Part III
Vacuum Waste Drainage Systems.

724.0 General.

This section regulates the design and installation provisions for vacuum waste drainage systems. Plans for vacuum waste drainage systems shall be submitted to the Authority Having Jurisdiction for approval and shall be considered an engineered designed system. Such plans shall be prepared by a registered or licensed person to perform plumbing design work. Details are necessary to ensure compliance with the requirements of this section, together with a full description of the complete installation including quality, grade of materials, equipment, construction, and methods of assembly and installation. Components, materials, and equipment shall conform to standards and specifications listed in Table 14-1 of this code or equivalent International Standard(s) approved by the Authority Having Jurisdiction and other national consensus standards applicable to plumbing systems and materials. Where such standards and specifications are not available, alternate materials and equipment shall be approved in accordance with Section 301.2.

724.1 System Design. Vacuum waste drainage systems shall be designed and installed in accordance with the manufacturer's installation instructions. A vacuum waste drainage system shall include a vacuum generating system, waste collection center, piping network, vacuum valve and control components used to isolate the vacuum piping network from atmospheric pressure and to collect waste at its point of origin. Where a vacuum system provides the only means of sanitation, duplicate vacuum generating equipment set to operate automatically shall be installed to allow the system to continue in operation during periods of maintenance.

724.1.1 Vacuum Generating System. The vacuum generating station shall include vacuum pumps to create a constant vacuum pressure within the piping network and storage tanks. The discharge from the tank shall be through an airgap in accordance with Table 6-3. Operation of pumps, collection tanks and alarms shall be automated by controls. The vacuum pumps shall be activated on demand and accessible for repair or replacement. The vent from the vacuum pump shall be provided for vacuum pump air exhaust, and shall be of a size capable of handling the total air volume of the vacuum pump.

724.1.2 Waste Collection Center or Storage Tanks. Vacuum collection center or storage tanks shall be of such capacity to provide adequate storage of waste to prevent fouling of the system. Such collection or storage tank shall be capable of withstanding 150 percent of the rated vacuum (negative pressure) created by the vacuum source without leakage or collapse. Waste collection center or storage tanks shall be accessible for adjustment, repair or replacement.

724.1.3 Piping Network. The piping network shall be under a continuous vacuum and shall be designed to withstand 150 percent of the vacuum (negative pressure) created by the vacuum source within the system without leakage or collapse. Sizing the piping network shall be in accordance with the manufacturer's installation instructions. The water closet outlet fitting shall connect with a piping network having not less than a 40mm (1-1/2 in.) nominal inside diameter.

724.1.4 Vacuum Interface Valve. A normally closed vacuum interface valve shall be installed to separate the piping network vacuum from atmospheric pressure. A control device shall open the vacuum interface valve where a signal is generated to remove waste from the plumbing fixture.

724.1.5 Control Components. Where a pneumatic signal is generated at the controller, a vacuum from the system to open the extraction valve shall be designed to operate when sufficient vacuum pressure exists to remove the accumulated waste. Each tank shall incorporate a level indicator switch that automatically controls the discharge pump and warn of malfunction or blockage as follows:

(1) Start discharge;

(2) Stop discharge;

(3) Activate an audible alarm when the level of effluent is usually high and

(4) Warning of system shut-down when tank is full.

724.2 Fixtures. Fixtures utilized in a vacuum waste drainage system shall comply with referenced standards listed in Table 14-1 or equivalent International Standard(s) approved by the Authority Having Jurisdiction. All components shall be of corrosion resistant materials. The water closet outlet shall be able to pass a 25mm (1 in.) diameter ball and shall have a smooth, impervious surface. The waste outlet and passages shall be free of obstructions, recesses, or chambers that would permit fouling. The mechanical valve and its seat shall be of such materials and design to provide a leak-free connection when at atmospheric pressure or under vacuum. The flushing mechanism shall be so designed as to ensure proper cleansing of the interior surfaces during the flushing cycle at a minimum operating flow rate. Mechanical