



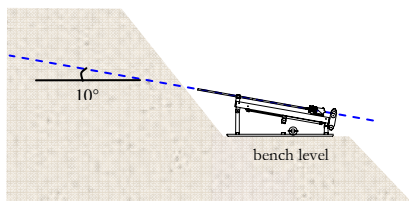
drilling & geotechnical

HORIZONTAL DRAINS

Horizontal drains performed for accommodating underground seepage that relief out water from the slope bank failure zones. This will increase the stability of slope.

Typical our Scope of Works

- Horizontal Drilling works for drain holes will use hydraulics rotary drilling equipment that suitable to the soil condition at project site and will be able to meet high productivity in achieving the works target.
- Installation of drain pipes and accessories into drain holes.
- Provide skilled labors for drilling works that understand all Safety requirements for this Particular works and as a standard practice in the project sites.
- Provide accommodations for the labors and transportation facilities including in Mobilization and Demobilization.
- All Other preparation works before commencing the works up to hand over of the works.

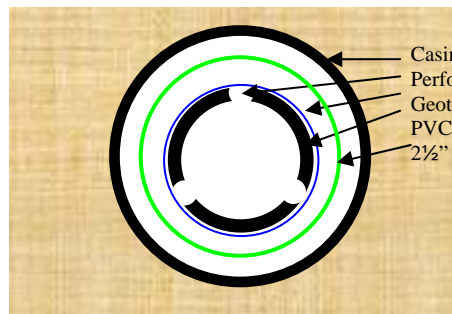


Technical Specifications

- The drain holes diameter is 89mm ~ 150mm
- The Length of drain holes could be achieves up to 150 meter length
- Drilling inclination could be 10 degrees upward direction.
- The drain pipe could be PVC 1½" pipe size.
- The PVC pipe shall be perforated with 8mm holes or slotted in three rows with 100mm centers spacing except at area from failure lines to finished fill slope surface the outlet end is not perforated.



- The perforated section of pipe shall be wrapped in geotextile non-woven material to provide a filter to exclude soil particle from the pipe
- The 500mm outlet end the pipes shall be grouted A.



Drilling Method

Drilling equipment shall be suitable for the soil strata to be encountered. The drilling works can be performed with water flush system. Before drilling start, it is important to position the rig properly. It must stand on firm bearing and lock the position by anchor the rig into the ground by steel bars. Sand/soil bags might use to align the bench surface. To ensure proper alignment, mast shall be checked from two directions before and throughout drilling work. As the drilling progresses, a suitable length of casing shall be installed into the hole to prevent soils collapsing.

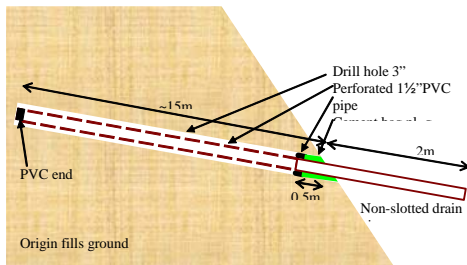
The rig position is located on bench level. Drilling mast direction is adjustable as required angle of drilling path. Any additional platform or support might be required if the actual bench width is less than our rig length.



Drilling can start using drilling bit 2½" (OD 73mm) diameter size with guide pipe to maintain hole alignment. Drilling bit will drive by 1½" drilling rod which is transferring torque and force from drilling machine. Suitable length of 2½"-3" casing will install to protect hole collapses. The required length of casing might be varies depend on the soil stability encountered. The sufficient casing length will be provided onsite to allow full casing drilling operation. We have to check the position of drilling rig during drilling works by checking the mast direction. The hole protection casing will installed according to drilling progress. Drilling can be stopped after reach design depth.

Cleaning

Upon completion of the excavation, the bottom of the trench will be cleaned by water flush. The process will continue until the sediment mud or sand clean out from the hole.



Drain Pipes Installation

Pipe perforation, geotextile wrap and bottom cap will be prefabricated on site. Drain pipe inserted into the hole after bottom hole is cleaned. Pipe installation must be done slowly and carefully to prevent excessive damage to the hole wall. When the pipe installed at required length, a cement bag and/or cloth will inserted into the hole to plug the gap between the pipe and soil in order to prevent the following cement grout plug to enter the perforated zone. The cement grout will installed at last 500mm drill section from ground surface.



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