22.01 General

A. The equipment requirements listed in this section are general in nature and should be edited to the suit the project. The items listed for a particular piece of equipment are generally not all required. For example, a variable volume terminal unit will have either a hot water coil or steam coil, but not both. Also some Clients and Authorities Having Jurisdiction may not permit some of this information to be included on the drawings (i.e., Manufacturer's Name and Model No.).

B. Abbreviations

1. CFM Air Flow Rate (Cubic Feet per Minute) 2. GPM Water Flow Rate (Gallons per Minute) 3. MBH 1,000 Btu/Hr. 4. Hp Horsepower 5. DB Dry Bulb Temperature (°F.) 6. WB = Wet Bulb Temperature (°F.) 7. RH Relative Humidity (%) 8. EAT Entering Air Temperature (°F.) 9. LAT Leaving Air Temperature (°F.) Entering Water Temperature (°F.) 10. EWT 11. LWT Leaving Water Temperature (°F.)

12. SP = Static Pressure (In. WG)

13. ESP = External Static Pressure (In. WG) 14. Total SP = Total Static Pressure (In. WG)

15. FLA = Full Load Amps 16. LRA = Locked Rotor Amps 17. FPM = Feet per Minute

18. Air PD = Air Pressure Drop (In. WG) 19. Water PD = Water Pressure Drop (Ft. H₂O) 20. PRV = Pressure Reducing Valve (Psig)

Relief Valve (Psig)

22. Psig = Pounds per Square Inch
23. SA = Supply Air CFM
24. RA = Return Air CFM
25. OA = Outside Air CFM
26. EXH = Exhaust Air CFM
27. RFA = Relief Air CFM
28. CC = Cooling Coil

=

29. HC = Heating Coil 30. PHC = Preheat Coil 31. RHC = Reheat Coil

22.02 Air Balance Schedule

Room Number Room Name Source

21. RV

Number of Occupants Code Requirements:

OA CFM

SA CFM

Supply CFM

Return CFM

Relief CFM

Exhaust CFM

Outdoor CFM

Transfer Air:

CFM

To Room

From Room

Remarks

22.03 Air Compressors

Designation

Location

Service

Type (Reciprocating, Rotary Screw, Duplex, Simplex)

CEM

Pressure Psig

Receiver Size:

Gallons

Diameter

Length

Motor:

Нр

RPM

Volts-Phase-Hertz

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.04 Air Cooled Condensers

Designation

Location

Service

Type

Tons or MBH

Refrigerant Type

Saturated Condenser Temperature

Condenser EAT °F.DB/°F.WB

Minimum OA Temperature

Fans:

Number

Hр

Volts-Phase-Hertz

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.05 Air Cooled Condensing Units

Designation

Location

Service

Type

Tons or MBH

Refrigerant Type

Saturated Condenser Temperature

Condenser EAT °F.DB/°F.WB

Minimum OA Temperature

Compressor:

Number

KW

Volts-Phase-Hertz

Fans:

Number

Hр

Volts-Phase-Hertz

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.06 Air Conditioning Units

Designation

Location

Service

Min. OA CFM

Fan:

CFM

ESP

Number of Wheels

Wheel Diameter In.

Motor Hp

Filters:

Type

Efficiency

Cooling Coil:

Refrigerant Type

Sensible MBH

Total MBH

EAT °F.DB/°F.WB

LAT °F.DB/°F.WB

Compressor:

Number

KW

Condenser:

EAT

Motor Hp

Exhaust Fan Motor Hp

Electric Heat:

KW

EAT

LAT

Gas Heater:

Output MBH

Input MBH

EAT

LAT

Hot Water Coil:

MBH

EAT

LAT

EWT

LWT

GPM

Steam Coil:

MBH

EAT

LAT

Steam/Hr.

Steam Pressure Psig

Electric, Volts-Phase-Hertz

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.07 Air Filters (Pre-Filters, Filters, Final-Filters)

Designation

Location

Equipment Served

Number

Type

Width

Height

Depth

Efficiency %

Initial Air PD

Final Air PD

Remarks

22.08 Air Handling Units-Custom, Factory Assembled, Factory Packaged, or Field Fabricated

Designation Location Service Min. OA CFM Fan: **CFM** Type (AF, BI, FC, DWDI, SWSI) Class (I, II, III, IV) Number of Wheels Wheel Diameter ESP Total SP Motor Hp Volts-Phase-Hertz Filters (See Air Filters) Coils (See Coils—DX, Electric, Steam, Water) Operating Weight Lbs. Manufacturers: Name and Model No. Remarks

22.09 Air Handling Units-Packaged

Designation Location Service Min. OA CFM Fan: **CFM** Type (AF, BI, FC, DWDI, SWSI) No. of Wheels Wheel Diameter In. **ESP** Total SP Motor Hp Volts-Phase-Hertz Filters (See Air Filters) Coils (See Coils—DX, Electric, Steam, Water) Operating Weight Lbs. Manufacturers: Name and Model No. Remarks

22.10 Boilers, Hot Water

Designation Location

Service

Output MBH

Water:

GPM

EWT

IWT

Water PD

Heater:

Gas Input MBH

Oil Input GPH

Electric:

KW

Volts-Phase-Hertz

RV Setting

Accessories:

HP

KW

Volts-Phase-Hertz

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.11 Boilers, Steam

Designation

Location

Service

Output # Steam/Hr.

Steam Pressure Psig

Feed Water Temperature

Heating Surface Sq. Ft.

Steam Drum Diameter

Lower Drum Diameter

Gas Input MBH

Oil Input GPH

Electric:

KW

Volts-Phase-Hertz

RV Setting

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.12 Cabinet Unit Heaters

Designation

Location

Type (Recessed, Semi-recessed, Exposed, Concealed, Ceiling, Floor, Up Discharge, Down Discharge, Hot Water, Steam, Electric, etc.)

Fan: **CFM RPM** Motor Hp Volts-Phase-Hertz Hot Water Coil: Capacity MBH **EAT GPM EWT** Steam Coil: Capacity MBH EAT # Steam/Hr. Steam Pressure Psig Electric Coil: KW Volts-Phase-Hertz **Runouts:** Supply Return Manufacturers: Name and Model No. Remarks

22.13 Chemical Feed Systems

Designation
Location
Service
Pump:
Type (Positive Displacement)
GPH
PSI
HP
Volts-Phase-Hertz
Tank Gallons
Agitator:
HP
RPM
Volts-Phase-Hertz
Remarks

22.14 Chillers, Absorption

Designation Location Service Type

Refrigerant Type Capacity Tons Cooling MBH Heating Evaporator **EWT** LWT **GPM** Water PD Condenser **EWT** LWT **GPM** Water PD Absorber Steam Pressure Psig # Steam/Hr. Gas Pressure In. W.G. Gas Input MBH Oil Input GPH Heating: **EWT** LWT **GPM** Water PD Electrical: Hр KW Volts-Phase-Hertz

22.15 Chillers, Air Cooled

Manufacturers: Name and Model No.

Operating Weight Lbs.

Remarks

Designation
Location
Service
Type
Refrigerant Type
Capacity Tons
Evaporator:
 EWT
 LWT
 GPM
 Water PD
Condenser Temperature
Condenser:
 EAT

Fans:
Number
Hp
Compressor
Number
KW
Volts-Phase-Hertz

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.16 Chillers, Water Cooled

Designation

Location

Service

Type

Refrigerant Type

Capacity Tons

Evaporator:

EWT

LWT

GPM

Water PD

Condenser:

EWT

LWT

GPM Water PD

Heating (Heat Recovery Type):

EWT

LWT

GPM

Water PD

Compressor:

Number

KW

Volts-Phase-Hertz

Evaporator Temperature

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.17 Coils, Direct Expansion (DX)

Designation
Location
Equipment Served
Service (CC, Heat Recovery)
Refrigerant Type

MBH

CFM

EAT °F.DB/°F.WB

LAT °F.DB/°F.WB

Maximum Face Velocity FPM

Air PD

Remarks

22.18 Coils, Electric

Designation

Location

Equipment Served

Service (PHC, HC, RHC)

MBH

CFM

EAT

LAT

Maximum Face Velocity FPM

Air PD

KW

Volts-Phase-Hertz

Number of Control Steps

Manufacturers: Name and Model No.

Remarks

22.19 Coils, Steam

Designation

Location

Equipment Served

Service (HC, PHC, RHC)

MBH

CFM

EAT

LAT

Maximum Face Velocity FPM

Air PD

Steam/Hr.

Steam Pressure Psig

Runout Sizes

Supply

Return

Remarks

22.20 Coils, Water

Designation

Location

Equipment Served
Service (PHC, CC, HC, RHC)
MBH
CFM
EAT °F.DB/°F.WB
LAT °F.DB/°F.WB
Max. Face Velocity FPM
GPM
EWT
LWT
Air PD
Water PD
Runout Size:

Supply Return Remarks

22.21 Condensate Pump and Receiver Sets

Designation
Location
Service
Type (Simplex, Duplex)
GPM
Heat Ft. H₂O
Motor Hp
Volts-Phase-Hertz
Tank Capacity Gallons
Operating Weight Lbs.
Manufacturers: Name and Model No.
Remarks

22.22 Convectors

Remarks

Designation
Location
Type (Recessed, Semi-recessed, Exposed, Concealed, Ceiling, Floor, etc.)
Capacity MBH
EAT
GPM
EWT
Steam/Hr.
Steam Pressure Psig
KW
Volts-Phase-Hertz
Runout Size
Supply
Return
Manufacturers: Name and Model No.

22.23 Cooling Towers

Location Service

Designation

Type

GPM

EWT

LWT

Ambient Air °F.WB

Fan

Number

CFM

No. of Motors

Hр

ESP In. W.G.

Volts-Phase-Hertz

Nozzle PD

Height Difference

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.24 Deaerators

Designation

Location

Service

Type

Number of Stages

Outlet Capacity Lb./Hr.

Storage Capacity:

Pounds

Minutes

Steam:

Lbs./Hr.

Psig

Size (Length × Diameter)

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.25 Design Conditions

Room Number

Room Name

Summer:

Outside °F.DB/°F.WB Inside °F.DB/%RH

Winter:

Outside °F.DB/°F.WB Inside °F.DB/%RH

Remarks

22.26 Electric Baseboard Radiation

Designation

Type (See Specification for Type Designation)

Style (Wall Mounted, Floor Mounted, Flat Top, Sloped Top, Etc.)

Number of Elements

Electric:

KW

Volts-Phase-Hertz

Manufacturers: Name and Model No.

Remarks

22.27 Electric Radiant Heaters

Designation

Type (See Specification for Type Designation)

Style

Number of Elements

Length of Unit

Electric:

KW

Volts-Phase-Hertz

Manufacturers: Name and Model No.

Remarks

22.28 Evaporative Condensers

Designation

Location

Service

Type

Tons or MBH

Refrigerant Type

Saturated Condenser Temperature

Condenser EAT °F.DB/°F.WB

Minimum OA Temperature

Fans:

Number

ESP

Hр

Volts-Phase-Hertz

Pump:

Hр

Head Ft.H₂O

Number

Volts-Phase-Hertz

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.29 Expansion Tanks

Designation

Location

Service (Hot Water, Chilled Water, Condenser Water, Etc.)

Type (Closed, Open, Diaphragm)

Capacity Gallons

Size Diameter × Length

PRV Setting Psig

RV Setting Psig

Connection Size:

Fill

System

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.30 Fans

Designation

Location

Service (SA, RA, EA)

CFM

RPM

Drive (Belt, Direct)

Type (BI, AF, FC, Roof, Propeller, Etc.)

Class (I, II, III, IV)

Wheel Diameter Inches

SP

Motor Hp

Volts-Phase-Hertz

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.31 Fan Coil Units

Designation

Nominal CFM

Type (2-Pipe, 4-Pipe, 2-Pipe with Electric Heat)

Style (Recessed, Semi-recessed, Exposed, Concealed, Cabinet, Hi-Rise, Ceiling, Floor, etc.)

Cooling:

Sensible MBH

GPM EWT LWT EAT °F.DB/°F.WB Water PD Runout Size: Supply Return Drain Size Heating: **MBH GPM** Water PD **EWT** LWT EAT °F.DB/°F.WB Runout Size: Supply Return KW Volts-Phase-Hertz Number of Control Steps Fan: **CFM** Motor Hp **ESP** Volts-Phase-Hertz Manufacturers: Name and Model No. Remarks 22.32 Finned Tube Radiation

Total MBH

```
Designation
Type (See Specification for Type Designation)
Style (Wall Mounted, Floor Mounted, Flat Top, Sloped Top, etc.)
Number of Elements
Element Size:
   Fins
  Tube
Water:
  Capacity MBH
  EWT
  LWT
  EAT
  GPM
  Water PD
Steam:
  Capacity MBH
  EAT
```

Steam/Hr. Steam Pressure Manufacturers: Name and Model No. Remarks

22.33 Flash Tanks

Designation
Location
Service
Type
Discharge Steam Pressure Psig
Tanks Size (Diameter × Height)
Operating Weight Lbs.
Manufacturers: Name and Model No.
Remarks

22.34 Fluid Coolers/Closed Circuit Evaporative Coolers

Designation Location Service Type Fluid Type **GPM EWT IWT** Ambient Air °F.WB Fan: Number **CFM** Number of Motors Hр **ESP** Volts-Phase-Hertz Pump: Нр Head Ft.H2O Number Volts-Phase-Hertz Operating Weight Lbs. Manufacturers: Name and Model No.

22.35 Fuel Oil Tanks

Designation Location

Remarks

Fuel Type Tank Type (Double Wall, Steel, Fiberglass) Capacity Gallons Size: Length Diameter Approximate Weight Connection Sizes: Supply Return Fill Vent Gauge Heating Supply and Return Sounding Drop (Tank, Storage) Pad Size $(L \times W \times Th)$ Manhole Size Manufacturers: Name and Model No.

22.36 Gas Pressure Regulators

Remarks

Designation
Location
Capacity Cu.Ft./Hr.
Inlet:
Psig
Pipe Size
Outlet:
Psig
Pipe Size
Manufacturers: Name and Model No.
Remarks

22.37 Gravity Ventilators

Designation Location Service Type Dome, Louvered, Filters, No Filters) Throat Size $(L \times W)$ Physical Size $(L \times W \times H)$ Manufacturers: Name and Model No. Remarks

22.38 Heat Exchangers, Plate and Frame

Designation Location

Service

Capacity MBH

Cold Side:

GPM

EWT

IWT

Water PD

Hot Side:

GPM

EWT

LWT

Water PD

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.39 Heat Exchangers, Shell and Tube, Steam to Water (Converter)

Designation

Location

Service

Capacity MBH

Shell:

Steam/Hr.

Steam Pressure Psig

Tubes:

GPM

EWT

LWT

Water PD

Minimum Surface Area Sq. Ft.

Number of Passes

Approximate Length Ft.

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.40 Heat Exchangers, Shell and Tube, Water to Water

Designation

Location

Service

Capacity MBH

Shell:

GPM

EWT

LWT

Water PD

Tubes:

GPM

EWT

LWT

Water PD

Minimum Surface Area Sq. Ft.

Number of Passes

Approximate Length Ft.

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.41 Heat Pumps, Air Source

Designation

Location

Service

Type (Recessed, Semi-recessed, Exposed, Concealed, Ceiling, Floor, etc.)

Fan:

Total CFM

OA CFM

ESP

Cooling:

Sensible MBH

Total MBH

EAT °F.DB/°F.WB

LAT °F.DB/°F.WB

Sink Air Temperature

Heating Capacity:

Compressor MBH

Total MBH

Source Air Temperature

Electrical:

Evaporator Fan Hp

Condenser Fan Hp

Compressor KW

Heater KW

Volts-Phase-Hertz

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.42 Heat Pumps, Water Source

Designation

Location

Service

 $Type \ (Recessed, Semi-recessed, Exposed, Concealed, Ceiling, Floor, etc.)$

Fan:

Total CFM

OA CFM

ESP

Cooling:

Sensible MBH

Total MBH

EAT °F.DB/°F.WB

LAT °F.DB/°F.WB

EWT

Heating Capacity:

Compressor MBH

Total MBH

EWT

Source Water:

GPM

Water PD

Runout Size:

Supply

Return

Electrical:

Fan Hp

Compressor KW

Heater KW

Volts-Phase-Hertz

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.43 Humidifiers

Designation

Location

Service

Capacity:

Steam/Hr.

Steam Pressure Psig

Electric:

KW

Volts-Phase-Hertz

Duct/Air Handling Unit Size

Number of Manifolds

Runout Size:

Supply

Return

Drain

Manufacturers: Name and Model No.

Remarks

22.44 Motor Control Centers

Item Number

Hp/KW

FLA

Starter Size

Circuit Breaker Size

Auxiliary Equipment (Specifications)

Nameplate Designation

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.45 Packaged Terminal AC Systems

Designation

Location

Service

Minimum OA CFM

Fan:

CFM

ESP

Number Of Wheels

Motor Hp

Filters:

Type

Efficiency %

DX Cooling:

Sensible MBH

Total MBH

EAT °F.DB/°F.WB

LAT °F.DB/°F.WB

Compressors:

Number

KW

Condenser:

EAT

Motor Hp

Electric Heat:

KW

EAT

LAT

Electric Volts-Phase-Hertz

Hot Water:

MBH

EAT

LAT

EWT

LWT

GPM

Water PD

Steam Heat:

MBH

EAT

LAT

Steam/Hr.

Steam Pressure Psig

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.46 Pumps

Designation

Location

Service (Chilled, Heating, Condenser Water, etc.)

Type (End Suction, Horizontal Split Case, In-Line, etc.)

GPM

Head Ft.

RPM

Motor Hp

NPSH

Volts-Phase-Hertz

Operating Weight Lbs.

Manufacturers: Name and Model No.

Remarks

22.47 Radiant Heaters

Designation

Output Capacity MBH

Gas Input MBH

Burner:

FLA

LRA

Volts-Phase-Hertz

Vacuum Pump:

Motor Hp

Volts-Phase-Hertz

Length of Reflector

Manufacturers: Name and Model No.

Remarks

22.48 Steam Pressure Reducing Valves

Designation

Location

Capacity # Steam/Hr.

Inlet:

Pressure Psig

Pipe Size

Outlet:

Pressure Psig

Pipe Size

Manufacturers: Name and Model No.

Remarks

22.49 Steam Pressure Relief Valve

Designation

Location

Capacity # Steam/Hr.

Relief Valve Setting Psig

Discharge Pipe Size

Manufacturers: Name and Model No.

Remarks

22.50 Sound Attenuators (Duct Silencers)

Designation

Location

Service

Type

CFM

Noise Reduction:

63 HZ

125 HZ

250 HZ

500 HZ

1,000 HZ

2,000 HZ

4,000 HZ

8,000 HZ

Face Velocity FPM

Maximum Air PD

Length Ft.

Manufacturers: Name and Model No.

Remarks

22.51 Terminal Units, Constant Volume Reheat

Designation

CFM Range

Inlet Duct Size

Hot Water Coil:

Capacity MBH

EAT

Number of Rows

GPM

EWT

Water PD

Steam Coil:

Capacity MBH

EAT

Number of Rows

#Steam/Hr.

Steam Pressure Psig

Runout Size:

Supply

Return

Electric Coil:

KW

Volts-Phase-Hertz

No. of Control Steps

Manufacturers: Name and Model No.

Remarks

22.52 Terminal Units, Dual Duct Mixing Box

Designation

CFM Range

Minimum/Maximum CFM:

Cold Deck

Hot Deck

Inlet Duct Size:

Cold

Hot

Manufacturers: Name and Model No.

Remarks

22.53 Terminal Units, Fan Powered

Designation

CFM Range

Minimum CFM Setting

Inlet Duct Size

Fan:

Type (Series, Parallel)

CFM

ESP

Motor Hp

Volts-Phase-Hertz

Hot Water Coil:

Capacity MBH

EAT

Number of Rows

GPM

EWT

Water PD

Steam Coil:

Capacity MBH

EAT

Number of Rows

Steam/Hr.

Steam Pressure Psig

Runout Size:

Supply

Return

Electric Coil:

KW

Volts-Phase-Hertz

Number of Control Steps

Manufacturers: Name and Model No.

Remarks

22.54 Terminal Units, Variable Air Volume (VAV)

Designation

CFM Range

Minimum CFM Setting

Inlet Duct Size

Hot Water Coil:

Capacity MBH

EAT

Number of Rows

GPM

EWT

Water PD

Steam Coil:

Capacity MBH

EAT

Number of Rows

Steam/Hr.

Steam Pressure Psig

Runout Size:

Supply

Return

Electric Coil:

KW

Volts-Phase-Hertz

Number of Control Steps

Manufacturers: Name and Model No.

Remarks

22.55 Unit Heaters

Designation Location Type (Horizontal Discharge, Vertical Discharge, Hot Water, Steam, Electric, Gas Fired, Oil Fired, etc.) Fan: **CFM RPM** Motor Hp Volts-Phase-Hertz Hot Water Coil Capacity MBH EAT **GPM EWT** Steam Coil Capacity MBH **EAT** # Steam/Hr. Steam Pressure Psig Gas Heater: Output Capacity MBH Input MBH EAT Oil Heater: Output Capacity MBH Input GPH EAT Electric Coil: KW Volts-Phase-Hertz **Runouts:** Supply

22.56 Water Softeners

Manufacturers: Name and Model No.

Return

Remarks

Designation
Location
Service
Number of Tanks
Capacity:
Minimum Grains
Maximum Grains
GPM

Tank Size (Diameter × Height)

 $\begin{array}{l} \text{Brine Tank (Diameter} \times \text{Height)} \\ \text{Electrical Volts-Phase-Hertz} \end{array}$ Operating Weight Lbs. Manufacturers: Name and Model No.

Remarks