

## **Simpson Strong-Wall® Shearwall Selector Version 3.0 Help File**

The Simpson Strong-Wall Shearwall Selector is a program with 2 Design Modes (Engineered and Wall Bracing) that guides a user towards the proper Shearwall selection and solution for a particular application in accordance with the latest Code requirements.

The Wall Bracing Design Mode is for individuals using the Prescriptive or Conventional Provisions of the Code and is based on the complex bracing requirements found in the International Residential Code. The user chooses the appropriate selection for the 4 input fields (application, foundation type, load type and wall height) and the program does the rest by computing possible wood or steel Strong-Wall solutions. The user then selects their preferred solution and a specific PDF file is generated that includes wall, anchor bolt and foundation information including a graphic view of the application and foundation details.

The Engineered Design Mode is a technical analysis that provides actual drift and uplift values for a wind or seismic horizontal load. The steel wall analysis also considers simultaneous vertically applied load. With multiple walls in a line, the program performs a rigidity analysis and determines the actual distributed shear to each wall. When walls are stacked in a 2 story configuration, the program evaluates cumulative overturning effects to ensure that the wall, anchor bolt and foundation are not overstressed. These evaluations can be performed on either the Optimized or Manual Tab. The Optimized tab lists several possible solutions, for the selected criteria, in the order of cost. The Manual tab evaluates any number or combination of walls for adequacy based on the selected criteria.

### **Engineered Design Mode**

Optimized In-Plane Shear  
Manual In-Plane Shear

### **Input Variables under Optimized and Manual Tabs**

Job Name  
Wall Name  
Wall Type (Manual Only)  
Application  
Cold Formed Steel Construction (CFS)  
1<sup>st</sup> Story Wall on Wood Floor

### **Design Criteria**

Code  
Load Type  
Concrete Strength  
Wall Height  
Shear Load  
Floor Joist Depth  
ASD Load Combination  
Header Thickness  
Header Type  
Max # of Wall Segments per wall line (Optimized Only)  
Fill each Segment (Optimized Only)  
Seg# Max Width Axial (lbs) (Optimized Only)  
Axial Load 1<sup>st</sup> Story (Manual Only)  
Max Wall Segment Width (Manual Only)  
Available Wall(s) (Manual Only)

### **Solutions and Output**

Possible Solution(s) (Optimized Only)  
Selected Solution (Manual Only)  
Add  
Remove  
Clear  
Output  
Design Anchorage  
Show Strong-Wall Product Information  
Notes for Designer

### **Wall Bracing Design Mode**

Job Name  
Wall Name  
Application

### **Design Criteria**

Foundation Type  
Load Type  
Show Wind and Seismic Map  
Wall Height

### **Solutions and Output:**

Possible Solution  
Output  
Show Strong-Wall Product Information

### **Toolbar**

File  
Options  
Tools  
Help

### **Engineered Design Mode**

**Optimized In-Plane Shear:** The Optimized tab provides the most cost effective Strong-Wall® solution(s), based on the input variables, to resist the design shear.

**Manual In-Plane Shear:** The Manual tab checks any combination and quantity of Strong-Wall® Shearwalls, based on the input variables, to resist the design shear.

#### **Input Variables under Optimized and Manual Tabs:**

**Job Name:** Enables the user to provide a specific job name for a project.

**Wall Name:** Enables the user to provide a name to each wall line in a project.

**Wall Type (Manual Only):** Solutions are provided for the selected Strong-Wall type: wood or steel.

**Application:** Defines the proposed application (use) of the wall. The choices are for walls at a Garage Front, on Concrete, on a 1<sup>st</sup> Story Wood Floor System, on a Second Floor Non-Stacked application, in a Two Story Stacked application or a Balloon Framed wall.

**Cold Formed Steel Construction (CFS):** This option appears for “Garage Front” and “Standard Wall on Concrete” applications. If the check box is enabled, the program will provide the proper steel wall model for use in cold-formed steel construction.

**1<sup>st</sup> Story Wall on Wood Floor:** This check box only appears if a “Two-Story Stacked” application has been selected. If enabled, then the program assumes the lower story wall, in a stacked application, is installed on a wood floor.

### Design Criteria:

**Code:** Wall solutions are provided in accordance with the requirements of the selected Code. The Code options are the 2003 & 2006 IBC (International Building Code) or the 2004 & 2007 FBC (Florida Building Code). Available applications and solutions will vary depending on the selected Code. Not all applications have a current Code approval. Code listed applications may be found at [www.strongtie.com](http://www.strongtie.com) or contact Simpson Strong-Tie Co., Inc. at 1-800-999-5099.

**Load Type:** Defines if the input shear load is due to wind or seismic. The appropriate seismic “R” values are provided for the selected Code.

**Concrete Strength:** Concrete strength options are provided for 2500 psi, 3000 psi and 4500 psi concrete and are only applicable to Steel Strong-Wall® Shearwalls. In some cases, higher shear values and lower uplifts may be obtained with a higher concrete strength.

**Wall Height:** Select the nominal wall height. Actual wall heights are shown under the “H” column of the Solution(s).

**Shear Load:** Input the total ASD design (demand) shear load along the wall line. Include all appropriate load factors on the shear load prior to input for the load combination under consideration. For Two-Story Stacked applications, input the story shear at each level and the program will evaluate the 1<sup>st</sup> story walls for the total shear.

**Floor Joist Depth:** This option only appears with 1<sup>st</sup> Story Wood Floor Systems and Two-Story Stacked applications. Floor joist depth affects the capacity of Steel Walls mounted on wood floors due to the rod buckling length. Floor joist depth is also considered in the cumulative overturning evaluation of Two Story Stacked Wood or Steel Walls.

**ASD Load Combination:** Earlier versions of the program yielded different Steel Wall capacities, when designed per the 1997 UBC or 2000 IBC Code, because a 1/3 steel stress increase was permitted when using the Alternate Basic Load combination. Under the 2003 & 2006 IBC (International Building Code) or the 2004 & 2007 FBC (Florida Building Code), the wall capacities and solutions are identical whether the Basic or Alternate Basic load combination is selected.

**Header Thickness:** This option only appears when “Garage Front” applications and Wall Heights of 7’ or 8’ w/Header on top are selected. This option is used to select the proper Wood-Strong-Wall model (thickness) as based on the nominal header thickness of 4” or 6”.

**Header Type:** This option only appears when “Header Thickness” of 4” is selected. It then provides an option to select a solid or double-ply header. Values for the Wood Strong-Walls will slightly decrease if the double-ply header option is selected. Steel walls with multi-ply headers are limited to wind designs and SDC A-C (IBC & IRC).

**Max # of Wall Segments per wall line (Optimized Only):** Here the maximum number of available wall segments along a particular wall line is specified. The program allows the user to select a maximum of four wall segments per wall line. For more wall segments per wall line, use the Manual Tab.

**Fill each Segment (Optimized Only):** If this checkbox is disabled, then the minimum quantity of Strong-Wall Shearwalls are provided as solutions up to the "Max # of Wall Segments" previously specified. If this checkbox is enabled, then the "Max # of Wall Segments" will always be used and filled with Strong-Wall® Shearwalls.

**Seg# Max Width Axial (lbs) (Optimized only):** For each wall segment along a wall line, the maximum desired width of that segment and the axial load on that particular segment may be specified.

The axial load is the total vertical downward load assumed to act on the entire panel width. Include all appropriate load factors on the axial load prior to input for the load combination under consideration. Axial load reduces the actual uplift of the panel.

The combined effect of the downward vertical axial load and overturning force is considered in the Steel Strong-Wall strength evaluation.

The combined effect of the downward vertical axial load and overturning on the compression post of the Wood Strong-Wall shall be evaluated by the Specifier as not to exceed the "C4" Allowable Vertical Load shown in Tools / Axial Capacities for the Wood Strong-Wall.

**Axial Load 1<sup>st</sup> Story (Manual Only):** See discussion above on axial load. The axial load that is selected is initially applied on all Available Wall solutions. As walls are selected by the Add button, the axial load remains constant. If it is desired that each wall have a different axial load, then input the corresponding axial load value for the first wall and click on Add to send it to the Selected Solution. Then re-enter the new axial load value for the next wall and continue this process until all the product selections are complete.

**Max Wall Segment Width (Manual Only):** This input is optional and will limit the Available Wall(s) to the maximum width specified.

**Available Wall(s) (Manual Only):** Based on the input Design Criteria, all Available Wall Models and their capacities are listed as an option for selection. The Available Wall list is independent of the input Shear Load and instead represents a list whereby any quantity or combination of walls can be selected to resist the Shear Load.

### **Solutions and Output:**

**Possible Solution(s) (Optimized only):** Where possible, up to 5 possible solutions may be displayed and are designated as Sol # (solution number) in the order of relative cost (lowest to highest material cost).

### **Selected Solution (Manual Only):**

**Add:** Click on Add button to select wall from Available Wall(s) list which enters it into the Selected Solution list. You may also Double Click on an Available Wall to add it to the Selected Solution.

**Remove:** Click on the Remove button to remove it from the Selected Solution list. You may also Double Click on a wall to remove it from the Selected Solution.

**Clear:** Click on Clear button to entirely remove all previously selected walls in the Selected Solution.

**Output:** This button creates a PDF summary of the wall solution. Under Optimized, the Output solution is created for the Sol# (solution number) that is highlighted. Under Manual, the Output is created for all walls shown in the Selected Solution list.

**Design Anchorage:** This option appears at the top of the Output page. If desired, Select Foundation Type then enable the check box next to Design Anchorage and the PDF page will re-generate with the anchorage solution on a subsequent page.

**Show Strong-Wall Product Information:** At the bottom of the Output Page, click on this button to see the relevant product information for the selected solution.

**Notes for Designer:** Special notes related to the input variables are displayed in this window during the input process.

### Wall Bracing Design Mode

**Job Name:** Enables the user to provide a specific job name for a project.

**Wall Name:** Enables the user to provide a name to each wall line in a project.

**Application:** This defines where and how the wall is used. The walls are used at either Garage Fronts or non-garage fronts (Standard Wall, Two-Story Stacked Wall or Balloon Framed Wall). The Garage Front applications provide equivalent wall strength for the Code "Amount of Bracing" required by IRC Table R602.10.1 and, in some cases, it will result in one Strong-Wall as sufficient to replace 2 Braced Panels or 2 Strong-Walls as permissible to replace 3 Braced Panels.

#### Design Criteria:

**Foundation Type:** The type of foundation that supports the Strong-Wall is defined in order to provide the proper anchor bolt embedment and footing dimensions.

**Load Type:** Defining the load type is necessary because seismic requirements and limitations are more restrictive than wind. Unless noted otherwise, wind solutions apply to wind speeds less than 110 mph (less than 100 mph in hurricane prone regions) in Seismic Design Categories (SDC) A, B or C (only detached one and two-family dwellings in SDC C) . Seismic solutions apply to structures in SDC C, D0, D1 and D2 with wind speeds less than 110 mph although detached one and two-family dwellings in SDC C may use the wind solutions.

**Show Wind and Seismic Map:** This map provides an idea of the generally governing load type in an area although the Building Official should always be contacted for verification.

**Wall Height:** Select the nominal wall height.

#### Solutions and Output:

**Possible Solution:** The narrowest possible wall solutions, designated as Sol# (solution number), for both the Wood and Steel Strong-Walls are provided that satisfy the input data. If desired, wider wall models could be used with the same anchorage solution.

2 Car Garage Front applications will provide (Single Wall) and (Double Wall) solutions that have equivalent wall strength to replace 2 or 3 Braced Panels respectively.

**Output:** Select one of the Possible Solutions by clicking the mouse over the row of the desired solution which highlights that row. Then select the Output Button which creates a PDF summary of the selected wall solution that is highlighted.

**Show Strong-Wall Product Information:** At the bottom of the Output Page, click on this button to see the relevant product information for the selected solution.

### Toolbar

**File:** Create (New), Open or Save files. Input data is saved in XML format.

**Options:** Default Design Mode allows the user to select either the Engineered Design Mode or Wall Bracing Design Mode as the default startup screen when the program is launched. A checkmark on Auto Update means, that if there is an internet connection, the program will automatically update for new releases that would include revisions or new features.

**Tools:** Additional support pages of wall and anchor bolt information are provided.

**Help:** About provides the Version Number of the Program and also an email address for support questions.