Public Document Pack

Planning and Transportation Committee

ADDITIONAL INFORMATION FROM THE APPLICANT

Date:	**TUESDAY, 13 APRIL 2021**
Time:	**10.30 am**
Venue:	**LIVERY HALL - GUILDHALL**

4. **BURY HOUSE 31 BURY STREET LONDON EC3A 5AR**

(Pages 1 - 10)

Item received too late for circulation in conjunction with the Agenda.

John Barradell
Town Clerk and Chief Executive

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<u>Note from City of London Officers Regarding Additional Material submitted by the applicant for application 20/00848FULEIA – 31 Bury Street.</u>

The Fly-through link forms part of the applicant's address to the committee and does not form part of the City of London officer's report or presentation to the Planning and Transportation Committee. As such it would not normally be uploaded to the City's website for prior public viewing. However in this case the fly-through visualisation of a neighbouring building, the Bevis Marks Synagogue and courtyard, provides representations commissioned by the applicant of the Synagogue and the Courtyard which cannot currently be viewed on site due to scaffolding. The link is being provided on the City's website to enable interested parties to have an opportunity to view and scrutinise the fly-through visualisation in advance of the committee meeting.

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31 Bury Street – Bevis Marks Synagogue Courtyard fly-through: https://vimeo.com/524275048

7th April 2021

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MODEL QUALITY AND ACCURACY STATEMENT

VU.CITY creates *Level of Detail 3* 3D models using state of the art remote sensing technology combined with high resolution imagery and manual modelling techniques.

LOD3 is our highest detail base model created by photogrammetry, which translates to every feature being represented if it falls within the 15 cm threshold orthogonally.

The source material of our models is vertical stereo aerial imagery established through photogrammetry.

The most important factor which determines the final product's (3D model) detail and accuracy is the resolution of the imagery. In the field of photogrammetry, we have an indicator, which is called Ground Sampling Distance. Ground Sampling Distance (GSD) gives a statistical value showing the distance between pixel centres in the photograph measured on the ground.

This is the reason that for every project to be able to maintain the 15 cm accuracy, we require higher resolution than 15 cm. In fact, aerial imagery less than 12.5 cm GSD cannot be used for production of our LOD3 models.

During the data acquisition process, we carry out a controlled aerial survey, which means that every step of the capture is according to internationally recognised industry standards. These standards involve comprehensive flight planning, calibrated and certified survey camera utilisation, strict and structured imagery processing and very thorough aerial triangulation procedure.

Our suppliers are following these rigorous steps.

The aerial survey company is using very accurate and precisely calibrated survey cameras which we specify. It means that every parameter of the flight and the sensor is recorded, and we perform highly accurate calculations on the data. That allows us to have the precise position of each photograph.

Figure 1 Photo of a survey-grade aerial camera with IMU in action

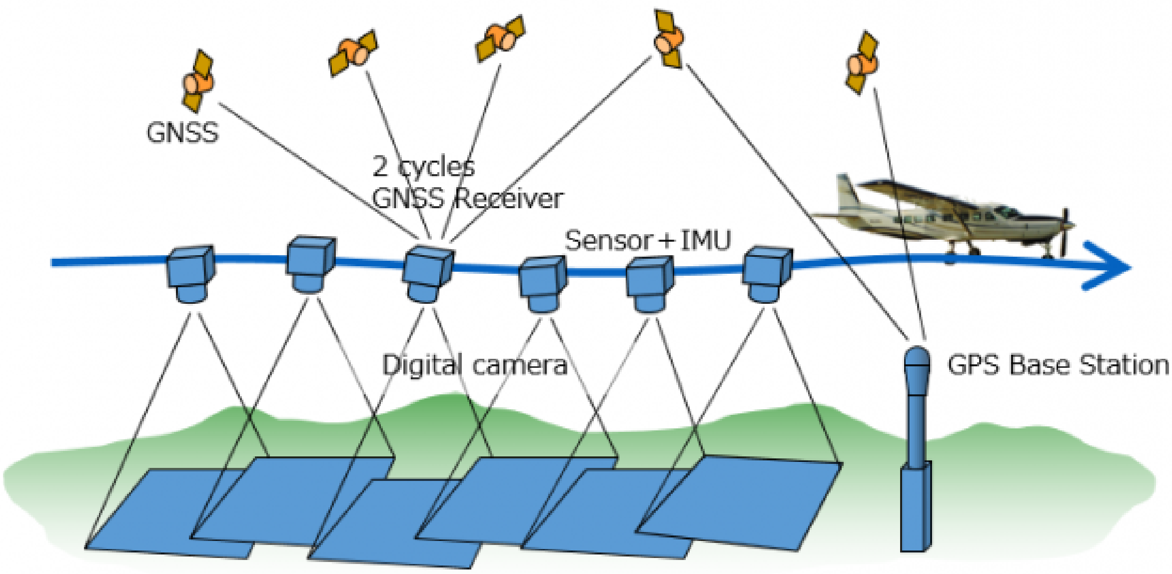

Figure 2 Concept of Navigational and Orientational instruments in use for aerial survey

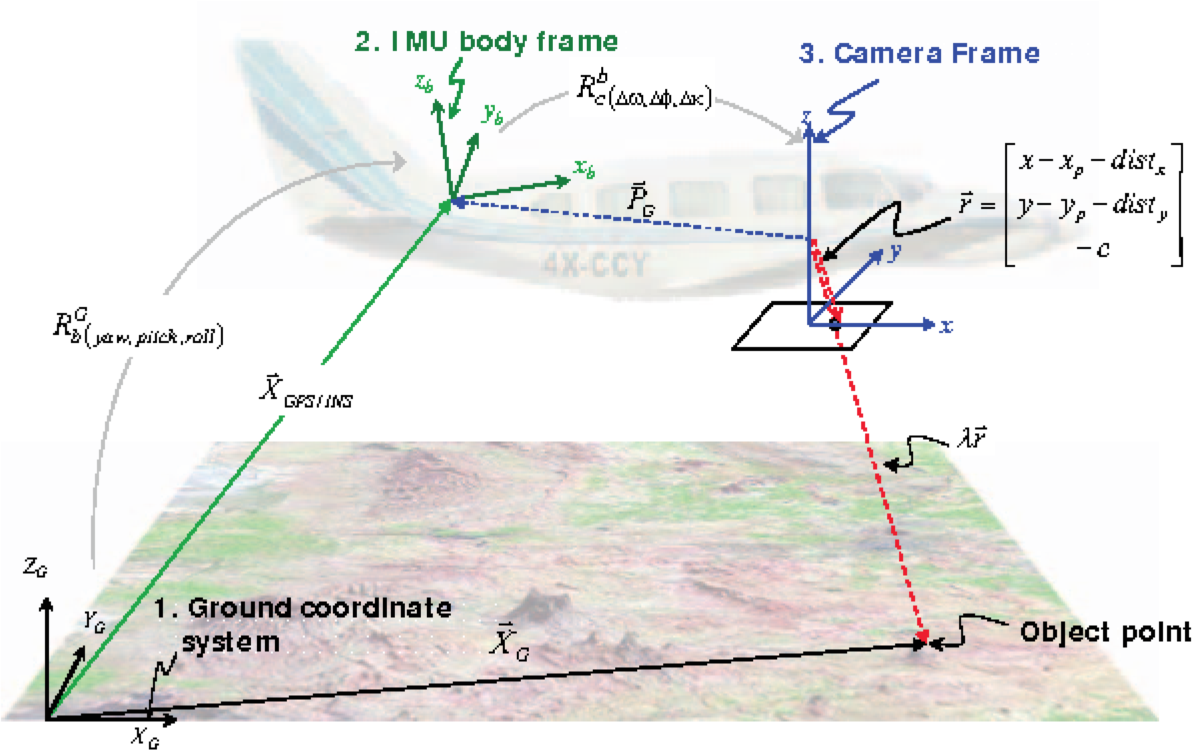

Figure 3 Complex positional and orientational relationship between ground and sensor

To gain the stereoscopic view from them, we need to accomplish a geometrically correct alignment of the frames. This process is called Aerial Triangulation (AT). With aerial triangulation we guarantee the general standard deviation of the images to be kept within the accuracy threshold we require. Also, part of the aerial triangulation is that we use Ground Control Points (GCP). The GCPs are real-world points measured with very high accuracy GPS receivers and they are serving as a reference point which is visible on the photo too.

Figure 4 photo of recording a Ground Control Point with a GPS receiver.

Figure 5 aerial image of the same site and the cursor points to the Ground Control Point.

Therefore, when we do the aerial triangulation, we also link the photo information to the real-world coordinates and produce a pinpoint accurate georeferencing.

The third component of model accuracy is the general error that is created by human interaction while modelling in stereo photogrammetry. For quality assurance, each photogrammetry modeller (photogrammetrist) must go through multiple-stage eye tests before becoming a part of the photogrammetry production team.

Since we need to account for each factor of error that the model could suffer, we always review the following formula: Standard Error of Model = GSD + AT + Photogrammetry modeller error.

These technical elements are all supporting that we could provide and uphold the +/- 15 cm nominal accuracy.

We also have our QA/QC systems in place. VU.CITY has its own dedicated team for QC which follows a 5-stage quality control process. The quality control consists of the following stages:

- 3D model overlay with stereo aerial imagery for general check (Photogrammetry software)
- Detailed check of 3D models in photogrammetry (Photogrammetry software)
- Inspection of 3D models in CAD software (AutoCAD)
- Review of 3D models in 3D modelling software (3Ds Max)
- Final validation of the 3D models in the application (VU.CITY)

Our QC reporters have been provided a comprehensive process and protocol document which takes account of every aspect of the 3D models and it also guarantees that they are searching for every possible issue a model could have.

In conclusion, our approach is scientifically based on verifiable measurements from survey grade remote sensing equipment and created using industry-standard modelling techniques. This affords us the highest possible accuracy while maintaining maximum control over the outcomes.

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