

Extending the Lifespan of the Luiz I Bridge – Porto, Portugal



Type: Railway (in addition to existing Roadway)

Location: Porto, Portugal

Completion Date: September 2005

Owner: Metro do Porto S.A

Engineering: GRID S.A

General Contractor: Soares da Costa S.A

Steel Fabricator: Socometal

- 390m long upper deck supported by seven piers and an arch with a span of 174m for a rise of 45m

- The shape of original elements reflects its structural function, an aspect to be preserved

- New steelworks material - 1100 tons (10% for solving damaged parts)

Structural Analysis and Design:

- detailed geometrical survey

- existing material: improved wrought iron (84 kN/m^3)

- tensile tests: $E=192.7 \text{ kN/mm}^2$, $\nu = 0.25$, $f_y= 160 \text{ N/mm}^2$

- static and dynamic load tests

