

FEATURE OF TECHNICAL SERVICE

Subject	Executive design, works supervision, laboratory and situ tests for the construction of theme park on marine life and flora, called «Oltremare», in Riccione (Province of Rimini).	
Carried out by	SGAI Srl of E. Forlani & C.	
Client	OLTREMARE Srl	
Service length	2000 - 2004	
Value of works	€ 54'227'974,40	
Categories value	S.05	€ 1'817'928,28
	S.06	€ 7'318'194,27
	D.04	€ 609'419,14
	V.02	€ 2'453'170,27

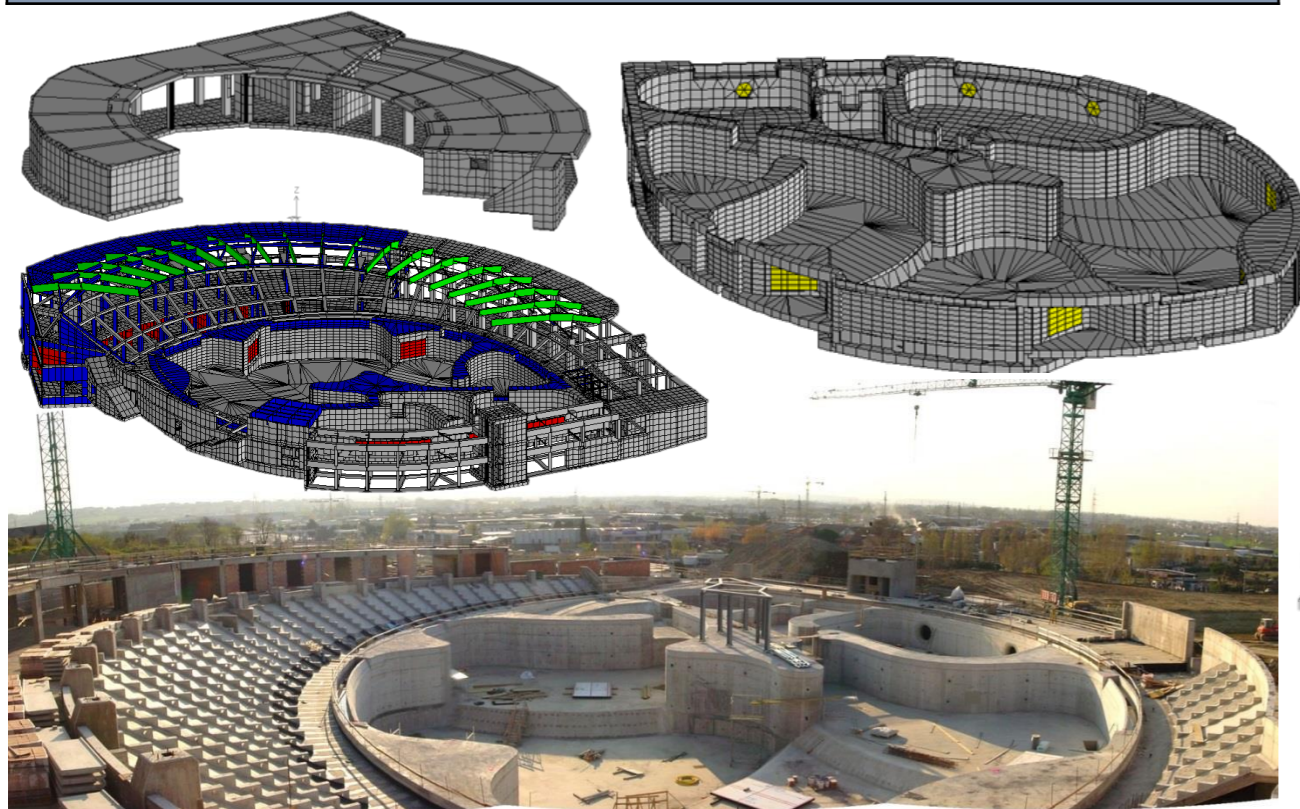
CIVIL STRUCTURES – Design issues and their resolutions

The intervention consists of the construction of a new theme park in the Municipality of Riccione, on the hilly area adjacent to the A14 motorway interchange. The main buildings and entertainment structures that have been studied and modeled are the following:

- Area called «almond», dolphinarium and museum area;
- Building used for three-dimensional projections (IMAX cinema);
- Buildings "lagune" area, of reception, entrance and park service (stands, tanks, technical rooms).

These are structures in c.a. characterized by variable heights with the course of the natural terrain between 10-18m height. The foundations are of the direct type, foundation slabs or girders, depending on the needs of the project. The different buildings have a vertical structure in c.a. consisting of pillars and walls. The intermediate floors are made of hollow-core concrete or solid slabs, depending on the case. The coverings are realized through c.a. slabs covered with vegetal soil or sheltered overhangs in laminated wood or metal carpentry and corrugated sheet. The main design problems were found in the execution of the "Imax" cinema, where excavation heights of up to 18m were reached, using bulkheads with three tiers of tie rod with six permanent strand, for which they were carried out specific stability analysis. Furthermore, the building was modeled taking into account the network of triangular-mesh metal tubes and expanded metal panels resting on a curb that surrounds the entire building.

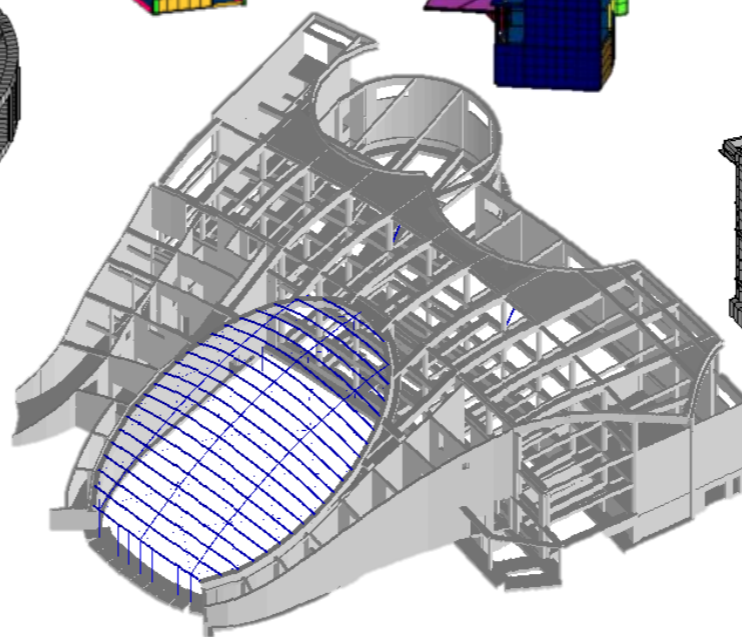
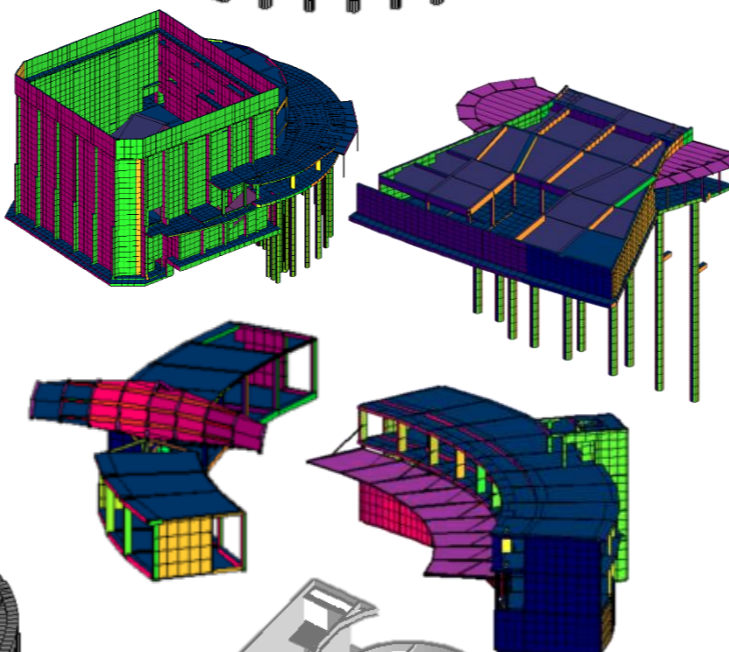
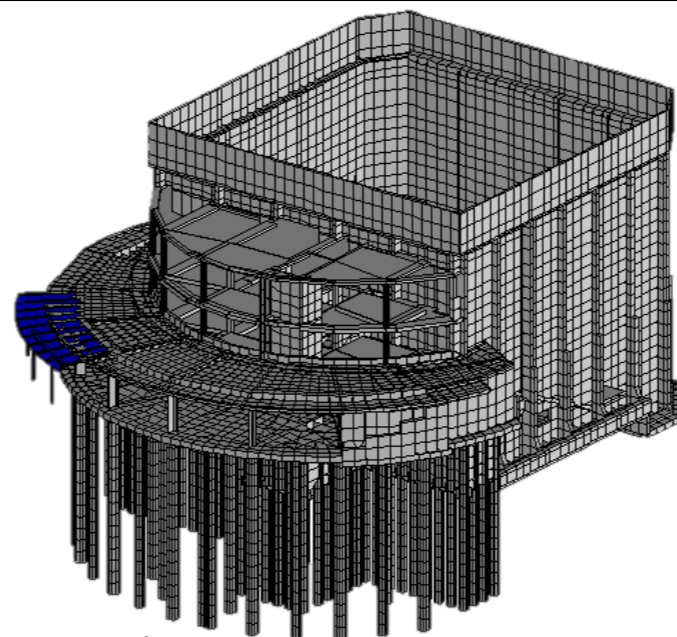
AREA «MANDORLA» - FEM numerical model of dolphin tanks, gallery and technical space



CIVIL STRUCTURES - Computational aspects, simulation, results and checks

The analysis and study of the static and dynamic behaviour of the different temporary structures and buildings was conducted by simulating the structure with 3D finite element numerical model, solved with calculation code PARATIE 6.0 (CeAS) and PROSAP (2.S.i. Software and engineering services). The analysis of ground-structure interaction was conducted with special attention, given by the grater excavations volumes and portions of underground buildings.

IMAX AND MUSEO DELLA VITA - FEM model



IMAX AND MUSEO DELLA VITA – Constructions phases works

