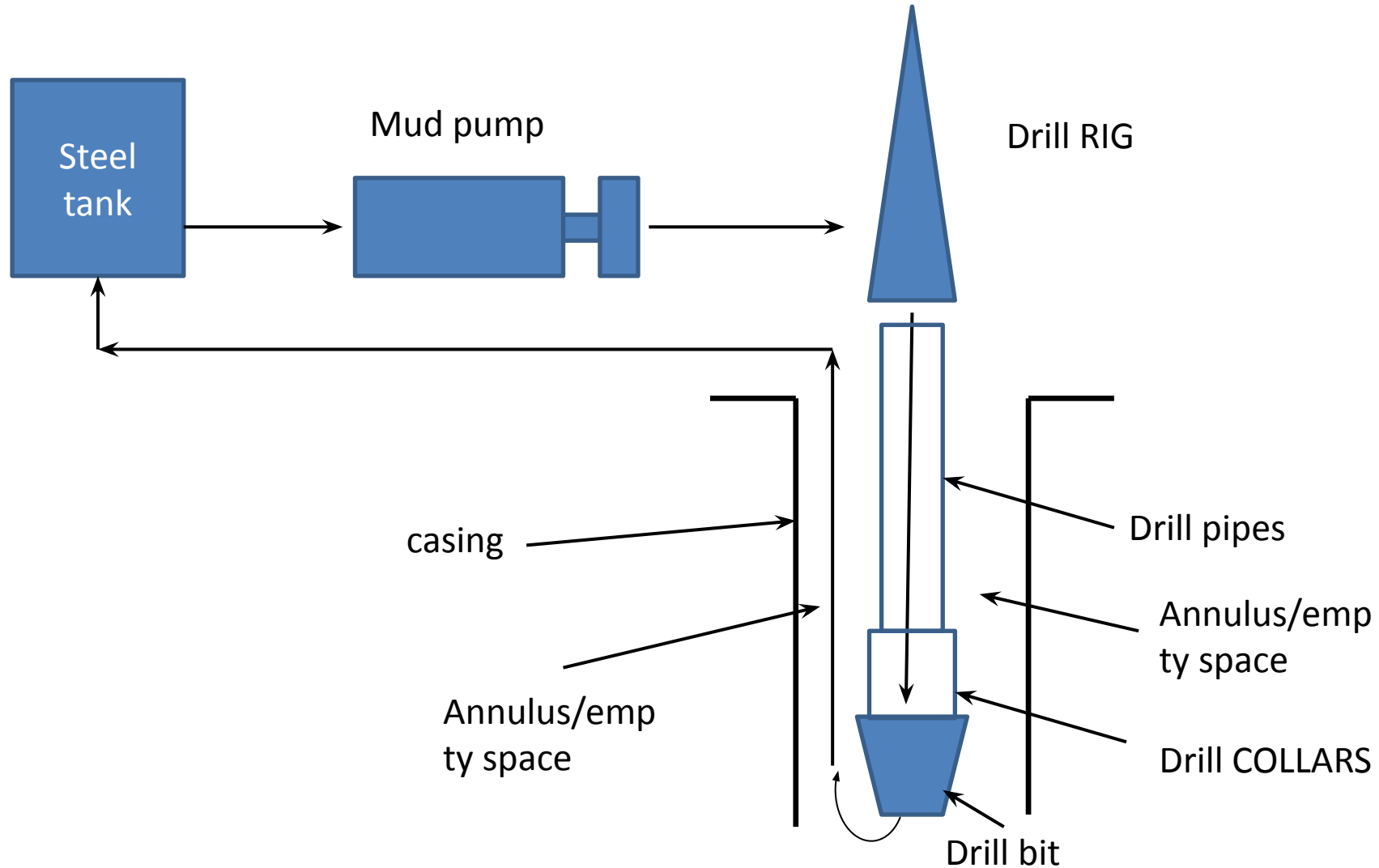


Circulating system. Drilling mud travel



Circulating system. Drilling mud travel

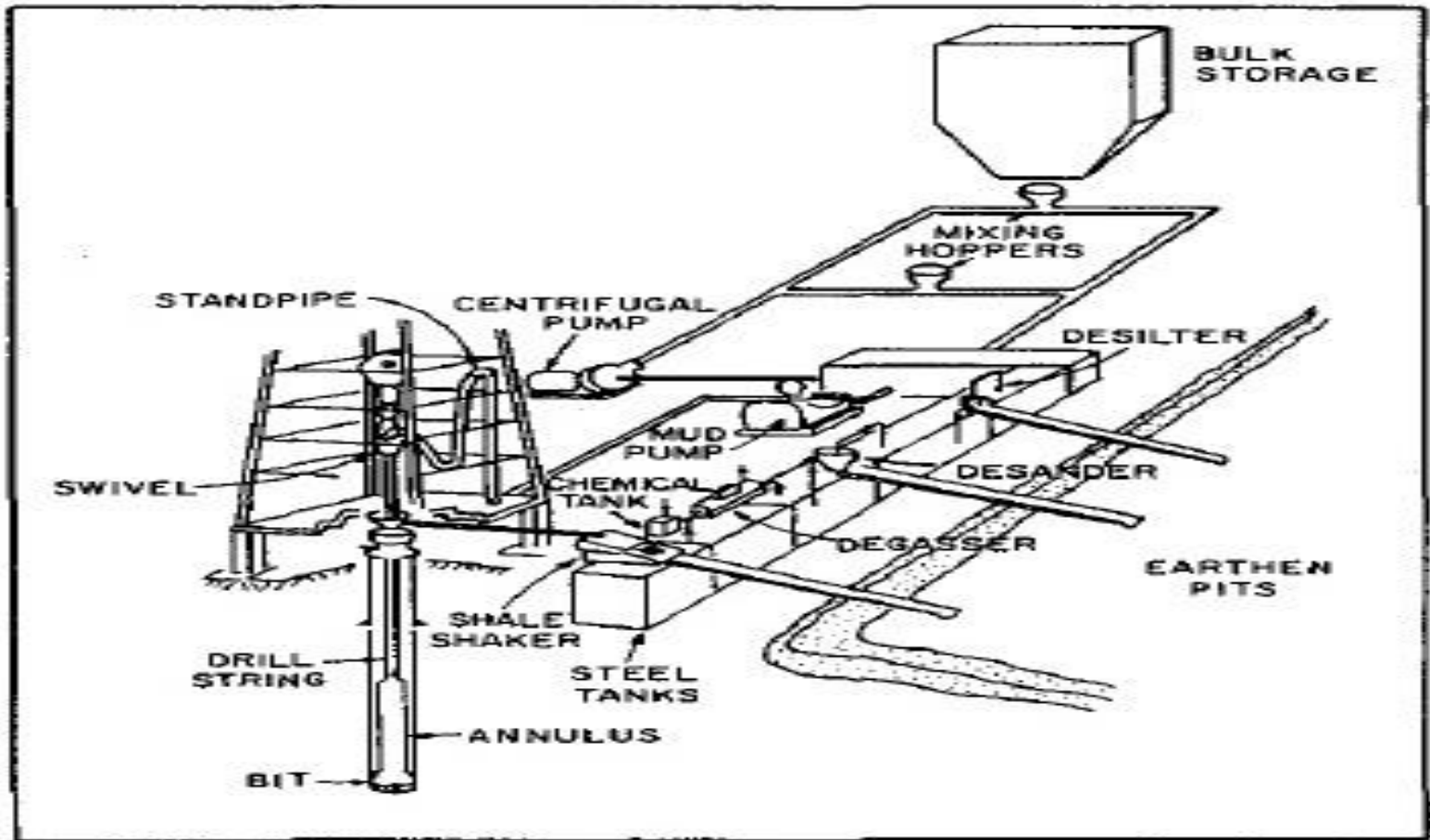


Fig. 1.23 – Schematic of example rig circulating system for liquid drilling fluids.

Source: Applied Drilling Engineering. Bourgoyne & Young

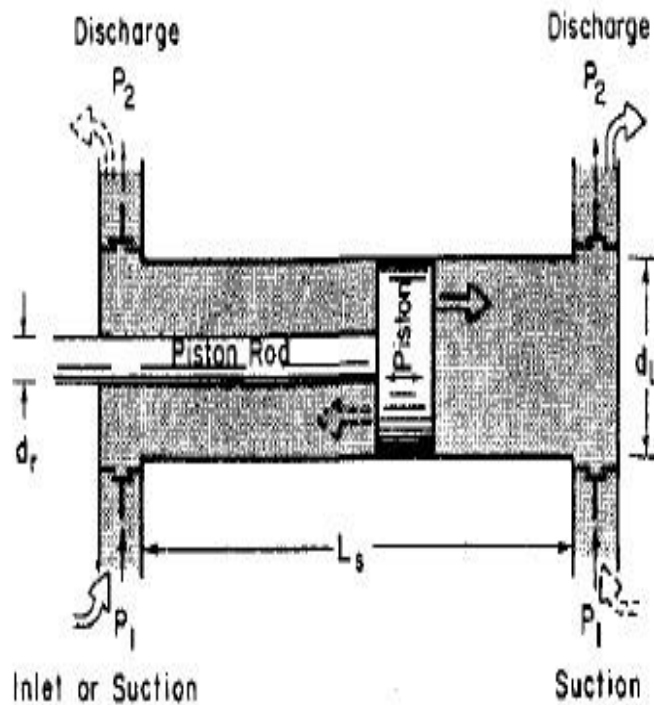
Advantages of positive displacement/duplex or triplex pumps:

- 1) Injection of large solid particles in the mud;
- 2) maintenance
- 3) ability to operate at any pressure and flow rate.

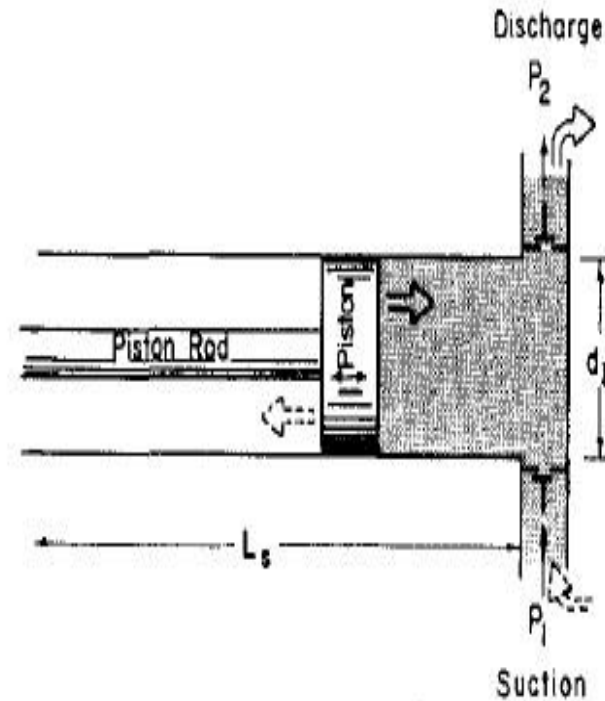
Circulating system

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APPLIED DRILLING ENGINEERING



(a) Double-acting (duplex) design.



(b) Single-acting (triplex) design.

Source: Applied Drilling Engineering. Bourgoyne & Young

Problem 3.

The liner diameter of the duplex pump is 16 cm and the piston rod diameter is 6.5 cm. The stroke length is 42 cm and the volumetric efficiency is 80%. Find the pump factor m^3/stroke .

Problem 4

A drill string has a pipe section with a length of 1000 meters, outer diameter of 12.5 cm and wall thickness of 8 mm. The pipe section is connected to the drill collars from the bottom with an outer diameter of 15 cm, inner diameter of 9 cm and length of 200 meters. The borehole diameter is 20 cm. Determine the number of pump cycles to inject the drilling mud from surface to the drill bits and from drill bits back to the surface by considering that the borehole remains stable. Use the pump factor which is found in problem 3.