

Plow installation of Pipe or Cable

This is a process where by a blade cuts through the earth in a knife like action and a product pipe or cable is fed in and laid down a chute at the rear of the blade or in certain ground conditions such as soft loams and wet clays it is possible to tow conduit into the ground attached to the heel of the blade proceeded by a bullet expander Product diameter is restricted to the width of the Laying via chute and the chute width is restricted by the size and HP of the prime mover Regardless of size or power some ground can require numerous pre rip passes to enable the laying plow to get down to the required depths.

Plow are either Static and Vibratory

Vibratory as the name implies causes the resipicateting of the blade the hydraulically driven offset counter rotating weights .

Pipe and Cable Ploughing is normally the most economic way of installing product over long distances. It is normally considered minimum disruptive technique the outcomes deepened on the style of plow and the site conditions. In 2006 the Australian Society of Trenchless Technology formally recognised ploughing as a trenchless technology. Trenchless is certified in traffic management organisation and designs its own traffic management plans.

The key benefits are

- Safety no open trench
- Environmental as it is minimally invasive process
- The speed at which the installation takes place
- Cost it is generally the cheapest of all sub installation process's
- Trenchless have been involved in trenchless technology
- Since 1993 Trenchless have been responsible for ploughing untold km of optic fibre and copper communication cable, both nationally and internationally.

Acid Sulphate

Acid Sulphate soils which are Western Australia are a serious problem in relation to contamination of the water table. Certain soil air react with oxygen to form acid sulphate which is then leached into the groundwater. Plowing does not allow this oxidation to take place.

- Cost saving of approximately 20% and more dependent on quantity
- Requires considerable less site preparation and reinstatement
- Provides natural soft bed eliminating the need transportation

Benefits of Plowing

- Rapid installation 2 step process 2-4000 meters per day and lay sand
- Uses between 15 -25% of environment polluting fuel
- Minimizes environmental damage to habitat does not produce acid sulphate soils that pollute ground water
- Much safer process
- no dangers open trench
- More economical cable and pipe can be used as protective layer can be thinner
- There is no backfilling involved to trench does not subside later on

Any cable ends left for future use should have their protective caps installed and sealed with tape prior to burial.

POST-INSTALLATION

Update the as-built drawings, by marking the exact cable installations as quickly and accurately as possible. Use permanent landmarks, i.e., streets, highways, railroads, measurements.

Survey markers etc., as references for distance

Restoration of ploughed surfaces and refilling of holes, joint pits should be accomplished as early as possible. Although the exact placement of steel cable markers will be left largely to the discretion of the field staff, the basic guidelines for the placement of markers are outlined in Appendix-2.

After installation completion, a thorough inspection of the entire route should be carried out to ensure that the completed installation:

- conforms to the engineering plans,
- regulations and general accuracy.
- permanent markers have been installed correctly.
- debris and trash have been removed from the site.
- other instructions specific to the installations have been completed as per specifications
- All deficiencies must be recorded and corrected within a specified time frame.

PLOUGHING IN BUILT UP AREA'S UNDER PULLING

This is a technique developed by Trench & Pipe to allow Cable and Conduit to be ploughed into the ground not normally suitable for plowing operations where other utilities exist in the path of the plough.

Procedure

This method is different from plowing the pipe or cable down the plough leg in this procedure a pit is dug in which the plough leg is lowered. The plough leg trails a cone shaped expansion tool which compacts the ground forming a

smooth tunnel into which the cable is pulled. The expander is toed behind the plough leg via chain which extends up the back of the plough leg to a securing latch.

The cable is linked to the expander via chain and a breakaway swivel which elevates any twisting and ensure that the cable is not stretched due to calibrated brake pin which snaps if the pull force exceeds 45kg.

To reduce drag in longer installations and dry ground Liquid Bentinite can also be pumped down the plough leg into the tunnel formed by the expander this Bentinite also serves a second purpose increase ground heat conductivity reducing heat build in transmission cables.

When crossing a shallow utility within the path of the cable route the utility is exposed by digging an oblong pit 1meter by 3meters North/ South in the direction of the plough. The plough approached the pit and drive straight over the top stopping just short of the exposed utility.

The chain hold the expander is then released and the plough leg is then raised the machine moves forward and the plough leg is then re lowered in front of the obstacle /utilities were the chain is then threaded under the Utility and back up the plough leg, the operation then continues as normal. This Technique allows plowing to be used in Brownfield areas normally not suited to plowing.

Executive Summary

The most advanced and economical way of laying cable/pipe in the soil The system was developed to enable the carefully laying of cable and pipe in the ground up to 140 mm diameter and up to a depth of 1500mm along with danger warning tape and or plastic guard barrier.

COMPARISON OF OPEN TRENCH VERSUS PLOUGHING

After the cable it is laid, the cable/pipe lies free and loose at the base of the hole. The trench is then wheel rolled closing the cabling slit from above to within just half of its size. The soil creates a bridge over the laid cable/pipe. falling rocks do not damage the cable/pipe.

They sit on top the pipe with only their own weight. The support bridge protects the laid cable/pipe. Even if the cabling slit is driven upon by the heaviest of vehicles, the laid cable/pipe is not affected. A sand bed is not required and the fine sand practical's are washed down and around the cable to provide a soft bed.

Cabling laying by open Trench

In an open trench Rocks falling onto the pipe when the trench is filled exert a surface pressure onto mass lying on top is approximately 6 kg). This surface pressure can be up to 4 times the allowable value.

As it is hard to evenly compact a narrow trench it is common for the backfilled area to sink weeks or months afterwards.