

9.8.2.6.4 Open bottom can intakes (Figure 9.8.10)

The minimum liquid level is considered a minimum operational level. When the pump is started, the minimum liquid level will reduce momentarily until the pump flow velocity is achieved. The intake piping must be large enough to limit draw down below the recommended minimum suction level to a period of less than 3 seconds during start-up.

Open bottom can intakes with flows greater than 315 l/s (5000 gpm) per pump require a model test.

Example 1 - This pump intake configuration is particularly effective when liquid elevations (pump submergence) is limited. Flows through a horizontal suction header with velocities up to 2.4 m/s (8.0 ft/s) can be effectively directed into a vertical turbine pump by use of a 90° vaned elbow. Intake model tests for pump flows above 315 l/s (5000 gpm) are recommended.

The 90° turning vane inlet diameter (D) shall be sized to limit the inflow velocity to 1.5 m/s (5.0 ft/s). Attachment of a 90° vaned elbow to the horizontal header is recommended to provide hydraulic thrust restraint. Caution is necessary when using this intake configuration in liquids containing trash or crustaceans that attach to the turning vanes.

Example 2 - The vortex suppressor and pump are an integral assembly which can be removed for repair, cleaning and inspection. A vortex suppressor is necessary to break up abnormal flow patterns ahead of the pump suction bell. For vertical turbine pumps with rated flows less than 315 l/s (5000 gpm) the maximum horizontal header velocity is 1.8 m/s (6.0 ft/s) and the maximum riser velocity is 1.5 m/s (5.0 ft/s). The installation must allow the pump to hang centered in the vertical riser pipe.

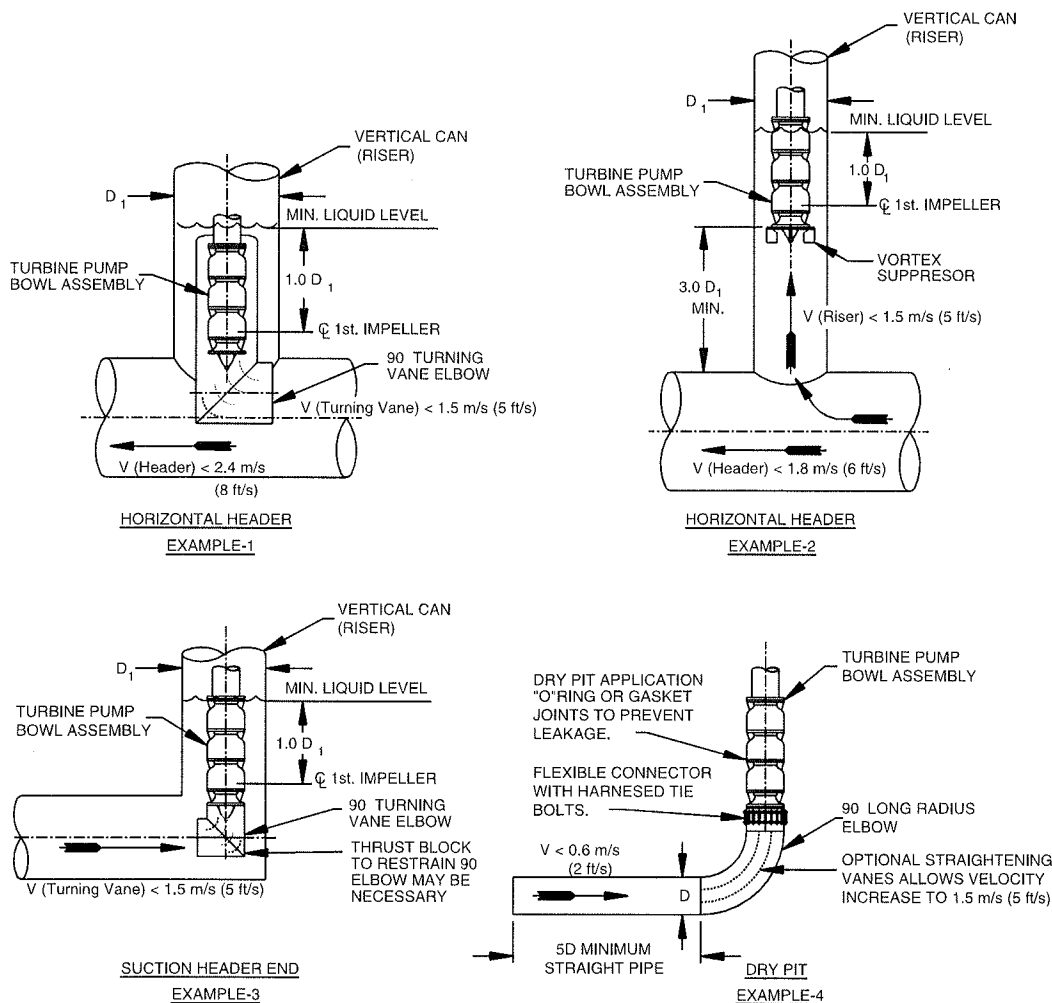


Figure 9.8.10 — Open bottom can intakes (pumps less than 315 l/s [5000 gpm])