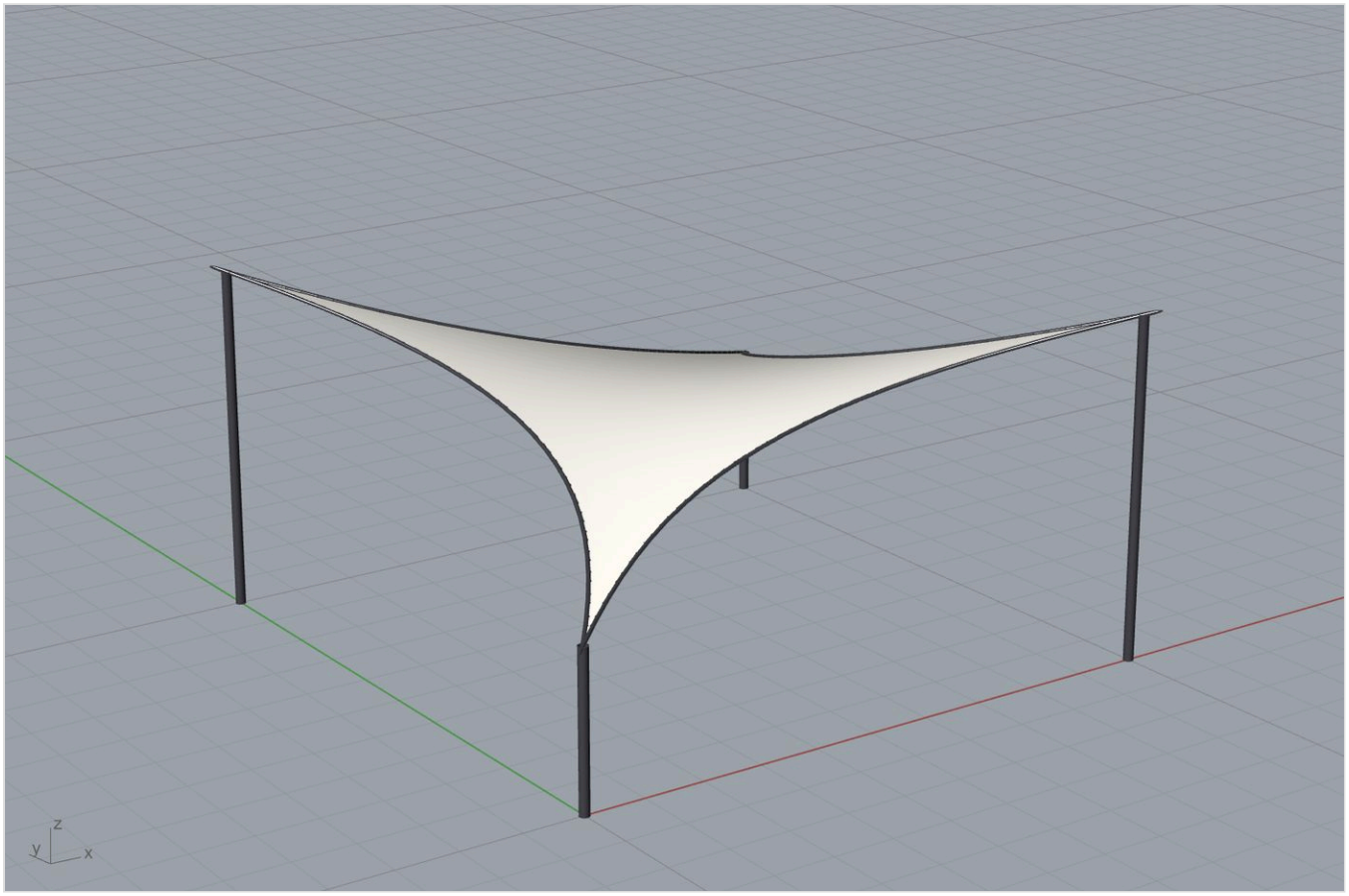
FORM FINDING

TENSILE MEMBRANE

Four-point sail or central-mast tent, form found with Kangaroo



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

A fabric net is pulled toward a minimal surface between its supports, with edge cables that curve inwards. Two types: a four-point sail with alternating high and low corners, or a tent lifted by a central mast. The panel reports fabric area and cable length.

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HOW TO USE

1. Open the file: a four-point sail appears.
2. Choose the 'Type'.
3. Set plan size, low and high points (or the mast top).
4. Adjust membrane and cable rest lengths and cable stiffness to change how deep the edges curve.
5. Read 'Membrane data' and bake 'Membrane', 'Edge cables' and 'Masts'.

OPTIONS

Type: 4-point sail
Hypar sail with two high and two low corners.

Type: Central mast
Tent with the four corners low and a mast lifting the centre.

BAKE

Membrane | Edge cables | Masts

GOOD TO KNOW

- A design form, not a cutting pattern or a structural analysis.
- Uses Kangaroo2, included with Rhino 7 and 8.

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INPUTS

PARAMETER	RANGE	DEFAULT
Size X (m)	3.0 – 40.0	10.0
Size Y (m)	3.0 – 40.0	10.0
Divisions	6 – 50	24
Low points (m)	0.50 – 10.00	2.50
High points (m)	1.00 – 20.00	5.50
Mast top (m)	1.00 – 20.00	6.50
Membrane rest length factor	0.00 – 1.00	0.10
Edge cable rest length factor	0.500 – 1.000	0.900
Edge cable stiffness	1 – 200	20
Max iterations	100 – 20000	5000
Type	4-point sail · Central mast	4-point sail

RESULTS AT DEFAULT VALUES

MEMBRANE DATA

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Membrane: 43.9 m2 over 100.0 m2 of plan
Edge cables: 46.1 m   iterations: 510
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INSIDE THE DEFINITION

STAGES, LEFT TO RIGHT AND TOP TO BOTTOM

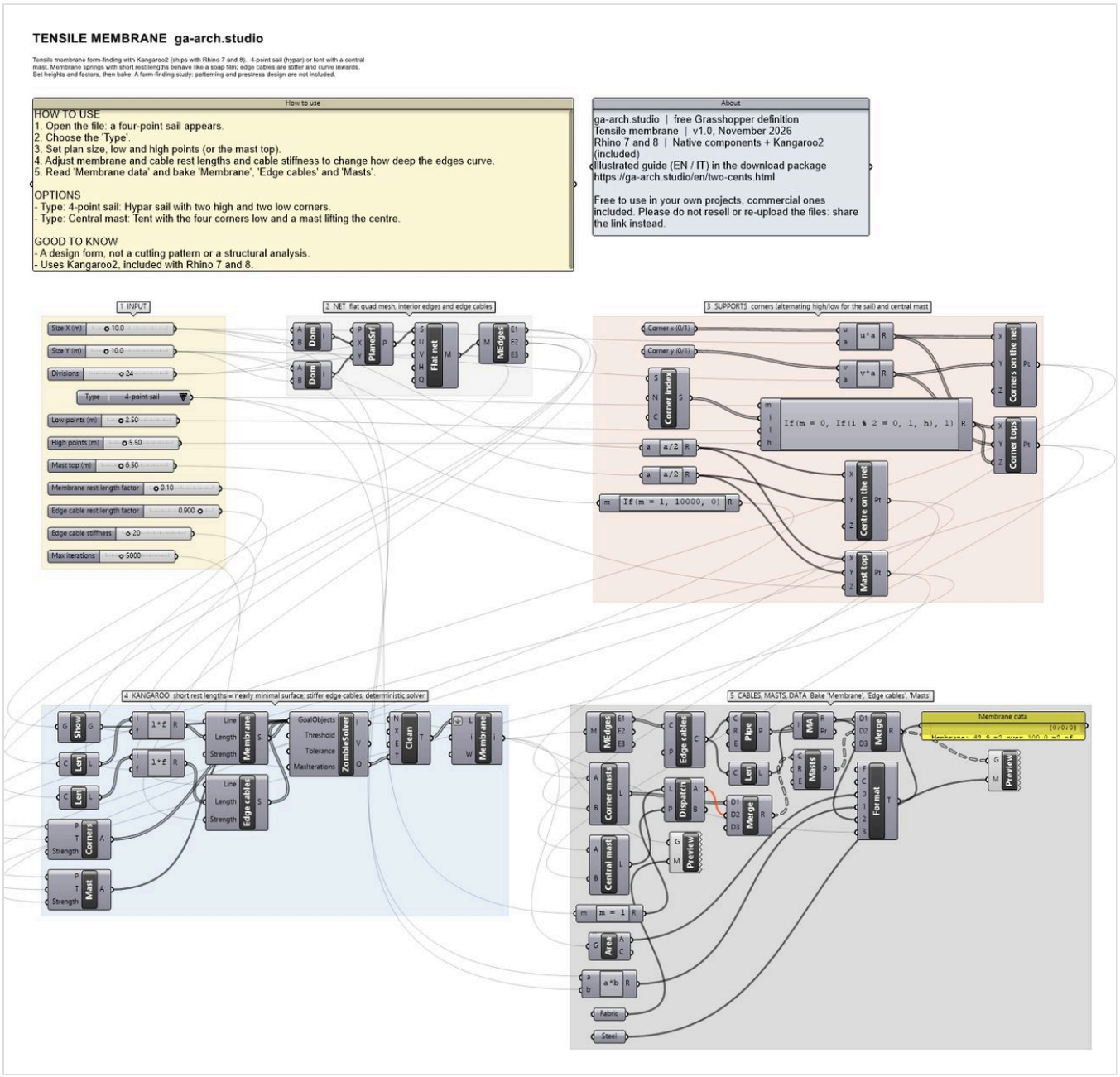
1 INPUT

2 NET flat quad mesh, interior edges and edge cables

3 SUPPORTS corners (alternating high/low for the sail) and central mast

4 KANGAROO short rest lengths = nearly minimal surface; stiffer edge cables; deterministic solver

5 CABLES, MASTS, DATA Bake 'Membrane', 'Edge cables', 'Masts'



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