H\B:ERT User Guide

This user guide is a practical guide to installing and running the beta version of HBERT for the first time. Guidance on methods of modelling and how the tool can be best used in the design process can be found in the HBERT_Booklet_digital.pdf file supplied in the download.

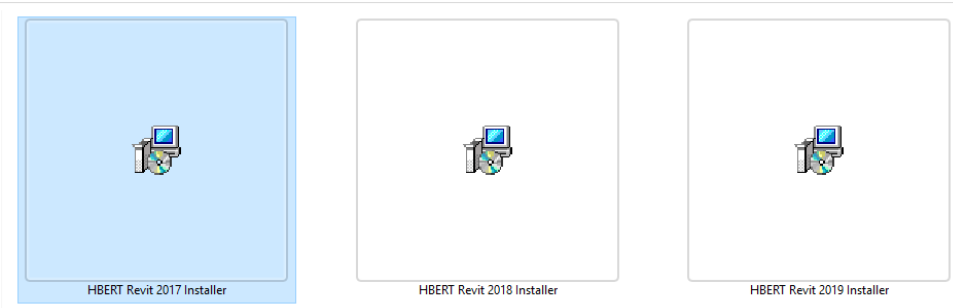
1_Installation

The HBERT plugin is designed to work with Autodesk Revit 2017, 2018, and 2019.

Once downloaded, the zipped files should be unzipped, using WinZip or another similar free program. The file contains the following:

- This User Guide
- Case study booklet
- 3 template files for Revit 2027, 2028, 2019
- Separate Installers for Revit 2017, 2018, 2019

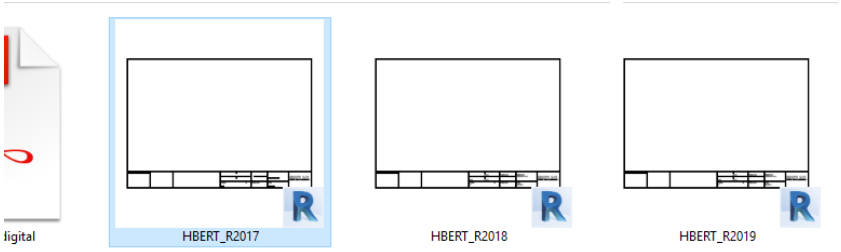
Once unzipped, simply double clicking on the appropriate installer will place the appropriate files in your Revit directory. By default, this is found in: C:\ProgramData\Autodesk\Revit\Addins\2017 for the 2017 version



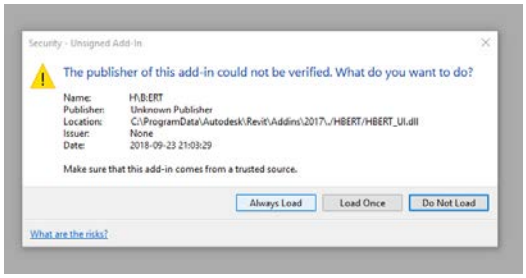
If you have several versions of Revit, then you will need to install it separately for each one.

2_Running for the first time

To access the default HBERT materials and Template then the Template files provided need to be used, if you try to run HBERT outside of these template files it will not work.
Open Revit, then navigate to the appropriate template from the zipped file and then open and save as a new central file with your desired name etc.

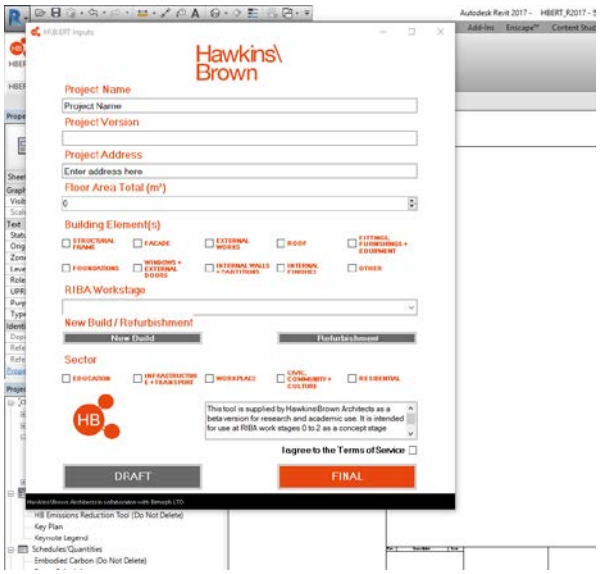


On running for the first time you may see the following message, click “Always Load” , or “Load Once” to continue with HBERT. The software in in the process of being digitally signed, and this message will not appear on future versions.



After opening Revit for the first time after installing a new HBERT menu should be visible on the toolbar, once clicked on you should be able to see the following icon, double click on it to start HBERT.

When the program is working you should see the following menu:



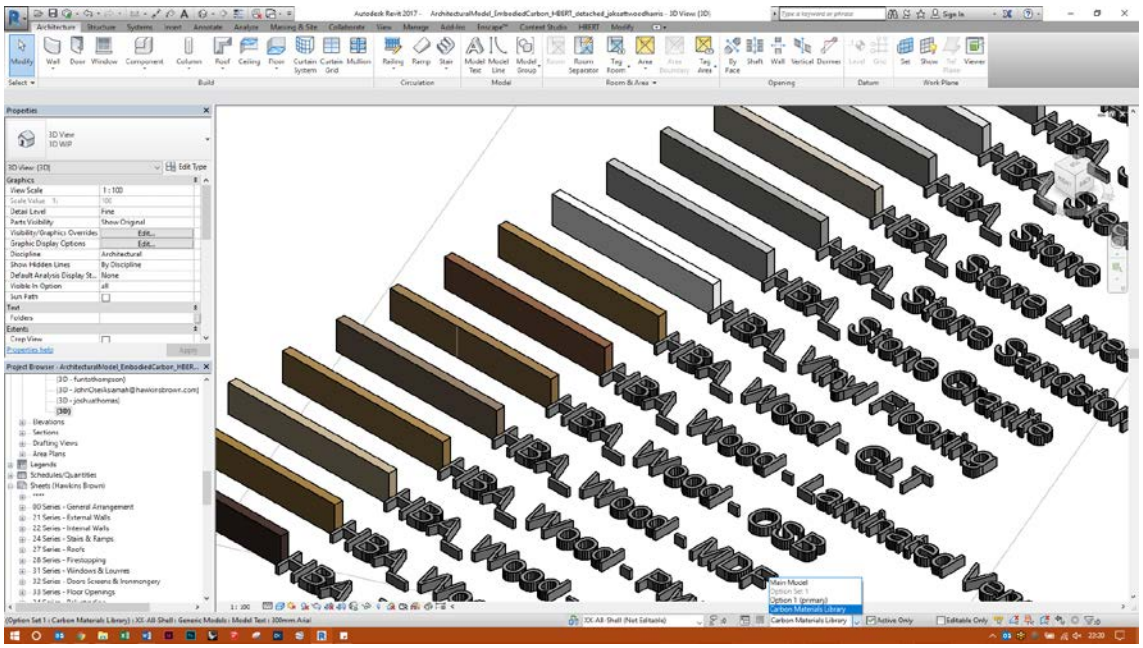
Further guidance on running the program can be found in these YouTube videos created by Yair Schwartz, for teaching his students at UCL. Yair worked with Hawkins\Brown to develop the tool and the methodology behind it.

3_Creating new models

New models should be created within the supplied Revit project files HBERT_R2017, HBERT_2018, or HBERT_2019 depending on the version of Revit installed.

Assigning materials

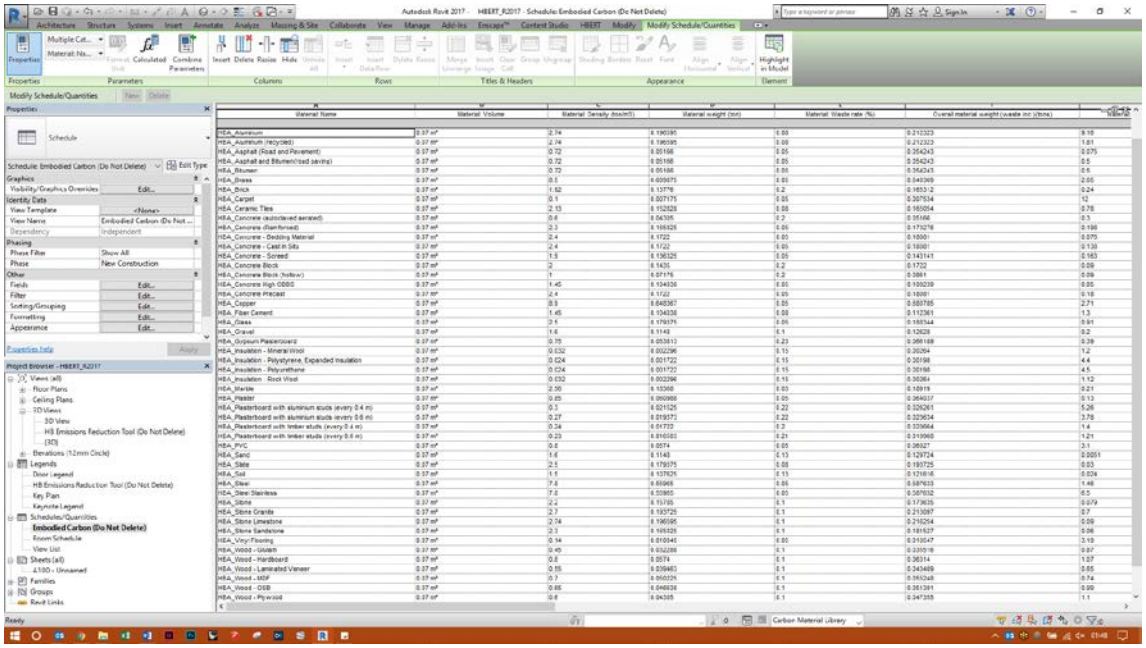
Once the supplied template is loaded a design option (named **Carbon Materials Library**) will be available which shows each of the standard materials (named **HBA_Material**).
All models should be created in a separate design option, this allows the tool to read the material volumes separately when comparing of a range of options.



These materials all have assigned values for embodied carbon and a range of other values, as can be seen in the Embodied Carbon Schedule.

Managing the Schedule

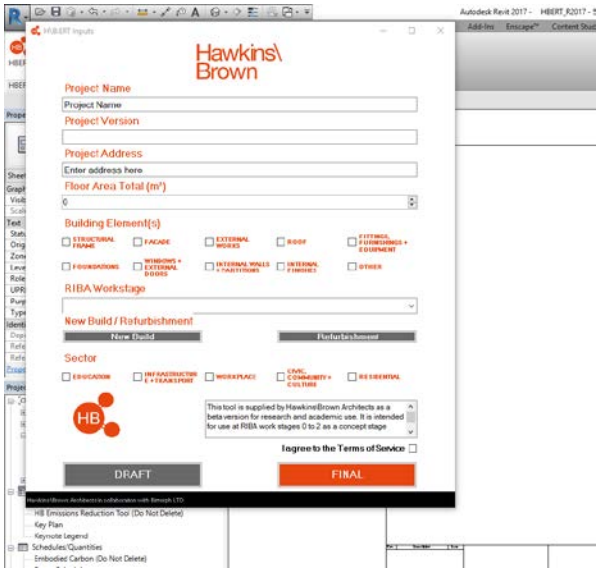
The template contains s schedule named Embodied Carbon (Do Not Delete:



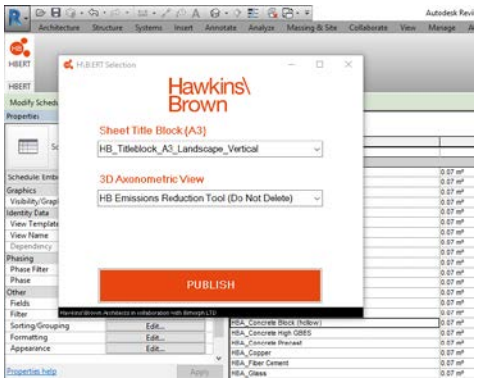
By selecting the carbon materials library you can see all the embodied carbon information contained in the model. These default values are taken from the Bath University Inventory of Carbon and Energy 2011.

Running HBERT

Clicking on the icon brings up the following menu:

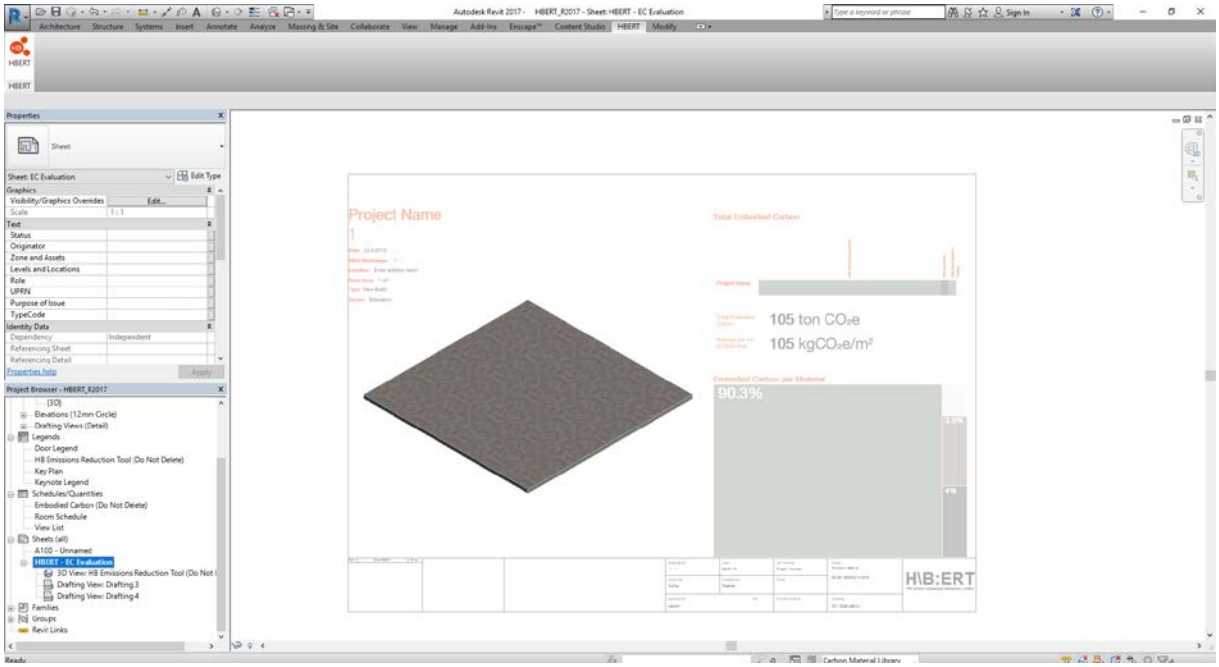


All fields must be filled, clicking either draft or final will mark the data sent for analysis, and show the screen in the following image. This data will be assessed anonymously and used to help develop benchmarks.



The required A3 landscape title block should be selected (the default is HB_Titleblock_A3_Landscape_Vertical). A default view window is also contained in the template named HB Emissions Reduction Tool (Do Not Delete).

Clicking Publish will send the data contained in the schedule, and the fields filled in the menus to the HBERT cloud storage for later analysis. It will also produce a sheet called HBERT – EC Evaluation which will look like the following image:

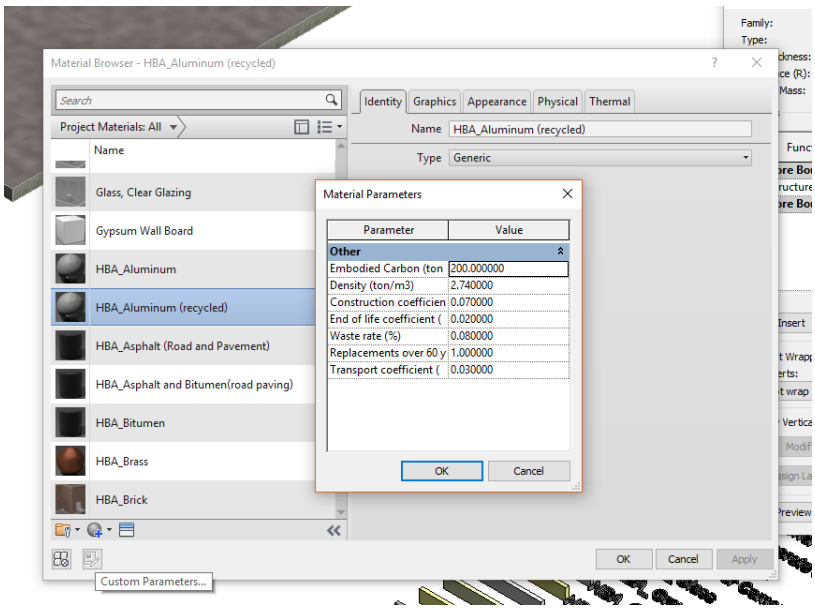


When HBERT is run the sheet is deleted and recreated. To retain previous versions of the analysis pdfs can be exported and the schedule saved as a spreadsheet. This spreadsheet has the embodied carbon broken down into different lifecycle stages according to RICS and RIBA guidance.

Custom materials:

Some values in the template, such as embodied carbon and density can be modified right on the template screen by clicking on the corresponding field. The calculated fields in the template will update automatically.

Any custom materials can also have their data manually added when the material is created or modified from another material in the **Material Browser** window. The best way to create a new HBA material is to duplicate the closest material and then rename it and add in the new materials data in **Custom Parameters....** as you can see in the following image.



4_Potential Issues

To accurately calculate some layers of typical wall build ups and other elements, custom materials must be created. The default materials list contains materials named **HBA_Plasterboard with...** the embodied carbon and density values have been calculated to account for the relative volumes of each material in typical build-up. These materials are used where elements such as the timber studs would not be modelled.
This method can also be necessary for elements such as timber rafters where they are not modelled individually. Custom values can be calculated for the material and a new material created as described above.

Additionally, Revit cannot measure the volume of materials of the following elements:

- Mullions
- Entourage
- Fascia's
- Gutters
- Railings
- Ramps
- Roof Soffits
- Slab Edges
- Stairs: Landings
- Stairs: Supports
- Wall Sweeps

These elements must be modelled separately and added to the final analysis. Mullions particularly can have a significant impact on the final analysis.

Users should also check any hollow components which may have been modelled as solid and apply a factor to account for the hollow portion.

The HBERT_Booklet_digital.pdf file explains further the methodology of modelling whole façade bays so they can be simply modelled as one material in Revit. This approach can be taken for a range of different components to build up a library of options.

5_Assessing existing models

Importing the schedule and sheet templates

The Schedule named **Embodied Carbon (Do Not Delete),** and Titleblock sheet named **HB_Titleblock_A3_Landscape_Vertical** can be imported into any existing models and are required to run the tool.

Reassigning materials

This must be done manually, by reassigning to the closest material in the default set of materials, or by creating a custom material based on information from the suppliers. All element types and families must be modified to use materials with an embodied carbon value.

The 'Carbon Materials Library' can be easily copied into any external models and is needed to be able to select these materials. It will be stored as a separate Design Option.

Setting the view

HB Emissions Reduction Tool (Do Not Delete) axonometric view is set up and scaled to 230x230 in the templates. This view can be imported, or another view created with the same size view window.

When all these elements are imported the tool should run in just the same way it runs in the supplied Revit project files.