

A GUIDE TO DATA VISUALIZATION WITH VECTORWORKS



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INTRODUCTION

Data Visualization provides the ability to return visual results in real-time, meaning you can use the feature on design layers as well as on sheet layers.

The feature applies graphic attributes to objects based on criteria, instead of the normal attributes set that's assigned by classes or the Attributes palette. This becomes a "Data Visualization set" developed by choosing criteria from drop-down dialogs. Data may be obtained from an object such as a wall or space, or may be obtained from a custom record format as shown in the Examples section below.

BENEFITS

Data Visualization can be used to aid in presentations as design decisions are made and then shown in real-time. For example, during the design development stage, Data Visualization can be used to help validate the BIM model by showing the location of bearing walls or by showing that the fire rating of doors and their corresponding walls are properly placed. Additionally, by using multiple Data Visualization sets, a project manager can open a file and confirm that the design meets code requirements. Furthermore, Data Visualization sets can be managed and shared across multiple files.

In addition, when using the newly enhanced Data Visualization feature on sheet layers, a customizable legend is automatically created based on the criteria defined in the Data Visualization set(s). This legend will update as additions and changes are made.

To summarize the benefits:

- An aid during the design process to ensure that proper information is assigned to building elements
- Model validation to ensure quality of design and information
- Help in managing office standards by sharing across multiple files and projects
- Automatic legend creation to streamline presentations and documentation

HOW TO

From the Data Visualization icon — located on the View bar next to the rendering icon — begin by selecting “New Data Visualization” and give the visualization a name like in the example dialogs below.

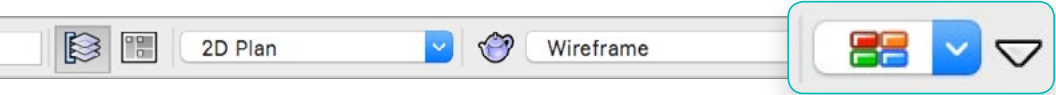


FIGURE 1: Data Visualization icon

Then define the criteria (see figure 2), then select what you want to visualize in the Display Criteria pane (see figure 3). We used “OccupancyType” that was assigned to each space when the spaces were first created. The types of spaces in this file are then displayed along with a color fill for each type using the “Auto-Color” button, or you can choose a color or hatch.

Other criteria for visualizations might be (see figure 4)

- Objects using parameters such as chairs, desks, or doors
- Objects using a record such as finishes or materials or perhaps a custom record defining the various LOD stages
- Objects using IFC entities such as walls
- Objects using a function such as a layer, class, or wall thickness

Keep in mind that the colors displayed in a Data Visualization set are completely independent from any colors, hatches, or textures that have been applied to an object via the class structure of the file.

HOW TO (CONT'D)

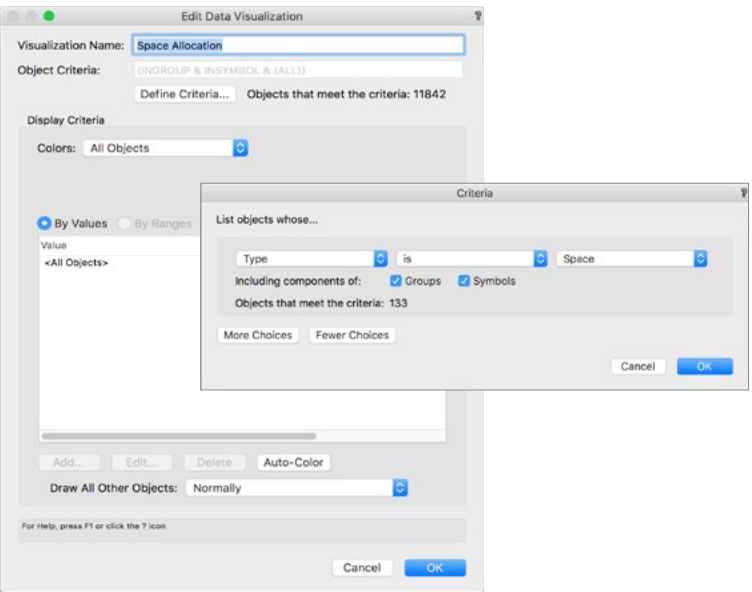


FIGURE 2: Define Criteria

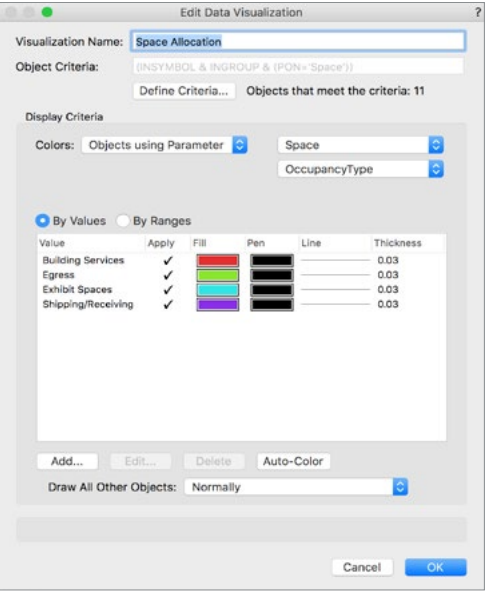


FIGURE 3: What Criteria

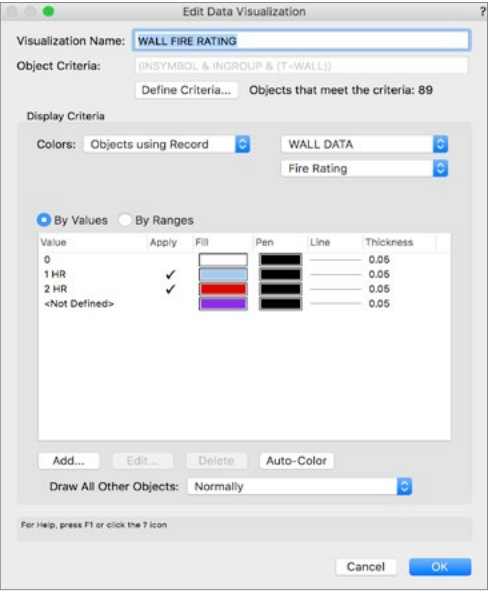


FIGURE 4: Other Design Criteria

HOW TO (CONT'D)

Once a Data Visualization set has been created, you can share it either by simply importing a visualization set from another file on your hard drive or by placing a visualization set within a template file on a server. From the Data Visualization icon, you can choose to manage their visualizations (see Figure 5).

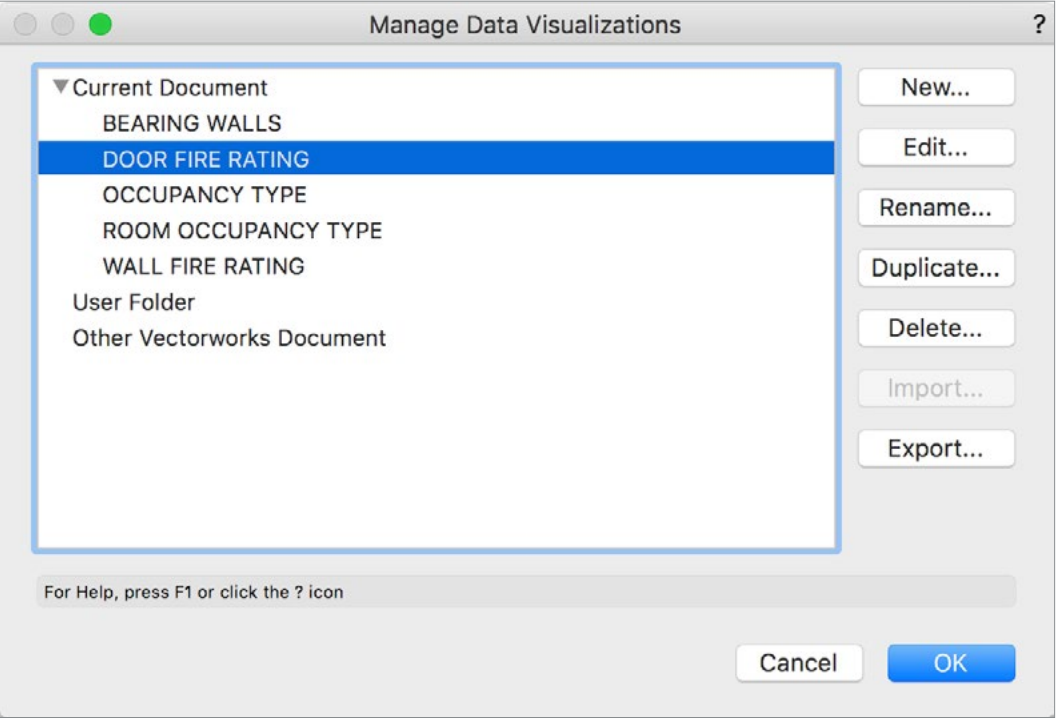


FIGURE 5: Manage Data Visualizations

HOW TO (CONT'D)

Additionally, you can choose to Import from or Export to:

- A file on the desktop or hard drive (User Folder)
- A file on a server via a Workgroup Folder

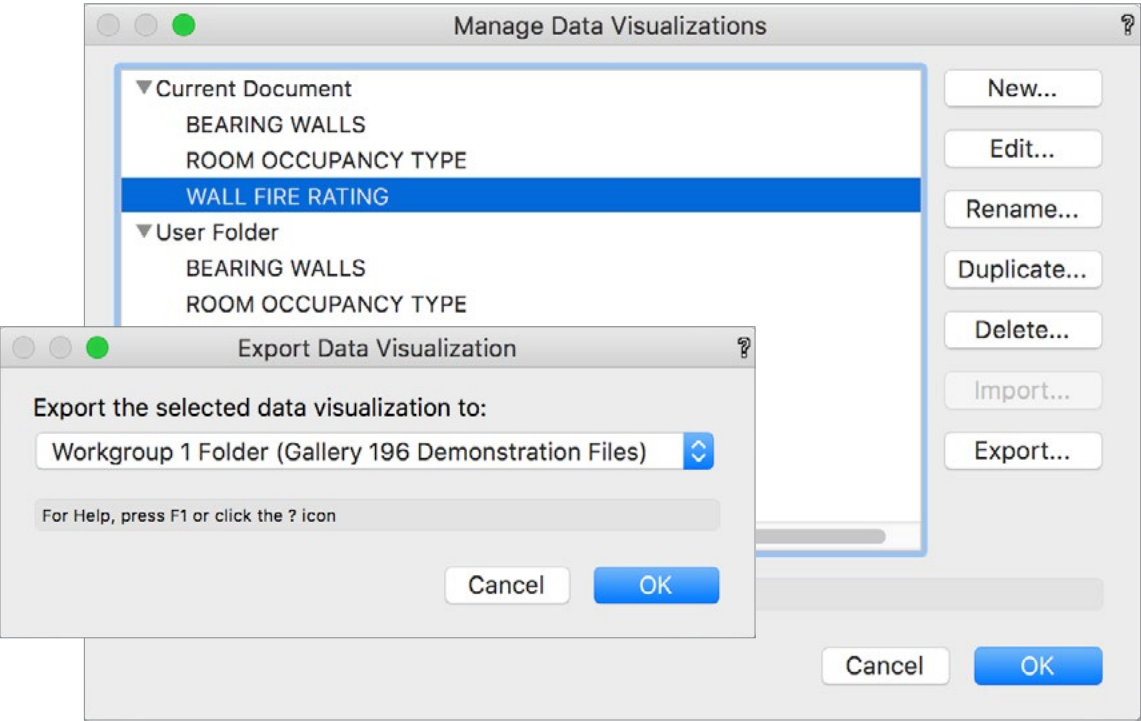


FIGURE 6: Export To

HOW TO (CONT'D)

Similar in concept to the first phase of Data Visualization, Data Visualization sets are available from a drop-down in the Object Information palette of a viewport on a sheet layer. Similar to how the feature works on design layers, all creating, editing, and saving controls are available from the drop-down.

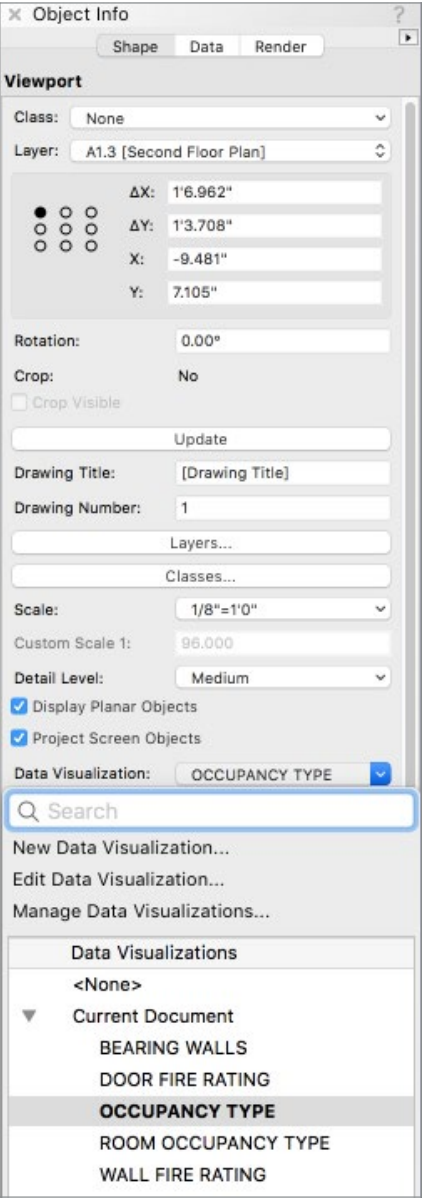


FIGURE 7: In viewport OIP

EXAMPLES

These two examples use a single custom record to visualize two aspects of a model – which walls are load bearing and which walls are fire rated (and what the rating is). The steps for creating the Data Visualization sets are:

- Create a custom record format
- Select which objects will use some or all of the data
- Run the Data Visualization to show the required outcome

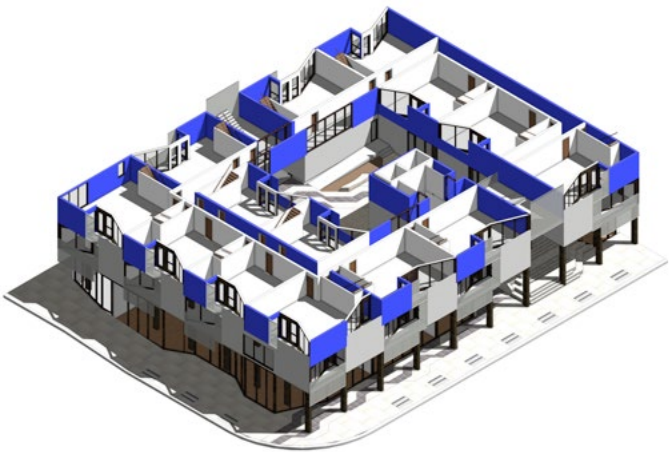


FIGURE 8: Example of Bearing Walls using Data Visualization



FIGURE 9: Example of Fire Rated walls using Data Visualization

EXAMPLES (CONT'D)

As you can see from the custom record's Edit Record Format dialog (see Figure 10), you have the option to define a Field Name and a Type. This can include text, numeric values, or a pop-up selection that's defined by the user. Default values can also be included as shown. Additional information regarding creating Record Formats can be found in Vectorworks Help.

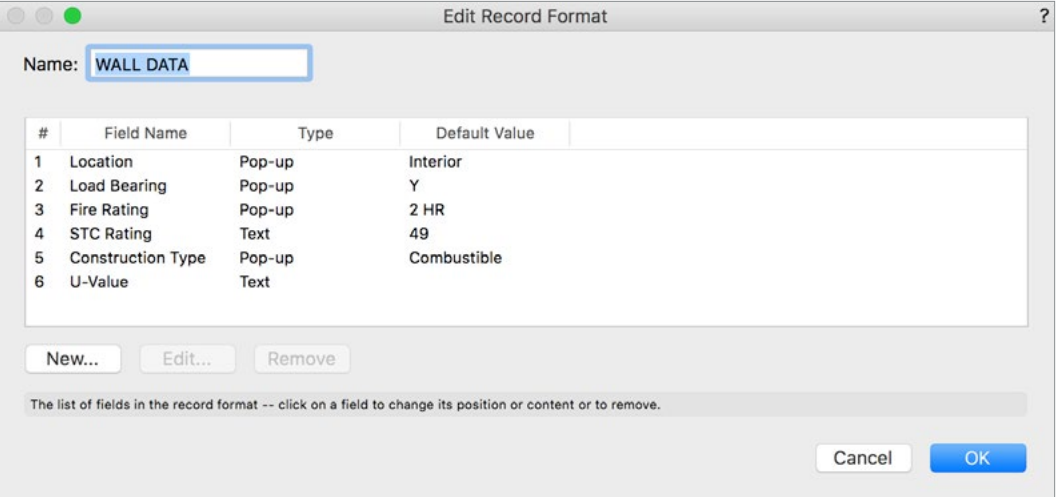


FIGURE 10: Edit Record Format dialog

EXAMPLES (CONT'D)

In this view (see Figure 11) we see that a wall has been chosen in the model, in the OIP the custom record format called WALL DATA has been selected, and the criteria pertaining to the wall via the drop-down "Load Bearing" has been established by selecting the "Y." Also notice how other criteria has been chosen, like the fire rating. We'll look at that in the following paragraph. The next step is to continue selecting the bearing walls in the project using the "Load Bearing" drop-down selection.

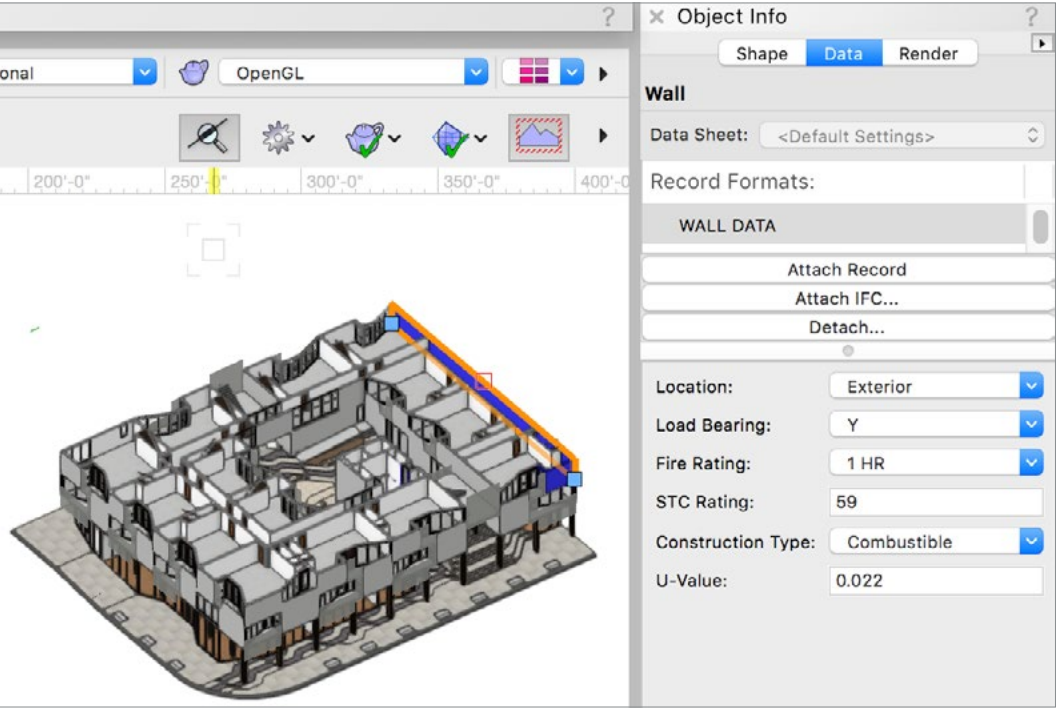


FIGURE 11: OIP Custom Record

EXAMPLES (CONT'D)

Now here's the real benefit: Data Visualization lets you check the model to ensure that all the bearing walls have been properly identified by running the Data Visualization set called BEARING WALLS. The final result is shown in Figure 8 above. Keep in mind that you can run the Data Visualization set at any time so that as you are choosing walls, they will show the chosen color in real-time. You do not have to wait until all choices have been made.

As mentioned above, selections such as whether or not walls are bearing walls, the fire rating, the STC, etc. were made for various walls. Now, using the same custom record, we can look at the data in an entirely different way.

If we create a Data Visualization set and call it "WALL FIRE RATING" and set the criteria under "Display Criteria" to use the record "WALL DATA" and then to look for "Fire Rating," the model will now graphically display the various fire ratings of the walls in the model. The result is shown in Figure 9.

Another example uses the multiple visualization aspect of the Data Visualization tool (see Figure 12).

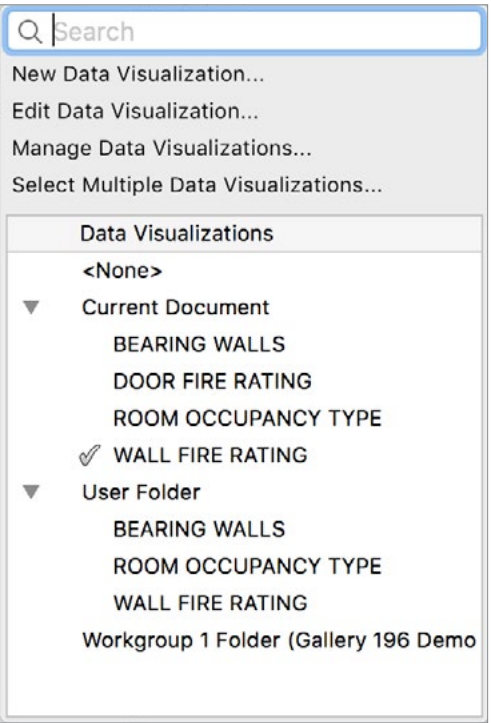


FIGURE 12: Multiple Data Visualizations

EXAMPLES (CONT'D)

This command lets the user visualize, for example, all of the two-hour rated walls along with the 90-minute rated doors that should be located in those walls. A door of the wrong color will clearly show as an error that then can be changed. When you choose the Select Multiple Data Visualizations command, a dialog lets you select which visualization sets are to be used (see Figure 13).

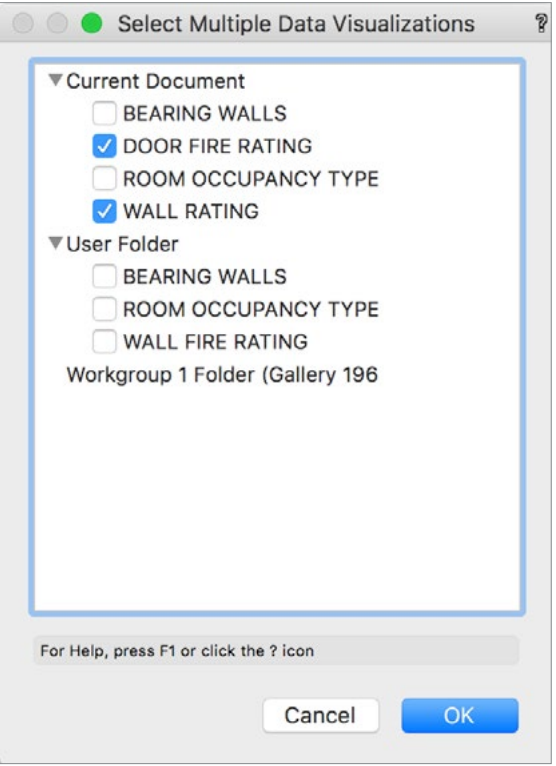


FIGURE 13: Multiple Visualization Control

EXAMPLES (CONT'D)

The result shows the two-hour rated walls in red and the 90-minute rated doors in green, all within the same Data Visualization set.

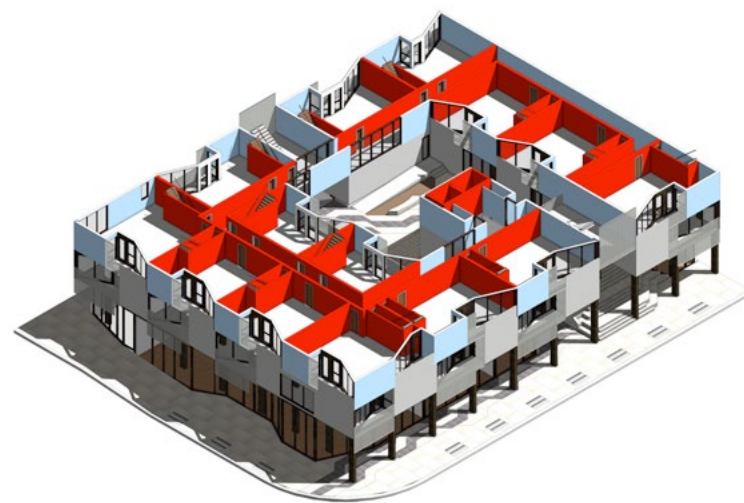


FIGURE 14: Wall and Door Fire Rating

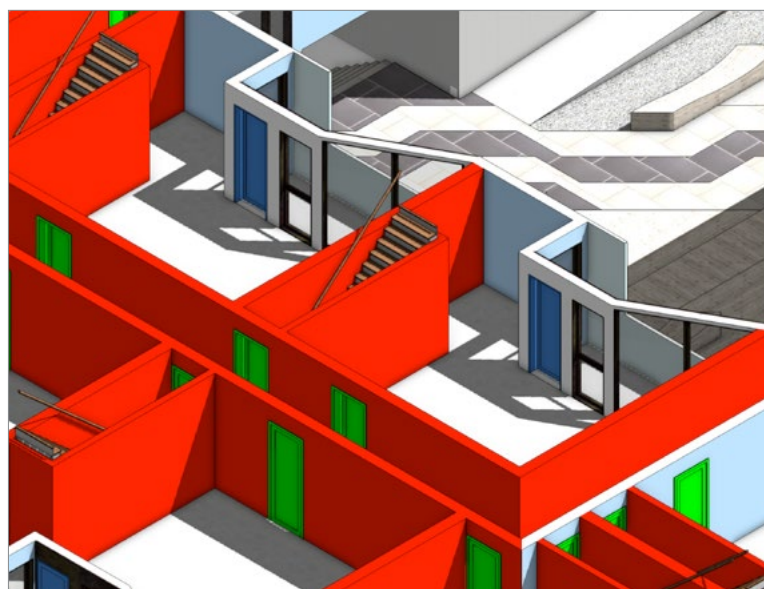


FIGURE 15: Wall and Door Fire Rating Zoomed In

SUMMARY

In summary, the phase two upgrade to the Data Visualization feature brings a number of benefits to the design team in real-time and offers the ability to see the effects of design decisions or even avoid potential modeling errors. Additionally, the feature further automates the process of displaying visualized data on sheet layers by providing an automated legend.

LEARN MORE

about how Vectorworks can help you
implement and develop BIM workflows.

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