



Utility Survey - Drawing Standards

Introduction

The purposes of this document are to give a brief description of how Utility Survey drawings produced by Survey & Engineering Projects are presented and to offer guidance on how to interpret them. This will include details on file formats, layering system, line types and text styles and the most commonly used abbreviations. This document does not supersede any industry standards regarding the location of underground services and is for use only with Survey & Engineering Projects drawings.

Disclaimer

At SEP we use skilled and experienced staff, modern up to date techniques and top of the range electromagnetic and radar technology to locate and trace sub-surface utilities. However, the performance of the equipment employed in non-invasive surveys can be adversely affected by factors outside the control of SEP. Therefore, SEP cannot guarantee that all utilities present on site have been located. It is the responsibility of the Client to consult regional authority records and undertake trial digs where appropriate.

Where similar services run in close proximity it may be impossible to separately trace individual services as the trace signal can experience interference. In such cases, services will be shown as a single, annotated line. The displayed depth will refer to the shallowest detected utility.

Successful tracing of non-conductive materials may be limited. Drainage gully's are dye tested where possible to prove connectivity, but it is not always possible to introduce the sonde due to narrow pipe sizes and/or accumulated silt.

Depth information of underground services/features are generally accurate to within +/- 10% (i.e. a pipe at 2m deep may be accurate to +/-200mm) but this cannot be guaranteed. Depths shown usually refer to the top of the service. Gravity sewer and drain depths are usually to invert (base of drainage channel) unless otherwise stated.

Some above ground features may have been obscured at time of survey. It is not always possible to operate the Ground Penetrating Radar in areas including, but not limited to, dense vegetation, rubble, debris and/or rough/uneven ground.

Existing record information that was made available to SEP by the Client or by the statutory utility provider should be regarded only as an indication and cannot be guaranteed.

Excavation in the vicinity of services shown should be carried out with due diligence (Ref. HSG47).



Standard Deliverables

As standard all Utility Survey drawings produced by Survey & Engineering Projects will be issued in the following formats:

AutoCAD 2010 .DWG

A single .PDF file that may consist of multiple pages.

A .ZIP file containing any/all external reference files such as plot styles, line types or attached images.

Unless otherwise requested, all drawings will be at 1:200 scale. In order to minimise paper usage, the fewest number of sheet layouts of the smallest paper size to cover the entirety of the survey area will be used.

Survey Grid & Level Datum

The survey grid and level datum will generally be consistent with the grid and datum of the associated Topographical drawing used as a backcloth. For example, where the Utility Survey data has been overlaid onto a Topographical drawing produced by Survey & Engineering Projects usually all levels relate to O.S (Newlyn) Datum, established using network RTK and plotted on a plane local grid, orientated to National Grid.

Where Topographical drawing has been supplied by the client, we will endeavour to orientate our survey data to match the grid and datum of the supplied drawing, unless requested otherwise. This may be achieved using existing survey control or by employing a graphical tie.

BSI PAS128:2014

All Utility Survey drawings produced by Survey & Engineering Projects are conducted in compliance with the BSI PAS128:2014 standards. Data shall generally be to quality level B and detection method M1, unless otherwise stated. Quality levels for each individual service detected will be displayed within its line type (e.g. WM-B1).

<u>Quality Level</u>	<u>Description</u>
A	Verification
B1	Horizontal/Vertical location using multiple techniques
B2	Horizontal/Vertical location using a single technique
B3	Horizontal location using a single technique
B4	Assumed route
C	Site Reconnaissance
D	Desktop utility records search

For full information regarding detection methods and quality levels please consult the BSI PAS128:2014 standards document.



Underground Utilities

The following is a list of the most common services located during underground utility surveys along with the abbreviations used in the drawings. This is not an exhaustive list as there are a large number certain site specific or specialised services such as you may find on waste water treatment works or MOD sites.

<u>Service Type</u>	<u>Abbreviation</u>
British Telecoms Cable	BT
Cable Ducting	DU
CATV Cable	CA
CCTV Cable	CC
Earthing Strip	ER
Electric Cable	EL
Fibre-Optics Cable	FO
Fuel Line	FL
Gas Main	GM
Combined Water Sewer	CW
Foul Water Sewer	FW
Surface Water Sewer	SW
Telecoms	TC
Traffic Signal Cable	TS
Vehicle Detection Cable	VD

Where an underground feature can not be identified, the following abbreviations are used:

Unidentified Pipe	UP
Unidentified Cable	UC
Generic Unidentified Trace	UI
Series of Consistent Radar Detections	GPR



Layering Scheme

Below is the AutoCAD layering convention used within each Utility Survey drawing produced by Survey & Engineering Projects. These layers will also be included within the PDF:

<u>Layer Name</u>	<u>Colour</u>	<u>Linetype</u>	<u>Linetype Scale</u>
SERVICES_BT_CABLE	85	BT_B2	12
SERVICES_CABLE_DUCTING	136	DU_B2	12
SERVICES_CATV	82	CA_B2	12
SERVICES_CCTV	106	CC_B2	12
SERVICES_COMMUNICATIONS	85	TC_B2	12
SERVICES_EARTH_CABLE	73	ER_B2	12
SERVICES_ELECTRIC_CABLE	30	EL_B2	12
SERVICES_FIBRE_OPTICS	130	FO_B2	12
SERVICES_FUEL_LINE	234	FL_B2	12
SERVICES_GPR	45	GPR_LINE	12
SERVICES_MAINS_GAS	210	GM_B2	12
SERVICES_MAINS_WATER	160	WM_B2	12
SERVICES_SEWER_CW	193	CW_B2	12
SERVICES_SEWER_FW	240	FW_B2	12
SERVICES_SEWER_SW	134	SW_B2	12
SERVICES_TRAFFIC_SIGNALS	153	TS_B2	12
SERVICES_UNIDENTIFIED	27	UI_B2	12
SERVICES_VEHICLE_DETECTION	22	VD_B2	12
SURVEY BOUNDARY	7	Dashed	1



Annotations

Text annotations in Utility Drawings use the *simplex.shx* font and have a height of 0.24 in AutoCAD at 1:200 scale. This translates to a text height of 1.2mm when plotted. All text will be assigned the colour "BYLAYER".

Below is a list of commonly used abbreviated annotations along with a brief description. Abbreviations not shown on this list will appear in the Legend on the titleblock of the drawing:

<u>Abbreviation</u>	<u>Description</u>
0.0d	Depth of service (m)
150 $\varnothing$	Pipe Diameter (mm)
EOT	End of Trace
OSA	Outside of Survey Area
UTL	Unable to Lift cover
UTS	Unable to Sonde pipe
UTT	Unable to Trace
S/L	Signal Lost
BLK	Blocked
IL	Invert Level
SUMP	Chamber Sump Level
WL	Water Level
NFH	No Further GPR contacts
BD	Backdrop pipe
NVP	No Visible Pipe within chamber
ToP	Top of Pipe
USP	Underside of Pipe

Where an abbreviation is insufficient a longer form note will be used as in the example below:

NOTE:- Unable to push sonde beyond this point.



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Statutory Records Searches

In order to be compliant with PAS128:2014 standards you may require us to collate local authority statutory plans of the area. Statutory Records Searches can take up to 28 days to complete as it's necessary to wait for a response from all service providers.

Statutory records information will be compared with utilities data recorded during the survey. This can often be used to identify previously unidentified services. Any services shown statutory records that were not detected during site investigation will be added to the drawing and annotated QL-D. For example, the line of an electric cable that is shown on the statutory records but we were unable to locate on site will be shown on our drawing as EL-D within the line type.