

## Company Directive

### ENGINEERING SPECIFICATION EE SPEC : 53/1

#### Relating to Guided or Directional Boring

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**Approved by**



**Policy Manager**

**Date**

19 December 2017

*All references to Western Power Distribution or WPD must be read as National Grid Electricity Distribution or NGED*

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## **IMPLEMENTATION PLAN**

### **Introduction**

This Engineering Specification deals with Western Power Distribution (WPD's) requirements for guided and directional boring equipment. This specification will be used across all areas of the Company.

### **Main Changes**

This specification has been updated to reflect the products currently required by the business.

### **Impact of Changes**

None - This Engineering Standard will enable the Purchasing section to tender.

### **Implementation Actions**

None

### **Implementation Timetable**

This Standard Technique can be implemented with immediate effect

## REVISION HISTORY

Document Revision & Review Table		
Date	Comments	Author
December 2017	<ul style="list-style-type: none"><li>• General; addition of a guided bore training manual in compliance list.</li><li>• New section added “7.0 ENVIROMENTAL PROTECTION”. Based on industry best practice.</li></ul>	Richard Summers/ Stephen Mullens

## **1.0 GENERAL**

This term is used to describe the installation of a cable system without the use of open cut trenching installation methods. The term is also used to describe both the “wet” and dry” guided boring methods available. In the case of a high voltage cable, the cables shall be installed in duct products that comply with the ESQCR. Low voltage cables may be installed without duct subject to agreement of WPD plc.

The term “wet” is used to loosely describe a type of guided boring systems, which use drilling fluids (Bentonite slurry) to create the tunnel and carry the finer particles back to the start or launch pit. Whereas the “dry” system is used to loosely describe a system which does not require the use of drilling fluids but uses compressed air and a small amount of lubricant to create the tunnel.

Contractors that use either of these types of guided boring system when undertaking projects for WPD shall comply with all relevant legislation, details provided in Appendix A

Every effort shall be made to locate ALL underground services before starting any form of guided or directional boring. Copies of notices and responses from all utilities including WPD shall be held on a file for each project and shall be available for inspection on demand by WPD. Where deemed necessary by WPD, or in highly congested areas the location of all underground services could include the use of 3D mapping of the immediate guided boring area to ascertain the exact location of all underground services. It shall be the responsibility of the guided boring contractor to ensure that at no time will the guided bore infringe the safety clearances of the other underground services, watercourses, railway lines and the like.

## **2.0 EQUIPMENT**

The drilling machine selected must be suitable for the operations for which it is to be used, taking into account the size of cable duct, the bore length, likely ground conditions, the site layout and environmental considerations. A current test, inspection and service record for all drilling machinery shall be available for inspection on demand by WPD. A notice confirming that the equipment is safe to use shall be provided to the WPD Engineer prior to commencement of work.

## **3.0 DRILL HEAD LOCATION**

The system to be used must have a location accuracy of at least 5% at working depth, and preferably incorporate a MWD System (measurement while drilling) to provide the drill operator with continuous information.

#### 4.0 COMMUNICATION

The drill operator should be in radio contact with the ‘walk over’ locator operator. Alternatively a “wire-line technique” must be used.

#### 5.0 ELECTRICAL CABLE STRIKE SAFETY SYSTEM

All records of existing Utility plant are to be held on site, read and understood by the location operator, and a full survey of the bore path is to be carried out to check the information shown on the plans.

Any Directional Drilling machine used must be fitted with a full Electrical Cable Strike Safety system consisting of metal mesh mats bonded securely to the drill rig, audible or visual alarm and specific PPE as below. This must be operable and tested prior to use and must be in service during all operations of the machine. The meshed area shall be surrounded on all sides by NRSWA signing and guarding.

#### 6.0 PERSONAL PROTECTIVE BOOTS AND GLOVES (PPE)

The drill rig operator must wear electrically insulating boots and gloves capable of resisting 20kV; this is in addition to standard PPE.

The ‘walk-over’ locator operator must also wear a visor and electrically insulated boots capable of resisting 20kV to guard against the risk of step potentials that may exist in the ground above the location of a cable strike.

#### 7.0 ENVIROMENTAL

If drilling under environmentally restricted sites, rivers, streams, SSSI’s etc., then so as to avoid surface heaving “Frac-out” the depth of the bore must be:-

- For a “compaction reamer” 10 x the bore diameter below the lowest point on the site; river bed etc.
- For a “cutter reamer” 7 x the bore diameter below the lowest point on the site; river bed etc.

Drilling fluids used **must** be **Biodegradable** and **Non-Toxic**. Prior to drilling appropriate geological surveys must be completed and reported back to WPD; core type sampling boreholes only are acceptable to establish local ground conditions, the National Geological survey is acceptable only for tendering for work, where practical boreholes must be completed..

Drilling contractors must carry adequate liability insurance and indemnify WPD for any damage occurring due to “Frac-Out” situations that may arise as a result of these drilling activities.

Contractors' using a "wet" type of guided boring system at no time is there to be any form of leakage into surrounding watercourses from the drilling fluids. The Contractor shall report any such leak(s) to the Environment Agency as soon as practicable and within 24 hours in accordance with ST:EN2A.

Re-fuelling of plant on site will only be permitted from a bunded storage tank or dual skin bowser. Single skin gas oil drums will not be permitted to reduce the risk of land contamination. An adequate supply of absorbent granules shall be kept on site for cleaning of fuel spillages.

## **8.0 BORE DIAMETER**

The bore diameter of the drill must be sized to accommodate the pipe products effectively. Reamer size Recommendations are:-

- Generally, when pulling in smaller diameter product, the size of the reamer should be approximately 1.5 x the outside diameter of the product.
- On pipes that are 250mm or Larger, a reamer of 1.3 times the size of the pipe is normally sufficient.
- In general, best practice is to have a bore volume approximately 50% greater than the product pipe.
- For drill bores that contain more than one pipe product the sum of the pipe products should set the basis of the bore diameter.

### **Example**

To install 2 x 225 mm product pipes and 1 x 180 mm product pipe

Total included product is  $(2 \times 225) + 180 \text{ mm} = 630\text{mm}$

From above: Minimum Bore diameter =  $1.3 \times 630\text{mm} = 819\text{mm}$

## **9.0 LIFTING AND HANDLING**

Current test certificates are to be available for inspection on site for any chain, sling crane and shackle used for lifting operations.

Test and Inspection certificates are to be available for inspection on site for any static or mobile crane equipment.

Crane operators shall hold a valid CITB or equivalent operator certificate appropriate to the category of plant.

## **10.0 WATER SUPPLY**

It is the responsibility of the successful contractor to arrange for a suitable supply of water for their drilling operations. Water must not be taken from Water Authority mains without approval and a licensed standpipe.

Water may not be taken from streams or rivers unless authorised to do so by the Environment Agency. Copies of EA approvals must be provided to WPD and originals kept on site for inspection.

## **11.00 COMPETENCE OF OPERATIVES**

All drill team members shall be trained and assessed for their competence to safely perform their duties. All members of the drill team must understand safety rules and procedures in the event of a cable strike and fully understand any risk areas. Written confirmation of this shall be provided to the WPD engineer, listing all the drill team members, for each job.

## **12.0 SUPPLY OF CABLE DUCT**

The materials to be used shall be SDR11 where pipe diameter is < 250 mm (thick wall) Black (or Red) virgin polymer, medium density polyethylene (MDPE). For pipe diameters larger than this SDR17 (Thin Wall) may be used. All ducts supplied shall comply with WPD EE: 128.

Jointing of ducts must be completed by Fully-Automatic Butt Fusion welding. Appropriately qualified personnel shall undertake jointing only. All joints in the duct system shall be free of beads of polymer on the inside of the duct. Under no circumstances should pipe products of differing material, grade or quality be used.

## **13.0 CABLE DUCT HANDLING**

Coiled cable duct must be dispensed from a proprietary coil trailer for safe handling. Duct ends are to be kept sealed to prevent the ingress of foreign matter, which may subsequently cause damage to cable.

When pulling in pipe products, so as to minimise material ingress during pipe pulling, “sealed shrouded towheads” **must** be used.

## **14.0 COSHH**

COSHH assessments are to be provided for all materials used in the Directional Drilling operations on any WPD contract.

## **15.0 DISPOSAL OF DRILLING FLUIDS**

Surplus Bentonite and other Boring Slurry is to be removed for authorised disposal by the Contractor in accordance with all legislation. Spillage of drilling fluids shall be cleaned immediately to remove a slip hazard, and absorbent granules must be available on site for this purpose.

On completion of the guided boring project the site is to be free of all drilling fluid and other forms of waste from the guided boring operation.

Contractors are urged to implement a holistic process to the environment. WPD would require that drilling fluids are filtered and separated, in such cases Bentonite Drilling Products can be reused and disposed of easily.

## **16.0 RISK ASSESSMENT**

The contractor for each project shall undertake a written assessment. This may take the form of a generic statement but **MUST** be reviewed for job specific risks on every project. A copy of this assessment shall be held on site and a copy provided to the WPD engineer prior to commencement of work.

## **17.0 LAUNCH / RECEIVE PITS**

The contractor shall be responsible for all pits required and for their reinstatement in accordance with the accompanying WPD specification.

Where relevant, the Contractor will be responsible for notices, signing, lighting and guarding excavations until they are either backfilled and reinstated adequately or the Engineer agrees in writing that the responsibility is taken over by WPD. Unless and until the responsibility is taken over, all costs incurred in complying with this requirement shall be at the Contractor's expense.

## **18.0 RAIL CROSSINGS**

When drilling under rail lines provision must be made so that work on site is progressed continuously until the job is complete. In addition the contractor must employ a CM CRE accredited engineer, accredited trackside monitor and profile design engineer.

## **19.0 SUB CONTRACTORS**

Where WPD Term Contractors complete directional drilling as part of the "Term Contract" then this policy applies to the Term Contractor. Drillers sub – contracted to the Term Contractor must be from WPD's list of approved drilling contractors so as to ensure this specialist work operation is completed in the way dictated by this policy.



## **APPENDIX A**

Relevant legislation.

All New Roads & Street Work Act - Codes of Practice.

NJUG Publications including No. 4 - Identification of small buried mains & services.

NJUG Publications including No. 7 - Recommended positioning of utilities mains & plant for new services.

NJUG Publications including No. 10 - Guidelines for the planning, installation and maintenance of utility services in proximity to trees.

Health & Safety Executive Guidance Note No. 47 - Avoidance of danger from buried underground services.

WPD Distribution Safety Rules.

Industry best practice training modules, to include:-

1. Safety and Bore Planning
2. Drill Rod & Tooling
3. Operation & Maintenance
4. Drilling Fluid, Pilot Bore & Pullback

## **APPENDIX B**

### **SUPERSEDED DOCUMENT**

This document supersedes EE SPEC 53 dated March 2000 which should now be withdrawn