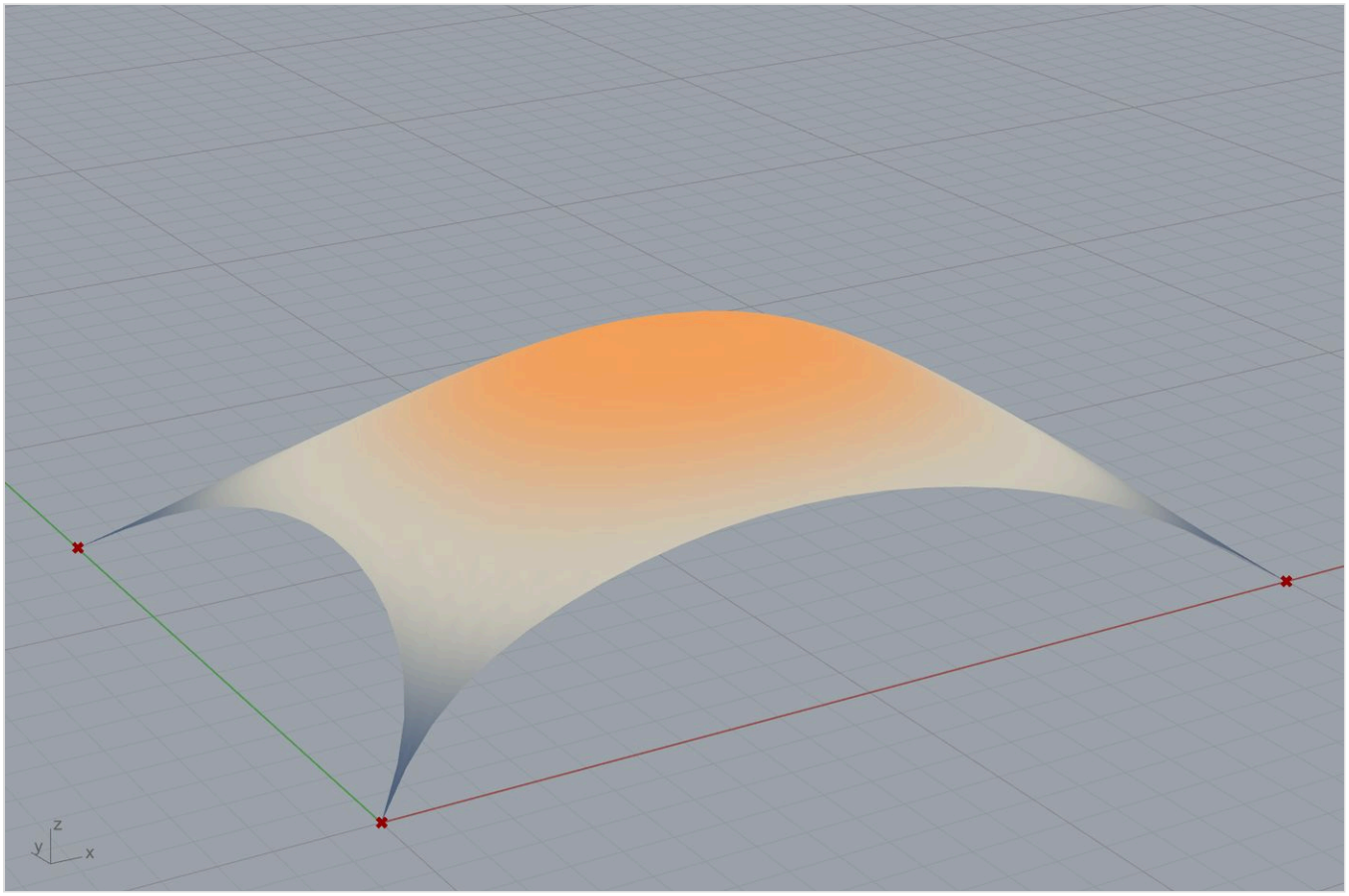
FORM FINDING

FUNICULAR SHELL

Compression shell from a Kangaroo hanging model



FREE | RHINO 7 · RHINO 8 | NATIVE + KANGAROO2 (INCLUDED) | VERSION 1.0 · NOVEMBER 2026

A flat net is hung under its own weight from the supports, like a chain, and then flipped and scaled to the rise you want: the result is a pure compression form. Supports can be the four corners, the two long edges or the whole perimeter. The solver is deterministic: no play button, the form updates by itself.

Free to use in your own projects, commercial ones included. Please do not resell or re-upload the files: share the link instead.

HOW TO USE

1. Open the file: a shell on four corner supports appears.
2. Set the spans and the mesh divisions.
3. Choose 'Supports'.
4. Set the rise; adjust rest length, load and stiffness to change the character of the form.
5. Read 'Shell data' and bake 'Shell'.

OPTIONS

Supports: Corners
Four point supports: the classic shell with arched edges.

Supports: Two long edges
A vault-like shell resting on the long sides.

Supports: Perimeter
A dome-like shell resting on the whole edge.

BAKE

Shell

GOOD TO KNOW

- Form finding, not structural analysis: thickness and reinforcement need an engineer.
- Uses Kangaroo2, included with Rhino 7 and 8.

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INPUTS

PARAMETER	RANGE	DEFAULT
Span X (m)	4.0 – 60.0	20.0
Span Y (m)	4.0 – 60.0	14.0
Divisions X	4 – 60	24
Divisions Y	4 – 60	16
Rest length factor	0.50 – 1.20	0.90
Load per node	0.00 – 5.00	1.00
Net stiffness	1 – 1000	100
Rise (m)	0.5 – 20.0	5.0
Max iterations	100 – 20000	3000
Supports	Corners · Two long edges · Perimeter	Corners

RESULTS AT DEFAULT VALUES

SHELL DATA

```
Surface: 180.3 m2   plan: 280.0 m2
Rise: 5.00 m   supports: 4
Iterations: 590
```


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INSIDE THE DEFINITION

STAGES, LEFT TO RIGHT AND TOP TO BOTTOM

1 INPUT

2 MESH flat quad mesh on the plan rectangle

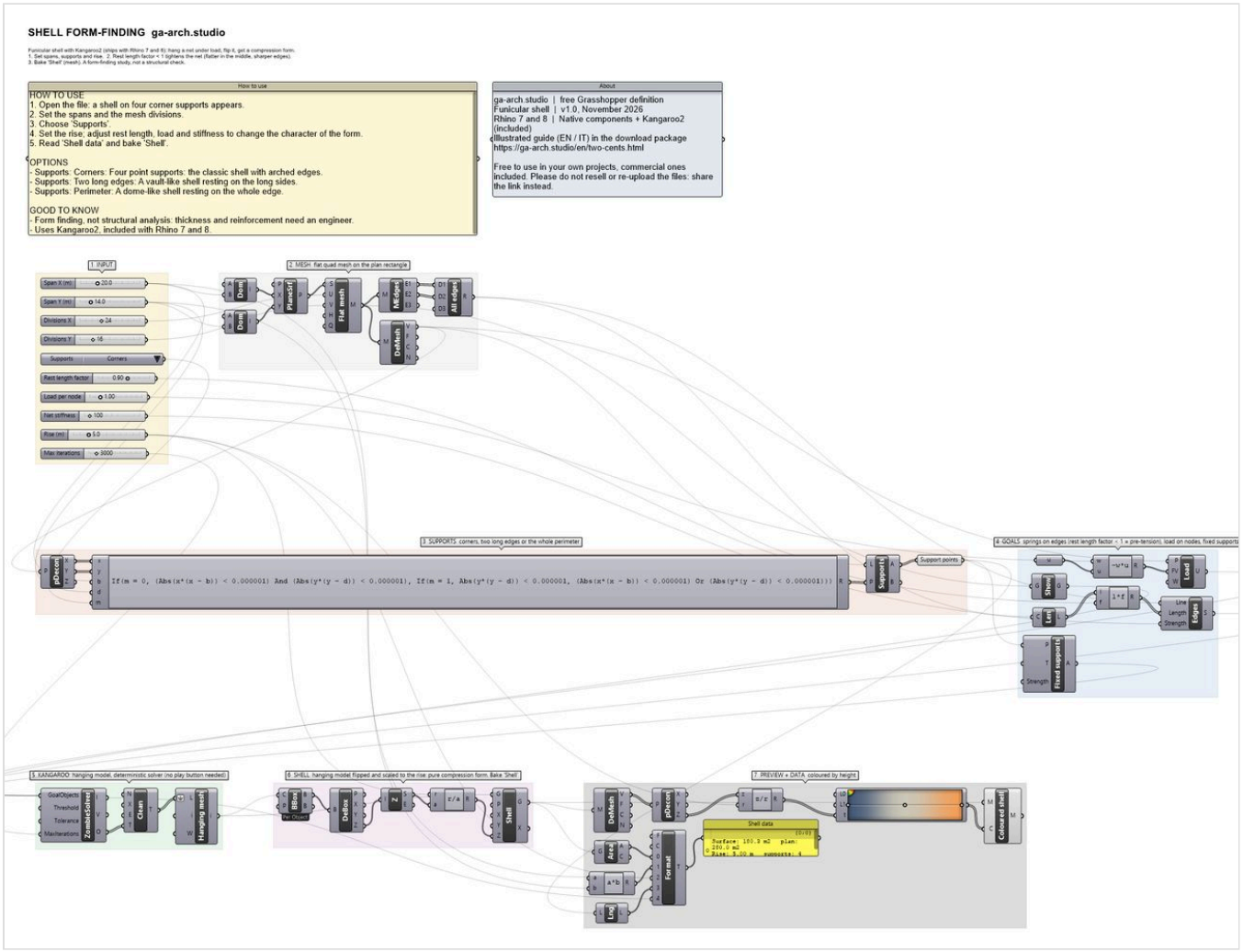
3 SUPPORTS corners, two long edges or the whole perimeter

4 GOALS springs on edges (rest length factor < 1 = pre-tension), load on nodes, fixed supports

5 KANGAROO hanging model, deterministic solver (no play button needed)

6 SHELL hanging model flipped and scaled to the rise: pure compression form. Bake 'Shell'

7 PREVIEW + DATA coloured by height



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