

Free-Fall Funnel

Scientific Application

The Free-Fall Funnel (FFF) is free-fall deployed to the seafloor before the bit is pulled out of the existing hole. This system provides a quick and low-cost method to reenter the hole to facilitate bit and bottom-hole assembly (BHA) changes.

Tool Operations

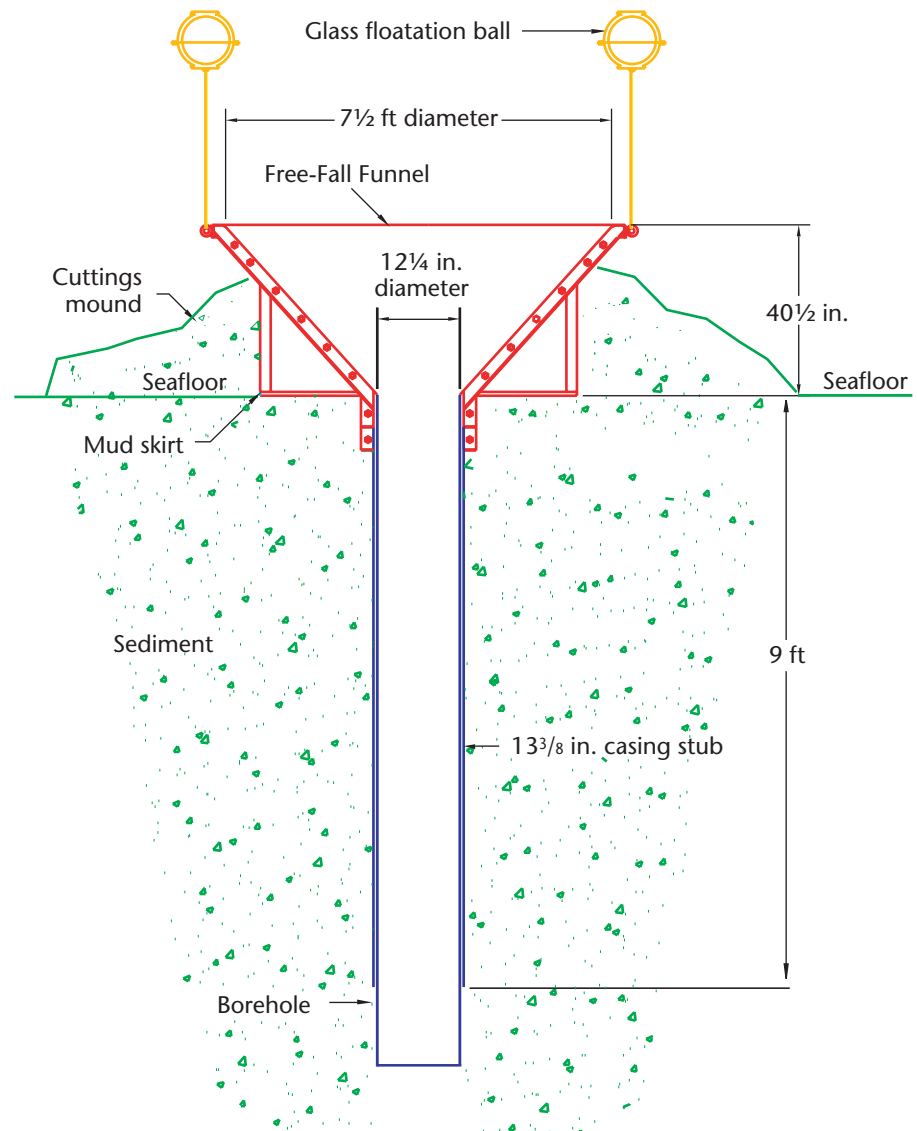
The FFF is split into two halves to permit installation around the drill string at the moonpool while the BHA is still in the hole. The FFF is equipped with a seafloor support plate and a split 9 ft (2.7 m) stub of 13³/₈ in. casing. Glass flotation balls can be attached to the FFF to aid in location and reentry using the underwater TV camera and sonar system.

Design Features

1) Continued Drilling Option

The FFF provides a quickly deployed and low-cost means to reenter an open borehole.

Benefit: Permits coring/drilling to continue in a hole where a standard reentry cone was not planned, but a bit or BHA change is necessary.



Schematic of a FFF deployed in sediment. After a hole is drilled in sediment, a FFF can be installed to assist in reentry. Glass flotation balls may be added to enhance hole relocation using sonar.

2) Simplified Assembly and Deployment

The split design of the FFF allows for quick and easy assembly and deployment.

Benefit: A FFF can be installed around a drill string in ~2 hr while the bit is still in the hole.

3) Borehole Alignment and Support

A short ~9 ft long stub of casing keeps the FFF aligned with the hole and a support plate provides a seafloor landing surface.

Benefit: The alignment of the FFF casing stub with the hole helps ensure that the bit will follow the existing hole rather than inadvertently start a new hole in soft sediments. The seafloor support plate helps keep the FFF above the seafloor despite soft sediments or upper hole enlargement.

Specifications

Diameter at the Top of the Cone
7.5 ft (2.28 m)

Height above the Seafloor Support
3.38 ft (1.02 m)

Cone Throat Diameter
12¼ in. (0.32 m)

Casing Stub Diameter
13⅜ in. (0.33 m)

Casing Stub Length
9 ft (2.7 m)

Assembled Weight
~2,000 lb (0.9 metric tons)



FFF with a 9 ft casing stub installed over the drill string and ready to drop in the moonpool.

Limitations

The FFF is not capable of supporting a casing string.

The FFF is not intended for use when reentry is considered likely during subsequent legs.

If the top of the borehole is washed out or the sediments are not consolidated enough for adequate support, the FFF can occasionally sink out of sight.

The FFF provides no guarantee that a collapsed borehole can be located and reentered.