

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

SYMBOLS

CH

CHILLED WATER SUPPLY

CHR

CHILLED WATER RETURN

CWTT

CONDENSER WATER TO TOWER

CWFT

CONDENSER WATER FROM TOWER

V

VENT LINE

D

DRAIN LINE

INDICATES NOTES ELSEWHERE ON SHEET

GATE VALVE

GLOBE VALVE

CHECK VALVE

BALANCING COCK (FOR BALANCING AND SHUT-OFF)

STRAIGHT-THRU MODULATING CONTROL VALVE

SAFETY VALVE OR PRESSURE RELIEF

MANUAL AIR VENT

BUTTERFLY VALVE

GATE VALVE WITH ADAPTER TO 3/4" HOSE THREAD

BALL VALVE

TEST PLUG (PRESSURE/TEMPERATURE)

|||||

PIPE TO BE REMOVED

DIRECTION OF FLOW

ANCHOR

TOP CONNECTION, 45° OR 90°

BOTTOM CONNECTION, 45° OR 90°

SIDE CONNECTION

CAPPED OUTLET

RISE OR DROP IN PIPE

POINT OF CONNECTION BETWEEN NEW AND EXISTING WORK

POINT OF DISCONNECTION

STRAINER

THERMOMETER

PRESSURE GAUGE

WATER FLOW MEASURING DEVICE

REDUCER OR INCREASER

ECCENTRIC REDUCER

INCLINED RISE, IN DIRECTION OF AIR FLOW

INCLINED DROP, IN DIRECTION OF AIR FLOW

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

EXISTING DUCT TO REMAIN INDICATED WITH LIGHT LINE WORK

LOUVER

EXHAUST DUCT (UP & DOWN)

SUCTION DIFFUSER

DETAIL NUMBER  
DRAWING NUMBER WHERE DRAWN

SECTION LETTER  
DRAWING NUMBER WHERE SHOWN

BUILDING NUMBER WHERE EQUIPMENT IS LOCATED  
EQUIPMENT ABBREVIATION (EXHAUST FAN)  
EXHAUST FAN NO. 1 IN BUILDING NO. 8

TYPICAL UNIT NUMBER

ABBREVIATIONS

CH

CHILLED WATER

CHR

CHILLED WATER RETURN

CT

COOLING TOWER

CW

COLD WATER

CWFT

CONDENSER WATER FROM TOWER

CWP

CONDENSER WATER PUMP

CWTT

CONDENSER WATER TO TOWER

E/A

EXHAUST AIR

EF

EXHAUST FAN

EFF.

EFFICIENCY

ENT.

ENTERING

ET

EXPANSION TANK

EX.

EXISTING

°F

DEGREES FAHRENHEIT

FC

FLEXIBLE CONNECTION

FLR.

FLOOR

FD

FLOOR DRAIN

FM

WATER FLOW MEASURING DEVICE

FT.

FEET

GPM

GALLONS PER MINUTE

GR.

GRAVITY

HP

HORSEPOWER

KW

KILOWATT

MAX.

MAXIMUM

MECH.

MECHANICAL

MIN.

MINIMUM

NOM.

NOMINAL

O/A

OUTSIDE AIR

PCHP

PRIMARY/RUN AROUND CHILLED WATER PUMP

P.D.

PRESSURE DROP (FEET OF WATER)

PEF

PROPELLER TYPE EXHAUST FAN

RM.

ROOM

RPM

REVOLUTIONS PER MINUTE

SCHP

SECONDARY CHILLED WATER PUMP

SP.

SPECIFIC

TEMP.

TEMPERATURE

VOLT.

VOLTAGE

WATER COOLED CHILLER UNIT

| UNIT NO. | LOCATION  | MIN TONS | MAX SOUND LEVEL dBA | INPUT POWER (KW) | MAX. FULL LOAD | MAX. IPLV | COMPRESSOR MOTOR |             | EVAPORATOR |                     |                     |           | CONDENSER |                     |                     |           |
|----------|-----------|----------|---------------------|------------------|----------------|-----------|------------------|-------------|------------|---------------------|---------------------|-----------|-----------|---------------------|---------------------|-----------|
|          |           |          |                     |                  |                |           | KW INPUT         | PHASE VOLT. | GPM        | ENT. WATER TEMP. °F | LVG. WATER TEMP. °F | MAX. P.D. | GPM       | ENT. WATER TEMP. °F | LVG. WATER TEMP. °F | MAX. P.D. |
| 8-CH3    | MECH. RM. | 1250     | 81                  | 809              | 0.543 KW/TON   | 0.328     | 679              | 4160/3/60   | 3000       | 53.99               | 44                  | 18.70     | 3750      | 85                  | 94.17               | 14.20     |

WATER PUMP SCHEDULE

| PUMP NO. | LOCATION | SYSTEM | CAPACITY |           |                        |              | % EFF. | TYPE | MOTOR    |            |      | REMARKS (BASIS OF DESIGN)         |
|----------|----------|--------|----------|-----------|------------------------|--------------|--------|------|----------|------------|------|-----------------------------------|
|          |          |        | FLUID    | GPM (U/S) | PUMP HEAD FT (M) FLUID | TEMP °F (°C) |        |      | NOM. HP. | PHASE VOLT | RPM  |                                   |
| 8-CWP3   | MECH.RM. | CWFT   | WATER    | 3750      | 70                     | 85           | 82.42  | DUTY | 100      | 480/3      | 1770 | B & G TYPE VSCS (CONSTANT VOLUME) |
| 8-PCHP3  | MECH.RM. | CHR    | WATER    | 3000      | 50                     | 54           | 77.78  | DUTY | 50       | 480/3      | 1780 | B & G TYPE VSCS (CONSTANT VOLUME) |

LOUVERED PENTHOUSE SCHEDULE

| SYMBOL | TYPE             | MAX. S.P. WG. | CFM    | PERIMETER VELOCITY | LOCATION OVER  | SERVES          | ROOF OPENING | INTAKE/RELIEF | REMARKS (BASIS OF DESIGN)     |
|--------|------------------|---------------|--------|--------------------|----------------|-----------------|--------------|---------------|-------------------------------|
| LP-1   | LOUVERED 4 SIDES | 0.10          | 35,000 | 600 FPM            | MECH. RM. ROOF | MECH. RM. VENT. | 66 x 120     | INTAKE        | TWIN CITY TYPE TIL (20 TIERS) |

NOTE:  
1. LOUVERED PENTHOUSE TO BE PROVIDED WITH INSECT SCREEN.  
2. CONTRACTOR TO PROVIDE A 12" HIGH ROOF CURB AND A MOTORIZED AUTOMATIC AIR DAMPER FLANGED TO FIT OVER ROOF OPENING.

HORIZONTAL UNIT HEATER SCHEDULE (STEAM)

| SYMBOL | CFM | RPM  | HP   | ELEC. CHAR. | MBH  | STEAM |        | FAT °F |
|--------|-----|------|------|-------------|------|-------|--------|--------|
|        |     |      |      |             |      | PSIG  | LBS/HR |        |
| UH-1   | 400 | 1100 | 1/20 | 120/60      | 32.7 | 2     | 33     | 135    |

EXHAUST AIR FAN SCHEDULE

| FAN NO. | LOCATION   | SERVES          | FAN CFM | S. P.  | FAN TYPE   | DIAMETER | HOUSING |        | MAX. RPM | DRIVE | MOTOR   |      |               | REMARKS |
|---------|------------|-----------------|---------|--------|------------|----------|---------|--------|----------|-------|---------|------|---------------|---------|
|         |            |                 |         |        |            |          | LENGTH  | HEIGHT |          |       | NOM. HP | AMPS | PHASE VOLTAGE |         |
| REF-1   | MECH. ROOF | MECH. RM. VENT. | 27,100  | 1 1/4" | UP BLAST   | 76"      | 54" SQ. | 58"    | 410      | BELT  | 5       | -    | 480/3/60      | -       |
| REF-2   | MECH. ROOF | REFRIG. EXH     | 5000    | 1 1/2" | UP BLAST   | 45"      | 30" SQ. | 38"    | 965      | BELT  | 1       | -    | 480/3/60      | -       |
| 29-EF-1 | TOILET 16  | TOILET RM.      | 287     | 1 1/2" | VENTILATOR | -        | -       | -      | 905      | -     | -       | 2.6  | 120/1/60      | NOTE 1  |

NOTE:  
1. EXHAUST FAN TO BE PROVIDED WITH UNIT MOUNTED SPEED CONTROL AND ROOF CAP

AIR HANDLING UNIT SCHEDULE (CW)

| SYMBOL   | SERVES         | TOTAL CFM | % OA | EXT SP | SUPPLY FAN DATA |       |      |      |     |        |     |        |      |        | CHILLED WATER COOLING COIL DATA |       |        |      |        |        |      |               |     |      | PRE FILTER DATA |       | FINAL FILTER DATA |      |         |       | ELECT CHAR | UNIT WEIGHT  | REMARKS |        |
|----------|----------------|-----------|------|--------|-----------------|-------|------|------|-----|--------|-----|--------|------|--------|---------------------------------|-------|--------|------|--------|--------|------|---------------|-----|------|-----------------|-------|-------------------|------|---------|-------|------------|--------------|---------|--------|
|          |                |           |      |        | CFM             | DRIVE | TYPE | RPM  | HP  | TOT SP | VFD | EAT °F |      | LAT °F |                                 | TOT M | SENS M | GPM  | EWT °F | LWT °F | WPD  | FACE VELOCITY | %   | TYPE | SP              |       | %                 | TYPE | SP      |       |            |              |         |        |
|          |                |           |      |        |                 |       |      |      |     |        |     | DB     | WB   | DB     | WB                              |       |        |      |        |        |      |               |     |      | INITIAL         | FINAL |                   |      | INITIAL | FINAL |            |              |         |        |
|          |                |           |      |        |                 |       |      |      |     |        |     |        |      |        |                                 |       |        |      |        |        |      |               |     |      |                 |       |                   |      |         |       |            |              |         | DB     |
| 29-AHU-1 | RM 15,16,17,18 | 1500      | 15   | 0.75   | 1500            | BELT  | AF   | 1764 | 1.5 | 1.94   | YES | 87.4   | 71.5 | 54.9   | 53.8                            | -     | 86     | 54.6 | 17     | 45     | 55.1 | 15.2          | 268 | 30   | PLEAT           | 0.19  | 0.25              | 60   | PLEAT   | 0.25  | 0.25       | 460 / 3 / 60 | 1709    | NOTE 1 |

NOTE:  
1. VFD TO BE PROVIDED AND INSTALLED BY EC

VARIABLE VOLUME BOX SCHEDULE

| SYMBOL   | LOCATION  | SERVES     | CFM |     | BOX DIMENSIONS |        |        | INLET DUCT (IN) | NOM COIL SIZE OR DISCH DUCT W X H (IN) | AUXILIARY HEATING COIL |        |        |        |        |        |     | TOTAL MBH | MAX SP LOSS (IN) | REMARKS |
|----------|-----------|------------|-----|-----|----------------|--------|--------|-----------------|--|------------------------|--------|--------|--------|--------|--------|-----|-----------|------------------|---------|
|          |           |            | MIN | MAX | L (IN)         | W (IN) | H (IN) |                 |  | FV FPM                 | EAT °F | LAT °F | EWT °F | WTD °F | WPD FT | GPM |           |                  |         |
| 29-VAV-1 | PENTHOUSE | RM 15 , 16 | 475 | 515 | 15 1/2         | 12     | 10     | 7               | 12 x 10                                | -                      | 55     | 95     | 180    | 46     | 0.4    | 1.1 | 20.5      | -                | -       |
| 29-VAV-2 | PENTHOUSE | RM 17      | 75  | 175 | 15 1/2         | 12     | 8      | 5               | 12 x 8                                 | -                      | 55     | 95     | 180    | 34     | 0.1    | 0.3 | 4.1       | -                | -       |
| 29-VAV-3 | PENTHOUSE | RM 18      | 250 | 720 | 15 1/2         | 12     | 10     | 9               | 12 x 10                                | -                      | 55     | 95     | 180    | 28.5   | 0.2    | 0.9 | 10.8      | -                | -       |

GRAVITY ROOF VENTILATOR SCHEDULE

| SYMBOL   | TYPE | LOCATION OVER | SERVES   | ROOF OPENING | INTAKE/RELIEF | REMARKS    |
|----------|------|---------------|----------|--------------|---------------|------------|
| 29-GRV-1 | -    | PENTHOUSE     | 29-AHU-1 | 14 x 30      | INTAKE        | SEE NOTE 1 |

NOTE:  
1. VENTILATOR TO BE PROVIDED WITH A MINIMUM 12" BASE, MOTORIZED BACKDRAFT DAMPER, AND PRE-FABRICATED ROOF CURB

WATER COOLED CHILLER UNIT (EXISTING - REFERENCE ONLY)

| UNIT NO.  | LOCATION  | MIN. TONS | MAX. SOUND LEVEL dBA | MAX. KW PER TON | MAX. IPLV    | COMPRESSOR MOTOR |             | EVAPORATOR |                     |                     | CONDENSER |      |                     |                     |           |
|-----------|-----------|-----------|----------------------|-----------------|--------------|------------------|-------------|------------|---------------------|---------------------|-----------|------|---------------------|---------------------|-----------|
|           |           |           |                      |                 |              | KW INPUT         | PHASE VOLT. | GPM        | ENT. WATER TEMP. °F | LVG. WATER TEMP. °F | MAX. P.D. | GPM  | ENT. WATER TEMP. °F | LVG. WATER TEMP. °F | MAX. P.D. |
| EX. 8-CH1 | MECH. RM. | 1000      | -                    | .56             | 0.53 KW/TON  | 500              | 4160/3/60   | 2400       | 54                  | 44                  | 14        | 3000 | 85                  | 95                  | 14        |
| EX. 8-CH2 | MECH. RM. | 1250      | 88                   | .519            | 0.417 KW/TON | 648.2            | 4160/3/60   | 2985       | 54                  | 44                  | 14.34     | 3750 | 85                  | 94.28               | 10.79     |

WATER PUMP SCHEDULE (EXISTING - REFERENCE ONLY)

| PUMP NO.    | LOCATION | SYSTEM | CAPACITY |           |                        |              | % EFF. | TYPE     | MOTOR    |            |      |
|-------------|----------|--------|----------|-----------|------------------------|--------------|--------|----------|----------|------------|------|
|             |          |        | FLUID    | GPM (L/S) | PUMP HEAD FT (M) FLUID | TEMP °F (°C) |        |          | NOM. HP. | PHASE VOLT | RPM  |
| EX. 8-CWP1  | MECH.RM. | CWFT   | WATER    | 3000      | 70                     | 85           | 77     | DUTY     | 75       | 480/3/60   | 1170 |
| EX. 8-CWP2  | MECH.RM. | CWFT   | WATER    | 3750      | 70                     | 85           | 78.85  | DUTY     | 100      | 480/3/60   | 1770 |
| EX. 8-PCHP1 | MECH.RM. | CHR    | WATER    | 2400      | 43                     | 54           | 75     | DUTY     | 40       | 480/3/60   | 1170 |
| EX. 8-PCHP2 | MECH.RM. | CHR    | WATER    | 2985      | 45                     | 54           | 80.03  | DUTY     | 50       | 480/3/60   | 1750 |
| EX. 8-SCHP1 | MECH.RM. | CH     | WATER    | 2754      | 175                    | 44           | 80.6   | DUTY     | 200      | 480/3/60   | -    |
| EX. 8-SCHP2 | MECH.RM. | CH     | WATER    | 2754      | 175                    | 44           | 80.6   | DUTY     | 200      | 480/3/60   | -    |
| EX. 8-SCHP3 | MECH.RM. | CH     | WATER    | 2754      | 175                    | 44           | 80.6   | STAND-BY | 200      | 480/3/60   | -    |

GENERAL CONSTRUCTION NOTES:

- CONTRACTOR SHALL PROVIDE FUME ABATEMENT FROM ACTIVITIES THAT PRODUCE FUMES.
- CONTRACTOR SHALL USE CONSTRUCTION METHODS THAT DO NOT EXCEED A NOISE LEVEL OF 65db MEASURED IN THE CAGE WASH ROOM OF THE ANIMAL RESEARCH FACILITY. THE OWNER WILL PROVIDE MONITORING OF SOUND LEVELS.
- CONTRACTOR SHALL USE CONSTRUCTION METHODS THAT ELIMINATE ALL VIBRATION AND FUMES IN THE ANIMAL RESEARCH FACILITY.

CONTRACT DOCUMENTS SUBMISSION

AMENDMENT No. 5  
Revisions

SHEET REISSUED  
Date

10/07/11

Professional Stamp/Seal  
DAVID C. PALMER  
REGISTERED PROFESSIONAL ENGINEER  
043216E  
6-23-11

**H.F. LENZ COMPANY**  
1407 Scalp Avenue  
Phone: 814-269-9300  
cadd@hflenz.com

Johnstown, PA 15904  
FAX: 814-269-9301  
www.hflenz.com

**architecture planning interior design**  
IKM Incorporated  
One PPG Place  
Pittsburgh, PA 15222  
412-281-1337  
www.ikminc.com

Approved:  
Approved:  
Approved:  
Approved:

Approved: Director, VA Pittsburgh Healthcare System  
Approved: Associate Director, VAPHCS  
Approved: Vice President, Facilities Management  
Approved: Manager, Projects Section

Drawing Title  
**SYMBOLS, ABBREV. AND SCHEDULES - MECHANICAL**  
Approved: Site Manager  
Approved: Project Manager

Project Title  
**COOLING TOWER REPLACEMENT**

Building No. 8  
Scale NONE  
Drawn/Checked JRO/DEP

Location  
VA PITTSBURGH HEALTHCARE SYSTEM  
UNIVERSITY DRIVE DIVISION  
PITTSBURGH, PA 15240

Date  
23 JUNE 2011  
Project No.  
646-09-126

DRAWING NO.  
**8M-1**  
Dwg. X of X

Veterans Affairs