

BIM Outreach

07 *Manufacturers & Suppliers –
What can BIM do for my
products?*

07

BIM IN PRACTICE



Australian
Institute of
Architects

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07 *Manufacturers & Suppliers – What can BIM do for my products?*

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INTRODUCTION

The paradigm shift from 2D CAD to Building Information Modelling (BIM) is affecting the entire building industry and it doesn't stop with designers, engineers or the contractors. For BIM to work throughout the industry, manufacturers, suppliers and subcontractors play a pivotal role in providing virtual representations of their physical products that can be utilised across disciplines. Furthermore, there are industry initiatives for the integration of design intent models and construction models¹, assisting to rationalise the construction process and reduce duplication of effort. What is required by industry is BIM objects that represent a product geometrically and embed product data in a format that can integrate with the systems used for design, analysis, coordination and operation – hence the entire building lifecycle.

CHALLENGES FOR MANUFACTURERS WHO WANT TO DO BIM

Apart from a very small number of large firms, most product manufacturers are usually not knowledgeable about how to set up a BIM equivalent of their product catalogue. The use of BIM authoring tools is likely not part of their core business. Further, BIM requirements for architects, engineers, contractors and facility managers are different. It is not easy for a manufacturer to find one common denominator (ie, standard) that would inform them what information about a product to include in a BIM object and what not to.

A solution for those firms who don't usually produce BIM objects themselves is to employ a third party that specialises in working with manufacturers in order to create their BIM objects. Firms and initiatives such as Autodesk Seek, ArchiCAD Warehouse, Arcat, bimstore, SmartBIM, Sweets, RevitComponents, ArcXL, TurboSquid, Design Content, Product Spec, Andekan, All-In-One, Broutek, BIMstop and BIMobject complement the efforts by some large scale manufacturers who make BIM objects of their products available via BIM content libraries. Even the UK construction industry (via the NBS) has developed the UK's National BIM Library for industry approved free content.

¹ Successes in this realm can be seen with the Air Conditioning and Mechanical Contractors' Association of Australia (AMCA). The BIM-MEP^{AUS} initiative has been launched with the aim of facilitating the implementation of Building Information Modelling and integrated project delivery within the Australian construction building services sector. The AMCA is seen as a global leader with this initiative http://www.bimmepaus.com.au/home_page.html.

OPENING THE BIM DOORS TO MANUFACTURERS

A key objective for manufacturers and suppliers is to make high quality BIM objects of their products available to a large number of consultants and subcontractors. These industry groups rely on high quality content libraries that they usually source via third parties (either for free or not). The quality aspect of a BIM object does not depend on the level of geometrical (or even data) detail. Instead it depends on understanding what information is useful for the various parties who will specify the product in their design at any given stage of the project. BIM needs to follow strict naming conventions to be useful. Hence the initiative of a group of Australian and New Zealand professionals using Revit created ANZRS to form a set of industry standards <http://www.anzrs.org/>.

WHAT ASPECTS OF BIM MODELLING ARE NEEDED?

BIM requires the information necessary to define, track and analyse elements. From a lifecycle perspective, the correct tagging of information is crucial to identifying the sum of components constituting a building project. From a documentation perspective, BIM components often encompass a range of parameters that allow them to be used under varying conditions (either in terms of geometry or notation). In some cases these parameters need to be supplemented by additional parameters that are utilised by the design consultants, builder, subcontractor, fabricator and facilities managers. These parameters need to be the same between the various groups that utilise them and they need to be interoperable between various BIM software packages. No small task!

It is important to note that not all information that can be included in a digital model should be included. The volume of data requires both the technology to drive it and the systems to manage it. Some products do not need to be modelled in 3D, such as paint or coating finishes nor flashings and individual bricks.

Some products should have:

- Sustainability parameters added so that they can be utilised by ESD consultants.
- Mechanical, electrical, hydraulic and structural parameters so that they can operate effectively in those environments.
- Cost information to be utilised by quantity surveyors.

Every category has its own particularities and needs its own specific list of parameters. By modelling the elements correctly in 3D/2D and adding the correct BIM parameters, one will have a product available to be used by all BIM consultants and project participants.

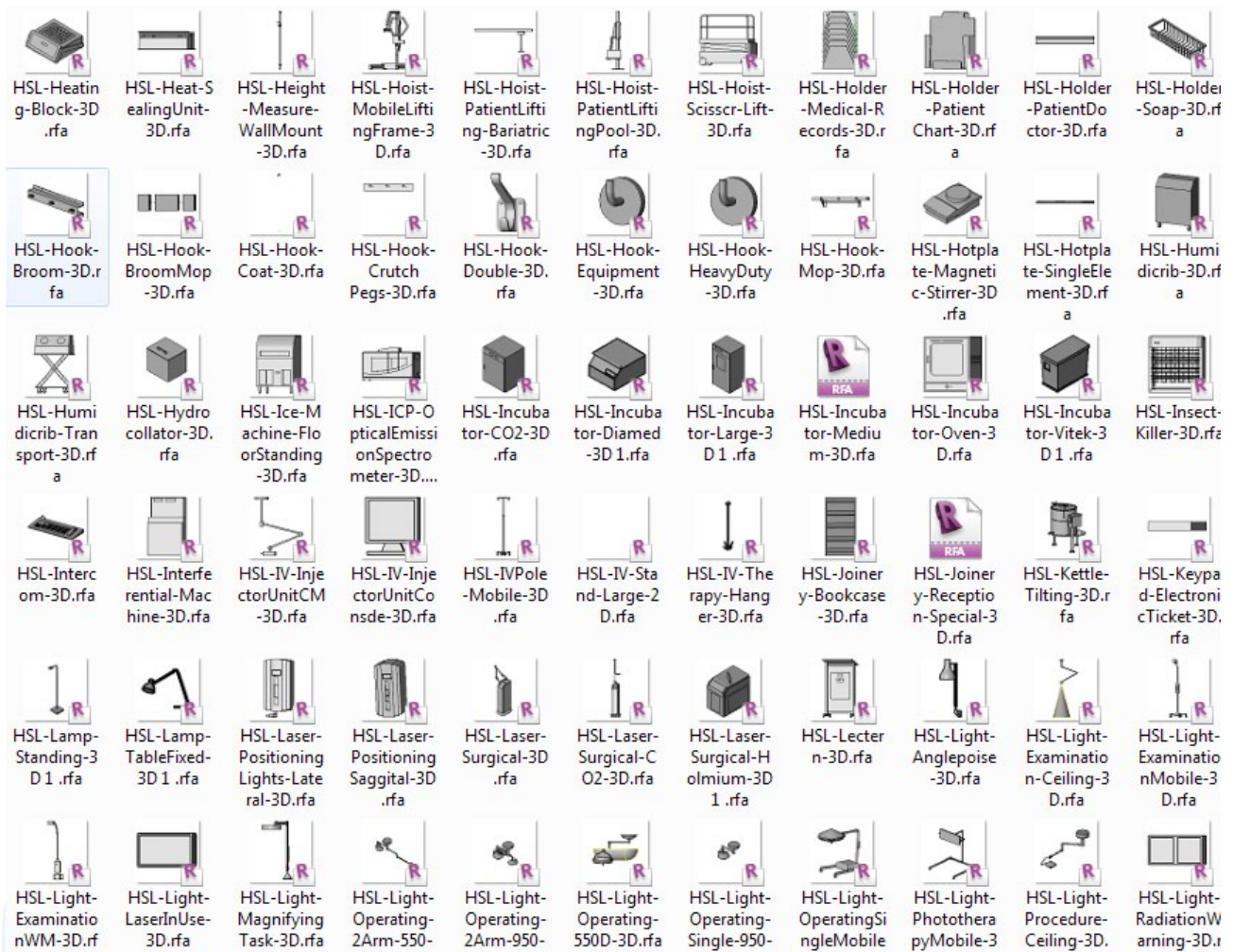


Image: Example of a BIM product library (Source: HASSELL)

FILE SIZES

In large projects, the file size of individual elements can be important. From the manufacturer's point of view, they would like to see their product represented as accurately as possible. Many fine details will not be visible or needed at the scale, or the level of detail that the designers work in. To show every screw, fold, junction, connection etc may result in a file size that is 3MB compared to a simplified version that is 400K. At times it is not just an excessive level of detail that conflicts with the usability of the component. Some objects will require a high number of polygons in order to represent a curved element and the polygon count will also lead to a drastic increase in file size if multiple instances of that element get included in a BIM project.

VIEWS

Most BIM software performs best when the plan, section and elevation views are set as 2D representations of the 3D element. This does not affect the file size, but will affect the software performance. Again, most consultants do not need to see the full 3D representation all the time.

BIM PRODUCT LIBRARIES

The industry is becoming increasingly concerned about the lack of high quality BIM content that is available to all at no (or low) cost. Consultants and subcontractors are unhappy about the need to model a large number of BIM components themselves. Software vendors shy away from the responsibility of providing BIM libraries, arguing it is the manufacturer's duty to do so.

We are starting to see some efforts emerging in this realm, driven by industry bodies and manufacturers.

CONCLUSION

Most manufacturers have already spent time and money creating CAD content, now they need to embrace BIM. For most this is not part of their core business so the creation of their product library usually gets contracted out. This can produce highly detailed objects that are large in file size and when loaded into a large project dataset slows the team down. Compounding this is the need for all content to be interoperable across the design teams and greater supply chain (using their individual BIM software of choice).

SELECTED BIM LIBRARIES

<http://seek.autodesk.com/>

<http://construction.com/bim/>

<http://www.nationalbimlibrary.com/>

http://www.arcad.com/bim/bim_objects.shtml

<http://archicadwarehouse.blogspot.com.au/>

<http://www.productspec.net/cad-files.aspx?index=0&ext=.rvt>

<http://www.archvision.com/>

<http://www.formfonts.com/>

<http://revitbay.com/>

<http://yellowbryk.com/>

<http://www.pinnaclecad.com/revit-families.html>

<http://andekan.com/?brtk=1>

<http://revitcomponents.com/>

<http://smartbim.wpengine.com/>

<http://bimstore.co.uk/>

<http://www.parametrx.com/912/templates/index.asp?>

http://www.hilti.co.uk/holuk/page/module/home/browse_main.jsf?lang=en&nodeId=-411802

<http://www.bradleycorp.com/bim/products/bim/>

<http://www.flexymodels.com/revitwarehouse.html>

<http://www.revitcity.com/index.php>

Summary

- Efforts have been made to rationalise the requirements of industry (BIM MEP AUS and ANZRS) so manufacturers should seek to align themselves with these industry initiatives.
- Currently many consultants are creating the same content across many firms. This is hugely wasteful and manufacturers have the opportunity to create one consistent object to represent their product rather than hundreds of potentially substandard clones.
- This content needs to be provided free to industry to eliminate duplication of effort and reduce waste.
- This would also increase productivity as the industry can concentrate on designing efficient, sustainable buildings (its core business) rather than building content.