

WHAT IS THE “TABLE INPUT”?

The “Table Input” is a user interface component that helps you create and maintain geometry and loads in a project. It is also a powerful tool for creating complex structures much faster. The table input helps you save a lot of time and effort so that you can focus it elsewhere.

With the table input, you can:

- **Optimize structures quickly and effectively**, by creating and managing a model with anywhere from lower to high amount of entities.
- **Create new projects in minutes** just by modifying the existing ones. This can be done by describing the geometry by functions in e.g. Excel and then inputting one structural model after another – just by changing a parameter or two – enabling you to create new projects in minutes!

We prepared practical user cases below to show you the power of the table input.

	Name	Coord X [...]	Coord Y [...]	Coord Z [...]	Mem...	2D mem...
1	N1	0.000	-1.622	2.950	B1; B...	
2	N2	0.368	-1.254	17.700	B22; ...	
3	N3	1.622	-1.622	2.950	B2; B...	
4	N4	1.254	-1.254	17.700	B24; ...	
5	N5	1.622	0.000	2.950	B3; B...	
6	N6	1.254	-0.368	17.700	B18; ...	
7	N7	0.000	0.000	2.950	B4; B...	

TABLE INPUT FEATURES

Most entities that you are currently able to input in the 3D graphical window, one by one, are also covered by the “Table Input”. Furthermore, new entity types are being constantly implemented, with 2D members and load panels being the latest addition.

USER CASES – EXPLORE THE TABLE INPUT FEATURES IN ACTION

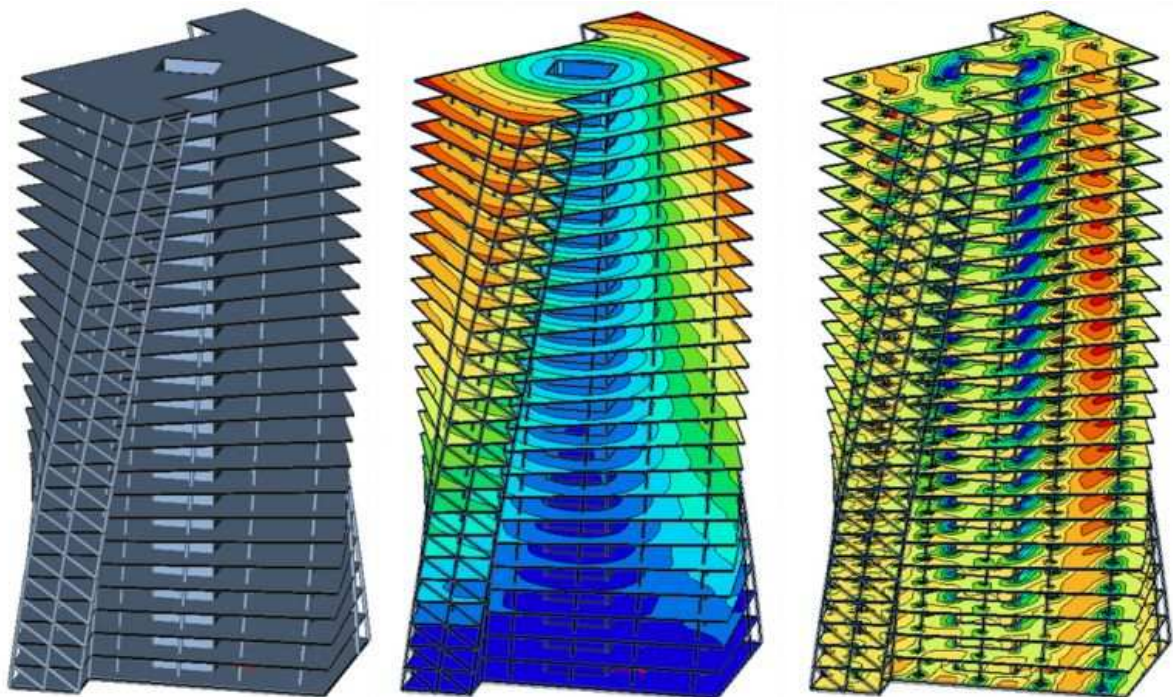
1) DESIGNING MULTI-STOREY BUILDINGS

Problem:

A high-rise building usually includes storeys that are similar to each other optionally with a minor adaptation in every storey. For example, the storeys in higher levels may get incrementally smaller, and the increments may be linear or follow a predefined curve. Each storey might also be shifted in respect to the storeys below. Designing this kind of a structure by hand, storey after storey, takes a lot of time, despite using features like multi-copy, rotation, etc. You may import the shape from a CAD application. But what if the conceptual design of the building changes? Are you going to design and recalculate it from the start?

Solution:

Define a single storey topology and then copy all structural nodes into different height in Excel. By transforming the coordinates, you may achieve incremental change in the shape for each storey. Changing parameters that you define within you Excel sheet enables you to import an entirely different conceptual design that includes all nodes, 1D and 2D entities, loads and supports.



2) DESIGNING A ROTATIONAL STRUCTURE SUBJECTED TO A WIND LOAD

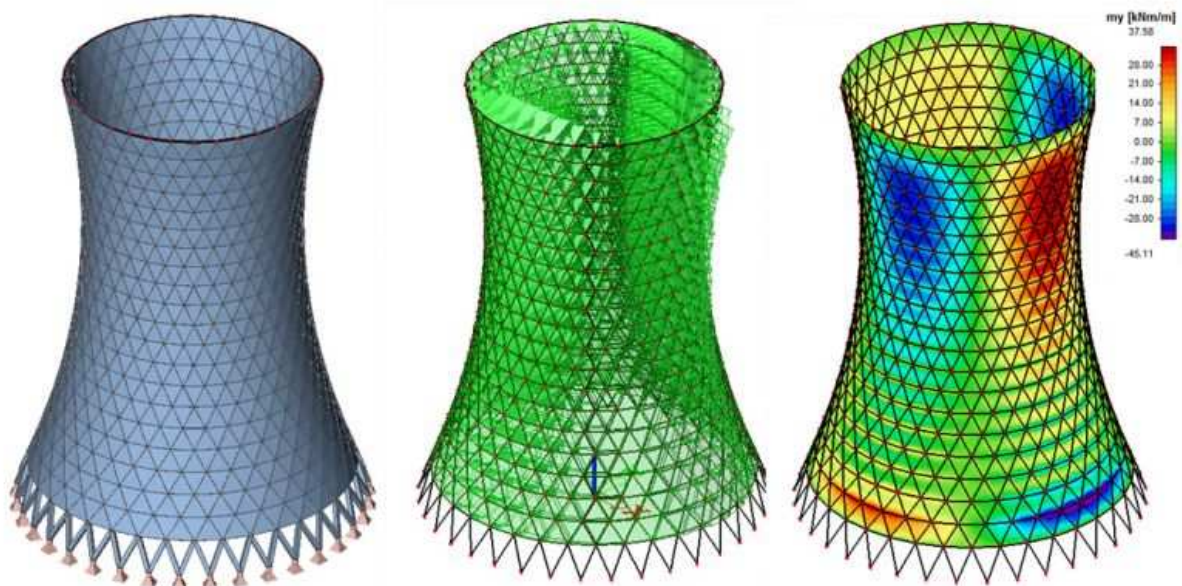
Problem:

Rotational structures, such as tall chimneys, cooling towers or all kinds of reservoirs, are specific structures that can easily leverage the Table Input. The wind load on such structures varies along the surface of the tower. That is why e.g. cooling towers are usually designed using a number of small 2D members instead of single shell. Each 2D member is then separately subjected to wind load calculated externally (in Excel). Designing this type of a model is already challenging enough, and when the shape slightly changes, you can start all over again.

Solution:

Since the SCIA Engineer 16.1 version, the Table Input has been extended by the possibility to input 2D flat members. Thanks to this an Excel sheet can calculate nodal coordinates based on the geometry specification. Also, the load can be calculated for every element. Thus, altering the geometry is only a matter of changing a few parameters in Excel and rewriting the structural nodes specification.

Define topology of nodes → Create 1D and 2D members → Load the structure → Calculate.



Need to perform different design or shape optimization? That's not a problem at all. Just change the input of nodes and rewrite them in the project.

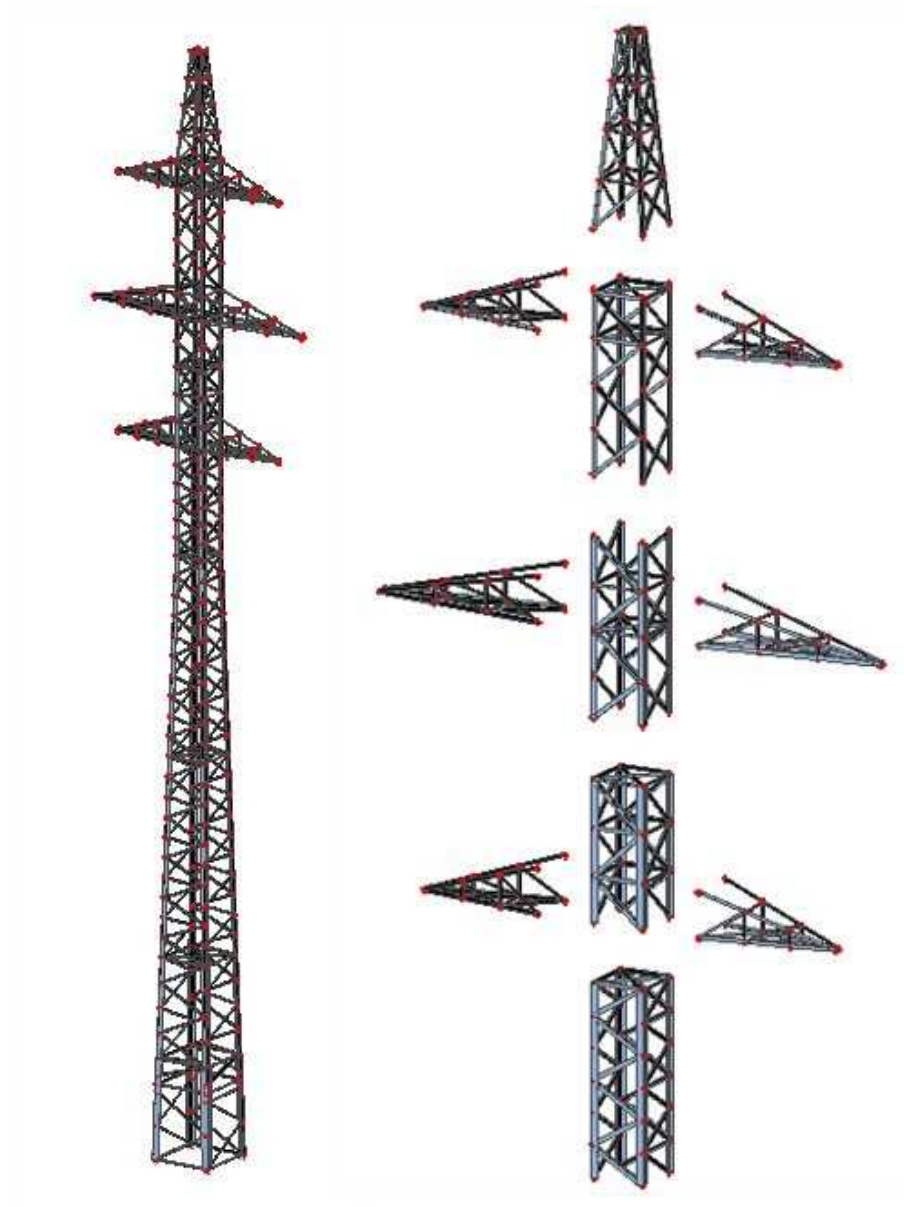
3) CREATING A MODEL OUT OF VARIABLE STRUCTURAL PARTS

Problem:

High-voltage lines or other steel towers are examples of structures composed of variable parts. Based on the design type, the towers share the same concept even though their height may vary. Such structures are composed of many 1D members that take time to input and load manually, for example by icing.

Solution:

Parts of the tower may be defined separately in Excel, and based on a parametric input, the tower may be composed of these predefined structural parts automatically. The whole tower may be then inputted into SCIA Engineer by a few clicks.



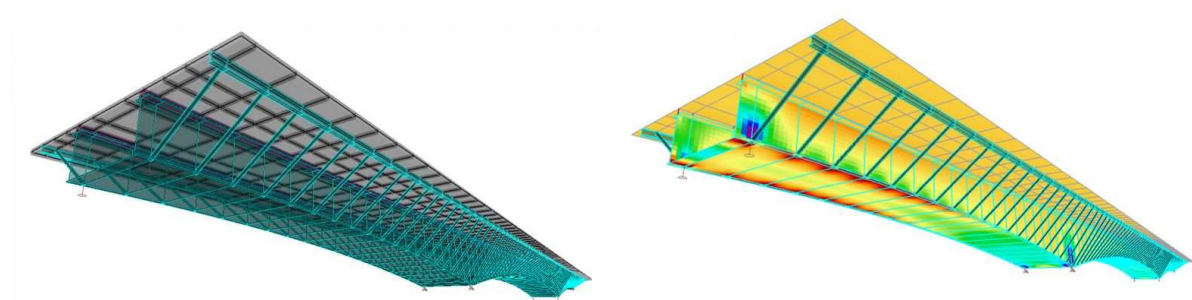
4) DESIGNING A WHOLE BRIDGE

Problem:

Bridge structures, especially when designed by 2D members, present a challenge due to varying height and thickness of structural parts along the span length. Thus, it is apparent that it can take a considerable amount of time to create and alter such models.

Solution:

The shape of the cross section and the longitudinal shape may be usually described by a simple polynomial function. Once it can be described by a function and the cross section is also defined, you just have to keep a certain approach to node names and then you can generate (copy) in the Excel sheet all the nodes for all sections in one step. Excel will automatically keep the formatting of the names as well as make an incremental change of the name for each section as needed, which is perfect! If the nodes are numbered consistently in each section, 2D members between sections may be created for the first section and then it takes only a single double-click to have it done for the whole structure.



Concrete, steel, composite? Truss, girder, arch or cable-stayed design? - You name it. You can easily use the Table Input functionality for them as well. Optimize the shape or thicknesses of entities by the Table Input, simply by using a single "Copy → Paste".

WHAT IS YOUR USER CASE WITH TABLE INPUT?

Do you have your own story and are not certain if it may be automated in a similar manner as shown in the cases above? Or has the Table Input helped you with any specific use case? Let us know directly at v.pribramsky@scia.net.

CURIOS TO LEARN MORE?

Has this article aroused your curiosity about Table Input?

Visit **SCIA Engineer online help** and learn about other features such as:

- selecting certain parts of the model:
https://help.scia.net/webhelplatest/en/#trx/modelling/tableinput_07_highlight.htm
- searching for specific items:
https://help.scia.net/webhelplatest/en/#trx/modelling/tableinput_09_search.htm
- filtering:
https://help.scia.net/webhelplatest/en/#trx/modelling/tableinput_03_1_tools.htm
- renaming:
https://help.scia.net/webhelplatest/en/#trx/modelling/tableinput_11_tips.htm
- and much more ...:
https://help.scia.net/webhelplatest/en/#trx/modelling/tableinput_book.htm