

shall be installed and filters tight prior to starting air handling equipment. If permanent filters for air handlers must be in place at substantial completion.

B' Factory startup of the AF drives shall be complete.

. Representative and appropriate documentation is to be forwarded to the Project Manager within 7 days of the test.

For 3" water, specify the Zircon Series F111; ; single turbine flow meter or approved equivalent for lines 6" and smaller. Specify the Zircon Series F116; ; inline electromagnetic flow meter or approved equivalent for lines 6" to 60" and larger. Locate meters in an accessible area in the mechanical room of the building being served. Meters shall communicate to DCS via Modbus RTU controller.

For compressed air, specify the Zircon series F169; ; inline vortex mass flow meter. Utilize 75- Class 1; ; pressure sensor with external 6" A/C. Meters shall communicate to DCS via Modbus RTU

Pipe Insulation

This section shall be adopted for minimum requirements for all pipe insulation common to several mechanical piping systems. It shall include all insulation, fittings and lagging. The manufacturer's installation instructions shall be referenced for each and every insulation application, and the insulation shall be installed in accordance with manufacturer's installation instructions.

Subject to compliance with requirements, provide products by one of the following:

- 1' Cellular Glass Insulation:
 - a' Pittsburgh Corning (Foamglas) or approved equal
- 6' Flexible, Elastomeric Thermal Insulation:
 - a' Armstrong World Industries, Inc.
 - b' DuPont Corning
- 3' Calcium Silicate Insulation:
 - a' Johns-Manville Corning Fiberglas Corning
 - b' Johns-Manville Thermo 116
- 3' Fiberglass:
 - a' Johns-Manville
 - b' Johns-Manville Corning
 - c' Pittsburgh Corning

Cellular glass insulation to be inorganic foamed or cellulated glass, annealed, rigid, hermetically sealed cells, incombustible.

- 1' Preformed Pipe Insulation, without Jacket. Comply with ASTM A5616, ISO 589509291(e)0.5902557164 (July 25)

*##ly insulation materials, accessories, and finishes according to the manufacturer's written instructions.) ith smooth, straight, and even surfaces. Free of voids throughout the length of ##ing, including fittings, valves, and specialties'

Service- Chilled water supply and return

1' -insulation material- Tunnels and mechanical rooms to be Foamglass or equivalent interior spaces to be fiberglass or equivalent

6' -insulation Thickness- Per design Professional

Field applied Jacket- mechanical room and Tunnel to have aluminum jacket with stainless steel bands

As required- Nes

Service- Refrigerant suction and hot gas piping

1' -insulation material- Flexible elastomeric

6' -insulation Thickness- Per design Professional

Field applied Jacket- Per design Professional

As required- Nes

Service- Heating hot water supply and return

1' -insulation material- 3 piece molded fiberglass

6' -insulation Thickness- Per design Professional

Field applied Jacket- interior building spaces per design Professional and aluminum in tunnel

As required- Per design Professional

Service- Steam and condensate

1' -insulation material- Calcium silicate

6' -insulation Thickness- Per design Professional

Field applied Jacket- aluminum or fiberglass Per design Professional

As required- Nes

Exterior Insulation Application Schedule-

This application schedule is for aboveground insulation outside the building'

Service- Refrigerant suction

1' -insulation material- Flexible elastomeric

6' -insulation Thickness- Per design Professional

Field applied Jacket- Per design Professional

As required- Nes

Service- Chilled water supply and return'

1' -nsulation " aterial-

a' Pittsburgh Corning (FoamGlass< or a##roved e (ual ,) ith lac/et \$tunnel * ##lications%'

b' 3 ne1#iece molded !iberglass'

6' -nsulation Thic/ness- Per esign Pro!essional

: ' Field1 * ##lied Jac/et- * luminum

> ' Aa#or . etarder . e (uired- Nes'

* If underground steam and condensate lines shall be Thermacor, Perma#i#e, or an a##roved e (ual #re!insulated #i#e'

Valves

This section shall be !ollo) ed !or all valves common to several mechanical #i#ing systems' -t shall include all valves and connections'

Use gate valves !or isolation and shut o!! duty' o not use !or throttling or balancing duty'

Gate Aalves, 61106 -nches and Smaller- Class 16?, 6 ; ; 1#si cold) or /ing #ressure \$CE P%, or Class 1? ; , : ; ; 1#si CE PL cast!bron4e body and bonnet, solid!bron4e) edge, rising stem, tel!on!im#regnated #ac/ing) ith bron4e #ac/ing nut, threaded or soldered end connectionsL and) ith malleable!iron hand) heel'

Gate Aalves, : -nches and Darger- Class 16?, 6 ; ; 1#si CE P, cast!iron body and bonnet, solid cast!iron) edge, brass!alloy stem, outside scre) and yo/e, tel!on!im#regnated #ac/ing) ith 61#iece #ac/ing gland assembly, !langed end connectionsL and) ith cast!iron hand) heel'

2all valves shall be used !or all isolation ty#e a#

Each Check Valve - Class 160, 6" ; 1" si C E P, cast iron body, bronze disc, stainless steel pins and springs, 2 Buna N seals, installed between flanges'

Each Check Valve - Class 160, bronze body and cast iron main components, horizontal or vertical pattern, flange, bronze disc with stainless steel holder threaded or soldered end connections'

Isolation valves for steam supply shall be gate valves' Valves for condensate return shall be steam rated ball valves or 316 gate valves'

Installation of valves-

- 1' Install valves in horizontal position with stem at or above the center of the pipe'
- 2' Install valves in a position to allow full stem movement'
- 3' For chain hoist operators, extend chains to 9" inches above finished floor elevation'
- 4' Installation of Check Valve - install for proper direction of flow as follows:
 - 5) In horizontal position with hinge in level'
 - 6) Each Check Valve - horizontal or vertical position, between flanges'
 - 7) Each Check Valve - with stem up and hump'

* If soldered joints shall be made with high temperature solid string or pure solder, H₂O tin, 50

: ' Plug Aalves= 2una 7 #ac/ing'

> ' Globe Aalves= Class 16?, cast iron body) ith bron4e discl or Class 16?'

? ' 2utter!ly Aalves= *luminum bron4e discl , P " sleeve and stem seals'

9' Chec/ Aalves= Class 16?, castliron body s) ing chec/) ith rubber seat

Comply with * E E * Standards for #public drin/ing)ater and disinfecting Eater " ains'

* All buildings)ill be designed for metering of cam#us)ater' domestic)ater shall have)ater meters installed either outside of the building or if approved by the 3)ner installed in the mechanical room of the building being served' Eater meters u# to 6 P< shall be 3nicon F1: ; ; ; series and)ater meters :< and larger shall be 3nicon F1: ? ; ; series' " eters shall communicate to 2 " S by 2 * Cnet via 11 ; ; controller'

For underground #i#ing si4es >< and smaller, #rovide *ST " 2 BB, hard(dra)n, Ty#e Q co##er)ater tube)ith)rough co##er fittings)ith soc/et ends,

The water hydrostatic test pressure shall be a minimum of 1.5 psi and a maximum of 1.5 times the working pressure. The pressure test shall be maintained for sufficient time to inspect all joints, with a minimum time of four hours.

Disinfection of Potable Water System

Whenever installed, altered, or repaired, a potable water system and tanks shall, after successful pressure testing, be thoroughly flushed with clean potable water and then disinfected prior to utilitarian final connection in strict accordance with the following: 1. The preliminary flushing velocity in the main shall not be less than 6 ft/sec unless the operator determines that conditions do not permit the required flow to be discharged to waste. Disinfection shall be done with either liquid chlorine or chlorine granules (no tablets allowed). Calculate the volume to give a water-chlorine solution concentration of 6 mg/l; mg/D based upon the volume of the system being treated. The solution will be allowed to stand for a period of

The Contractor shall be responsible for the disposal of all domestic wastewater with chemicals resulting from
new construction. Wastewater shall be disposed in accordance with Federal, State and local requirements.

Contractor to use the City of Dubbo's Microbiology Laboratory for wastewater testing. The lab is located at 9171 Guava