

# VAREvitLink 21.0

## User's Guide

### **A New Commercial Version is Available.**

IES has upgraded VAREvitLink 21.0. The latest release can be found on our website at: [www.iesweb.com/downloads](http://www.iesweb.com/downloads)



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## Table of Contents

1.	Help Topics	2
1.1.	Welcome	2
1.2.	Release History	3-4
1.3.	Part 1: Export	4-7
1.4.	Part 2: Import - Existing Revit Project	7-8
1.5.	Part 3: Import - Empty Revit Project	8-10
1.6.	Support Resources	10

## 1 Help Topics

### 1.1 Welcome to VAReVitLink 21.0 User's Guide

#### **A New Commercial Version is Available.**

IES has upgraded VAReVitLink 21.0. The latest release can be found on our website at: [www.iesweb.com/downloads](http://www.iesweb.com/downloads)

The VAReVitLink can be used to transfer model data between VisualAnalysis and Autodesk's Revit. Once the link has been installed, both Export and Import will show up on the "Add-Ins Tab" in Revit, as shown in Figure 1.

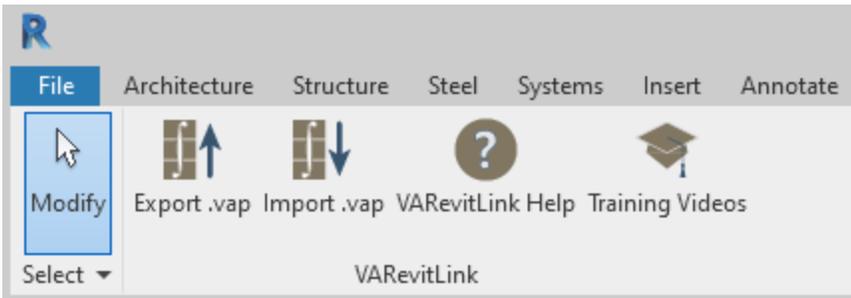


Figure 1: VAReVitLink Add-in Ribbon Panel

#### **Getting Started**

- [Release History](#)
- [FAQ Answers](#) at iesweb.com for business, licensing, installation issues.

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## 1.2 Release History

### VARevitLink 21.0

Released: 2/2/2022

Works with:

- VisualAnalysis: 21.0
- Autodesk Revit: 2022, 2021, 2020

### VARevitLink 20.0

Released: 1/12/2021

Works with:

- VisualAnalysis: 20.0
- Autodesk Revit: 2021, 2020, 2019

### VARevitLink 19.0

Released: 8/15/2019

Works with:

- VisualAnalysis: 19.0
- Autodesk Revit: 2020, 2019, 2018

### VARevitLink 18.0

Released: 5/14/2018

Works with:

- VisualAnalysis: 18.0
- Autodesk Revit: 2019

### VARevitLink 17.0

Released: 9/16/2017

Works with:

- VisualAnalysis: 17.0
- Autodesk Revit: 2018, 2017

### Version Compatibility

Previous versions of the VARevitLink may work with newer version of Autodesk Revit by following the steps below. Note that because the VARevitLink works as an AddIn within Revit, there is no guarantee this will work in all circumstances

and with all versions of the VAREvitLink.

1. Install the VAREvitLink that works with the version of VisualAnalysis you have installed and would like to use. For example, if you are using VA 20.0, install the VAREvitLink 20.0.
  - *Example - If you are using VA 20.0, install the VAREvitLink 20.0 on your computer.*
  - The VAREvitLink can be downloaded from [www.iesweb.com/downloads](http://www.iesweb.com/downloads), and is listed under the Supplementary Downloads midway down the page.
2. Navigate to the directory: C:\ProgramData\Autodesk\Revit\Addins, and select a folder for a version of Revit that the VAREvitLink is said to work with.
  - *Example - If you are using VA 20.0, select C:\ProgramData\Autodesk\Revit\Addins\2021*
3. Copy the VAREvitLinkXX.addin file from the directory above.
  - *Example - Copy the VAREvitLink20.addin file within the C:\ProgramData\Autodesk\Revit\Addins\2021 directory.*
4. Paste the .addin file into the folder of the version of Revit you would like to use with your version of VisualAnalysis.
  - *Example - If you would like to use VAREvitLink 20.0 with Revit 2022, paste the VAREvitLink20.addin file within the C:\ProgramData\Autodesk\Revit\Addins\2022 directory.*

## 1.3 Part 1: Exporting a Revit Project to VisualAnalysis



The VAREvitLink makes use of Revit's Analytical Model as the structure to export. Therefore, it is critical that you take the time to ensure your Revit Analytical Model is well defined. Please consult the Revit documentation for managing the Analytical Model if you have questions about this.

Selecting the **Export .vap** option with an active Revit project will allow you to generate a .vap file to be used in VisualAnalysis. The Export Dialog is shown in Figure 2, and will become active when the Export command is chosen.

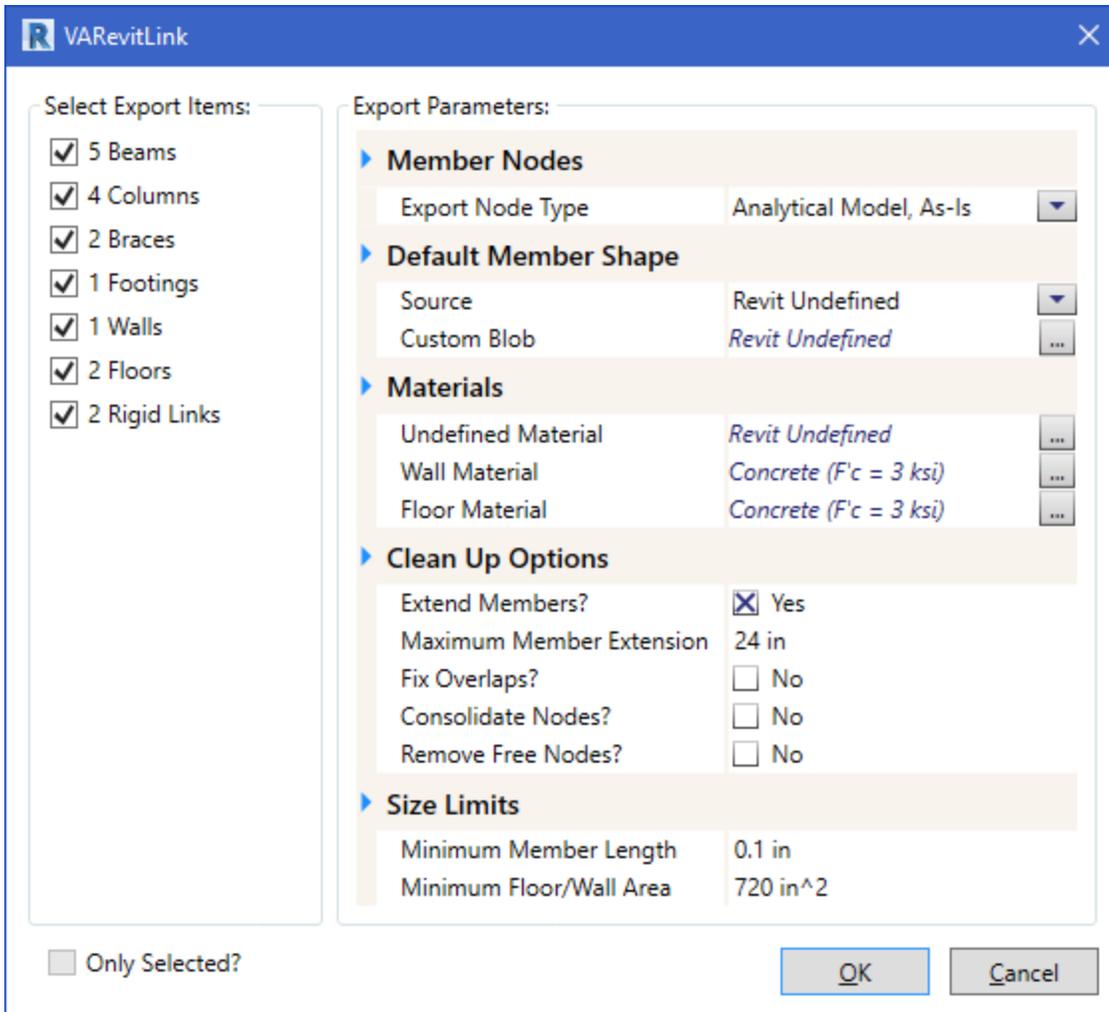


Figure 2: Export Dialog

The left portion of the Export Dialog displays a summary of the items in Revit's Analytical Model with checks boxes allowing all or a portion of the Analytical Model to be exported. The right portion of the Export Dialog contains a set of Export Parameters that you can adjust to get the desired export model. The Export Parameters are described below.

## Member Export Node Type Nodes

- **Analytical Model, As-Is:** Exports Revit's Analytical Model as it is defined, with no adjustment based on the physical members provided.
- **Generate Centerline Offsets:** The Global-Z coordinates of all member nodes will be at the elevation of the reference level and the members in VA will have a centerline offset equal to half of the member depth.
- **Create Nodes At Beam Centerline:** Member nodes in VA will be created at the actual member centerline (half the member depth) and the members will not have centerline offsets. Note that this will result in multiple nodes getting created at beam/column intersections. If this mode is selected, you should closely inspect your VA model to ensure the geometry is how you intended.

**Composite Beam?** - This option is available when the Export Node Type is set to Generate Centerline Offsets. This value represents the largest offset value to use before separate nodes will be created instead of choosing Revit's analytical nodes. In some cases, the Revit model might be created with very large offsets and the VA model would not be accurate using these offset values. This is a way to use

offsets for small values like setting the beam top to match the slab level and use large offsets to represent "mid-column height" members.

- Default Member Shape** **Source:** This shape will be used if a "similar" VisualAnalysis shape cannot be found. Most Revit Family Symbols can be used to find an equivalent shape in VA. These include rolled steel shapes; concrete circular, rectangular and square shapes; and wood solid sawn, glued-laminated, and machine laminated lumber. When a shape cannot be found in VA, the shape entered here will be used. Use the dropdown to use the VA Shape Database to select the preferred shape. The default value for the Source is Revit Undefined. When left unchanged, VA will generate a blob shape named Revit Undefined, which may be useful to you because once inside of VA, the members can be filtered to quickly locate any shapes that did not match so they can be corrected.
- Materials** **Undefined Material:** This material will be used if a "similar" VisualAnalysis material cannot be found for a member being exported. Most steel, concrete, and wood materials will be matched in VA. The default value for the Source is Revit Undefined. Similar to the Default Member Shape Source parameter, this can be useful in locating any materials that we unmatched during the export process once in VisualAnalysis.
- Wall Material:** This material will be used if a "similar" VisualAnalysis material cannot be found for a wall area being exported. Most concrete and masonry materials will be matched in VA. In the case they are not, this material will be used.
- Floor Material:** This material will be used if a "similar" VisualAnalysis material cannot be found for a floor area being exported. Most concrete materials will be matched in VA. In the case they are not, this material will be used.
- Clean Up Options** The VARevitLink offers several options that are meant to help you export the Revit Analytical Model and get a VisualAnalysis Model that closely match one another. The options listed below address many of the common issues that result from differences between Revit and VA.
- Extend Members?:** Check this option to have members which have "free ends" extended to the next crossing member or node. This option is useful to get members which fall short of their connected member to be extended so the connection is made. If you don't check this option you might get "floating" members which you will have to manually extend in VA so that everything is connected.
- Maximum Member Extension:** This value is available when Extend Members? is checked. If a member's extension to make a connection would exceed this value the end will not be extended.
- Fix Overlaps?:** If this option is used, the VA model, once created, will be examined for members that overlap each other. The overlapping members will be combined into a single member to eliminate the overlap.
- Consolidate Nodes?:** When checked, any nodes generated in the VA model will be consolidated into one node when within the Close Node Tolerance. This consolidation will occur once all the VA model members and areas have been assembled.
- Close Node Tolerance:** This value is available when Consolidate Nodes? is checked. Any nodes within this distance with other nodes will be consolidated into one node.
- Remove Free Nodes?:** Check this option if you would like to remove any nodes that are not connected to a member or an area once the VA model has been assembled.
- Size Limits** **Minimum Member Length:** If a Revit analytical member has a length less than this value, it will not be imported into the VA model.
- Minimum Floor/Wall Area:** If a Revit floor or wall has an area that is less than this value, it will not be imported into the VA model.

After all Export Parameters have been set, select OK to save a *.vap* file of the project. After the *.vap* file is created, a Summary of the Export operation will display, similar to the one shown in Figure 3. The Summary will note the

# VARevitLink 21.0 User's Guide

members and areas that were exported, as well as those that could not be exported. Any “fixes” that were made based on the Export Parameters will also be noted.

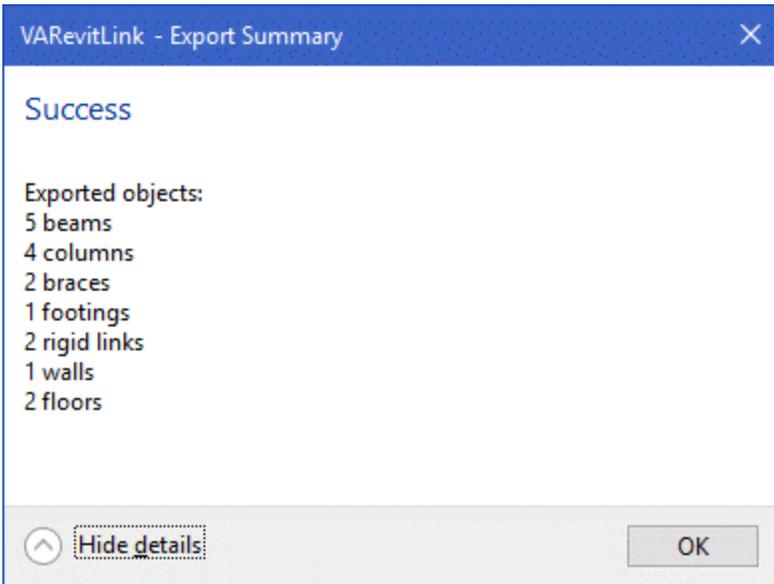


Figure 3 - Example Export Summary

## 1.4 Part 2: Importing a VisualAnalysis model into an existing Revit Project

Both VisualAnalysis and Revit have hidden internal identification numbers for their objects (which you cannot modify). In VA, these are nodes, members, areas, and plates. In Revit, these are beams, columns, braces, walls, and floors. When you export a Revit model to VA, the internal ID's of the Revit objects are used to set the internal ID's of the VA objects, which stay in the VA model. That said, for the import process to work correctly, Revit objects internal IDs must match VA object internal IDs. A VA object without a matching Revit object will not be imported.

In this section, it is assumed that you have previously exported a VisualAnalysis (see [Part 1: Exporting a Revit Project to VisualAnalysis](#)) model and worked on it outside of Revit. Selecting the **Import .vap** option when a Revit model already exists will open up a VisualAnalysis project and merge certain things as discussed in this section. The Import Dialog is shown in Figure 4, and will become active when the Import command is chosen. This dialog gives you the option to select which VisualAnalysis objects will be imported and will merge information from the .vap project into the Revit project.

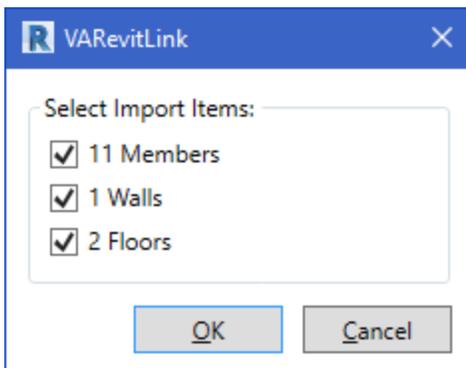


Figure 4: Import Dialog (with an existing Revit Project)

The things imported to Revit are very limited in order to retain the validity of the Revit model. For VA member elements (Revit beams, columns, and braces) only the Family Symbol will be modified if the VA member section has changed. Furthermore, if the VA member section has not been loaded into the Family Symbol list before import, it will not be changed in the Revit model and you will be warned about the failed import.

For VA area elements (Revit floors and walls) only the Revit *WallType* or *FloorType* will be changed. If the area material or thickness was modified in VA, this change will be made in the Revit Floor/Wall material and thickness. Note that the Families for Floors and Walls must contain the changed VA material and thickness for the import to work. If the Families do not contain the changed type, you will be warned about the failed import.

After the Import is complete, a Summary of the Import operation will be displayed, similar to the one shown in Figure 5. This Summary dialog will indicate which Revit Symbols have been changed along with the Revit Floors and Walls which had their material/thickness changed. In addition to the changes, any Symbols that could not be found will be shown so that you can load them ahead of the Import and try importing again.

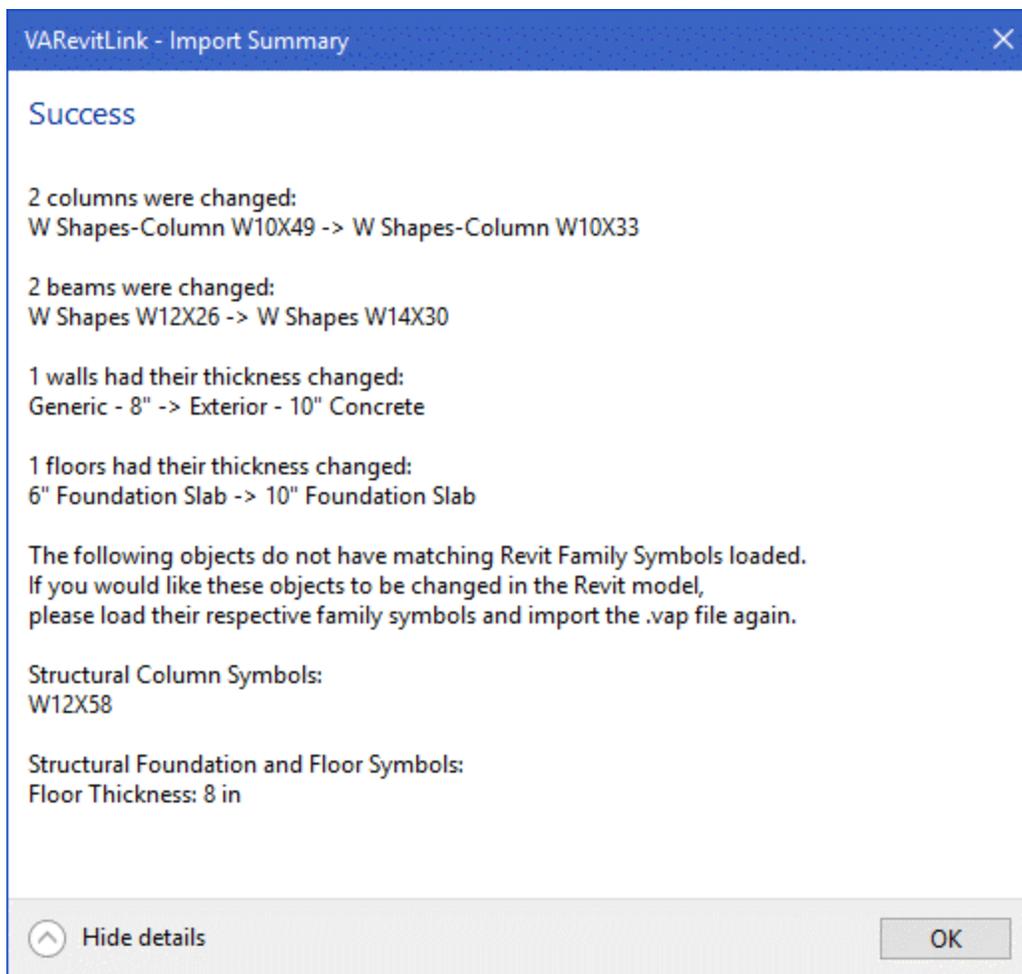


Figure 5: Example Import Summary

## 1.5 Part 3: Importing a VisualAnalysis model into an empty Revit Project

Selecting the **Import .vap** command without having a .vap project that was created during the Export process will allow you to merge a VisualAnalysis project into the Revit project currently open. The behavior of this link will depend on whether the Revit project has anything currently in it. If you create any empty Revit project from a "Structural Template" the VisualAnalysis members will be placed into the Revit project as beams, columns, and braces, whereas

# VAREvitLink 21.0 User's Guide

VisualAnalysis areas will be placed into the empty project as walls and floors. Figure 6 shows the Import Dialog when performing this command.

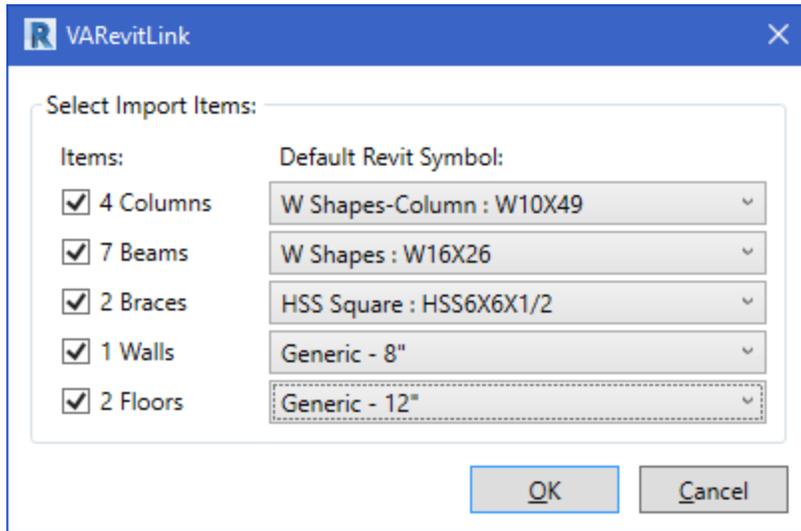


Figure 6: Import Dialog (with an empty Revit Project)

On the left you will see a summary of the objects in the VisualAnalysis project that can be imported into the Revit project. These checkboxes can be used to select which objects are to be imported. Note that an Analytical Model object will be created for all of the items imported.

During the Import process, the VAREvitLink will search the loaded Family Symbols for a match to the VisualAnalysis member. Most steel, concrete, and wood shapes in a VA model can be matched to Revit Symbols. However, for this to happen the corresponding Family Symbols must be loaded into the Revit project before importing. If a match cannot be found, the values in the right column will be used as the default Revit Symbols used to import the VA beams, columns, and braces. Also in this list are the default Revit Walls and Floors that will be used if a matching type cannot be found for the VA areas being imported. Concrete and masonry materials used in VA will usually match Revit concrete and masonry Families if they have been loaded before importing.

Note that Area elements in VisualAnalysis will be imported as Revit Floors if their normal vector is parallel to the Z axis. VA Areas with a normal vector which has a "Z" coordinate component of zero will be imported as Revit Walls. Also note that Areas with openings that are being imported as floors will have the openings created in the Revit Model. This is not true for Revit Walls, as holes in walls will be ignored.

After the Import is complete, a Summary of the Import operation will be displayed, similar to the one shown in Figure 7.

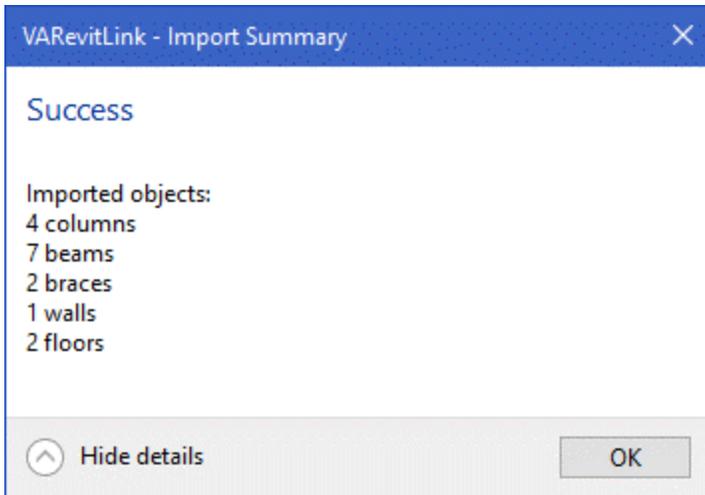


Figure 7: Example Import Summary

## 1.6 Support Resources

### Did you Search this Help File?

Be sure you make use of the help and support built into the software. This document may be searched, and you should try various search terms, sometimes less is more when searching -- use just the unique word or words. There is also a logical Table of Contents available.

### Do Not Contact Support For

- Questions about how to model a particular structure. Such questions are your responsibility as an engineer.
- IES cannot validate your model or your results. If they "seem" incorrect, please figure out WHY they are incorrect. If you can document a defect, we will be happy to investigate deeper and fix things as necessary.
- Questions about engineering theory. IES is not in the business of educating engineers. There are design guides referenced in this help file and we can provide more guidance as to where to look if you cannot find one.

### Technical Support

- Email Support: [support@iesweb.com](mailto:support@iesweb.com) (Replies are usually within 2 business hours, if you don't hear anything within a day, assume it got spam filtered or lost and follow-up. For best results, be sure to ask a question, indicate exactly which IES product & version you are using, include as much detail as is practical or relevant, including attaching a project file.
- Telephone Support: No, sorry. We have found this to be too inefficient for everybody. With email you can attach a screen shot, a project file, and we can better direct your question to the IES expert for that product or area. Phone 'tag' takes longer than you think.
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