

BIM objects as the foundation of specification writing for organizational project-based design and construction.

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Introduction

One of Building Information Modeling's (BIM) major tenets is the integration of multiple design and construction processes through a technology-based federation of data. If a building can be planned, designed, constructed, and maintained through a common understanding of all its parts, time, effort, and capital could be focused on making progress rather than rework.

Information is the common currency that these processes leverage, evolving from general to specific over the course of the building's lifecycle. Often the challenge of BIM is perceived as maintaining the aggregated data in multiple disciplines' files, rather than ensuring the consistency of the data no matter where it resides.

Models do not typically address external sources of data such as reports, contracts, and specifications created outside the graphical BIM software.

As specification creation and management has often been of secondary or tertiary concern in the typical BIM process, there is an industry-wide need to align model data and specification data, without greatly disrupting the established workflows of each.

Using tools like BSD's *SpecLink Cloud*¹ and other software that can connect specification content to model objects allows project teams to create in tandem, reducing rework and revision as they advance the design.

For this connection to be an effective means of syncing data, a common thread must be maintained during each phase.

As projects vary based on teams, constraints, and deliverables, it is difficult for organizations to define and manage consistent data for all sources when the data is not shared beyond the project.

The challenge is to build these projects on a foundation of consistent data that evolves organizationally, rather than a part of a project-based lifecycle.

While many architecture and engineering firms recognize this challenge, the effort to address it with meaningful process change is largely siloed at the technology level.

Overview

To better understand how to align specifications with models, this document proposes that firms manage data standards for content at the organizational

¹ <http://bsdspeclink.com/>

level, rather than at the project level, while drawing from design data to maintain validity. Teams that coordinate project assemblies and materials by passing CSI² MasterFormat data through Autodesk Revit³ families for both models and specifications will be more consistent.

The purpose is to show the establishment of a data standard for content, the practical use of keynotes in project deliverables, the connection to the specification process, and the roundtrip back to firm-wide content management.

Immediate project needs, over long-term organizational content

The main problem of having project-based content management is twofold: inconsistent data and unconnected data.

Neither prevents success on the project, but both reduce the organization's efficiency and effectiveness in the long run.

Data is inconsistent whenever it has been gathered from various sources, internal and external, without the context of a system of data standards.

For example, an object downloaded from a manufacturer's website might contain much of the correct data that makes it a valuable addition to any model. It may not, however, conform to the organization's standards for notation, categorization, or specification.

The object may not have the right data in the case of missing parameters, or the wrong data if it is not current or poorly created.

Missing data is often less of an issue as BIM coordinators or project team members can supply the missing (and more

importantly relevant] data. Inaccurate data is much riskier in that it may be plausible, but incorrect, triggering a QA/QC effort for verification.

This review still may not reveal its inaccuracy until a change order is needed.

Unconnected data is less risky, but certainly no less of a concern for those who look to maintain or improve an organization's processes.

Multiple specialist roles on a project can sometimes lead to a disconnect from the overall processes and tools.

A common example of this is a design architect developing a facade in Rhino⁴ while a specification writer describes the curtain wall system in a short-form specification during the Design Development phase.

How connected are these efforts? A weekly coordination meeting may or may not reveal that a new design does not conform to the ASTM C1349⁵ requirements. With these two processes following their respective purpose-built workflows, the interaction needed to share a common understanding of what is to be designed and defined may not be planned.

The result may be positive, but likely unpredictable.

Current spec writers' data management across projects

Most architectural and engineering firms maintain an office master specification that is used as the basis for a majority of their projects. These masters are managed by specification writing leads who continually update the content based on changes to manufacturer's data and reviews of their

² <https://www.masterformat.com/>

³ <https://www.autodesk.com/products/revit/overview>

⁴ <https://www.rhino3d.com/>

⁵ <https://www.astm.org/Standards/C1349.htm>

company's own experiences on current and past projects. With these masters, they have established technical standards commonly deploying quality reviews that improve their content over time. However, these reviews may not be related directly to project QA/QC efforts and may not be tied to other processes that contain the same data, namely BIM data standards.

Current management of BIM content

BIM content management is a younger process and often not as well-defined or maintained as typical QA/QC processes.

For design firms, it is frequently a concept rather than a reality. For firms that have made a commitment to content management, often their efforts have taken the form of a tool-based solution.

Applications such as Unifi⁶ and AVAIL⁷ provide organizations with a central repository for components shared with every project. Maintaining this BIM library suggests that both graphical and data standards are maintained, but it may not be a requirement.

Selecting the right tool for teams does not mean the governance of the standards is any better.

Consistently maintaining specifications and content parameters

If an organization has a desire to connect the specifications and the models to each other effectively, establishing a consistency between the MasterFormat divisions and sections in the content is essential.

For Autodesk Revit-based workflows, the most direct approach is to use the Keynote parameter in model families to maintain the MasterFormat numbers and section titles. In *figure 1* [next column], the family object that can be managed in a company

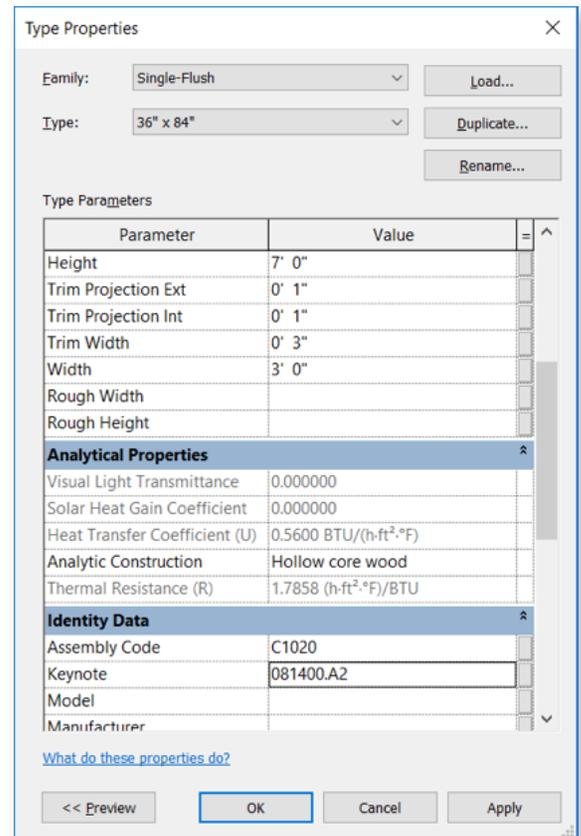


Figure 1 – Keynote parameter

library across multiple projects can consistently use this data.

However, the project teams can customize this data based on specific project needs. The default information would still be the starting point when the content is loading, establishing consistency but allowing flexibility.

Ultimately, the design professional makes the decision to deviate from the standard, if needed, but has no need to research and create the correct data at the onset.

With the information coming from a common file, such as Revit's delimited keynote file (whether out-of-the-box or custom), the project team can still add an additional smart notation to their projects, as seen in *figure 2* [next page].

⁶ <https://unifilabs.com/>

⁷ <https://www.getavail.com/>

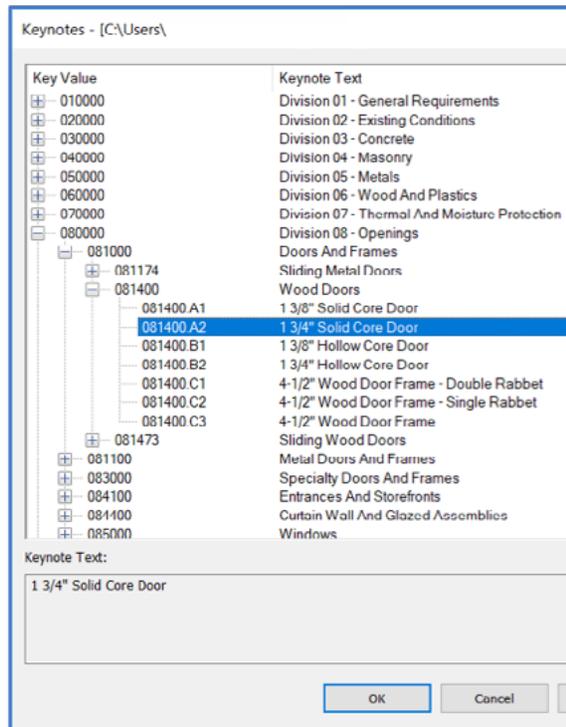


Figure 2 – Keynote file

When content has this information, it can be processed easily by an integrated specifications tool like *SpecLink Cloud* using its model mapping feature.

Companies need not use keynoting to take advantage of this property, as with any other Revit parameter. The data can be present, whether it is exposed through annotation, schedules, or not at all.

Firms that use third-party keynote managers may need to add data to the

keynote field in addition to the data used by the tool. Teams that need to add keynote data to current projects that do not prepopulate fields in their content can use a couple of streamlined processes to quickly add that information: schedules or catalogs.

A Revit schedule can be built with multiple categories and can include the keynote field. This schedule could also be grouped/sorted to only show types, rather than each instance.

Using the linked keynote file, all the project’s (and organization’s) fields are available as choices.

The other option is to load the family with a catalog, an infrequently used Revit feature for providing data to families when loading (or reloading) into projects.

Using the organization’s keynote file, a series of catalogs can be created to retrofit each component loading into the Revit file.

This process would require more processing but could allow other changes simultaneously, such as updating the dimensions to match the qualities of equipment in a cut sheet.

Teams should consider the scheduling method first.

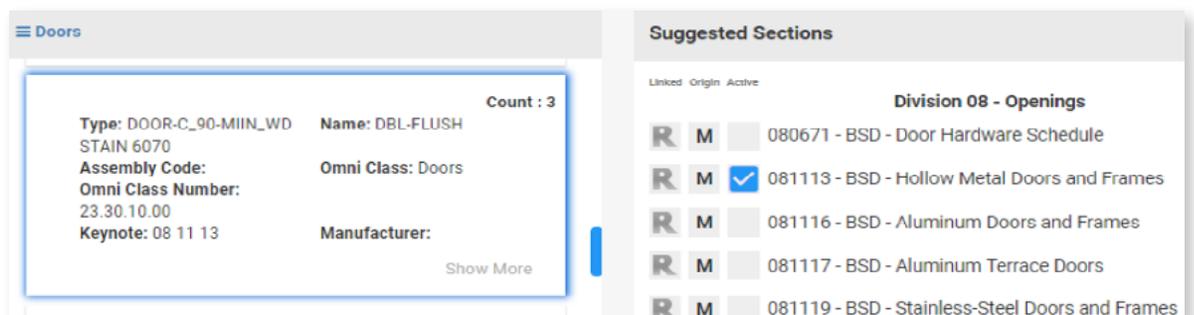


Figure 3 – Specification mapping

Managing organizational content over project content

By storing data common to both specifications and geometric delineation in the content that supports all projects, rather than solely in each project, a firm can better manage the integration between the specifications writing process and building information modeling.

Using common processes with existing tools, an organization can maintain consistency and improve efficiency in the design workflow.

Summary

As firms continue to develop and optimize their use of BIM processes in their design environments to provide more professional and coordinated deliverables, maintaining consistent and valid building data across all aspects of the workflow will be increasingly important.

Using content as the common data platform for both specifications and models will reduce rework and subsequently save the designers, contractors, and owners time and money.



About the author: Lance Kirby

As Building Systems Design's Director of Customer Success, Lance's primary focus is accelerating the adoption of BIM and VDC practices amongst owners and their supply chain of designers and contractors.

Currently supporting SpecLink solutions, he has also helped to develop Revit since version 1, supported hundreds of BIM projects, and trained thousands of Revit users over the past 15 years as a consultant for Autodesk.

He co-authored "Mastering Autodesk Revit 2017 for Architecture" and "Mastering Autodesk Revit 2018," the leading industry books on the use of Revit and BIM in the architecture and design field.

He organized and executed assigned business projects on behalf of 15 of the ENR's 2017 Top 20 Design Firms, including AECOM, Gensler, and Jacobs.