1 General
1.1 Materials and installations shall be in accordance with the following industry and association standards.
   - ASME Boiler and Pressure Vessel Code
   - ASME B31.1 Power Piping Code
   - ASTM Materials
   - AWS Welding

2 Design Conditions
2.1 Capacity of new condensate pumps shall be determined with Utilities Engineering for each project.
2.2 Capacity of receiver shall be determined with Utilities Engineering for each project. Discharge pressure of pumps shall be a minimum of 50 psig and determined with Utilities Engineering for each project.
2.3 Pumps shall be capable of pumping 210°F condensate without cavitation.
2.4 Condensate receiver inlet shall be lower than the discharge of lowest steam trap in the system. If a pit is required for the pump, design the pit such that it is not a confined space.
2.5 Condensate return systems shall be designed with a common header that all pumps discharge into. In no case shall a pump discharge to another receiver.
2.6 Consult Utilities Engineering if an application is believed to be outside of these conditions.
2.7 Piping should not be run below grade.
   Note: A number of University buildings in the past were designed with piping under the basement slab running to a sunken area holding the condensate pump. Without exception, the below grade pipes have premature failure and numerous leaks.

3 Condensate Pumps
3.1 Mechanical pumps are the preferred design for Utilities Distribution.
3.2 Pumps shall be duplex type, with controls that automatically alternate between pumps.
3.3 Pressure-powered and vacuum pumps shall not be used unless specifically requested by Utilities Engineering.
3.4 Pump shall be flanged or threaded to allow removal for maintenance or replacement.

3.5 Receiver shall be cast iron or steel, and include threaded connections for temperature gauge and pH transmitter.
3.6 Preferred Manufacturers
   - Shipco
   - Hoffman HC Series
   - Domestic

4 Gauges
4.1 Pressure: 4½” iron case, Bourdon-type pressure gauge complete with siphon and gauge cocks. Pressure range is to be indicated on plans.
4.2 Temperature: 4½” iron case, temperature gauge with insertion well. Temperature range is to be 250°F unless otherwise indicated on plans.

5 Installation Guidelines
5.1 Condensate pumps and receivers shall be mounted and piped with vibration isolation. Pump should be mounted on a spring frame with air gap between floor and bottom of pump.
5.2 Pumps shall be piped together with isolation valves such that one pump can be removed for maintenance or replacement while the other pump remains in operation.
5.3 Provide a check valve on the discharge of each pump to prevent back-flow through pump into receiver.
5.4 Provide a balance valve (e.g. a manual globe valve) on the discharge of each pump.
   Note: This is to set the pump to run on an appropriate operating point on the curve
5.5 Provide pressure gauges on the discharge line of each pump.
5.6 Pumps shall be oriented to provide adequate space for maintenance as well as best egress path through tunnels and buildings.
5.7 Pressure-powered condensate pumps shall be provided with removable custom fitted insulated jackets.