Stair Maker
Version 1.0.3

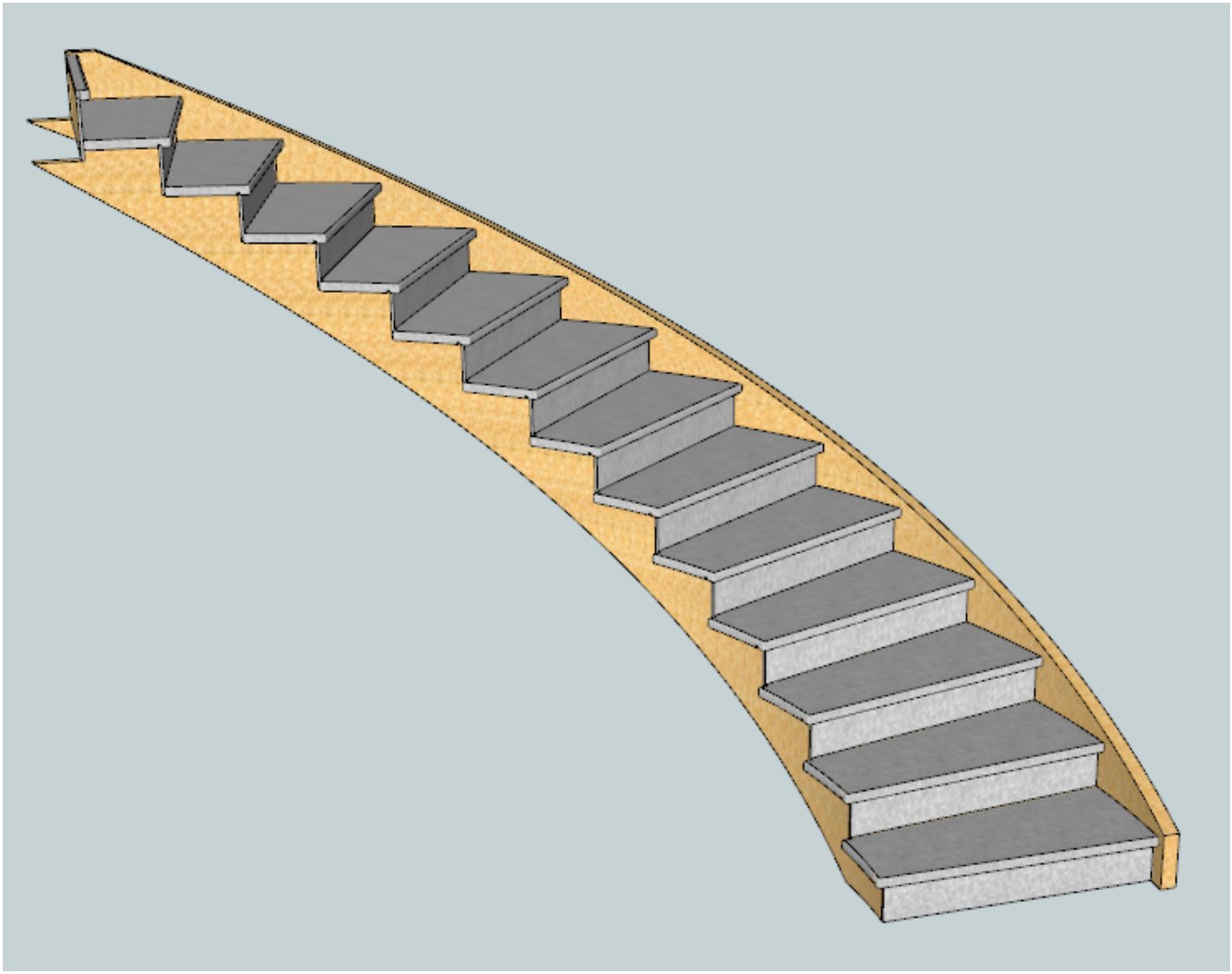


Table of Contents

1 Introduction

The Stair Maker system has two buttons in the GKWare CabMaker button bar and has four commands under the Plugins / Stair menu. The first button brings up the Stair Maker Input Box and the second button brings up the Handrail Input Box. Two of the four menu items work exactly the same as the two buttons. The other two menu items are to combine edges into a curve and to add additional Handrail Profiles.

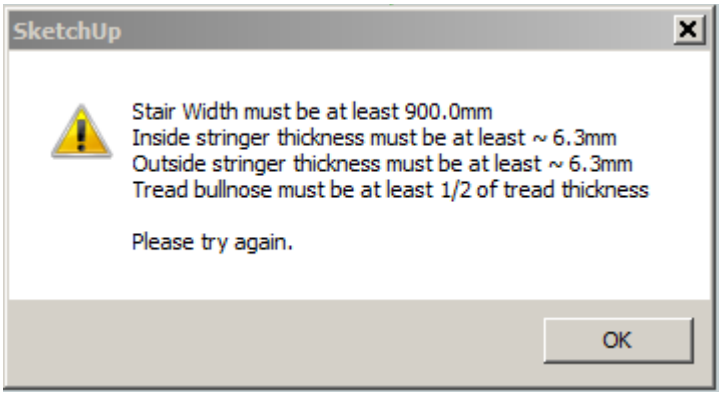
Here is the button bar.

Please note that the first button is from the Door Maker plugin

2 Important Notes

It is recommended that you open up a second instance of Sketchup and build your stair there. You can then copy and paste it into your model. The Stair Maker is quite complicated and uses the origin [0,0,0] as the center radius point.

The Stair Maker plugin provides a few built in checks. Here is an example



Please note that there are a number of stair defaults that are in defaults.txt. This includes minimum stair width etc.

The Stair Maker plugin can calculate a one of three values providing that only one of the three values is initially set to 0. These three values are Radius, Degrees and Average Run.

If you provide Degrees and Average Run and set Radius to 0 the Stair Maker will calculate the Radius.

If you provide Radius and Average Run and set Degrees to 0 the Stair Maker will calculate the Degrees of stair rotation.

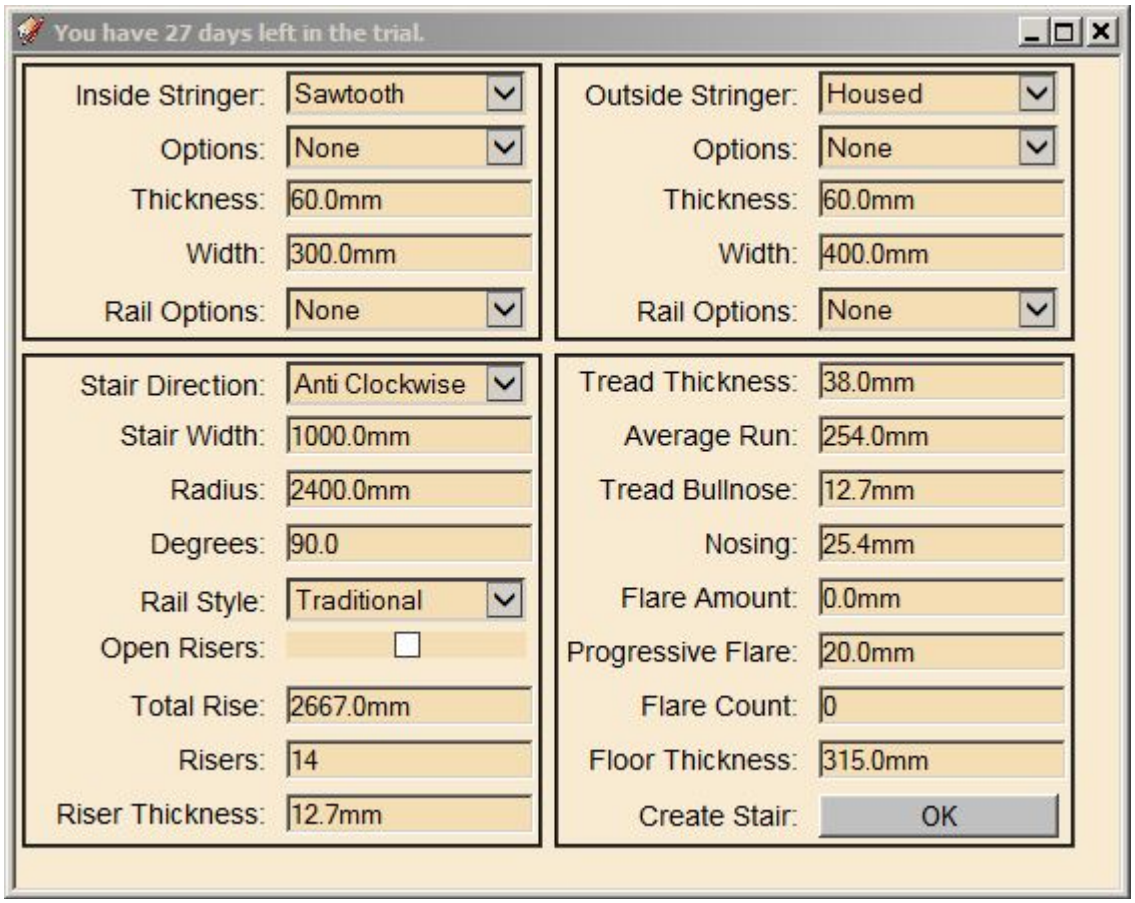
However if you provide Degrees and Radius the Stair Maker will calculate run.

If you set your Radius to 50 mm or less (but greater than 0) then Stair Maker will build a spiral staircase with a center pole.

If you want to delete a stair immediately after rendering then use the undo keys. Ctrl Z will remove the stair. Click stair – make a change and click “OK”

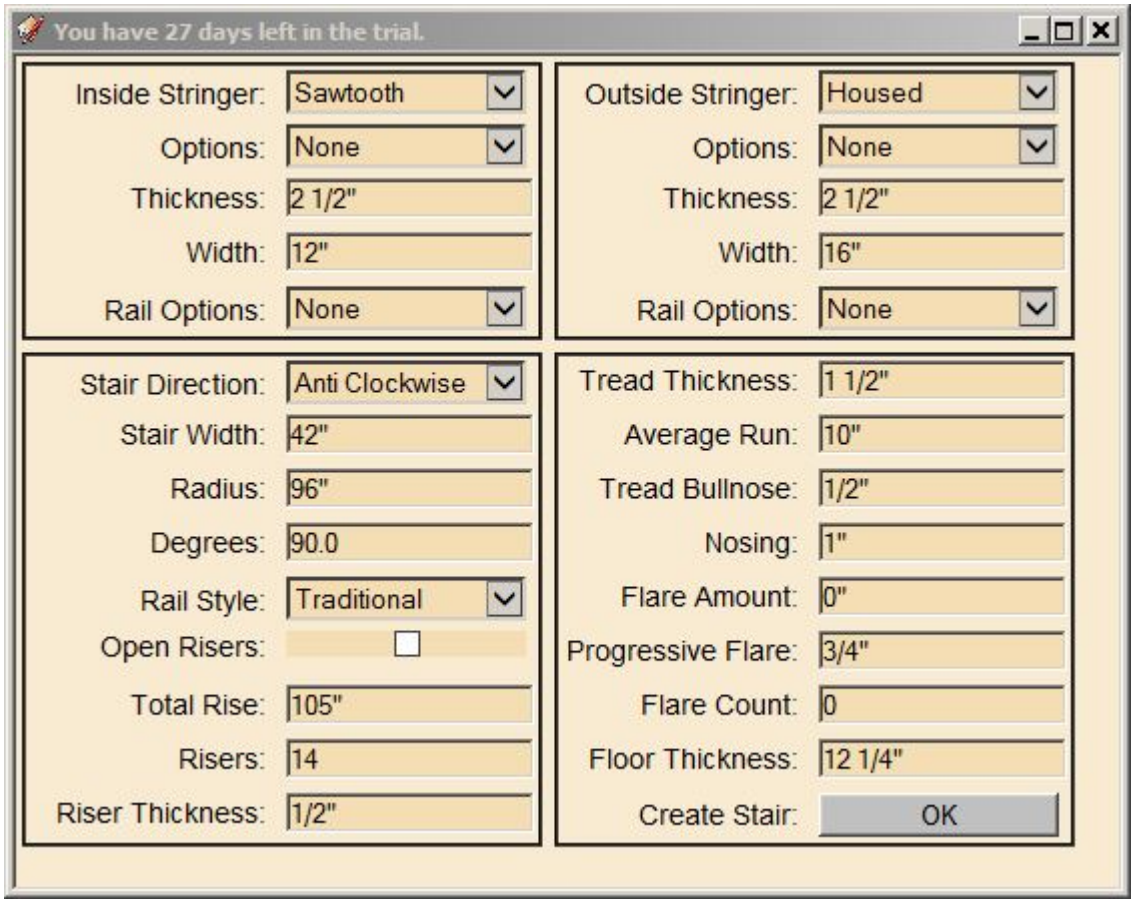
3 Metric Stair Maker Input Box

Stair Maker uses an input box which contains four sections. This is the input box when using metric units.



4 Imperial Stair Maker Input Box

Here is the input box when using imperial units.



5 Input Box Items

Section 1)

Inside Stringer

The Inside Stringer type is Sawtooth, Housed or None. None is useful if you are building a spiral staircase without a stringer.

Options
The choices for Options are Heel, Foot, Both or None. Currently the Foot is not supported.

Thickness

This is the thickness of the inside stringer. If for instance you have 5 layers of 3/8” spruce and 1/4” oak plywood then set it to 2 1/8” or 54 mm. It is a good idea when building the stair to set this value to exactly the thickness of the stringer. Use a digital micrometer and measure a sample of all 6 layers.

Width

This is the width of the inside stringer. The default is set to 300 mm or 12”. A freestanding stair may require a bit more width. A housed stringer could be set to less than 300 mm.

Rail Option

The options are Guard Rail, Wall Rail and None. A Guard Rail is for posts and spindles and a Wall Rail is just a hand rail.

Section 2)

Outside Stringer

The Outside Stringer type is Sawtooth, Housed or None. None is useful if you are building a spiral staircase without a stringer or if you are building a stair that has a thick single staircase.

Options
The choices for Options are Heel, Foot, Both or None. Currently the Foot is not supported.

Thickness

This is the thickness of the outside stringer. If for instance you have 5 layers of 3/8” spruce and 1/4” oak plywood then set it to 2 1/8” or 54 mm. It is a good idea when building the stair to set this value to exactly the thickness of the stringer. Use a digital micrometer and measure a sample of all 6 layers.

Width

This is the width of the outside stringer. The default is set to 400 mm or 16”. A freestanding stair may require a bit more width. A housed stringer could be set to less than 400 mm.

Rail Option

The options are Guard Rail, Wall Rail and None. A Guard Rail is for posts and spindles and a Wall Rail is just a hand rail.

Section 3)

Stair Direction

The stair can be Clockwise or Anti Clockwise. The default is Anti Clockwise

Stair Width

This is the width of the stair from inside of the inside stringer to the outside of the outside stringer. The stair must be at least minimum width. The minimum width is found in the defaults.txt file under metric_min_stair_width and imperial_min_stair_width.

Radius

This is the radius at the inside of the inside stringer. You may set it to 0 and the Stair Maker will figure out the radius based on Average Run and Degrees.

Degrees

You may set the degrees to 0 and the Stair Maker will figure out how far the stair rotates based on Average Run and Radius.

Rail Style

This is a dropdown list of all the rail styles that you have. The StairMaker plugin supplies 6 different handrail profiles. You can add more handrail profiles.

Open Risers

This is a check box that will build either open or closed riser stairs.

Total Rise

This is the total Rise of the stair.

Risers

Set the number of risers that you wish for the stair. This number is somewhat dependent on the minimum and maximum rise per riser. These values are found in the defaults.txt file under metric_min_rise, metric_max_rise, imperial_min_rise and imperial_max_rise. If you set the number of risers to a value where the rise per tread exceeds the maximum rise then the Stair Maker adjusts the number of Risers. Conversely if you set the number of risers to a value where the rise per tread is less than the minimum number of risers then the Stair Maker will automatically adjust the number of risers.

Riser Thickness

This is the thickness for the risers and sets the riser portion of a sawtooth stringer and or the

dado for the riser portion of a housed stringer. It also sets the width of the dado for the tread where the riser fits into the tread. If you want an open riser stair then set this value to 0. The depth of the dado for both housed stringers and the tread is found in the defaults.txt file under metric_tread_dado, metric_stringer_dado, imperial_tread_dado and imperial_stringer_dado.

Section 4)

Tread Thickness

This is the thickness of the treads and top nosing. An open riser stair should have a thicker tread such as 3 layers of 3/4” fir plywood glue laminated. A 1” tread is minimum tread thickness governed under most building codes. The default is set to 1 1/2” or 38 mm. Again you may change the defaults in the defaults.txt file to suit your requirements.

Average Run

The average run is measured at the middle of the tread. You may set this value to 0 and let the Stair Maker calculate a value based on Radius and Degrees.

Tread Bullnose

This is the radius of the tread bullnose. You can adjust how many segments that the bullnose uses. The setting is in the defaults.txt file and is found under Segments. For example if you want 1/4” radius bullnose then you might try Segments=4 or if you want a 1/2” bullnose which would be good for carpet you might try Segments=6. Alternatively you could set Segments=1 and the Stair Maker plugin will create a chamfer.

Nosing

This is the amount of the Tread nosing for both the front of the tread and for side nosings when building sawtooth stringers. In most jurisdictions the minimum allowed nosing is 1”. The Stair Maker plugin does not adjust this value. You may set it 0 if you wish. There may be cases where you want to attach a solid oak nosing after the fact.
Flare Amount
This is the amount that you want each and every tread to flare forward. We also call this a continuous flare.

Flare Amount

This is the amount that every step is flared. It is measured at the center of the tread. Riser boards will also flare by this same amount. Set this to 0 for no flare.

Progressive Flare

A progressive Flare stair is where each step is flared this amount more than the previous step. For example, if you Flare Count to 5 and Progressive flare to 20 mm then counting backwards from the bottom step the flares would be 100, 80, 60, 40, 20, 0 and so on.

Flare Count
This is the number of steps that are progressively flared.

Floor Thickness

This is the floor thickness at the top of the stair and is used to calculate the Stringer Heel and top riser board.

6 Defaults.txt

There is an optional file called defaults.txt which contains 1 or more lines that override the plugins defaults. You may overide any number of defaults.

```
# user information
userid=user
password=test
host=http://cabmaker32.com/

# default non length values for input box
debug_level=0
direction=Anti Clockwise
inside_option=None
outside_option=None
inside_stringer=Sawtooth
outside_stringer=Housed
risers=14
degrees=90
inside_sections=3
outside_sections=4
flare_count=0
segments=6
inside_rail_option=Guard
outside_rail_option=None
open_risers=false
rail_style=Traditional

# metric default values for input box
metric_stair_width=1000
metric_floor_thickness=315
metric_radius=2400
metric_inside_thickness=60
metric_inside_width=300
metric_outside_thickness=60
metric_outside_width=400
metric_total_rise=2667
metric_riser_thickness=12.7
metric_top_riser_thickness=19
metric_tread_thickness=38
metric_tread_bullnose=12.7
metric_nosing=25.4
metric_average_run=254
metric_flare_amount=0
metric_progressive_flare=20
metric_rail_width=76
```

```
# imperial default values for input box
imperial_stair_width=42
imperial_floor_thickness=12.25
imperial_radius=96
imperial_inside_thickness=2.5
imperial_inside_width=12
imperial_outside_thickness=2.5
imperial_outside_width=16
imperial_total_rise=105
imperial_riser_thickness=0.5
imperial_top_riser_thickness=0.75
imperial_tread_thickness=1.5
imperial_tread_bullnose=0.5
imperial_nosing=1
imperial_average_run=10
imperial_flare_amount=0.0
imperial_progressive_flare=0.75
imperial_rail_width=3.0
```

```
# metric building code and stair configuration
metric_tread_dado=12.7
metric_stringer_dado=12.7
metric_riser_nosing=12.7
metric_minimum_radius=50
metric_stair_rail_height=800
metric_level_rail_height=900
metric_housed_stringer_reveal=38
metric_stringer_above_floor=12.7
metric_min_rise=125
metric_max_rise=200
metric_min_run=210
metric_max_run=355
metric_min_stair_width=900
metric_rail_clearance=38

# imperial building code and stair configuration
imperial_tread_dado=0.5
imperial_stringer_dado=0.5
imperial_riser_nosing=0.5
imperial_minimum_radius=2.0
imperial_stair_rail_height=32
imperial_level_rail_height=36
imperial_housed_stringer_reveal=1.5
imperial_stringer_above_floor=0.5
imperial_min_rise=5
imperial_max_rise=8
imperial_min_run=8.25
imperial_max_run=14
imperial_min_stair_width=36
imperial_rail_clearance=1.5
```

7 Files

The Stair Maker Plugin has the following files (based on Sketchup 7):

1. Inside Google Sketchup 7/Plugins
    1. GKWare_StairMaker_Ext.rb
2. Inside Google Sketchup 7/Plugins/GKWare/StairMaker
    1. StairMaker_Loader.rf
    2. StairMaker.rbs
    3. StairMakerLib.rbs
    4. StairLib.rbs
    5. TreadLib.rbs
    6. RiserLib.rbs
    7. defaults.txt
    8. StairMaker_SM.png
    9. StairMaker_LG.png
    10. ExtrudeHandrail_SM.png
    11. ExtrudeHandrail_LG.png
3. Inside Google Sketchup 7/Plugins/GKWare/StairMaker/Handrail
    1. Classic.txt
    2. Modern.txt
    3. Round.txt
    4. Square.txt
    5. Standard.txt
    6. Traditional.txt