



Custom Shapes & Materials

ShapeBuilder 4.5 is the tool for database customization!

Many IES customers have specialized needs beyond steel W shapes. While IES includes an extensive database of shapes and materials for use in the USA and even some foreign shapes, there are often situations where you might need to create a structural frame model using member shapes not included in the normal IES databases of commonly used cross sections. Examples include:

- Forensic work: historical shapes (no longer produced)
- Repair work: damaged or corroded, flitch beams, doubled, plated, etc.
- Foreign work: non-US shapes
- Works of art: unusual forms
- Connections or detailed investigations: holes, copes, or attachments
- Specialized structures: assemblies, extrusions, mechanical components
- Composites: shapes made of multiple materials

Tools Built for Customization

IES shape and material database system was built for customization and IES offers a number of ways to create customized items for analysis and/or design. The primary tool for customizing the database is [ShapeBuilder 4.5](#) and we will explore the possibilities available in this product in this article.

What About the Database Editor Utilities?

In the past, we provided the Shape & Material Database Editors, which have now been retired with the release of ShapeBuilder 4.5. These products are no longer available or supported for database customization. (The editors that shipped with ShapeBuilder 4.0 still work as they always have, but they cannot work with VisualAnalysis 6.0 data files directly.)

VisualAnalysis Customization

VisualAnalysis also offers built-in ways to use custom shapes, but these are more limited: custom "blob" shapes, parametric shapes of typical cross-sections. These are useful for a single project, or when the custom shapes fit the parametric model. See the VisualAnalysis Help file for details. For custom shapes to be used repeatedly, manipulating the database with ShapeBuilder 4.5 provides easier and more persistent customization features.

How to Customize the Material Database?

Before we delve into shapes, note that ShapeBuilder 4.5 introduces a new, simpler way to customize the material database. You access the customization features through the **Choose Material** dialog box. Anytime you go to select a material, you can also create a new one or edit an existing material. You can **right-click** on the database "tree" view to access a context menu of customization features.

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AnalysisGroup Survey

Use it or lose it!

Knowing how you use [AnalysisGroup](#), and what features you use (or don't use) is critical for our engineers trying to create the new version 3.5. To maximize our efforts and bring out improvements that meet real demands, rather than useless bells & whistles, we needed YOUR help: (The AnalysisGroup Survey is complete).

What is AnalysisGroup?

AnalysisGroup is a suite of six tools in one package, for the analysis of common structural components. The tool helps you avoid the normal intricacies of FEA modeling for:

- Grade Beams (Elastic Foundation)
- Continuous Beams
- Circular Tanks
- Rectangular Plate Bending
- Rectangular Mat Footings
- Circular Tanks

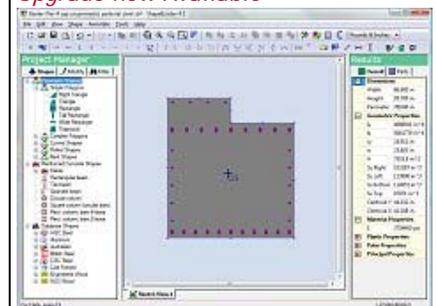
If you use AnalysisGroup 3.0

Please take a couple minutes to review how you have used AnalysisGroup, and then take our very short (5 minute) customer survey:

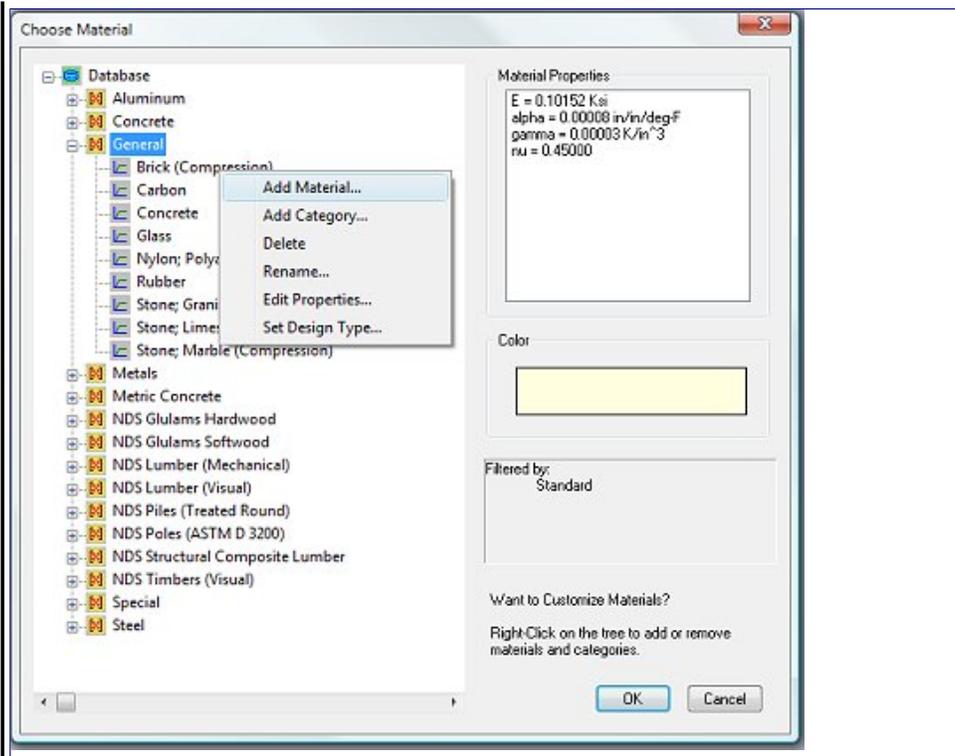
(The AnalysisGroup Survey is complete)

ShapeBuilder 4.5

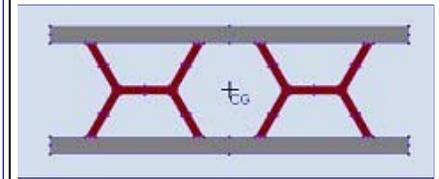
Upgrade now Available



IES released [ShapeBuilder 4.5](#) at the

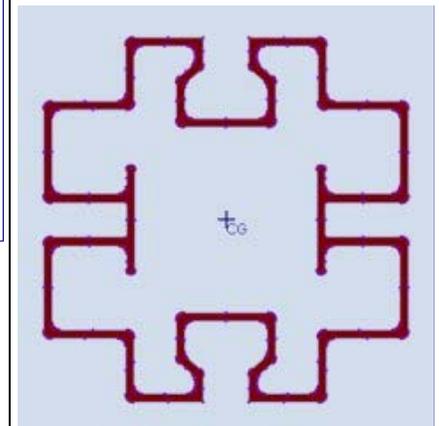


end of July. This is an upgrade (that you must purchase) rather than an update (free patch). The upgrade price for ShapeBuilder 1.x, 2.x, 3.x, and 4.x customers is just \$180 per license.

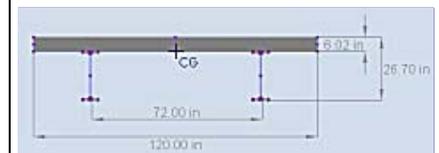


Free Upgrade?

Those customers on a [maintenance](#) (subscription) plan that includes ShapeBuilder should have already received a new license key via email.



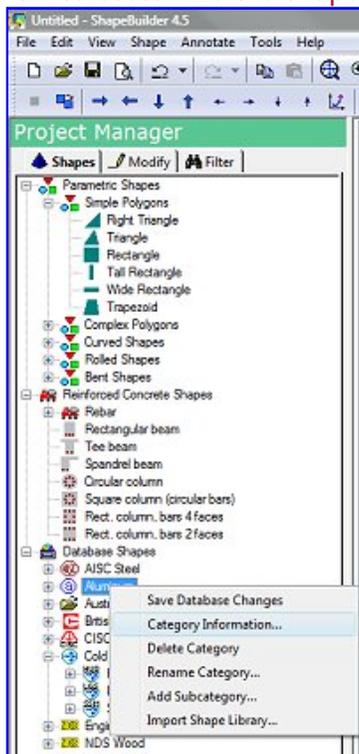
Similarly, those customers who purchased ShapeBuilder 4.0 during the previous 3-months, should also have received a free upgrade, via email. If you did not receive the email, please contact the business office to inquire.



What's New?

ShapeBuilder 4.5 offers many enhancements and improvements to make it easier, faster, and more fun to create arbitrary cross-sections. There is a [new features](#) list and some animated movies available from the [ShapeBuilder page](#) on our web site: check it out!

How to Customize the Shape Database?



Within ShapeBuilder 4.5 you can access the database customization features by **right-clicking** on the database items in the **Shapes** tab of **Project Manager**. Once you make database customizations, the result will be a new (or modified) .dbs file on your machine. You should be sure to back-up this file. You may copy custom .dbs files to other machines you or your coworkers use to make the custom shapes available elsewhere.

Creating an Occasional Custom Shape

If you have a few shapes to put in the database, the easiest approach is to create each shape in ShapeBuilder and then use **File | Export Shape**, to place it in the database and make it available in VisualAnalysis or other IES products.

Importing a Family of Shapes

If you have a library of shapes, say a table of foreign steel wide flanges, you can import the entire table of shape names and properties in one step. ShapeBuilder's Help file describes the types of shapes that can be imported this way to enable design checks, or you can simply import basic analysis properties (A, I, J, S; like custom "blobs" in VisualAnalysis).

Cold-Formed Shapes for Design Checks

Because VisualAnalysis uses the CFS product from [RSG Software](#) for cold-formed steel design checks, there is a different procedure for creating or using custom cold-formed steel shapes: First you use the CFS product to create your shape(s) and save them in an .scl file (shape library). Then you can import this file using ShapeBuilder to set up the data required in the IES database. *(If you just need to analyze cold-formed shapes, you may create them like any other custom shape; the CFS procedure is only required if you need design checks.)*

Custom Shapes for Design? Use Caution!

When creating custom shapes to use in design checks in VisualAnalysis you need to "match" your shape to one of the available design-types. A design-type is like "Steel W", "Steel HSS Rectangle", or "NDS Glulam". Design checks are not magic, comprehensive or even "intelligent"--there are some limitations!

Shape & Category Requirements

There are certain requirements on shapes if you wish to get design checks. So you have to pay attention to the details to get the database set up properly. ShapeBuilder 4.5 makes this process much easier than it has ever been and automates or guides you through most of the steps. ShapeBuilder also provides the means for you to inspect and fix these requirements where necessary:

1. Select the appropriate design-type for your shape(s).
2. Group shapes into categories by design-type.
3. Insure shapes have the required properties for design checks.
4. Insure the category is "marked" as supporting the design-type.
5. Define a compatible default-material for the shape category.

Unpredictable Results

If you create some complex shape, it will not be possible to get reasonable design checks. Even something as simple as putting holes in a W shape and exporting it for design checks as a W shape may yield unpredictable results. The design checks in VisualAnalysis were written for "known" shape categories and will often calculate properties like b/t ratios, or the area of a flange, from other known properties to facilitate a check.

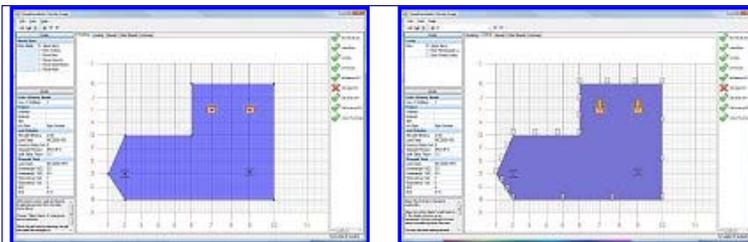
Be sure that you carefully review what the design software is giving you for checks on custom shapes. Testing a few problems where you already know the answers is a good place to begin. Custom shapes can introduce subtle errors that IES programmers could not anticipate, so extra diligence on your part will be essential to your success in this area.

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VisualFoundation Sneak Peek

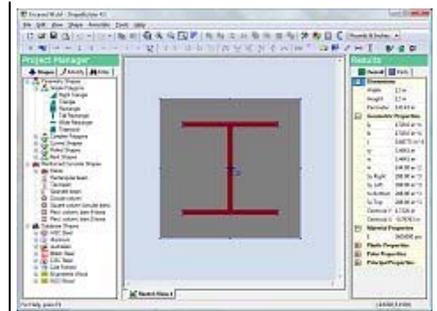
Easy Tool for Complex Mat Footings

Concrete mat footing design is not a trivial undertaking, even when using a tool like VisualAnalysis, which offers all the necessary components for a sophisticated finite element analysis, still does not make it an easy problem to solve, and many things must be handled manually. IES engineers have developed an exciting new product, dedicated to this task to manage much of the complexity in mat footing analysis and design. The following screen images show our "first cut" at the user-interface, which will likely change significantly as we complete the development:



Features & Capabilities

- Setting up the geometry, including column, pile, grade beam and wall locations
- Creating a finite element mesh, and maintaining it as things change
- Creating spring supports to represent the soil under the mat
- Applying loads to the mat, columns or walls.
- Checking stability requirements
- Determining design forces through a nonlinear analysis
- Checking the concrete shear, including punching shear
- Determining the area of steel required based on moments
- Reporting the results, both graphically and textually



Getting Started

Try ShapeBuilder 4.5 free for 30 days, whether you have a prior version or not. [Download it today!](#) Use our secure online [order form](#) to purchase it new or to buy the upgrade.

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Technical Support News

The Case of the Missing Message

It is almost expected that software systems will fail. We have dealt various types of failures throughout the years:

"Abort, Retry, or Ignore",

"Fatal Error",

"Unhandled Exception",

"The Application has Terminated",

"The system will now restart. OK?"

However, it is **unforgivable** when your operating system fails to launch a program and doesn't tell you **anything** about why or how it failed!

VisualAnalysis 6.00.0105?

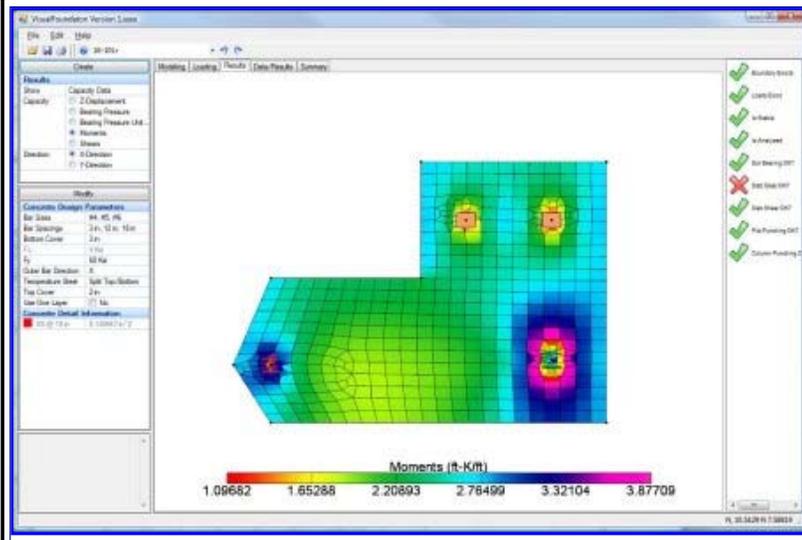
Yet, the silent treatment, is exactly what some customers were getting on Windows XP recently with our latest update for VisualAnalysis 6.0.

The software was working great in our office and on our test platforms, and numerous customers installed and executed build 105 just fine. Yet on half a dozen customer machines, the software simply would not run.

No message! Nothing, but an "I'm just going to ignore you!" attitude. Needless to say everyone gets frustrated when this happens. We are still scratching our heads about it and trying to figure out what is going wrong...so build 105 is currently on hold. If you have it installed, great, if not, you will need to be patient...the IES support detectives are on the case.

QuickRWall 2.01 Update

Our Canadian customers will be happy to note that [QuickRWall 2.0](#) now



Goals for VisualFoundation 1.0

With the first release of this product, IES has a number of goals:

- Fill a hole in our product lineup (another piece in the full-building design puzzle).
- Master new technologies to help position IES for the future of software development.
- Provide a basic engineering tool that is fast, easy, and robust for our customers.
- Create a tool that is reasonably priced.

By design, the first version of VisualFoundation will **not** provide everything an engineer might want in a foundation design program, such as full rebar detailing and the production of design drawings. We will be looking for ideas and suggestions from practicing engineers as to how this product should evolve.

As we ready the product for customer beta-testing you might think about what you like or don't like about other tools you have used, or tools you wish you had for this kind of project and let us know. We are always on the lookout for your expert opinion.

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supports the latest CSA specifications.

- Option to take lateral pressure from backfill to bottom of key, vs. footing bottom.
- Option to specify separate stability factors of safety for seismic load combinations.
- Reinforcement checks for horizontal (S&T) bars.

Numerous bug-fixes also went into this release, so all customers are encouraged to download and [install this latest update](#).

QuickRFooting Build 1.00.0009

A minor update has been released for the spread footing design tool. The program now references IBC 2006 (rather than IBC 2003), the relevant checks and provisions have not changed. There were also a couple minor bug fixes.

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