



Cable Protection Systems

Installation Guide
V.1 2018

CABLEprotect / MULTIduct™

Introduction



This guide addresses the acceptable methods and details for installation of CABLEprotect ducting & troughing systems.

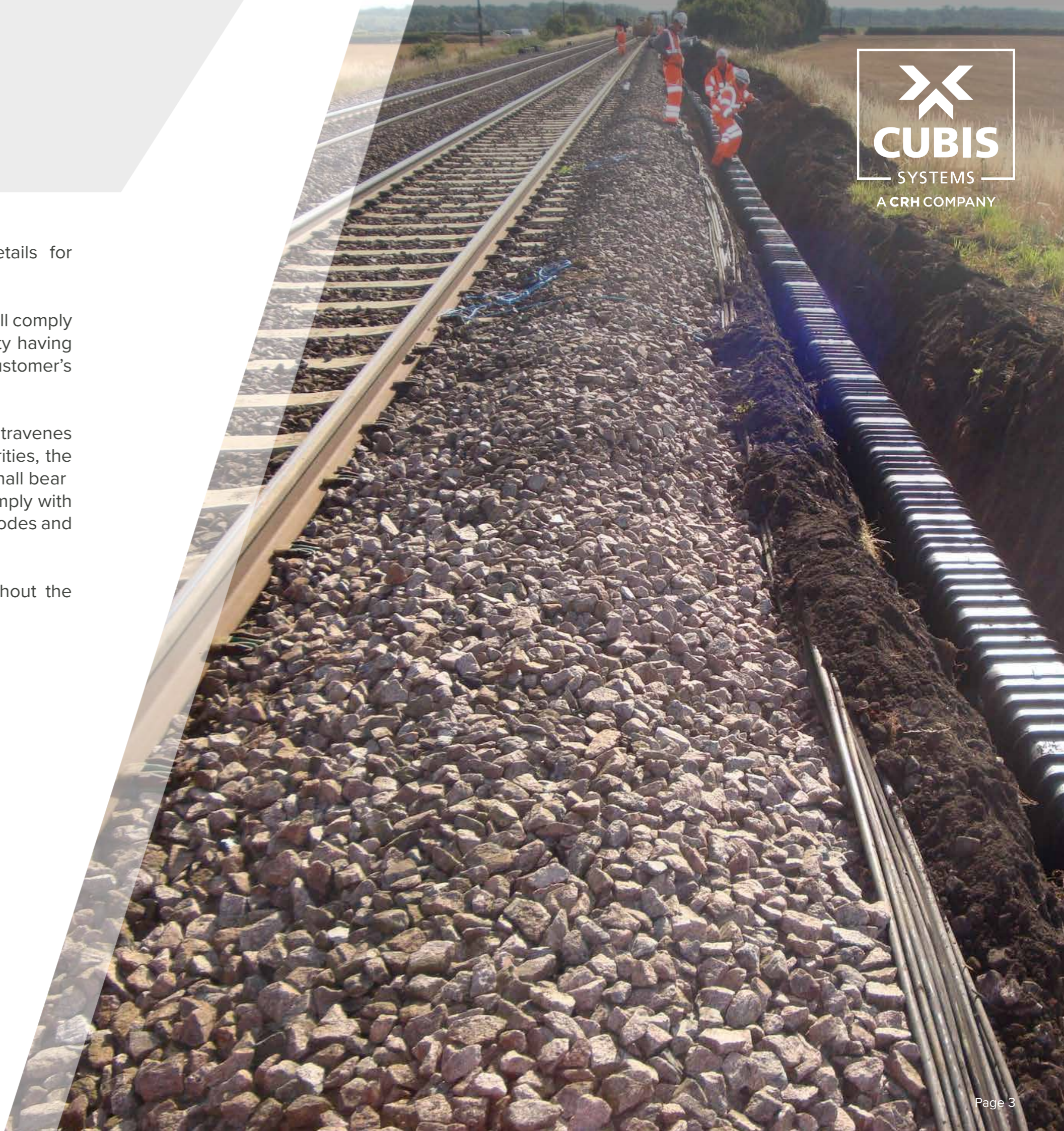
The purpose is to serve as a guideline and the customer shall comply with all laws, regulations, codes and orders of any authority having jurisdiction over the customer and which relate to the customer's installation, maintenance and use of the products.

If the customer's installation or use of any products contravenes any such laws, regulations, codes or orders of such authorities, the customer shall be responsible for the violation thereof and shall bear costs, expense and damage attributable to its failure to comply with the provisions of such laws, ordinances, rules, regulations, codes and orders.

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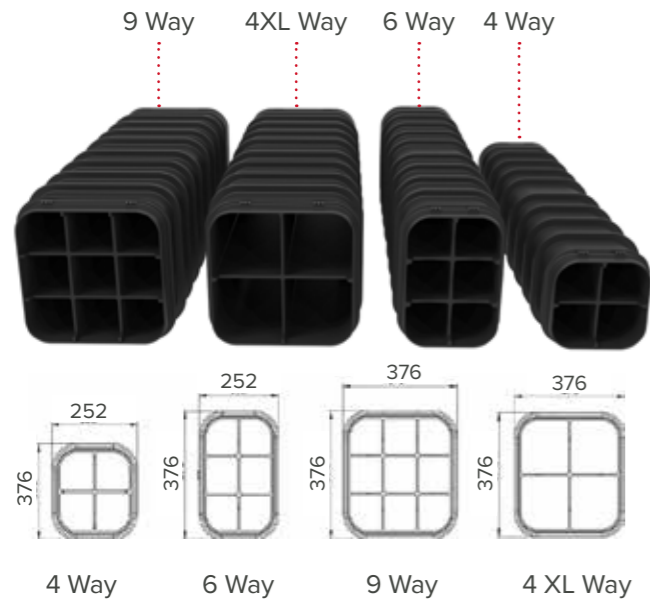
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Overview

MULTIduct™ has been designed to offer a number of cable routing solutions in varying locations and applications. The following information provides guidance for the successful use of this versatile product.

MULTIduct™



MULTIduct™ Micro



Product Description

MULTIduct™ is manufactured from Nitrogen foamed-High Density Polyethylene (HDPE), offering high strength-to-weight properties, resulting in a product that has a high-crush resistance. Duct banks are built by connecting nominal one (1) metre long sections together.

Notes on Application

The MULTIduct™ multiple duct system has been designed for use in the construction of under track or road crossings, bridge crossings and linear routes.

Product	Length (mm)	Height (mm)	Width (mm)	Internal Ducting Space (mm)
4 Way	1120	263	263	110
4 Way LX	1120	384	384	160
6 Way	1120	372	265	110
9 Way	1120	384	384	110
Micro 4 Way	500	154	154	50
Micro 6 Way	500	154	210	50



Health & Safety Notice

In areas where the public have access, the site should be properly signed and guarded in accordance with the State and Territory Regulators, Laws and Codes on Health and Safety.

Additionally, all other safety precautions required by legislation, the customer and as specified by the contract, the Local Authorities, other Landowners and the Police should be observed at all times.

Before excavation takes place, all necessary precautions to locate and protect existing buried services in the location of the ducting & troughing system should be taken.



Scan QR Code for the MULTIduct™ Material Safety Data Sheet (MSDS).

Installation Guidelines

Part A - Installation Method Buried Usage

- 1** Dig trench depth based on MULTIduct™ size used. As a guide, create the trench 75mm wider than the MULTIduct™ unit on each side

The depth required will vary depending on the size of the MULTIduct™ system used and the loading or asset owner requirements (refer to Installation Guide Depth, Appendix A, Table 1, pg. 16).

- 2** At a minimum, MULTIduct™ should be installed onto a level and well compacted base

It is recommended that for better results, a free flowing granular material is used for the base.

- 3** In hard clay or rock installations, a 50mm layer of crushed rock should be used to ensure full support of the MULTIduct™ units is achieved

- 4** MULTIduct™ can be assembled either inside or outside of the trench placed in four (4) metre long sections and placed into the trench

Refer to Part B Assembly Method (pg. 12) for guidance on installation requirements.

- 5** Upon completion of the MULTIduct™ assembly, backfilling can now take place

If the as-dug material meets asset owners requirements, this can be used for backfilling. Otherwise, crushed rock or a similar material should be used in its place (refer to Appendix A, Table 2, page 17).

- 6** If multiple runs of MULTIduct™ are to be used, Cubis recommends that a 50mm gap is present to ensure the backfill can flow between each unit

Bridge Crossing Installation

- 7** MULTIduct™ can be used for bridge crossings in a variety of locations

Please contact Cubis for further details

- 8** The main requirements for bridge crossings is to ensure the MULTIduct™ is adequately supported in one (1) metre intervals

Failing to provide structural support at required intervals will result in broken MULTIduct™ units.



Notes

At a minimum, backfill must be free of large stones (greater than 50mm), lumps, and debris to ensure the finished surface will not be effected by below ground voids.

It is recommended that at the end of each MULTIduct™ run, cabling should be terminated using a single duct adapter (SDA) and standard conduit runs attached.

9 It is recommended that MULTIduct™ is strapped down to ensure it will not move once the installation is complete

10 Cubis does not supply or design support brackets as these must be designed to meet the specific bridge structure requirements

Tunnel Installation

11 MULTIduct™ is ideal for tunnel installations where numerous cables are installed either at the side of the road or a rail track

12 It is recommended that the MULTIduct™ system is encased inside a 200mm concrete surround for additional protection

Contact Cubis Systems for further advice.

Part B - Assembly Method

13 Each MULTIduct™ unit has a socket and a spigot end

14 To start, place a spigot into the socket end lining up the push fit clip system

15 Connect the two MULTIduct™ sections together until they click into place

Alternatively, use a timber block and hammer to force the two MULTIduct™ units together.

16 Check each side of the MULTIduct™ to ensure the two sections are securely connected and no gaps are present around the joints, see figure 1.1 pg. 13

17 If any units become damaged during construction and the damage is limited to the push fit system only, a clip fit solution can be used

Refer to installation image and stainless steel clip to right, see figure 1.2 pg. 13.



(Fig. 1.1)



(Fig. 1.2)



Spigot End

Socket End

Bend & Termination Methods

18 MULTIduct™ can be terminated and bent in a variety of ways depending on the site layout requirements

- a. Finishing into a pit or manhole, see figure 1.3.
- b. As a single duct adapted and used to split off into individual conduit runs, see figure 1.4.
- c. Used in conjunction with supplied MULTIduct™ caps to seal off an end.

For further advice consult the Cubis Specialist Team.

19 MULTIduct™ will allow up to 2° of movement at each joint

For bends greater than 2°, Cubis can fabricate a variety of angles.

20 MULTIduct Mitre Joints allow a 3° bend over a 305mm length

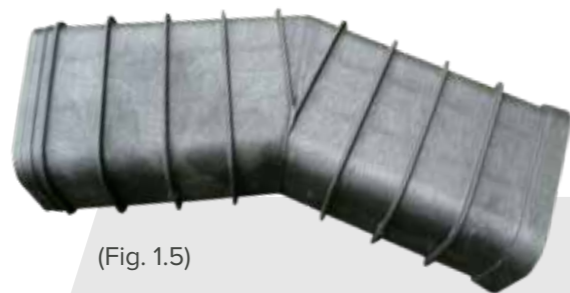
Refer to figure 1.5 below



(Fig. 1.3)



(Fig. 1.4)



(Fig. 1.5)



22 After the MULTIduct™ system is installed, if cable repairs are required the MULTIduct™ sections can be cut apart and a repair kit can be supplied, see figure 1.6

Contact Cubis for further information.



(Fig. 1.6)

Cabling Methods

23 Cables can be installed in the MULTIduct™ system via any preferred method used with standard conduit

24 Three recommended methods are mandrelling, rodding, and blowing.

The chosen method will be dependent upon the application and the installers preference



Appendix A



Installation Depth Guide

MULTIduct™ has been extensively tested in order to determine the maximum loading capacity for each unit section.

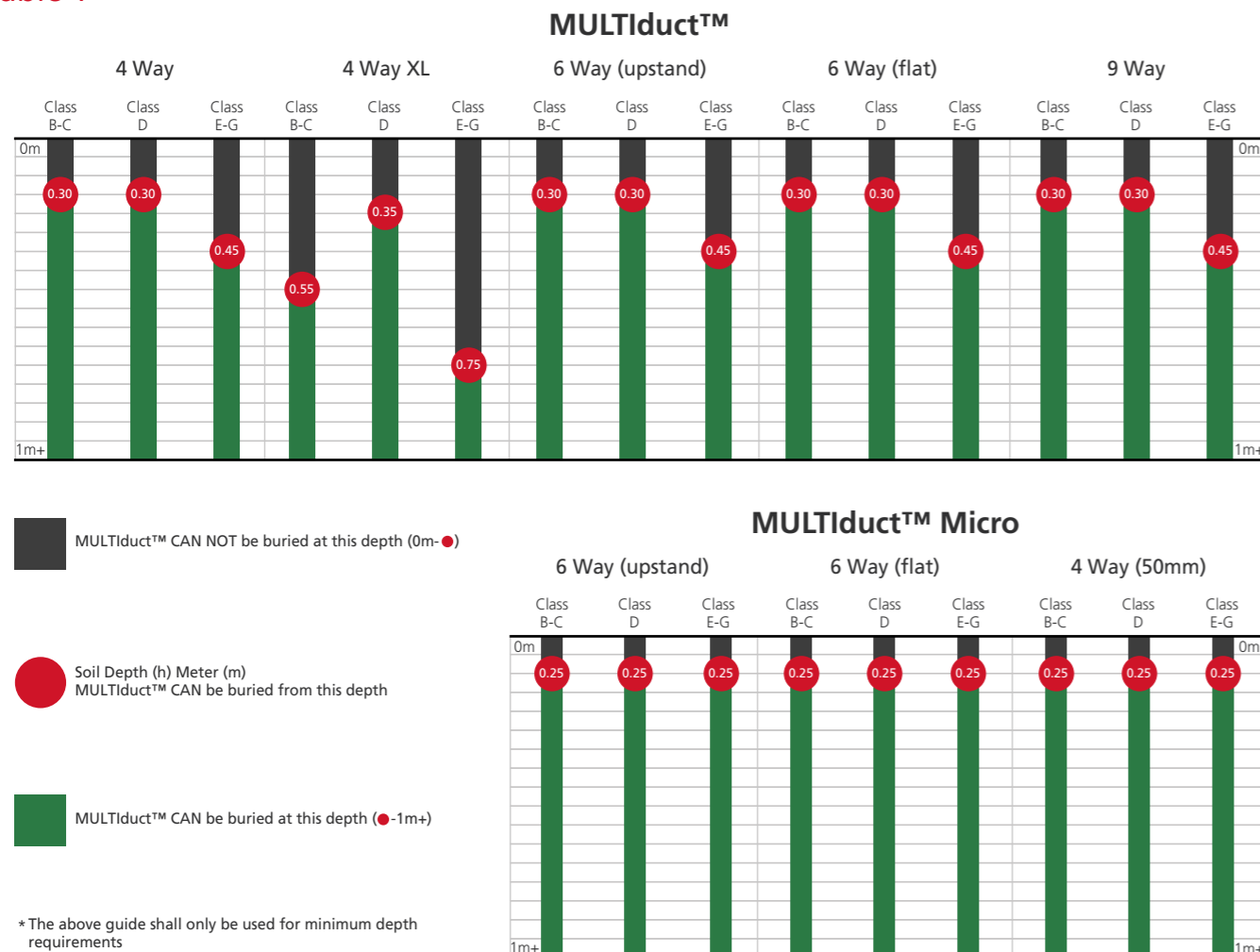
The test results below (see chart) demonstrate the suitability of burying MULTIduct™ for various applications at differing depths in accordance with AS 3996 Load Classification Class B to G.

Note:

Minimum cover for Network Rail projects for all MULTIduct™ units under railway loading will be 0.6m or as per Utility specifications for minimum cover.

For carriageway installations, the minimum required depth for cover shall comply with the guidance notes from applicable Utility Regulations.

Table 1



Backfill Material

Backfill material shall be well graded (not single size particles) with maximum particle size 40mm.

Table 2 gives the typical material types which may be used to comply with relevant road material specifications in each state.

Compaction

Minimum of 200mm backfilling material layer shall be placed on top of ducts before carrying out compaction.

Compaction can be carried out using tamping, ramming, rolling, or vibration, or a combination of all these processes. Usually Tampers (whackers) and rammers can be used for compaction when installing ducting systems in tight spaces.

Table 2

STATE	SPECIFICATION	MATERIAL
QLD	Transport and Main Roads Specifications MRTS05 Unbound Pavements	Type 2.1 or equivalent
NSW	Roads and Maritime Services QA Specification B30 Excavation and backfill for bridgeworks	Select Fill or equivalent
VIC	VicRoads Section 812 - Crushed rock for pavement base and subbase	40mm Class 3 Subbase or equivalent
SA	Department of Planning, Transport and Infrastructure Attachment R15A Pavement material specification, List of products	40mm Class 3 PM 3/40QG or equivalent
NT	Department of Infrastructure Standard Specification for Roadworks	Type 1 or Type 4 or equivalent

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Any alterations or unforeseen issues please consult the Cubis Specialist Team before proceeding.

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