System Configuration (Continuous Filtration)

Figure 2-1. Schematics of the continuous filtration system. Black, blue, and green lines represent slurry/filtrate, cooling water, and air lines, respectively.

Figure 2-2. Front view of the continuous filtration system.
The major components of the continuous filtration system are the slurry tank, rotary drum filter, vacuum system, and the filtrate tank (see Figure 2-1, Figure 2-2, and Figure 2-3):

- The slurry is mixed in the slurry tank by a stirrer and recirculation induced by the slurry pump. The slurry pump also draws the fluid from the slurry tank into the filter basin (if valve V1 is open).
- The vacuum pump creates pressure drop across the filter surface to induce the filtrate flow. The filtrate mixed with some air is then pulled into the filtrate separator, which is simply a vertical tank. In this tank, gravity pulls the filtrate downwards and the vacuum pump pulls air from the top of the tank. The filtrate leaves the separator through its bottom and is collected in the filtrate tank.
- Air leaves the separator through its top and is pulled into the vacuum pump.
- The vacuum pump discharges air mixed with cooling water into the buffer tank, in which air and water are separated by gravity.
- Air is then used for the blowback on the filter that pushes the solid cake off the drum surface. The cake should be collected in a sample tray.

Note: The inner diameter of the filtrate tank is 13.5 inches.