



IHE Passive Safety Electrical Guide 2021

Electrical requirements for passively safe ITS roadside installations to BS EN 12767

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Introduction

The vision of the Institute of Highway Engineers (IHE) is simply *“to be the Institute of choice for Highway Engineers”* and has been registering engineers and technicians with the Engineering Council since 1972 and accrediting academic courses since 1989. Its mission is to provide professional development opportunities, support and leadership for individuals to achieve and maintain professional recognition.

As part of this approach to supporting and developing engineers working in the sector, the Institute has published a range of guidance documents which cover a diverse range of topics. This paper introduces the new **IHE Passive Safety Electrical Guide 2021** which joins other recent publications, such as the **Sign Structures Guide 2021** and the **Traffic Control and Information Systems** documents which are available to freely download from the Institute of Highway Engineers website at <https://www.theihe.org/news-info/ihe-publications/>.

The guidance document author is Alistair Gollop, a long-term proponent of passively safe roadside ITS installations, due to his work on the strategic road network in England, where he has witnessed the issues associated with vehicles striking traditional steel poles and columns. Because of this, he was part of a ‘crash friendly’ initiative at Mott MacDonald and UK Roads where the ‘Passive Revolution’ undertook a large number of real crash demonstrations for both traditional and passive structures, as part of an educational programme to provide highways engineering practitioners with examples of how these different types of structures perform when struck by vehicles. During this time, Alistair wrote the *“Electrical Connections for Traffic Signals”* chapter within David Milne’s **Designing Safer Roadside – A Guide for Highway Engineers Manual** which was published by TEC Magazine in 2008.

The IHE Passive Safety Electrical Guide 2021

The guidance document was produced to assist highway and road authorities, consultants and contractors who design and implement roadside Intelligent Transport Systems (ITS) equipment deployments, such as Traffic Signals. It is an advisory best-practice document, to provide guidance regarding the implications that are posed by the electrical safety requirements for the majority of passively safe ITS roadside installations. It should be read in conjunction with BS EN 12767:2019 *“Passive safety of support structures for road equipment”*.

The necessity for the IHE Passive Safety Electrical Guide 2021 has been heightened due to changes in the current version of the BS EN 12767 standard, which includes the removal of electrical requirements from the National Annex. Due to the complexity of cable arrangements found in typical ITS installations such as traffic signals, this omission poses potential problems to practitioners undertaking the design, specification or management of ITS equipment. It is not unusual to have a mix of cable types with multiple cores for numerous electrical circuits, mixed in with data/communications, coax video/antenna feeds and separate power supply cables for ancillary units within roadside equipment.

The guide therefore examines why Impact Electrical Isolation (IEI) systems should be considered when designing any roadside ITS installation, including those mounted on passively safe or traditional structures. It looks at why an IEI system may be required in addition to standard electrical protective devices, the different types of IEI solutions which are commercially available in the UK, and how the selection of the type of pole and column should influence the IEI technology used.

It should be noted that for street lighting columns and illuminated signs, reference should be made of the separate guidance produced by The Institution of Lighting Professionals (ILP).

The guide examines the issues that occur when a roadside ITS structure is struck by an errant vehicle, and the problems posed for the electrical connections present within these. Using real world examples, it illustrates these issues and sets out best practice solutions for the provision of Impact Electrical Isolation (IEI) implementations for different classes of passively safe structures. It also examines underpinning issues such as effective risk assessments, Extra-Low Voltage (ELV) installations and other supporting infrastructure which should be considered whilst designing installations to provide an effective overall package that works as expected if hit by a vehicle.

More Information

Alistair will present the background and key points of the IHE Passive Safety Electrical Guide and copies can be downloaded from the IHE at <https://www.theihe.org/passiveits> or by scanning this QR code:

