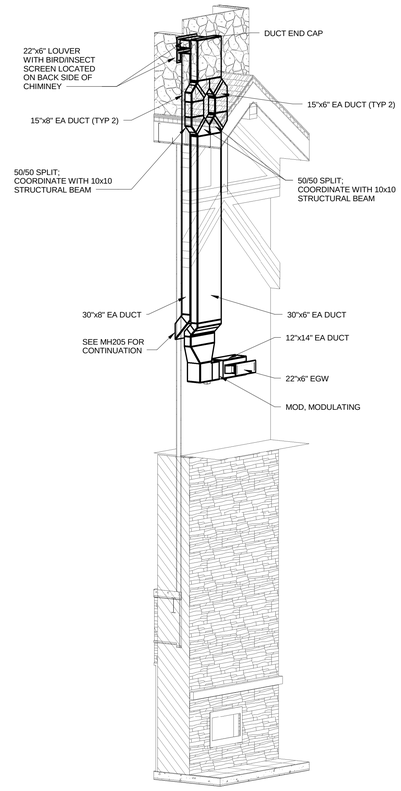
3 MECHANICAL ROOM 2ND FLOOR SECTION
SCALE: 1/4" = 1'-0"



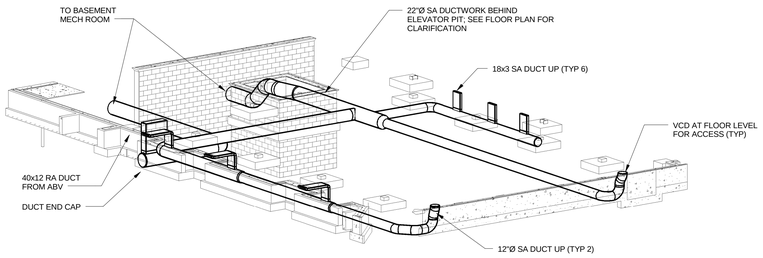
4 MECHANICAL ROOM 2ND FLOOR
SCALE: 1/4" = 1'-0"



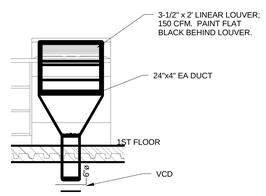
6 MECHANICAL ROOM 2ND FLOOR ISOMETRIC
NOT TO SCALE



5 COMMONS VENT THRU CHIMNEY ISOMETRIC
NOT TO SCALE



7 UNDERGROUND DUCTWORK ISOMETRIC
NOT TO SCALE



8 TRAINING KITCHEN ISLAND EXHAUST DUCTWORK
SCALE: 1/2" = 1'-0"

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer: Dewberry — 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9683, Fax (973) 739-9710

Structural Engineer: WZG — 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.E. Lenz Company — 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9300, Fax (814) 269-9301

Environmental Consultant: SSM — 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc. — 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER TIMOTHY M. EARHART

ARCHITECT:

ARRAY
healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406

t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	As indicated

Drawing Title: MECHANICAL ISOMETRICS AND SECTIONS

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date	Checked	Drawn
07/27/2012	TME	DJA

VA Project Number: 595-109

Building Number: 34

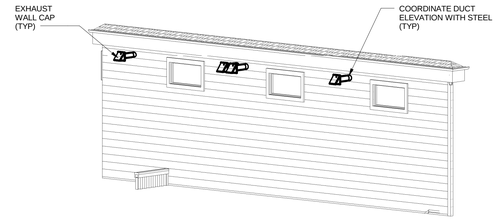
Drawing Number: MH801

Dwg. 86 of 123

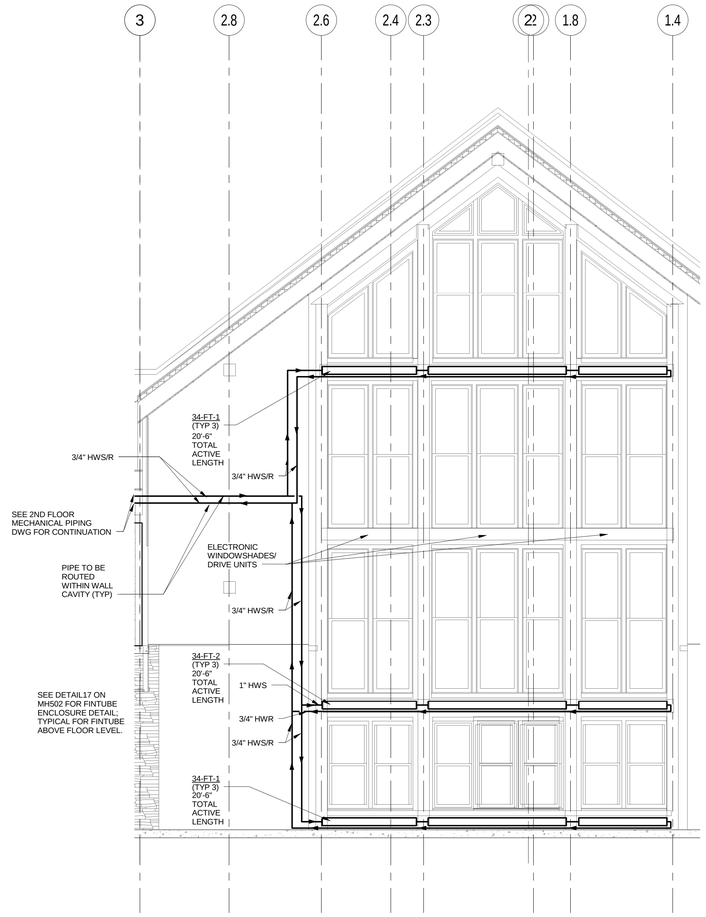
Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



2 EXHAUST CAP - EXTERIOR ISOMETRIC
NOT TO SCALE



1 SOUTH WALL
SCALE: 1/4" = 1'-0"

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer
Dewberry
600 Parsippany Road, Suite 301
Parsippany, NJ 07054-3715
Tel (973) 576-9663
Fax (973) 739-9710

Structural Engineer
WZG
180 W. Ridge Pike
Limerick, PA 19468
Tel (214) 329-5559

MEP Engineer
H.F. LENZ COMPANY
1407 Scalp Avenue
Johnstown, PA 15904
Tel (814) 269-9200
Fax (814) 269-9301

Environmental Consultant
SSM
1047 North Park Road, P.O. Box 6307
Reading, PA 19610
Tel (610) 621-2000

Cost Estimator
International Consultants, Inc.
221 Chestnut Street, Suite 200
Philadelphia, PA 19106
Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
TIMOTHY M. EARHART
No. PE-059811-E

ARCHITECT:
ARRAY
healthcare facilities solutions
2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406
t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	1/4" = 1'-0"

Drawing Title: MECHANICAL ISOMETRICS AND SECTIONS

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date: 07/27/2012 | Checked: SDA | Drawn: DJA

VA Project Number: 595-109

Building Number: 34

Drawing Number: MH802

Dwg. 87 of 123

Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978

GENERAL PLUMBING NOTES:

1. ALL NOTED "BELOW FLR" OR "ABV CLG" SHALL BE CONCEALED IN SPACE BETWEEN STRUCTURAL JOIST AND CEILING.
2. ALL WATER LINES IN EXTERIOR WALLS SHALL BE INSULATED AND LOCATED WITHIN THE INSULATION ENVELOPE OF THE BUILDING.
3. SET ALL FLOOR DRAINS AND FUNNEL DRAINS OVER P-TRAPS.
4. COORDINATE LOCATIONS OF ALL LINES AND EQUIPMENT WITH OTHER CONTRACTORS.
5. REMOVE ALL EXPOSED PIPING NOT A PART OF THE REMODELED SYSTEM IN THE EXISTING BUILDING. RENDER CONCEALED PIPING NOT A PART OF THE REMODELED SYSTEM IN THE EXISTING BUILDING COMPLETELY "DEAD." WHERE CONCEALED PIPING IS IN EXISTING PARTITIONS TO BE REMOVED OR INTERFERES WITH REMODELING CONSTRUCTION, THE CONTRACTOR SHALL REMOVE PIPING AND RENDER REMAINING PIPING COMPLETELY "DEAD" OR RELOCATE PIPING IF IT IS PART OF THE REMODELED SYSTEM.
6. AT LOCATIONS INDICATED TO CONNECT NEW SANITARY LINES TO EXISTING SANITARY SEWER. DETERMINE EXACT LOCATION, SIZE AND ELEVATION AT THE SITE BEFORE INSTALLING NEW SEWER LINES.
7. AT LOCATIONS INDICATED TO CONNECT NEW WATER LINES TO EXISTING WATER LINES. DETERMINE EXACT LOCATION AND SIZE AT SITE BEFORE INSTALLING NEW WATER LINES.
8. PROVIDE ACCESS PANELS IN PLASTER CEILING FOR ALL VALVES, WATER FLOW SWITCHES AND ANY OTHER DEVICES WHICH REQUIRES INSPECTION OR MAINTENANCE. FURNISH AND INSTALL ACCESS PANELS UNDER ARCHITECTURAL SPECIFICATIONS.
9. LIGHT LINES INDICATE EXISTING PIPING TO REMAIN. HEAVY LINES INDICATE NEW PIPING.
10. FOR WHEELCHAIR MOUNTING HEIGHTS FOR PLUMBING, SEE ARCHITECTURAL DRAWINGS.
11. RUN DRAINAGE PIPE AS CLOSE AS POSSIBLE BELOW FLOOR SLAB OF PLAN ON WHICH SHOWN.
12. MAKE OFFSETS IN VERTICAL WASTE, SOIL, AND VENT PIPES AT 45 DEGREE ANGLE WHEREVER POSSIBLE.
13. WHERE SUSPENDED CEILINGS ARE INSTALLED, RUN PIPING ABOVE THE CEILING.
14. FOR COMPLETE ROOM NAMES AND NUMBERS, SEE ARCHITECTURAL DRAWINGS.
15. THE CONTRACTOR SHALL PROVIDE AND INSTALL APPROVED PIPE SLEEVES AND FIRE STOPPING AT ALL NEW AND EXISTING FLOOR/CEILING SLAB AND WALL PENETRATIONS WITHING THE LIMITS OF THE CONTRACT WORK AREA TO MAINTAIN THE TIME RATED CONSTRUCTION SPECIFIED. (REFER TO DETAILS ON THIS DRAWING)
16. ALL ITEMS HUNG FROM UTILITY FLOOR HAVING A LOAD GREATER THAN 70 POUNDS SHALL BE SUPPORTED FROM STEEL FRAMING MEMBERS AND NOT FROM THE UTILITY FLOOR SLAB OR STELL DECK.
17. ALL MEDICAL GAS PIPING MODIFICATIONS SHALL BE PERFORMED IN ACCORDENCE WITH NFPA 99 REQUIREMENTS BY CERTIFIED CONTRACTOR, AND SHALL INCLUDE TESTING AND CERTIFICATION OF THE MODIFIED SYSTEM BY AN INDEPENDENT TEST FIRM HIRED BY THE CONTRACTOR.
18. REFER TO ARCHITECTURAL PLANS AND SPECIFICATIONS FOR PHASING AND ICRA REQUIREMENTS.
19. TRAP PRIMER LINES SHALL BE INSULATED. TRAP PRIMER LINES BELOW SLAB SHALL BE RUN IN PIPE SLEEVES.

SYMBOL IDENTIFICATION

FL MTD	FLOOR MOUNTED
W MTD	WALL MOUNTED
FV	FLUSH VALVE
DS	DOWNSPOUT
GPM	GALLON PER MINUTE
C AND H (C/H)	COLD AND HOT
WP	WASTE PIPE
SP	SOIL PIPE
VP	VENT PIPE
CW	COLD WATER
HW	HOT WATER
EX	EXISTING
(R)	RELOCATED
RD	ROOF DRAIN
OD	OVERFLOW ROOF DRAIN
ABV	ABOVE
BLW	BELOW
CLG	CEILING
FLR	FLOOR
INV ELEV	INVERT ELEVATION
GPF	GALLONS PER FLUSH
VV	VA APPROVED & INSTALLED
CC	CONTRACTOR PROVIDED & INSTALLED
T	TEMPERED WATER
FHC	FIRE HOSE CABINET
RWC	RAIN WATER CONDUCTOR

PLUMBING LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	WATER RISOR (SIZE 5")		HAMMER ARRESTER
	SANITARY/WASTE OR VENT STACK (SIZE 6"	M	METER
	AUTOMATIC AIR VENT		ACCESS/ZONE PANELBOX 12x4
BP	BACK FLOW PREVENTER		ACCESS/PANEL BOX 18x4
	BALANCING VALVE		PIPE ANCHOR
	BALL VALVE LEVER		PIPE BOTTOM CONNECTION
	CHECK VALVE	C	PIPE DOWN
	CIRCULATING PUMP		PIPE GUIDE
	CLEANOUT IN RISER		PLUG VALVE
	CLEANOUT EXTENDED UP TO FLOOR/GRADE		PRESSURE GUAGE
	COMBINATION HOSE BIBB		PRESSURE REDUCING VALVE
	CONCENTRIC REDUCER	PS	PRESSURE SWITCH
	DOUBLE CHECK VALVE		RELIEF VALVE
	ECCENTRIC REDUCER		SHOWER HEAD
	CAP OR PLUG		STRAINER
	EXPOSED MIXING VALVE		TEMPERATURE GAUGE
F	FILTER	TP	TRAP PRIMER
	FLOOR DRAIN W/ OUT TRAP		UNION
	FLOOR DRAIN CORNER CONNECTION		VALVE AND VALVE BOX
	FLOOR DRAIN SIDE CONNECTION		WASHING MACHINE SUPPLY AND DRAIN UNIT
	FLOOR SINK WITH 1/2 GRATE TOP	HB	HOSE BIBB
	FLOOR SINK WITH 3/4 GRATE TOP	WH	WALL HYDRANT
	FLOW DIRECTION ARROW		NEW CONNECTION TO EXISTING
	FUNNEL DRAIN	X	INDICATES NOTE LOCATED ELSEWHERE ON DRAWING AND NOTE NUMBER
	GAS COCK VALVE		SQUARE FOOT
R	GAS PRESSURE REGULATOR	X / FXXX	DETAIL/PLAN REFERENCE SYMBOL X: INDICATES DETAIL/PLAN NUMBER FXXX: INDICATES DRAWING No. FOR WHICH THE DETAIL/PLAN IS LOCATED.
	GATE VALVE		
	PRESSURE REGULATOR VALVE		

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer
Dewberry
600 Parsippany Road, Suite 301
Parsippany, NJ 07054-3715
Tel (973) 576-9683
Fax (973) 739-9710

Structural Engineer
WZG
180 W. Ridge Pike
Limerick, PA 19468
Tel (214) 329-5559

MEP Engineer
H.E. LENZ COMPANY
1407 Scalp Avenue
Johnstown, PA 15904
Tel (814) 269-9300
Fax (814) 269-9301

Environmental Consultant
SSM
1047 North Park Road, P.O. Box 6307
Reading, PA 19610
Tel (610) 621-2000

Cost Estimator
International Consultants, Inc.
221 Chestnut Street, Suite 200
Philadelphia, PA 19106
Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL TIMOTHY M. EARHART LICENSE No. PE-061810-E COMMONWEALTH OF PENNSYLVANIA

ARCHITECT:
ARRAY
healthcare facilities solutions
2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406
t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

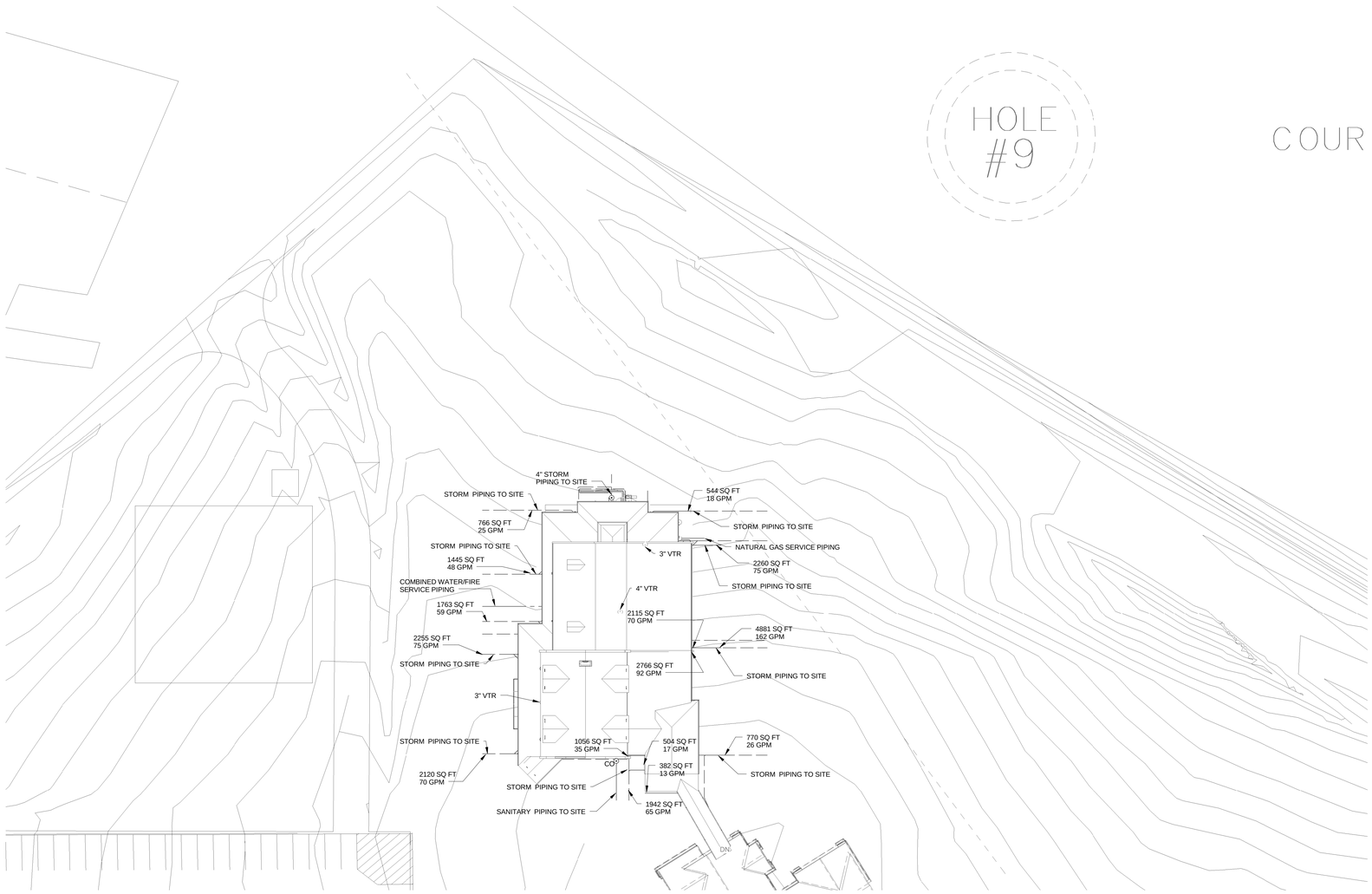
Project Number	Scale
3468	As indicated

Drawing Title	GENERAL INFORMATION
Approved: Project Director	
Project Title	Behavioral Health Complex
Location	1700 South Lincoln Ave. Lebanon, PA 17042
Date	07/27/2012
Checked	TME
Drawn	MGS
VA Project Number	595-109
Building Number	34
Drawing Number	PL001
Dwg. 88 of 123	

Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



1 SITE PLAN - PLUMBING
SCALE: 1" = 30'-0"

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer
Dewberry
600 Parsippany Road, Suite 301
Parsippany, NJ 07054-3715
Tel (973) 576-9683
Fax (973) 739-9719

Structural Engineer
WZG
180 W. Ridge Pike
Limerick, PA 19468
Tel (214) 329-5559

MEP Engineer
H.E. LENZ COMPANY
1407 Scalp Avenue
Johnstown, PA 15904
Tel (814) 269-9300
Fax (814) 269-9301

Environmental Consultant
SSM
1047 North Park Road, P.O. Box 6307
Reading, PA 19610
Tel (610) 621-2000

Cost Estimator
International Consultants, Inc.
221 Chestnut Street, Suite 200
Philadelphia, PA 19106
Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
TIMOTHY M. DARRAH
ARCHITECT
No. RA-051313-A

ARCHITECT:

ARRAY
healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406

t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	1" = 30'-0"

Drawing Title: PLUMBING SITE PLAN

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date	Checked	Drawn
07/27/2012	TME	MGS

VA Project Number: 595-109

Building Number: 34

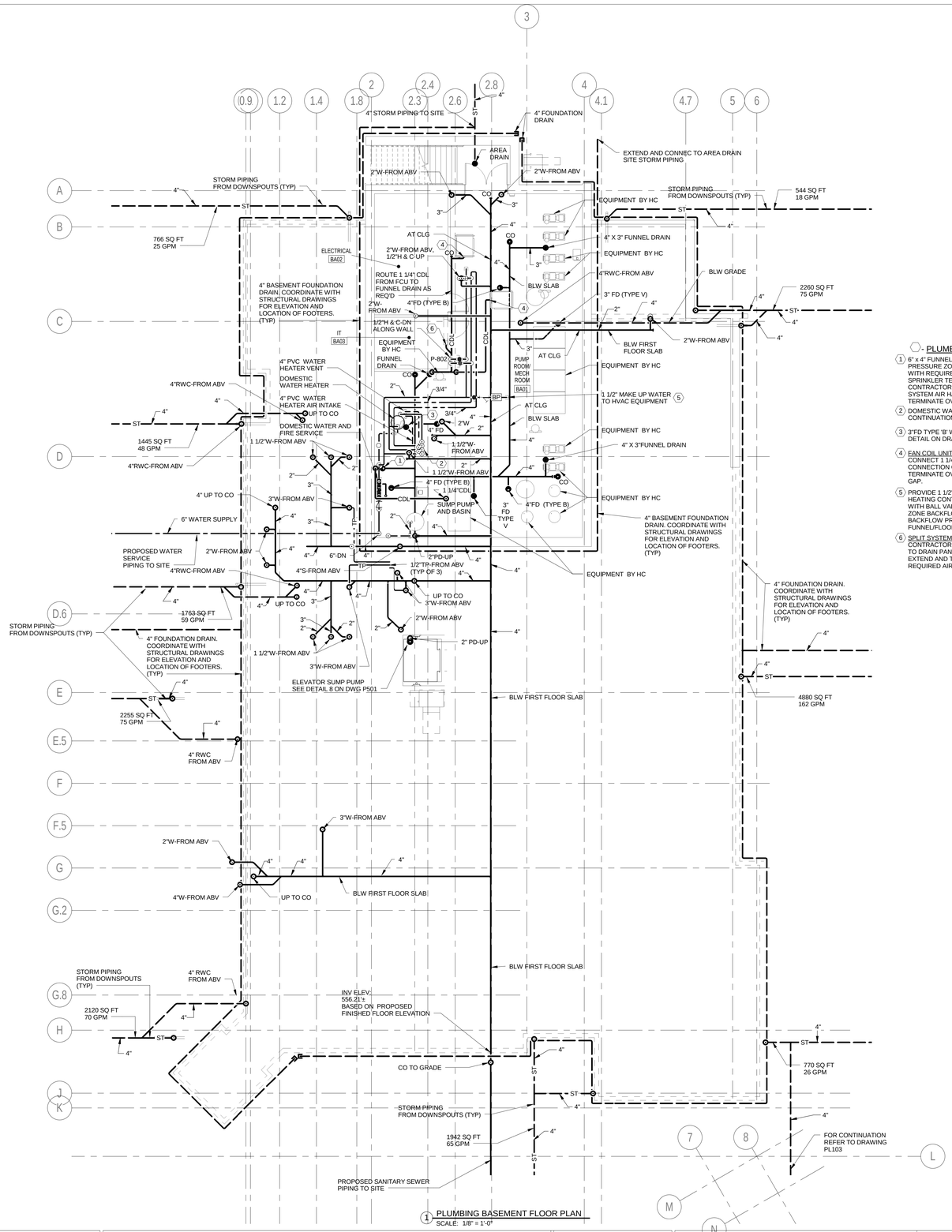
Drawing Number: PL101

Dwg. 89 of 123

Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



1 PLUMBING BASEMENT FLOOR PLAN
SCALE: 1/8" = 1'-0"

◯ - PLUMBING KEYNOTES

1. 6" x 4" FUNNEL DRAIN. TERMINATE DRAIN LINE FROM REDUCED PRESSURE ZONE BACKFLOW PREVENTER OVER FUNNEL DRAIN WITH REQUIRED AIR GAP. COORDINATE TERMINATION OF SPRINKLER TEST DRAIN AT FUNNEL DRAIN WITH FIRE SPRINKLER CONTRACTOR. EXTEND CONDENSATE DRAIN LINE FROM SPLIT SYSTEM AIR HANDLING UNIT ON FIRST FLOOR ABOVE AND TERMINATE OVER FUNNEL DRAIN WITH REQUIRED AIR GAP.
2. DOMESTIC WATER RISERS UP. REFER TO DWG PL-103 FOR CONTINUATION.
3. 3"FD TYPE 'B' WITH FUNNEL. REFER TO WATER HEATER DETAIL ON DRAWING PL502.
4. FAN COIL UNIT-AT CEILING-BY HEATING CONTRACTOR. CONNECT 1 1/4" CONDENSATE DRAIN LINE TO DRAIN CONNECTION OF FAN COIL UNIT AND EXTEND AND TERMINATE OVER FUNNEL DRAIN WITH REQUIRED AIR GAP.
5. PROVIDE 1 1/2" MAKE UP WATER LINE FOR EXTENSION BY HEATING CONTRACTOR. MAKE UP LINE SHALL BE PROVIDED WITH BALL VALVE, STRAINER, AND REDUCED PRESSURE ZONE BACKFLOW PREVENTER. CONNECT DRAIN LINE FROM BACKFLOW PREVENTER AND EXTEND AND TERMINAT OVER FUNNELFLOOR DRAIN WITH REQUIRED AIR GAP.
6. SPLIT SYSTEM AIR HANDLING UNIT-AT CEILING-BY HEATING CONTRACTOR. CONNECT 1 1/4" CONDENSATE DRAIN LINE TO DRAIN PAN CONNECTION OF SPLIT SYSTEM UNIT AND EXTEND AND TERMINATE OVER FUNNEL DRAIN WITH REQUIRED AIR GAP.

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date
ADDENDUM NO. 3	06/22/2012

CONSULTANTS:

Civil Engineer: Dewberry, 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9683, Fax (973) 739-9710

Structural Engineer: WZG, 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.E. Lenz Company, 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9300, Fax (814) 269-9301

Environmental Consultant: SSM, 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc., 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL TIMOTHY M. DARNAY ENGINEER No. 044573-E

ARCHITECT:

ARRAY
healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406

t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	1/8" = 1'-0"

Drawing Title: PLUMBING BASEMENT FLOOR PLAN

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date: 07/27/2012 | Checked: TME | Drawn: MGS

VA Project Number: 595-109

Building Number: 34

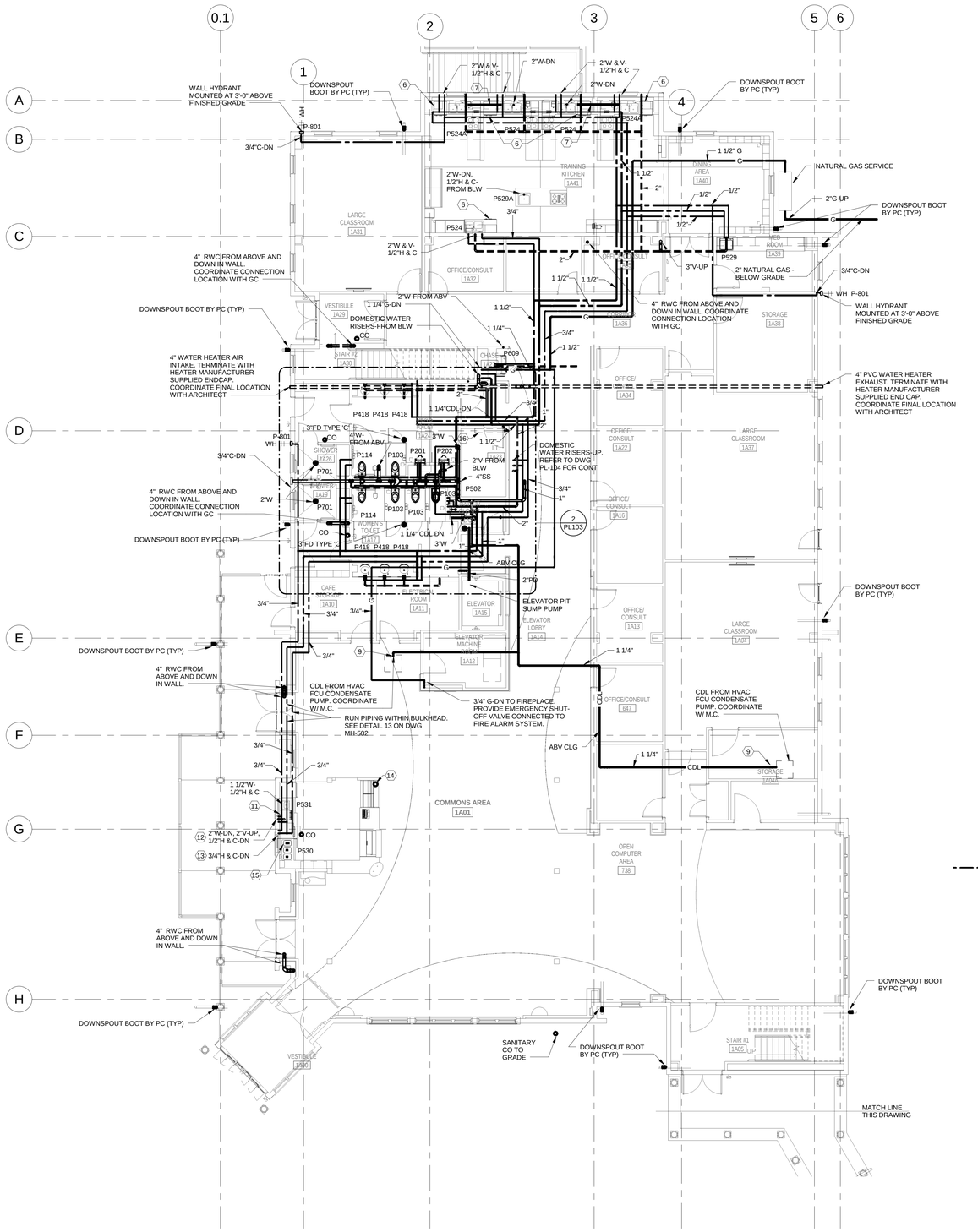
Drawing Number: PL102

Dwg. 90 of 123

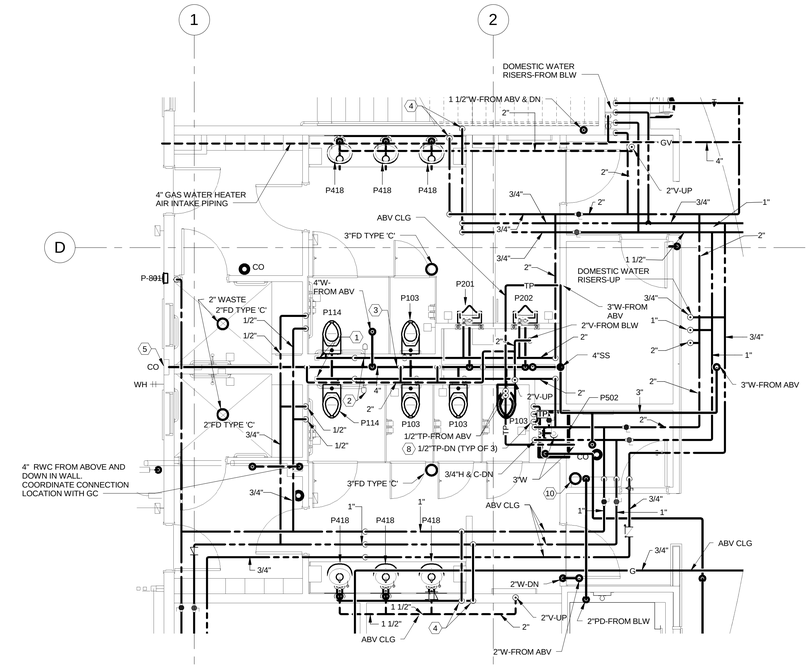
Office of Facilities Management

Department of Veterans Affairs

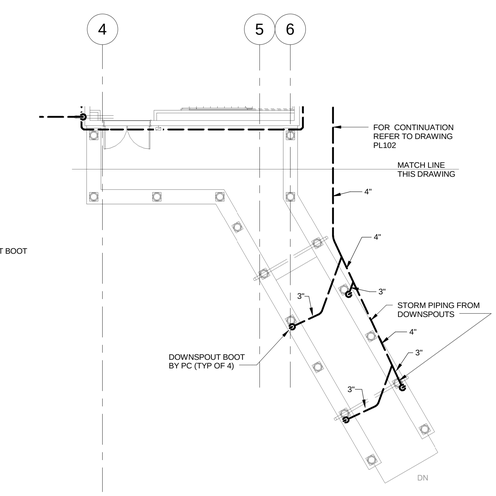
VA FORM 08-6231, OCT 1978



1 PLUMBING FIRST FLOOR PLAN
SCALE: 1/8" = 1'-0"



2 ENLARGED PLUMBING FIRST FLOOR PLAN
SCALE: 1/4" = 1'-0"



- PLUMBING KEYNOTES

1. EXTEND 2" WATER SUPPLY HEADER TO LAST FIXTURE AS INDICATED. RUN WATER PIPING ALONG WALL IN PIPE CHASE AT FIXTURE CONNECTION LEVEL.
2. PROVIDE WATER HAMMER ARRESTOR SIZE 'C' ON COLD WATER SUPPLY PIPING TO FIXTURE. WATER HAMMER ARRESTOR SHALL BE LOCATED BETWEEN LAST TWO FIXTURES AS PER MANUFACTURERS RECOMMENDATIONS. ACCESS TO WATER HAMMER ARRESTORS SHALL NOT BE REQUIRED.
3. RUN 2" VENT LINE IN CHASE AT A MINIMUM OF 6" ABOVE THE FLOOD LEVEL RIM OF THE HIGHEST MOUNTED FIXTURE. EXTEND UP TO ABOVE CEILING AND CONNECT TO VENT PIPING AS INDICATED.
4. EXTEND 3/4" HOT AND COLD WATER PIPING DOWN IN WALL TO BELOW COUNTER. RUN WATER SUPPLY PIPING ALONG WALL BELOW COUNTER TO LAVATORY FAUCETS AND CONNECT. PROVIDE ASSE 1070 APPROVED MIXING VALVE BELOW COUNTER ON HOT WATER LINE TO BANK OF LAVATORIES.
5. EXTEND 4" SANITARY PIPING FROM CHASE BEHIND PLUMBING IN FIXTURES IN WALL BETWEEN SHOWERS TO EXTERIOR WALL. PROVIDE CLEANOUT AND 12" x 12" RECESSED BOX WITH LOCKING COVER AT EXTERIOR OF BUILDING. COORDINATE SANITARY PIPING RUN WITH ARCHITECT.
6. DISHWASHER- BY OTHERS. CONNECT 1/2" HOT WATER LINE TO HOT WATER SUPPLY LINE BELOW SINK. EXTENT AND CONNECT TO HOT WATER CONNECTION OF DISHWASHER. PROVIDE WATER HAMMER ARRESTOR SIZE 'A' ON HOT WATER LINE TO DISHWASHER. EXTEND DRAIN LINE FROM DISHWASHER WITH AIR GAP FITTING AND CONNECT TO DISHWASHER DRAIN CONNECTION OF DISPOSER BELOW SINK. PROVIDE TAILPIECE WITH DISHWASHER CONNECTION ON SINKS WITHOUT DISPOSER.
7. CONNECT DRAIN LINES TO FROM SINKS AND DISPOSER TO SANITARY WASTE LINE BELOW COUNTER.RUN 2" SANITARY WASTE LINE BELOW COUNTER AND DROP TO BASEMENT BELOW AS INDICATED. COORDINATE LOCATION OF SANITARY LINE IN CASEWORK WITH ARCHITECT.
8. EXTEND 1/2" TRAP PRIMERS DOWN IN WALL TO BELOW FLOOR AND EXTEND AND CONNECT TO TRAP PRIMER CONNECTIONS OF FLOOR DRAINS AND FUNNEL/FLOOR DRAIN.
9. FAN COIL UNIT - ABOVE CEILING - BY HEATING CONTRACTOR. CONNECT 1 1/4" CONDENSATE DRAIN LINE TO PUMP DISCHARGE LINE OF FAN COIL UNIT. EXTEND AND TERMINATE CONDENSATE DRAIN LINE OVER FUNNEL DRAIN WITH REQUIRED AIR GAP.
10. 4" x 3" FUNNEL DRAIN. TERMINATE PUMP DISCHARGE LINE FROM ELEVATOR SUMP PUMP OVER FUNNEL DRAIN WITH REQUIRED AIR GAP.
11. CONNECT 1/2" COLD WATER LINE TO COLD WATER SUPPLY LINE BELOW BELOW COUNTER TO SINK. EXTEND AND CONNECT TO COFFEE MAKER WITH BALL VALVE, STRAINER, IN LINE FILTER, AND DUAL CHECK BACKFLOW PREVENTER. IN LINE FILTER SHALL BE CUNO AQUA PURE MODEL NO. AP200, WITH NO. AP217 CARTRIDGE, OR APPROVED EQUAL. CPNTRACTOR SHALL FURNISH ONE (1) EXTRA FILTER CARTRIDGE FOR SPARE. FINAL CONNECTIONS TO COFFEE MAKER BY PLUMBING CONTRACTOR. COORDINATE FILTER LOCATION WITH ARCHITECT.
12. EXTEND 1 1/2" WASTE PIPING FROM SINK TRAP TO WASTE AND VENT RISER LOCATION. EXTEND 2" DRAIN PIPING DOWN TO BELOW SLAB AND CONNECT RUN AS INDICATED ON BASEMENT PLAN ON DRAWING PL102. EXTEND 2" VENT PIPING UP TO CEILING AND OFFSET AND EXTEND UP THRU ROOF AND TERMINATE WITH 3" VENT THRU ROOF. RUN 1/2"HOT AND COLD PIPING DOWN IN WALL TO BELOW COUNTER AND EXTEND AND CONNECT TO WATER SUPPLIES OF SINK FAUCET.
13. RUN 3/4"HOT AND COLD PIPING DOWN IN WALL TO BELOW COUNTER AND EXTEND AND CONNECT TO WATER SUPPLIES OF SINK FAUCET(S).
14. CONNECT DRAIN LINE TO DRAIN CONNECTION OF PASTRY COOLER DISPLAY CASE AND EXTEND AND TERMINATE OVER RAISED LIP DRAIN WITH REQUIRED AIR GAP. COORDINATE EXACT DRAIN LOCATION WITH ARCHITECT. RAISED LIP DRAIN MOUNTED WITH TOP OF LIP FLUSH WITH FINISHED FLOOR. PROVIDE DRAIN ZURN MODEL NO. Z415 WITH TYPE "I" STRAINER. 3" OUTLET, OR APPROVED EQUAL.
15. PROVIDE FLOOR SINK JOSAM MODEL NO. 49310-3-43, 8" x 8" WITH 1/2 GRATE AND 4" OUTLET, OR APPROVED EQUAL. GATHER WASTE PIPING EACH BOWL OF TRIPLE BOWL AND CONNECT TOGETHER AND TERMINATE OVER FLOOR SINK WITH REQUIRED AIR GAP. PROVIDE FLOW CONTROL VALVES ON WASTE PIPING TO EACH BOWL OF TRIPLE BOWL SINK.
16. SPLIT SYSTEM AIR HANDLING UNIT - AT CEILING - BY HEATING CONTRACTOR. CONNECT 1 1/4" CONDENSATE DRAIN LINE TO DRAIN PAN CONNECTION OF SPLIT SYSTEM UNIT. EXTEND DOWN IN WALL TO BASEMENT BELOW AND TERMINATE OVER FUNNEL DRAIN AT DOMESTIC WATER SERVICE LOCATION WITH REQUIRED AIR GAP.

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date
ADDENDUM NO. 3	06/22/2012

CONSULTANTS:

Civil Engineer: Dewberry — 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9693, Fax (973) 739-9710

Structural Engineer: WZG — 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.E. LENZ COMPANY — 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9300, Fax (814) 269-9301

Environmental Consultant: SSM — 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc. — 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

ARCHITECT:

ARRAY healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406

t: 610.270.0599
f: 610.270.0595
www.arrayhfs.com

Project Number	Scale
3468	As indicated

Drawing Title: PLUMBING FIRST FLOOR PLAN

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date	Checked	Drawn
07/27/2012	TME	MGS

VA Project Number: 595-109

Building Number: 34

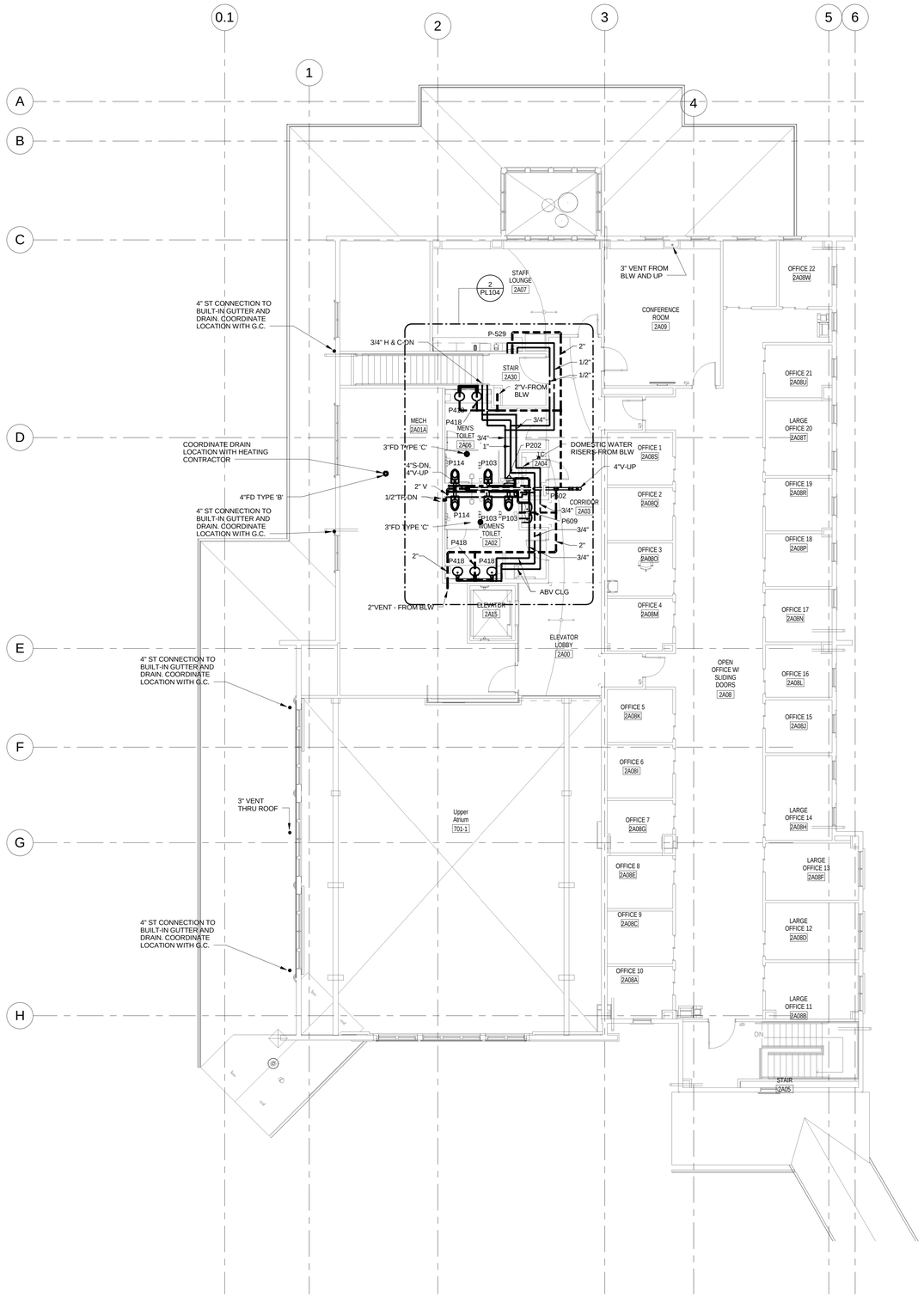
Drawing Number: PL103

Dwg. 91 of 123

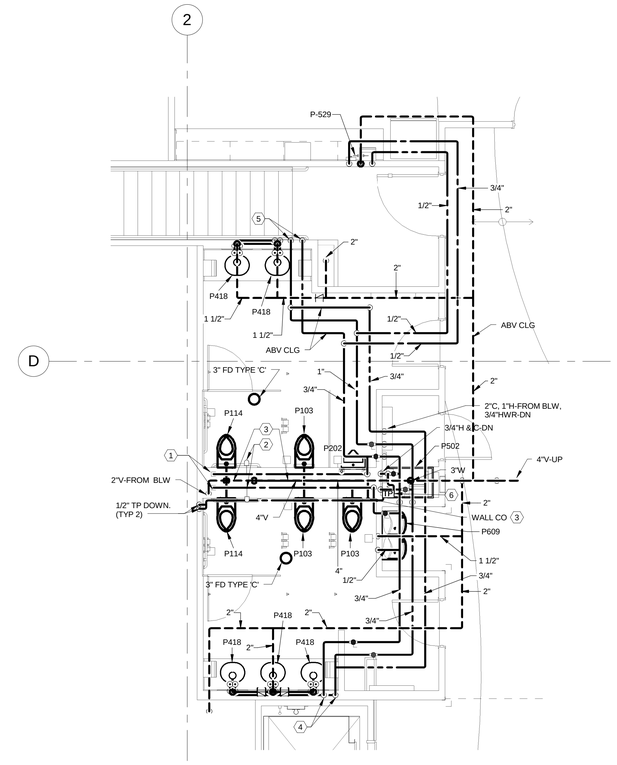
Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



1 PLUMBING SECOND FLOOR PLAN
SCALE: 1/8" = 1'-0"



2 ENLARGED PLUMBING SECOND FLOOR PLAN
SCALE: 1/4" = 1'-0"

- PLUMBING KEYNOTES

1. EXTEND 2" WATER SUPPLY HEADER TO LAST FIXTURE AS INDICATED. RUN WATER PIPING ALONG WALL IN PIPE CHASE AT FIXTURE CONNECTION LEVEL.
2. PROVIDE WATER HAMMER ARRESTOR SIZE 'C' ON COLD WATER SUPPLY PIPING TO FIXTURE. WATER HAMMER ARRESTOR SHALL BE LOCATED BETWEEN LAST TWO FIXTURES AS PER MANUFACTURERS RECOMMENDATIONS. ACCESS TO WATER HAMMER ARRESTORS SHALL NOT BE REQUIRED.
3. RUN 4" VENT LINE IN CHASE AT A MINIMUM OF 6" ABOVE THE FLOOD LEVEL RIM OF THE HIGHEST MOUNTED FIXTURE. EXTEND UP TO ABOVE CEILING AND CONNECT TO VENT PIPING AS INDICATED. RUN SANITARY WASTE PIPING IN CHASE TO SANITARY STACK LOCATION. PROVIDE WALL CLEANOUT AS INDICATED.
4. EXTEND 3/4" HOT AND COLD WATER PIPING DOWN IN WALL TO BELOW COUNTER. RUN WATER SUPPLY PIPING ALONG WALL BELOW COUNTER TO LAVATORY FAUCETS AND CONNECT. PROVIDE ASSE 1070 APPROVED MIXING VALVE BELOW COUNTER ON HOT WATER LINE TO BANK OF LAVATORIES.
5. EXTEND 1/2" HOT AND COLD WATER PIPING DOWN IN WALL TO BELOW COUNTER. RUN WATER SUPPLY PIPING ALONG WALL BELOW COUNTER TO LAVATORY FAUCETS AND CONNECT. PROVIDE ASSE 1070 APPROVED MIXING VALVE BELOW COUNTER ON HOT WATER LINE TO BANK OF LAVATORIES.
6. CONNECT 1/2" TRAP PRIMER LINE TO 3/4" COLD WATER SUPPLY TO SERVICE SINK. CONNECTION SHALL BE MADE AFTER COLD WATER SHUT OFF ISOLATION VALVE TO SERVICE SINK. EXTEND ABOVE CEILING AS INDICATED AND DROP DOWN IN WALL TO ABOVE CEILING OF FLOOR BELOW AND CONNECT TO FLOOR DRAIN TRAP PRIMER CONNECTION.

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer: Dewberry — 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9683, Fax (973) 739-9710

Structural Engineer: WZG — 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.E. LENZ COMPANY — 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9300, Fax (814) 269-9301

Environmental Consultant: SSM — 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc. — 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

ARCHITECT:

ARRAY
healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406

t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	As indicated

Drawing Title: PLUMBING SECOND FLOOR PLAN

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date	Checked	Drawn
07/27/2012	TME	MGS

VA Project Number: 595-109

Building Number: 34

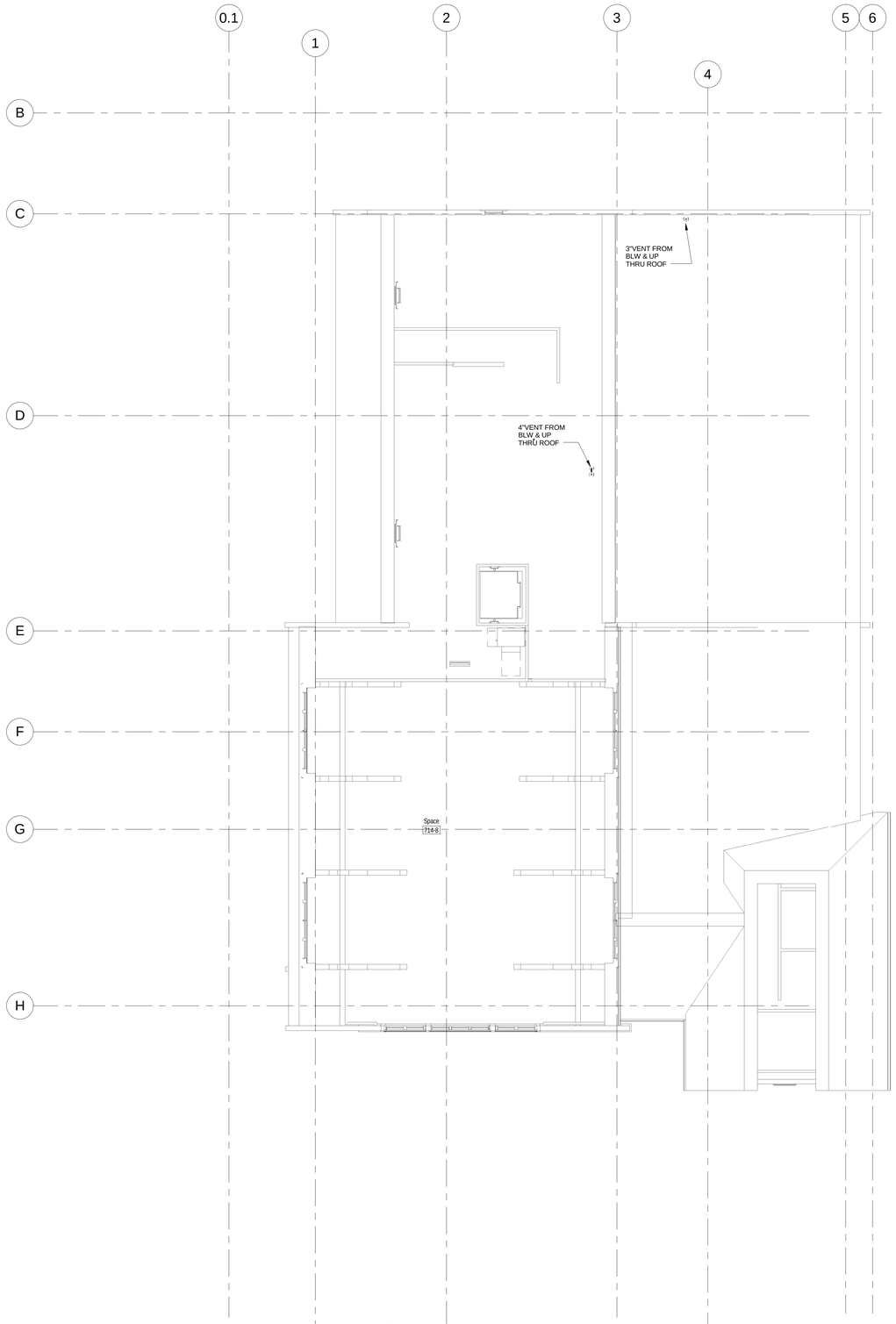
Drawing Number: PL104

Dwg. 92 of 123

Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



1 PLUMBING ATTIC FLOOR PLAN AND ROOF PLAN
SCALE: 1/8" = 1'-0"

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer
Dewberry
600 Parsippany Road, Suite 301
Parsippany, NJ 07054-3715
Tel (973) 576-9683
Fax (973) 739-9710

Structural Engineer
WZG
180 W. Ridge Pike
Limerick, PA 19468
Tel (214) 329-5559

MEP Engineer
H.E. LENZ COMPANY
1407 Scalp Avenue
Johnstown, PA 15904
Tel (814) 269-9300
Fax (814) 269-9301

Environmental Consultant
SSM
1047 North Park Road, P.O. Box 6307
Reading, PA 19610
Tel (610) 621-2000

Cost Estimator
International Consultants, Inc.
221 Chestnut Street, Suite 200
Philadelphia, PA 19106
Tel (215) 923-8888

ARCHITECT:

ARRAY
healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406

t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	1/8" = 1'-0"

Drawing Title: PLUMBING ATTIC FLOOR PLAN AND ROOF PLAN

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date	Checked	Drawn
07/27/2012	TME	MGS

VA Project Number: 595-109

Building Number: 34

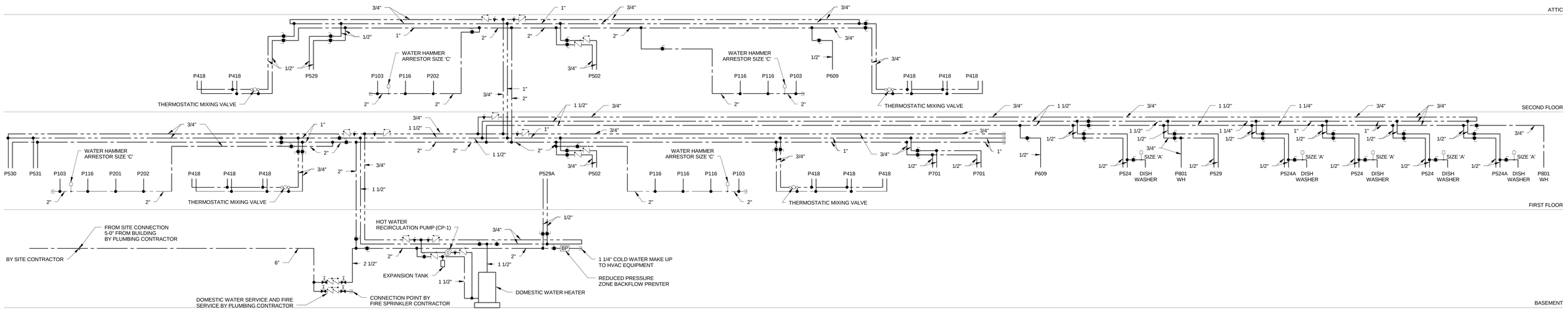
Drawing Number: PL105

Dwg. 93 of 123

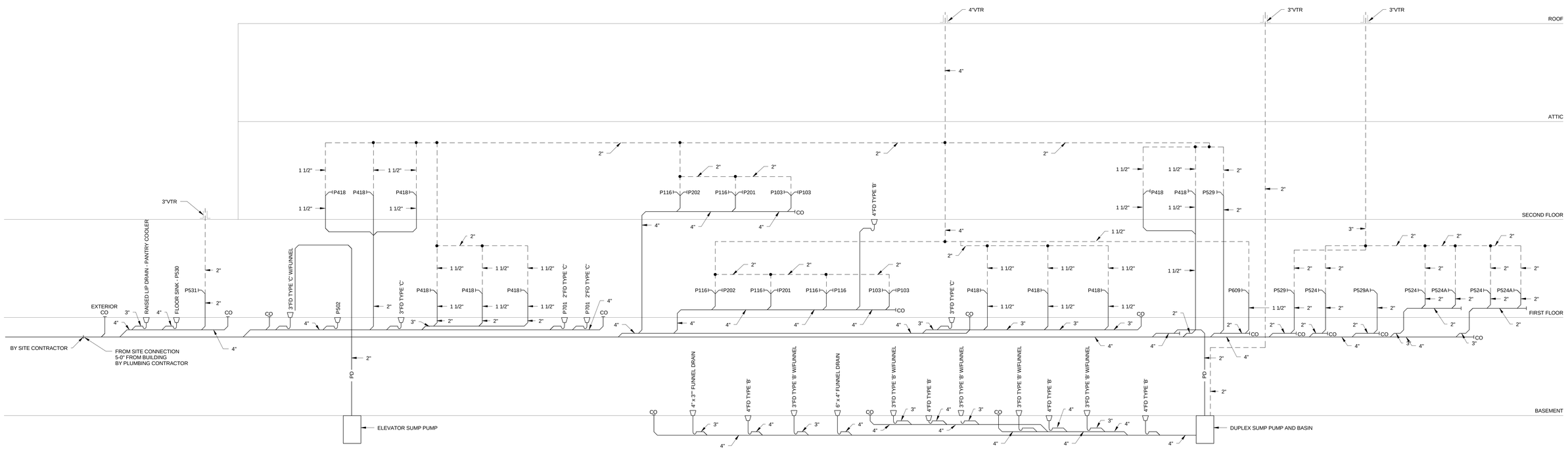
Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



1 DOMESTIC WATER RISERS
NOT TO SCALE



2 SANITARY WASTE AND VENT RISERS
NOT TO SCALE

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer: Dewberry — 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9683, Fax (973) 739-9710

Structural Engineer: WZG — 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.F. Lenz Company — 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9300, Fax (814) 269-9301

Environmental Consultant: SSM — 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc. — 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — TIMOTHY M. EARHART — No. RA-053611-E — PENNSYLVANIA

ARCHITECT:

ARRAY — healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406

t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	1/8" = 1'-0"

Drawing Title: PLUMBING RISERS

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date: 07/27/2012 | Checked: SDA | Drawn: MGS

VA Project Number: 595-109

Building Number: 34

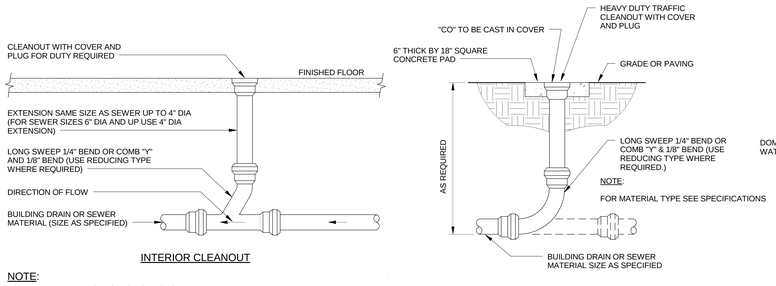
Drawing Number: PL301

Dwg. 94 of 123

Office of Facilities Management

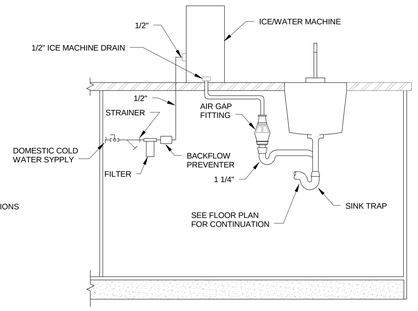
Department of Veterans Affairs

VA FORM 08-6231, OCT 1978

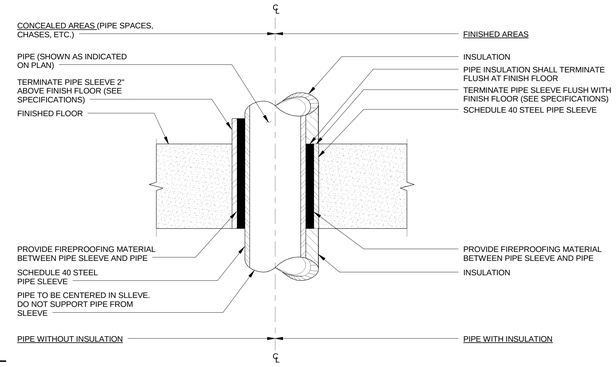


NOTE:
FOR MATERIAL TYPE, SEE SPECIFICATIONS.

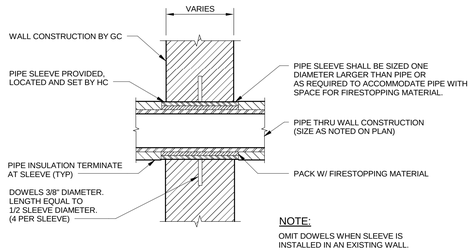
1 INTERIOR AND EXTERIOR FLOOR CLEANOUT DETAILS
NOT TO SCALE



2 ICE MACHINE DRAIN TO OPEN RECEPTACLE
NOT TO SCALE

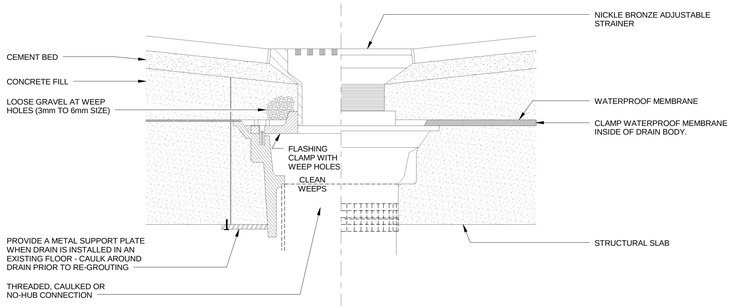


3 PIPE SLEEVE THROUGH FLOOR DETAIL
NOT TO SCALE

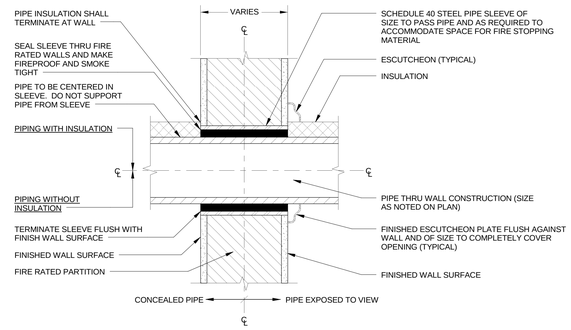


NOTE:
OMIT DOWELS WHEN SLEEVE IS INSTALLED IN AN EXISTING WALL.

4 WALL SLEEVE DETAIL
NOT TO SCALE



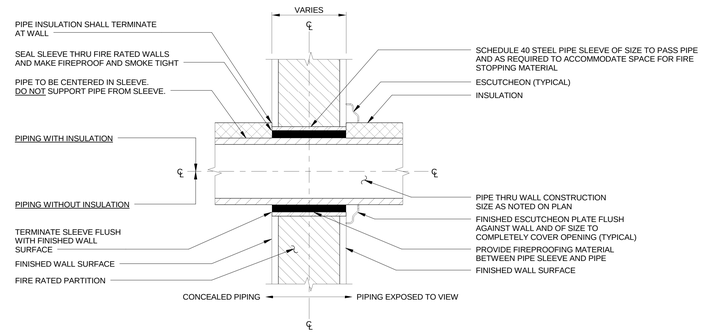
5 TYPE "C" FLOOR DRAIN DETAIL
SCALE: 1/8" = 1'-0"



INTERIOR WALLS

NOTE:
1. APPROVED FIRE STOPPING SHALL BE PROVIDED AND INSTALLED AT ALL EXISTING AND NEW WALL PENETRATION THRU TIME RATED WALLS AND PARTITIONS.
2. APPROVED SPLIT PIPE SLEEVE ASSEMBLY SHALL BE PROVIDED WHERE EXISTING WALL PENETRATIONS OCCUR THRU EXISTING TIME RATED WALLS AND PARTITIONS. (SEE SPECIFICATIONS)

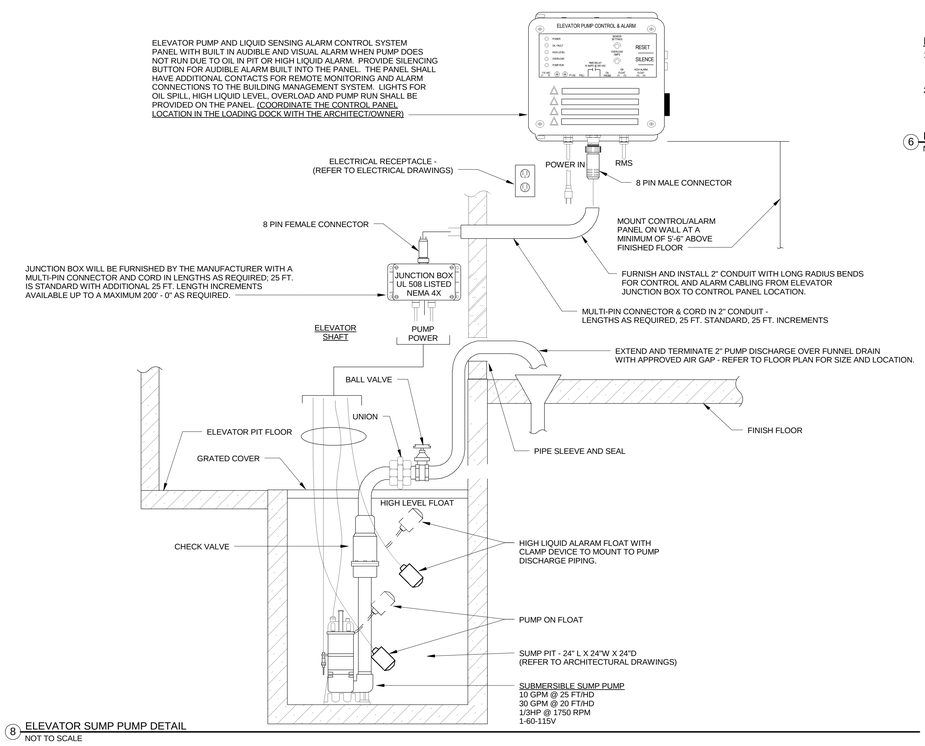
6 PIPE SLEEVE THRU FIRE-RATED WALL DETAIL
NOT TO SCALE



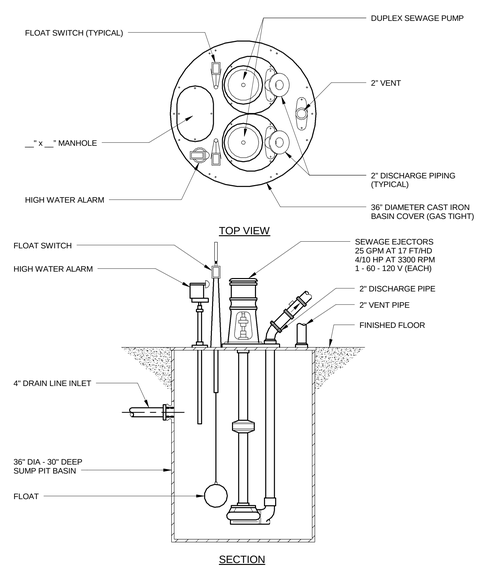
INTERIOR WALLS

NOTES:
1. APPROVED FIRE STOPPING SHALL BE PROVIDED AND INSTALLED AT ALL EXISTING AND NEW WALL PENETRATION THRU TIME RATED WALLS AND PARTITIONS.
2. APPROVED SPLIT PIPE SLEEVE SHALL BE PROVIDED WHERE EXISTING WALL PENETRATIONS OCCUR THRU EXISTING TIME RATED WALLS AND PARTITIONS. (SEE SPECIFICATIONS)

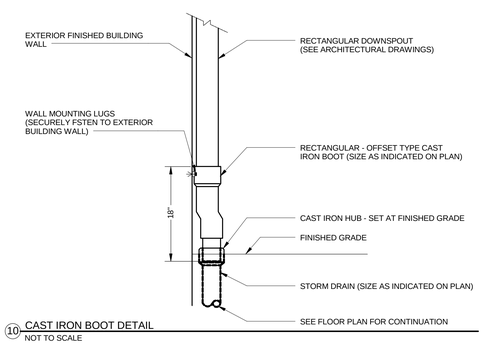
7 PIPE SLEEVE THROUGH WALL DETAIL
NOT TO SCALE



8 ELEVATOR SUMP PUMP DETAIL
NOT TO SCALE



9 SEWAGE EJECTOR DETAIL
NOT TO SCALE



10 CAST IRON BOOT DETAIL
NOT TO SCALE

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer: Dewberry, 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9663, Fax (973) 739-9710

Structural Engineer: WZG, 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.E. Lenz Company, 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9300, Fax (814) 269-9301

Environmental Consultant: SSM, 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc., 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA, REGISTERED PROFESSIONAL ENGINEER, TIMOTHY M. EARHART, No. PE-073227-E, PENNSYLVANIA

ARCHITECT:
ARRAY
healthcare facilities solutions
2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406
t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	As indicated

Drawing Title: PLUMBING DETAILS

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date: 07/27/2012 | Checked: TME | Drawn: MGS

VA Project Number: 595-109

Building Number: 34

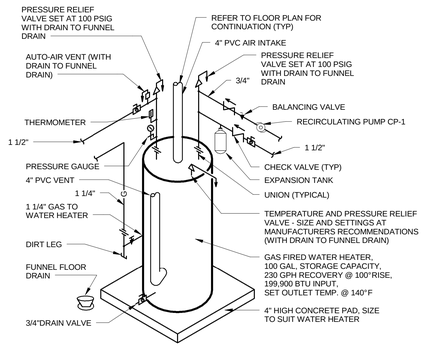
Drawing Number: PL501

Dwg. 95 of 123

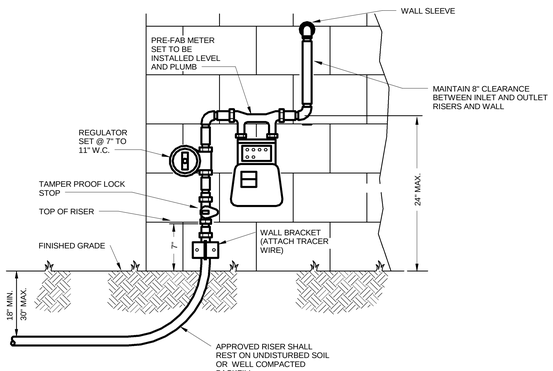
Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978



7 Detail - Gas Fired Water Heater
NOT TO SCALE



8 Detail - Natural Gas Service
NOT TO SCALE

WALL HYDRANTS AND HOSE BIBBS SCHEDULE

FIXTURE IDENTIFICATION	DESCRIPTION	MOUNTING REQUIREMENTS	FIXTURE MANUFACTURER AND MODEL NUMBER (OR APPROVED EQUAL)	FIXTURE ACCESSORIES MAKE AND MODEL NUMBER (OR APPROVED EQUAL)	FOOTNOTES AND REMARKS
WH-1 P801	EXTERIOR WALL HYDRANT BUILDING PERIMETER WALL BOX AND COVER	24" ABOVE FINISH GRADE WALL MOUNTED	NON-FREEZE, ANTI-SIPHON WITH BACKFLOW PREVENTION AND ALL BRONZE PARTS JOSAM #71000, OR APPROVED EQUAL	REMOVABLE KEY FOR LOCKING COVER AND HYDRANT OPERATION WITH "WATER" STAMPED IN COVER	1, 2
HB-1	GENERAL BUILDING AND MECHANICAL AREAS	42" ABOVE FINISH FLOOR WALL MOUNTED	CHROME PLATED LEVER HANDLE WITH HOSE END OUTLET CHICAGO FAUCETS MODEL NO. 835-369CP, OR APPROVED EQUAL	------	1, 3

WALL HYDRANTS AND HOSE BIBBS SCHEDULE FOOTNOTES:

1. REFER TO SPECIFICATIONS FOR REQUIREMENTS OF MATERIALS, COLOR, FINISHES, INSTALLATION, APPROVED EQUAL MANUFACTURERS, ETC.
2. INSTALL WALL HYDRANT WALL BOX AND COVER FLUSH WITH EXTERIOR WALL FINISH. THE DEPTH OF THE VALVE STEM SHALL BE COORDINATED WITH THE THICKNESS OF THE EXTERIOR WALL AND THE DEPTH TO VALVE STOP WITHIN THE INTERIOR SPACE BEYOND THE INSULATION ENVOLOPE. EXTEND 3/4" COLD WATER SUPPLY ISOLATION SHUT-OFF VALVE TO THE WALL HYDRANT.
3. EXTEND 1/2" OR 3/4" COLD WATER SUPPLY CONCEALED OR EXPOSED PIPING TO THE HOSE BIBB AS NOTED ON DRAWING.

DOMESTIC HOT WATER CIRCULATION PUMP SCHEDULE

CIRCULATION PUMP NUMBER	LOCATION	WATER TEMP °F	DESIGN		PERFORMANCE		HP	RPM	ELECTRIC PH-HZ-V	REMARKS
			GPM	FT/HD	GPM	FT/HD				
CP-1	BASEMENT MECHANICAL ROOM	120°F	15	15	10	19	1/4	1750	1-60-120	HOT WATER SYSTEM RETURN CIRCULATION
					20	17.5				

THERMAL EXPANSION TANK SCHEDULE

SYMBOL	FIXTURE	VOLUME CAPACITY	ACCEPTANCE VOLUME	WORKING PRESSURE	REMARKS
DWH-1	ELECTRICAL WATER HEATER	4 GALLONS	1.8 GALLONS	150 PSIG	LOCATED IN BASEMENT MECHANICAL ROOM

PLUMBING FIXTURE SCHEDULE

NUMBER	TYPE OF FIXTURE	DRAINAGE		WATER		REMARKS (SEE NOTE)
		WP*	VP*	CW*	HW*	
P-103	WATER CLOSET WALL MOUNTED	4"	2"	1 1/4"	---	STAINLESS STEEL SOLAR SENSOR OPERATED FLUSH SLOAN MODEL NO. 8111, OR APPROVED EQUAL VALVE - SEE NOTE 1, 2, & 3
P-114	BARIATRIC WATER CLOSET WALL MOUNTED - ADA	4"	2"	1 1/4"	---	VITREOUS CHINA SOLAR SENSOR OPERATED FLUSH SLOAN MODEL NO. 8111, OR APPROVED EQUAL VALVE - SEE NOTE 1, 2, & 3
P-201	URINAL WALL MOUNTED	2"	2"	1"	---	VITREOUS CHINA SOLAR SENSOR OPERATED FLUSH SLOAN MODEL NO. 8186, .125 GALLON PER FLUSH, OR APPROVED EQUAL VALVE - SEE NOTE 1, 2, & 3
P-202	URINAL WALL MOUNTED - ADA	2"	2"	1"	---	VITREOUS CHINA SOLAR SENSOR OPERATED FLUSH SLOAN MODEL NO. 8186, .125 GALLON PER FLUSH, OR APPROVED EQUAL VALVE - SEE NOTE 1, 2, & 3
P-418	LAVATORY COUNTER MOUNTED ADA/HANDICAP ACCESSIBLE (TOILET ROOM FACILITY) SOLID SURFACE LG HAUSYS 1612, OR EQUAL	1 1/2"	1 1/2"	1/2"	1/2"	SENSOR SOLAR POWERED FAUCET SLOAN BASYS MODEL NO. EFX-277-500-0100 KOHLER, ZURN, OR EQUAL
P-524	CASEWORK SINK COUNTERTOP CASEWORK DROP IN ADA TYPE, 5 1/2" DEPTH, 8" OC 33" X 22" DOUBLE COMPARTMENT STAINLESS STEEL ELKAY LR3322, OR EQUAL	2"	2"	1/2"	1/2"	2 3/8" LEVER ADA GOOSENECK FAUCET CHICAGO FAUCETS No. 1100-HA8-368VPACP-29CP KOHLER, ZURN, OR EQUAL SEE NOTES 4
P-524A	CASEWORK SINK COUNTERTOP CASEWORK DROP IN ADA TYPE, 5 1/2" DEPTH, 8" OC 33" X 22" DOUBLE COMPARTMENT STAINLESS STEEL ELKAY LR3322, OR EQUAL	2"	2"	1/2"	1/2"	2 3/8" LEVER ADA GOOSENECK FAUCET CHICAGO FAUCETS No. 1100-HA8-368VPACP-29CP KOHLER, ZURN, OR EQUAL SEE NOTE 4 and 5
P-529A	CASEWORK SINK COUNTERTOP CASEWORK DROP IN ADA TYPE, 5 1/2" DEPTH, 8" OC 25" X 22" SINGLE COMPARTMENT STAINLESS STEEL ELKAY LRAD2522, OR EQUAL	2"	2"	1/2"	1/2"	2 3/8" LEVER ADA GOOSENECK FAUCET CHICAGO FAUCETS No. 1100-HA8-368VPACP-29CP KOHLER, ZURN, OR EQUAL SEE NOTE 4
P-530	CASEWORK SINK COUNTERTOP CASEWORK DROP IN TYPE, TRIPLE COMPARTMENT STAINLESS STEEL FURNISHED BY CANTEEN SUPPLIER, INSTALLED BY PLUMBING CONTRACTOR	2"	2"	1/2"	1/2"	FAUCET(S) FURNISHED BY CANTEEN SUPPLIER, INSTALLED BY PLUMBING CONTRACTOR SEE NOTE 6
P-531	CASEWORK SINK COUNTERTOP CASEWORK DROP IN TYPE, SINGLE COMPARTMENT STAINLESS STEEL FURNISHED BY CANTEEN SUPPLIER, INSTALLED BY PLUMBING CONTRACTOR	2"	2"	1/2"	1/2"	FAUCET FURNISHED BY CANTEEN SUPPLIER, INSTALLED BY PLUMBING CONTRACTOR
P-502	SERVICE SINK	4"	2"	3/4"	3/4"	SERVICE SINK FAUCET
P-609	BI LEVEL ELECTRIC WATER COOLER ELKAY MODEL No. EZXTL8C	1 1/2"	1 1/2"	1/2"	---	COORDINATE WITH ELECTRICAL CONTRACTOR
P-701	SHOWER	2"	2"	1/2"	1/2"	TYPE T/P COMBINATION THERMOSTATIC AND PRESSURE BALANCING VALVE

FOOTNOTES:

1. PLUMBING FIXTURE CONNECTIONS SHALL BE AS INDICATED UNLESS NOTED OTHERWISE ON DRAWING. REFER TO SPECIFICATIONS FOR ADDITIONAL FIXTURE INFORMATION AND DETAILS.
2. CONNECT AND EXTEND TO NEW WASTE AND WATER SUPPLY ROUGH-IN'S.
3. PROVIDE SOLAR SENSOR OPERATED FLUSH VALVE ASSEMBLIES AS SPECIFIED. FLUSH VALVE SHALL BE PROVIDED WITH BATTERY BACK UP.
4. PROVIDE SINK WITH OFF CENTERED REAR DRAIN OPENING. 3-HOLE PUNCH. 8" ON CENTER.
5. PROVIDE DISPOSER ON SINK DRAIN. INSINKERATOR MODEL SS-75, 115/208V / 60 HZ / 1 PH, OR EQUAL. DISPOSER SHALL BE PROVIDED WITH DISHWASHER DRAIN CONNECTION.
6. SINK AND FAUCTET(S) FURNISHED BY CANTEEN SUPPLIER, INSTALLED BY PLUMBING CONTRACTOR. GATHER WASTE PIPING FROM TRIPILE BOWL SINKS, TIE TOGETHER, AND EXTEND AND TERMINATE OVER FLOOR SINK WITH REQUIRED AIR GAP. PROVIDE FLOW CONTROL FOR EACH WASTE OUTLET.

* ALL FIXTURE ROUGH-INS AND CONNECTIONS ARE AS NOTED UNLESS OTHERWISE NOTED AND INDICATED ON PLAN. (TYPICAL)

* PROVIDE WATER HAMMER ARRESTORS ON HOT AND/OR COLD SUPPLY LINES TO FIXTURES. ACCESS TO WATER HAMMER ARRESTORS IS NOT REQUIRED.

NOTES

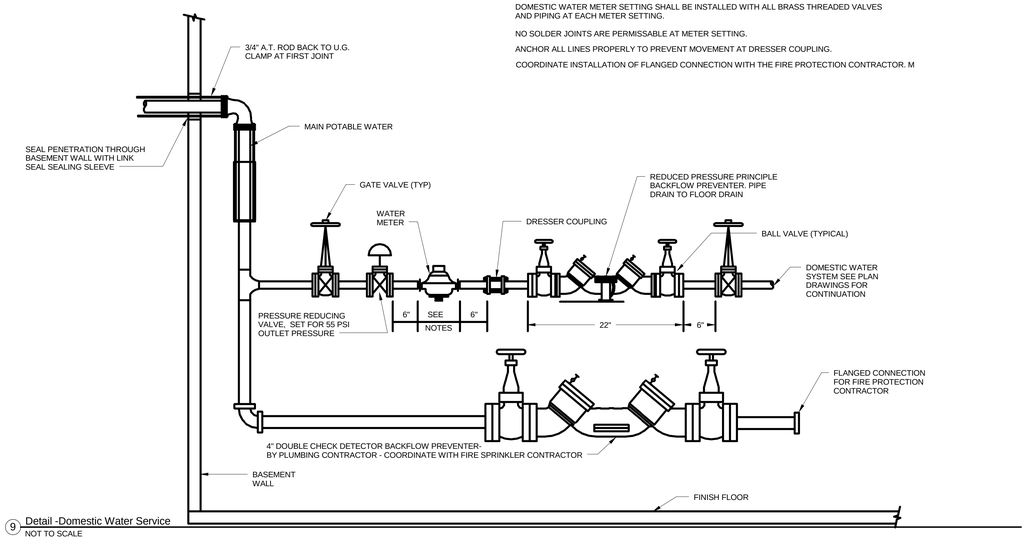
ALL METER AND BACKFLOW PREVENTERS SHALL BE INSTALLED IN THE HORIZONTAL POSITION.

DOMESTIC WATER METER SETTING SHALL BE INSTALLED WITH ALL BRASS THREADED VALVES AND PIPING AT EACH METER SETTING.

NO SOLDER JOINTS ARE PERMISSABLE AT METER SETTING.

ANCHOR ALL LINES PROPERLY TO PREVENT MOVEMENT AT DRESSER COUPLING.

COORDINATE INSTALLATION OF FLANGED CONNECTION WITH THE FIRE PROTECTION CONTRACTOR. M



9 Detail -Domestic Water Service
NOT TO SCALE

PLUMBING FIXTURE CONNECTION SCHEDULE

FIXTURE	WATER	WASTE, SOIL, & VENT (UNO)
WATER CLOSET (FLUSH VALVE)	1"C	4"S & 2"V
LAVATORY	1/2"H & C	1 1/2"W & V
MISCELLANEOUS SINK	1/2"H & C	1 1/2"W & V
SERVICE SINK	1/2"H & C	3"W
CLINIC SINK	3/4"H & 1 1/2"C	4"W & 2"V
SHOWER	1/2"H & C	2"W

FULLY SPRINKLERED

100% CONSTRUCTION DOCUMENTS

Revisions	Date

CONSULTANTS:

Civil Engineer: Dewberry, 600 Parsippany Road, Suite 301, Parsippany, NJ 07054-3715, Tel (973) 576-9683, Fax (973) 739-9710

Structural Engineer: WZG, 180 W. Ridge Pike, Limerick, PA 19468, Tel (214) 329-5559

MEP Engineer: H.E. LENZ COMPANY, 1407 Scalp Avenue, Johnstown, PA 15904, Tel (814) 269-9200, Fax (814) 269-9301

Environmental Consultant: SSM, 1047 North Park Road, P.O. Box 6307, Reading, PA 19610, Tel (610) 621-2000

Cost Estimator: International Consultants, Inc., 221 Chestnut Street, Suite 200, Philadelphia, PA 19106, Tel (215) 923-8888

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER TIMOTHY M. EARHART No. 044572

ARCHITECT:

ARRAY
healthcare facilities solutions

2520 Renaissance Boulevard, Suite 110
King of Prussia, PA 19406

t: 610.270.0599
f: 610.270.0995
www.arrayhfs.com

Project Number	Scale
3468	As indicated

Drawing Title: PLUMBING DETAILS & SCHEDULES

Approved: Project Director

Project Title: Behavioral Health Complex

Location: 1700 South Lincoln Ave. Lebanon, PA 17042

Date: 07/27/2012 | Checked: TME | Drawn: MGS

VA Project Number: 595-109

Building Number: 34

Drawing Number: PL502

Dwg. 96 of 123

Office of Facilities Management

Department of Veterans Affairs

VA FORM 08-6231, OCT 1978