

Steel in Housing Web Design Aid Tutorial

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Key Words

steel in housing, tutorial, design aids

An Introduction to Steel in Housing Website

The purpose of Steel in Housing online design aid is to assist builders, draftspersons, engineers and architects to specify and use a range of pre-engineered structural steel beam solutions in various residential building applications. This tutorial uses a simple house project to demonstrate the basics of how to use this web based design aid. Users may select a suitable beam, post and foundation detail for this project by mean of a simple seven step process.

Website Access

The Steel in Housing Online is hosted under Steel Construction New Zealand website www.scnz.org. The Steel in Housing Online can be accessed by members from the navigation bar on the front page of SCNZ website as shown in Figure 1. Move the mouse cursor on the **Steel in Housing** tag and then left click on **Create Project** from the automatic pop-out sub-menu to start a new project.



Figure 1 Website Access

General Project Information

On this page users may input the general project information. Type in the text as shown in Figure 2 and then click on **Create Project** button.

Create a housing project

This application allows you to specify design parameters for a number of beams in a housing project. Begin by entering details about the project you are working on below

Project Name	<input type="text" value="Steel House"/>
Project Location	<input type="text" value="Auckland"/>
Project Number	<input type="text" value="1001"/>
Designer	<input type="text" value="Matthew"/>
Company	<input type="text" value="Kiwi Steel Design"/>
Phone No	<input type="text" value="09-888 1234"/>
Email	<input type="text" value="info@kiwisteeldesign.co.nz"/>
Address	<input type="text" value="8 Kiwi Road, Auckland"/>
<input type="button" value="Create Project"/>	

Figure 2 Create Project

Beam Configuration

There are four beam design options to select from the Beam Design page. These are **Lintels Supporting Roof or Verandah**, **Lintels Supporting Roof and Floor**, **Lintels Supporting Roof, Floor and Cantilevered Deck** and **Floor Beams and Bearers**. Click **Truss Roof** under **Lintels Supporting Roof or Verandah** category to continue. Users can also **click Edit Project Details** button to edit the previous project information or click **Cancel Project** to terminate the design.

Beam Design

There are no beams in the current project. Select a beam from the options below to begin.


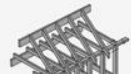
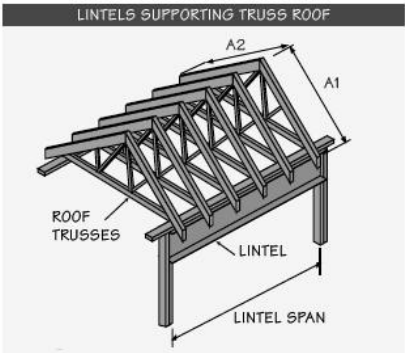
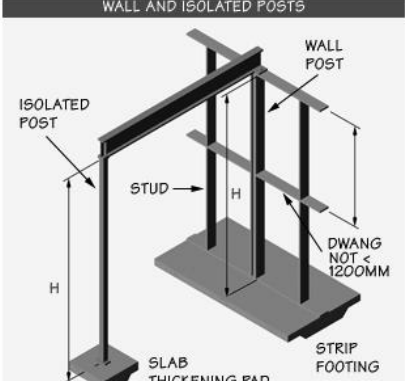
	Lintels Supporting Roof or Verandah
	<input type="button" value="Truss Roof"/> <input type="button" value="Conventional Roof"/> <input type="button" value="Verandah"/>
	Lintels Supporting Roof and Floor
	<input type="button" value="Truss Roof"/> <input type="button" value="Conventional Roof"/>

Figure 3 Beam Configuration

Span and Loading

Type in the span and load parameters shown in Figure 4 and left click on the option buttons to finish Step 1. Click **Submit** button to proceed to the next step.

Lintels Supporting Truss Roof

Step 1 of 4

Enter the specifications of the beam you would like to design.
Use the diagram to the left as a reference
Note: Post heights cannot exceed 2.7m

Name	<input type="text" value="B1"/>
Lintel Span (m)	<input type="text" value="4.5"/>
Measurement A1 (m)	<input type="text" value="3"/>
Measurement A2 (m)	<input type="text" value="3"/>
Post Height (m)	<input type="text" value="2.6"/>
Isolated Post	<input checked="" type="radio"/>
Wall Post	<input type="radio"/>
Light Roof	<input checked="" type="radio"/> Refer NZS3604 for roof weight definitions
Heavy Roof	<input type="radio"/>
Low Wind	<input type="radio"/> Refer NZS3604 for wind zone definitions
Medium Wind	<input checked="" type="radio"/>
High Wind	<input type="radio"/>
Very High Wind	<input type="radio"/>

Figure 4 Span and Loading

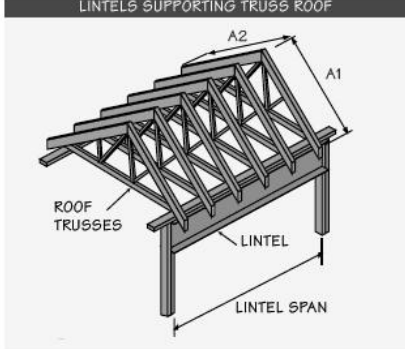
Beam Selection

Lintels Supporting Truss Roof

B1

Design Parameters

Lintel Span	A1	A2	H	Weight	Wind
4.5m	3.0m	3.0m	2.6m	Light	Medium
Calculated Loadwidth		Calculated Reaction			
3.0m		6.4kN			



Step 2 of 4

The beams listed below meet the requirements you have specified, select one to use in the project. Values shown are upper limit values.

Beam	Load Width	Max Span	
180 UB 16.1	3.0m	4.6m	<input checked="" type="checkbox"/> Select
180 UB 18.1	3.0m	5.0m	<input checked="" type="checkbox"/> Select
180 UB 22.2	3.0m	5.6m	<input checked="" type="checkbox"/> Select
200 UB 18.2	3.0m	5.0m	<input checked="" type="checkbox"/> Select
200 UB 22.2	3.0m	6.0m	<input checked="" type="checkbox"/> Select
200 UB 25.4	3.0m	6.3m	<input checked="" type="checkbox"/> Select
200 UB 29.8	3.0m	7.1m	<input checked="" type="checkbox"/> Select
250 UB 25.7	3.0m	6.3m	<input checked="" type="checkbox"/> Select
250 UB 31.4	3.0m	7.2m	<input checked="" type="checkbox"/> Select
250 UB 37.3	3.0m	8.0m	<input checked="" type="checkbox"/> Select
310 UB 32.0	3.0m	7.2m	<input checked="" type="checkbox"/> Select
150 PFC	3.0m	5.3m	<input checked="" type="checkbox"/> Select
180 PFC	3.0m	5.8m	<input checked="" type="checkbox"/> Select
200 PFC	3.0m	6.1m	<input checked="" type="checkbox"/> Select
230 PFC	3.0m	6.2m	<input checked="" type="checkbox"/> Select
250 PFC	3.0m	7.9m	<input checked="" type="checkbox"/> Select

Figure 5 Beam Selection

The values defined in Step 1 of 4 are presented on the left hand side of this page shown in Figure 5. Users can click **Edit** to modify these values. On the right hand side of the page there is a list of beams suitable for the span and load data specified in Step 1. Choose **180UB18.1** for this tutorial by clicking **Select** beside the green tick sign.

Post Selection

In Step 3 users may select a post for the project. Three different types of posts are suggested. Choose **89x5 SHS** by using the same technique introduced in Step 2.

Lintels Supporting Truss Roof

B1

Design Parameters Edit

Lintel Span	A1	A2	H	Weight	Wind
4.5m	3.0m	3.0m	2.6m	Light	Medium

Calculated Loadwidth: 3.0m Calculated Reaction: 6.4kN

Beam Selected Edit

Beam
180 UB 18.1

LINTELS SUPPORTING TRUSS ROOF

Step 3 of 4

The posts listed below meet the requirements you have specified, select one to use in the project

Post	Type	Capacity		
100 x 100 Timber	Isolated Post	18.0kN	<input checked="" type="checkbox"/>	Select
75 x 5 SHS	Isolated Post	105.0kN	<input checked="" type="checkbox"/>	Select
89 x 5 SHS	Isolated Post	158.0kN	<input checked="" type="checkbox"/>	Select

Figure 6 Post Selection

Footing Selection

A range of suitable footing options are presented on the right hand side of the page shown in Figure 7. Select **300 wide strip x 200 slab thickening, 2-D12 longitudinal + R10 links @ 600** for this tutorial to finish Step 4. A design summary page shown in Figure 8 is then generated. Users can either click **Edit/Add a Beam** to add or modify data or click **Finish** to go next step.

Lintels Supporting Truss Roof

B1

Design Parameters Edit

Lintel Span	A1	A2	H	Weight	Wind
4.5m	3.0m	3.0m	2.6m	Light	Medium

Calculated Loadwidth: 3.0m Calculated Reaction: 6.4kN

Beam Selected Edit

Beam
180 UB 18.1

Post Selected Edit

Post	Type	Capacity
89 x 5 SHS	Isolated Post	158.0kN

LINTELS SUPPORTING TRUSS ROOF

Step 4 of 4

The footings listed below meet the requirements you have specified, select one to use in the project

View	Description	Capacity		
①	300 x 300 x 200 slab thickening pad, 2-D12 both ways, 75 bottom cover	12.0kN	<input checked="" type="checkbox"/>	Select
①	300 wide strip x 200 slab thickening, 2-D12 longitudinal + R10 links @ 600	20.0kN	<input checked="" type="checkbox"/>	Select
①	450 x 450 x 200 slab thickening pad, 3-D12 both ways, 75 bottom cover	28.0kN	<input checked="" type="checkbox"/>	Select
①	300 x 300 external strip footing, 2-D12 longitudinal + R6 links @600	30.0kN	<input checked="" type="checkbox"/>	Select
①	600 x 600 x 200 slab thickening pad, 4-D12 both ways, 75 bottom cover	50.0kN	<input checked="" type="checkbox"/>	Select
①	750 x 750 x 200 slab thickening pad, 5-D12 both ways, 75 bottom cover	80.0kN	<input checked="" type="checkbox"/>	Select
①	900 x 900 x 250 slab thickening pad, 5-D16 both ways, 75 bottom cover	115.0kN	<input checked="" type="checkbox"/>	Select

Figure 7 Footing Selection

Lintels Supporting Truss Roof Edit/Add a Beam Finish

B1

Design Parameters Edit

Lintel Span	A1	A2	H	Weight	Wind
4.6m	3.0m	3.0m	2.6m	Light	Medium

Calculated Loadwidth	Calculated Reaction
3.0m	6.4kN

Beam Selected Edit

Beam
180 UB 18.1

Post Selected Edit

Post	Type	Capacity
89 x 5 SHS	Isolated Post	158.0kN

Footing Selected Edit

Description	Capacity
300 wide strip x 200 slab thickening 2-D12 longitudinal + R10 links @ 500	20.0kN

Figure 8 Design Summary

Surface Treatment

The selection of the suitable surface treatment for the steel work is related to the five factors shown on Figure 9. User can use the five dropdown boxes on this page to select the most appropriate options to suit the project. In this tutorial, select **Salt water bay**, 1.5-3km, Exposed Position, Unenclosed and Galvanised Steel and then click the **Generate Report** button.

Create a housing project

Surface Treatment

Figure 1 Definition of a 'protected position'

Figure 2 Maximum extent of openings in masonry walls for steelwork to be deemed to be enclosed

Surface Treatment

With reference to the diagrams on the left, please fill in the form below to select the treatment needed for this project

Source of corrosion	Salt water bay
Distance from source of corrosion	1.5 - 3km
Position	Exposed Position
Degree of enclosure	Unenclosed
Type of steel	Galvanised Steel
Generate Report	

Figure 9 Surface Treatment

A summary report in Adobe PDF format of this project can be generated by clicking **Generate Report** button shown on Figure 9. A sample report based on the values defined in above procedures is appended.

This tutorial is intended to illustrate basics of using Steel in Housing online. Other design options such as **Lintels Supporting Roof** are not included in this tutorial but the design procedures are very similar. Users are encouraged to try all the design options to be familiar with this online design aid.