

GENERAL REQUIREMENTS FOR THE INSTALLATION OF OPTICAL CABLE IN PROTECTIVE DUCTS

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PURPOSE AND SCOPE

The use of fibre optic cable installed in underground ducts is required for the construction of access loops and end links, to extend the Operational Telecommunications network (OPTEL) to the relevant point of service.

This document provides general guidelines for the installation of 32 mm diameter (nominal) subduct into 100 mm diameter underground ducting, pulling in optical cable, splicing, identifying cable ends and testing the installed cable.

The construction of underground ducting, draw boxes, splice boxes and above ground equipment pedestals shall be constructed in accordance with specification TS 3.8.22.

PART 1 - PROCEDURAL

1 GENERAL REQUIREMENTS

1.1 Contractors

- a) Specific requirement documentation and detailed route drawings will be provided for contractors. In some instances contractors will be involved in the preliminary and final planning processes.
- b) Contractors shall preferably be ISO 9001/9002 accredited and shall have acceptable fully documented and implemented Codes of Practice for the safety of Personnel, Plant, and Road Safety.
- c) The contractor shall also have acceptable, fully documented and implemented Codes of Practice for the testing and cleaning of existing ducting, the installation of sub ducting, the installation of optical cable, fusion splicing and optical testing.

1.2 Ducting and Associated Accessories

- a) In certain circumstances cables will be installed in existing ducting. When this occurs National Grid or its Operational Telecommunications Service Provider will provide sufficient detail on the use of the existing ducts, the type of duct, details of existing occupancy, types of cable etc, if sub ducting is to be installed in existing ducting, and if there are any specific requirements at draw boxes and joint boxes.
- b) All newly constructed underground ductwork, draw boxes, joint boxes, cable bearers, and associated accessories shall be constructed in accordance with specification TS 3.8.22, taking into account the Local Authority and the Highway Authority regulations and requirements where applicable.

1.3 Optical Cable for Ducts

Optical cable for ducts shall comply with the requirements in TS3.8.22 and the relevant BOM 03_22 series document. Cable types and guidance is in particular provided in BOM 03_22B.

2 INSTALLATION OF SUB-DUCT

2.1 Safety

- a) All required road guarding items, warning signs, cones, protection barriers and lighting shall be in place or constructed to the required codes for pedestrian and vehicular traffic before work commences and throughout the time work is taking place.
- b) Explosive Gas/foul air detection shall be undertaken in all duct work at each access chamber, draw box, and joint box prior to any installation work commencing.
- c) Duct work shall be checked for excessive water collection. Water shall be pumped out into the nearest surface water drain, in a manner that will not adversely affect property or vehicular traffic or pedestrian safety.

2.2 Sub Duct Type

All ducts shall comply with the requirements of BOM 03_22A.

2.3 Duct Preparation

The existing duct system shall be checked to ensure it is free from obstructions. If found necessary, the ducting should be rodded, brushed clean and fitted with a suitable draw rope for the installation of the sub-duct(s) to be fitted.

2.4 Sub Duct Preparation

The end of the sub-duct is to be prepared appropriately for the relevant type of pulling grip (cable type of pulling grip, internal threaded type of pulling grip). The sub-duct shall be cut using the correct cutting tools care being taken not to damage the pre-installed cable pulling rope. The cable pulling rope shall be made secure to the plugs of either type of pulling grip to ensure the end of the rope is not lost when pulling in.

2.5 Sub Duct Lubrication

- a) The outside of the sub-duct shall be lubricated if the pull distances and route conditions dictate that lubrication will be necessary. Duct lubricant shall be applied using an appropriate applicator for the sub-duct being used.
- b) The lubrication pump and applicator shall be set up in conjunction with the flexible guide used to protect the sub-duct at the draw box where the sub-duct drum is set up.

2.6 Sub Duct Installation

- a) It is unlikely that sub-duct will have to be pulled in for distances exceeding 600 metres except in special circumstances. The duct work, constructed to BOM 03_22 series is likely to have draw boxes or splice boxes at approximately 250 metre intervals, possibly longer where fibres are installed together with power cables to TS3.08.22.
- b) The sub-duct drum and winch shall be aligned and secured in a safe and satisfactory manner. Snatch blocks and installation wheels shall be attached to anchor irons in draw boxes and jointing boxes to aid the pulling in operation.
- c) The winch rope shall be attached to the sub-duct pulling grips using a non-fused connector.
- d) Sub-duct pulling shall be at a steady pace, the take up winch and pay off drum operators shall be in total communication so that speed control and emergency stopping are instantly possible.

2.7 Jointing and Setting Back

- a) Allowances shall be made for any expected draw back of sub-duct subsequent to pulling. The sub-duct shall be cut back square at the ends using the correct tool for the size of sub-duct, the work being done at draw boxes, turn boxes or other access points.
- b) The ends of the pull ropes are to be joined using acceptable rope splicing methods and the bores of the sub-ducts shall be chamfered using the correct chamfering tool for the size of sub-duct.
- c) The prepared sub-duct shall be joined together using a sub-duct in line connector for the type of sub-duct being used (see BOM 03_22A / TS 3.8.22).
- d) The connector shall be wrapped with adhesive tape to cover the screws and sharp projections prior to installing a wrap around heat shrinkable sealing sleeve over the in line connector and the ends of the sub-duct, working to the manufacturers recommended installation instructions.