

| ELECTRIC UNIT HEATER SCHEDULE |  |  |  |  |  |  |  |   |  |
|-------------------------------|--|--|--|--|--|--|--|---|--|
| DESIGNATION                   | UH-1   | UH-2   | UH-3   | UH-4   | UH-5   | UH-6   | UH-7   | UH-8  | UH-9   |
| CONSTRUCTION TYPE             | STANDARD   | STANDARD   | STANDARD   | STANDARD   | STANDARD   | STANDARD   | STANDARD   | HOSE DOWN CORROSION RESISTANT   | HOSE DOWN CORROSION RESISTANT                            |
| MANUFACTURER                  | CHROMALOX  | CHROMALOX  | CHROMALOX  | CHROMALOX  | CHROMALOX  | CHROMALOX  | CHROMALOX  | CHROMALOX   | CHROMALOX  |
| MODEL NUMBER                  | KUH-10-83-34   | KUH-10-83-34   | KUH-10-83-34   | KUH-10-83-34   | KUH-10-83-34   | KUH-10-83-34   | KUH-05-83-34   | HDH-A-500   | HDH-A-1500   |
| HEAT CAPACITY - KW            | 10   | 10   | 10   | 10   | 10   | 10   | 5  | 5   | 15   |
| FAN CAPACITY - CFM            | 750  | 750  | 750  | 750  | 750  | 750  | 420  | 405   | 1330   |
| FAN DRIVE                     | DIRECT   | DIRECT   | DIRECT   | DIRECT   | DIRECT   | DIRECT   | DIRECT   | DIRECT  | DIRECT   |
| MOTOR VOLTAGE/PHASE           | SEE ELECTRICAL   | SEE ELECTRICAL   | SEE ELECTRICAL   | SEE ELECTRICAL   | SEE ELECTRICAL   | SEE ELECTRICAL   | SEE ELECTRICAL   | SEE ELECTRICAL  | SEE ELECTRICAL   |
| TYPE DISCHARGE                | HORIZONTAL   | HORIZONTAL   | HORIZONTAL   | HORIZONTAL   | HORIZONTAL   | HORIZONTAL   | HORIZONTAL   | HORIZONTAL  | HORIZONTAL   |
| MOUNTING HEIGHT, FT           | 8  | 8  | 8  | 8  | 8  | 8  | 7  | 7   | 7  |
| REMARKS                       | BUILT-IN THERMOSTAT, DISCONNECT, & WALL MOUNTING BRACKET | BUILT-IN THERMOSTAT, DISCONNECT, & WALL MOUNTING BRACKET | BUILT-IN THERMOSTAT, DISCONNECT, & WALL MOUNTING BRACKET | BUILT-IN THERMOSTAT, DISCONNECT, & WALL MOUNTING BRACKET | BUILT-IN THERMOSTAT, DISCONNECT, & WALL MOUNTING BRACKET | BUILT-IN THERMOSTAT, DISCONNECT, & WALL MOUNTING BRACKET | BUILT-IN THERMOSTAT, DISCONNECT, & WALL MOUNTING BRACKET | BUILT-IN THERMOSTAT, DISCONNECT, & WALL MOUNTING BRACKET, PROVIDE CORROSION RESISTANT ACCESSORIES | BUILT-IN THERMOSTAT, DISCONNECT, & WALL MOUNTING BRACKET |

| HEAT EXCHANGER SCHEDULE    |   |                            |
|----------------------------|---|----------------------------|
| DESIGNATION                | HX-1  | HX-2                       |
| LOCATION                   | EQUIP RM                                    | EQUIP RM                   |
| CAPACITY, MBH              | 137.9                                       | 137.9                      |
| FOULING FACTOR (TUBE-SIDE) | .002  | .002                       |
| SHELL-SIDE                 | WATER FLOW, GPM                             | 25                         |
|                            | WATER TEMP. IN DEG. F                       | 75.0                       |
|                            | WATER TEMP. OUT DEG. F                      | 64                         |
|                            | MAX. WATER PRESS. DROP FT. H <sub>2</sub> O | 4.0                        |
| TUBE-SIDE                  | WATER FLOW, GPM                             | 53                         |
|                            | WATER TEMP. IN DEG. F                       | 55                         |
|                            | WATER TEMP. OUT DEG. F                      | 60.2                       |
|                            | MAX. WATER PRESS. DROP FT. H <sub>2</sub> O | 2.0                        |
| REMARKS                    | STRAIGHT TUBE B&G QOF68-12                  | STRAIGHT TUBE B&G QOF68-12 |

GENERAL NOTES - HVAC

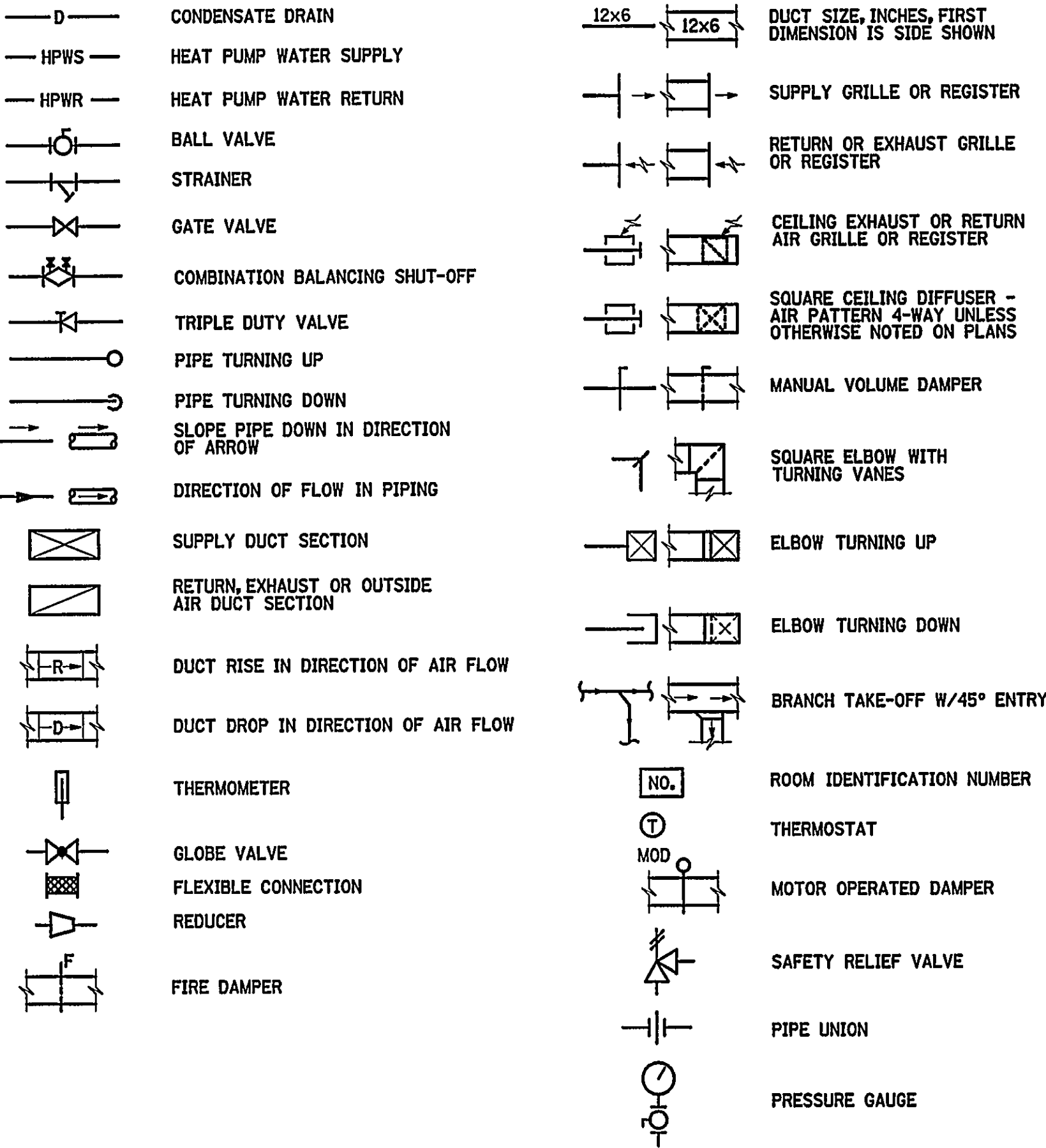
- COORDINATE MECHANICAL EQUIPMENT AND MATERIAL LOCATIONS WITH ELECTRICAL, PLUMBING, FIRE PROTECTION, STRUCTURAL, CIVIL AND ARCHITECTURAL PLANS TO AVOID CONFLICTS.
- ALL WORK ON THIS PROJECT SHALL BE INSTALLED IN ACCORDANCE WITH APPLICABLE CODES AND REGULATIONS.
- CONTRACTOR SHAL OBTAIN AND PAY FOR PERMITS AND ARRANGE FOR INSPECTIONS BY LOCAL AUTHORITIES HAVING JURISDICTION.
- REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATION OF ALL LOUVERS, VENTS, DUCTS, ETC, THAT PENETRATE EXTERIOR ROOFS OR WALLS.
- THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF WORK WITH THE WORK OF OTHER TRADES. MINOR DEVIATIONS FROM THE PLANS MAY BE MADE TO AVOID MINOR CONFLICTS. WHEN MAJOR CONFLICTS ARE APPARENT, THE ARCHITECT SHALL BE ADVISED IMMEDIATELY, AND AFFECTED WORK SHALL NOT BE INSTALLED UNTIL THE CONFLICT HAS BEEN RESOLVED.
- ALL NECESSARY ALLOWANCES AND PROVISIONS SHALL BE MADE BY THIS CONTRACTOR FOR BEAMS, COLUMNS OR OTHER OBSTRUCTIONS OF THE BUILDING OR THE WORK OF OHTER CONTRACTORS, WHETHER OR NOT SAME IS INDICATED. WHERE NECESSARY TO AVOID OBSTRUCTIONS, THE DUCTS SHALL BE TRANSFORMED, DIVIDED, OFFSET, RAISED OR LOWERED WITH THE REQUIRED FREE AREA BEING MAINTAINED.
- SEE REFLECTED CEILING PLANS FOR EXACT LOCATION OF AIR DEVICES.
- ALL PIPING AND DUCTWORK, ETC., SHALL BE SLEEVED THROUGH WALL PENETRATIONS.
- RUN ALL DUCTWORK AND PIPING CONCEALED ABOVE CEILING AND AS HIGH AS POSSIBLE UNLESS OTHERWISE NOTED OR INDICATED.
- PROVIDE FLEXIBLE CONNECTIONS BETWEEN HVAC UNITS AND SHEET METAL DUCTWORK.
- PROVIDE MANUAL AIR VENTS AT ALL HIGH POINTS IN HVAC PIPING SYSTEM.
- ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN SUCH A MANNER SO THAT ALL FILTERS, VALVES, MOTORS, ETC., ARE COMPLETELY ACCESSIBLE AND SERVICEABLE, INCLUDING ACCESS DOORS IF REQUIRED.
- WHERE PIPING AND/OR DUCTWORK PASS THROUGH FIRE AND/OR SMOKE RATED WALLS OR CEILINGS, OPENINGS SHALL BE FIRE AND/OR SMOKE STOPPED PER THE APPROPRIATE UL DETAIL.
- COMPLETE AND PROPER INSTALLATION OF THERMOSTATS AND ALL OTHER NECESSARY FIELD MOUNTED CONTROL COMPONENTS SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR. THE MANUFACTURER OF HVAC UNITS, ETC. SHALL FURNISH COMPLETE WIRING CONTROLS. ALL CONTROL WIRING SHALL BE IN CONDUIT AND INSTALLED PER DIVISION 16 OF THE SPECIFICATIONS.
- SLOPE CONDENSATE DRAINS AT 1/4" INCH FALL PER FOOT MINIMUM IN THE DIRECTION OF FLOW. PROVIDE DRAINAGE TYPE FITTINGS.
- PROVIDE OPENINGS IN BUILDING CONSTRUCTION FOR PASSAGE OF PIPING AND DUCTWORK. DO NOT PENETRATE STRUCTURAL MEMBERS WITHOUT PRIOR APPROVAL OF ARCHITECT.
- PROVIDE AIR TURNING DEVICES IN DUCTWORK AT ANY CHANGES IN DIRECTION OF 30 DEGREES OR GREATER.
- SQUARE THROAT ELBOWS WITHOUT TURNING VANES, MITERED ELBOWS, STRAIGHT RECTANGULAR AND ROUND DUCT TAPS, AND AIR SCOOPS ARE NOT PERMITTED.

| AIR DISTRIBUTION DEVICE SCHEDULE |  |   |   |  |
|----------------------------------|--|---|---|--|
| DESIGNATION                      | RG   | ER  | TG  | CD   |
| DEVICE                           | RETURN GRILLE                                  | EXHAUST REGISTER  | TRANSFER GRILLE   | CEILING DIFFUSER   |
| MANUFACTURER                     | ANEMOSTAT                                      | ANEMOSTAT   | ANEMOSTAT   | ANEMOSTAT  |
| MODEL NO.                        | GC5L   | GC5   | XIH   | EP-D   |
| TYPE                             | LAY-IN   | SURFACE MOUNTED   | SURFACE MOUNTED   | HORIZ. AIR PATTERN, LAY-IN   |
| NECK                             | SQUARE   | SQUARE  | RECTANGULAR/SQUARE  | ROUND  |
| CONSTRUCTION                     | ALUMINUM                                       | ALUMINUM  | ALUMINUM  | STEEL  |
| REMARKS                          | STANDARD WHITE FINISH 1/2"x1/2"x1/2" GRID CORE | STANDARD WHITE FINISH 1/2"x1/2"x1/2" GRID CORE & OPPOSED BLADE DAMPER | STANDARD WHITE FINISH 3/4" SPACING, HORIZONTAL BLADES AT 45° DEFLECTION | STANDARD WHITE FINISH WITH DIRECTIONAL TABS & OPPOSED BLADE DAMPER |

| WATER SOURCE HEAT PUMP SCHEDULE  |                         |                         |                         |                |
|----------------------------------|-------------------------|-------------------------|-------------------------|----------------|
| DESIGNATION                      | WSHP-1                  | WSHP-2                  | WSHP-3                  | WSHP-4         |
| TYPE                             | HORIZONTAL              | HORIZONTAL              | HORIZONTAL              | HORIZONTAL     |
| MANUFACTURER                     | TRANE                   | TRANE                   | TRANE                   | TRANE          |
| MODEL NUMBER                     | GEHA 042                | GEHA 018                | GEHA 036                | GEHA 009       |
| AIRFLOW - CFM                    | 1330                    | 600                     | 1300                    | 320            |
| EXTERNAL STATIC PRESSURE, IN.H2O | 0.65                    | 0.60                    | 0.65                    | 0.3            |
| FAN HP                           | 1/2                     | 1/3                     | 1/2                     | 1/12           |
| TOTAL COOLING MBH                | 44.4                    | 22.2                    | 37.5                    | 9.7            |
| SENSIBLE COOLING MBH             | 33.8                    | 15.9                    | 28.0                    | 7.0            |
| HEAT OF REJECTION MBH            | 54.4                    | 26.0                    | 45.8                    | 11.7           |
| COOLING EAT, DB/WB DEG F         | 80.6/66.2               | 80.6/66.2               | 80.6/66.2               | 80.6/66.2      |
| HEATING CAPACITY MBH             | 41.6                    | 17.1                    | 37.1                    | 9.6            |
| HEAT OF ABSORPTION MBH           | 29.1                    | 12.4                    | 27.8                    | 7.2            |
| WATER FLOW GPM                   | 9.7                     | 5.0                     | 8.3                     | 2.1            |
| MAX WATER PD, FT HD              | 16.0                    | 12.0                    | 10.6                    | 5.0            |
| VOLTS/PHASE                      | SEE ELECTRICAL          | SEE ELECTRICAL          | SEE ELECTRICAL          | SEE ELECTRICAL |
| HPWS PIPE SIZE - INCHES          | 1/4                     | 3/4                     | 1/4                     | 3/4            |
| HPWR PIPE SIZE - INCHES          | 1/4                     | 3/4                     | 1/4                     | 3/4            |
| DRAIN PIPE SIZE - INCHES         | 1                       | 1                       | 1                       | 1              |
| OUTSIDE AIR CFM                  | 300                     | 160                     | 260                     | 40             |
| REMARKS                          | HIGH STATIC FAN PACKAGE | HIGH STATIC FAN PACKAGE | HIGH STATIC FAN PACKAGE |                |

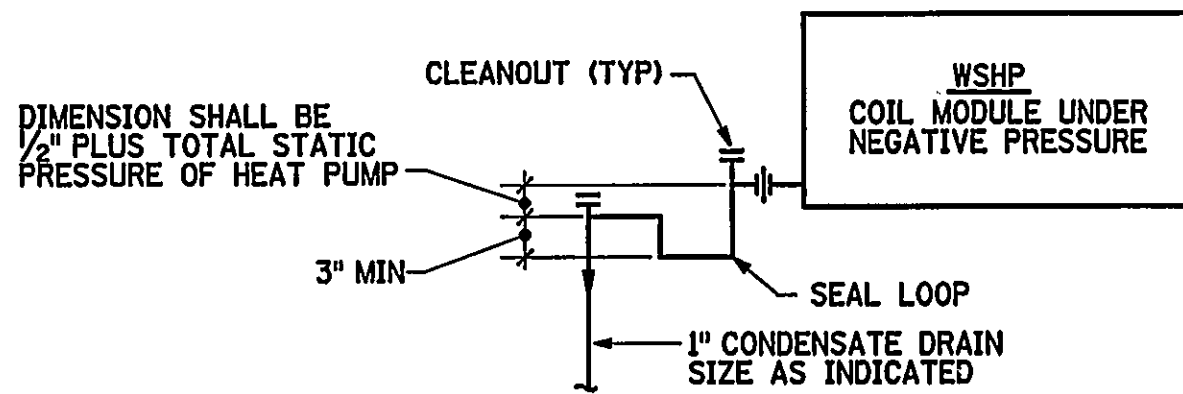
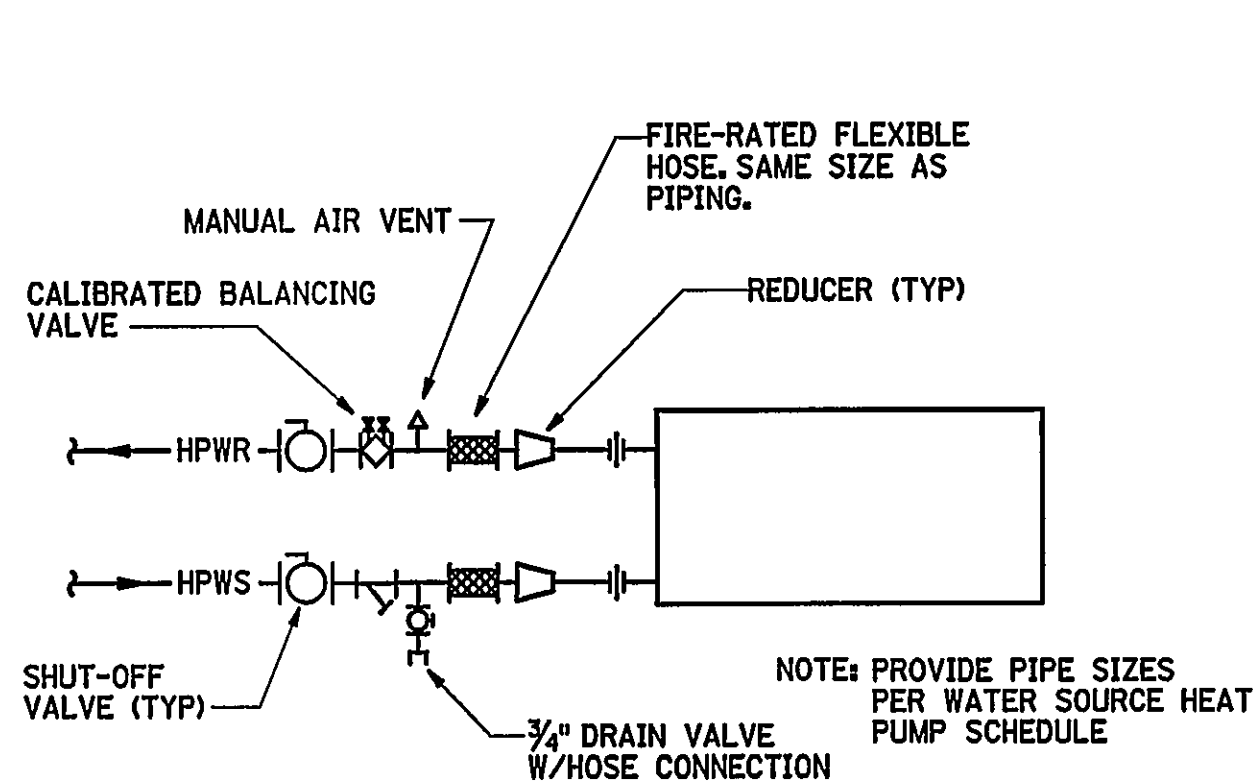
| PUMP SCHEDULE                        |                |                |
|--------------------------------------|----------------|----------------|
| DESIGNATION                          | P-1            | P-2            |
| FUNCTION                             | HEAT PUMP LOOP | HEAT PUMP LOOP |
| MANUFACTURER                         | B&G            | B&G            |
| MODEL NUMBER                         | 1510, 1/4AC    | 1510, 1/4AC    |
| TYPE                                 | CENTRIFUGAL    | CENTRIFUGAL    |
| CAPACITY - GPM                       | 25             | 25             |
| DEVELOPED HEAD - FT H <sub>2</sub> O | 50             | 50             |
| APPROX EFFICIENCY - PCT              | 45             | 45             |
| MOTOR HORSEPOWER                     | 1.5            | 1.5            |
| MOTOR VOLTAGE/PHASE                  | SEE ELECTRICAL | SEE ELECTRICAL |
| PUMP SPEED - RPM                     | 1750           | 1750           |
| OUTLET DIAMETER - INCHES             | 1.25           | 1.25           |
| INLET DIAMETER - INCHES              | 1.5            | 1.5            |
| REMARKS                              |                |                |

HEATING, VENTILATING AND AIR CONDITIONING LEGEND



- NOTES: 1. COOLING CAPACITY BASED UPON 64°F ENTERING WATER TEMPERATURE.  
2. HEATING CAPACITY BASED UPON 50°F ENTERING WATER TEMPERATURE AND 68°F ENTERING AIR TEMPERATURE.

| FAN SCHEDULE                           |  |  |  |                         |   |                                |  |  |  |  |
|--|--|--|--|-------------------------|---|--------------------------------|--|--|--|--|
| DESIGNATION                            | EF-1   | EF-2   | EF-3   | EF-4                    | EF-5  | EF-6                           | EF-7   | EF-8   | EF-9   | EF-10  |
| AREA SERVED                            | TOILET   | TOILET   | TOILET   | CHLORINE RM             | FLUORIDE RM   | AIR COMP RM                    | EQUIP RM   | EQUIP RM   | EQUIP RM   | EQUIP RM   |
| MANUFACTURER                           | LOREN COOK   | LOREN COOK   | LOREN COOK   | HARTZELL                | LOREN COOK  | LOREN COOK                     | LOREN COOK   | LOREN COOK   | LOREN COOK   | LOREN COOK   |
| MODEL NUMBER                           | GN 520   | GN 420   | GN 520   | SERIES 34               | AWD12A17D   | AWD30A8D                       | 30A11DB  | 30A11DB  | 30A11DB  | 30A11DB  |
| FAN TYPE                               | CENTRIFUGAL IN-LINE  | CENTRIFUGAL IN-LINE  | CENTRIFUGAL IN-LINE  | IN-LINE DUCT FAN        | PROPELLER WALL EXHAUST  | PROPELLER WALL EXHAUST         | PROPELLER WALL EXHAUST                               | PROPELLER WALL EXHAUST                               | PROPELLER WALL EXHAUST                               | PROPELLER WALL EXHAUST                               |
| CAPACITY - CFM                         | 250  | 150  | 250  | 900                     | 300   | 4920                           | 10,000   | 10,000   | 10,000   | 10,000   |
| FAN WHEEL DIAMETER - INCHES            | -  | -  | -  | 12                      | 12  | 30                             | 30   | 30   | 30   | 30   |
| STATIC PRESSURE - IN. H <sub>2</sub> O | 3/8  | 3/8  | 3/8  | 3/8                     | 1/8   | 3/8                            | 1/8  | 1/8  | 1/8  | 1/8  |
| FAN SPEED - RPM                        | 1200   | 1075   | 1200   | 2203                    | 1075  | 860                            | 1140   | 1140   | 1140   | 1140   |
| DRIVE                                  | DIRECT   | DIRECT   | DIRECT   | BELT                    | DIRECT  | DIRECT                         | DIRECT   | DIRECT   | DIRECT   | DIRECT   |
| MOTOR HORSEPOWER/WATTS                 | 175W   | 175W   | 175W   | 1/3                     | 172W  | 3/4                            | 1.5  | 1.5  | 1.5  | 1.5  |
| ACCESSORIES                            | BRICK VENT MODEL BV2, VARIABLE SPEED CONTROLLER, RUBBER-IN-SHEAR ISOLATORS | BRICK VENT MODEL BV2, VARIABLE SPEED CONTROLLER, RUBBER-IN-SHEAR ISOLATORS | BRICK VENT MODEL BV2, VARIABLE SPEED CONTROLLER, RUBBER-IN-SHEAR ISOLATORS | -                       | WIRE GUARD, MOTORIZED SHUTTER, HERESITE COATING & INTEGRAL DISCONNECT | WIRE GUARD & MOTORIZED SHUTTER | WIRE GUARD & MOTORIZED SHUTTER & INTEGRAL DISCONNECT | WIRE GUARD & MOTORIZED SHUTTER & INTEGRAL DISCONNECT | WIRE GUARD & MOTORIZED SHUTTER & INTEGRAL DISCONNECT | WIRE GUARD & MOTORIZED SHUTTER & INTEGRAL DISCONNECT |
| REMARKS                                | W/BACKDRAFT DAMPER   | W/BACKDRAFT DAMPER   | W/BACKDRAFT DAMPER   | FIBERGLASS CONSTRUCTION |   |                                |  |  |  |  |



CONDENSATE DRAIN TRAP DETAIL

NOT TO SCALE (FOR NEGATIVE PRESSURE COIL MODULE)

RECORD DRAWING

DATE: MAY 1, 2003

Wiley & Wilson  
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An Employee-Owned Company

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NORFOLK, VIRGINIA 23502  
757-222-1500

|                          |              |  |           |
|--------------------------|--------------|--|-----------|
| DESIGNED<br>DAN          | DRAWN<br>DAN | PROJECT<br>CRYSTAL SPRING<br>WATER TREATMENT PLANT<br>FOR THE<br>CITY OF ROANOKE, VIRGINIA |           |
| CHECKED<br>MJG           | REVIEWED     | REFERENCE<br>MECHANICAL  |           |
| COMM. NO.<br>200171.01   |              | TITLE<br>SCHEDULES   |           |
| CADD NO.<br>200171M4.DGN |              | SHEET NO. 59 OF 72   |           |
| DATE<br>AUG 26, 2001     |              | DWG. NO.<br>M-3  | REV.<br>0 |