

- A. Confine surface operations to drilling entry point and exit point and the area immediately adjacent to these points. Keep the working area to the minimum practicable for the proper construction of the works.
- B. Take any measures necessary to prevent damage or deterioration of the soil reaction face during the construction of the temporary and permanent works from whatever possible cause, such as ingress of water, softening, corrosive soil or loss of fines from a granular soil.

### **2.3.2 Examination**

- A. The Contractor shall obtain existing utility information, and execute trial pits to locate and confirm services at pit/shaft locations and elsewhere as required.
- B. Preconstruction photographs and pre construction grid survey of surface levels along the length of the proposed tunnel shall be taken by the Contractor.

### **2.3.3 Pilot Drilling and Pipe Installation**

- A. Establish and agree with the Engineer the entry and exit point.
- B. Pre hydrate the drilling mud at least 4 hours before commencing drilling and in accordance with the manufacturer's recommendations.
- C. Drill a pilot hole along the approved profile. Use either a non-distributed magnetic field instrument behind the drill head, or a hard wire system laid alongside the pipe, to provide survey information to steer the drill head. Continuously check the position of the drill head against the design position and adjust using the steering mechanism to maintain the designed profile.
- D. Enlarge the drill hole, where necessary, by reaming to achieve the required hole diameter.
- E. Connect a product pipe to the drill pipe using a purpose built head and swivel, and a pullback pipe.
- F. If pipe buoyancy in the drill hole is liable to occur, fill pipe with water and/or take other buoyancy avoidance precautions as necessary, prior to pull back.
- G. In the event of significant loss of drilling fluid, cease drilling for 30 minutes. Add more drilling fluid with a fixed viscosity and wait a further 30 minutes. If mud fracture or return loss continues provide alternative options for the Engineer's approval.

**END OF SECTION**