Ingenieursbureau Stendess N.V.

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Ingenieursbureau Stendess N.V., a steel and concrete engineering company

The engineering firm Stendess was founded by an experienced team specialising in the study and design of steel constructions. From its establishment Stendess has made high quality and full service provision its top priority. Thanks to this integral service, where the design of the metal superstructure and the concrete substructure are calculated and drawn by experts in the same office, the building owner and principal contractor retain 100 % control over the complete structure.

Stendess can follow up on cross-border projects in accordance with most standards and codes: Eurocode, NBN, NEN, DIN, NF, AISC, British Standards and specific national codes.

Key activities

- Industrial buildings: steel factories, power plants, depots, etc,
- Other buildings: service buildings, concert halls, sport facilities, swimming pools, apartment buildings,
- Bridge constructions: arch bridges, cable –stayed bridges, suspension bridges, bascule bridges, swing bridges, orthotropic bridges, mixed steel-concrete bridges…
- Off-shore projects: lock gates, Roro, oil rigs…
- Industrial equipment: silos, cranes, crane ways, storage tanks…
- Erection engineering: longitudinal and transverse repositioning, skidding, lifting, bridge launching…

Locations of the constructions: Belgium, the Netherlands, France, Germany, United Kingdom, Spain, Sweden, Saudi Arabia, Greece, Singapore, Chile, Brazil, Cameroun, Russia, Thailand…

Short Description

Lock complex, Evergem

The lock complex of Evergem (situated near Ghent) lies on one of the busiest water routes in Belgium. To maintain a safe and reliable passage of cargo- and leisure-ships on this important junction, the government decided to update the complex. As a part of this update, 12 lock gates had to be replaced.

Project Information

Owner: Waterwegen en Zeekanaal N.V.
Architect: AMS
General Contractor: Aelterman, Belgium
Engineering Office: Ingenieursbureau Stendess N.V.

Construction Start: 2007
Construction End: 2008
Location: Evergem (Ghent), Belgium

- Total steel weight: 12 lock gates weighing ± 62 tons, amounting to 744 tons in total
- Dimensions: Height: +/- 8, 40 m
- Overall length: +/- 14, 10 m (total width when closed +/- 25 m)
- Thickness: +/- 1, 50 m

Description of the project

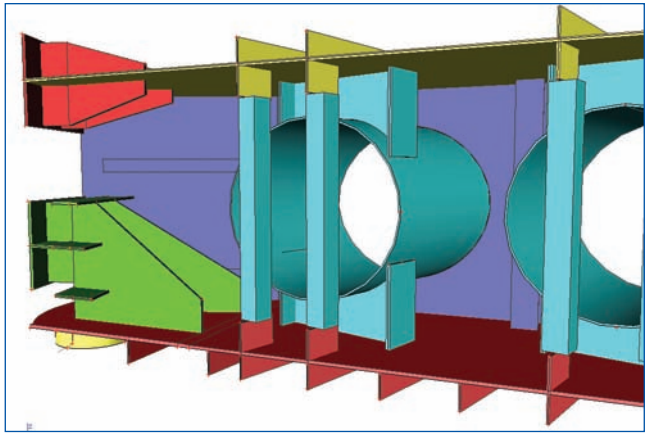
The lock complex of Evergem (situated near Ghent) lies on one of the most heavily trafficked routes in Belgium. To maintain a safe and reliable passage of cargo- and leisure-ships on this important junction, the government decided to update the complex. As a part of this update, 12 lock gates had to be replaced.

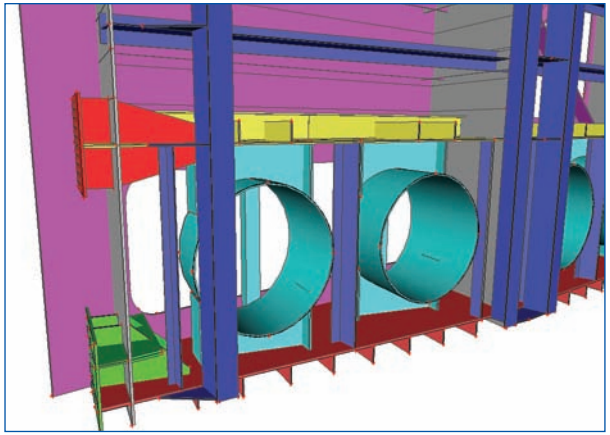
Use of Scia Engineer

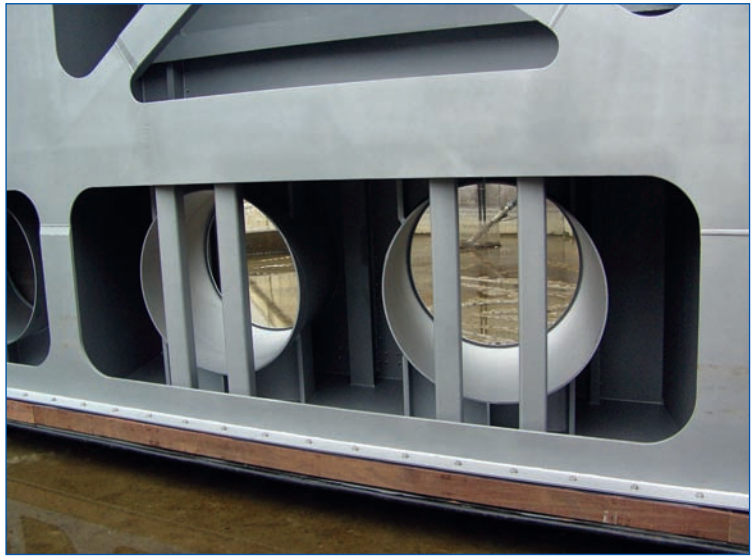
Description of technical questions to be solved with Scia Engineer

The lock gate has a quite complex geometry: the presence of tubes cutting through an inclined plate, the global section is slanted instead of a rectangular box; the presence of an airbox… This complexity necessitated the use of a detailed FEM-model to simulate the real behaviour with all its intricacies. An independent, simplified beam-model was used to double-check the veracity of both models.

The low ratio between height, width and rise disrupted the normal working, in a three-hinged arch. Due to tension occurring on the concrete abutments,







Used software: Scia Engineer

a non-linear calculation was performed to simulate the real behaviour of the gate.

Description of our experience with Scia Engineer with the realisation of this project

The ease of use of Scia Engineer.
Scia Engineer proved its worth when creating a FEM-model of significant complexity. Due to the instinctive and extensive possibilities when creating, manipulating and altering such a model, Scia Engineer really made a difference.

The different modes of visualisation (layers, saved selections containing shells and bars, cutting box…) really made it possible to keep an oversight and select the most appropriate visualisation in function of what the engineer wanted.

The new document-functionalities (in comparison with prior software) also made the compilation of the results significantly easier. The possibility of copying and altering a given resulttable was used to great effect, just as the possibility to generate data in function of a collection instead of manually creating the data for every element within the collection.

These advantages greatly outweighed the somewhat more cumbersome resultquerying (time needed to visualise results).

Used modules

- Base
- Shells
- Non linear calculations