EFFECTIVENESS AND LIMITATIONS OF SUBSURFACE UTILITY INFORMATION (SUI) SURVEYS

AS5488 -2019 Classification of Subsurface Utility Information is the Australian Standard for SUI Surveys. It lists all relevant technical terms and their meaning and describes the 4 Quality Levels (D-A).

QL-B allows the use of electromagnetic locating equipment to indicate the plan position and depth of Subsurface Utilities (SSU's). The stipulated relative tolerance is +/-300mm in plan and +/-500mm in depth.Most QL-B locates will comply with these tolerances but significant outliers can occur, particularly in congested areas.

It is important to realise that not all SSU's can be electronically located. For example, nylon gas mains/services without trace wire can only potentially be located with GPR or GAS TRACKER. Soil conditions and pipe material have a marked influence on the effectiveness of both techniques.

AS5488 stipulates that electronic detection should not be used for obtaining accurate depth information due to potential interference form other adjacent services or due to geological conditions. We recommend Potholing to be carried out to confirm plan position and depth of SSU's located electronically and all Utility Asset Owners also stipulate this.
Small diameters nylon gas pipes in clay soil are particularly difficult to locate

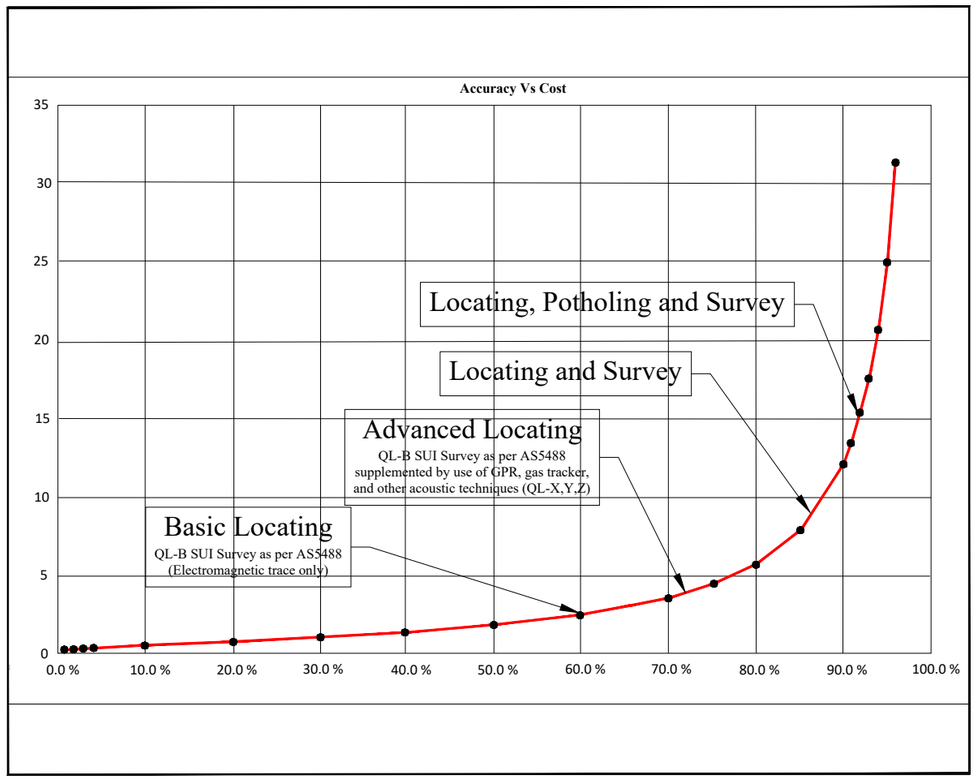
Durkin have created their own internal Quality Levels (QL-X, QL-Y, QL-Z) to compliment the QL-B locates described in AS5488.

Ground Penetrating Radar (GPR) is an essential tool in SUI Surveys and is described in AS 5488 but is not allowed to mark QL-B assets. GPR and other locating equipment can give indications of possible SSU's that do not meet the strict definition of AS5488 QL-B.

These Internal Quality Levels indicate SSU's located with a high confidence level without inducing an electromagnetic signal into the SSU (QL-X). They also indicate potential SSU positions at medium and low confidence levels. (QL -Y and Z)

Our research indicates that best practice around the world is electronomic locations rates of 80-90 % of all Sub Surface Utilities on site.

The graph below indicates the relationship between Locating Techniques, Accuracy and Cost. Potholing and Survey of exposed assets add significantly to the cost but increase the accuracy of the SUI Survey. However 100 % detection of SSU's cannot be achieved regardless of the cost incurred.



DURKIN QUALITY LEVELS DEFINITION

QL-D is the lowest of the four quality levels stipulated in AS5488. It is an indicative position compiled from Existing Records Cursory Site Inspection, Anecdotal Evidence.

EG. GM Ⓓ 32NY (1980)
WMⒹ750 DICL(1901)

QL-C is the next level up from QL-D. AS5488 states that QL-C is a surface feature correlation or an interpretation of the approximate locations and attributes of a surface feature using a combination of existing records (anecdotal evidence) sonic boom techniques and a site survey of visible evidence, or GPR scans. Tolerance of relative horizontal position in QL-C is -/+300mm as per AS5488 2019. QL-C locate does not indicate the depth of the sub-surface asset.

EG. SW — Ø300Ⓒ — SW

QL-B Electronically traced as per AS5488 (direct connection, induction, flexitrace/sonde, flexirod/sonde) with an estimated positional tolerance of +/-300mm in plan, +/-500mm in depth (high confidence level).

EG. WMⒷ750 DICL(1901)
850d

QL-A is the highest quality level as per AS5488 and consists of the positive identification of the attribute and location of a subsurface utility at a point to an precise spatial position in three dimensions. This can be achieved at opened pits and in the potholes where the utility is exposed. Horizontal and Vertical Tolerance: -/+ 50mm.

EG. T 100 PVC Ⓐ — T
400d

QL-X Electronically located with Ground Penetrating Radar or other electronic locating techniques not compliant with AS5488. Estimated positional tolerance is +/-300mm in plan, +/-500mm in depth (high confidence level).

EG. GM Ⓧ 32NY (1980)
500d

QL-Y Electronically located but with reduced confidence in plan position/depth (medium confidence level). EG. WMⓎ750 DICL(1901)
900d

QL-Z Electronically located with low confidence level in plan position/depth (low confidence level).

EG. GM Ⓩ 32NY (1980)
300d

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