structures

The Structures Department is the technical-operational point of reference for issues relating to the structural design of transport infrastructure and civic buildings on rail and road infrastructures. Its role is crucial for the development of complex and evolved infrastructure projects, where the multidisciplinary component becomes a fundamental element for the success of the project. The team of structural engineers is able to provide design solutions ranging from individual specific works, with their particular characteristics and technical features, to integrated solutions for complex projects relating to the entire linear infrastructure, with a focus on the sustainability of design choices, materials, and partners.
The issue of safety is a priority in any infrastructure project. Our team of structural engineers is on hand to provide both static and dynamic structural analysis services, as well as diagnostics and structural monitoring of works of art, inspections and seismic vulnerability analyses, a topic that is very much in the spotlight in Italy.
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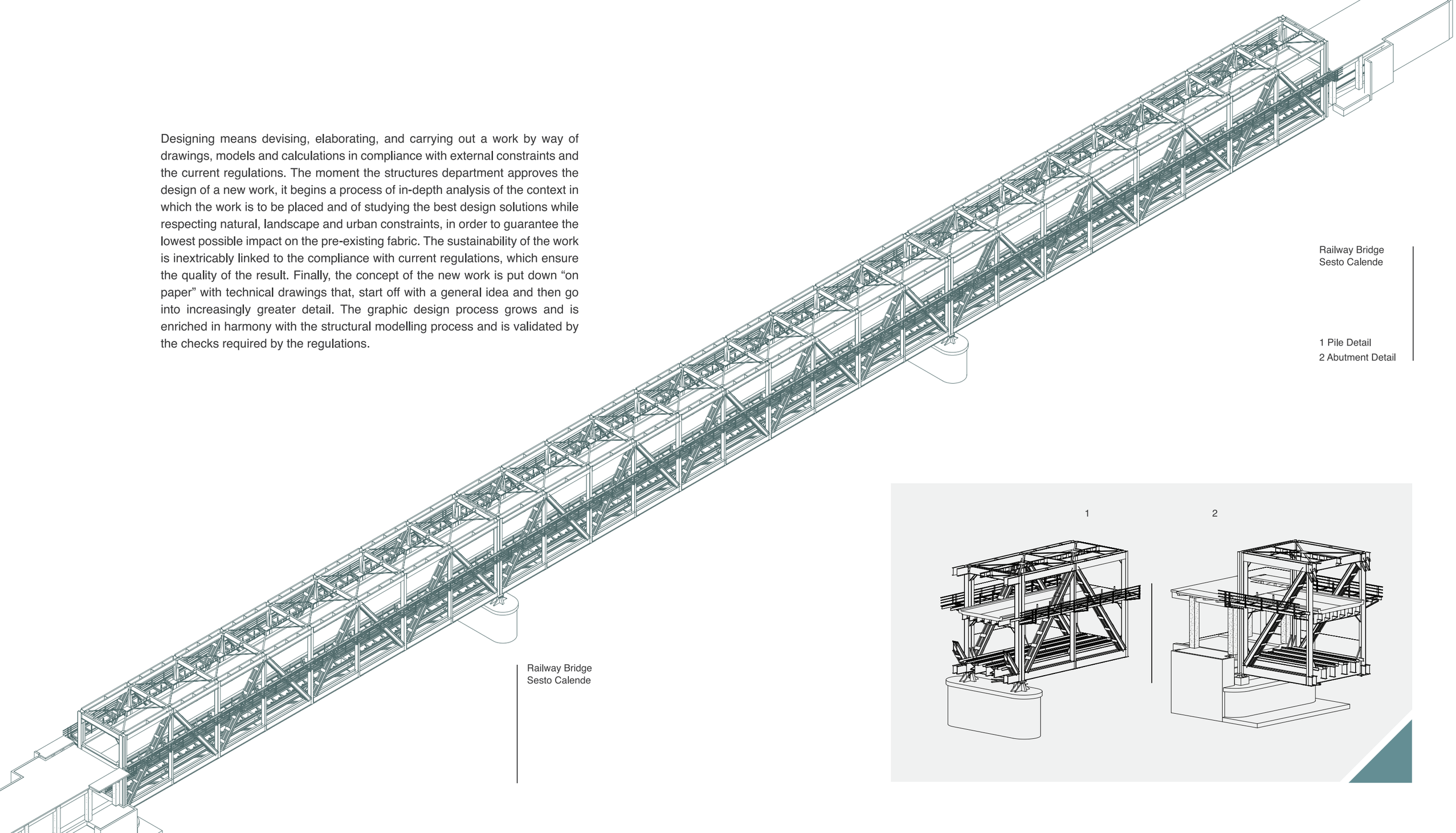
Designing means devising, elaborating, and carrying out a work by way of drawings, models and calculations in compliance with external constraints and the current regulations. The moment the structures department approves the design of a new work, it begins a process of in-depth analysis of the context in which the work is to be placed and of studying the best design solutions while respecting natural, landscape and urban constraints, in order to guarantee the lowest possible impact on the pre-existing fabric. The sustainability of the work is inextricably linked to the compliance with current regulations, which ensure the quality of the result. Finally, the concept of the new work is put down “on paper” with technical drawings that, start off with a general idea and then go into increasingly greater detail. The graphic design process grows and is enriched in harmony with the structural modelling process and is validated by the checks required by the regulations.



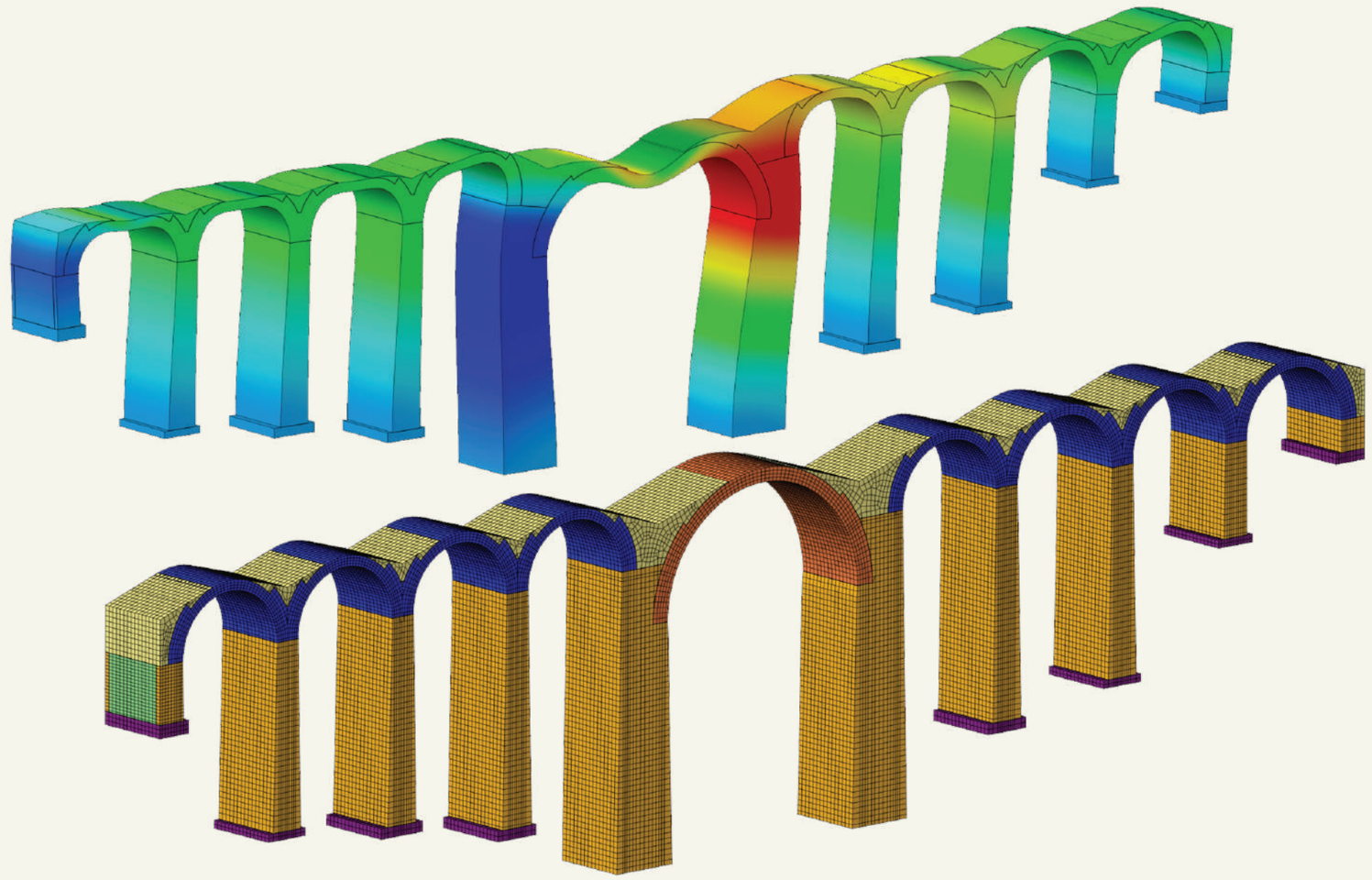
Railway Bridge
Sesto Calende

Railway Bridge
Sesto Calende

1 Pile Detail
2 Abutment Detail

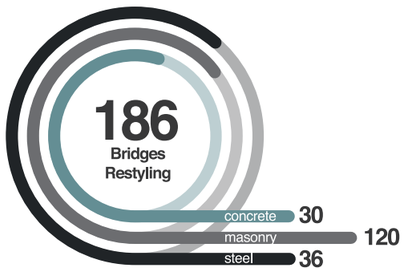
assets & services solutions

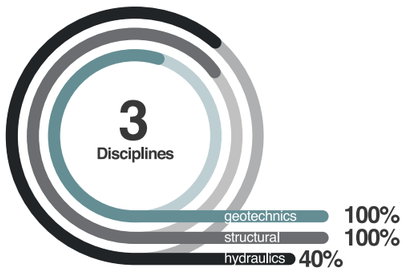
Existing structures are an asset to be preserved and protected, applying all the latest knowledge and technologies to extend their service life. Most of the existing structures on which the Structures Department intervenes fall into the category of historic structures, i.e. more than 70 years old. The first responsibility to these structures is to assess the risk of earthquakes and, when necessary, to provide for reinforcement works using sustainable solutions and materials that respect the aesthetic aspects of the structure. Intervening, therefore, on works of art of a historical nature is complex and entails evaluating technical solutions that take into account the use of new materials in combination with existing materials and technical solutions that are in harmony with the original concept of the work.

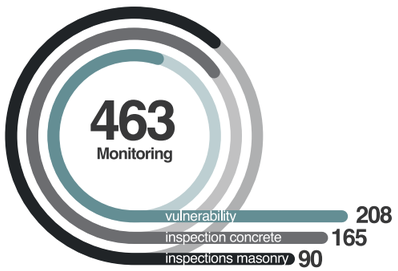


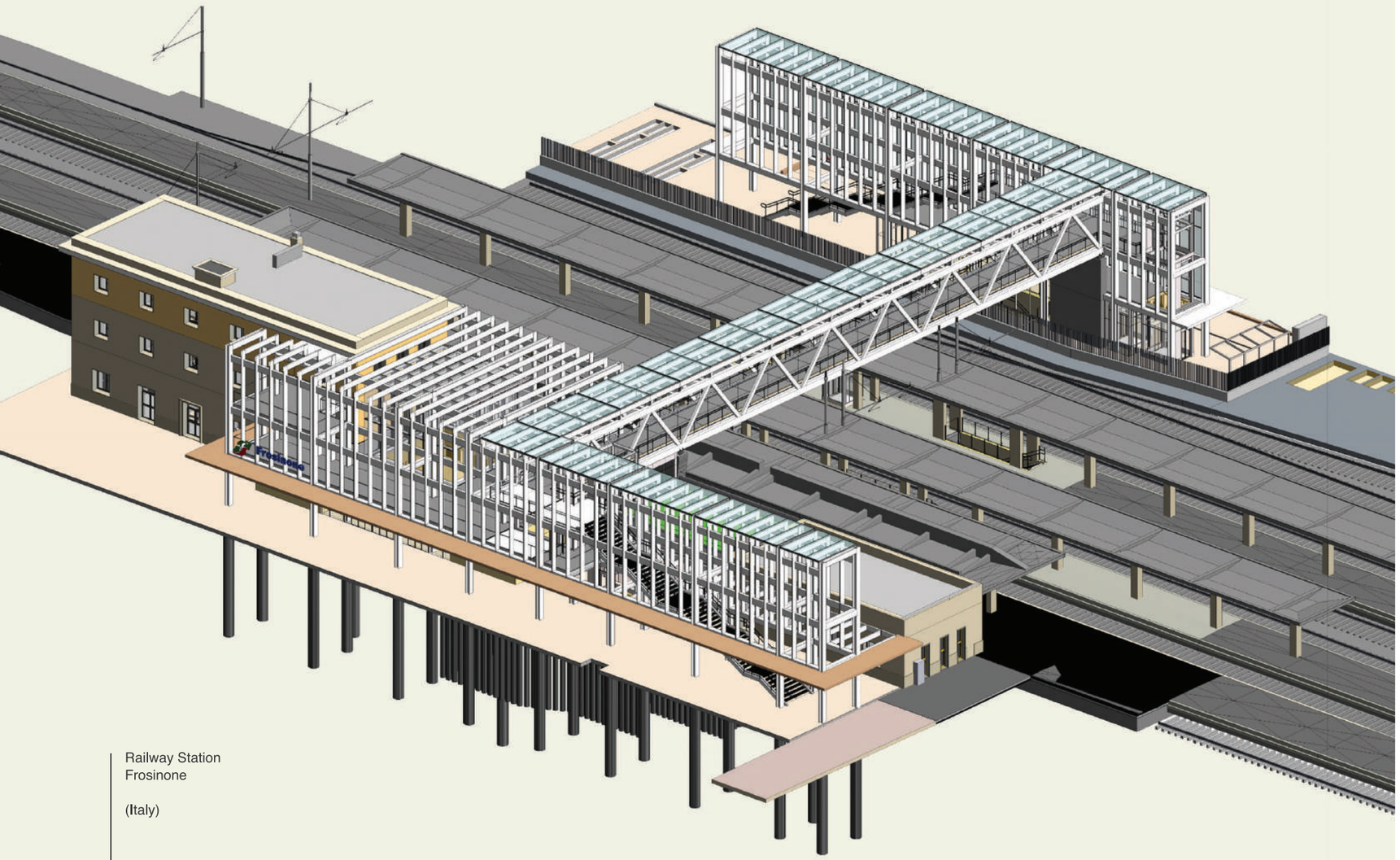
Railway Bridge
Cisano Bergamasco

(Italy)









Railway Station
Frosinone

(Italy)

The observation of repeated behaviour of natural phenomena was the basis for the development of modern science. In the same way, observing the behaviour of a structure under the action of well-defined external forces is the basis for the new discipline of structural monitoring. Monitoring serves two purposes: in the short term, it must ensure the safety of the structure and its users; in the long term, it must increase its service life. Monitoring, the checking and recording of the static and dynamic phenomena to which a structure is subjected, is a necessary means of understanding how the structure responds to external inputs and therefore of understanding where and how to intervene with the measures, whether one-off or large-scale, necessary to extend the useful life of the work itself. Structural monitoring is therefore a new and important tool through which increasingly specific data sets can be obtained, which, when analysed and put together, become tools for designing increasingly precise and sustainable interventions.