

POLYTECHNIC OF TORINO
FACULTY OF ARCHITECTURE
Degree in Architecture
Honors theses

**The former "Officine Ferroviarie" Buildings of Turin: metallic structure.
Analysis of the lathes room**

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Symbol of the city's strong growth and development, the "Nuove Officine Ferroviarie" (1884) and their urban setting area, are subjected to a deep analysis finalised to their re-qualification and exploitation.

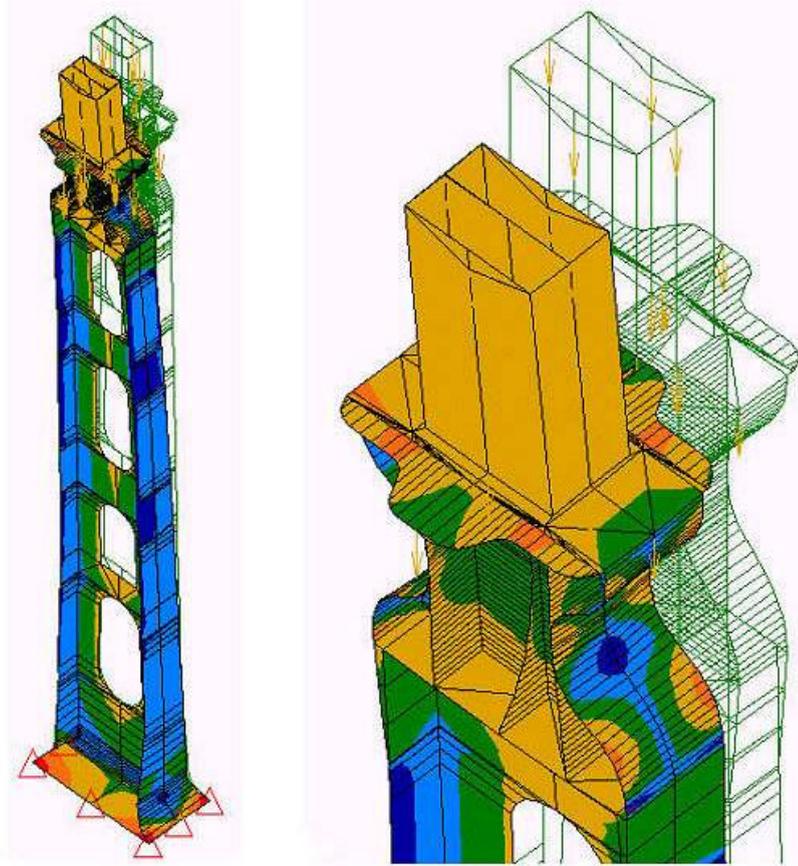
The aim of our degree thesis is to evaluate, within the railway workshop plant, the lathes room structure reaction to external stress conditions, appraising in this way their real effectiveness.

The Turin former Officine Ferroviarie

The building load-bearing function is performed by both the external walls, consisting in a typical masonry, and the inner metallic skeleton. These facilities, externally hiding their structure, are still linked to old fashioned decorating modes.

The contemporary presence of new and old building techniques represents the most interesting aspect of the Officine Ferroviarie research: on one hand the need of using new technologies in building facilities must be satisfied, on the other hand there is the inability to host them in aesthetically advanced structures. The Nuove Officine Ferroviarie are symbolic of strongly characterised architectures, which were able to hide building technologies, coming from different European countries, behind forms and colours surely belonging to our culture and utilising typical local building materials.

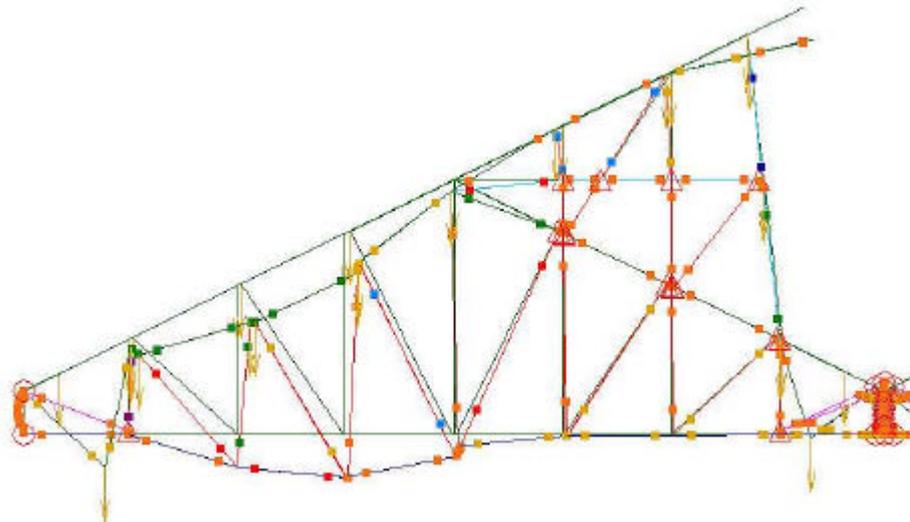
Local architectures are re-proposed as strongly integrated with modern European building techniques but unable to independently express equally modern concepts.



The Finished Elements Analysis (F.E.A.): a method for the Structural Analysis

The model has been created with the aim of studying the structure static behaviour when stressed by loads and, in the meanwhile, of assessing its compliance with the effective regulation.

The analysis were performed using the software ALGOR-SUPERSAP, whose usefulness consisting mainly in giving immediate visual evidence to tensional and deformation effects by means of a colour scale allowing the immediate representation of the structure static status.



Our calculation model originates from a careful study on the metallic structure of the lathes room. The building metallic structure is composed of three main elements: the pillar, the beam and the truss.

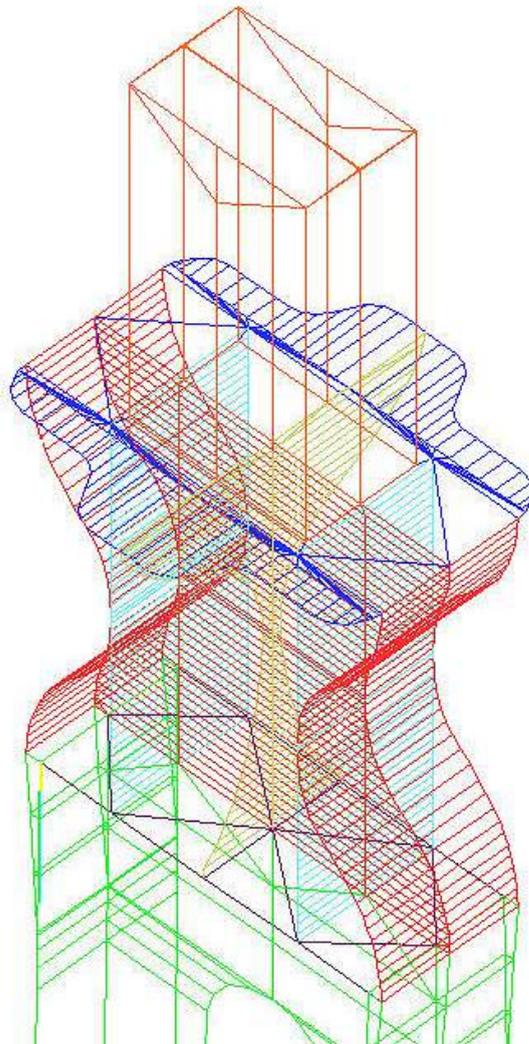
The curvilinear course of the cast ironed pillar greatly differ from the beams and trusses linear ones. It is easy to understand the influence of these differences in developing our model.

Taking into account these two variables, two parameters has been introduced:

- Beam
- Plate

The first one was used for beam and truss design, while the second was used for pillar and capital design.

In order to better understand the static reaction of these components, a striped coloured differentiation has been created and, when requested by the geometric element (i.e. capital), opportunely strengthened (marked).



What results from the structural analysis is that the Officine Ferroviarie lathes room has been designed using rational criteria consisting in controlling the maximum figures of traction and compression stress. Because of this we can state with

reasonable certainty that the metallic structure, greatly oversized designed, fulfils the contemporary regulatory requirements.

The Politecnico di Torino functional re-qualification project on lathes room results particularly suitable both for the satisfaction of the need to empower didactic tools and for the evidence given to the importance of preserving old architectures as a heritage for present times.

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