Integrating the BIM and Spec Design Process

A White Paper by Chalkline, Inc.

Why Integration of the BIM Model and Specs Matter

Architectural and Engineering design deliverables include the BIM models and design specifications. The BIM modeling and spec writing processes have been performed by different users, on different timelines, and even different companies. The difficult manual process of coordinating the two design efforts results in RFIs and addendums due to errors and omissions which have not been identified by the tools used in practice. There is a huge opportunity to reduce time, save money, and deliver higher quality products with integration and coordination between these separate processes and deliverables.

Reluctancy in the integration endeavor has been seen in both the BIM modeling team as well as the specifiers.

- How accurate is the model data?
- Will we first have to change our model elements or use other elements to make this work?
- Does a specifier need to learn and subscribe to the modeling tools?
- What if the specifier accidently moves or changes something while in the model?
- Will this integration effort increase the design time or introduce major process changes?
- Will this integration weigh down our model or change where we store our BIM models?
- We don't think we have coordination issues so why adopt tools to verify it?

This paper's goal is to answer these questions so firms can take steps to achieve the benefits of an integrated BIM and spec design process. The model design quality will improve as the knowledge and experience of the specifiers can be integrated into the process and have a better understanding of the design intent. The design teams realize the model is not just about the 3D view, but also the data contained within. The integration of these processes should flag inconsistencies in the models and specifications helping ensure all team members are aware of the selections and changes being made. Issues found earlier in the design process require less time and cost to fix enabling time to be spent in other areas. Issues should easily be seen early, mid, and late in the design process without forcing process changes and a new paradigm on the design team.

VisiRevit® is an application developed for specifiers without familiarity or training in Autodesk® Revit®. Without any BIM model changes required, the integration and coordination can start immediately. Specifiers can use the free Revit Viewer reducing their fear of accidentally breaking the model. VisiRevit tools give the specifier access to their specifications and the Revit model data linked together. The specifier can edit and view the model key links to the specs in the Link Console or the Project Tree which they are already familiar with having used VisiWord®. Searching for a model element of interest is available in the Data Tree or Link Console which automatically highlights the elements in the model viewer (and vice versa). VisiSpecs® lists all sheets and views an item is placed on with a feature to automatically open and zoom on the item in any view. VisiRevit includes tools for the specifier to filter the model data down to the preferred disciplines and categories. Sorting the data by linked spec, model element, link status, or assigned Keynote in the Link Console further assist in identifying coordination alerts and areas of interest. Creating model key links between the model elements and the required specs is performed using the Doc Linker.

Specifiers appreciate access to their specs and related model elements without having to spend days to weeks learning the modeling application. The current process of manually scanning PDFs for call-offs is mundane, time consuming, and error prone. They also realize using VisiRevit for coordination helps better understand the modeling data for collaboration with the design team, their intent, and how changes affect the spec requirements. Identifying issues
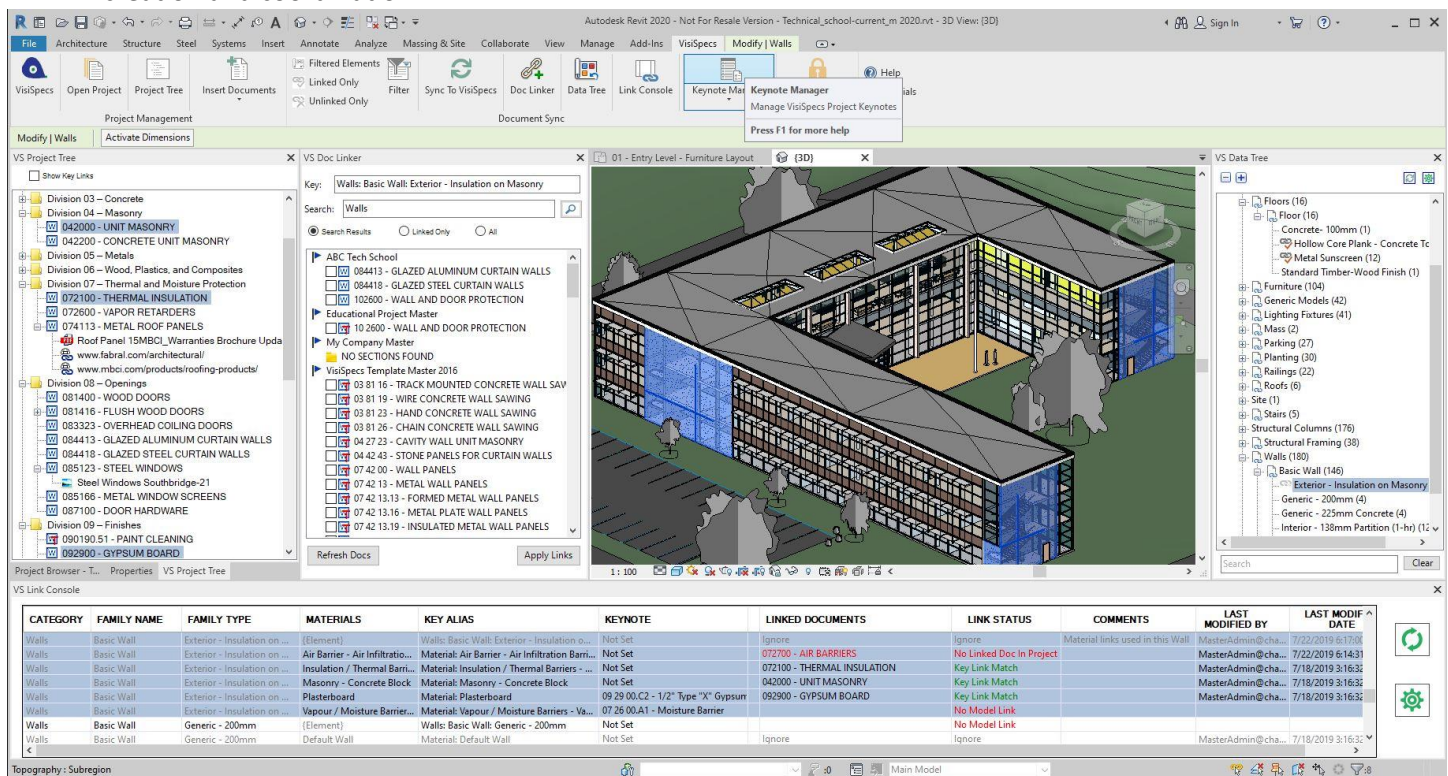
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earlier in the design process not only saves time but can result in fewer RFIs and Addendums due to errors and omissions.

Getting Started with the Model and Spec Integration

It is recommended to start the integration linking using a project model and specs recently completed. Chances are you will see errors you can immediately act upon and waiting for the perfect project and design team only delay the benefits months to years. The teams are familiar with the completed design and the linking process from the elements to the related specs is streamlined to just hours. Since the model key links created are stored for use on other projects, there is no waste of effort. You may even find errors and omissions on the 1st project that can benefit from your immediate attention. While the first integrated project is not expected to achieve 100% design coordination, subsequent projects will utilize more and more automation and coordination benefits and improved BIM element usage.

The VisiRevit panels should be setup in such a way that is familiar, consistent, and appropriate for specifiers and others. Learning to use Revit can be daunting and a lot of the model data is not applicable to what specifiers are interested in. Wandering through the model searching for sheets and views wastes time and items are inevitably missed.

1. Setup the VisiSpecs Panels docked in Revit as shown in the image below. The Project Tree is already familiar to specifiers and the dynamic highlighting of the linked specs based on selected elements in the Data Tree, Model Viewer, and Link Console is important not only in the ease of use, but an understanding of the model key link creation and coordination.

2. Use the VisiSpecs Filter to just show Walls and Windows initially (or a few of your preferred elements).
3. Display all Link Console columns using the Link Console Settings Gear icon.
4. Right Click in Project Tree selecting Show Key Links to see what model items are linked to those specs.
5. Use the Search feature in Data Tree to easily find elements and select to highlight the element in other panels.
6. Right click on an element or keynote in the Link Console to zoom to the sheet/view that item exists on.
7. Right click to View the element or material properties.

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Now you have a specifier view with easier navigation to elements and materials with the available links to their project specs. The dynamic highlighting of the elements in all panels facilitates the coordination and understanding. Then you can explain the Revit commands like Properties to find more details about the element or material selected.

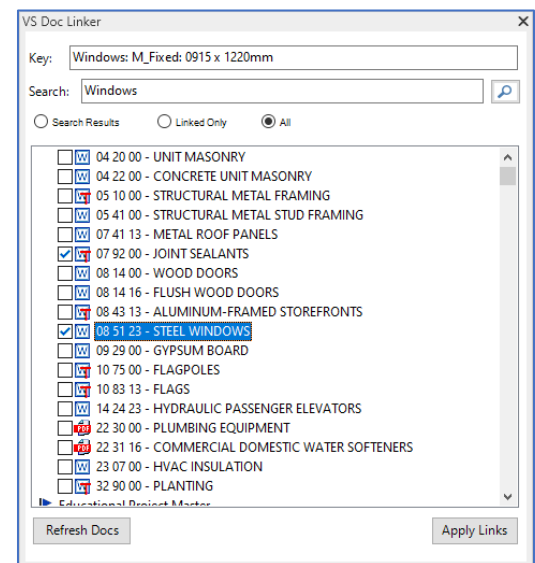**Creating Model Key Links to Required Specs**

"If we use this product in our project, what specs would be required?" Specifiers have the experience to answer this question. Experience also exists with the PAs, PMs, PEs, and BIM Managers so they can also assist in creating the model key links. Some element or material naming conventions will require collaboration and clarification.

A model key link is a relationship from an element or material name to the required spec(s). Model key links are managed for the entire Corporate Account and not per project. Linking your firm elements to the required specs do not have to be recreated or modified per project. Opening another model with the same element means the required specs are already known and can be checked in the VisiSpecs project. Firms may find that the same element or material is being used in the 3D model for different purposes (i.e., curtain walls used for toilet partitions). Separating the element or correcting the element used ensures the data matches the design intent and links to the required specs are accurate.

Starting with a recently completed project simplifies this step since existing elements/materials in the model can be linked to the existing project specs.

Note: If the specifier does not have access to the Revit model, the model data may be sync'd to the VisiSpecs Cloud Server for use in VisiWord. VisiWord includes the linking and coordination tools explained below with access to sync'd sheets and drawings instead of the full Revit 3D model which is preferred. Refer to the VisiWord Tutorial on Model Integration Manager.

1. Select an element or material of interest in the Data Tree, Link Console or Model. Specifiers not familiar with the model viewer or Revit commands will appreciate the ease of use.
    a. To view where the element is used in the model, right click on that row in the Link Console and select Zoom to Element, Zoom to Keynote, or Show all Instances of the Keynote/Element in the model.
    b. Right click to view the element or material Properties.
2. Select the Doc Linker option to show All project specs.
3. Check the required specs for the element and click Apply Links.
4. Right click in the Link Console to Ignore visual only model elements such as entourage and the docs in Division 00 and 01.
5. If further discussion is required, right click in Link Console to add a Comment such as Clarify element/material name.
6. Review the remaining Red Link Status alerts indicating links not yet created or missing or unnecessary model elements and specs. Throughout the design phases the current model and specs may be opened with the Link Console displaying the link statuses for review.

*Note: The above model key links are from model elements to the required spec(s) which provide a good level of coordination. VisiSpecs also supports linking the same elements directly to the spec paragraphs and bracket options for advanced doc automation and coordination. The advanced linking is typically implemented after the initial spec section linking. Refer to the VisiWord Tutorial on Model Key Filtering.*

Automating Required Specs using the Model Key Links

Specifiers may initially prefer to manually select the required specs for their project from a master or a previous project. Whether the project specs are manually or automatically inserted, the coordination of the BIM model and specs is the same. Automatically inserting several or all the specs required saves time and reduces errors.

1. In VisiRevit, select Insert Model Linked Documents.
   a. Review the specs and from what project/master in the search path they were found to insert.
   b. The search path you define to find the required spec is an important tool in the integration. Rather than needing to link a model element to every doc in every master and project (and manage all those links), VisiSpecs searches for the first matching spec number in the search path. Here you see the first place to search for a required spec such is the Education Project Master, then My Company Master, and then the VisiSpecs Template Master (which might be your commercial unedited masters). Setup your project's search path and let the automation find the right specs to insert. Specifiers may also manually insert the required specs from elsewhere.
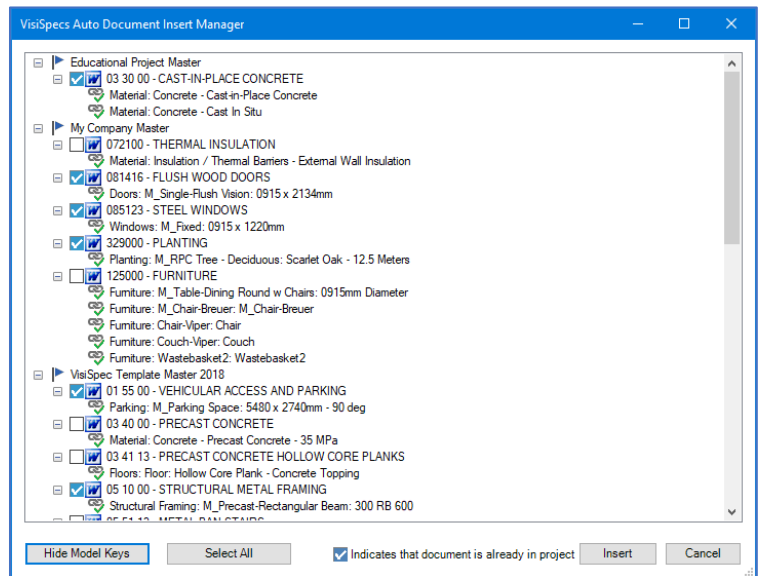
Quality Control of the Model and Specs

Most specifiers will find immediate value reviewing the model key links and specs as a QC tool and prior to design meetings. The QC process is less time consuming than scanning PDFs for call-offs and ensures broader coordination using the data contained within the model. QC issues can be identified by all team members including:

- Are specs missing from the project that are required?
- Are model elements or materials being used correctly?
- Are specs included that are no longer required due to design changes?
- Is a new product being used that requires team discussion?

The Link Console is a dashboard for reviewing the coordination of the model and specs. Search for Red Link Status alerts that need attention. Identify issues to discuss with the design team now rather than after the project submission. At any time in the design phase simply open the model and specs for VisiSpecs to:

1) List the elements and materials placed
2) List the specs in the project
3) Retrieve the Corporate Account Model Key Links
4) Display the coordination status and alerts

VisiSpecs also saves model data snapshots so that changes to the model such as elements and materials that have been added or removed or their parameters changed are easily viewed.

Resolving Coordination Flagged Issues

Common issues can be identified when initiating this level of design integration, and coordination. The resolutions are not difficult and do not need to all be performed on the first project. Common issues and remedies typically include:

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1. The same element is used in different places. The shape looks ok in 3D views and drawings, but the elements should be different as they require different specs based on the product they are representing.
   a. Use the correct element for the design's intent. Elements may need to be created if they do not exist to ensure model key links to the correct specs can be created.
   b. Educate the modelers to open the Link Console while modeling. Seeing the linked specs can flag when the incorrect model element is being used.
   c. Create separate materials when linked specs are different based on the material use.
2. A spec is in the VisiSpecs project, yet the BIM model does not include an element to link to it.
   a. Has a design change occurred where that spec is no longer needed?
   b. Include links to specs not modeled such as Joint Sealants to the element requiring it such as Windows.
   c. Ignore Div 00 and 01 docs as these do not require an element to be linked.

As previous designs were completed and submitted with the above issues, it is not a requirement to hold up the initial project delivery to fix every error or ensure there are no link status alerts. The integration helps to easily identify areas to improve, and some items will be easier to fix than others. Include a punch list of items to fix for the next project knowing that the integration is improving your design process and efficiencies.

Deliver an Integrated Product to Clients

Looking for ways to differentiate your services? Improve the value of your product delivered? Win more business? Improving product quality always helps and there is more you can also provide to your client. The dynamic linking of elements and materials to the required specs and related docs is not only valuable during design, but also of value in the next phases. VisiSpecs was designed with project sharing in mind. Export the model key links used for this project so others may import those links enabling the dynamic highlighting to improve their processes and efficiencies. Delivering the model integrated with the specs to your client improves the value in these areas.

- Estimating and Bidding
- Construction Admin
- Updating of As-Builts
- Linking Submittals to Specs/Model elements
- Commissioning, Operations, Maintenance
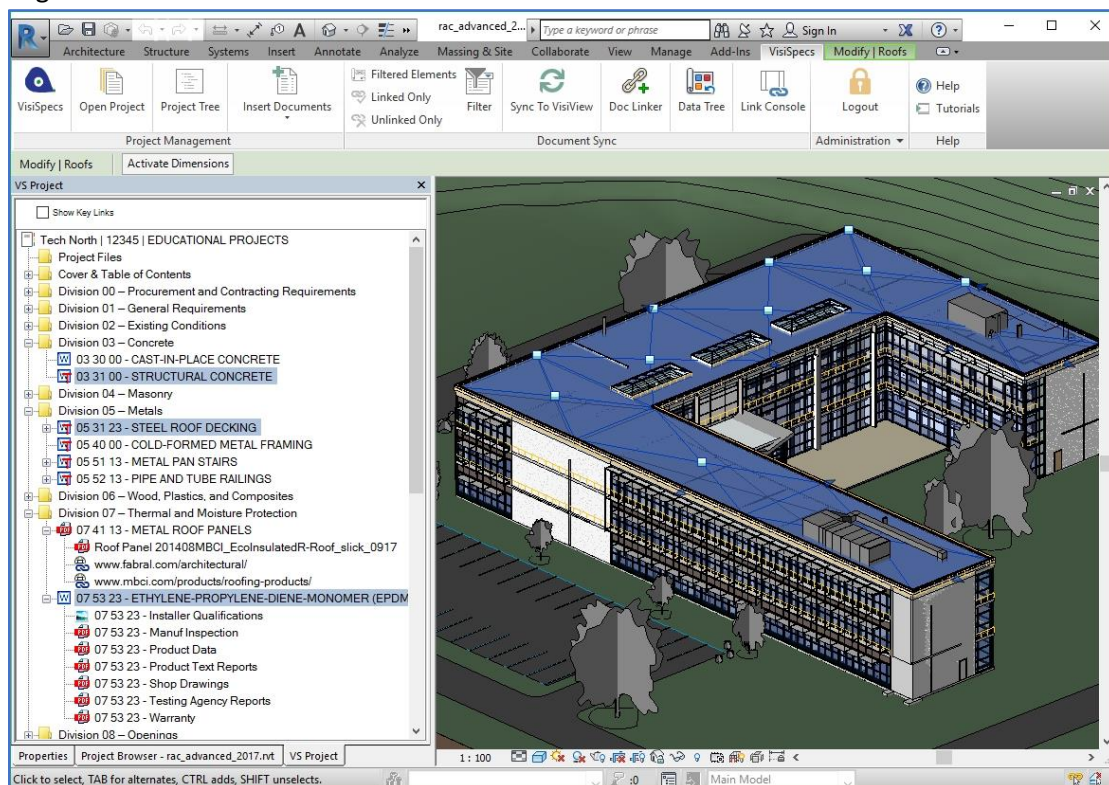
In Summary

The ability to improve your firm's design process, improve team collaboration, and deliver a better product can start immediately with your most recently completed project. Users have stated this integration has highlighted errors on their 1st and 2nd projects that were not identifiable through manual coordination. Even if you know your modeling is not quite there, this integration will help you prioritize modeling tasks while establishing a more efficient design process.

VisiSpecs is also designed for those team members managing, assigning, placing, and verifying the Keynotes through coordination with the specs and the model. This paper focused on the BIM model element integration with specs. Those interested in the VisiSpecs Keynoting solutions should request the link to the keynote video demos.

For those ready to integrate your first project, contact us at Chalkline to receive a FREE BIM Integration Kick-Start training session ensuring success.

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