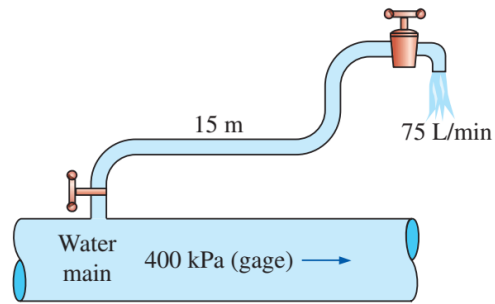
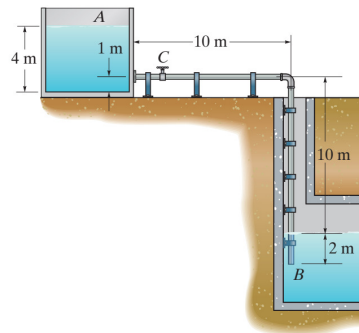


**8-141** A water fountain is to be installed at a remote location by attaching a cast iron pipe directly to a water main through which water is flowing at  $20^\circ\text{F}$  and  $400\text{ kPa}$  (gage). The entrance to the pipe is sharp-edged, and the 15-m-long piping system involves three  $90^\circ$  miter bends without vanes, a fully open gate valve, and an angle valve with a loss coefficient of 5 when fully open. If the system is to provide water at a rate of  $75\text{ L/min}$  and the elevation difference between the pipe and the fountain is negligible, determine the minimum diameter of the piping system. *Answer: 1.92 cm*

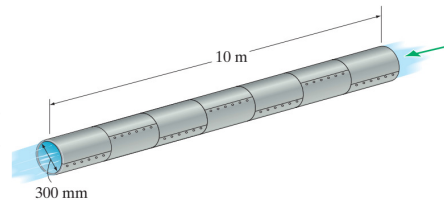


**FIGURE P8-141**

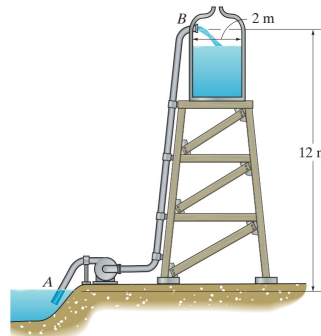
**F10-5.** The tank is filled with water at a temperature of  $20^\circ\text{C}$ . When the gate valve at  $C$  is opened, determine the flow through the 80-mm-diameter cast iron pipe. Include minor losses at the flush entrance, fully opened gate valve, and  $90^\circ$  elbow.



**10-6.** If air at a temperature of  $40^\circ\text{C}$  flows through the smooth circular duct at  $0.685\text{ m}^3/\text{s}$ , determine the pressure drop that occurs over a 10-m length of the duct.



**10-14.** A cast iron pipe having a diameter of 100 mm is used to fill the cylindrical tank with water at  $T = 25^\circ\text{C}$ . Determine the required power output of a pump necessary to fill the empty tank to a depth of 3 m in 6.5 min. The pipe has a total length of 50 m.



**10-49.** If the length of the 150-mm-diameter commercial steel pipe from  $A$  to the pump and from the pump to  $B$  is 8 m and 50 m, respectively, determine the discharge generated by the 25-kW pump. Also, draw the EGL and HGL for the pipe from  $A$  to  $B$ . The water temperature is at  $20^\circ\text{C}$ .

