



PROTECTION OF UNDERGROUND ELECTRIC CABLES

PLASTIC V CONCRETE

A DISCUSSION PAPER



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Introduction

For many years underground electric cables were covered with clay tiles and subsequently with concrete tiles which were seen to be stronger and offered more protection.

However, in 1981 plastic cable covers were introduced to the UK electricity industry and, due to the benefits of this new product the electricity industry in the UK changed almost completely to using it.

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These tiles were so successful that they were introduced to other European countries, the Middle East, Australia and the Carribean .

Since this time concrete tiles have progressively been seen as an outmoded means of protecting underground cables primarily because of their weight. Plastic cable covers offer an attractive alternative. With the benefits of developments in the plastic industry they provide lightweight and equivalent protection at small additional cost.

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Identification Markings

- Concrete - “Danger Electricity” cast into concrete

- Plastic - “Any legend required by customers bonded onto the cable cover

Brightly coloured plastic cable covers are vividly marked with a bold warning text printed in any language. They are highly visible and can be easily seen by workmen excavating near buried cables.

Natural coloured concrete tiles are much harder to distinguish, and the warning cast into the concrete is easily obliterated by sand or soil.

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Method of Laying

- Concrete - Tiles are laid end to end. The concave/convex ends prevent lateral movement.
- Plastic - These are laid overlapped and held firm in all directions by a plastic jointing peg pushed through holes drilled in the tiles.

Plastic cable covers will not move and leave gaps exposing the cable, a problem common to concrete tiles which are affected by even small amounts of land settlement.

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Which system provides the best protection?

Laid out below are some of the results drawn from testing concrete and plastic cable covers against the three most common excavation tools. These tests were carried out by a UK Area Electricity Authority.

	Concrete	Plastic
Pick Axe	Slight Flaking	2mm Indentation
Pneumatic breaker	3 seconds to penetrate	10 seconds to penetrate

When digging using a pick it is easy to believe a concrete tile to be a stone and to drive through on the second or third strike. Plastic cable covers “hold” the pick if penetration is achieved alerting workmen to an obstruction and prompting investigation.

Hydraulic Diggers

These will haul up both concrete and plastic, however broken concrete tiles are easily

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mistaken for normal earth debris in the digger's shovel.
In contrast to this plastic cable covers will be snagged up in a continuous brightly coloured strip clearly alerting the driver to a hazard below.

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There are other important advantages of plastic cable covers over concrete tiles

- Loss and breakages of concrete tiles are approximately 20%. With plastic cable covers this would be eliminated
- If concrete tiles are dropped or fall into a trench they cause damage to cables due to the weight of the tiles. This cannot happen with plastic cable covers.
- Third party damage involving mechanical excavation normally involves the concrete tiles being driven into the cable.
- Plastic cable covers are user friendly. Workmen prefer them because they eliminate damaged and torn fingers commonly caused by concrete tiles.
- Installation costs are considerably reduced when using plastic cable covers and contractors state that savings of up to 50% of the concrete laying costs can be achieved.

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Plastic cable covers offer the same protection as concrete tiles yet are a fraction of the weight

	Size	Weight
Concrete	914mm x 229mm x 63/38mm	25.85 Kgs
Plastic	1000mm x 244mm x 12mm	2.87 Kgs

This means that

- One man can easily carry 10 plastic cable covers or 1 concrete tile, and therefore trips between trench and tipping point are radically reduced.
- A 10 tonne lorry can carry 3,500 plastic cable covers
or
385 concrete tiles

Our plastic cable covers meet the impact requirements of BS2484:1985 Para 4 App. A.

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Conclusion

Plastic cable covers offer significant advantages in safety and in reducing damage to buried cable.

Whilst they may appear more expensive on a 1st cost basis, when on going costs are considered they are extremely competitive.

The benefits of plastic cable covers when compared with concrete tiles have already been widely recognised in around the world. We hope this paper shows that the advantages can be enjoyed for no extra cost.

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