

***Project Title:*** “User Guide for Geo-referencing in IFC”  
**(version 2.0)**

***Project Subtitle:*** “How to set up Geo-referencing in a Building or Linear Infrastructure Model.”

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***bSI Room:*** Building Room

## ***Executive Summary***

The User Guide for Geo-referencing in IFC is aimed at all building/ infrastructure/ built asset modellers, to robustly establish the guiding model set-out parameters - map location and site configuration - for their respective asset (BIM or Digital Engineering) models.

The User Guide therefore defines a standardised way for setting up a multi-disciplinary geo-referenced project model using the IFC open standard format data.

The document also defines a standard way of incorporating Cadastral data as a starting point for representing land legal ownership, zoning and planning data.

The document focusses on the geo-referencing issue and in the appendices demonstrates an example site imported and exported in IFC2x3 and IFC4 format embedding the geo-referencing data.

### ***bSI maturity level***

Following review and update, this version 2.0 of the technical report has been re-structured as a User Guide and published in January 2020 by the buildingSMART International Building Room and buildingSMART Australasia.

The original version of the report was published in August 2018 with the title Model Setup IDM (Information Delivery Manual).

### ***What are the outputs and deliverables of the project?***

The User Guide consists of the following sections:

- |   |                            |
|---|----------------------------|
| 1. Executive Summary                                      | (v2.0 Word document)       |
| 2. <b>User Guide for Geo-referencing in IFC</b>           | (v2.0 Word document)       |
| 3. Appendix A: Demonstration Scenario for Model Setup IDM | (v2.0 Powerpoint document) |
| 4. Appendix B: Geo-referencing BIM                        | (v2.0 Word document)       |
| 5. Appendix C: Process Model                              | (v2.0 Word document)       |
| 6. Appendix D: MSI Exchange Requirements                  | (v2.0 Excel document)      |

These files are available on the buildingSMART International Sharefile at the following link:

### **Opportunities addressed and created value**

Initial discussions with industry identified the lack of knowledge with regards to geo-referencing and the strong interest in this subject in the user base in Australia. Discussions during the project confirmed the global status of this topic, including lack of knowledge in users, and, for advanced infrastructure users, the necessity of the approach set out in the User Guide.

### **What has been done?**

The project has been presented at several bSI International Summits and meetings which elicited strong support for this approach in linear infrastructure projects. In particular, at the Tokyo bSI Summit the project was presented as part of the Building Room agenda and received considerable support including that from a study undertaken in Germany. A Swedish academic paper has also reviewed the proposals and the project value was further highlighted in the Tokyo bSI Summit Final Plenary.

### **Who has contributed?**

Key project team members responsible for mapping expert knowledge, trial implementations and providing key contributions include:



### **Consensus process**

We have had extensive consultation throughout the project with over 40 individuals participating overall. Thank you to all. Material from a Norwegian IFG project was reviewed to provide an input at the start of the project.

There have been at least three separate discussions with the bSI Implementation Support Group (ISG). The bSI Model Support Group (MSG) and representatives from the bSI Technical Room have reviewed and provided feedback on several occasions.

This version 2.0 has been reviewed by the project team key contributors and several improvements and changes made.

### **Software testing**

Trial implementations have been undertaken by ArchiCAD (beta interface), and by Tekla. Listech (a member of the of the Hexagon Group) have implemented in both IFC2x3 and IFC4 and this has been used as the basis of the Demo Scenario in Appendix A.

### **Further recommendations**

This User Guide is a useful addition to the schema and will have direct international benefit by allowing much greater reliability for collaborative model sharing.

There are some issues to be reviewed by bSI MSG and/or ISG:

- A strong recommendation from Listech and 12D was to allow for the storing of the Helmert 2D paired coordinate points, which would allow Surveyors carrying out transformations to assess the accuracy of the process.
- Some ISG/Technical members were not clear whether this data was associated with the ifcProject or ifcSite entities. The recommendation is to be with ifcSite.

Implementation of this approach in IFC4 is also recommended. Vendor software certification also needs to be addressed.

### **Contact**

1. For questions or specific feedback on the User Guide, please contact John Mitchell buildingSMART Australasia at [john.mitchell@cgr.net.au](mailto:john.mitchell@cgr.net.au)
2. For more general queries and for access to the User Guide document please contact buildingSMART International at [contact@buildingSMART.org](mailto:contact@buildingSMART.org)

[end of Executive Summary]