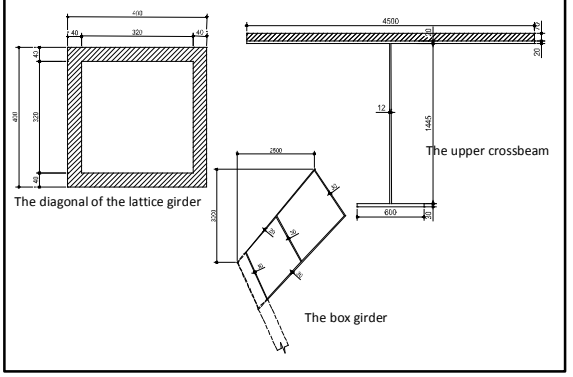
Thermal Analysis of a Double Deck Viaduct

Dan Pintea

Prepared for COST TU0904
Chania 14-15 October 2011

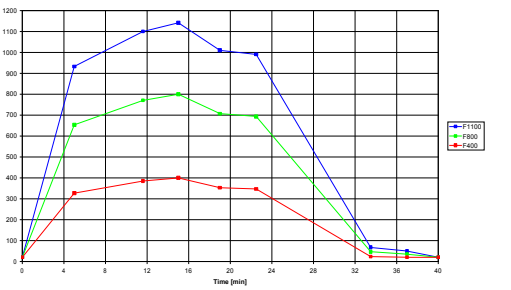
Structural Elements Tested



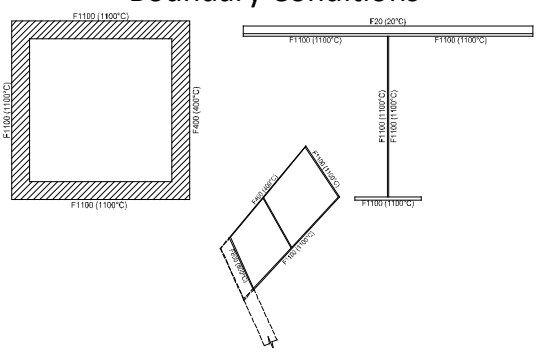
Materials

- The material laws and physical principles are based on the Eurocode 1993-1-2 and 1994-1-2
- On the upper crossbeam the sheathing is assimilated to a siliceous concrete water content of 26 l/m^3
- The protection material that is used for the protected simulations, PROMATECT, constant specific heat and density linear conductivity

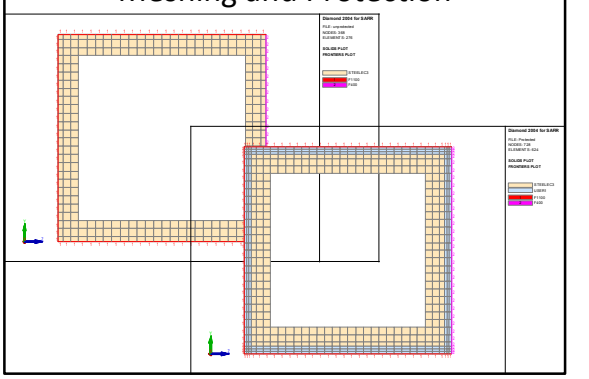
The Fire



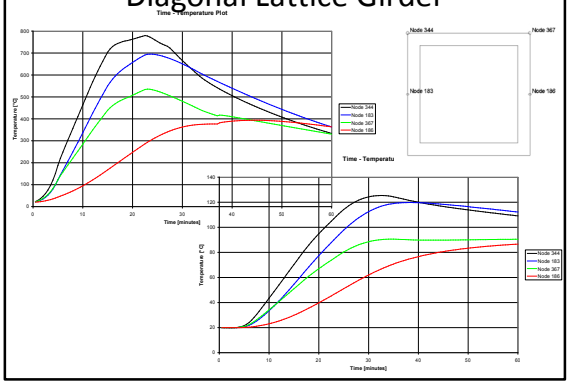
Boundary Conditions



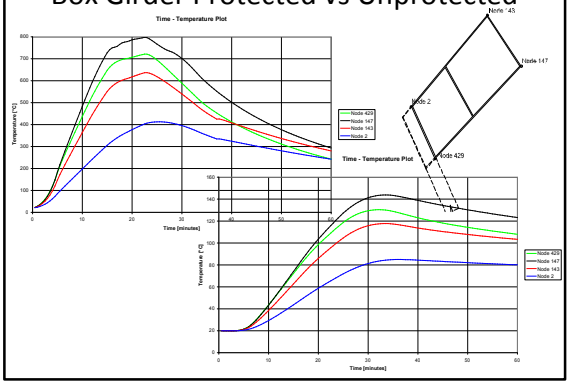
Meshing and Protection



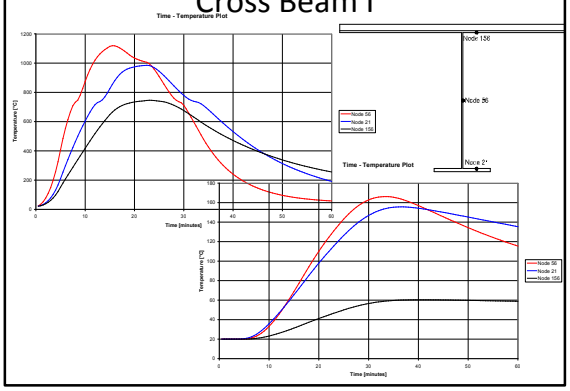
Diagonal Lattice Girder



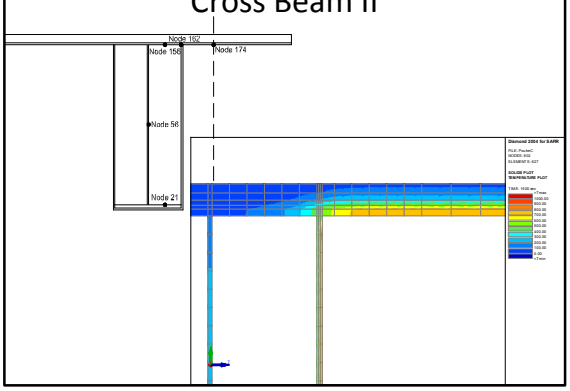
Box Girder Protected vs Unprotected



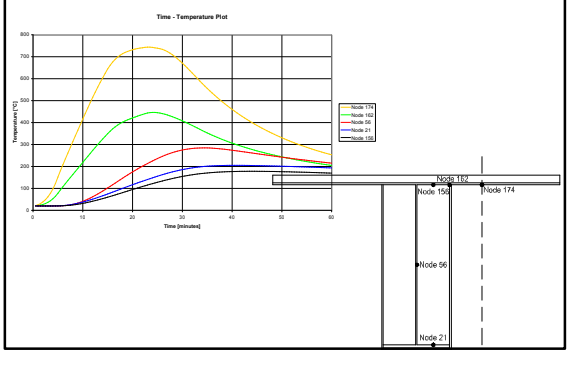
Cross Beam I



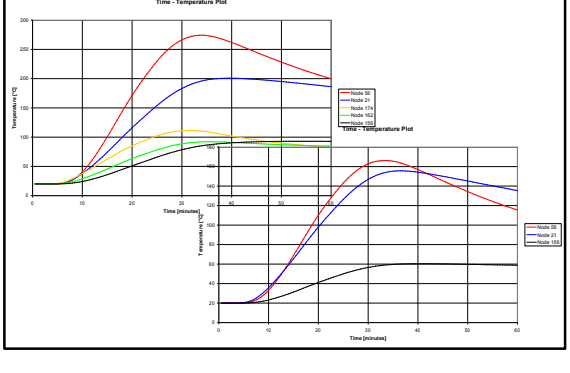
Cross Beam II



Cross Beam II



Cross Beam II Continuous Protection



Conclusions

- The complete thermal analysis of a double decked viaduct was presented
- Different fire scenarios were taken into account from severe to mild
- Several protection solutions were studied to achieve a maximum fire protection with a minimum cost