

Conference Applications of Structural Fire Engineering Prague 29, April 2011



decivil universidade de aveiro
departamento de engenharia civil



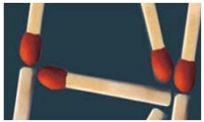
Evaluation of the fire resistance of the steel structure of a waste treatment plant using structural fire safety engineering

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Fire scenarios



Evaluation of the Fire resistance of the steel structure of a waste treatment plant in Gaia (Portugal)

Scenario 1



Scenario 2

Scenario 3



Fire scenarios

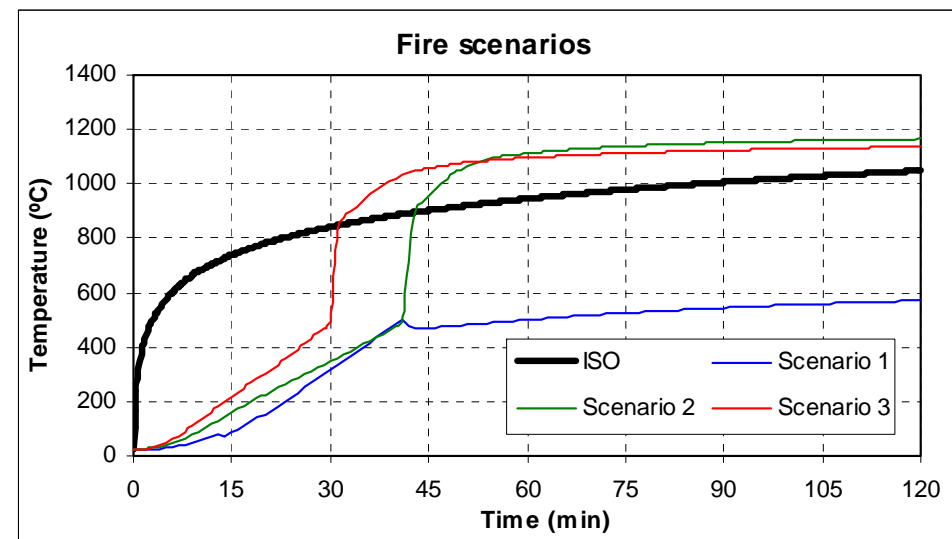


□ Compartment fires

- Natural fire considering 1 or 2 zone models (Ozone v2.2)
- Compartments height 7.8 m (Post-composing) and 12.1 m
- No openings variation
- Fast fire grow rate
- $RHR = 500 \text{ kW/m}^2$
- Fire density $q_{f,k} = 4960 \text{ MJ/m}^2$

□ Localized fires

- $RHR_f = 500 \text{ kW/m}^2$
- Fast fire grow rate





Mechanical analysis

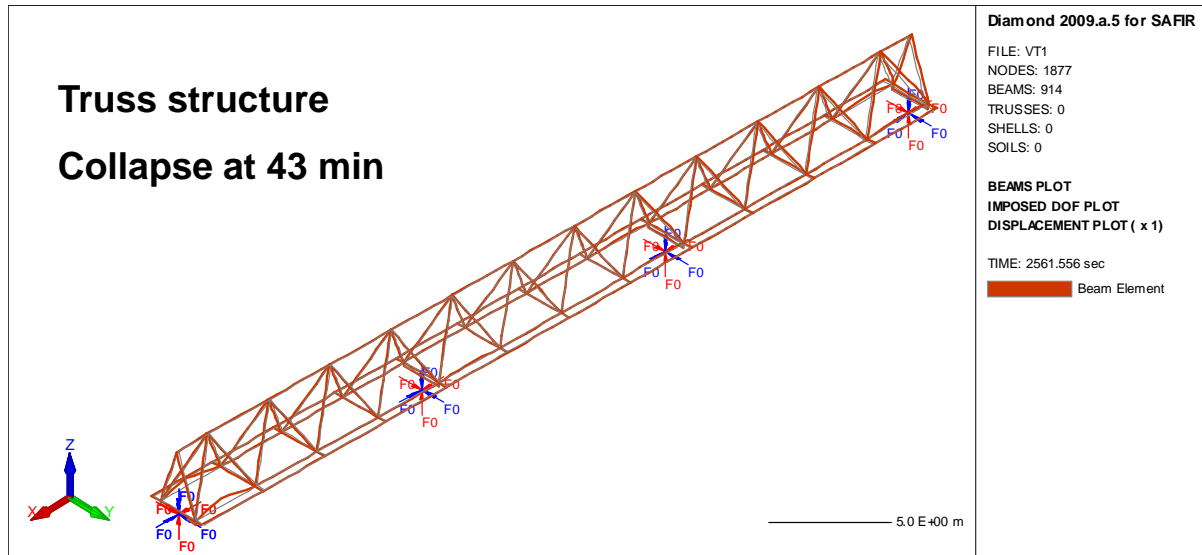


Scenario 2



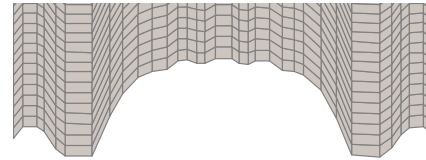
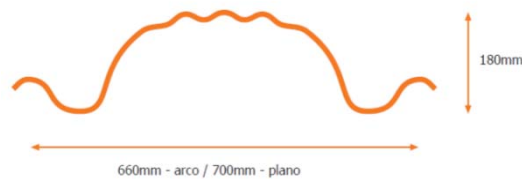
SAFIR

**Truss structure
Collapse at 43 min**





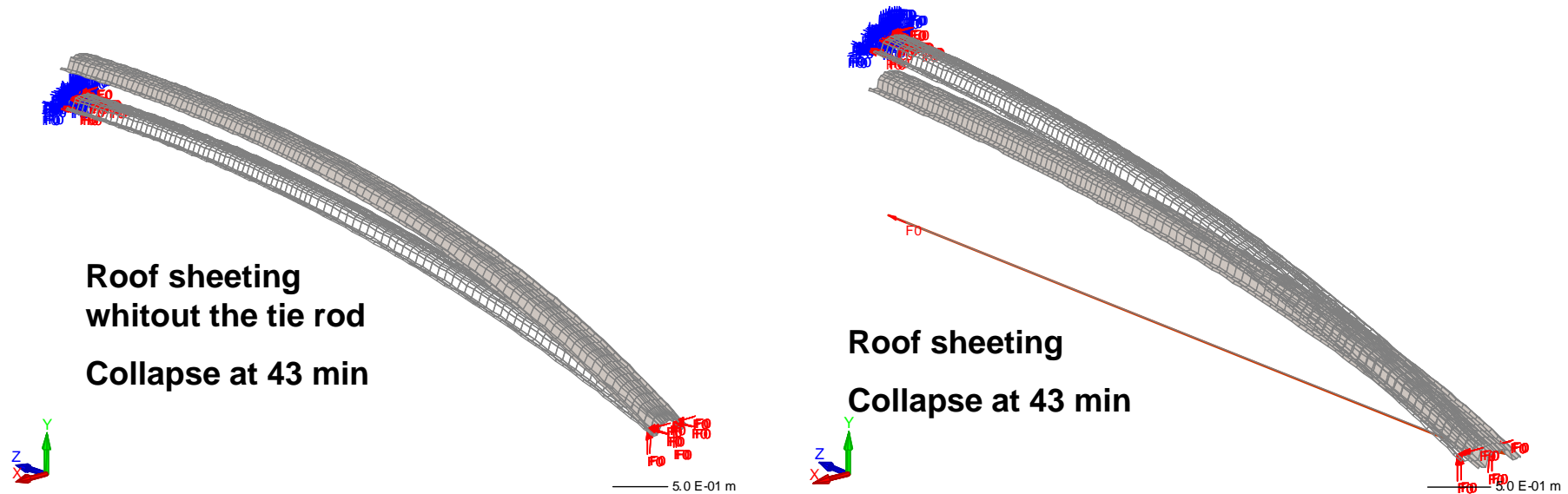
Mechanical analysis



Scenario 2

SAFIR

self-supporting roofs composed of thin-walled cold formed steel sheeting, which had to be analysed using finite shell elements (BNTA 700) with thickness of 1.12 mm



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Thank you for your attention



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