August 26-28, 2015 Stresa - Italy

International Workshop

Innovative Electrical Networks for a Sustainable Development in Low Carbon Scenarios

Vitruvio towers

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August 26,2015

OHL towers evolution

Latticed steel towers

1900

Monopoles

Foster towers

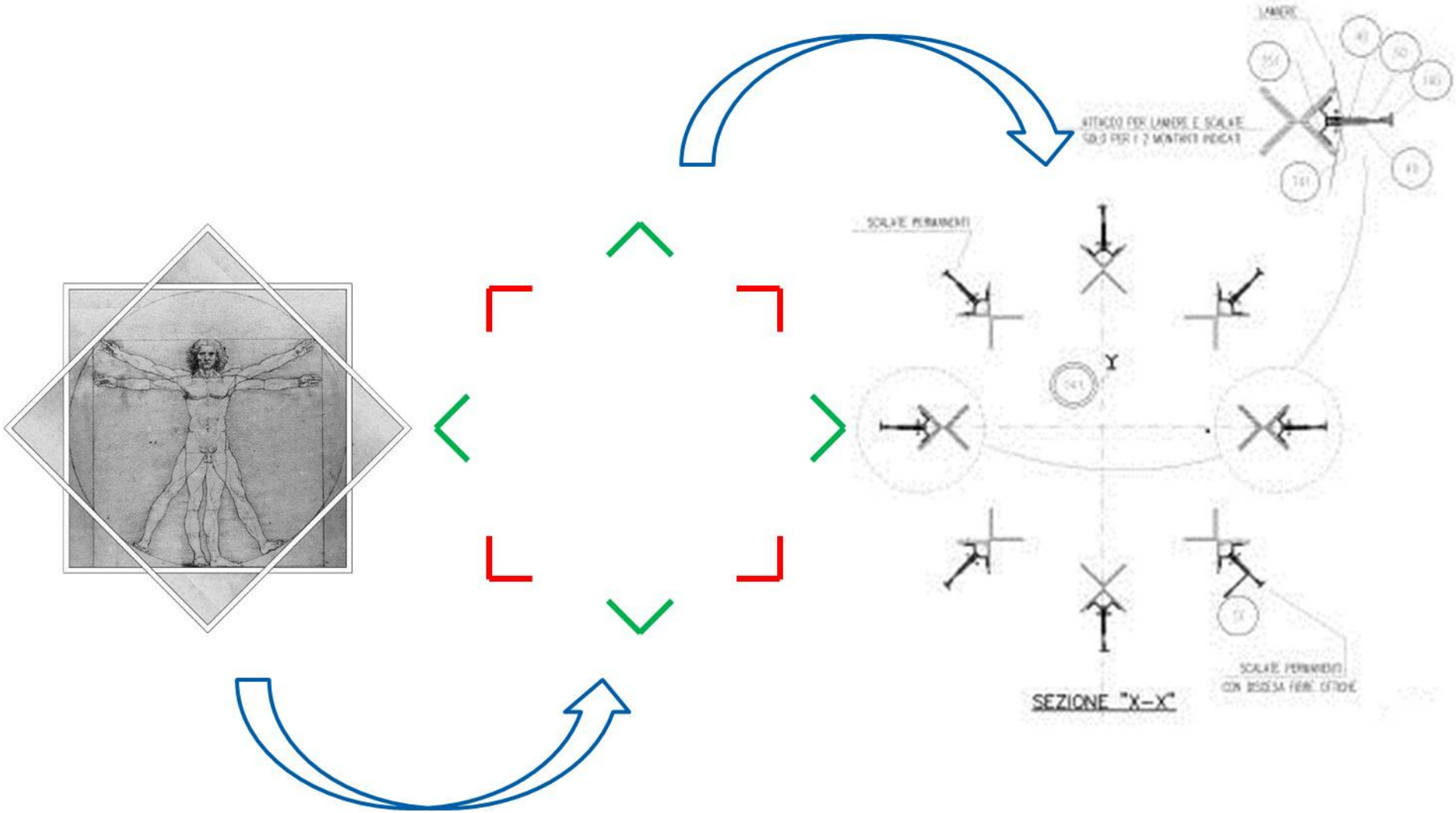
Dutton “*Germoglio*” towers

2013

OHL towers design criteria

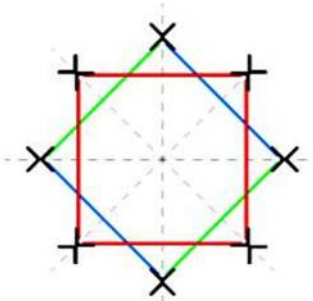
- Technical requirements (electrical and mechanical)
- National regulation / International standards
- Qualification / construction
- Transportation / installation
- Environmental impact
- Aesthetic
- Reduced soil utilization
- OHL life cycle
- Cost

“*L’uomo Vitruviano: homo ad quadratum et ad circulum*”



Vitruvio towers. Main features

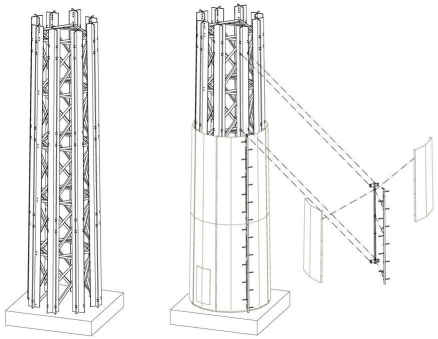
- Geometry →



- Connections →

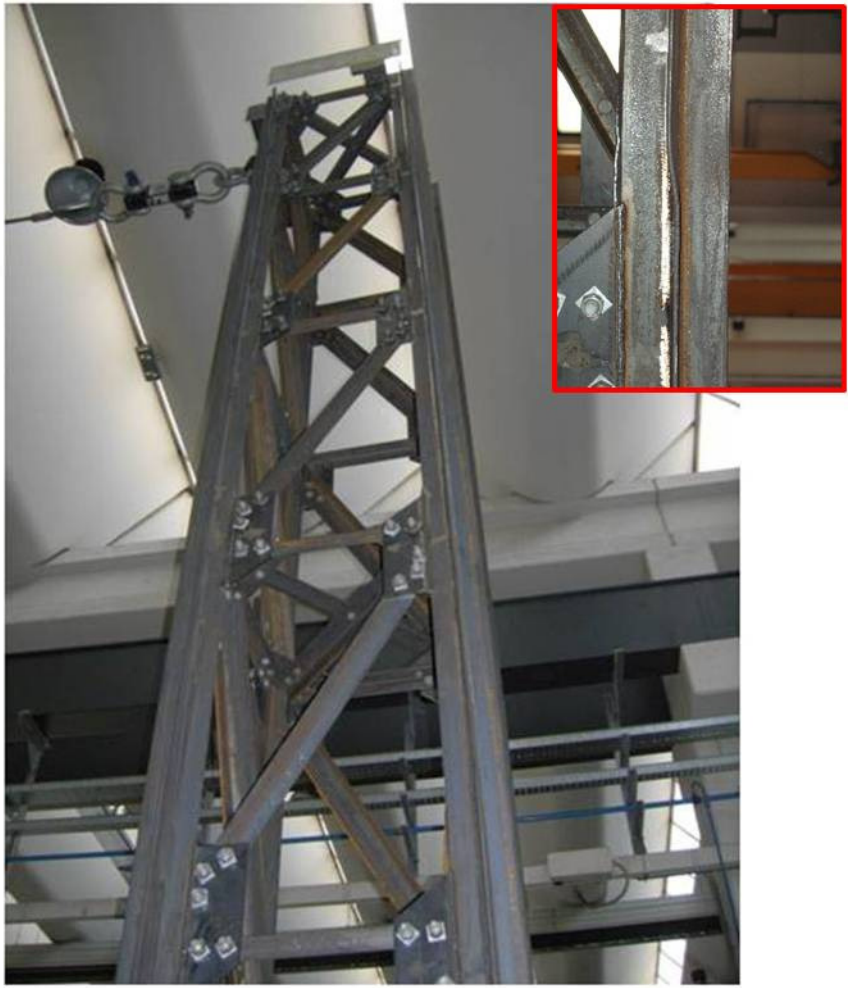
- Materials → **high strength steels**

- External cover →



Vitruvio towers. Bolt Vs. weld: scale prototype

Bolted connections

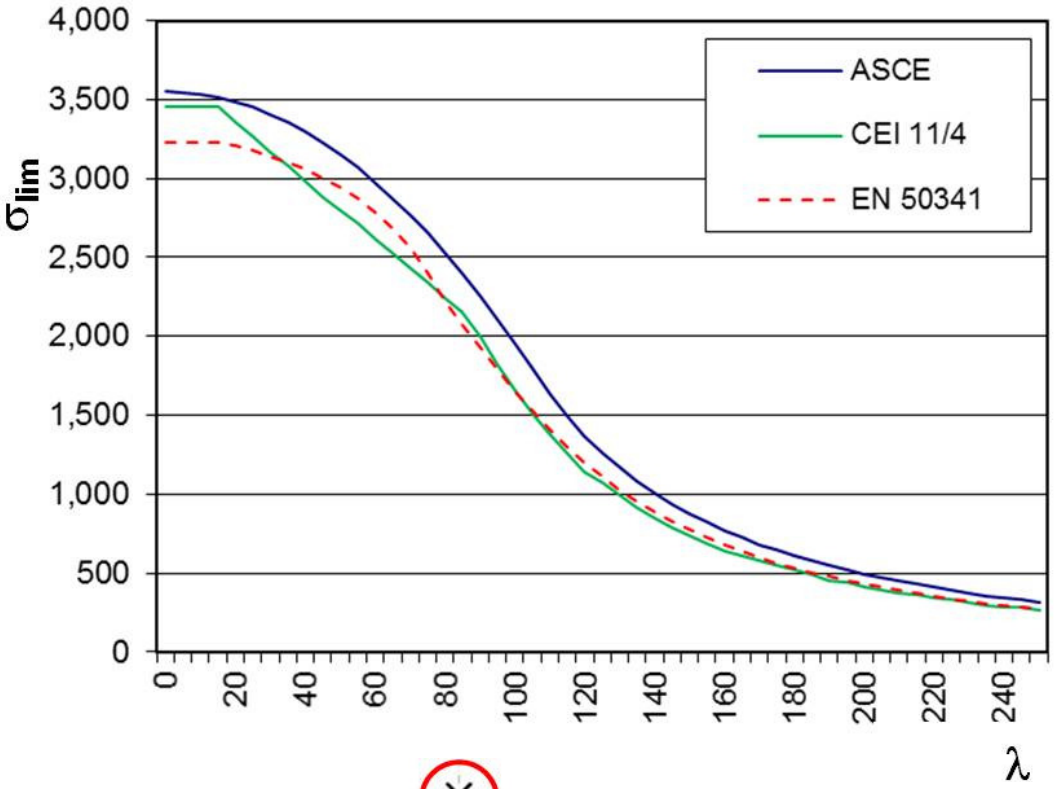


Welded connections

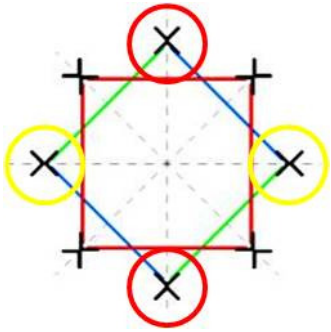
Vitruvio towers. High strength steels

Reference standards

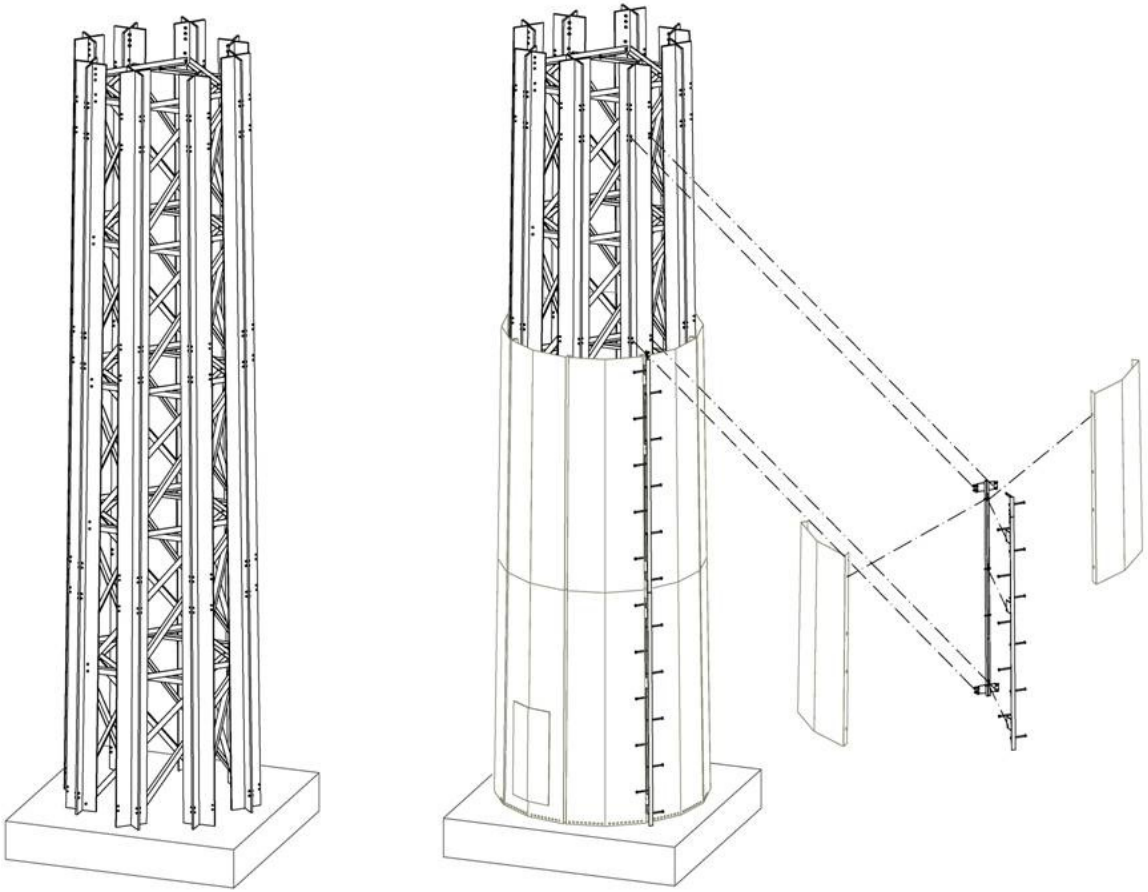
- CEI 11-4
- CENELEC EN 50341
- EN 1993-1-1
- ASCE 10-97

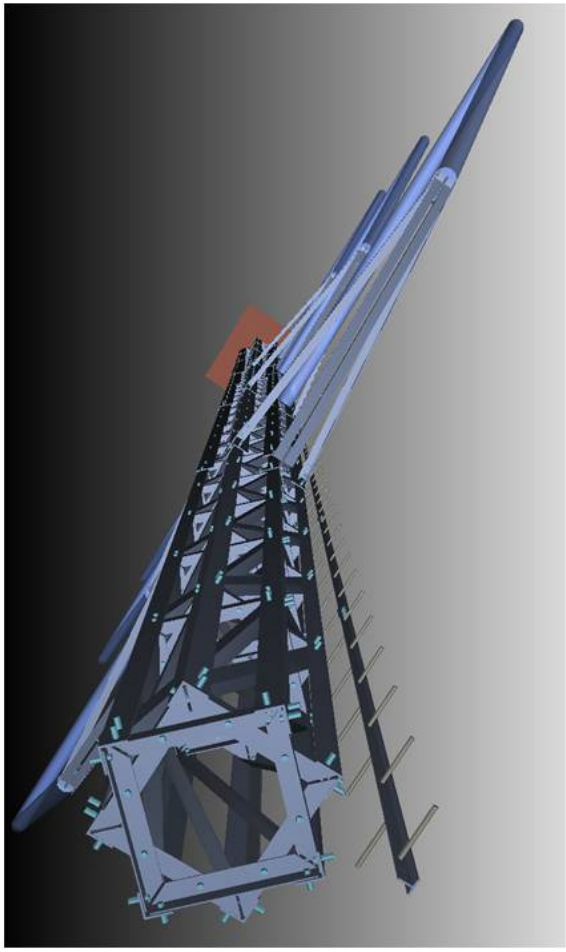


S355JR → { S420N, S460N }



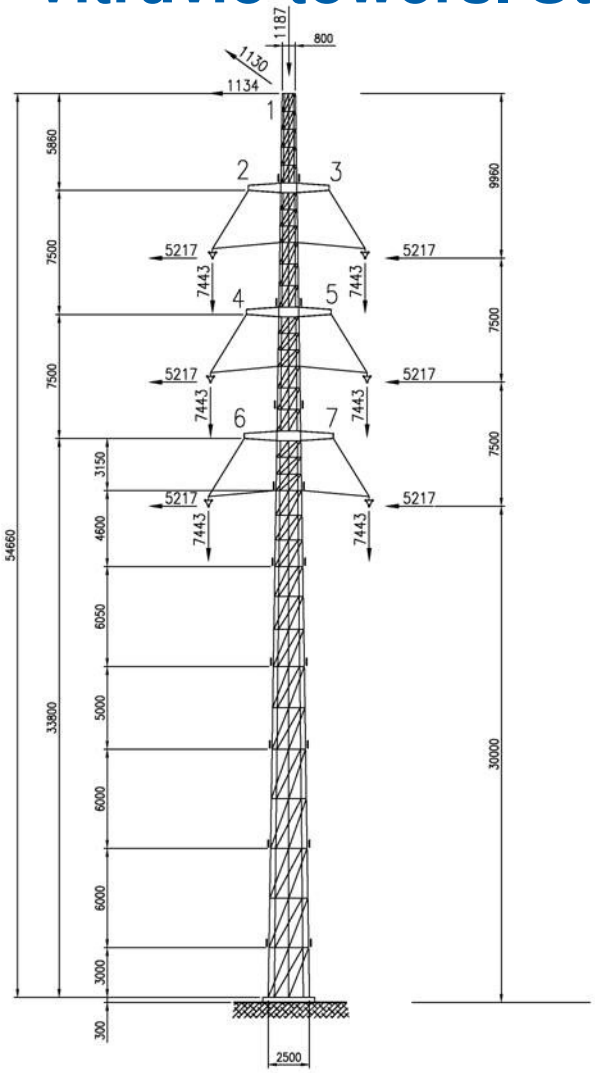
Vitruvio towers. Structural design



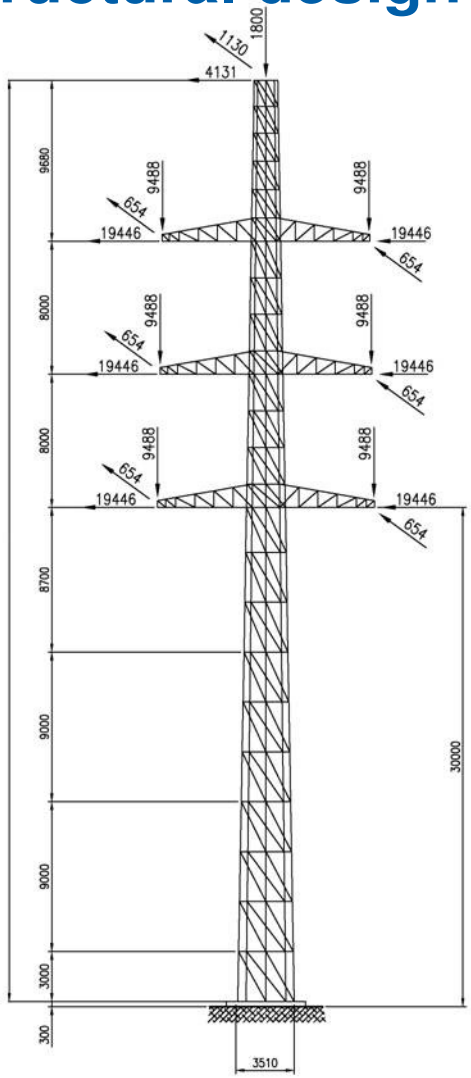


External cover

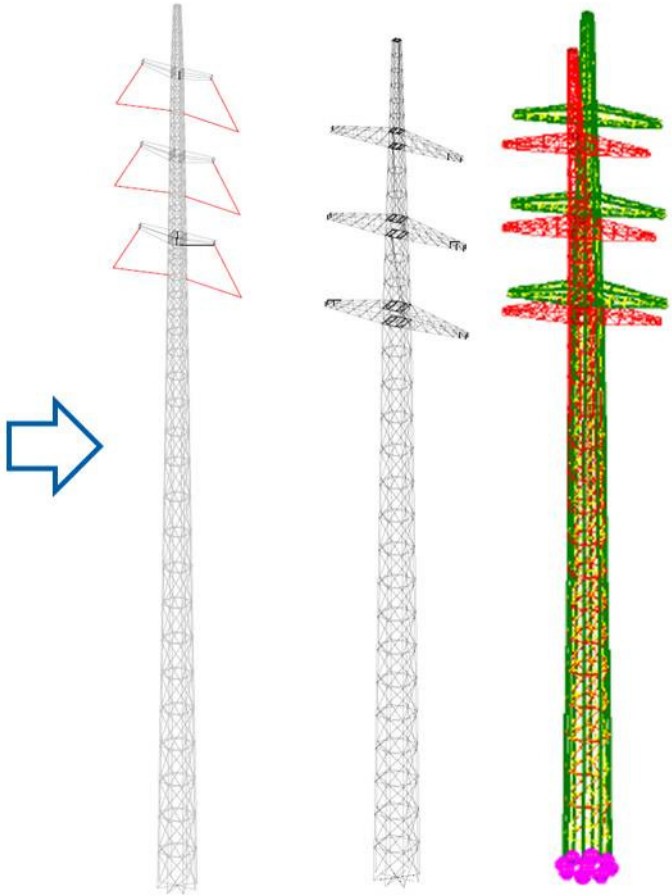
Vitruvio towers. Structural design



Suspension tower



Tension tower



FEM models

Vitruvio towers. Full scale test

Insulating cross arms suspension prototype

- Type tests during production

- Deflection check

- Global Resistance + strain gauges verifications

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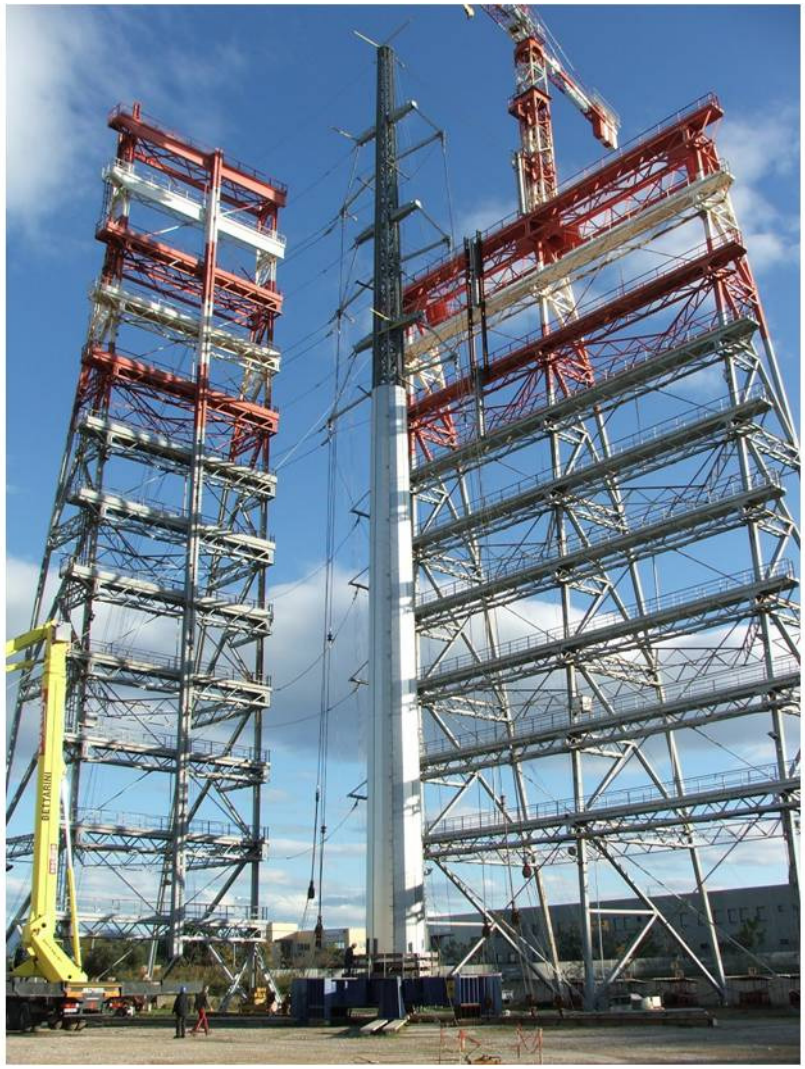
load condition of CEI 11-4 applied according to IEC 60652

Vitruvio towers. Full scale test

Vitruvio towers. Full scale test

T loads



P, L loads

Load test with partial cover

Vitruvio towers. 380kV double circuit OHL Villanova-Gissi

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