

**The bell tower of the Cathedral of St. Pietro Apostolo in the Alessandria.
Studies for the maintenance**

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The bell tower of the Cathedral in Alexandria is a monument and a symbol for the city, as the Mole for Turin or the bell tower of S. Marco for Venice.

Projected at the end of 800, from the Arch. Boidi Trotti in eclectic style, the bell tower also introduces innovative structural elements typical of the period of passage between the '800 and the '900 like the metallic cage that is the load-bearing structure of the steeple. In the period in which the bell tower was built, the architecture made use not only of the iron as element accessory for the constructions, for example anchorages and connecting rods, but as real structural element even if often hidden from elements in masonry or in cement conglomerate typical of the traditional constructions.

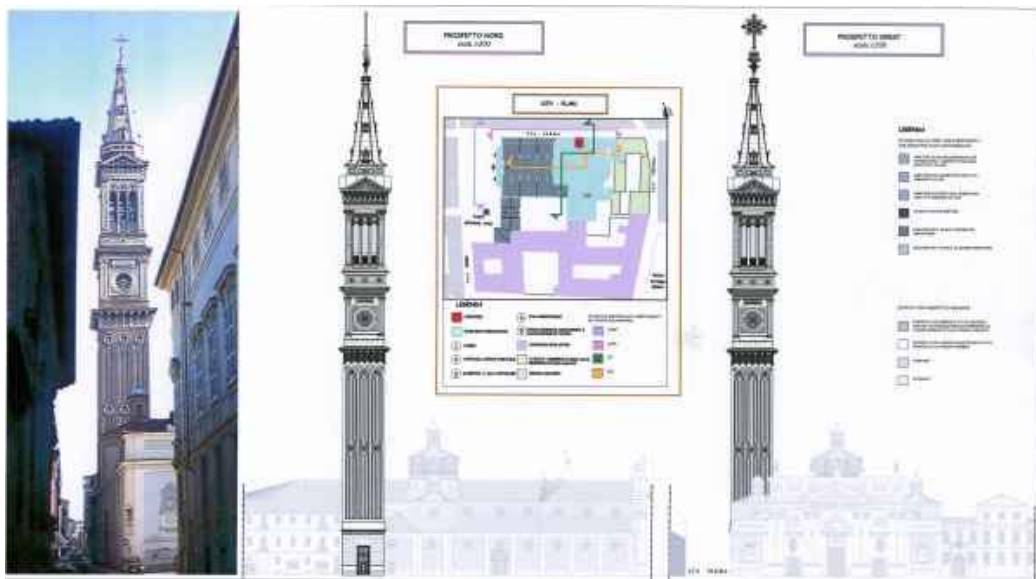
The objective of this thesis has initially been, that of search of the historical documents, for then to assemble the job on the execution of a relief detailed of the bell tower to the purpose to identify, to interpret and to represent the problem list type conservative, with particular respect to the steeple.

To such purpose, the job has been developed for phases:

- a *first phase* of search of historical documents in the archives and libraries in Turin, Alexandria and province, so as to understand well the historical phases of its construction, the purposes and the criterions for which the bell tower has been conceived. The search has brought to the recovery of original documents (section and plant of the bell tower, signed by the Arch. Boidi Trotti and the section and the plants of the diaphragms of the steeple) that have allowed a greater knowledge of the object. From the various recovered historical documents, is learned that the bell tower wasn't realised in a few years like initially was thought, but for lack of funds were employed 33 years: since 1889 to 1922. The search has allowed besides to know with precision the different phases of the construction and the problem list of the yard: in fact were found documents about the used materials, as well as the suppliers of the same and the technique used for building the scaffoldings.

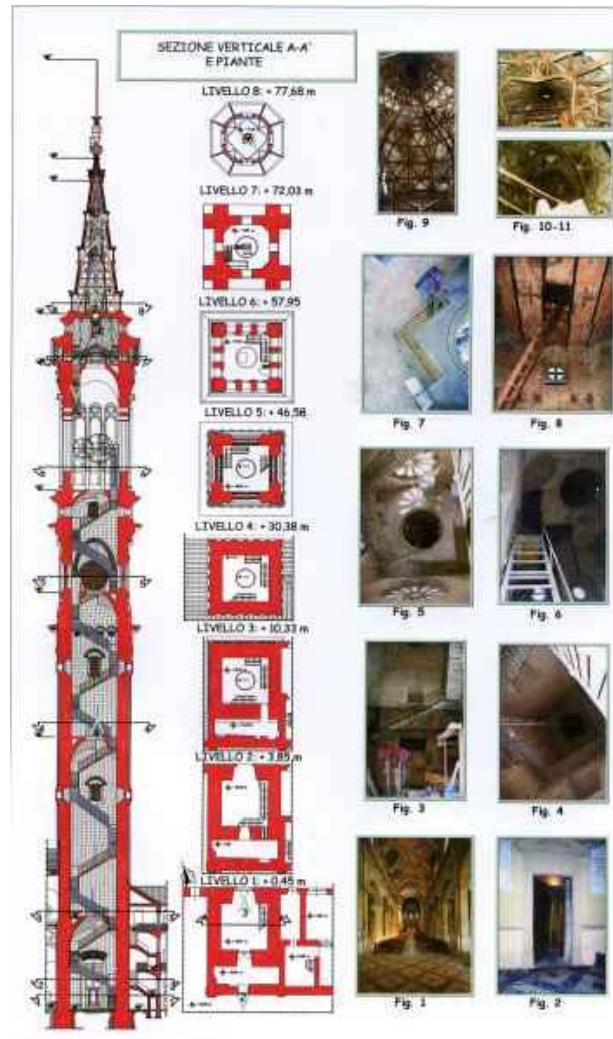
From the comparison between the initial projects and the state of fact, it could deduce what changes were effected in progress of work concerning the choice of materials less appreciated (use of the artificial stone) than those expected initially and the carrying structure of the steeple.

- a *second phase* founded on the relief of the bell tower through measures on site that has allowed to compile the elaborate graphic with computer support, in which were underlined the constructive and architectural element as well outside as insides of the bell tower.
- A *third phase* in which is tried to represent the bell tower with the Cathedral, the urban context (through planimetries, extracts of the P.R.G., etc.) and then contextualize the bell tower with the others and next building (in prevalence ex convent and scholastic structure) through elaborated on the scale of 1:200.



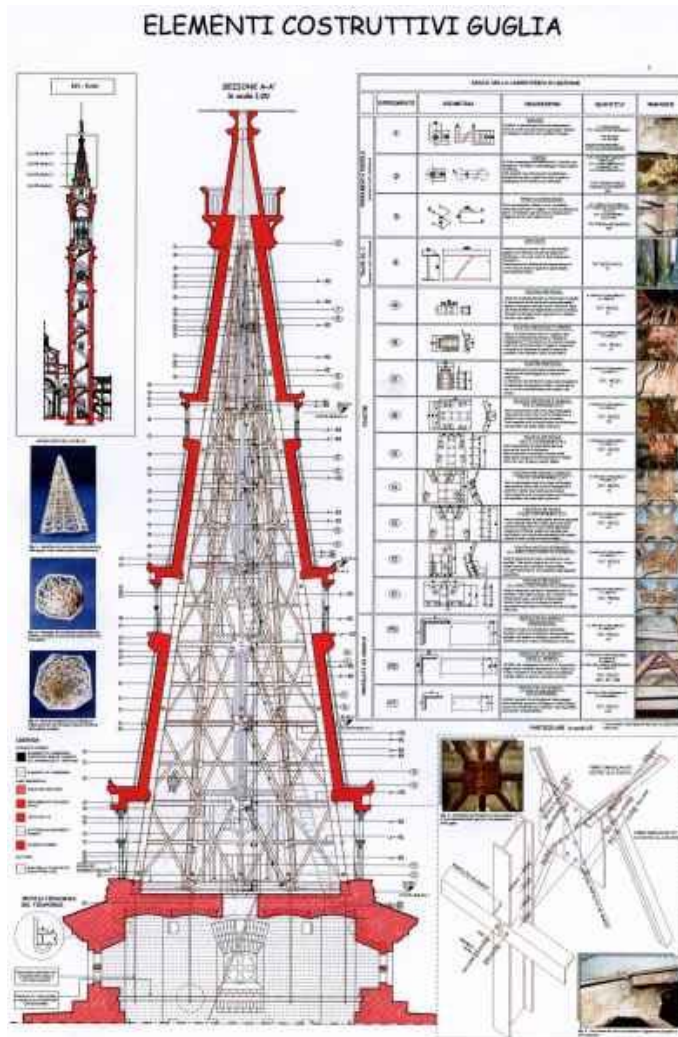
The bell tower of the Cathedral of St. Pietro Apostolo and its principal fronts

- A *fourth phase* of representation more detailed of the inside architectural elements through sections and of its four external fronts (elaborate on the scale of 1:100 and 1:50) with greater respect for the steeple, projected and made to build by the Società Nazionale delle Officine di Savigliano.



Section and plants of the bell tower with relative photos of the inside

For the steeple, a careful consistent graphic reproduction has been performed in to count and represent with care every single element (Scale 1:5) and in to represent the section and the plants for every single diaphragm on the Scale 1:20. This has allowed to understand the principle of operation of the constructive system, the interaction of every single element that united through boltings and hot rivetings, interacts with the others creating a strong metallic cage.



Section of the steeple, abacus of the carpentry and detail of an element

- A fifth phase in which a relief of the steeple is performed with particular attention to the consistence (materials and structures) and to the state of the defects (degrades) and a the end was made a proposal of intervention of a conservative restoration.

From the detailed relief was found that the carrying building structure of the bell tower up to the bell cell is in a good state of maintenance, thanks to the recent restorations that were carried out in the years 1998-1999, while the steeple shows an advanced state of degrade due in prevalence to: the rust, the presence of guano and the damp. Therefore it is essential that is performed as soon as possible an intervention of a conservative restoration.

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