

Summary of Standard Drilling Techniques

Technique	Description of Standard Technique (different diameters available on request)	Standard Monitoring Well Installations (different diameters available on request)	Appropriate Situations for use of Technique/Depth Capabilities
Hand Augering	Use of manually operated augers, shells and casing (if required) to install narrow diameter (up to 100mm) boreholes for the purposes of soil sampling and well installation for gas and groundwater monitoring and sampling.	32mm OD 63mm OD Installed in open or cased borehole	This technique is ideal for investigation locations which are inaccessible with drilling rigs and where drilling depths are relatively shallow (up to 5-10m depending on the nature of the geology).
Window Sampling (Portable)	Use of hand held electrically powered equipment to install narrow diameter (up to 70mm) boreholes for the purposes of soil sampling and well installation for gas and groundwater monitoring and sampling. Steel tubes with cut-out sections for sampling are driven into the ground by a breaker hammer and extracted by the use of a hydraulic lifting device.	32mm OD Installed in open borehole	This technique is ideal for investigation locations which are inaccessible with drilling rigs and where drilling depths are relatively shallow (up to 5-10m depending on the nature of the geology), but where conditions require the additional power of mechanical equipment.
Window Sampling (Rig)	Use of a small track mounted hydraulic drilling rig (Geotool GTR 790, Geoprobe or Powerprobe) to advance steel sampling tubes by either hydraulic hammer or drop weight assembly. Tubes are extracted hydraulically and by rig mounted winch.	32mm OD Installed in open borehole	This technique is ideal for investigation locations where the additional power of the rig is required to advance and extract the soil sampling tubes. Drilling depths of between 5 and 10m are achievable depending on the geological conditions.
Dual Tube Windowless Sampling (Rig)	Use of a small track mounted hydraulic drilling rig (Geotool GTR 790, Geoprobe or Powerprobe) to advance a dual tube sampling system (outer steel casing and inner windowless sampler lined with PVC sample tube) by either hydraulic hammer or drop weight assembly. Sample tubes are extracted hydraulically and by rig mounted winch and lined samples are removed each metre for soil logging and sampling	32mm OD 63mm OD Installed in open or cased borehole	This technique is used in situations where high quality soil samples are required; where the geological conditions require the borehole to be cased to prevent collapse during drilling and prior to well installation; and where a casing is required to prevent cross contamination between different water or contamination bearing strata. Drilling depths of between 5 and 10m are achievable depending on the geological conditions.

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Hollow Stem Augering	This technique uses a series of connecting flighted augers (205mm OD) with a central hollow core (108mm) to advance a borehole by a rotary action. This technique can be performed by our fleet of multi-purpose hydraulic rigs including the Nordmeyer DSB 0/3 .	63mm OD Installed through hollow central section of augers (cased borehole), or in open borehole if retracting augers leaves open borehole.	This technique is most appropriate to situations where rapid drilling progress within unconsolidated/saturated sediments is required. Drilling depths of between 10 and 15m are achievable depending on the geological conditions.
Shell & Auger Drilling	This technique can be performed by our range of multi-purpose drilling rigs (e.g. Nordmeyer DSB 0/3 , 1/1.5, Wirth Eco1). Rather than the traditional tripod system, our rigs use a combination of solid stem auger drilling (through cohesive sediments) and hydraulically controlled cable percussion drilling (through non-cohesive sediments) to achieve borehole advancement. Temporary steel casing (up to 324mm diameter) is advanced simultaneously to borehole advancement by a hydraulically controlled rotary casing table.	63mm OD Installed in 178mm cased borehole 63mm OD 125mm OD Installed in 219mm cased borehole 63mm OD 125mm OD 160mm OD 250mm OD Installed in 324mm cased borehole	This technique is suitable for drilling boreholes up to a diameter of 324mm within unconsolidated sediments. Drilling depths are dependant on the geological conditions. This technique allows the collection of soil samples from discrete depths and allows accurate logging of the sequence encountered. On reaching the bedrock, this technique can be followed on by rotary drilling through the solid material if required.
Open Hole Rotary Drilling	This technique can be performed by our range of multi-purpose drilling rigs (e.g. Nordmeyer DSB 0/3 , 1/1.5, Wirth Eco1). Rock drilling bits (e.g. tricone, PCD etc.) are used to advance boreholes through bedrock strata in a range of possible diameters. Either water or air (supplied by a air compressor) can be used as a flushing medium. The bit, fitted to the end of a rotary drilling rod, is rotated and advanced at the base of the borehole to the target depth.	63mm OD Installed in 100 to 140mm open borehole 125mm OD Installed in >140mm open boreholes	This technique is used to advance a borehole through solid bedrock strata. It can be used as a stand alone technique if bedrock is at the surface, but more commonly, it is used in combination with Shell & Auger drilling which advances the borehole to the top of the bedrock prior to using rotary drilling. Drilling depths in excess of 50-200m can be achieved using this technique.
Rotary Coring	Information available on request		
Symmetrix	Information available on request		
D-T-H Hammer	Information available on request		