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ISIS practice
For BT people

EPT/OHP/B005

Issue 11, 02-May-2023
Use until 02-May-2025

Published by Access Engineering & Innovation

Privacy- None

Above-ground Distribution

Installation of Security Protection Plant

About this document ...

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Content approval

This is the Issue 11 of this document.
The information contained in this document was approved on 02-May-2023 by Daniel Calver, Innovation Specialist

Version History

Version No.	Date	Author	Comments
Issue 11	02-May-2023	Matthew Wilkins	Section 7 rewritten
Issue 10	10-Nov-2022	Matthew Wilkins	Change of author and approver
Issue 9	03-Mar-2015	Document Manager T	Document migrated onto new platform with no content change
Issue 9	24-Nov-2011	Chief Engineer AEI Technical Documentation team	Change of Author
Issue 8	2-Jan-2009	Chief Engineer AEI Technical Documentation team	Change of author and approverPara. 1.6, 2.2, 3.3, 4.5, 5.4, 6.2.2, 6.3, 7.1.3, 7.5, 8.4, 9 deletedPara. 6.2.6, 7.2.1 revised
Issue 7	25-Jan-2008	Clive Owens	Change of Author
Issue 6	31-Jan-2006	Graham Newell	Annual Review
Issue 5	1-Feb-2005	Graham Newell	Document review
Issue 4	27-Jan-2004	Graham Newell	Reviewed and amended
Issue 3	18-Nov-2003	Graham Newell	Change of Approver/Author
Issue 2	1-Sep-95	Janet Cooper	2nd Issue
Issue 1	1-Jun-95	Janet Cooper	1st Issue
Issue Draft 0a	19-Jul-96	Janet Cooper	Retype in Word

Table of Content

1 *Introduction*

1.1 History

Following an investigation into the security of BT's network, it was found to be necessary to provide increased physical protection for plant at specific locations. This document is a guide to the installation of base, enhanced and high-level security protection plant. The products detailed in this guide can be used to minimise illicit access to BT's network where the motive is to defraud BT or its customers and the result is a potentially incorrect bill. Products at the high level of protection will also resist vandalism and criminal attack.

1.2 Scope

This guide includes new and retrospective installations for plant in external and sheltered locations (a sheltered location is one where plant is installed in a public place, but sheltered from the weather, for example a shopping mall), for above-ground plant from the Distribution Point to the Network Termination Point, it does not include Primary Cross Connection Points, ie cabinets see ISIS EPT/CJT/D020), underground structures (see ISIS EPT/UGP/B012 and underground joints (see ISIS EPT/CJT/C020).

- Individual paragraphs of this document have been marked as obligatory.

1.3 Safety

- The work and working practices described in this publication must only be carried out in strict accordance with the safety standards outlined in the Health and Safety Handbook and detailed in associated ISIS documents.

1.4 Security Protection Level Definitions

Plant has been classified into three protection levels, these are:

- Base level.
- Enhanced level.
- High level.

1.4.1 Base level security protection

This level of plant protection is the least secure. Access to the network transmission medium, connection or termination can normally be gained by hand or by a simple hand-held tool, for example, a screwdriver. Illicit access to the network would not necessarily be evident.

Note: Installation of base level protection has not been detailed in the configuration sections of this document, as all new and existing products provide a minimum of base level protection.

1.4.2 Enhanced level security protection

This is an intermediate protection level. Access to the network is gained by a special tool or key. Illicit access should be evident, for example, the absence of a security seal or damage to plant.

Enhanced security products mainly consist of upgrade kits and hollow pole doors which, when fitted to base level security plant, upgrade the product to enhanced level protection; for example, a Kit Upgrade Enhanced Security BT66 is used to upgrade an existing Block Terminal BT66.

1.4.3 High level security protection

This is a higher level of protection than enhanced. Access requirements are the same as enhanced; however, plant protected at this level should be able to resist an attack for a specified time before illicit access to the network is gained.

For the majority of installation work it should be possible to provide protection at any one of the three security levels. In some situations, however, it will not be possible to provide protection at each level; for example, a block terminal, mounted on a pole, cannot be provided with high level protection.

1.4.4 Security Screws and Seals

Most of the enhanced level security products make use of an integral security screw which can only be unscrewed using a special screwdriver; Wrench Hexagon 25 (i/code 129074). Also coupled to the security screw design is the facility to use a security seal; Seal security 1A (i/code 074886), which once inserted, must be broken in order to gain access to the security screw head. This is an effective means of indicating whether or not an item has been tampered with (for fitting instructions see Section 4.4.2, *Seal Security 1A*).

1.4.5 Keys for Enhanced and High Level Security Products

To minimise problems with the control and issue of keys for enhanced and high level security products, a single key; Key Radial 1A (i/code 095235), common to all products listed in this guide, has been adopted. See *Section 4.4.1*.

1.5 Security plant deployment

Plans should, where possible, be positioned such that it is not easily accessible to the public. For example:

- Install internal block terminals and box connections in secure building risers or equipment rooms.
- Install external block terminals in prominent positions - not in secluded areas concealed from public view.
- Avoid termination points in positions where access can be easily gained without the use of steps or ladders. However, do not, under any circumstances, compromise the safety of BT staff.
- Avoid joints on walls.
- Ensure that external block wiring cable runs cannot be intercepted by a third-party circuit.

2 *Overhead - retrospective installations*

This section details the enhanced and high level protection products that are available for specified plant at retrospective installations.

Plant		**Enhanced**	**High**
Hollow Poles	Type A and C (GRP)	Door Hollow Pole Enhanced Security 1A	Not Offered
	Type B (Galvanised steel)	Door Hollow Pole Enhanced Security 2A	Not Offered
	Type D (Stainless steel)	Door Hollow Pole Enhanced Security 3A	Not Offered

Note: The above list of plant is not exhaustive. If an item of plant to be protected is not listed above it will be generally necessary to carry out the work as a new installation and refit appropriate plant.

2.1 Product descriptions

This section provides a brief description of the security products available.

Unless otherwise stated, all cabling and plant should be installed using standard practices and procedures.

2.1.1 Door Hollow Pole Enhanced Security 1a

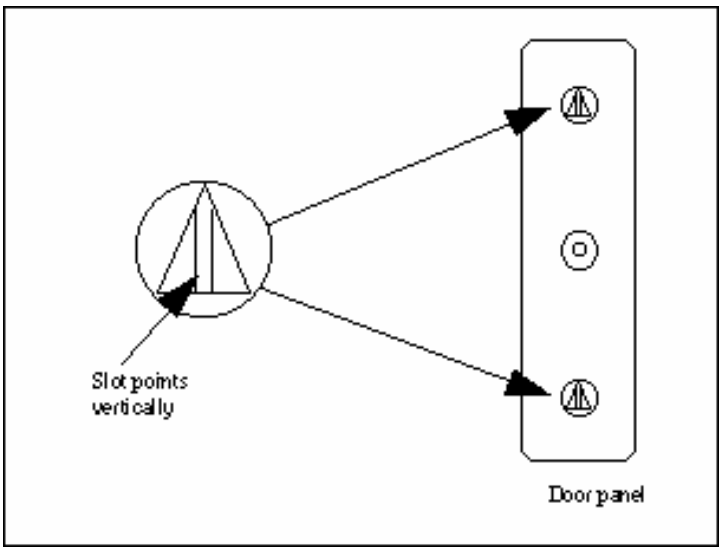
This is a lockable, replacement door for Type A and C hollow poles (GRP - circular cross section).

Note: The triangular keyways for this door are designed such that the door can only be removed and fitted when the slot in each keyway is aligned vertically; see Figure 1.

The title and item code is
- Door Hollow Pole Enhanced Security 1A (i/code 095212).

The following item needs to be ordered separately:
- Key Radial 1A (i/code 095235)

Figure 1 - Door Hollow Pole Enhanced Security 1A - alignment of keyways



2.1.2 Door Hollow Pole Enhanced Security 2a

This is a lockable, replacement door for Type B hollow poles (galvanised steel - octagonal cross section).

The title and item code is:
- Door Hollow Pole Enhanced Security 2A 095213

The following item needs to be ordered separately:
- Key Radial 1A 095235

2.1.3 Door Hollow Pole Enhanced Security 3a

This is a lockable, replacement door for Type D hollow poles (stainless steel - octagonal cross section).

The title and item code is:
- Door Hollow Pole Enhanced Security 3A 095217

The following item needs to be ordered separately:

- Key Radial 1A 095235

Product	Item Code	Security Protection Level
Door Hollow Pole Enhanced Security	095212	Enhanced

1A		
Door Hollow Pole Enhanced Security 2A	095213	Enhanced
Door Hollow Pole Enhanced Security 3A	095217	Enhanced

3 *Overhead new installations*

This section details the enhanced and high level protection products that are available for specified plant at new installations.

Plant		Enhanced	High
Hollow Pole	Type D (stainless steel)	Door Hollow Pole Enhanced Security 3A	Not offered
Hollow Pole	Type B (Galvanised steel)	Door Hollow Pole Enhanced Security 2A	Not offered

3.1 Product descriptions

This section provides a brief description of the security products available.

Unless otherwise stated, all cabling and plant should be installed using standard practices and procedures.

3.2 Hollow pole enhanced doors

These doors provide enhanced level protection and are intended as replacements for existing doors.

The doors are similar in design to existing pole doors, but in addition to the triangular keyways they have a security lock fitted.

Product	Item Code	Security Protection Level
Door Hollow Pole Enhanced Security 2A	095213	E - Enhanced level Protection
Door Hollow Pole Enhanced Security 3A	095217	Enhanced

4 Connectivity product descriptions

This section provides a brief description of the security products available. For a consolidated parts list, with item code numbers, see table in Section 5.3.

- Unless otherwise stated, all plant should be installed using standard practices and procedures.

4.1 Block Terminals and Box Connections

Block terminals and box connections are a range of distribution connector enclosures, with a capacity ranging from 2 to 1000 pairs. These can provide either enhanced or high level protection when mounted on walls at new and retrospective installations in both external and sheltered locations. High level protection is not currently available for pole-mounted box connections and block terminals.

Depending on the type of block terminal or box connection, enhanced and high level protection is afforded by the product supplied or by fitting enhanced security upgrade kits or high security overboxes.

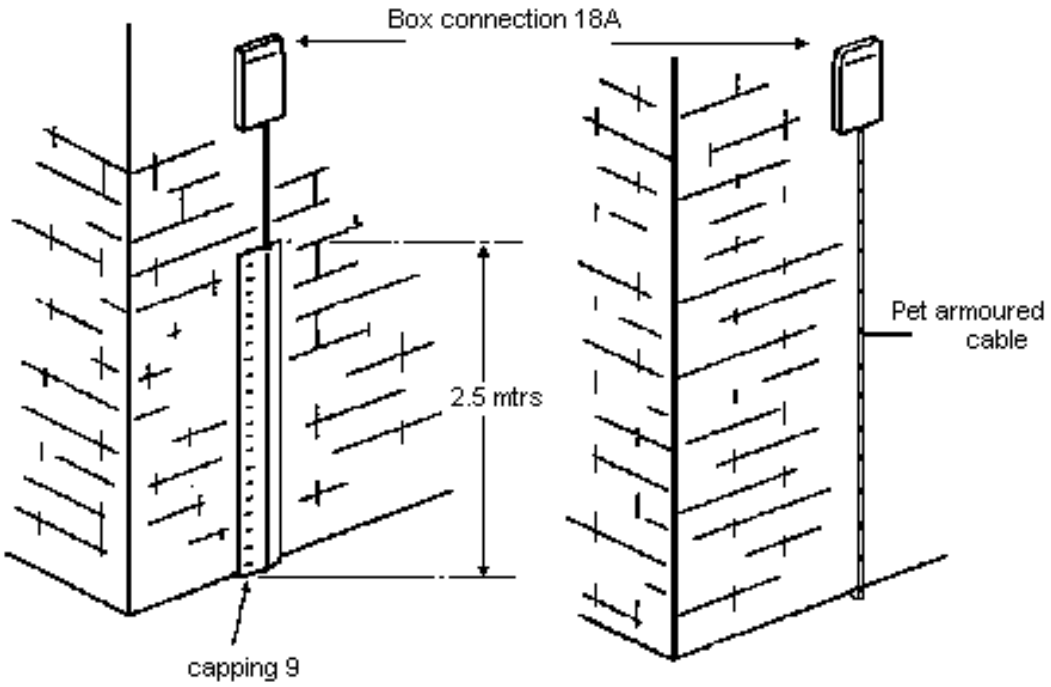
Note: If a particular block terminal or box connection is not mentioned in this publication, it will not be possible to upgrade to enhanced level protection. if wall mounted it may be possible to upgrade it by fitting an overbox. For all other circumstances, a complete change-out will be required.

Wherever possible wall mounted block terminals should be installed at a height of at least 2.5m above ground level, with its feed cable protected by capping or armoured cable; see Figure 2 below.

4.1.1 Block Terminals 17, 41, 41A, 42, 76 and 86 Series and Box Connection 15A

These are a range of obsolete enclosures that can be upgraded to high level protection using overboxes. Upgrades to enhanced level protection are **not available.**

Figure 2 External Wall Mounting of Enclosures Using Steel Capping or Armoured Cable



4.1.2 Block Terminal 66b

This is an existing plastic enclosure for external locations. It may be upgraded to enhanced level protection using an upgrade kit or upgraded to a high level using an Overbox High Security 1A.

4.1.3 Block Terminals 80A, 85A and Box Connections 201C/222A, 251A, 300A/301A and 303A

This is an existing range of plastic enclosures for sheltered locations. These enclosures may be upgraded to enhanced level protection using upgrade kits, or upgraded to a high level protection using overboxes. For item codes, see *table in Section 5.3**, and*** for fitting instructions see *OSCA Engineering Handbook (CSS/LAS/B200*).

4.1.4 Block Terminal Enhanced Security 85a

This is a newly-modified version of Block Terminal 85A and provides enhanced protection in sheltered locations. A feature of this block terminal is the use of an integral security screw and the facility to fit a plastic anti-tamper security seal (for fitting instructions see miscellaneous items, *Seal Security 1A.* Before the lid can be removed, the security seal must first be broken, then the security screw released using a special hexagonal screwdriver; Wrench Hexagon 25. A new seal is fitted through the security screw assembly on completion of the installation.

Note: The Wrench Hexagon 25 and Seal Security 1A are not supplied with the box; they are to be ordered separately. See table in Section 5.3 for item code numbers.

4.1.5 Box Connection 16a

This is an external enclosure that can be upgraded to high level protection using an Overbox High Security 1A. An enhanced level of protection is not available for this product.

4.1.6 Box Connection 18a and 19a

These are external enclosures for mounting on poles or walls and supersede the Block Terminal 76 and 86 series. The Box Connection 18A allows up to 20 External Connection Module 1Bs to be fitted, whilst the Box Connection 19A allows up to 10 External Connection Module 1Bs to be fitted. An enhanced level of protection is available on these products when fitted with a Seal Security 1A. When wall mounted, they can be upgraded to high level protection using an Overbox High Security 3A and Overbox High Security 2A, respectively.

Earth connections are available for lightning protection when using External Protector Modules 2B.

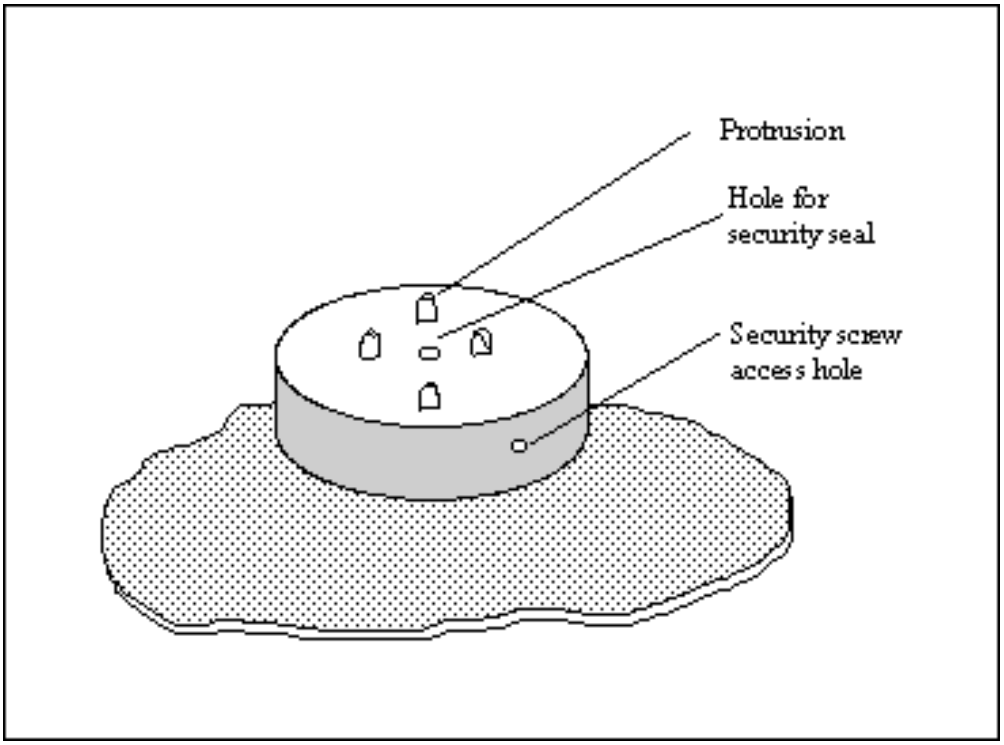
When required, the following items will need to be ordered separately:

- External Modular Connection 1B
- External Protector Module 2B (for EMC 1B above)
- Mounting Block Terminal 1A (for pole mounting)
- Seal Security 1A (anti-tampering measures)
- Overbox High Security 3A (wall mounting only)
- Overbox High Security 2A (wall mounting only)
- Wrench Hexagon 25

Box Connections 18A and 19A do not necessarily have to be fitted with a seal and therefore there is a need to be able to visually identify if a seal should be present. The head of the security screw assembly on the box incorporates four small plastic protrusions as shown in the Figure 3 below. When a security seal is fitted, one of the four protrusions is removed For instructions see miscellaneous items, *Seal Security 1A*

Note: Only one protrusion is ever removed no matter how many seals are subsequently fitted. The protrusions act as a reminder that a seal may have been fitted.

Figure 3 Box Connection 18A - Security Screw Assembly



4.1.7 Box Connections 505A, 515A, 525A and 535A

This is an existing range of metal enclosures for sheltered locations and provide enhanced level protection as standard, but cannot be upgraded to a high level protection.

Where high level protection is required:

- Replace box Connection 505 with a Box Connection 301 and an Overbox High Security 3A combination.
- Replace box Connection 515 or 525 with a Box Connection High Security 525A.
- Replace box Connection 535 with two Box Connection 525As.

See table in Section 5.3 for item code numbers, and for fitting instructions see *OSCA Engineering Handbook (CSS/LAS/B200)*.

4.1.8 Box Connection High Security 525a

This is a, 500 pair, lockable metal enclosure, offering high level protection in sheltered locations. It is designed for new installations as well as used to replace Box Connections 515, 525 and 535 at existing installations where a high level protection is required. For each Box Connection 535, two Box Connections High Security 525As will be required.

Note: Fitting instructions are provided with each box.

The Key Radial 1A is required and must be ordered separately:

4.2 Overboxes

These are a range of lockable steel boxes which, when fitted over specific block terminals and box connections, offer high level protection at installations in external and sheltered locations.

Fitting instructions are provided with each overbox.

4.2.1 Overbox High Security 1a

This is a lockable steel enclosure for providing high level protection when fitted to:

- Block Terminals 66, 80A and 85A
- Box Connections 15A and 16A
- Covers 101
- NTE 5.

The Key Radial 1A is required and must be ordered separately:

4.2.2 Overbox High Security 2a

This is a lockable steel enclosure for providing high level protection when fitted to:

- Block Terminals 86 series
- Box Connections 201/222 and 250/251
- Box CN13794.

The Key Radial 1A is required and must be ordered separately:

4.2.3 Overbox High Security 3a

This is a lockable steel enclosure for providing high level protection when fitted to:

- Block Terminals 17, 41, 41A, 42, 76 series
- Box Connections 18A, 300/301 and 303.

The Key Radial 1A is required and must be ordered separately:

4.3 Up grade kits

These kits are used to upgrade certain block terminals and box connections to enhanced level protection at specified new and retrospective installations in external and sheltered locations.

4.3.1 Anti-tamper Security Seals and Security Screw Fixings

A feature of certain block terminals and box connections is the use of an integral security screw and the facility to fit a plastic anti-tamper security seal, for fitting instructions see miscellaneous items, *Seal Security 1A*. Before a block terminal or box connection lid can be removed, the security seal must

first be broken, then the security screw released using a special hexagonal screwdriver; Wrench Hexagon 25. A new seal is fitted through the security screw assembly on completion of the installation.

Note: The Wrench Hexagon 25 and Seal Security 1A are not supplied with upgrade kits; they are to be ordered separately. See *table in Section 5.3 for item codes*.

4.3.2 Kit upgrade enhanced security block terminal 66

This kit is used to upgrade an existing Block Terminal 66 from base to enhanced level protection. Each kit comprises of special security screws which replace the existing lid retaining screws.

4.3.3 Kit upgrade enhanced security box connection 201/222

This kit is used to upgrade an existing Box Connection 201/222 from base to enhanced level protection. Each kit comprises a special replacement security screw which replaces the existing lid retaining slotted, round headed screw.

Note: Fitting instructions are supplied with this product.

4.3.4 Kit Upgrade Enhanced Security Box Connections 250/251, 300/301 and 303

These kits are used to upgrade existing Box Connections 250/251, 300/301 and 303 from base to enhanced level of protection. Each kit comprises a new lid with its panels bonded in place, and a fixing frame.

4.4 Miscellaneous items

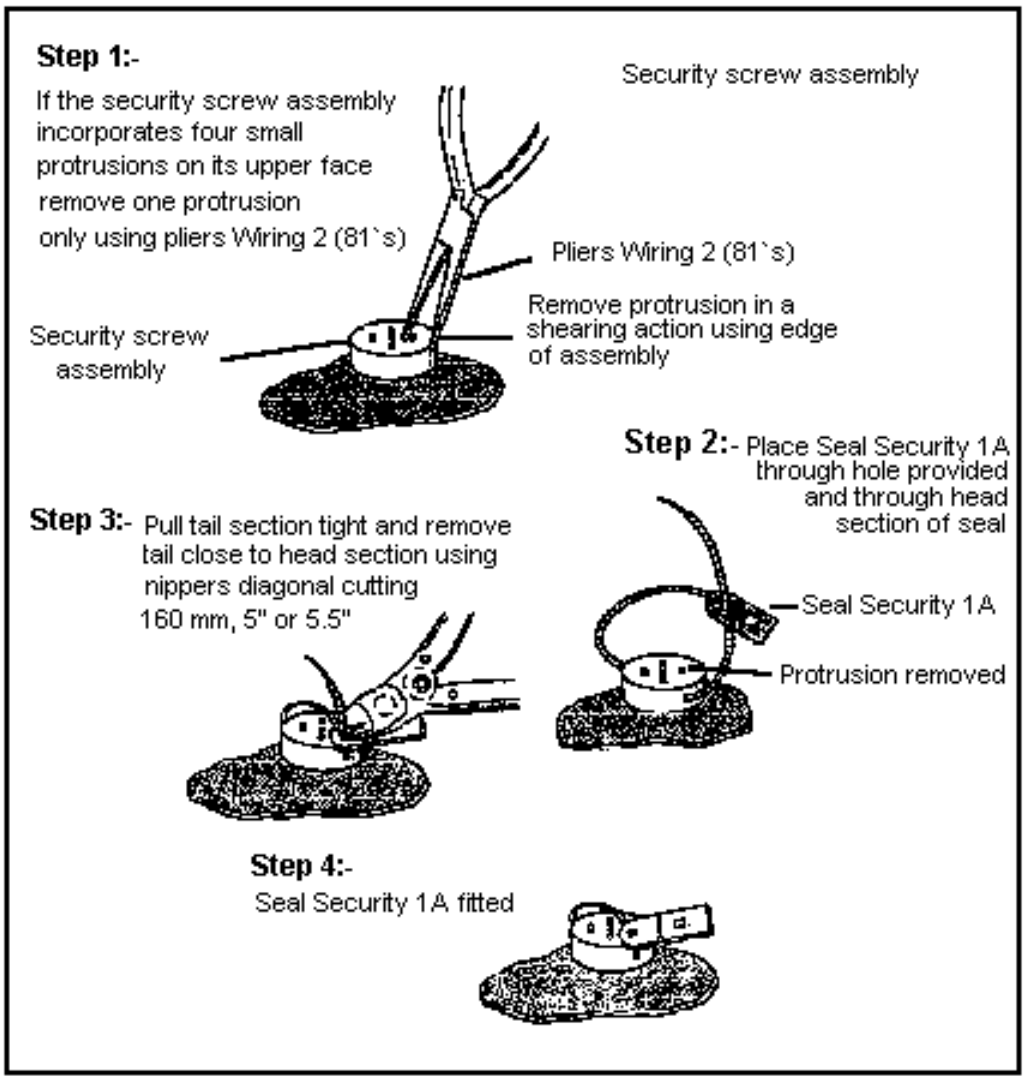
4.4.1 Key Radial 1a

This is a key used to open and close all enhanced and high level security products listed in this guide which are fitted with a radial security lock.

4.4.2 Seal Security 1a

This is a ratchet type, anti-tamper, plastic seal for insertion through the security screw assembly on enhanced level protection products. Each seal is printed with a unique 7-digit serial number. Overall length 225 mm x 2 mm dia.

Figure 4 Seal Security 1A - Fitting Instructions



Note: 1) The example shown here illustrates the fitting of a seal through a security screw assembly for example, kit Upgrade Enhanced Security BT66.

Note: 2) It is important that the tail passes the correct way through the head - 'insert here' is clearly marked on the head of the seal.

4.4.3 Wrench hexagon 25

This is a special 2.5 mm across flat, hexagonal driver used for securing and releasing security screws fitted to enhanced level protected block terminals and box connections.

5 *Block Terminal and Box Connection Installations*

5.1 Retrospective installations

Plant		Enhanced	High
Block Terminals and Box Connections	Block Terminal 41	Not offered	Fit Overbox High Security 3A
(External location) - Wall mounted)	Block Terminal 41A	Not offered	Fit Overbox High Security 3A
	Block Terminal 66	Kit, Upgrade Enhanced Security BT 66	Fit Overbox High Security 1A
	Block Terminal 76	Not offered	Fit Overbox High Security 3A
	Block Terminal 76P	Not offered	Fit Overbox High Security 3A
	Block Terminal 86	Not offered	Fit Overbox High Security 2A
	Block Terminal 86P	Not offered	Fit Overbox High Security 2A
	Block Terminal 17 and 42	Not offered	Fit Overbox High Security 3A
	Box Connection 15A and 16A	Not offered	Fit Overbox High Security 1A
Block Terminals - Pole mounted	BT 17, 41 41A, 42, 66, 76, 76P, 86 and 86P	Remove existing block terminal and fit Box Connection 18A	Not offered
Block Terminals and Box Connections	Block Terminals 80A and 85A	Remove existing Block Terminal and fit Block Terminal Enhanced Security 85A	Fit Overbox High Security 1A
(Sheltered location) - Wall mounted	Box Connection 201/222	Kit, Upgrade Enhanced Security BC 201/222	Fit Overbox High Security 2A
	Box Connection 250 and 251	Kit, Upgrade Enhanced Security BC 250/251	Fit Overbox High Security 2A
	Box	Kit, Upgrade Enhanced	Fit Overbox High

	Connection 300 and 301	Security BC 300/301	Security 3A
	Box Connection 303	Kit, Upgrade Enhanced Security BC 303	Fit Overbox High Security 3A
	Box Connection 505	Already provided	Remove and fit Box Connection 301 + Overbox High Security 3A
	Box Connection 515 and 525	Already provided	Remove and fit Box Connection High Security 525A
	Box Connection 535	Already provided	Remove and fit two Box Connections High Security 525A

5.2 New installations

Plant		**Enhanced**	**High**
Distribution boxes (External location)	Pole mounted 1-20 pair	Box Connection 18A	Not offered
	Pole mounted 1-5 pair	Block Terminal 66 + Upgrade Kit Enhanced Security Block Terminal 66	Not offered
	Wall mounted 1-20 pair	Box Connection 18A	Box Connection 18A + Overbox High Security 3A.
	Wall mounted 1-10	Box Connection 19A	Box Connection 19A Overbox High Security 2A.
	Wall mounted 1-5 pair	Block Terminal 66 + Upgrade Kit Enhanced Security Block Terminal 66	Overbox High Security 1A + Block Terminal 66
Distribution boxes (Sheltered location)	501-1000 pair	Box Connection 535	Box Connection High Security 525A (mount two together)

	251-500 pair	Box Connection 525	Box Connection High Security 525A
	101-250 pair	Box Connection 515	Box Connection High Security 525A
	51-100 pair	Box Connection 505	Box Connection 301 + Overbox 3A
	21-50 pair	Box Connection 251 + Kit, Upgrade Enhanced Security BC 251	Box Connection 251 + Overbox High Security 2A
	3-20 pair	Box Connection 201/222 + Kit, Upgrade Enhanced Security BC 201/222	Box Connection 201/222 + Overbox High Security 2A
	1 or 2 pair	Block Terminal Enhanced Security 85A	Block Terminal 80A/85A + Overbox High Security 1A

5.3 Connectivity Parts List With Security Protection Levels and Item Code Numbers

Product	**Item Code**	**Security Protection Level**
Block Terminal Enhanced Security 85A	074875	Enhanced
Box Connection 18A	074855	Enhanced
Box Connection 19A		Enhanced
Box Connection High Security 525A	074859	High
Block Terminal 80A	436270	Base
Block Terminal 85A	437093	Base
Box Connection 201C	314562	Base
Box Connection 222A	314810	Base
Box Connection 250A	314460	Base
Box Connection 251A	314445	Base
Box Connection 300A	314350	Base
Box Connection 301A	314351	Base
Box Connection 303A	314383	Base
Box Connection 505A	878451	Enhanced
Box Connection 515A	878446	Enhanced
Box Connection 525A	878447	Enhanced
Box Connection 535A	878448	Enhanced

Kit Upgrade Enhanced Security Block Terminal 66	074872	Enhanced
Kit Upgrade Enhanced Security Box Connection 201/222	074878	Enhanced
Kit Upgrade Enhanced Security Box Connection 250/251	074879	Enhanced
Kit Upgrade Enhanced Security Box Connection 300/301	074880	Enhanced
Kit Upgrade Enhanced Security Box Connection 303	074881	Enhanced
Overbox High Security 1A	074882	High
Overbox High Security 2A	074883	High
Overbox High Security 3A	074884	High
Key Radial 1A	095235	N/A
Screw Security 1A	074982	Enhanced
Seal Security 1A	074886	Enhanced
Wrench Hexagon 25	129074	N/A

6 *Cable protection retrospective*

Plant		**Enhanced**	**High**
Cable on walls (External location)	Up to 6.5 mm dia	Reposition, or fit Capping Steel 9	Reposition, or remove and fit Cable PET armour
	Between 6.5 and 34 mm dia	Reposition, or fit Capping Steel 10	Reposition, or remove and fit Cable PET armour
	Over 34 mm dia (100 pair)	Reposition	Reposition
Cable on walls (Sheltered location)	Up to 50 pair	Trunking (PVC)	Reposition, or remove and fit Cable PET armour
	Over 50 pair	Trunking (PVC) or Reposition	Reposition
Network Terminating Equipment	NTE5	Not offered	Fit Overbox High Security 1A
Underground feed	Cover 101 on outside wall	Not offered	Fit Overbox High Security 1A
	Box CN13794	Not offered	Fit Overbox

	in cavity wall		High Security 2A

6.1 Product descriptions

This section provides a brief description of the security products available. For a consolidated parts list, with item code numbers, see *Appendix A.*

- Unless otherwise stated, all cabling and plant should be installed using standard practices and procedures.

6.1.1 Capping steel 9

This is galvanised steel capping for protecting cables up to a maximum of 6.5 mm in diameter and is supplied in 2.5 metre lengths. Screw Security 1A is used with this item.

The title and item code is:
- Capping Steel 9 074978

6.1.2 Capping Steel 10 and Cover Capping Steel 10

This is galvanised steel capping for protecting cables up to a maximum of 34 mm in diameter and is supplied in 2.5 metre lengths, the Cover Capping Steel 10 is used with Capping Steel 10 to cover cable entry on ground lead-in. Screw Security 1A is used with this item.

To be ordered separately Screw Security 1A is used with this item.

The titles and item codes are:
- Capping Steel 10 074980
- Cover Capping Steel 10 075193

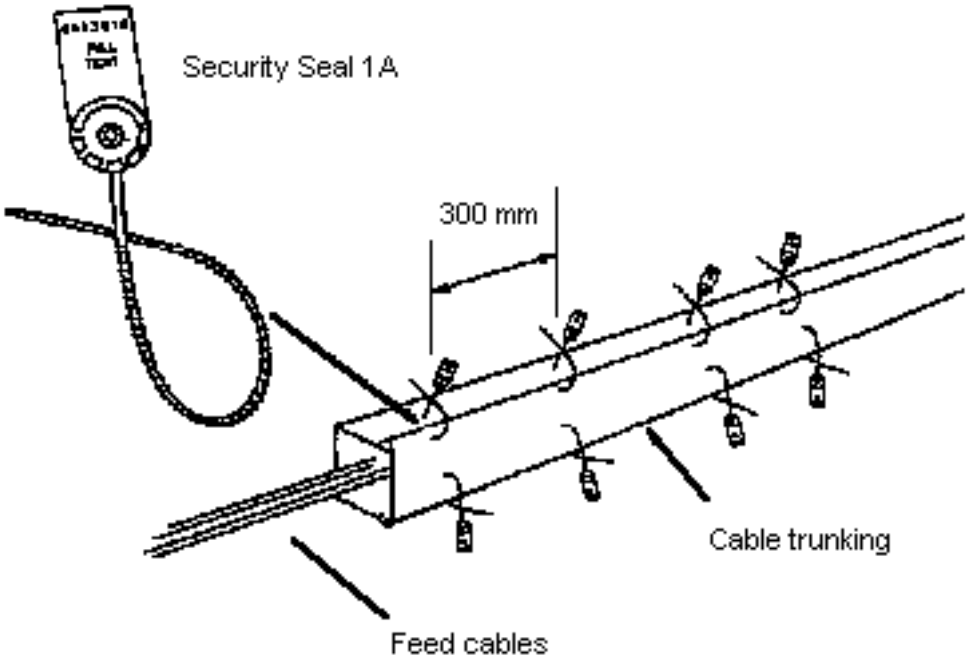
6.2 Trunking (PVC)

This range of plastic trunking (Trunking 1A, 2A, 4A, 5A, 5B and 5C) can be easily modified to provide enhanced level protection for cables at installations in sheltered locations.

The modification involves drilling pairs of 2.5 mm diameter holes on either side and the lid, spaced at 300 mm intervals on straight runs and inserting a Seal Security 1A through each pair (for fitting instructions see page 25, *Seal Security 1A*). Each elbow unit requires two pairs of holes and two Seals Security 1A fitted, see Figure 5.

Warning: When drilling holes in trunking for the seals make sure the cable is not damaged by the drill bit.

Figure 5 Internal Wall Enhanced Security Option



For descriptions and item codes, see ISIS document *CSS/LAS/B206* and the *External and Installation* section of the *Engineering Stores Catalogue.*

6.2.1 Cable pet armour

This cable is used on walls for high level protection. It comprises a Polyethylene Twin (PET) cable with galvanised steel armour wires around it and the whole assembly protected by a grey polyethylene oversheath.

The item codes are:

- 5 pair 0.5 (12.5 mm Dia) 054816
- 5 pair 0.6 (16.2 mm Dia) 055012
- 10 pair 0.5 (13.6 mm Dia) 067572
- 10 pair 0.6 (18.9 mm Dia) 055013
- 20 pair 0.5 (16.0 mm Dia) 067577
- 20 pair 0.6 (22.8 mm Dia) 055014
- 50 pair 0.5 (22.7 mm Dia) 067579
- 50 pair 0.6 (31.0 mm Dia) 055015
- 100 pair 0.5 (28.0 mm Dia) 067580

6.2.2 Overbox High Security 1a

This is a lockable steel enclosure for providing high level protection when fitted to:

- Block Terminals 66, 80A and 85A
- Box Connections 15A and 16A
- Covers 101
- NTE 5.

The title and item code is:

- Overbox High Security 1A 074882

The following item is required to be ordered separately:

- Key Radial 1A 095235

6.2.3 Overbox High Security 2a

This is a lockable steel enclosure for providing high level protection when fitted to:

- Block Terminals 86 series
- Box Connections 201/222 and 250/251
- Box CN13794.

The title and item code is:

- Overbox High Security 2A 074883

The following item is required to be ordered separately:

- Key Radial 1A 095235

6.2.4 Screw Security 1a

This is a round-headed, No 8 x 1 in. special security, one-way, bladed, hardened steel screw and is inserted using a cabinet screwdriver.

Note: Although these screws are referred to as one-way, they may be unscrewed using a screwdriver cabinet 51N and heavy hand pressure when applying an anticlockwise turn. screws which are removed in this manor **MUST NOT** be reused.

The title and item code is:

- Screw Security 1A (issued in bags of 100) 074982

6.2.5 Plug Screw Fixing 1c

This is a plastic wall plug used for fixing Screw Security 1A, and requires a 5.5 mm diameter drilled hole for insertion.

The title and item code is:

- Plug Screw Fixing 1C (issued in boxes of 100) 070882

Product	**Item Code**	**Security Protection Level**
Cable PET armour, 5 pair 0.5	054816	High
Cable PET armour, 5 pair 0.6	055012	High
Cable PET armour, 10 pair 0.5	067572	High
Cable PET armour, 10 pair 0.6	055013	High
Cable PET armour, 20 pair 0.5	067577	High
Cable PET armour, 20 pair 0.6	055014	High
Cable PET armour, 50 pair 0.5	067579	High
Cable PET armour, 50 pair 0.6	055015	High
Cable PET armour, 100 pair 0.5	067580	High

Product	Item Code	Security Protection Level
Capping Steel 9	074978	Enhanced
Capping Steel 9 Elbow	074979	Enhanced
Capping Steel 10	074980	Enhanced
Capping Steel 10 Elbow	074981	Enhanced
Overbox High Security 1A	074882	High
Overbox High Security 2A	074883	High
Overbox High Security 3A	074884	High
Screw Security 1A	074982	Enhanced
Seal Security 1A	074886	Enhanced

7 Cable protection - new installation

Cable (External location)	Up to 100 pair	Capping steel 9 or 10	Cable PET armour
	Over 100 pair	Not offered	By position only
Cable (Sheltered location)	Up to 100 pair	Trunking (PVC)	Cable PET armour
	Over 100 pair	Trunking (PVC) or by position	By position only
Underground feed	Cover 101 on outside wall	Not offered	Fit Overbox High Security 1A
	Box CN13794 in cavity wall	Not offered	Fit Overbox High Security 2A

7.1 Product descriptions

This section provides a brief description of the security products available. For a consolidated parts list, with item code numbers, see *Appendix A.*

- Unless otherwise stated, all cabling and plant should be installed using standard practices and procedures.

7.1.1 Armoured cable

Armoured cable offers high level protection for cabling along walls at new installations in external and sheltered locations.

Two types of armoured cable are used; Cable PET armour and. Due to the construction of armoured cable, careful preparation of the cable end is required.

Warning: (1) Sheath stripping must not be carried out with the cable resting over the knees.

Warning: (2) Eye protection must be worn when handling and cutting springy wire.

Warning: (3) Whenever wire armouring is cut, the ends must be taped over to avoid accidents to the person or damage to the cable sheathing.

Warning: (4) Always cut away from yourself.

To cut through armoured cable and prepare it for termination:

1. Using stripper Cable Sheath 8, cut back sheathing to expose the armoured wires. Ensure that the cable is adequately supported and tie back each side of the section to be removed; see *Warnings (1).*
2. Select a point half way along the exposed portion of the armoured wires, carefully insert the blade of a screwdriver between three or four wires (Figure 6) with the screwdriver in a near-vertical position, then gently push down with a twisting action to lift the wires clear of the lay.
3. Using Nippers, Diagonal 5.5 inch, cut each exposed wire, laying the cut wires back, clear of the working area (Figure 7); see *Warnings (2).*
4. Using Nippers, diagonal 5.5 inch, cut each wire at the butt of the sheathing; see *Warnings (2).*
5. Once all the armoured wires have been cut back, tape over the cut ends with two layers of Tape, Plastic, Adhesive 24 mm, applied at half-lap over both the cable inner and over sheaths; see *Warnings (3)*.
6. Cut the exposed inner wiring and sheath to the required length.

Figure 6 Screwdriver Insertion

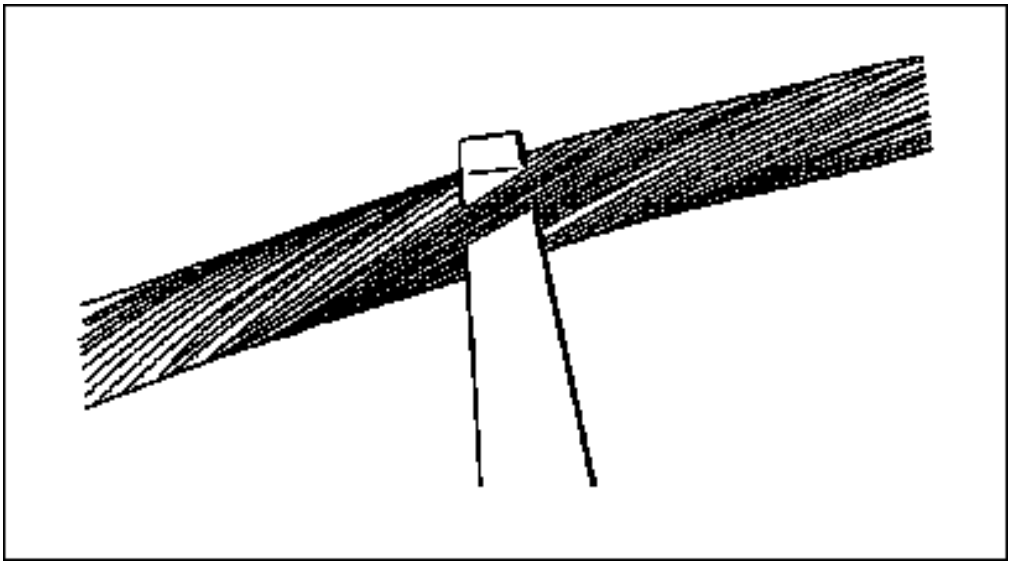
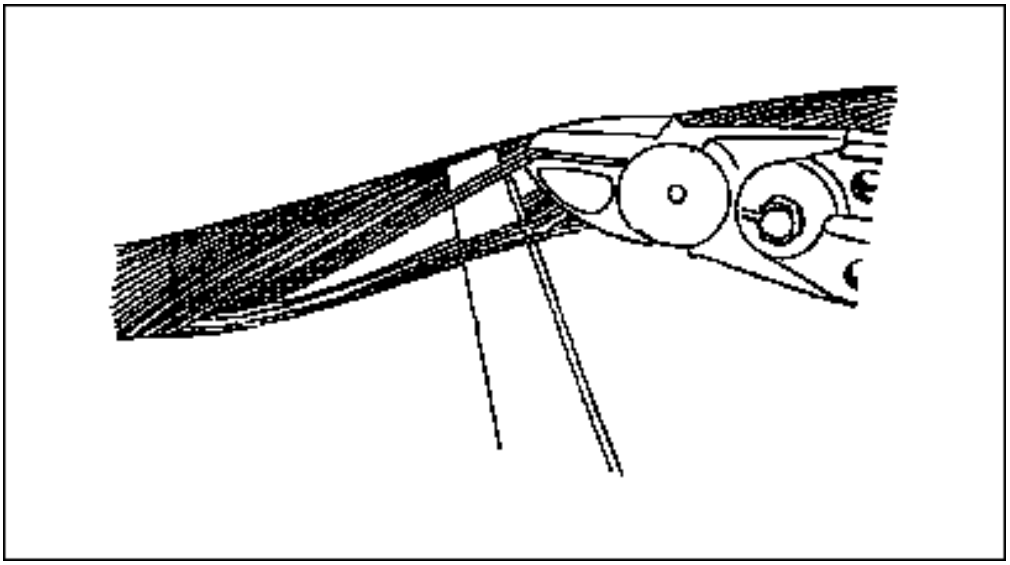


Figure 7 Cutting The Armoured Wires



7.1.2 Cable pet armour

This cable is used on walls for high level protection. It comprises a Polyethylene Twin (PET) cable with galvanised steel armour wires around it and the whole assembly protected by a grey polyethylene oversheath.

The item codes are:

- 5 pair 0.5 (12.5 mm Dia) 054816
- 5 pair 0.6 (16.2 mm Dia) 055012
- 10 pair 0.5 (13.6 mm Dia) 067572
- 10 pair 0.6 (18.9 mm Dia) 055013
- 20 pair 0.5 (16.0 mm Dia) 067577
- 20 pair 0.6 (22.8 mm Dia) 055014
- 50 pair 0.5 (22.7 mm Dia) 067579
- 50 pair 0.6 (31.0 mm Dia) 055015

- 100 pair 0.5 (28.0 mm Dia) 067580

7.2 Associated items

7.2.1 Cleats Wiring 1A and 4

These cleats are used for securing armoured cable.

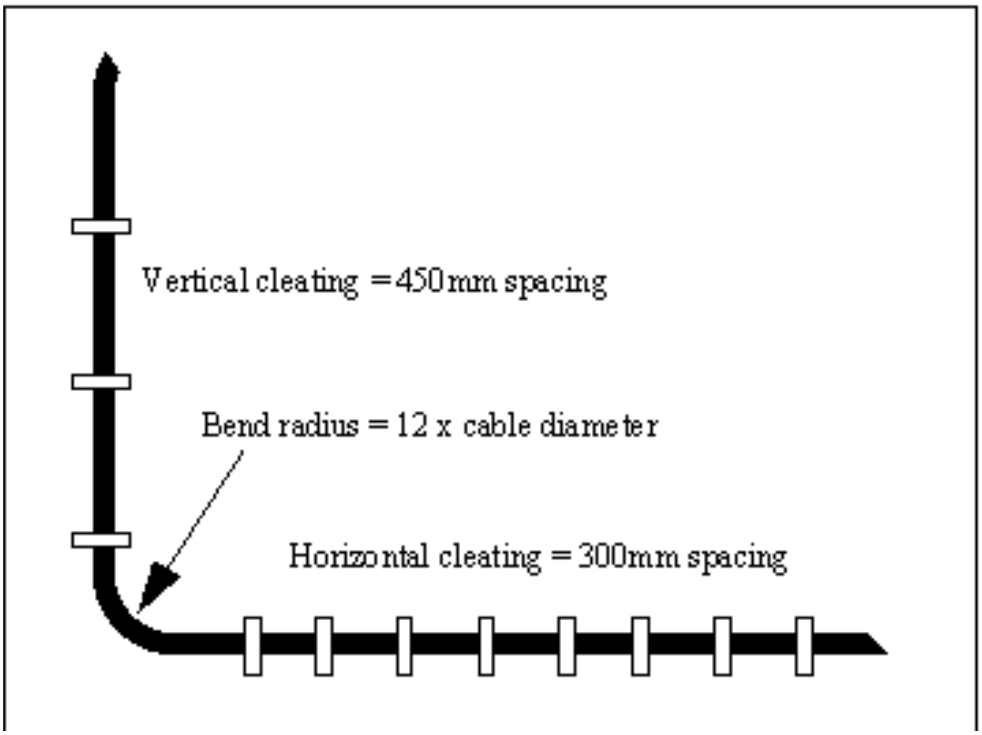
The titles and item codes are:

- CW4-G (used on Cable PET Armour 5 pr 0.5) 072566 (Black) (used on Cable PET Armour 10 pr 0.5)
- CW1A (used on Cable PET Armour 5 pr 0.6) 075034 (20 mm) (used on Cable PET Armour 10 pr 0.6) (used on Cable PET Armour 20 pr 0.5)
- CW1A (used on Cable PET Armour 50 pr 0.5) 075035 (28 mm) (used on Cable PET Armour 100 pr 0.5) (used on Cable PET Armour 20 pr 0.6)
- CW1A (used on Cable PET Armour 50 pr 0.6) 075036 (38 mm)

Armoured cables are fixed to walls using the above cleats at the distances illustrated in Figure 8.

Product	**Item Code**	**Security Protection Level**
Cleats Wiring 1A, (20 mm)	075034	Enhanced
Cleats Wiring 1A, (28 mm)	075035	Enhanced
Cleats Wiring 1A, (38 mm)	075036	Enhanced
Cleats Wiring 4 - G (black)	072556	Enhanced

Figure 8 Cleating Distances - Armoured Cable



7.2.2 Recognition of Security Seal Fitted

It is important to be able to visually identify whether a security seal should be fitted to plant. For the majority of products this will be obvious, as seal(s) should always be fitted (for example, an upgrade kit for a Box Connection 303 utilises a tamper-proof lid which should always encompass a security seal).

7.3 Capping

Capping fits directly over cable, mounted on a wall or on a pole up to a height of 2.5 meters to protect cable from damage. Capping is supplied in Plastic and steel form of different sizes; these can be secured in place with screws and plugs if fixing into solid wall or brickwork. Nails Bonding (072034) & Galvanished washers (073202) can be used to secure capping to poles. Steel pin fixing (070864) can also be used on small capping 22. These items can be removed using the Pry bar set (083778), so capping and fixings can be reused.

One-way security screws; Screw Security 1A, to provide an enhanced level of protection at installations in external and sheltered locations. This is an Ibuy only item through your line manager. Item code 074982, Supplier Joseph Gleave 0161 865 6025.

7.3.1 Capping to be used? Steel or Plastic?

Depending on the size of cable, the multiplies of cables, the security risk instructions within job pack, local knowledge of Damaged/ vandalised Plant, obvious risk posed by industrial hedge/tree cutting, placement of Capping within risk of being stuck.

This will determine the capping to be used, please see pictures below for examples.

Plastic where possible should be used and Steel in the instances named above for protection when required.

Only cable that is above ground level, up to a height of 2.5 metres should require protecting with capping. 90-degree bends can only be protected on a flat surface using capping elbows designed for that purpose. It is recommended that all bends around external and internal corners are made at a height more than 2.5 metres.

Capping Steel 1	Item Code (070320) A galvanised steel channel section 2400mm long x 76mm wide. Used on wooden poles for protected cable space up to 19 mm in diameter.
Capping Steel 4	Item Code (070323) A galvanised steel channel section 2400mm long x 54mm wide. Used on wooden poles for protected cable space up to 51 mm in diameter.
Capping Steel 5	Item Code (070324) A galvanised steel channel section 2400mm long x 80mm wide. Used on wooden poles for protected cable space up to 76 mm in diameter.
Capping Steel 8	Item Code (016272) A galvanised steel channel section 610mm long x 100mm wide. Used on wooden poles for protected cable space up to 89 mm in diameter.
Capping 22	Item Code (070316) Black PVC channel section 2440mm long x 51mm wide. Used on walls and wooden poles for protected cable space up to 19mm in diameter.
Capping 23	Item Code (070317) Black PVC channel section 380mm long x 51mm wide. Used on wooden poles for protected cable space up to 19mm in diameter.
Capping 26	Item Code (072903) Black PVC channel section 2440mm long x 111mm wide. Used on poles and walls for protected cable space up to 42 mm.

Example of correct use of steel capping in rural location

due to industrial hedge cutting.

Item Code (070323) A galvanised steel channel section 2400mm long x 54mm wide. Used on wooden poles for protected cable space up to 51 mm in diameter.

Example of correct use of large steel capping to protect a Multiple of cables, sited on country single track road, with a chance of being struck by passing vehicles as tyre marks indicate.

Item Code (070324) A galvanised steel channel section 2400mm long x 80mm wide. Used on wooden poles for protected cable, space up to 76 mm in diameter.

Example of correct use of Plastic capping 22 and connector bend No1

on footpath in residential area.

Item Code (070316) Black PVC channel section 2440mm long x 51mm wide. Used on walls and wooden poles for protected cable space up to 19mm in diameter.

7.3.2 Capping steel 9

This is galvanised steel capping for protecting cables up to a maximum of 6.5 mm in diameter and is supplied in 2.5 metre lengths. Screw Security 1A is used with this item.

The title and item code is:

- Capping Steel 9 074978

7.3.3 Capping steel 9 elbow

A 90 Degree bend for use with Capping Steel 9.

The title and item code is:
- Capping Steel 9 Elbow 074979

7.3.4 Capping Steel 10 and Cover Capping Steel 10

This is galvanised steel capping for protecting cables up to a maximum of 34 mm in diameter and is supplied in 2.5 metre lengths, the Cover Capping Steel 10 is used with Capping Steel 10 to cover cable entry on ground lead-in. Screw Security 1A is used with this item.

To be ordered separately Screw Security 1A is used with this item.

The titles and item codes are:
- Capping Steel 10 074980
- Cover Capping Steel 10 075193

7.3.5 Capping steel 10 elbow

A 90 Degree bend for use with Capping Steel 10.

The title and item code is:
- Capping Steel 10 Elbow 074981

7.3.6 Duct Secure Entry 1a

This product provides added security to above ground, external duct lead-ins, rather like the Cover Capping Steel 10. (see Section 7.3.3). It takes the form of a 40mm bore steel tube with a 45 degree bend which can be embedded into the property wall to provide a very secure entry into premises. The item code is 075870. Full details of its use can be found on drawing number CN 15561.

Product	Item code	Security Protection Level
Capping Steel 9	074978	Enhanced
Capping Steel 9 Elbow	074979	Enhanced
Capping Steel 10	074980	Enhanced
Capping Steel 10 Elbow	074981	Enhanced
Duct Secure Entry 1A	075870	Enhanced

7.3.7 Associated items

7.3.7.1 Screw Security 1a

This is a round-headed, No 8 x 1 in. special security, one-way, bladed, hardened steel screw and is inserted using a cabinet screwdriver.

Note: Although these screws are referred to as one-way, they may be unscrewed using a screwdriver cabinet 51N and heavy hand pressure when applying an anticlockwise turn. screws which are removed in this manor **MUST NOT** be reused.

The title and item code is:

- Screw Security 1A (issued in bags of 100) 074982

7.3.7.2 Plug Screw Fixing 1c

This is a plastic wall plug used for fixing Screw Security 1A, and requires a 5.5 mm diameter drilled hole for insertion.

The title and item code is:

- Plug Screw Fixing 1C (issued in boxes of 100) 070882

7.4 Trunking (PVC)

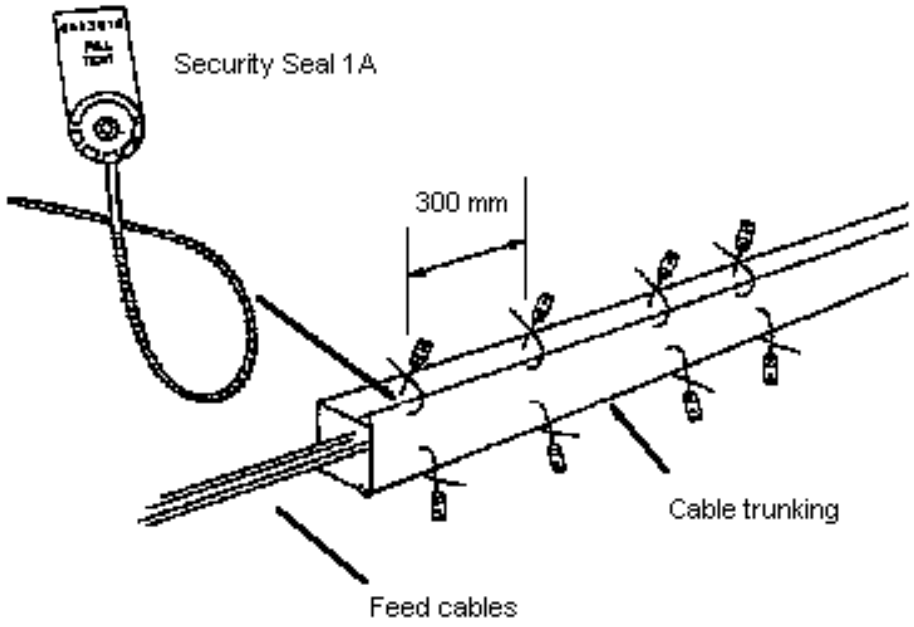
This range of plastic trunking (Trunking 1A, 2A, 4A, 5A, 5B and 5C) can be easily modified to provide enhanced level protection for cables at installations in sheltered locations.

The modification involves drilling pairs of 2.5 mm diameter holes on either side and the lid, spaced at 300 mm intervals on straight runs and inserting a Seal Security 1A through each pair (for fitting instructions see Section 8.2, *Seal Security 1A*). Each elbow unit requires two pairs of holes and two Seals Security 1A fitted, see Figure 9.

Product	**Item code**	**Security Protection Level**
Screw Security 1A	074982	Enhanced
Plug Screw Fixing 1C	070882	N/A
Trunking 1A, 2A, 4A and 5A-C	Refer to ESC	Base

Warning: When drilling holes in trunking for the seals make sure the cable is not damaged by the drill bit.

Figure 9 Internal Wall Enhanced Security Option



For descriptions and item codes, see ISIS document *CSS/LAS/B206* and the *External and Installation* section of the *Engineering Stores Catalogue.*

8 *Miscellaneous items*

8.1 Key Radial 1a

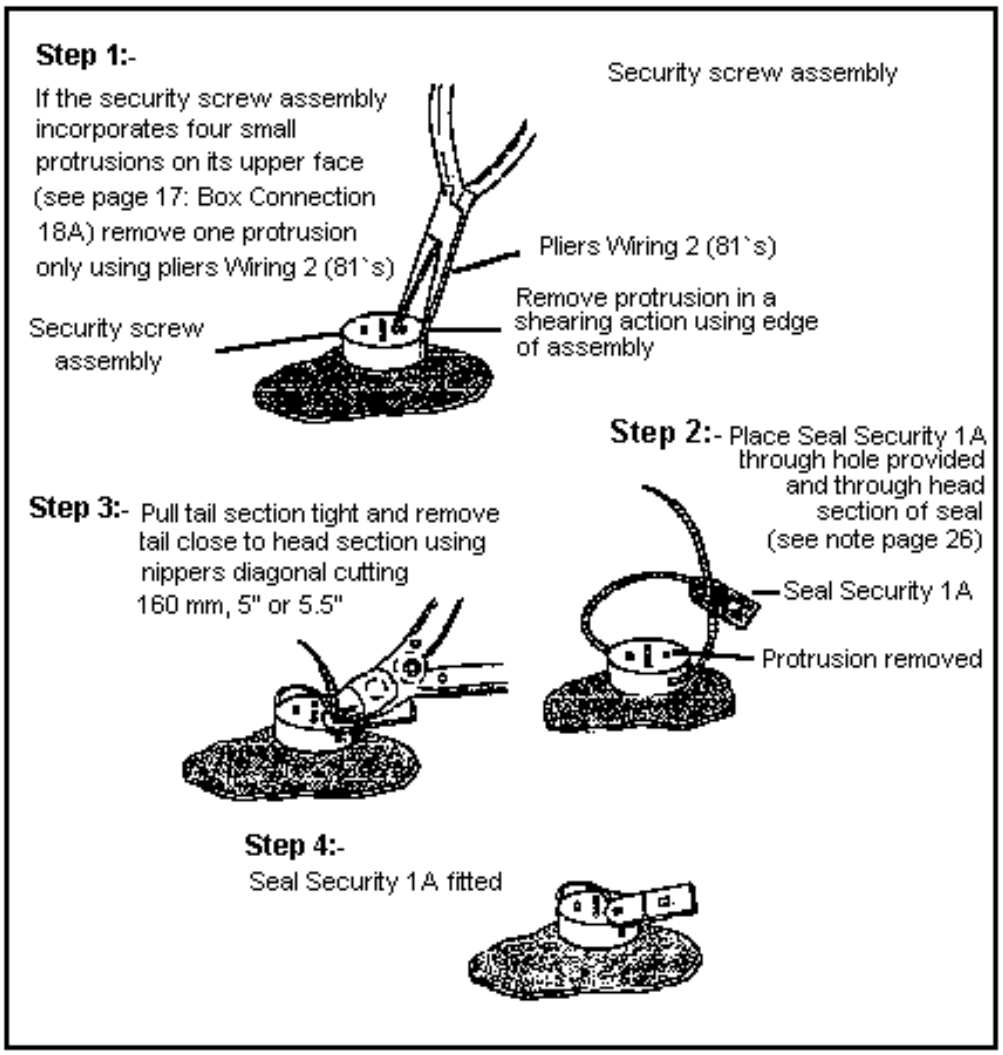
This is a key used to open and close all enhanced and high level security products listed in this guide which are fitted with a radial security lock.

The title and item code is:
- Key Radial 1A 095235

8.2 Seal Security 1a

This is a ratchet type, anti-tamper, plastic seal for insertion through the security screw assembly on enhanced level protection products (also used on trunking, see Page 23). Each seal is printed with a unique 7-digit serial number. Overall length 225 mm x 2 mm dia.

Figure 10 Seal Security 1A - Fitting Instructions



Note: 1) The example shown here illustrates the fitting of a seal through a security screw assembly for example, kit Upgrade Enhanced Security BT66. The same principles are applied when the seal is fitted to trunking, see Section 7.4.

Note: 2) It is important that the tail passes the correct way through the head - 'insert here' is clearly marked on the head of the seal.

The title and item code is:

- Seal Security 1A (issued in bags of 10) 074886

8.3 Wrench hexagon 25

This is a special 2.5 mm across flat, hexagonal driver used for securing and releasing security screws fitted to enhanced level protected block terminals and box connections.

The title and item code is:

- Wrench Hexagon 25 129074

Product	Item code	Security Protection level
Key Radial 1A	095235	N/A
Seal Security 1A	074886	Enhanced
Wrench Hexagon 25	129074	N/A

END OF DOCUMENT