Invitation to Tender for   
Point Cloud, Topographical and Underground Services Survey

Council Offices  
South Staffordshire Council Wolverhampton Road   
Codsall  
Wolverhampton  
WV8 1PX

Document no. **CCH-KBS-XX-XX-SP-A-1000-ITTPointCloudTopoAndUndergroundServicesSurvey-D2-P03**

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# Document Control

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| **Report Title** | **Invitation to Tender for Point Cloud, Topographical & Underground Services Survey** |
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**Distribution**

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| **South Staffordshire Council – Client’s Project Manager** | **Imre Tolgyesi** | **electronic** |
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1. **Introduction**
   1. We are pleased to invite you to submit a fixed price lump sum tender, in limited completion, for carrying out the following at **South Staffordshire Council Offices**:

* Point cloud survey and creating a corresponding Revit model of part of the existing building.
* Topographical survey of part of the site.
* Underground services survey of part of the site.

This ITT must be read in conjunction with the accompanying drawings and documents as listed in Section 2.1.

1. **Supporting Documents**
   1. The following documents are to be read in conjunction with this ITT document:

|  |  |
| --- | --- |
| **File name** | **Description** |
| CCH-KBS-ZZ-XX-DR-A-1900-PointCloudTopoAndUGServicesSurveyExtents-D2-P02 | Existing site plan showing point cloud, topographical and underground services survey extents |
| CODSALL-KWS-XX-XX-DR-A-SK010-PROPOSED SITE PLAN-OPTION 10-S1-P05 | Proposed site plan option 10 at feasibility stage |
| CODSALL-KWS-XX-XX-DR-A-SK013-PROPOSED PLANS-OPTION 10-S1-P05 | Proposed building plans option 10 at feasibility stage |
| Existing1970'sBuildingStructuralEngineersGADrawings | Structural Engineer’s GA drawings for existing building built in 1970’s |
| Existing1980'sExtensionBuildingControlDrawings | Building Control drawings for extension built in 1980’s |
| South Staffordshire Council Offices-Existing Floor Plans | South Staffordshire Council Offices existing floor plans |
| TEMPLATE CONTRACT FOR THE SUPPLY OF GOODS AND SERVICES | Template contract for the supply of goods and services for South Staffordshire Council |

1. **Development Proposals**
   1. It is proposed to develop a new extension to the existing council offices, consisting of a new single storey entrance, two storey atrium, and two storey offices. The existing council offices are to be partly remodelled and refurbished to various levels. Externally, the existing car parking will be expanded.
2. **Point Cloud Survey & Revit Model Specification**
   1. **Scanning Equipment**  
      The survey should be conducted via a 3D laser scanning instrument, The XYZ points collected should also be matched with an appropriate RGB value. Where an RGB value is not possible an intensity rating should be collected. All equipment must be tested and certified to be accurate within the manufacturer’s tolerances, Please provide evidence that these tests have been carried out as part of your deliverables. Raw data should be registered, georeferenced and compiled into an RCP format for use with Autodesk Recap and Autodesk Revit.
   2. **Level of Detail (LOD) Option 1 - to be priced separately**The point cloud survey should be conducted to a tolerance / accuracy of **+/- 10mm** with a maximum point spacing of **5mm** in order to create a Revit model to Level of Detail **400** (LOD).

The below table sets out the required accuracies of the point cloud and Revit model required. Please contact the document author to clarify any of the below. The required level of detail for the survey and model under this option is: LOD **400.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Level of Detail** | **Laser scan point Accuracy** | **Resolution (Point density)** | **Model Tolerance** | **Typical model use scale** |
| 400 | +/- 10mm | 5mm | +/- 10mm | 1:20 – 1:50 |

Typically; vertically the LOA should be +/- 30mm or better.

* 1. **Level of Detail (LOD) Option 2 - to be priced separately**  
     The point cloud survey should be conducted to a tolerance / accuracy of **+/- 20mm** with a maximum point spacing of **10mm** in order to create a Revit model to Level of Detail **300** (LOD).

The below table sets out the required accuracies of the point cloud and Revit model required. Please contact the document author to clarify any of the below. The required level of detail for the survey and model under this option is: LOD **300,** as highlighted

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Level of Detail** | **Laser scan point Accuracy** | **Resolution (Point density)** | **Model Tolerance** | **Typical model use scale** |
| 300 | +/- 20mm | 10mm | +/- 20mm | 1:50 – 1:100 |

Typically; vertically the LOA should be +/- 30mm or better.

* 1. **Level of Information (LOI)**  
     The Revit model output described in section 1.1 should be delivered with Level of Information **300** assigned to all model elements. The Revit model must also be geo located in relation to the point cloud survey noted in 4.3.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **LOI** | **Information Content** | | | | |
| 100 | Category  (Beam) |  |  |  |  |
| 200 | Category  (Beam) | Position |  |  |  |
| 300 | Category  (Beam) | Position | Type  (UB) |  |  |
| 400 | Category  (Beam) | Position | Type  (UB) | Finish  (Steel) |  |
| 500 | Category  (Beam) | Position | Type  (UB) | Finish  (Steel) | Construction Information  (28kg/m) |

* 1. **Outputs**  
     The point cloud information collected in accordance with section 4.1 should be supplied in a .rcp format. Any created Revit model(s) should be supplied in .rvt format suitable for use in Autodesk Revit Year and be detailed to the LOD LOI LOA set out in this document. Please ensure the models are separated by the volume strategy as indicated on the supporting documents.
  2. **Model LOD Table**

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| --- | --- | --- |
| LOD 100 | Mass Model  Outline Mass model of the building or structure.  External Walls, Floors and Roof will be modelled as a mass block, and will include simplified topography  No windows or door openings, services or architectural details will be included |  |
| LOD 200 | Basic Model  Models will include key structural components and openings in the building.  Structural Walls with overall thickness  Floors with undefined thickness  Ceilings modelled from floor level with undefined thickness  (Ceiling voids not included)  Roof modelled with overall thickness (where access allows)  Door and Window openings (to o/a structural openings)  Primary structure (where exposed, boxing will be measured otherwise)  Stairs (no handrails)  Major plant items; as mass only  Lifts; as core and openings only  Site; simplified topography with regions for varying components (no detail items i.e kerbs or street furniture)  No architectural detail will be modelled, and no bespoke families will be created. |  |
| LOD 300 | Standard survey model  Structural walls modelled with overall thickness  Floor modelled from FFL with thickness (if accessible)  Ceiling modelled from FFL with thickness (if accessible)  Roof modelled to show key structure and thickness (If accessible)  Rainwater goods  Door and Windows modelled as generic families to include basic detail  Sanitary ware (with standard families) no MEP connections included  Primary structure  Stairs with handrails  Major MEP services, overall size and type, including ducts and pipework, but excluding trunking, cable trays or cables for power and data.  Lifts; core and doors  Site; topographic surface with regions and basic street furniture  Asset data or virtual tags are not required. COBIE data sheets are not required. |  |
| LOD 400 | Detailed model  Fully detailed model for analysis / asset management.  Significant ceiling mouldings  Detailed rainwater goods  Secondary structure  Doors and Windows as bespoke families  MEP modelled as bespoke families  Higher level of detail in families and fixed furnishings, inc; Skirtings, trims, radiators etc.  Significant surface finishes modelled |  |
| LOD 500 | Verification model  Colour laser scan of asset for comparison with Project Information Model PIM  Depending on the stage which the survey is carried out, the design team may retain modelling responsibility and LOI management. |  |
|  | Generally models will be produced with plan, elevation and section views contained within the model, for direct export to CAD if required. These models will be Georeferenced in order to allow communication with other models and or CAD packages. Sheets are not to be set up in the model unless requested, if sheets are requested, a kier logo should be displayed alongside the surveyors company information. | |

#### **Topographical Survey Specification**

* 1. **Accuracy**The default measured survey detail accuracy band for this project will be accuracy band **D (1:50)** (ref. Measured surveys of land buildings and utilities 3rd edition, Professional Guidance, 2014, RICS).

Sufficient accurate horizontal measurements should be taken to enable the survey to be plotted to a true scale.

* 1. **Calibration and Checking of Equipment**All equipment must be tested and certified to be accurate within the manufacturer’s tolerances. 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.
  2. **Coordinate Reference System**

The survey shall use the following coordinate reference system in plan: Ordnance Survey National Grid and Datum. The subsequent Revit model will be required to utilise a shared coordinate system.

* 1. **Extents**  
     The survey must extend beyond the boundaries so that boundary details are clear of any doubts. The area to be surveyed shall include up to the opposite side of the road carriageway where adjacent to the site boundary, and shall also include any public footpaths also where directly adjacent to the site boundary. Levels are required to the top of all boundary walls and fences, and ground levels each side of each wall and fence are also required.
  2. **Features**  
     The survey must consist of a grid of 5m x 5m (or closer) spot levels with contour lines throughout each site and allow for recording all other significant building, landscape and services features such as lamp posts, bollards, footpaths, steps/stairs, ramps, handrails, external walls, street furniture, gullies, drainage channels, roads, car parks, fences, planter beds, surfacing, kerb levels and other significant above ground features. Manhole, duct and service covers must be positioned with all cover levels and invert levels recorded. Directions of drains and diameter of pipes within drainage manholes must be recorded and marked on the plan. Any obvious service trenches across the site must be located on the plan. Sharp changes in topography must be recorded. A level is to be recorded for the existing finished floor at all building thresholds, as well as regular levels for the head and foot of existing building external walls. The location of all trees with a stem diameter of greater than 75mm at 1.5m above ground level must be given, together with an indication of trunk size/girth and diameter of canopy. A spot ground level adjacent to each tree must be provided. Details of existing fences and walls either crossing the site/s or lying on the boundary lines should be specified. Any significant breaks in boundary lines or obvious changes in level at site boundaries on top of walls or fences must be recorded.
  3. **Obscured Features**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:

1. features obscured by vegetation, debris, snow, sand, earth, when working outside and plaster, cladding, carpet etc. when working inside buildings.
2. features obscured by vehicles, trailers, temporary covers, stacked materials.
3. features inside buildings obscured by coverings, furniture, fixtures and fittings.
4. features inside inspection covers/manholes/chambers obscured by debris, blockages (where internal chamber survey details are requested in the scope).
5. features obscured by flooding when undertaking non hydrographic surveys.
6. features omitted due to lack of adequate lighting or physical access (i.e. at height).
7. setting out of points where the placement of appropriate markers is restricted due to obscuration, lack of permission, impermeable or un‐markable surfaces.  
   1. **Standards**Layer naming to be in accordance with 'AEC (UK) Protocol for Layer Naming'   
      Compliance with 'AEC UK BIM Protocol for Autodesk Revit' is required.   
      For reference, and as per AEC UK BIM Protocol for Autodesk Revit, the following worksets are to be included within each separate Volume model;

(Volume Number)‐Ceilings \*

(Volume Number)‐Cores \*

(Volume Number)‐FFE \*

(Volume Number)‐Interiors \*

(Volume Number)‐Shell \*

(Volume Number)‐Slabs \*

(Volume Number)‐Circulation \*

(Volume Number)‐Structure \*

(Volume Number)‐M&E Services \*

(Volume Number)‐Topo Landscape \*\*

(Volume Number)‐Topo Features \*\*

(Volume Number)‐Topo Trees \*\*  
  
Key

\* Measured Building Survey

\*\* Topographical Survey

* Within the Topo‐Surface workset, all hard and soft landscaping is to be included and modelled as separate regions. Ramps, stairs, footpaths, car parks, existing standalone structures must be modelled as part of the hard landscaping. Soft Landscaping will consist mainly of grassed areas.
* Within the Topo‐Trees workset, basic 3D trees only are to be used due to file size limitations. The location of the trunk and indication of canopy size in plan are preferred to 3D visuals of the trees.
  1. **Outputs**All Topographical Survey Data in DWG format compatible with Autodesk AutoCAD 2017.  
     Note: this will subsequently be used for addition of Underground Services Survey Information.  
     3D Topographical Revit Models (.rvt) compatible with Autodesk Revit 2017.

#### **Underground Services Survey Specification**

* 1. **Desktop Utility Search**A desktop utility search of all available utility data should be undertaken, in addition to carrying out the physical scanning of the site for buried services, to comply with PAS 128:2014 Specification for Underground Utility Detection, Verification and Location. The cost of this search should be included in your tender.
  2. **Extents**  
     The survey must extend beyond the boundaries so that boundary details are clear of any doubts. The area to be surveyed shall include up to the opposite side of the road carriageway where adjacent to the site boundary, and shall also include any public footpaths also where directly adjacent to the site boundary.
  3. **Outputs**

Underground Services Survey compatible with AutoCAD 2017.Upon completion of the survey, you shall add the accurately measured records of drain lengths, diameters, depths and directions of flow etc to the Topographical AutoCAD drawing as described in Item 4.10 above. Line style and line weight, the CAD/BIM drawing layers, model names and colour coding shall be in accordance with TSA’s (The Survey Association) The Essential Guide to Utility Surveys. A .DWG file format inclusive of all surveyed elements is required.

* 1. **Quality Level**The underground services survey shall be carried out according to Quality Level **B** on Table 1 in PAS 128.
  2. **Scope**The underground services survey shall:‐
* Determine the arrangement of all buried services within the boundaries.
* Measure and record the depth below ground of each service pipe, duct, cable, wire and other underground infrastructure indicating changes in level where appropriate.
* Identify and record the type of service (i.e. gas, water, telecommunication, HV or LV electricity, drains etc).
* Measure and record the size/diameter of each service or service trench.
* Record the direction of travel of the service run, where applicable.
  1. **Standards**

The survey will be carried out in accordance with the ‘Code of Practice for Site Investigations’ BS 5930, and Measured surveys of land buildings and utilities 3rd edition, Professional Guidance, 2014, RICS. All current investigation underground survey methods available, such as radio detection (CAT), acoustic detection, ground penetrating radar, CCTV and Sonde should be used, as deemed appropriate by the survey specialist, to achieve the aims of the survey, which are listed in the Scope above.

1. **CDM Regulations, Health & Safety**
   1. You must conduct your surveys in accordance with the CDM Regulations and as such you must submit a Risk Assessment and Method Statement for the survey work at tender stage. You must include in your tender for any equipment and contractor’s attendance that you require to safely execute your survey. No attendance will be provided by others. You should note that some levels are required on public roads and public spaces that will most likely be occupied when you carry out your work. You must allow for all safety measures such as protecting open manhole covers when working in occupied areas.
   2. If working on site, you will be expected to have familiarised yourself with the site sufficiently to confirm access limitations, and to have taken reasonable steps to identify the presence of existing services. 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.
2. **Survey Work Conditions**
   1. No attendance from others or equipment will be provided and you will be working at the building during normal working hours (see 15.1 below).
3. **Quality Management & Warranty**
   1. Tenderers must have an accredited quality management system and outputs must be checked and approved under this system. Output information must be provided with a warranty so that they may be used by a Building Contractor appointed by the Client. Allow within your tender for ensuring that this warranty will be provided.
4. **Competence of Survey Staff**
   1. The surveyor is responsible for ensuring that their staff are qualified, competent, appropriately insured and trained to do the tasks for which they are engaged. Tenderers are required to be accredited within the Contractors Health and Safety Assessment Scheme (CHAS), members of Constructionline, or members of an equivalent organisation as a minimum. You will be expected to provide evidence of this within your tender return.
5. **Survey Records Retention**
   1. The surveyor shall retain survey records for a period of no less than 7 years.

1. **Insurances**
   1. It will be a condition of your engagement, if you are successful, that you will be required to indemnify the Client from any claim whatsoever that might arise from your presence, activities on site, or inaccuracies in output data. Please confirm details of your insurance policies, including certificates, with your tender for the following:

Employers Liability, min. cover **five million pounds.**

Professional Indemnity, min. cover **two million pounds** for each and every claim.

Public/Products Liability, min. cover **five million pounds.**

1. **Client, Invoicing & Payment**
   1. If you are successful, **South Staffordshire District Council** will instruct your work and will be your client and employer. **Attached are a set of the Client's General Conditions of Contract, which are to apply to this commission.**
   2. Your invoices must be addressed to the Client, but forwarded to Kier Business Services for checking and approval, to the email address contained within the Tender Return section of this document.

Your output documents are to be addressed to the Client (with a copy also submitted to Kier Business Services). The contents of these output documents may be relied upon by each and every such party with equal rights as held by the Client and Employer.

1. **Programme**
   1. Please indicate your availability for carrying out this work and any lead times necessary from placement of order. Please indicate your proposed programme for all aspects of the survey, testing (if applicable) and deliverables with your tender. **Please also provide your proposed programme for delivering the Priority Areas A, B and C as indicated on the supporting documents.**
2. **Protection of Property**
   1. The surveyor is responsible for the prevention of damage to property and/or the environment caused by their works or the actions of employees or people under their 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. 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.
3. **Safeguarding**
   1. All of your staff members who visit site must be prepared to be vetted if the building occupiers’ policies require this approach. This normally involves supplying names and addresses of relevant staff members and following normal site procedures for signing in and out and carrying identification whilst working on the premises. Further details must be obtained from the Facilities Manager prior to attending site.
4. **Site Access**
   1. Site access should be arranged at least **48 hours** in advance for Council occupied areas, and **72 hours** for tenanted areas, with either of the following:

**Adam Hale Imre Tolgyesi  
Facilities Manager Client’s Project Manager  
Tel. 01902 696 114 Tel. 01902 696 210**

**a.hale@sstaffs.gov.uk i.tolgyesi@sstaffs.gov.uk**

The following specific Client constraints will apply to the work carried out under this project:

**Normal working hours: 8:30am - 5:30pm, Monday to Friday.  
Extensions can be made with prior appointment. A large proportion of the building is tenanted space where prior agreements to access can be obtained but would be required.**

**In areas where it will be necessary to gain access to ceiling and/or other voids you will be expected to provide location inspection plans as part of the prior notification process.**

1. **Tender Pricing**
   1. **Fixed price lump sum, in limited competition, including all travel, expenses and VAT if applicable.**
   2. Your tender must be fixed in price for **3 months** from the date of tender.
   3. Please email your tender to:

**gary.tasker@kier.co.uk**

* 1. If you are unable to provide a tender by the date requested below or if you wish to decline to tender, please contact the above upon receipt of this ITT.
  2. Requests for clarifications regarding this ITT should be emailed to the contact given in 18.3 above, not less than **48 hours** before the tender return date.
  3. The closing date for receipt of your tender is:

**14th December 2018**