

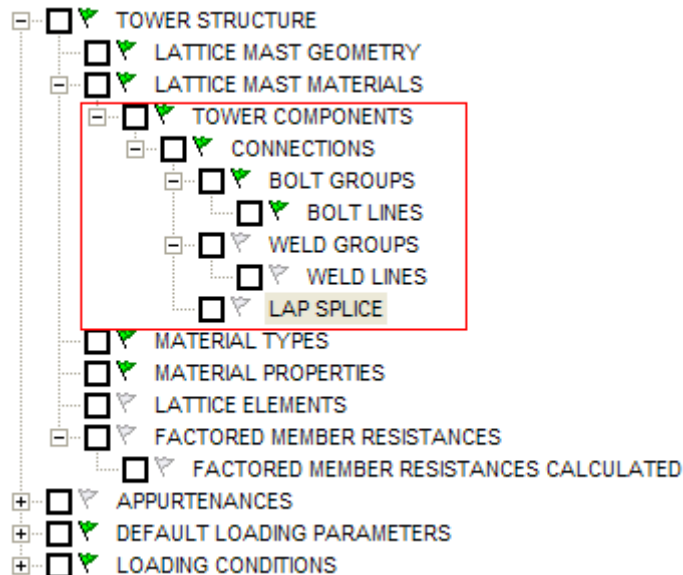
GUYMASTER Version with Resistance Calculations

The proper assessment of tower component resistances requires more information than had previously been part of the input data. In particular, there are three critical elements of data: component length, stitch bolts, and end connections. There could be different connection details at the two ends of the component, especially in the case of leg components.

The resistances calculated by GUYMASTER will be found in a new table: FACTORED MEMBER RESISTANCES CALCULATED BY GUYMASTER. The resistances used by GUYMASTER in analysis reports will be those in the FACTORED MEMBER RESISTANCES table, for which the data is entered by the user. If the user wishes, he may transfer the data from the FACTORED MEMBER RESISTANCES CALCULATED BY GUYMASTER by clicking on Apply. This approach allows the user to override, where he feels it is appropriate, the resistance calculations by GUYMASTER.

The user can click on any cell in FACTORED MEMBER RESISTANCES CALCULATED BY GUYMASTER and see all the parameters used in the calculation of that value.

The headings of the new tables are outlined in red:



We have expanded the allowable types of entries in the LATTICE MAST MATERIALS table in order to accommodate input of component-specific information as opposed to material-specific information. If only an integer value is entered, it will be interpreted as being a material type and the component connection will be assumed to be welded. This will do very well for all-weld towers. To specify a connection type for a component, it must be entered, in the LATTICE MAST MATERIALS table, as the appropriate TOWER COMPONENT ID from the TOWER COMPONENT table, prefixed by “TC”, as shown below.

- **LATTICE MAST MATERIALS**

LATTICE MAST MATERIALS								
BOTTOM ELEV ft	TOP ELEV ft	TYPE OF MATERIALS USED IN.....						
		LEGS	DIAGS	HORIZ	INTER BRACING	SUB DIAGS	SUB HORIZ	GUSSET
0.000	200.000	1	TC1	TC1	0	0	0	0

- **TOWER COMPONENTS**

The TOWER COMPONENTS table is the following:

TOWER COMPONENTS									
COMP. ID	MATER. TYPE	LENGTH OFFSET ft	LENGTH ft	FLANGE V/H	...CONNECTIONS...			STITCH SPACING in	..SPLICES...
					START	MID	END		START END
1	2	0.00	4.02	V	B1		B1	0.00	

- The first item in this table is the component ID, an integer that will be entered into the LATTICE MAST MATERIALS table, annexed to the identifier “TC”.
- The second item in this table is the material ID referenced from the MATERIAL TYPES table.
- The third item is an offset to be used for reducing the centre-to-centre length of the component as calculated by GUYMASTER based on the LATTICE MAST GEOMETRY table. This offset will be applied to both ends of the component.
- As an alternative, in the fourth column, the user may specify the length to be used.
- Often, when flanged elements are used, only one flange is connected. The fifth column indicates which flange, as defined in the MATERIAL TYPES table, is connected. If both flanges are connected, the user will have to enter a separate line for the second flange. Of course, the component ID remains the same.
- The next three columns reference the connection at the start, middle or cross-over point, if there is a crossing component, and the end of the component. The references are IDs in the BOLT GROUP or WELD GROUP tables, prefixed by “B” in case of the first and “W” in case of the second.
- The ninth column indicates the maximum spacing of stitch bolts or welds in the case of built-up members.
- The last two columns indicate the splices used at each end of the component. This will be mostly applicable to leg components, but

could conceivably be used for bracing as well. The references are IDs in the LAP SPLICE table, prefixed by “L”.

BOLT GROUPS

The BOLT GROUPS table provides for defining all bolts at one particular type of connection and is as follows:

BOLT GROUPS					
GROUP	BOLT LINE	.LOCATION.		.HOLE SIZE.	
ID	ID	GAGE	END	IN	ACROSS
		LINE	DIST.	LINE	
		in	in	in	in
1	1	1.13	0.94	0.79	0.79

- The first item in this table is the GROUP ID, an integer that will be entered into the TOWER COMPONENTS table.
- The second item is the bolt line being referenced from the BOLT LINES table.
- The third and fourth columns position the bolt line in terms of gage distance (that is, the distance from the edge of a plate, the heel of an angle, or the centre of a round element), and the distance from the reference end of the component to the leading bolt in the referenced line.
- The BOLT LINE TABLE will give bolt sizes, but the resistance may also be affected by the hole size. These are given here. If the in line hole size is different from the across line hole size, a slotted hole will be defined.
- Several BOLT LINES may be defined for one BOLT GROUP and entered on separate lines of the table. All of these must be given the same GROUP ID. This will most likely be the case for leg splices.

BOLT LINES

The BOLT LINES table allows the definition of a set of bolts that form a line in which the type, size, and spacing are constant as seen below:

BOLT LINES					
LINE	NO OF	SPACING	.BOLT SIZE.		STRENGTH
ID	BOLTS	C/C	DIA	LENGTH	Fub
		in	in	in	ksi
1	2	0.75	0.63	5.00	120.00
2	4	0.75	0.63	5.00	120.00

- The first column is the ID of the bolt line. The rest is quite obvious.

WELD GROUPS

The WELD GROUPS table provides for defining all welds at one particular type of connection and is as follows:

WELD GROUPS							
WELD	WELD	GAGE	END	ROTATION	LENGTH	...SIDE...	AROUND
GROUP	LINE	DIST	DIST			NEAR	FAR
ID	ID						
		in	in	deg	in		

- The first item in this table is the WELD GROUP ID, an integer that will be entered into the TOWER COMPONENTS table.
- The second item is the weld line being referenced from the WELD LINES table.
- The third and fourth columns position the weld line in terms of gage distance (that is, the distance from the edge of a plate, the heel of an angle, or the centre of a round element), and the distance from the reference end of the component to the leading weld in the referenced line.
- Several WELD LINES may be defined for one WELD GROUP and entered on separate lines of the table. All of these must be given the same GROUP ID.

WELD LINES

The WELD LINES table allows the definition of a set of welds that form a line in which the type and size are constant, as seen below:

WELD LINES				
WELD	TYPE	SIZE	..INTERMITTENT..	UNIT
LINE	*		LENGTH	PITCH
ID				STRENGTH
		in	in	in
				ksi

- The first column is the ID of the weld line.
- The type of weld can be one of the following:
 - FIL – fillet
 - PLU – plug
 - SQU – square
 - BEV – bevel
 - CP – complete penetration
- The rest of the fields are quite obvious.

LAP SPLICE

The LAP SPLICE table provides for defining lap splice connections and is as follows:

LAP SPLICE				
SPLICE	MATERIAL	LENGTH	..CONNECTIONS..	
ID	TYPE		START	END
		ft		

- The first column is the ID of the splice connection.
- The second item in this table is the material ID referenced from the MATERIAL TYPES table.
- The third item is a splice length to be used for this connection.
- The next two columns reference the connections immediately below and above the joint. The references are IDs in the BOLT GROUP or WELD GROUP tables, prefixed by “B” in case of the first and “W” in case of the second.