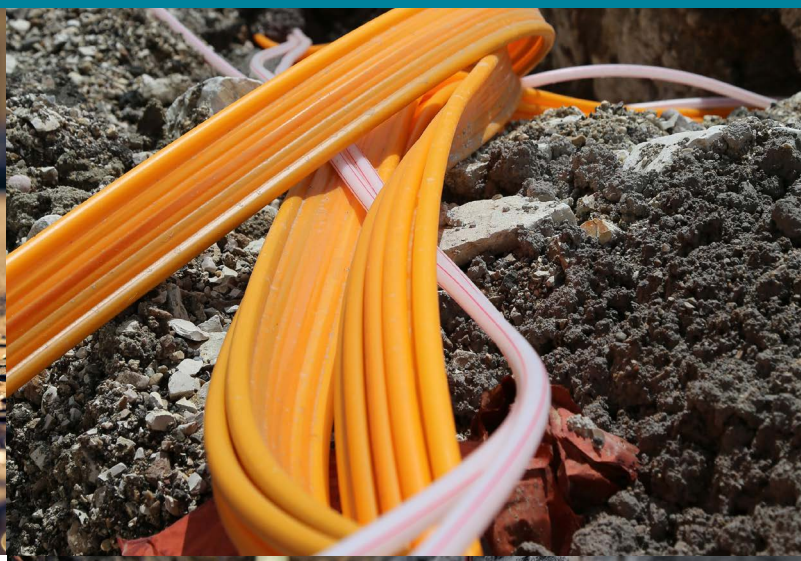
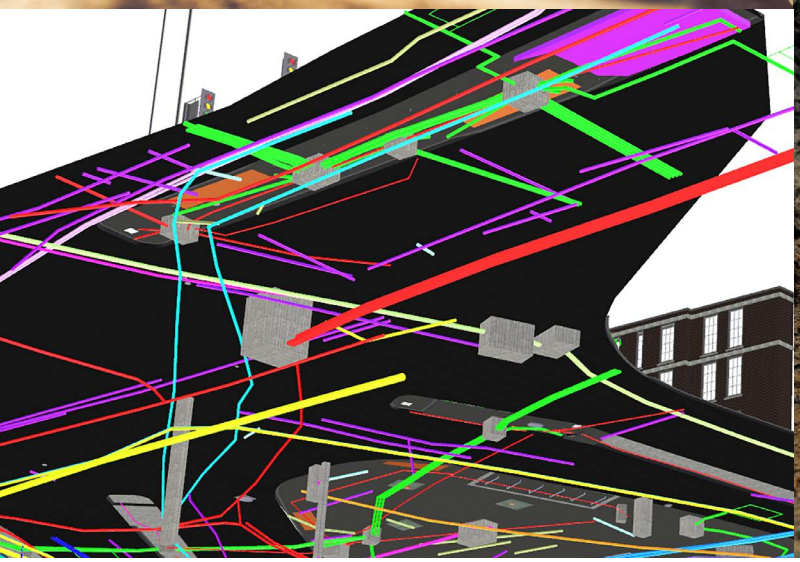
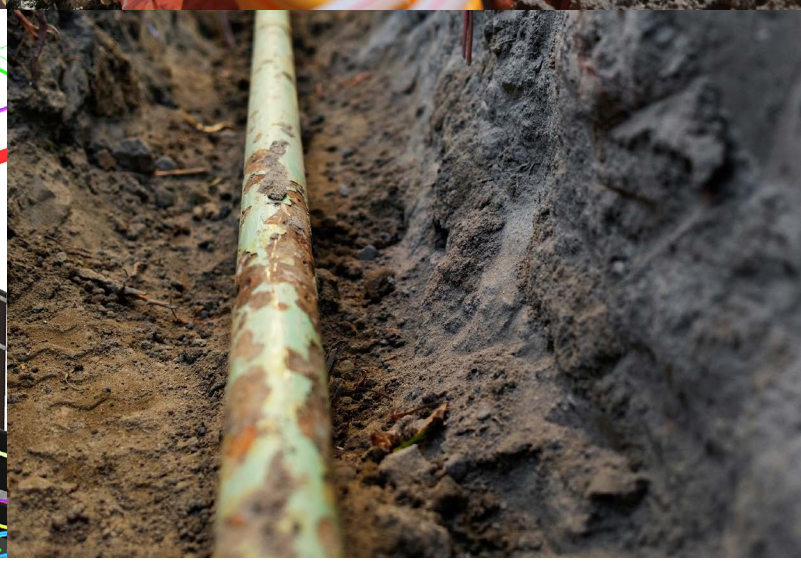
Buried assets – Capturing, recording, maintaining and sharing of location information and data – Code of practice

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Contents

Foreword

This PAS was sponsored by the Institution of Civil Engineers (ICE). Its development was facilitated by BSI Standards Limited and it was published under licence from The British Standards Institution. It came into effect on 31 March 2017.

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The PAS process enables a code of practice to be rapidly developed in order to fulfil an immediate need in industry. A PAS can be considered for further development as a British Standard, or constitute part of the UK input into the development of a European or International Standard.

This PAS is not to be regarded as a British Standard. It will be withdrawn upon publication of its content in, or as, a British Standard.

Hazard warning

WARNING. This PAS calls for the use of procedures that can be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

Use of this document

It has been assumed in the preparation of this PAS that the execution of its provisions will be entrusted to appropriately qualified, and experienced people, for whose use it has been produced.

This PAS is not intended to be used retrospectively and therefore only applies to those assets that are:

- newly-installed and newly-replaced (after the publication of this PAS);
- surveyed in line with the PAS 128 methodology (survey type A); or
- exposed whilst other work is being undertaken.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its methods are expressed as a set of instructions, a description, or in sentences in which the principal auxiliary verb is "should".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. "organization" rather than "organisation").

Where reference is made to English regulations and terminology, (e.g. highway authority) then the equivalent also needs to be considered for Scotland, Wales and Northern Ireland (e.g. roads authority).

Related documents

This PAS is intended to be used alongside PAS 128, *Specification for underground utility detection, verification and location*. PAS 128 specifies requirements for the detection, verification and location of existing and new underground utilities. PAS 128 applies to active, abandoned, redundant or unknown underground utilities and the location of their associated surface features and sets out:

- the accuracy to which the data are captured;
- the quality expected of these data; and
- a means by which to assess and indicate the confidence that can be placed in such data.

This PAS is also intended to be used alongside HSG47, *Avoiding danger from underground services*. HSG47 outlines the potential dangers of working near underground services and gives advice on how to reduce any direct risks to people's health and safety, as well as the indirect risks arising through damage to services.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a PAS cannot confer immunity from legal obligations.

Particular attention is drawn to the following specific regulations:

- Highways Act 1980 [1]
- New Roads and Street Works Act 1991 (NRSWA) [2]
- Roads (Scotland) Act 1984 [3]
- The Street Works (Northern Ireland) Order 1995 [4]
- Traffic Management Act 2004 (TMA) [5]
- Transport (Scotland) Act 2005 [6]

0 Introduction

0.1 Background

There is a vast network of buried assets owned by utility companies, local authorities and other organizations across the UK. Access to accurate mapping of this critical national infrastructure is vital for those undertaking excavations to maintain service, minimize costs and comply with health and safety legislation.

It is estimated that there are in excess of 3 million excavations in the highway each year; 2.53 million works were estimated to have been carried out by utility companies in England and Wales in 2015 [1)] and around 95,000 utility openings in Scotland [2)]. In addition, a similar number of works and openings are estimated to have been carried out by highway authorities and others each year, and other excavations are made outside of the highway network by various stakeholders.

The quality, accuracy and reliability of asset owners' records are variable as there are limited established industry standards to which they are to adhere. Asset owners also provide access to their plans in many different formats and on many different platforms to a highly variable timescale.

This has the following implications:

a) confusion and delays for those needing the information to be able to work safely; and
b) higher risk of asset strikes causing:
    1) safety risks to the public;
    2) higher costs to the project, customers, general public, local businesses, etc.;
    3) delays to the project, customers, general public, local businesses, etc.; and
    4) risks of environmental damage.

Active involvement of key industry players and their agreement through consensus around the capturing, recording, maintaining and sharing of location information and data related to buried assets is likely to provide the lowest overall cost to all. Organizations wishing to abstain from the consensus might miss out on the benefits of early involvement, and the cost to align in the future might significantly increase.

A key benefit of improved asset records is improved safety whilst working in the vicinity of utility assets. However, this does not remove the responsibility of anyone working in the immediate vicinity of utility services, and any employer, to ensure that their employees work safely, at least to the level set out in HSE guidance HSG47, *Avoiding danger from underground services* [NR1].

Additional benefits arising from improved data quality are expected to support:

i) long-term asset management objectives;
ii) enhanced design and planning; and
iii) multi-organizational societal improvements such as future/smart cities and building information modelling (BIM).

0.2 Aims of this PAS

This PAS builds on existing legislation of the New Roads and Street Works Act 1991 [2], the Traffic Management Act 2004 [5], the equivalent street and roads works legislation in Scotland, Wales and Northern Ireland [3)], and the requirements set out in PAS 128. It aims to provide the framework for those owning buried assets to:

a) drive towards improved accuracy when capturing and recording information;
b) share more accurate records collaboratively, with those working in the vicinity of their buried assets; and

[1)] See ALARM survey 2016, http://www.asphaltuk.org/wp-content/uploads/ALARM_survey_2016.pdf [7]

[2)] See http://www.roadworksscotland.gov.uk/nmsruntime/saveasdialog.aspx?lID=1728&sID=99 [8]

[3)] For example, The Street Works (Northern Ireland) Order 1995 [4].

c) improve the linkage between assets that are part of the critical national infrastructure with initiatives such as Smart Cities, and building information modelling (BIM).

***NOTE** Further information on BIM is given in the PAS 1192 suite of standardization documents. In particular, PAS 1192-2 provides the framework for collaborative working, information exchange and information management in a BIM Level 2 environment.*

This PAS aims to enable:

1) an improvement in planning, together with more certainty of the location of assets, in order to reduce excavation and reinstatement costs, and encourage more use of trenchless or minimum dig technology;
2) provide a standard format for asset data that is recognized by industry as being more resilient, in order to allow smoother interchange into future and emerging technologies and innovations, for example, Smart Cities and BIM;
3) the sharing of more consistent and more accurate asset information, including the warning and physical protection devices afforded to buried assets, where known;
4) better visibility of records for survey practitioners in order to reduce the number of unknowns and allow better-targeted survey work;
5) increased knowledge of the underground network for those designing or excavating, thereby reducing the risk of injury, damage or disruption;
6) increased efficiency of street works and a reduction in the associated delays to the public;
7) a reduction in the environmental impact and environmental costs of works;
8) a long-term reduction in the cost, effort and time it takes for utilities and highway or roads authorities to share asset records;
9) a reduction in the time taken to update records in order to enable timely sharing of more current data;
10) improved knowledge of all asset owners of the spatial relationship of their asset with respect to those of other asset owners, in order to improve future planning and further improve co-ordination;
11) the development of a feedback mechanism from those undertaking works around the positional accuracy of their asset in relation to their asset plans; and
12) improved ease of access towards a complete set of records by facilitating a move towards electronic data exchange over time taking into consideration individual organizations' operational, financial, commercial and security concerns.

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1 Scope

This PAS gives recommendations for improving the capturing, recording and maintaining of data related to buried assets (and associated above-ground assets) together with the sharing, in a security-minded manner, of asset information relating to utilities, local authorities and other providers' infrastructure.

This PAS is not intended to be used retrospectively and therefore only applies to those assets that are:

a) newly-installed and newly-replaced (after the publication of this PAS);

b) surveyed in line with the PAS 128 methodology (survey type A); or

c) exposed whilst other work is being undertaken.

This PAS applies to buried assets located in public and private land.

This PAS covers:

1) a data glossary;

2) data formats, such as geography markup language (GML);

3) transition of spatial data, using relative accuracy as a minimum and moving towards absolute accuracy (including depth), together with supporting evidence such as photographs or tagging;

4) the inclusion of decommissioned or abandoned assets when sharing data;

5) a target number of days to make data available for sharing from installation;

6) the capture of data emanating from works carried out under a s50 licence or equivalent;

7) the inclusion of local authority and other organizations' buried assets;

8) movement from paper or microfiche records to a structured, accessible digital format;

9) the capture and sharing of measurable deviations from straight line installations;

10) the use of warning and protection devices to aid the final location of the buried asset; and

11) symbology, typology, colour coding and layering.

NOTE 1 *At the time of publication, efforts to standardize symbology are being undertaken by The Survey Association and these are expected to be introduced as best practice when published. In the interim, this PAS directs users towards the NJUG publication,* Guidance on the Positioning and Colour-Coding of Underground Utilities Apparatus *[NR2] (see Clause **17**). Each organization is advised to share the symbology used in its records whenever data is shared.*

NOTE 2 *Scotland already has a centralized Scottish electronic records system [4] which makes underground pipe and cable information accessible via the Scottish Road Works Register (SRWR).*

NOTE 3 *Attention is drawn to The INSPIRE Regulations 2009 [9], The INSPIRE (Scotland) Regulations 2009 [10], The INSPIRE (Amendment) Regulations 2012 [11] and The INSPIRE (Scotland) Amendment Regulations 2012 [12].*

This PAS does not cover:

i) how or where data are stored or how the integrity of storage is assured;

NOTE 4 *Information on data and file retention is given in PAS 128, **11.7**.*

ii) mines and quarries, with the exception of the buried assets associated with these types of undertaking;

iii) asset owners' policies, processes, procedures and systems for maintaining and providing data to ensure legal compliance; or

NOTE 5 *This PAS is cognizant of the need to maintain commerciality and security. Further information on adopting a security-minded approach to open data is given in PAS 1192-5 and the guidance notes on the CPNI website [5].*

[4] See http://www.roadworksscotland.gov.uk/LegislationGuidance/Guidance/Vault.aspx.
[5] See http://www.cpni.gov.uk.