

## **BRANDON SURVEYS**

### **STANDARD SPECIFICATION (2018)**

The specification is based on "RICS professional guidance, global – Measured surveys of land, buildings and utilities – 3<sup>rd</sup> edition". RICS is at the forefront of developing international standards, working in coalitions with organisations around the globe, acting in the public interest to raise standards and increase transparency within markets.

The surveyor is responsible for ensuring all equipment is calibrated/verified and checked prior to use and maintained as such throughout the period of survey works, as well as ensuring it is fit for the survey purpose required.

The surveyor is responsible for the prevention of damage to property and/or the environment caused by his/her works or the actions of employees or people under his/her direct control. This includes responsibility to ensure security of property where the surveyor has been supplied keys for access to normally locked areas and where no additional client security measures are in place.

The client should notify the surveyor of any restrictions in relation to the marking of survey control, vegetation clearance and security requirements. Surveyors should be aware of the potential damage that survey marking can cause to structures, underground utilities and to the environment and take appropriate steps to mitigate this.

Unless expressly removed by written instruction the surveyor is responsible for the preparation of method statements, risk assessments, safety and task briefing prior to works commencement and the safety of staff.

The surveyor will not be responsible for omission of details obscured during site survey dates unless action for clearance in advance has been agreed and completed for:

- (a) features obscured by vegetation, debris, snow, sand, earth, when working outside and plaster, cladding, carpet etc. when working inside buildings
- (b) features obscured by vehicles, trailers, temporary covers, stacked materials
- (c) features inside buildings obscured by coverings, furniture, fixtures and fittings
- (d) features inside inspection covers/manholes/chambers obscured by debris, blockages (where internal chamber survey details are requested in the scope)
- (e) features obscured by flooding when undertaking non hydrographic surveys
- (f) features omitted due to lack of adequate lighting or physical access (i.e. at height)
- (g) setting out of points where the placement of appropriate markers is restricted due to obscuration, lack of permission, impermeable or un-markable surfaces
- (h) other (specify)

The surveyor shall advise the client of any access restrictions or related issues which could have an impact on the survey requirements or deliverables. He/she should notify the client as soon as practical of such issues and ensure all reasonable steps are taken to reduce adverse impacts.

The client and surveyor shall agree any actions to resolve identified access issues or provide explicit agreement on omission from the survey scope of areas proven to be inaccessible.

The surveyor shall retain survey records for no less than 7 years.

1 Sigma = 68% of all measurements within the stated +/- range

2 Sigma = 95% of all measurements within the stated +/- range



## **Topographical Survey 1:200**

### **Accuracy**

Where possible the survey will correspond to accuracy band F from “RICS professional guidance, global – Measured surveys of land, buildings and utilities – 3<sup>rd</sup> edition”.

Plan Accuracy (X,Y) : 1 Sigma +/-50mm / 2 Sigma +/-100mm

Height Accuracy (Z) : Hard detail +/-50mm / Soft detail +/-100mm

Minimum size of feature shown true to scale (not symbolised) = 100mm

### **Co-ordinate reference system**

The survey shall use one of the following (to be agreed with the client) :

A local grid with a unitary scale factor which is either :

- An existing local grid for which there are existing survey control points
- A site grid based on existing site features (e.g. a building grid)
- An arbitrary grid proposed by the surveyor and agreed by the client
- Derived from the national grid with the scale factor removed
- The country's national grid (UK = OSGB36)

The survey shall use the following height/vertical datum (to be agreed with the client):

- Surveyed heights/levels shall be orthometric and quoted in metres above the national height datum published by the national mapping agency (These heights to be derived from GNSS measurements)
- Surveyed heights/levels shall be orthometric and quoted in metres above a datum defined by existing control.
- Surveyed heights/levels shall be orthometric and quoted in metres above a datum defined by the surveyor and agreed with the client (Local TBM, control station or floor level)

### **Survey control markers**

The surveyor shall provide at least 2 permanent survey control markers on site.

Permanent markers for survey control shall not be placed so that they present a health and safety hazard to people or animals or cause damage to property or equipment.

### **Survey deliverables**

A 2D plan and a 3D plan in .dwg (AutoCAD) format and accompanying PDF plan will be delivered as standard. Any additional deliverables such as survey reports, 3D models, laser scanner point clouds etc. Can be delivered if requested prior to the survey commencing.

### **Features to be surveyed :**

#### **Permanent structures**

Buildings  
Foundations (where exposed)  
Archways, underpasses, culverts, bridges  
Canopies, porches etc (overhead features)  
Ramps  
Steps

#### **Roads, paths and tracks**

Channel line at 15m intervals (road)  
Centre line at 15m intervals (road)  
Carriageway edge  
Drop kerbs  
Top of kerb (on specific request)  
Barriers  
Speed humps etc

**Topographical Survey 1:200 cont.**
**Temporary structures**

Sheds, containers, mobile buildings etc

**Boundary features**

Fences (with type and height)

Walls (with type and height)

Buttresses

Gates

Hedges

Ditches

Watercourses

Boundary markers (posts, stakes etc)

**Utility covers**

**(invert levels not surveyed unless specified)**

Gullies

intervals

Rodding eyes

Air valves

Cable TV covers

Electricity covers

Fire hydrants

Drainage covers

(inspection chambers and manholes)

Water meters

Stop taps

Gas valves

CCTV cameras

Telecoms

Telephone call boxes

**Trees, wooded areas and dense vegetation**

Woodlands ; perimeter trees and tree canopy

Bushes & shrubs (minimum girth 0.3m)

Trees (minimum girth 0.3m)

Edge of vegetation

Areas of saplings

Shrubberies and planters

**Earth works**

Banks, top and bottom

Mounds and depressions

Spoil heaps (rubble, soil & rubbish)

Quarries, pits and mineral workings

Retaining walls (top and base)

Sloping masonry (top and base)

**Contours**

0.5m intervals or other intervals

as proposed by the surveyor

**Street Furniture**

Beacons & Bollards

Barriers

Traffic islands

Bus stop and shelters

Junction/control boxes

Hoardings

Lamp posts

Telephone/electricity poles

Road signs & Traffic lights

Changes of surface (hard and soft)

Post boxes

Markers

Notice boards/Signs

**Water Features**

Watercourses

(drains, ditches, streams with levels at 15m

Waterline

Water level

Water bodies (ponds, lakes, reservoirs)

Top of banks

Bottom of banks

Weirs

Locks

Flood gates

Retaining walls

Sheet piling

Sea defenses/groynes

Pipes, outfalls and culverts

Bridges, walkways, gantries, jetties etc

Fountains

Waterfalls

Gabions

**Sports pitches and playgrounds**

Pitch extents

Play equipment extents

**Industrial sites**

Aerials

Chimneys

Electricity sub stations and transformers

(perimeter fence only)

Filter beds and plant (extents only)

Overhead cables

Pylons

Tanks and storage chambers

Lifting equipment (cranes)

## **Topographical Survey 1:500**

### **Accuracy**

Where possible the survey will correspond to accuracy band F from "RICS professional guidance, global – Measured surveys of land, buildings and utilities – 3<sup>rd</sup> edition".

Plan Accuracy (X,Y) : 1 Sigma +/-100mm / 2 Sigma +/-200mm

Height Accuracy (Z) : Hard detail +/-50mm / Soft detail +/-100mm

Minimum size of feature shown true to scale (not symbolised) = 100mm

### **Co-ordinate reference system**

The survey shall use one of the following (to be agreed with the client) :

A local grid with a unitary scale factor which is either :

- An existing local grid for which there are existing survey control points
- A site grid based on existing site features (e.g. a building grid)
- An arbitrary grid proposed by the surveyor and agreed by the client
- Derived from the national grid with the scale factor removed
- The country's national grid (UK = OSGB36)

The survey shall use the following height/vertical datum (to be agreed with the client)

- Surveyed heights/levels shall be orthometric and quoted in metres above the national height datum published by the national mapping agency (These heights to be derived from GNSS measurements)
- Surveyed heights/levels shall be orthometric and quoted in metres above a datum defined by existing control.
- Surveyed heights/levels shall be orthometric and quoted in metres above a datum defined by the surveyor and agreed with the client (Local TBM, control station or floor level)

### **Survey control markers**

The surveyor shall provide at least 2 permanent survey control markers on site.

Permanent markers for survey control shall not be placed so that they present a health and safety hazard to people or animals or cause damage to property or equipment.

### **Survey deliverables**

A 2D plan and a 3D plan in .dwg (AutoCAD) format and accompanying PDF plan will be delivered as standard. Any additional deliverables such as survey reports, 3D models, laser scanner point clouds etc. Can be delivered if requested prior to the survey commencing.

### **Features to be surveyed :**

#### **Permanent structures**

Buildings  
Foundations (where exposed)  
Archways, underpasses, culverts, bridges  
Canopies, porches etc (overhead features)  
Ramps  
Steps

#### **Roads, paths and tracks**

Channel line at 15m intervals (road)  
Centre line at 15m intervals (road)  
Carriageway edge  
Drop kerbs  
Top of kerb (on specific request)  
Barriers  
Speed humps etc

## Topographical Survey 1:500 cont.

### Temporary structures

Sheds, containers, mobile buildings etc

### Boundary features

Fences (with type and height)

Walls (with type and height)

Buttresses

Gates

Hedges

Ditches

Watercourses

Boundary markers (posts, stakes etc)

### Utility covers

(invert levels not surveyed unless specified)

Gullies

intervals

Rodding eyes

Air valves

Cable TV covers

Electricity covers

Fire hydrants

Drainage covers

(inspection chambers and manholes)

Water meters

Stop taps

Gas valves

CCTV cameras

Telecoms

Telephone call boxes

### Trees, wooded areas and dense vegetation

Woodlands ; perimeter trees and tree canopy

Bushes & shrubs (minimum girth 0.3m)

Trees (minimum girth 0.3m)

Edge of vegetation

Areas of saplings

Shrubberies and planters

### Earth works

Banks, top and bottom

Mounds and depressions

Spoil heaps (rubble, soil & rubbish)

Quarries, pits and mineral workings

Retaining walls (top and base)

Sloping masonry (top and base)

### Contours

0.5m intervals or other intervals

as proposed by the surveyor

### Street Furniture

Beacons & Bollards

Barriers

Traffic islands

Bus stop and shelters

Junction/control boxes

Hoardings

Lamp posts

Telephone/electricity poles

Road signs & Traffic lights

Changes of surface (hard and soft)

Post boxes

Markers

Notice boards/Signs

### Water Features

Watercourses

(drains, ditches, streams with levels at 15m

Waterline

Water level

Water bodies (ponds, lakes, reservoirs)

Top of banks

Bottom of banks

Weirs

Locks

Flood gates

Retaining walls

Sheet piling

Sea defenses/groynes

Pipes, outfalls and culverts

Bridges, walkways, gantries, jetties etc

Fountains

Waterfalls

Gabions

### Sports pitches and playgrounds

Pitch extents

Play equipment extents

### Industrial sites

Aerials

Chimneys

Electricity sub stations and transformers

(perimeter fence only)

Filter beds and plant (extents only)

Overhead cables

Pylons

Tanks and storage chambers

Lifting equipment (cranes)

## **Measured Building Surveys 1:50**

### **Accuracy**

Where possible the survey will correspond to accuracy band D from "RICS professional guidance, global – Measured surveys of land, buildings and utilities – 3<sup>rd</sup> edition".

Plan Accuracy (X,Y) : 1 Sigma +/-10mm / 2 Sigma +/-20mm

Height Accuracy (Z) : Hard detail +/-10mm / Soft detail +/-20mm

Minimum size of feature shown true to scale (not symbolised) = 20mm

Where possible floor plans will be created from measurements taken at a height of 1.2m above finished floor level. The surveyor may, at his/her discretion, adjust this level to the best possible location to ensure an unobstructed measurement.

### **Co-ordinate reference system**

The survey shall use one of the following (to be agreed with the client) :

- An existing local grid for which there are existing survey control points
- A site grid based on existing site features (e.g. a building grid)
- An arbitrary grid proposed by the surveyor
- Derived from the national grid with the scale factor removed

The survey shall use the following height/vertical datum (to be agreed with the client)

- Surveyed heights/levels shall be orthometric and quoted in metres above a datum defined by existing control.
- Surveyed heights/levels shall be orthometric and quoted in metres above a datum defined by the surveyor.
- (Usually a ground floor entrance level of 100.00 meters)
- Surveyed heights/levels shall be orthometric and quoted in metres above the national height datum published by the national mapping agency (These heights to be derived from GNSS measurements)

### **Survey control markers**

All internal building control shall be of a temporary nature and removed following survey completion. Temporary markers for survey control shall not be placed so that they present a health and safety hazard to people or animals or cause damage to property or equipment.

### **Survey deliverables**

A 2D plan in .dwg (AutoCAD) format and accompanying PDF plan will be delivered as standard. Any additional deliverables such as survey reports, laser scanner point clouds etc. Can be delivered if requested prior to the survey commencing.

### **Asbestos report**

It is assumed that the client will provide a condition/asbestos report for the building before the survey commences should this be required.

**Measured Building Survey 1:50 cont.**

**Features to be surveyed :**

**Floor Plans**

**Main (structural) elements**

Walls  
Doors  
Windows  
Steps/stairs  
External building footprint  
Columns  
Beams  
Ramps  
Sky lights

**Levels/Heights (from floor level)**

Floor levels  
(centre of each room & top/bottom of stairs)  
Ceiling heights (structural & false)  
Beam soffits  
Window sill/head heights  
Door heights  
Arch heights

**Elevations**

Building Outline  
Ground profile  
Roof details  
Parapets  
Doors  
Windows  
Balconies  
Chimneys  
Pipes  
Plant/services (outline only)  
Vents  
Brick string courses  
Signage  
Construction materials  
Scale bar  
Datum line

**Secondary elements**

Partitions  
Raised floors  
Fixed furniture

**Services**

WC's  
Sinks/basins/baths/showers  
Inspection covers (location & level)  
Pipes (downpipes only)

**Roof plan**

Chimneys  
Drainage features  
Fire escapes (outline only)  
Catwalks (outline only)  
Parapets  
Plant/services (outline only)  
Ridge lines  
Surface materials  
Vents  
Windows  
Skylights

**Sections (outline)**

External building outline  
Floors  
Walls  
Ceilings  
Doors  
Windows  
Stairs  
Beams  
Columns  
Roof line  
Parapets  
Scale bar  
Datum line

## **Measured Building Survey 1:100**

### **Accuracy**

Where possible the survey will correspond to accuracy band E from "RICS professional guidance, global – Measured surveys of land, buildings and utilities – 3<sup>rd</sup> edition".

Plan Accuracy (X,Y) : 1 Sigma +/-25mm / 2 Sigma +/-50mm

Height Accuracy (Z) : Hard detail +/-10mm / Soft detail +/-50mm

Minimum size of feature shown true to scale (not symbolised) = 50mm

Where possible floor plans will be created from measurements taken at a height of 1.2m above finished floor level. The surveyor may, at his/her discretion, adjust this level to the best possible location to ensure an unobstructed measurement.

Co-ordinate reference system

The survey shall use one of the following (to be agreed with the client) :

- An existing local grid for which there are existing survey control points
- A site grid based on existing site features (e.g. a building grid)
- An arbitrary grid proposed by the surveyor
- Derived from the national grid with the scale factor removed

The survey shall use the following height/vertical datum (to be agreed with the client)

- Surveyed heights/levels shall be orthometric and quoted in metres above a datum defined by existing control.
- Surveyed heights/levels shall be orthometric and quoted in metres above a datum defined by the surveyor.
- (Usually a ground floor entrance level of 30.00 meters)
- Surveyed heights/levels shall be orthometric and quoted in metres above the national height datum published by the national mapping agency (These heights to be derived from GNSS measurements)

### **Survey control markers**

All internal building control shall be of a temporary nature and removed following survey completion. Temporary markers for survey control shall not be placed so that they present a health and safety hazard to people or animals or cause damage to property or equipment.

### **Survey deliverables**

A 2D plan in .dwg (AutoCAD) format and accompanying PDF plan will be delivered as standard. Any additional deliverables such as survey reports, laser scanner point clouds etc. Can be delivered if requested prior to the survey commencing.

### **Asbestos report**

It is assumed that the client will provide a condition/asbestos report for the building before the survey commences should this be required.



**Measured Building Survey 1:100 cont.**

**Features to be surveyed:**

**Floor Plans**

**Main (structural) elements**

Walls  
Doors  
Windows  
Steps/stairs  
External building footprint  
Columns  
Beams  
Ramps  
Sky lights

**Levels/Heights (from floor level)**

Floor levels  
(centre of each room & top/bottom of stairs)  
Ceiling heights (structural & false)  
Beam soffits  
Window sill/head heights  
Door heights  
Arch heights

**Elevations**

Building Outline  
Ground profile  
Roof details  
Parapets  
Doors  
Windows  
Balconies  
Chimneys  
Pipes  
Plant/services (outline only)  
Vents  
Brick string courses  
Signage  
Construction materials  
Scale bar  
Datum line

**Secondary elements**

Partitions  
Raised floors  
Fixed furniture

**Services**

WC's  
Sinks/basins/baths/showers  
Inspection covers (location & level)  
Pipes (downpipes only)

**Roof plan**

Chimneys  
Drainage features  
Fire escapes (outline only)  
Catwalks (outline only)  
Parapets  
Plant/services (outline only)  
Ridge lines  
Surface materials  
Vents  
Windows  
Skylights

**Sections (outline)**

External building outline  
Floors  
Wall  
Ceilings  
Doors  
Windows  
Stairs  
Beams  
Columns  
Roof line  
Parapets  
Scale bar  
Datum line

## Underground Services Surveys

### Overview

This specification refers to the survey of underground utilities which includes the locating, detecting and identifying of pipes and cables buried underground.

In order to present the results of this survey one of the following will be required:

1. Topographical Survey
2. Ordnance survey digital background.

Both of these can be provided by Brandon Surveys at an additional cost.

It is assumed that a Statutory Utilities search pack or local site records, detailing records of services within the survey area, will be provided by the client.

A Statutory Utilities search pack can be obtained by Brandon Surveys at an additional cost. This must be requested before the survey commences.

Methods and procedures will be based on The Survey Association (TSA) Guidance Notes for Utility Surveys and PAS 128:2014 (Specification for underground utility detection verification and location)

Unless otherwise requested we would undertake the survey to the TSA **Level 3** standard.

### Method

Visual observations to locate trench scarring and locate covers, identify service type and provider where possible.

Electro-magnetic detection techniques to be used to trace all metallic pipes and cables, in both passive and active modes, as appropriate.

Drainage covers will be lifted, invert depths and pipe sizes will be measured (there will be no confined space work, we will **NOT** enter any manholes)

We will not attempt to lift any covers which are visibly damaged.

We will not attempt to lift any covers which may cause damage to their surroundings on lifting.

Manhole connections will be determined by echo-detection or by a Sonde placed in the pipe and induced with an Electro-magnetic signal.

Ground Penetrating Radar can be used on request from the client at an additional cost.

### Summary

Services survey: Electro-magnetic Location (EML) survey of all services in both active and passive modes.  
Show results on AutoCAD drawings

Drainage survey: Locate and lift covers  
Confirm connections  
Record depth of all connections  
If necessary to confirm connections undertake EML survey (sonding)  
Show results on AutoCAD drawings

## Underground Services Surveys cont.

### Levels of Utility Survey (TSA Guidance Notes)

**Level 1:** Desk top survey involving a search of existing utility records. This can be consolidated on to one CAD plan and overlaid on to base mapping.

**Level 2:** A site visit including a visual inspection and walk over of the site. This would normally be in addition to a Level 1 survey. This would not include a CAD plan unless carried out in addition to a Level 1 survey.

**Level 3:** Electromagnetic location survey in passive and active modes with located services being marked on to ground surface. Includes lifting of covers to enable confirmation of connections by echo detection or sonding. All services to be shown on CAD plan. Non metallic pipes (plastic) and fibre optic cables may NOT be detected.

**Level 4:** A level 3 survey with the addition of Ground Penetrating Radar (GPR). The specification for the spacing of GPR scan lines to be discussed and agreed before the survey commences.

**Level 5:** A level 3 survey with the addition of Ground Penetrating Radar (GPR) over an agreed percentage of the site with post data collection, processing, analysis and interpretation of results. Records to be shown on CAD plans.

**Level 6:** A level 3 survey with the addition of Ground Penetrating Radar (GPR) over 100 percent of the site with post data collection, processing, analysis and interpretation of results. Records to be shown on CAD plans.

### Notes on Ground Penetrating Radar

The effectiveness of GPR is determined by ground conditions and the shape, size, type and depth of the target utility. Small pipes and cables, particularly plastic pipes may not be detected.