

Support walls

Civil engineering - Tie Rods - Pinning - Micropiles - Site cast columns - Earthworks

MONACAN INSTITUTE OF SPORTS MEDICINE

MONACO



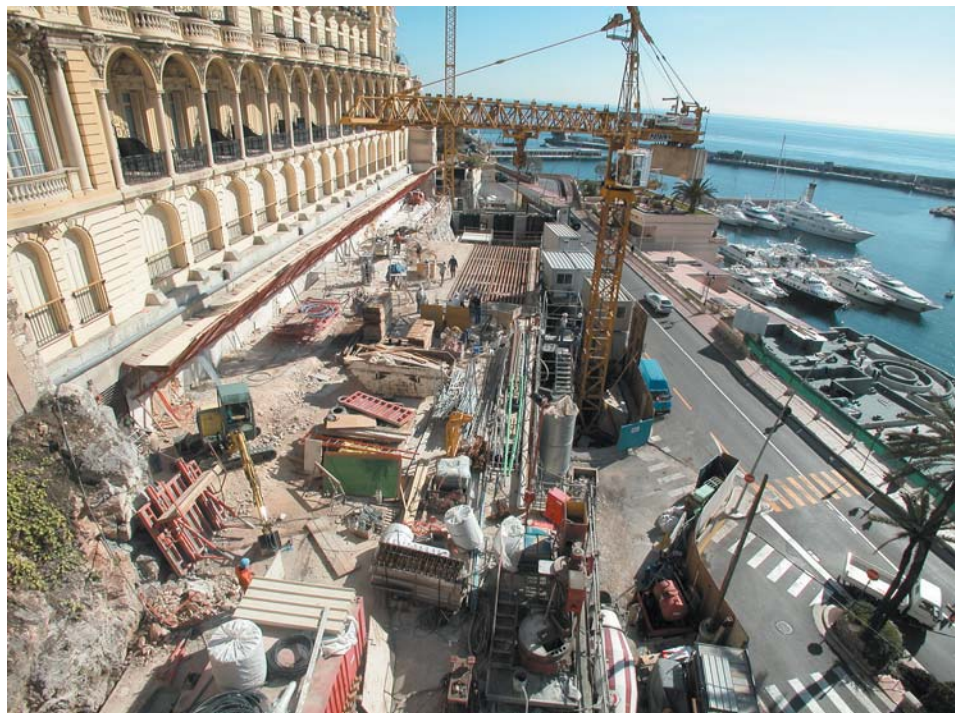
The construction of retaining walls 38m high in a cliff and earthworks tunneled with explosives

At the foot of the Hermitage Hotel opposite Port Hercule, Solétanche Sam is operating as group agent to undertake retaining wall work and earthworks for the Monacan Institute of Sports Medicine.

The construction of this structure is one of the most complex worksites as it is embedded in the cliff overhung by the Hermitage Hotel and bordered by a car park and cardio-thoracic centre.

Started in October 2002 at the cliff top, this very ambitious project has five main work phases entrusted to Solétanche Sam:

- Construction of capping beam and cutting up of the cliff into blocks with construction of vertical support (pinned RC shell) 17m high with 3m sections.
- Earthworks with explosives after peripheral sawing for some tens of meters high on both sides of Boulevard du Larvortto, maintained in continuous use.

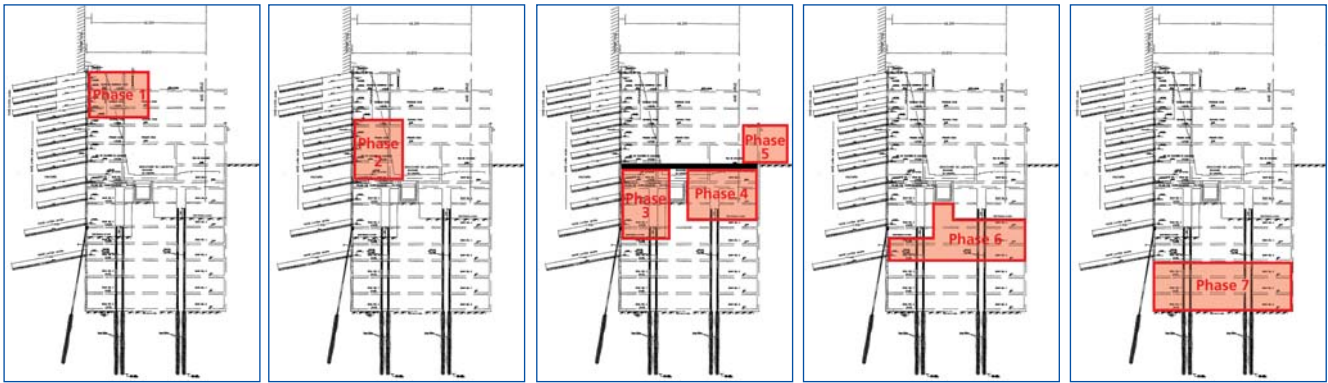


General view of decking and worksite installations

OWNER:	SIIO
DELEGATED OWNER:	CMTG
ARCHITECT:	SCHMELTZ
TECHNICAL ENGINEER:	OTH MONACO
TECHNICAL INSPECTION:	VERITAS MONACO
EXECUTION:	SOLETANCHE SAM - VUILLERMIN - ENTREPOSE GROUP
AMOUNT OF THE WORK:	16 M. EUR

MAIN QUANTITIES:

- 36,000m³ earthworks in rock
- 6,000m anchorages
- 3,000m site casting
- 5,000m² support shell thickness 250-300mm
- 4,500m² slabs and floors
- Access tunnel 40m long



PHASE 1
Initial cliff sawing work and anchored support

PHASE 2
Continuation of cliff sawing work, anchorages and support wall as far as Bld du Larvotto

PHASE 3-5
Start of infrastructure work under Bld du Larvotto up and down stream sides and construction of ground floor slab

PHASE 6
Earthworks and tunnel support work up to 8 NCM and construction of top floors SC3 and SS4 of IM25

PHASE 7
End of earthworks and tunnel support and construction of the access tunnel

- Construction of site cast columns with micropiles and RC, which are the foundation elements of the whole building.
- Construction of ground floor slab and two floors of infrastructure, close to technical gallery and very sensitive fiber-optic network.
- Tunnel excavation of five underground car park levels 12m high, with earthworks with explosives in area of RC columns and wind bracing. Construction of access tunnel from Avenue d'Ostende.

methods, in particular:

- earthworks by cliff sawing into blocks and fracturing with hydraulic cushions from work decking,
- tunnel earthworks with explosives and peripheral sawing,
- top down excavation & construction method, in very restricted space.

There were many constraints:

- very sensitive urban environment (luxury hotel, medical center),

- presence of technical gallery, fiber-optic networks, boulevard in continuous use, crossing the work zone,
- limited hours and short time constraints,
- earthworks with explosives in restricted environment with superstructure under construction (very strong mini vibration),
- very awkward site and very high co-activity of workshops (earthworks, site casting, sawing, support shell, etc.).



This worksite was a real technical challenge, involving innovative



Reinforcement by anchorages under the Hotel and the first concreting work of the support wall



Excavated bottom at 5.20 NGM, peripheral sawing and sprayed concrete shell, RC sealing of down columns as work progresses