FEM Static on DHP 2 Half Pipe

The design is optimized by FEM static calculation for strongest climate conditions based on the cable stay project in Shantou Bridge, located in the typhoon area of southeast China.

The structural analysis considered several loads

- Cable length up to 273 meter
- Non-uniform thermal stress: top 80°C/bottom 60°C
- Non-uniform thermal stress of outer wall: outside 20°C/inside 50°C
- Uniform thermal stress
- Wind speed up to 220 Km/hr=61m/s
- Temperature Range of 0°C to 80°C
- Dead load
- Pulling up the half pipes
- A pair of gusts

The assumption was made that any aero dynamical instability is prevented by constructive means.
To obtain tangential stresses a two dimensional finite element model was used.
After combining relevant load cases maximum stresses from 5.6 to 6.39 N/mm2 were found.
They don't exceed the minimum resistance values 6.4 N/mm2 and 22 N/mm2.
Maximum force at pylon is 11900 N.
Maximum elongations due to dead load and uniform thermal stress are +3790 mm and – 859 mm.