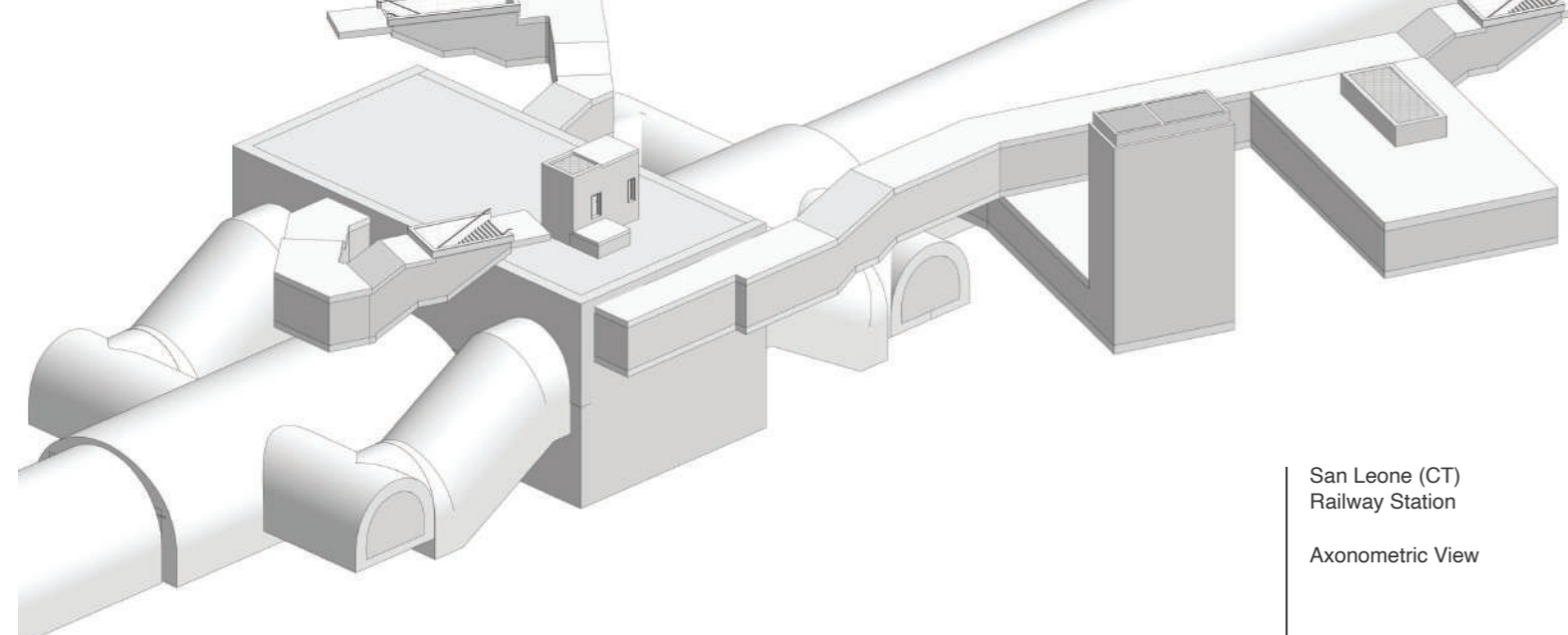


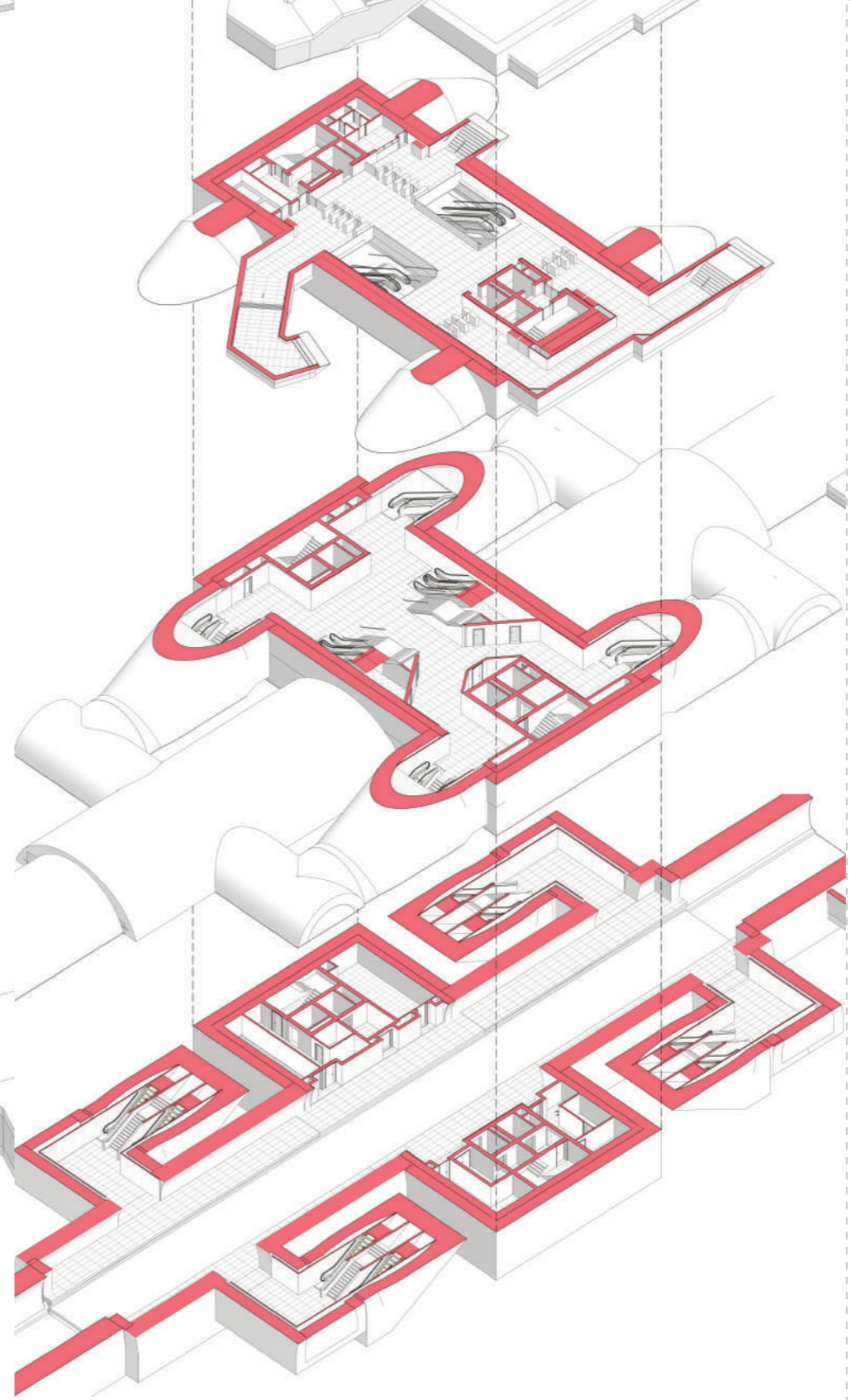
geotechnics geology and hydraulics

The Geotechnics, Geology and Hydraulics (GGH) Department is the point of reference for the design, diagnostics, management services of underground works, geotechnical structures and hydrogeological instability, as well as specialised and advanced studies in hydraulics, geology, geotechnics and risk analysis. The team is made up of specialists in various technical and scientific fields such as engineers, geologists, architects, surveyors, as well as a series of established and profitable collaborations with universities and private partners in Italy and around the world. Innovation, multi-disciplinary skills, expertise and sustainability are the key elements that guide the GGH team in its methodology and design choices, with the aim of finding the balance between People, Profit and Planet, the true driving force of our future.



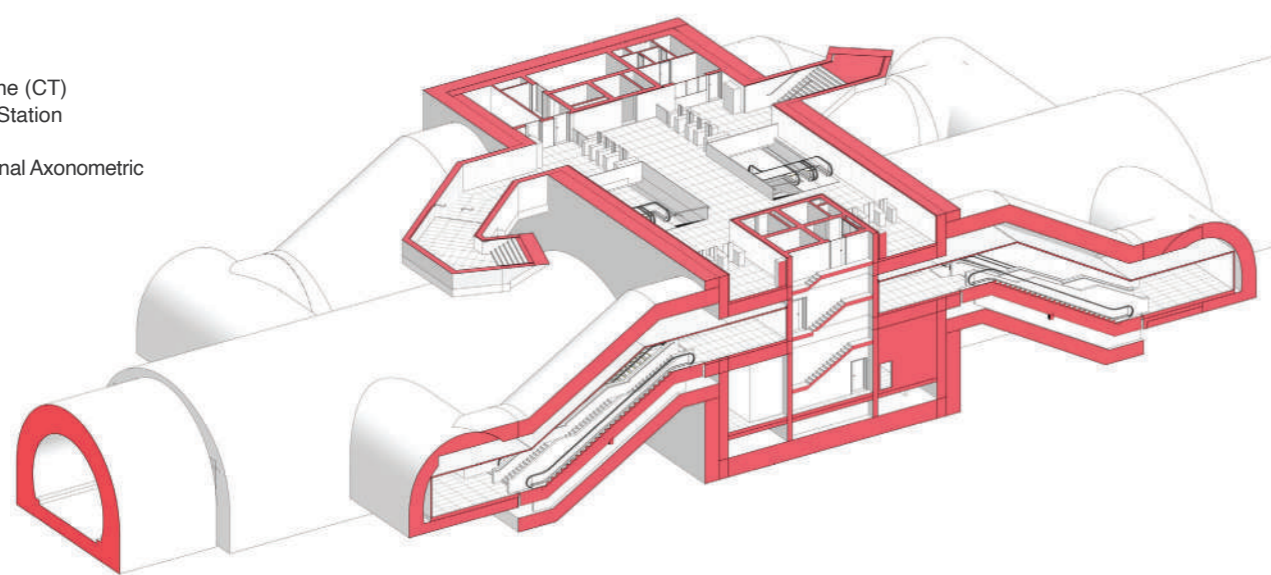
San Leone (CT)
Railway Station
Axonometric View

Expertise in design from feasibility studies to construction, up to site assistance and asset management with BIM tools and innovative methodologies. As part of the project for the extension of Catania underground railway line, in the Stesicoro-Aeroporto section, we provided support for the executive design of three underground stations with the relevant portions of tunnels in a traditional new construction. The complex geological and geotechnical structure of the sites under consideration required specific advice on construction methods, site organisation and the analysis of the infrastructure as a whole, which took full advantage of the Department's multidisciplinary capabilities.



San Leone (CT)
Railway Station
Exploded Axonometric
View

San Leone (CT)
Railway Station
Longitudinal Axonometric
Section



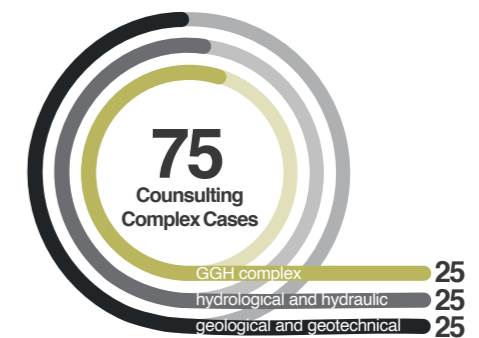
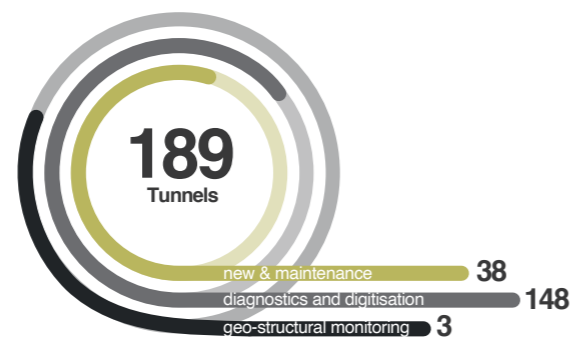
assets & services solutions

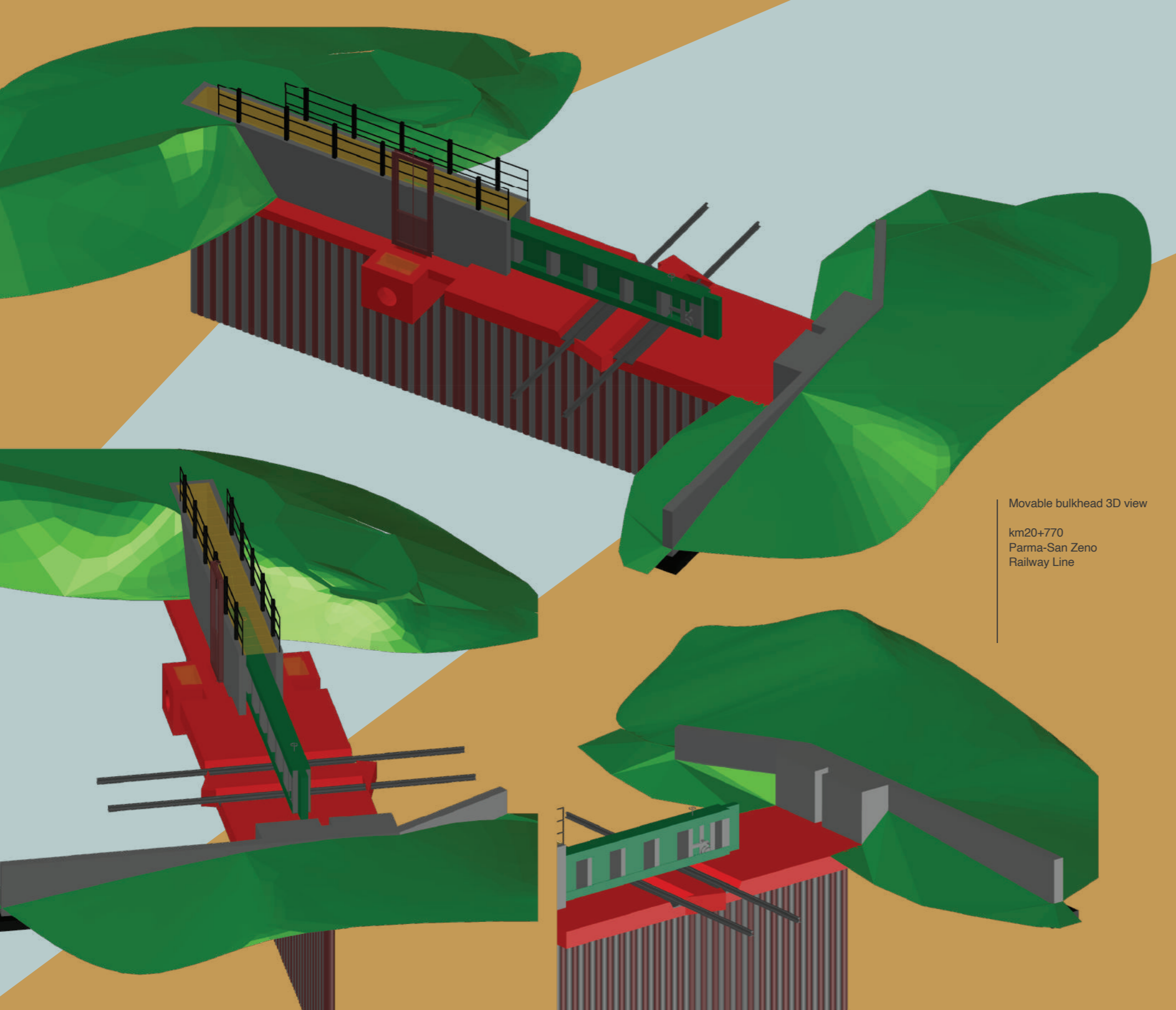
The GGH department is a centre of corporate excellence in innovation, making a major contribution to the promotion of state-of-the-art design solutions, with a focus on the sustainability of the proposed processes and solutions. Considerable effort is devoted to enhancing the know-how and tools for digitisation, risk analysis, works life cycle assessment and advanced numerical modelling. The main assets analysed are pre-existing and new tunnels, underground stations, major works of art and related hydrogeological risk mitigation, and works on infrastructure as a whole.



Section Railway Line

Liguria (Italy)





Movable bulkhead 3D view

km20+770
Parma-San Zeno
Railway Line

The GGH Department carries out hydrogeological and climatic risk analysis and management with state-of-the-art technologies and processes, complemented by the company's Research & Development Department. Innovative methodologies and techniques make it possible to design solutions and management tools to manage complex multi-disciplines over time and on different scales. In the field of river flood risk management in proximity to railway lines, interventions become particularly complex and involve numerous factors of different levels and kinds, up to previously unseen design interventions, such as the design of the first moveable horizontal railway retaining wall in Italy, designed in correspondence with the right main embankment of the River Po, and the design of pier protection structures in the riverbed.