

Menu buttons

UP 



Create textile structure



Calculate



Modify



Modify edge cable



Modify membrane



Help



About

Require first selecting the structure edges. Set the options to create the membrane.

Border lines are defined by an external closed path of n edges (convex "polygon", n is minimum equal to 3) to create a membrane in between with the possibility to have ONE inner ring inside this closed path (top ring for instance).

Run the simulation. Depending on the parameters, the simulation can take up to tens of seconds. In particular, setting a higher number of subdivisions or a non-zero inflating pressure increases the computation duration.

Select a previously generated membrane to modify its parameters.

Change the tension in a cable on a selected edge (use initial line -before calculation- for selection). Also works with several selected edges. A higher tension value will result in a lower cable curvature (higher radius of curvature).

The option *Straight edge?* can be used to model a clamped membrane on a straight edge.

Change the options of the simulation.

Open this document.

Information about the plugin.

Parameters

UP 

Inflating pressure

Pressure difference between the interior and the exterior of the membrane.

The inflating pressure is expressed in arbitrary units (but always with a positive value); high values can make the computation much longer.

Warp/weft tension ratio

Tension ratio between warp and weft (fill) directions of the fabric.

Warp orientation (°)

Angle between the warp and the red SketchUp axis (by default, the warp direction follows the red axis).

This parameter is only available with a closed external polygon (in case of an inner ring, the warp direction is always radial to this ring).

Default edge cable tension

Increasing this value results in less curved edge cables (higher tension).

Subdivisions

Number of subdivisions of the membrane for the computation.

Default value is 20. Increase it in case of inappropriate shape of the membrane, mainly on one edge (however it will also increase computation time).

This parameter is only available with a closed external polygon ("rectangular" mesh is used for calculation).

**Radial subdivisions /
Angular subdivisions**

Number of subdivisions of the membrane for the computation.

Default values are 12 and 36. Increase them in case of inappropriate membrane shape, mainly on one edge (however it will also increase computation time).

This parameter is only available with a closed external polygon with an inner ring ("circular" mesh is used for calculation).

Accuracy level

Precision of the computation.

Computation stops when $d_{\max} < H \cdot 10^{-a}$, where $d_{\max}$ is the maximal displacement between two iterations, H is the height of the membrane and a the level of accuracy (a higher value result in a more precise calculation).

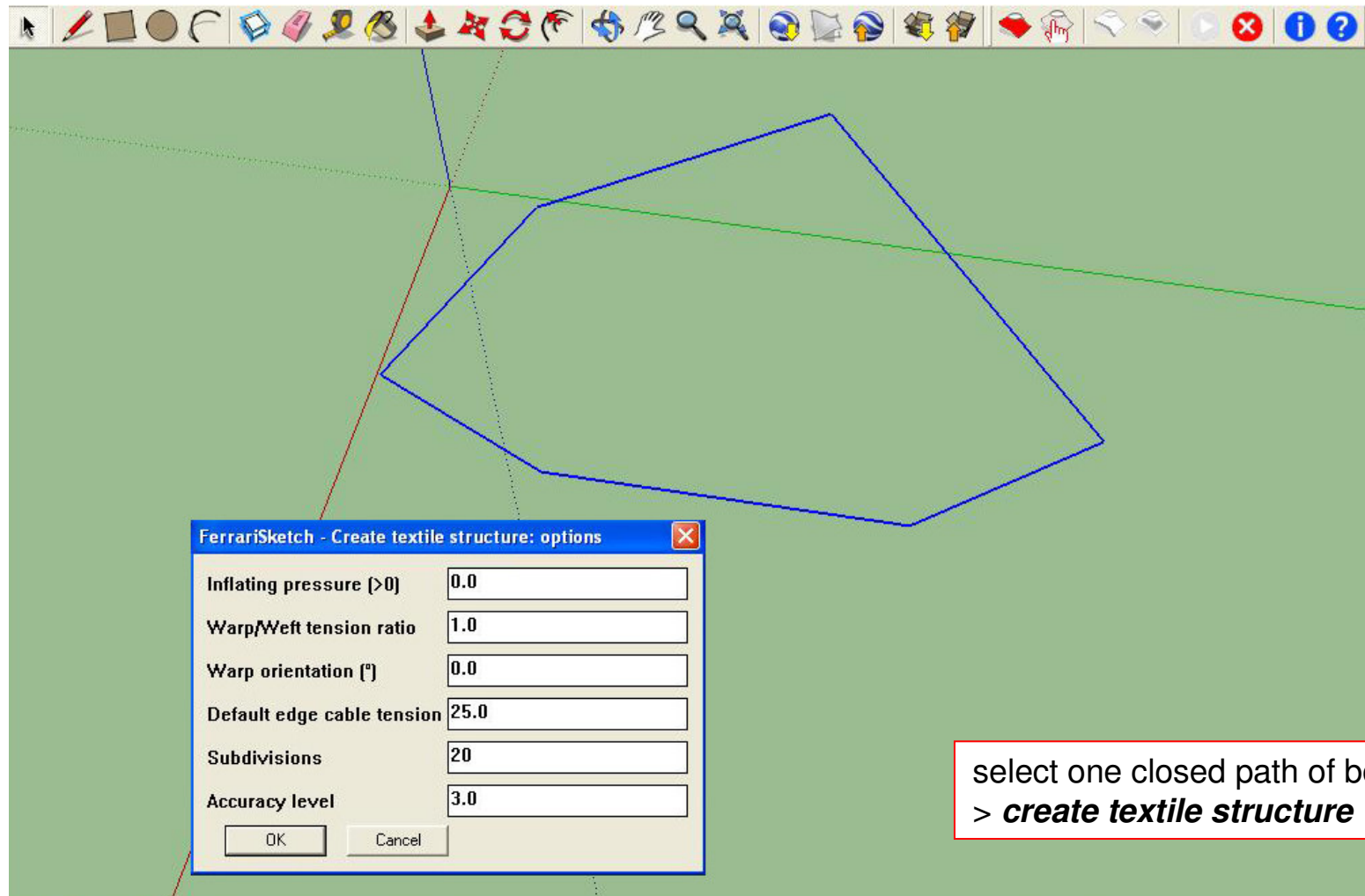
FERRARI

architecture

Composite
Textiles
& Membranes

> FerrariSketch V1.0: « hypar » membrane

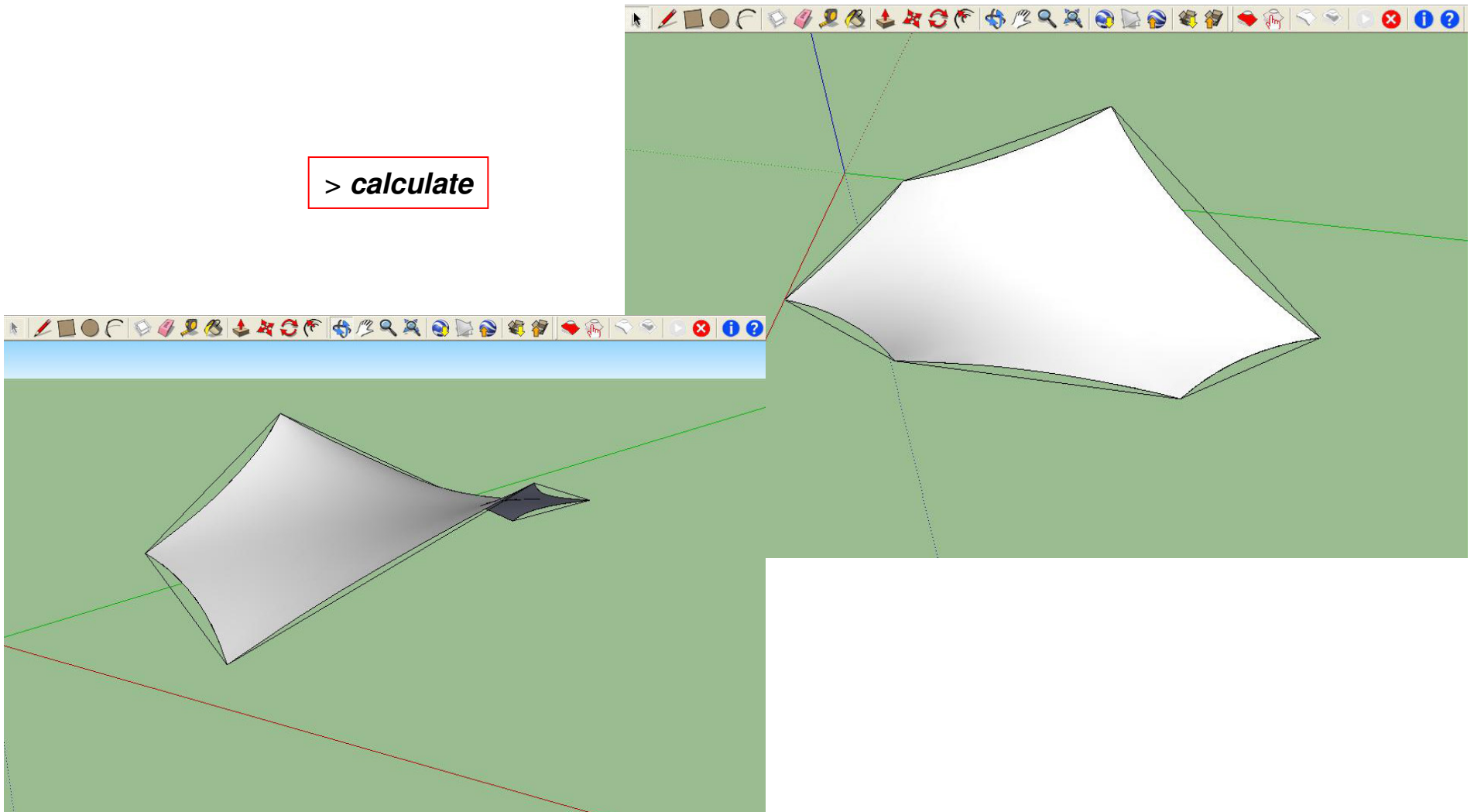
Border choice and membrane parameters



> FerrariSketch V1.0: « hypar » membrane

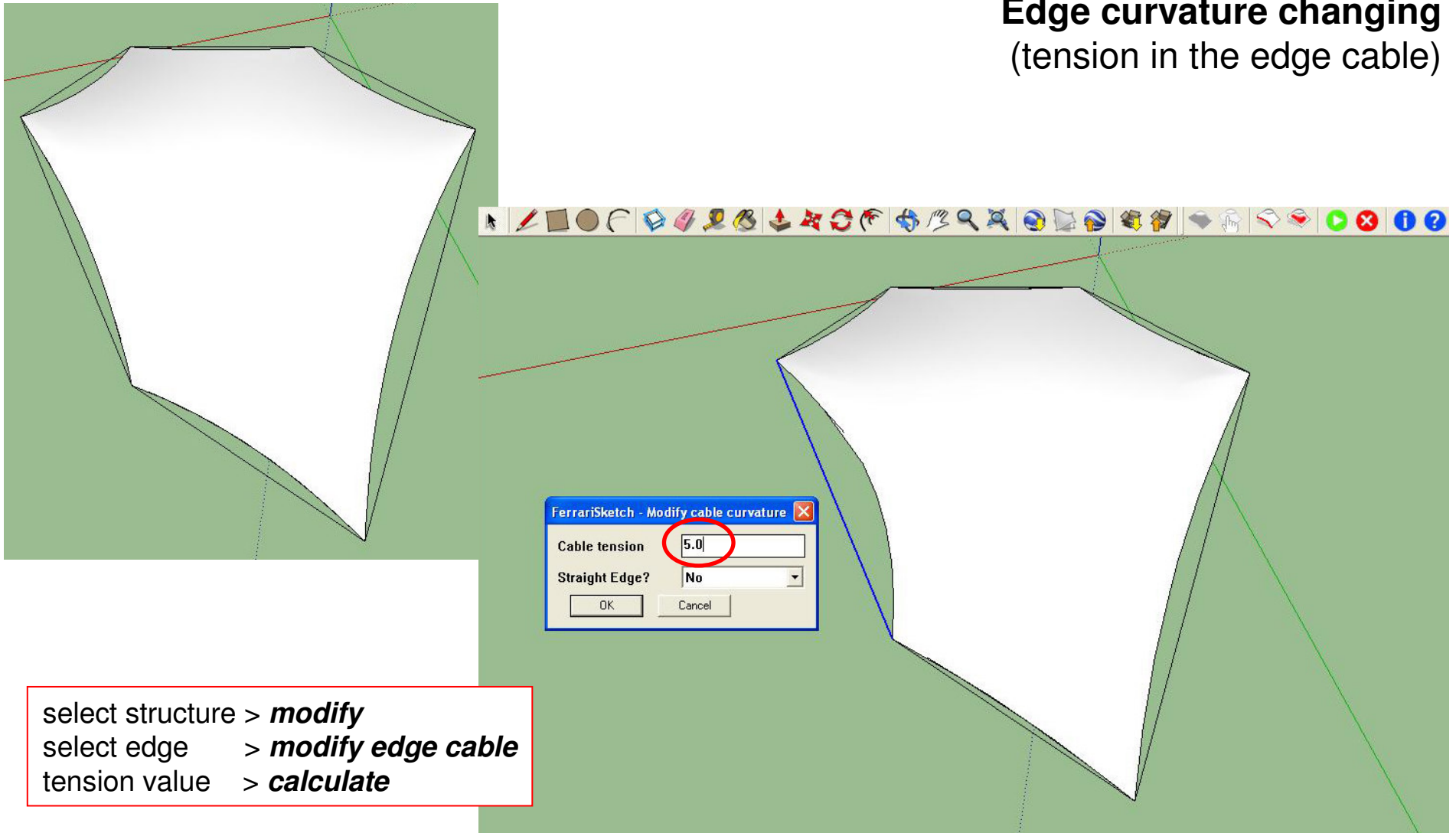
Membrane generation

> *calculate*



> FerrariSketch V1.0: « hypar » membrane

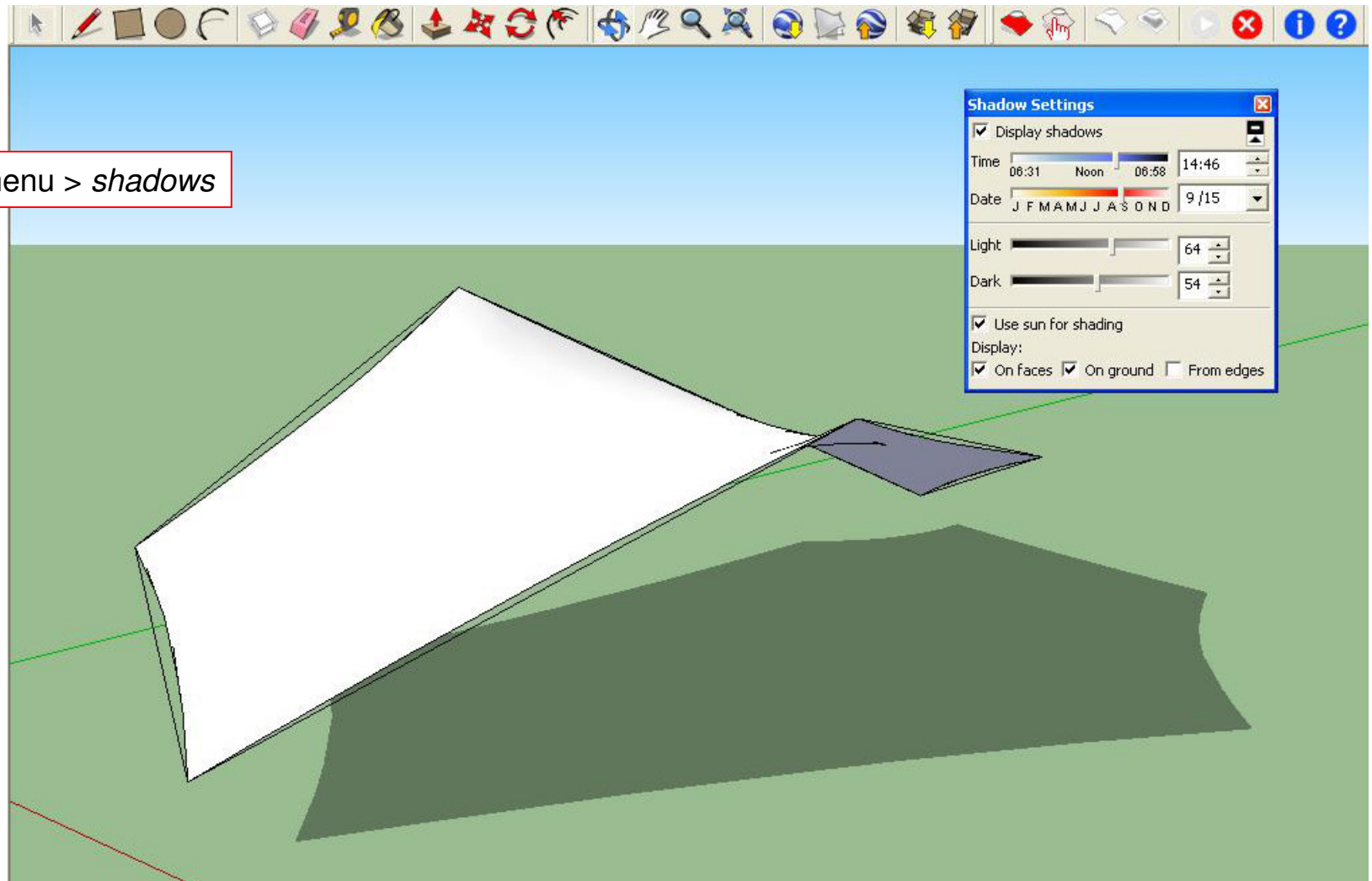
Edge curvature changing
(tension in the edge cable)



> FerrariSketch V1.0: « hypar » membrane

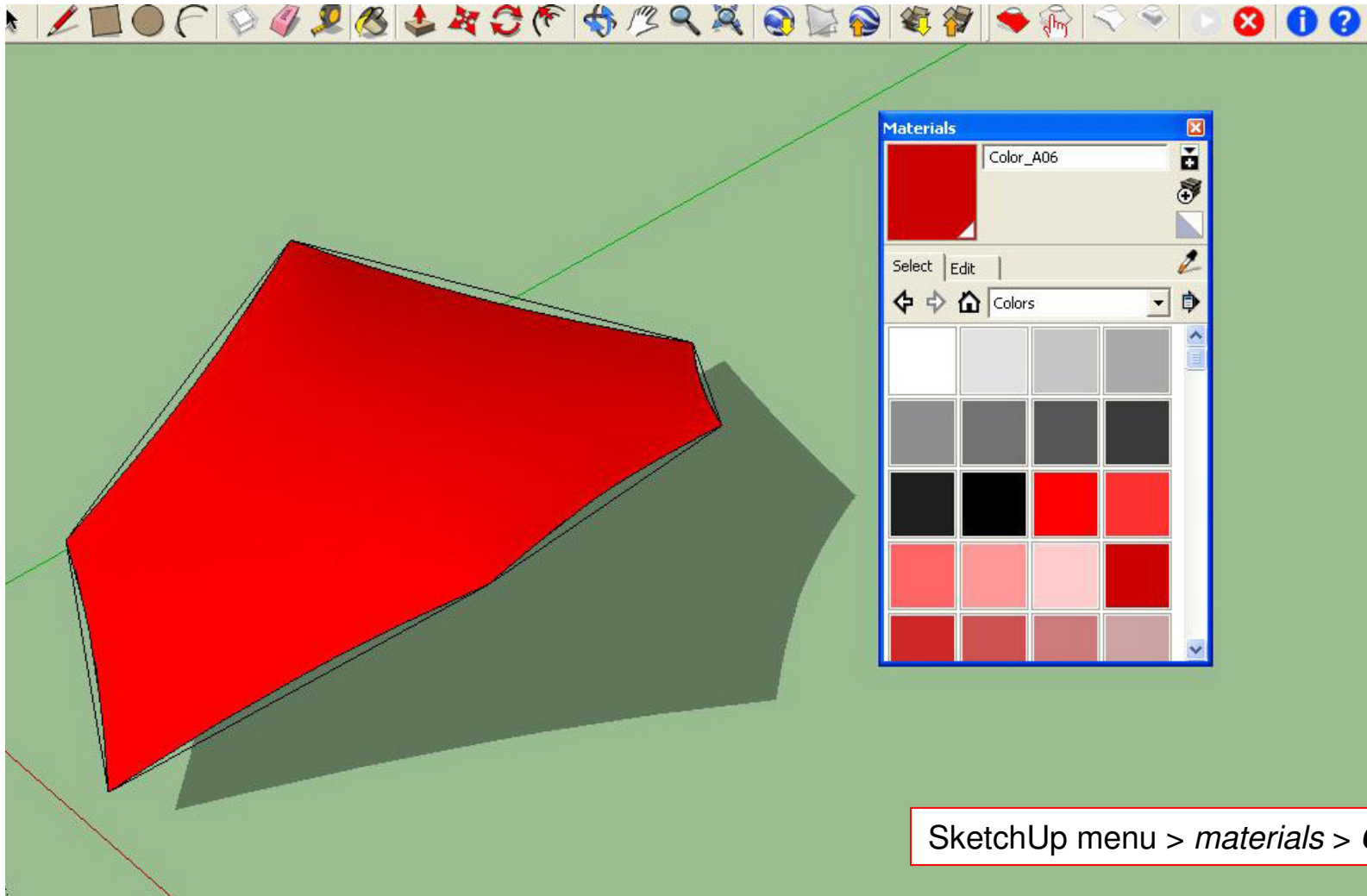
Shadows adding

SketchUp menu > *shadows*



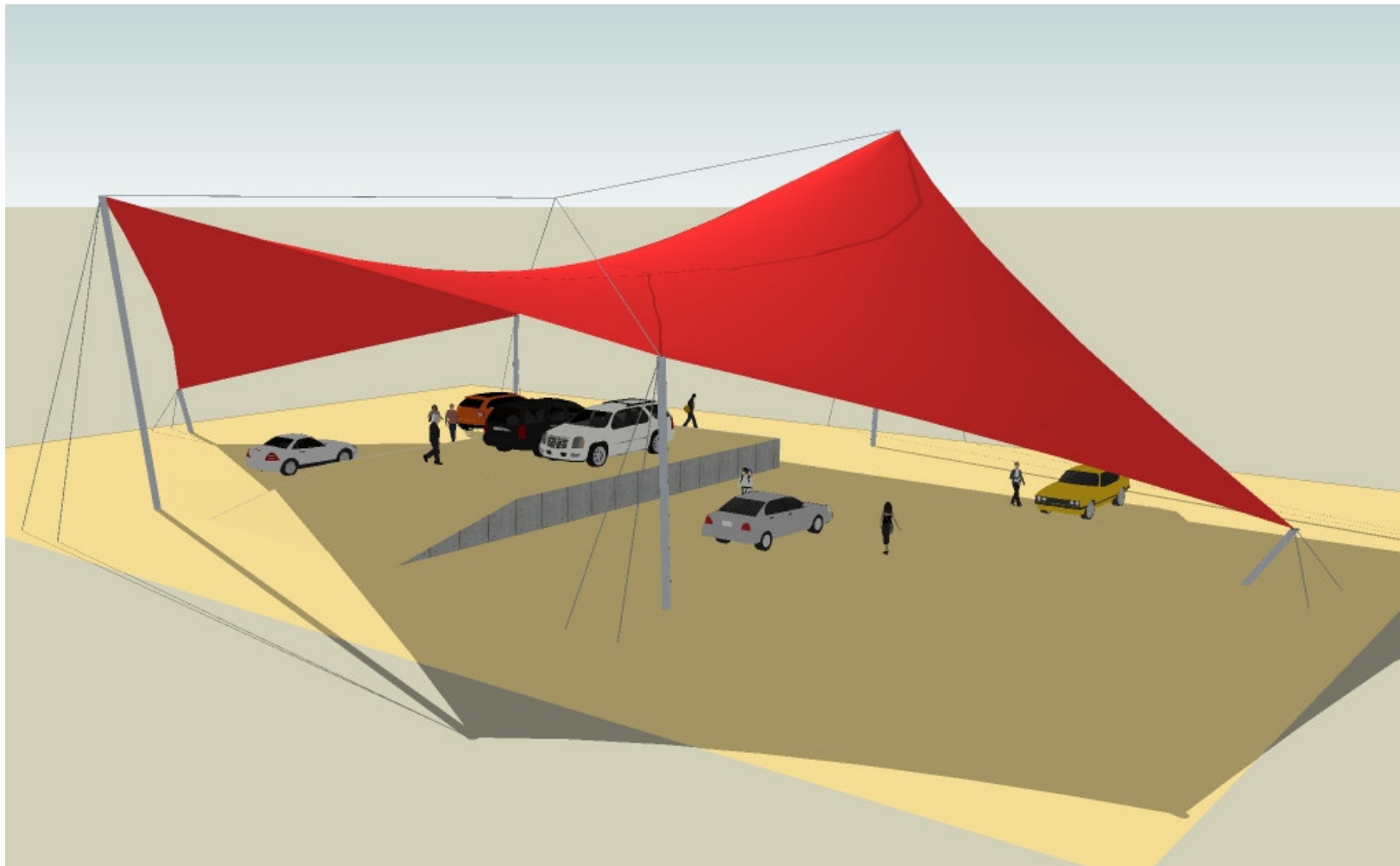
> FerrariSketch V1.0: « hypar » membrane

Fabric color choice



> FerrariSketch V1.0: « hypar » membrane

Final modelling with structure (steel elements)



> FerrariSketch V1.0: « hypar » membrane

Google Earth exportation (Paris, place du Trocadéro)



location choice on Google Earth
> SketchUp
> *get current view* > *place model*

> Comments

FERRARI
architecture

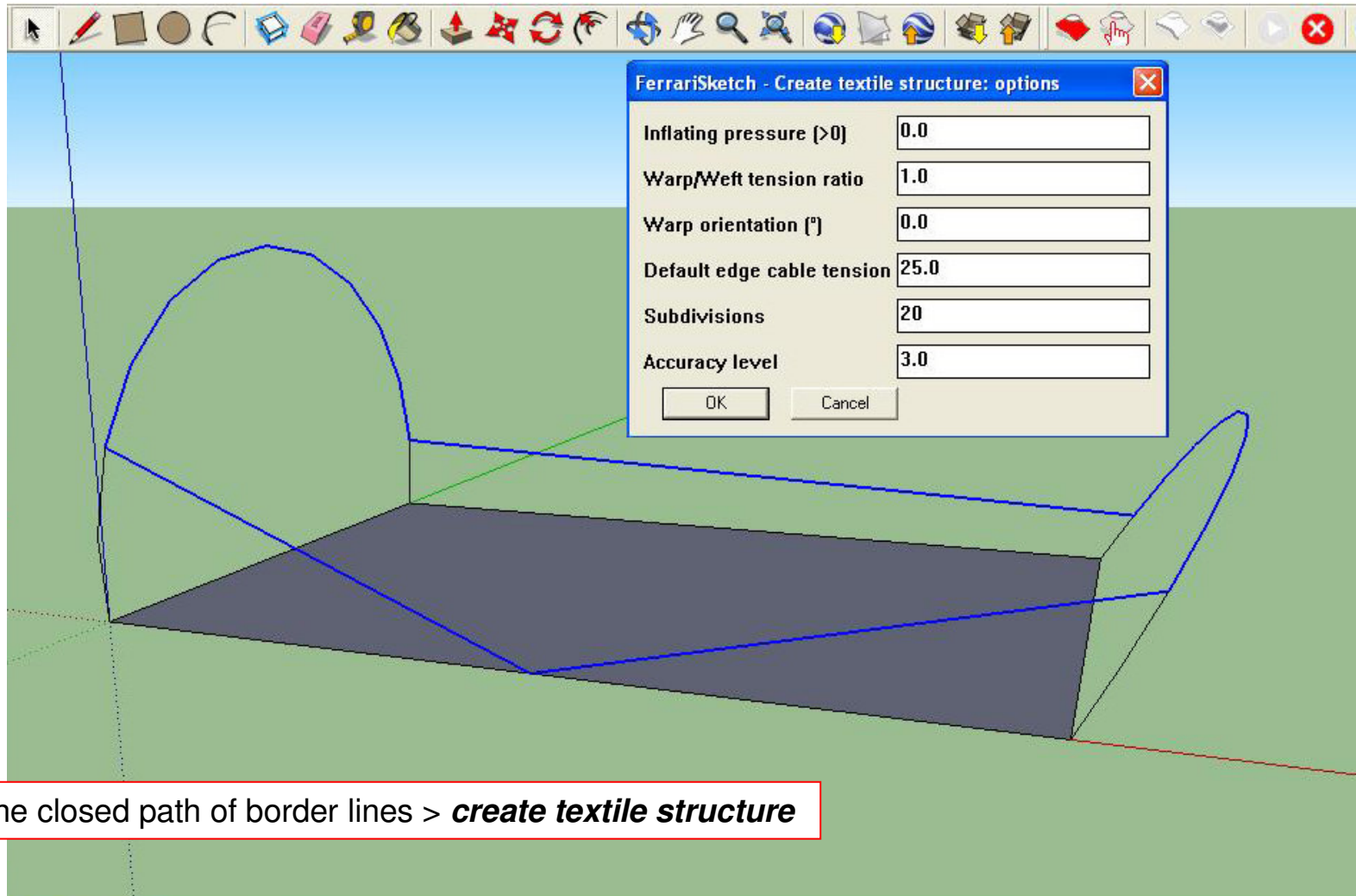


FERRARI architecture

Composite
Textiles
& Membranes

> FerrariSketch V1.0: membrane with arches

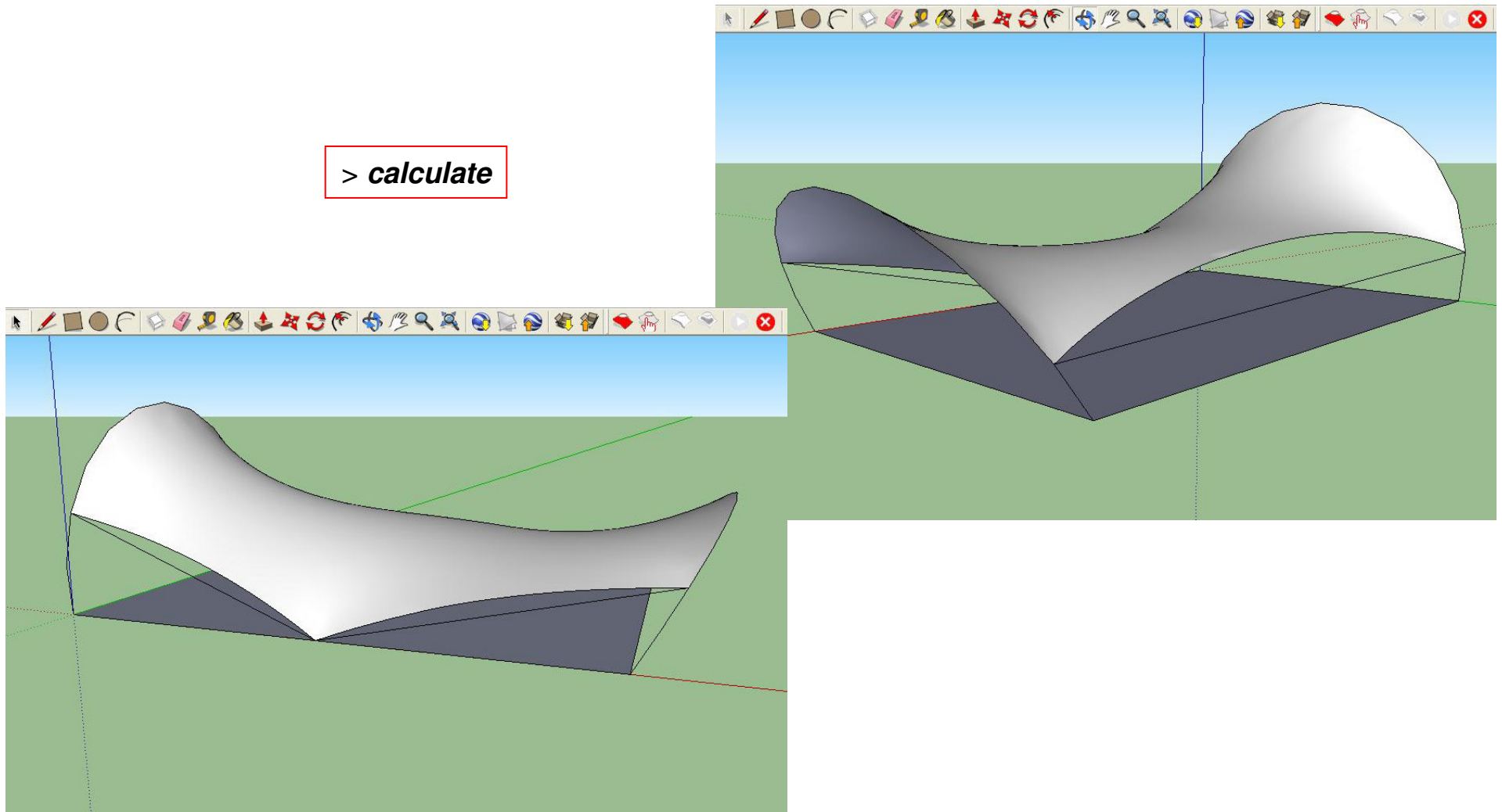
Border choice and membrane parameters



> FerrariSketch V1.0: membrane with arches

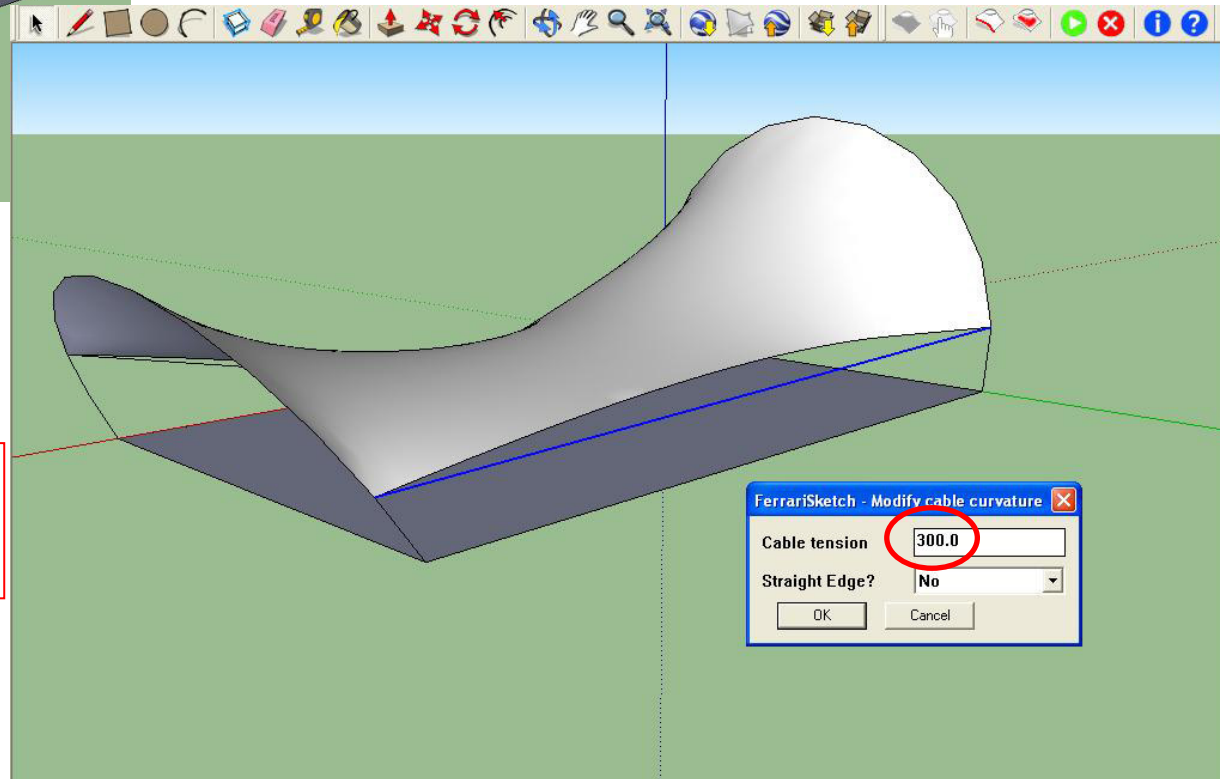
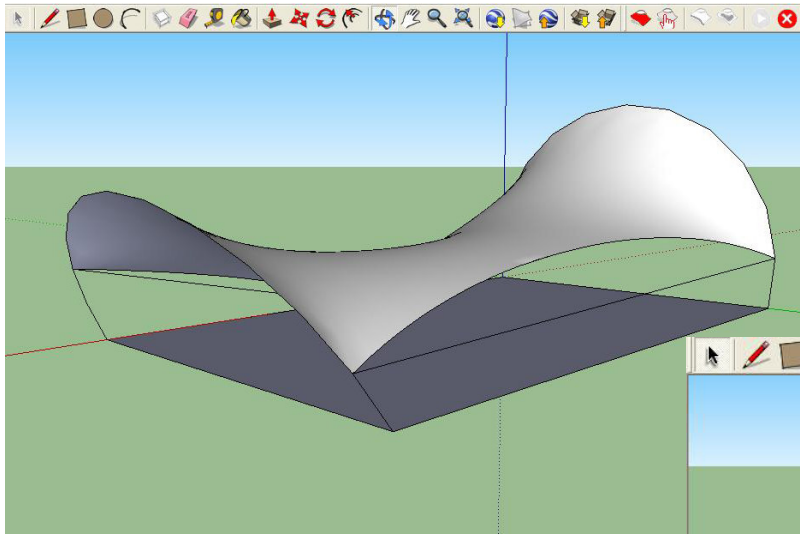
Membrane generation

> *calculate*



> FerrariSketch V1.0: membrane with arches

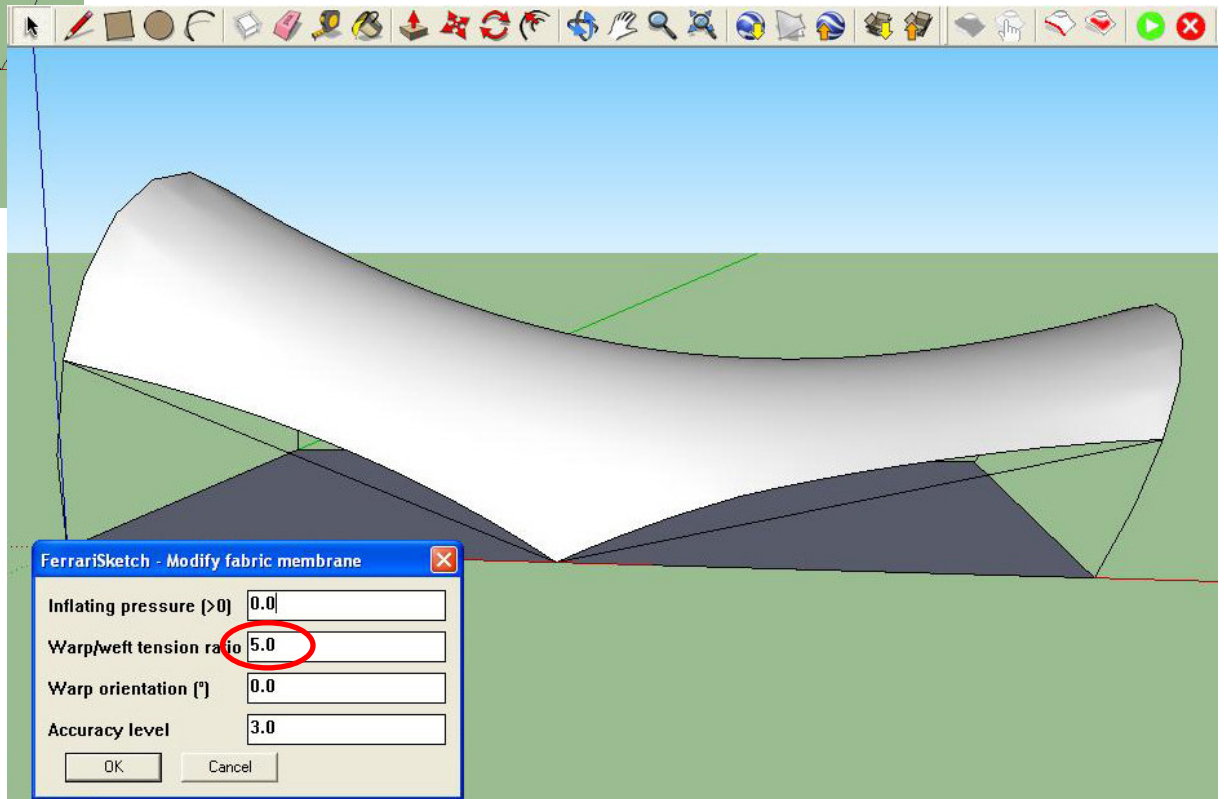
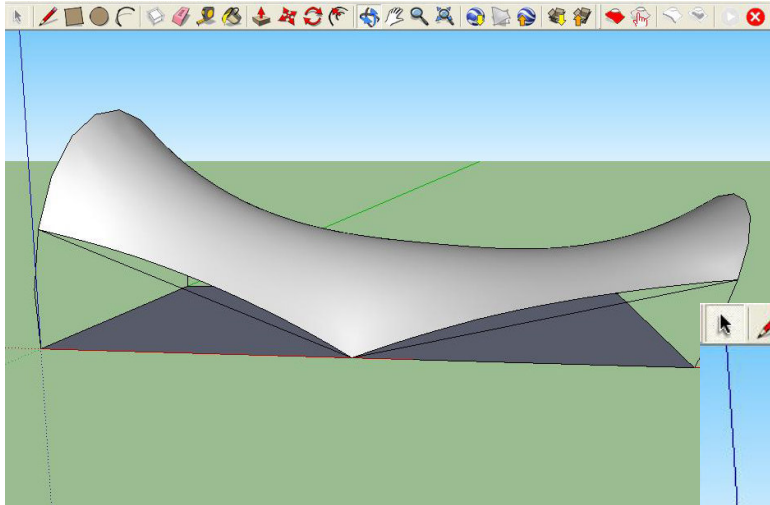
Edge curvature changing
(tension in the edge cable)



select structure > **modify**
select edge > **modify edge cable**
tension value > **calculate**

> FerrariSketch V1.0: membrane with arches

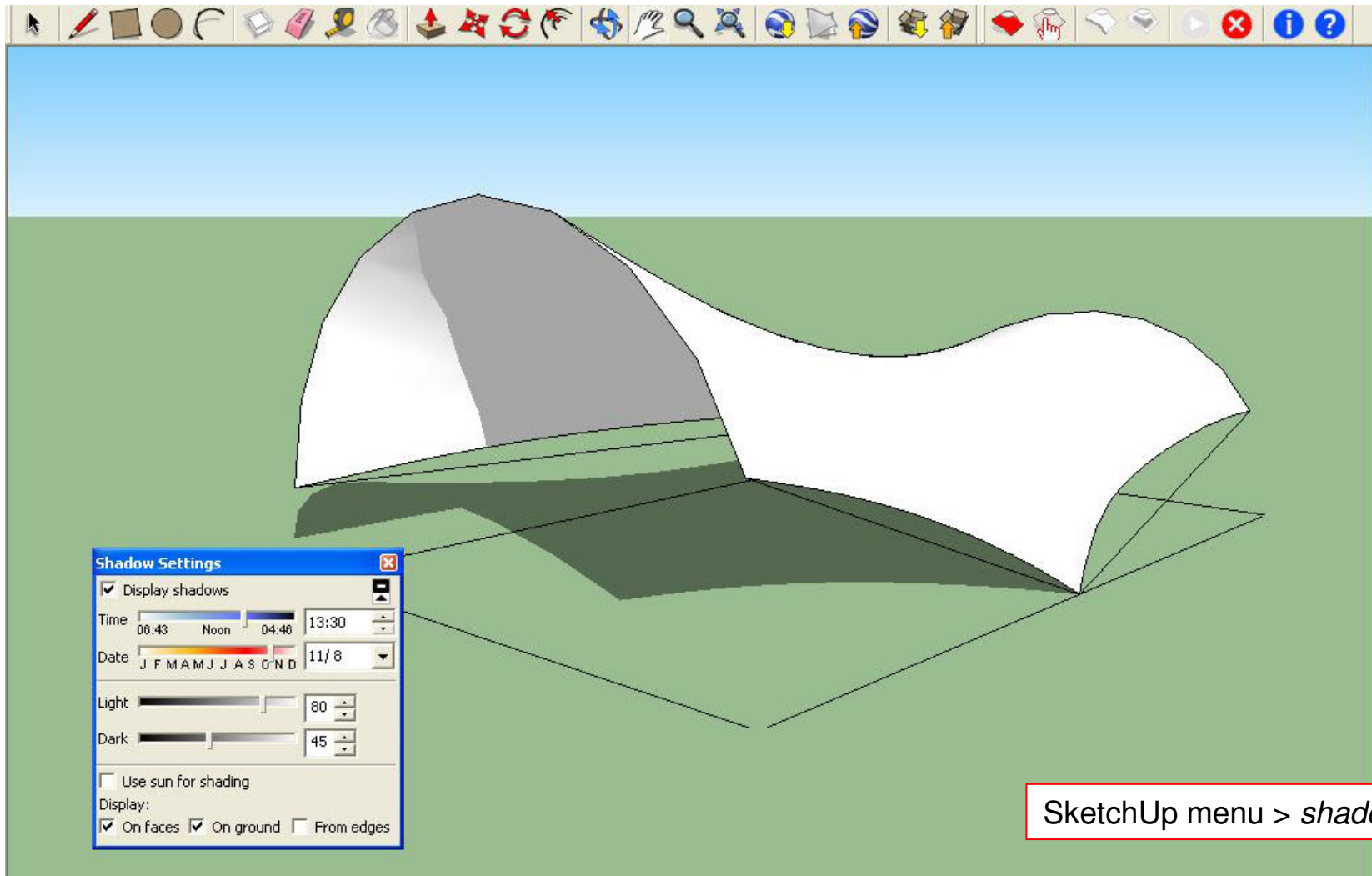
Membrane curvature changing
(warp/fill tension ratio)



select structure > **modify**
select fabric > **modify membrane**
ratio value > **calculate**

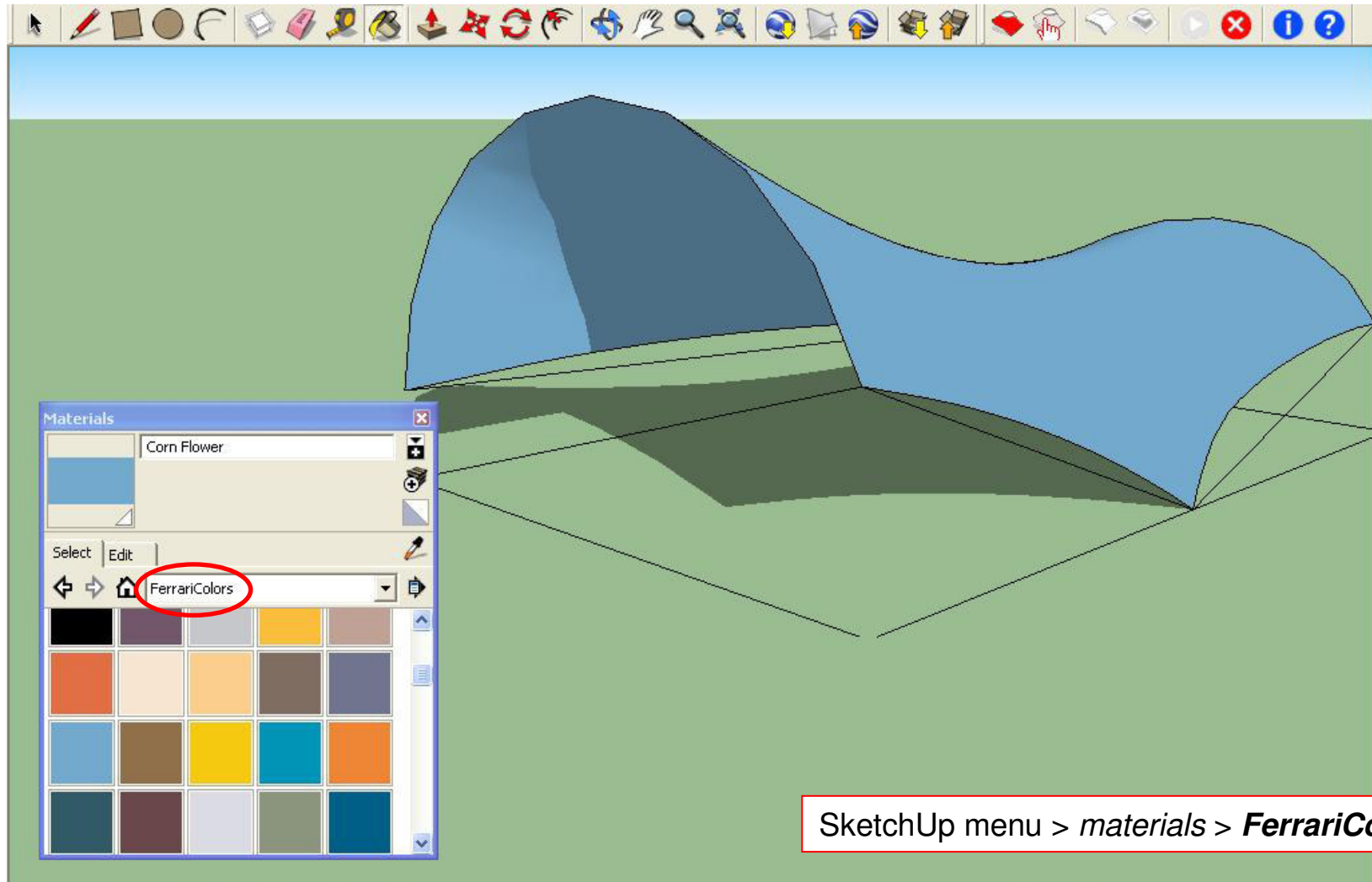
> FerrariSketch V1.0: membrane with arches

Shadows adding



> FerrariSketch V1.0: membrane with arches

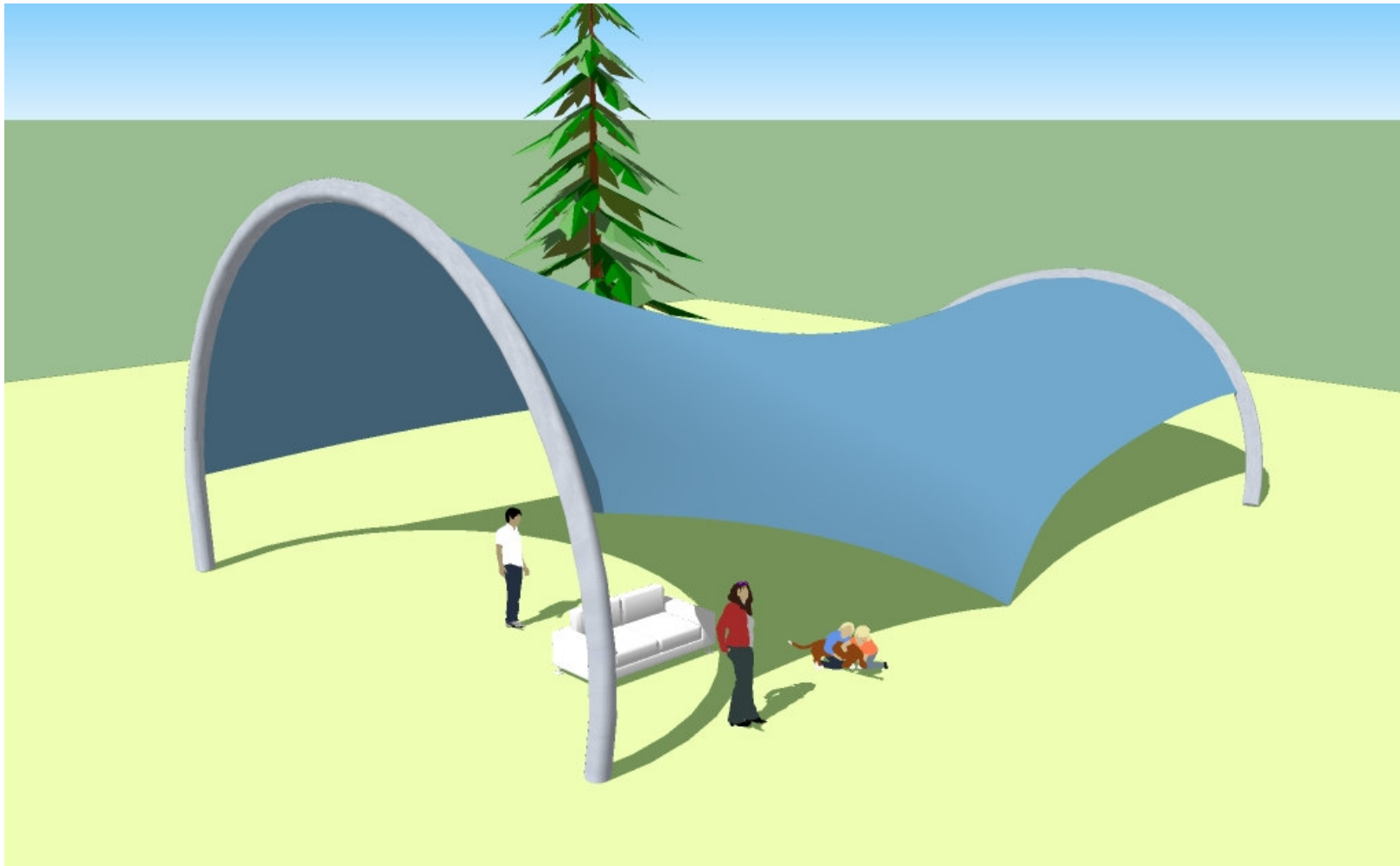
Fabric color choice



SketchUp menu > *materials* > **FerrariColors**

> FerrariSketch V1.0: membrane with arches

Final modelling with structure (tubular steel arches)



> FerrariSketch V1.0: membrane with arches

Google Earth exportation (Paris, place du Trocadéro)



location choice on Google Earth
> SketchUp
> *get current view > place model*

> Comments

FERRARI
architecture

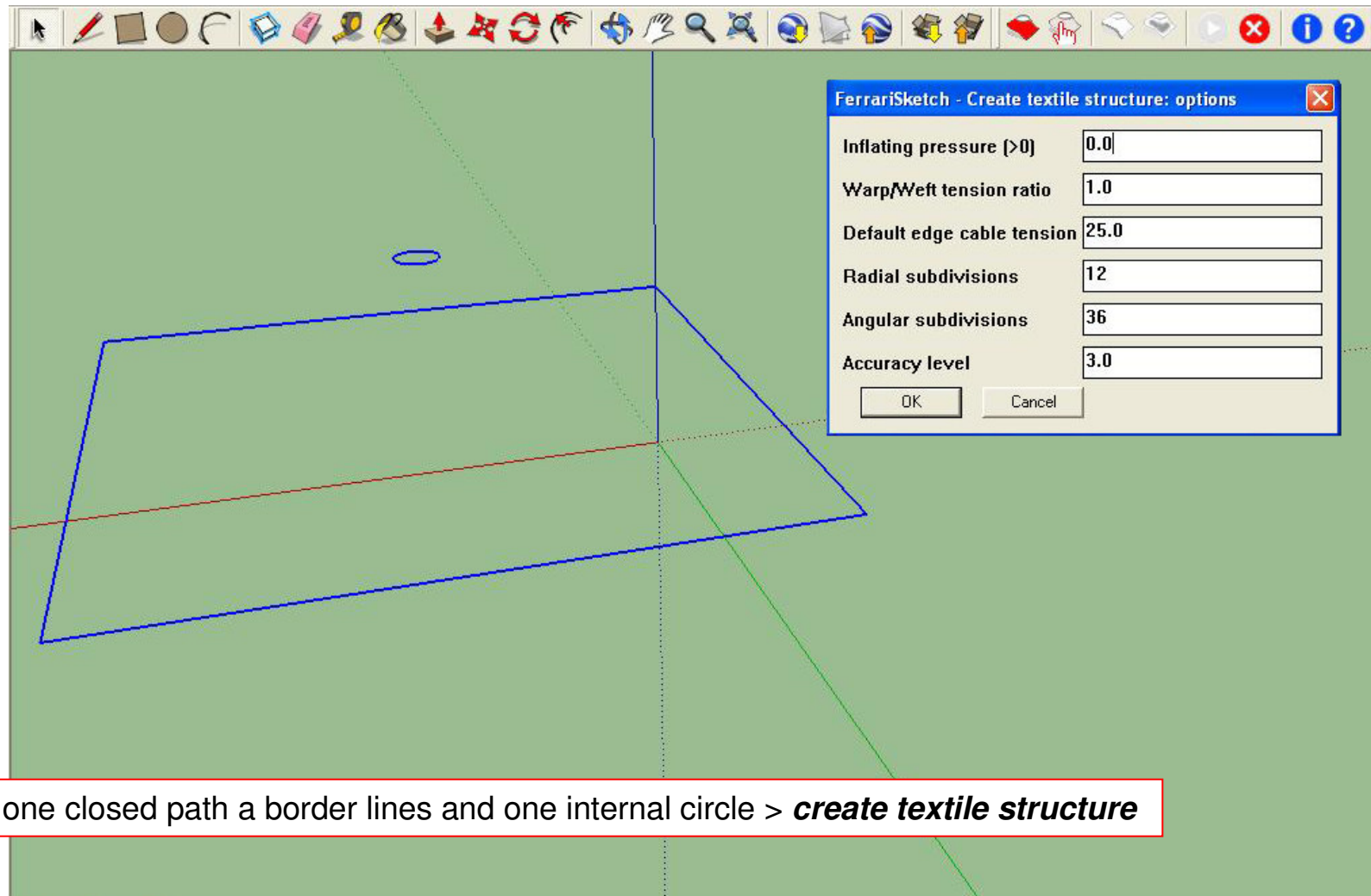


FERRARI architecture

Composite
Textiles
& Membranes

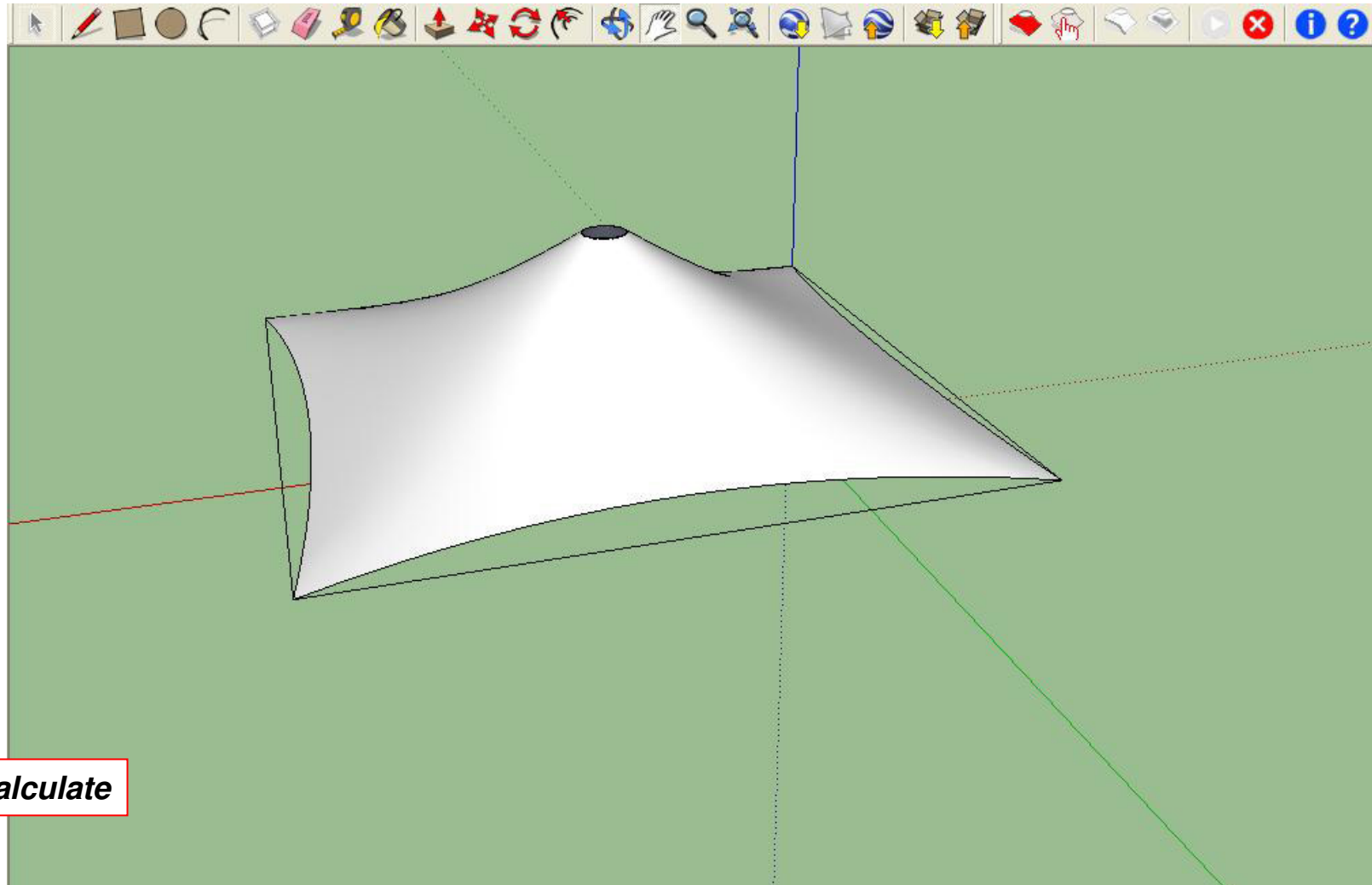
> FerrariSketch V1.0: conoidal membrane

Border choice and membrane parameters



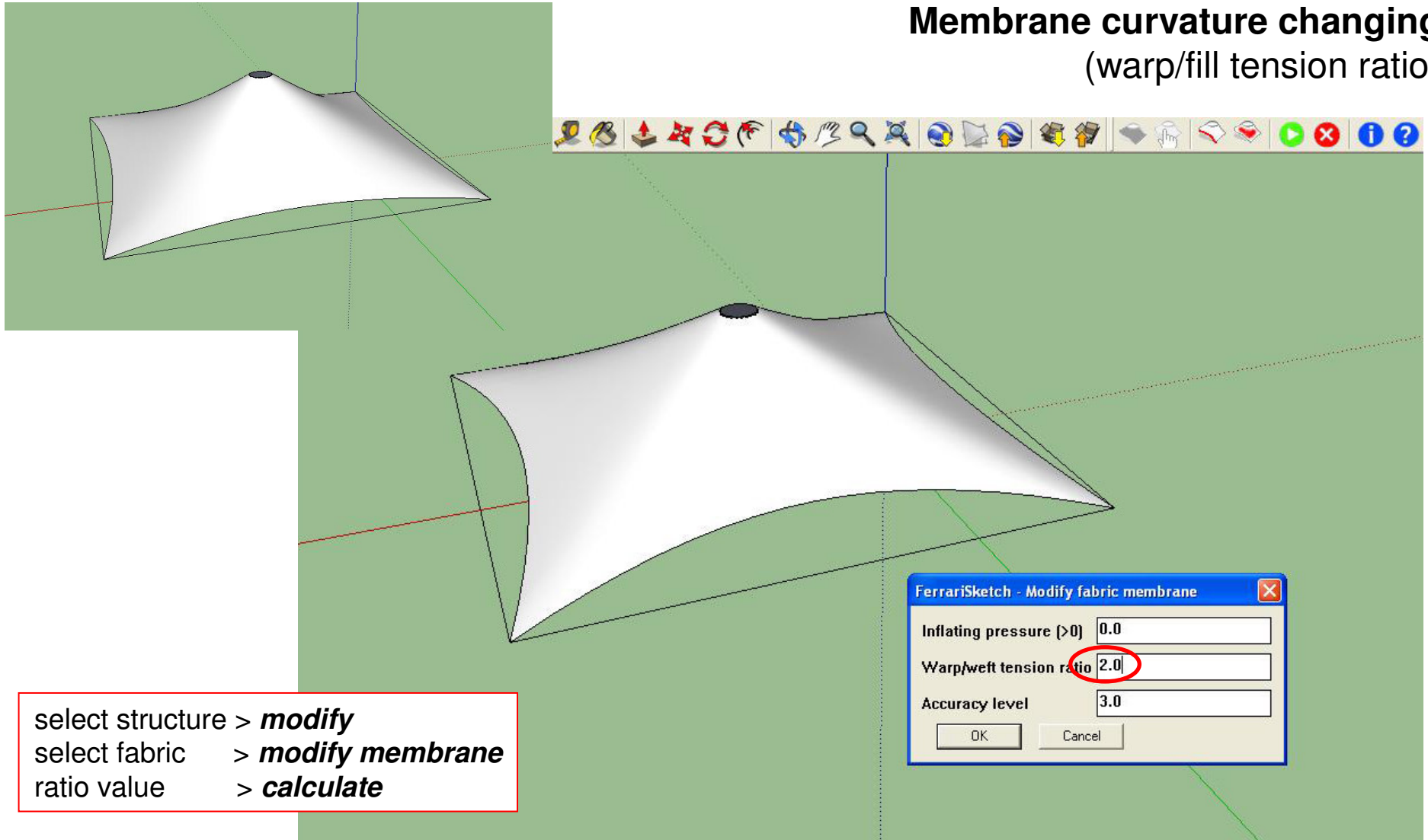
> FerrariSketch V1.0: conoidal membrane

Membrane generation



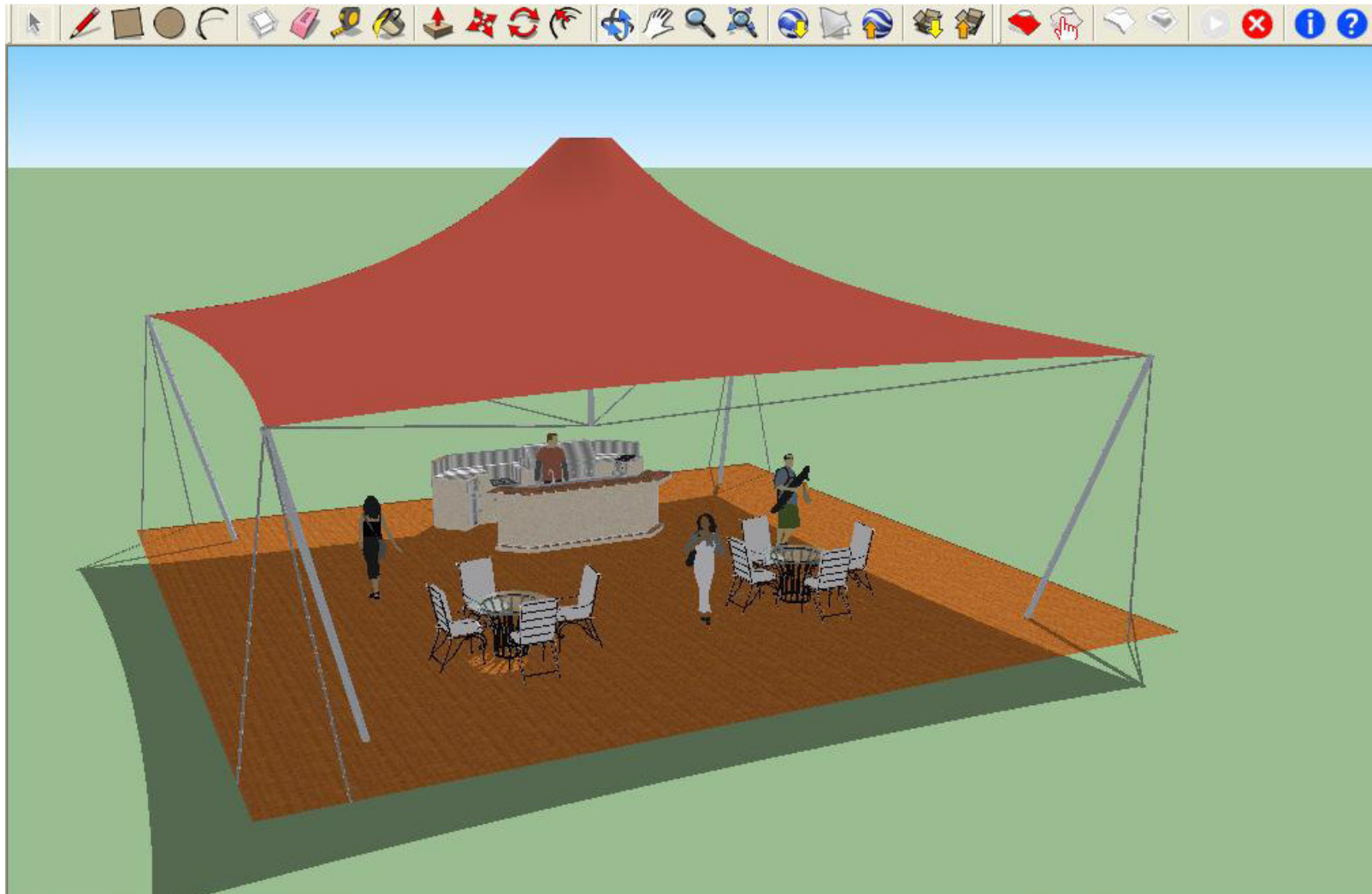
> FerrariSketch V1.0: conoidal membrane

Membrane curvature changing
(warp/weft tension ratio)



> FerrariSketch V1.0: conoidal membrane

Final modeling with structure (case of flying mast)



> FerrariSketch V1.0: conoidal membrane

Google Earth exportation (Paris, place du Trocadéro)



location choice on Google Earth
> SketchUp
> *get current view > place model*

> Comments

FERRARI
architecture

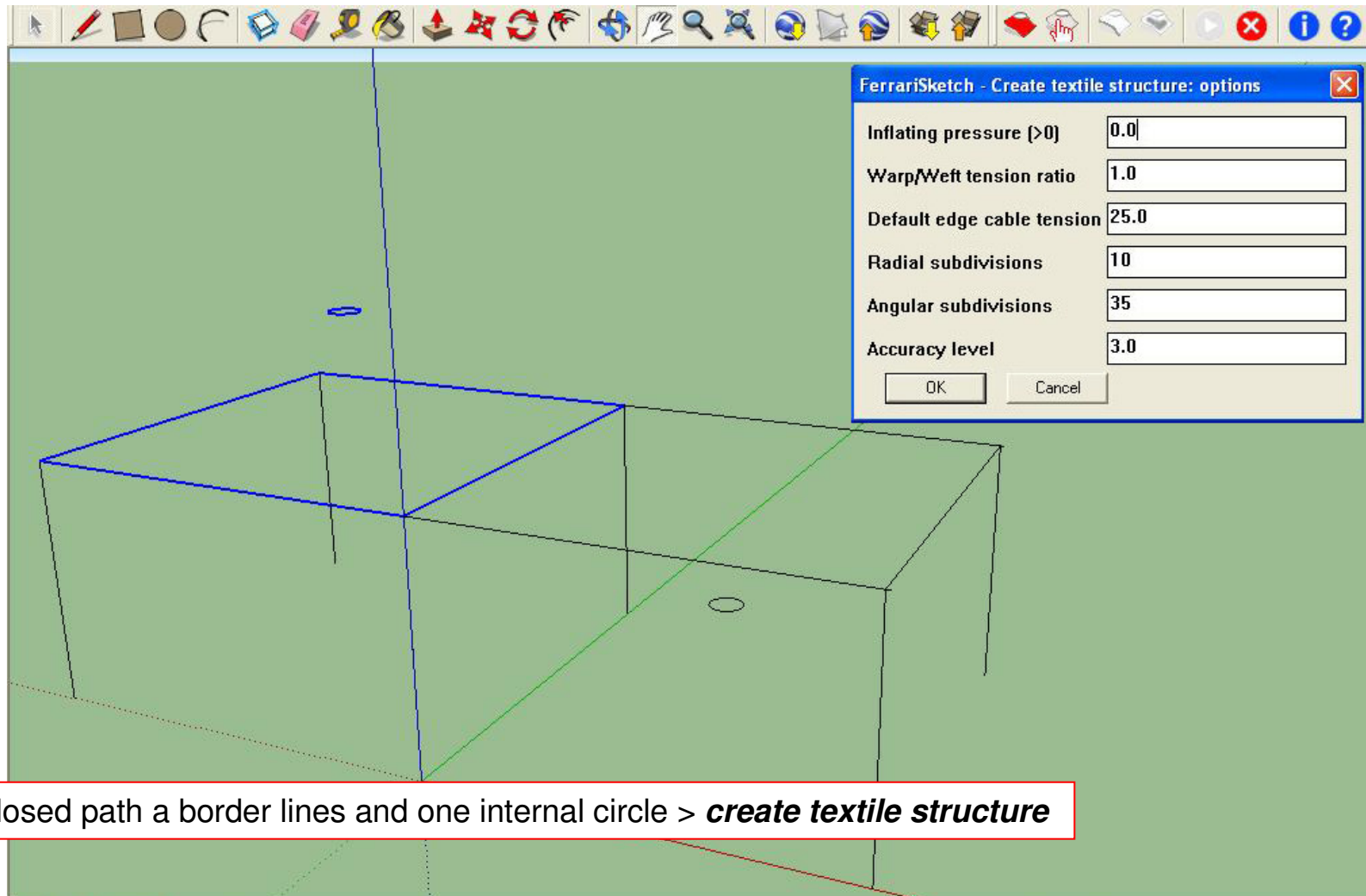


FERRARI architecture

Composite
Textiles
& Membranes

> FerrariSketch V1.0: multi-cones membrane

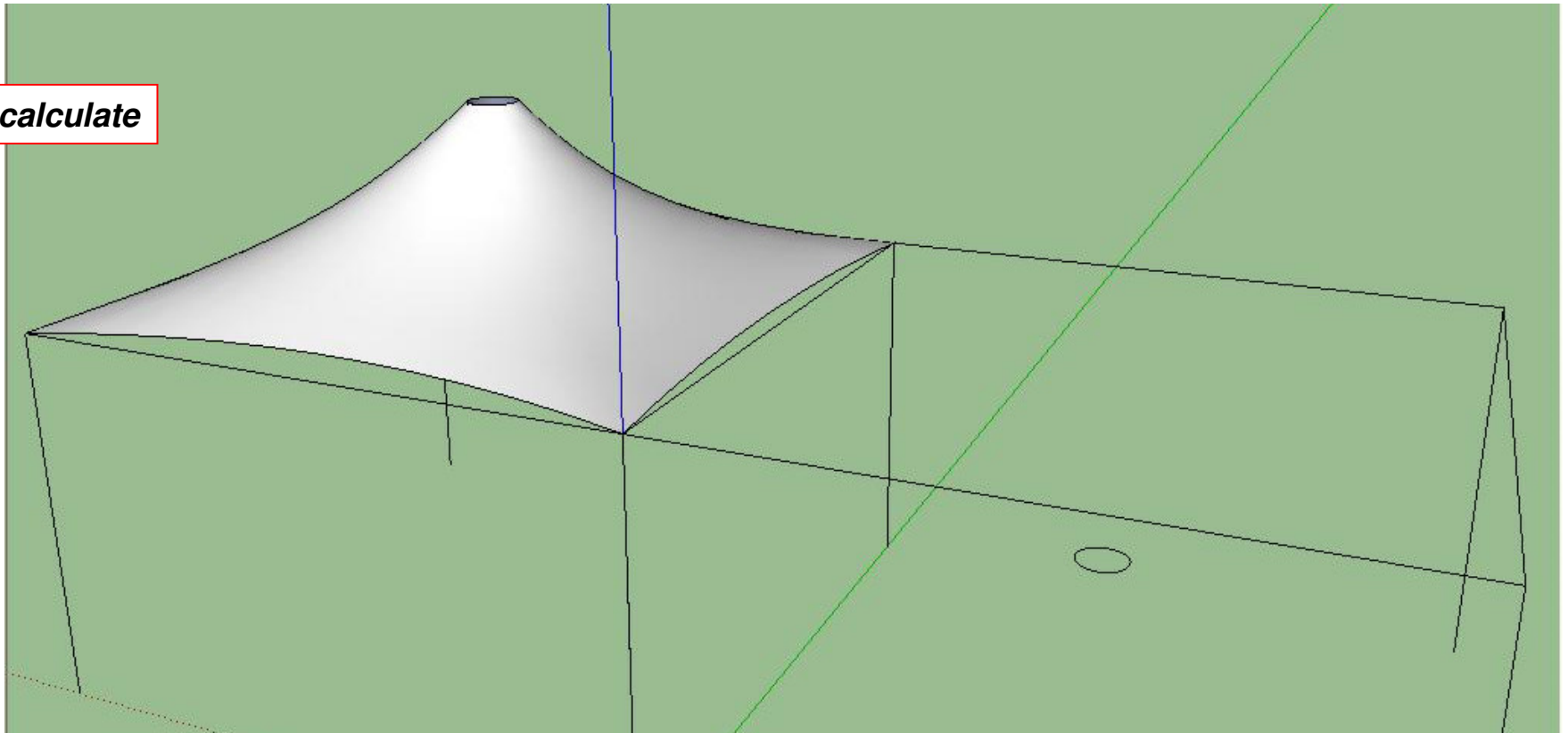
First cone: border choice and membrane parameters



> FerrariSketch V1.0: multi-cones membrane

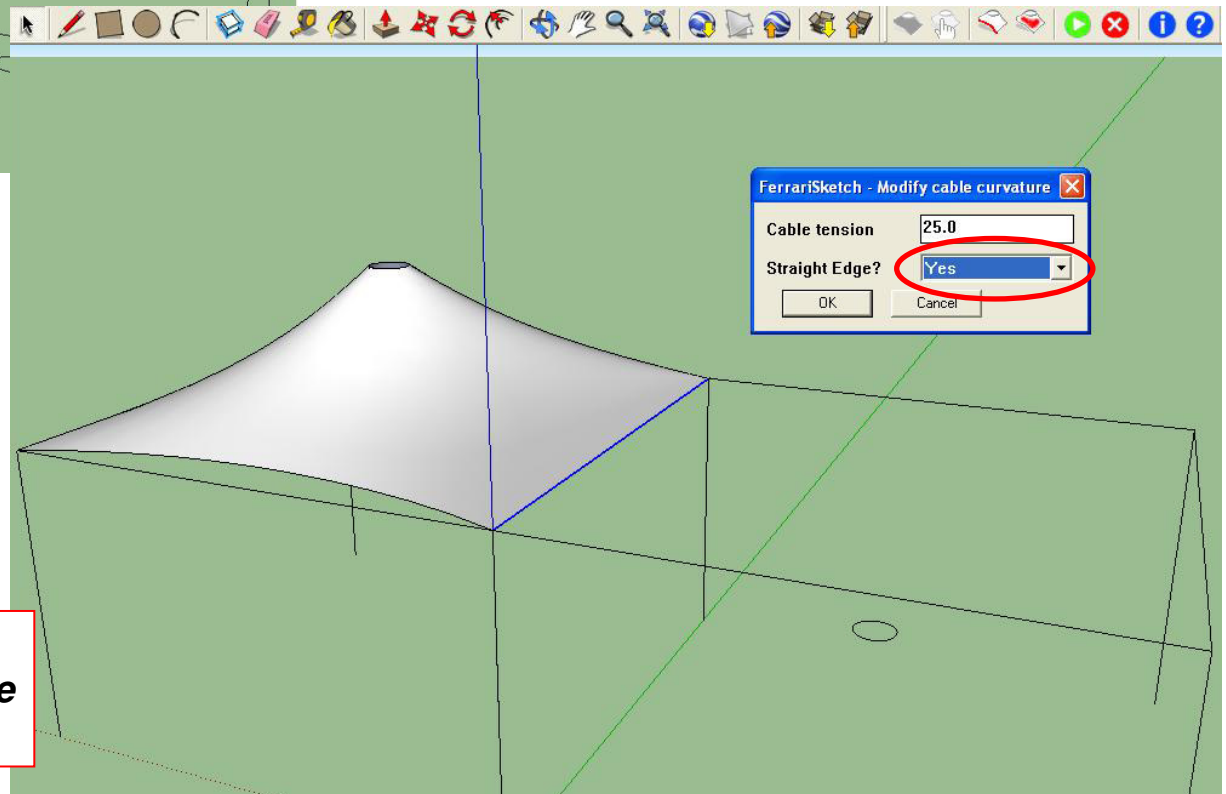
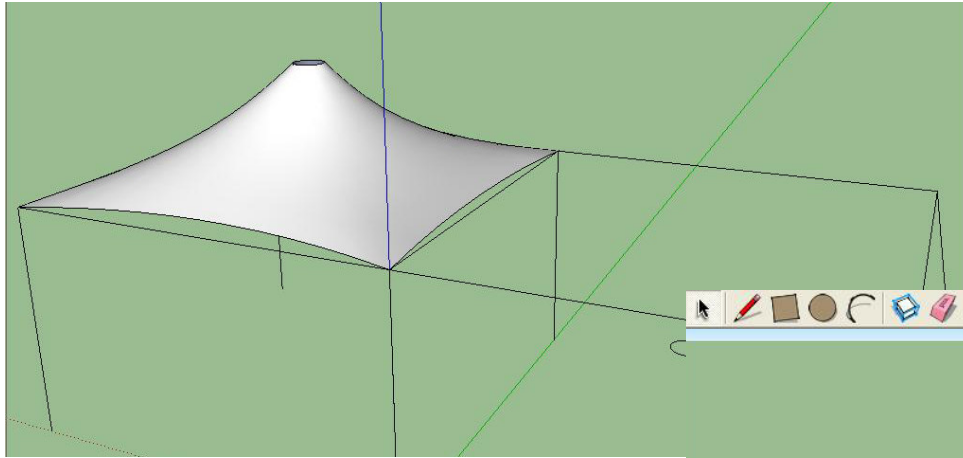
First cone generation

> *calculate*



> FerrariSketch V1.0: multi-cones membrane

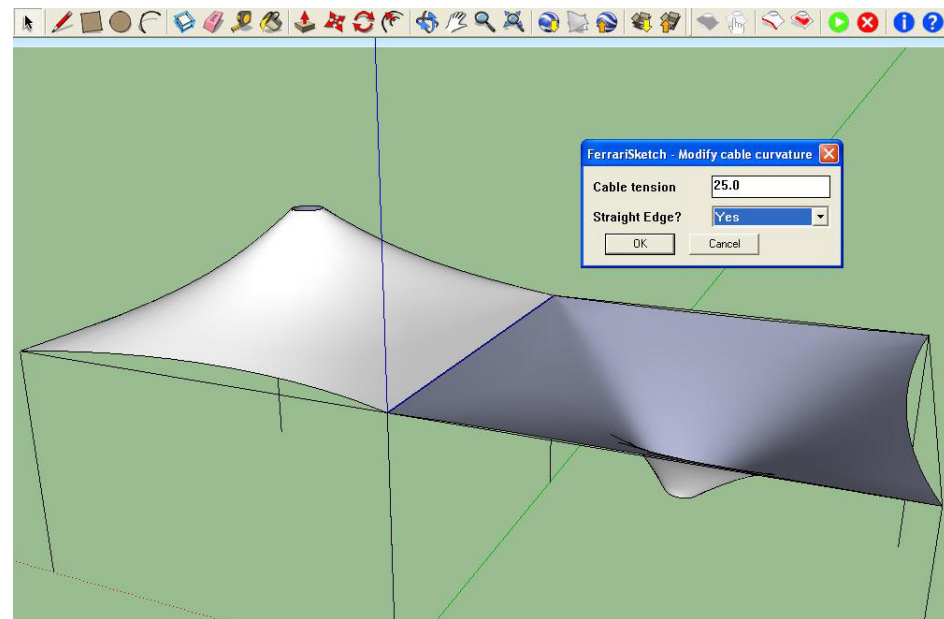
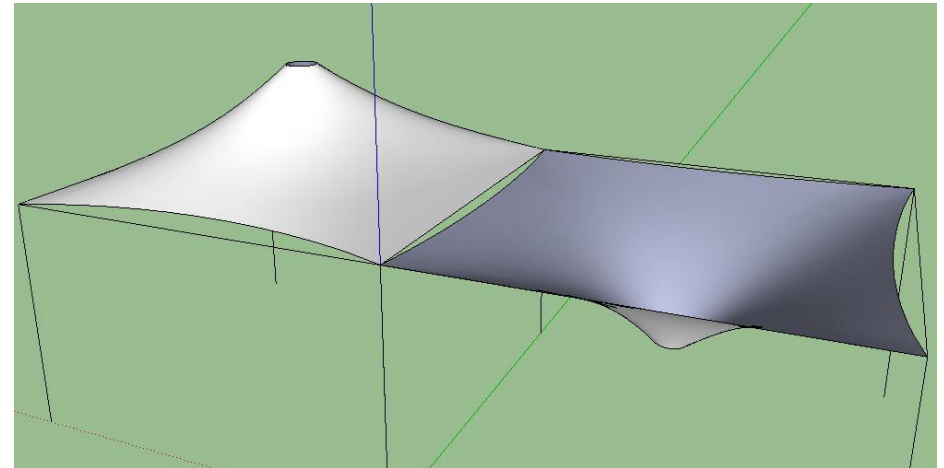
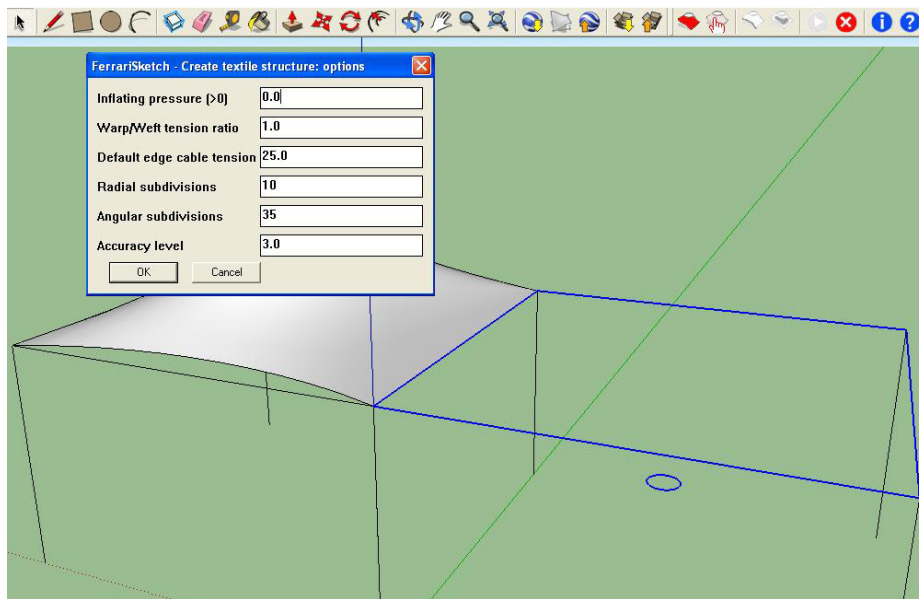
Edge curvature changing: straight edge
(clamped border edge)



select structure > **modify**
select edge > **modify edge cable**
straight edge? > **yes**

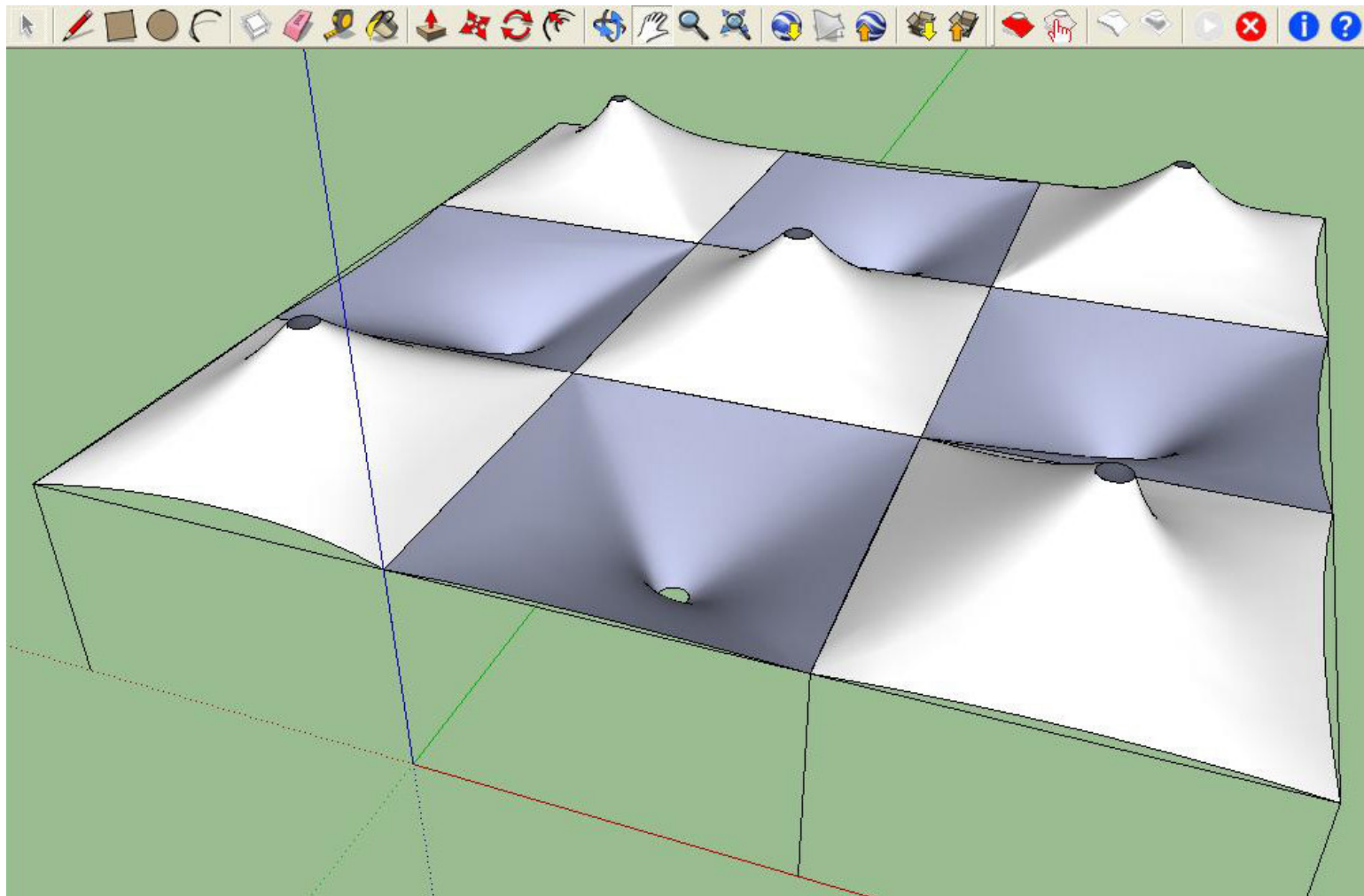
> FerrariSketch V1.0: multi-cones membrane

Second cone generation



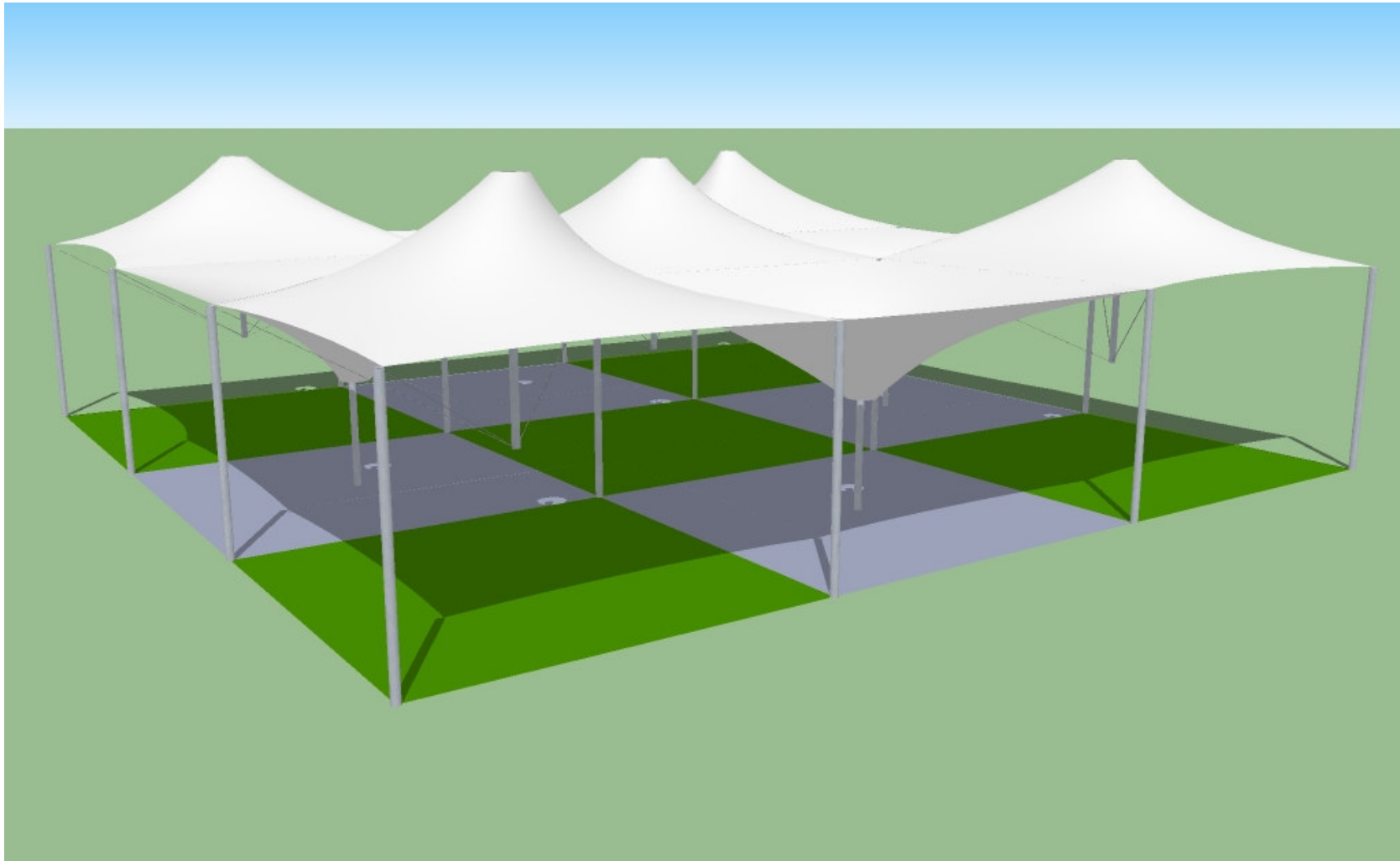
> FerrariSketch V1.0: multi-cones membrane

Other cones duplication



> FerrariSketch V1.0: multi-cones membrane

Final modelling with structure (with flying masts)



> Comments

FERRARI
architecture

