



University of Camerino

The STRIC Project



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Commissario Straordinario
Ricostruzione Sisma 2016
Presidenza del Consiglio dei Ministri



Presidenza del Consiglio dei Ministri
Struttura di Missione Sisma 2009
Struttura di Missione per il coordinamento dei processi di ricostruzione
e di sviluppo dei territori colpiti dal sisma del 6 aprile 2009

International Center for Research on Sciences and Techniques of Physical, Economic and Social Reconstruction STRIC



University of Camerino
Leader

Partners



Università
Politecnica
delle Marche



Università
degli studi di
Macerata



Università
degli studi di
Perugia



Università
degli studi
dell'Aquila



Gran Sasso
Science
Institute



Istituto
Italiano di
Fisica Nucleare



Istituto
Nazionale di
Geofisica e
Vulcanologia



Università
degli studi
Gabriele
D'Annunzio

- **Realization of a reference center for international research aimed at preparedness and post-event reconstruction**
- Sendai framework**
- (i) enhance the understanding of disaster risk (hazard, vulnerability and exposure)
 - (ii) strengthen the governance called to manage the risk of catastrophic events and the ability to activate bottom-up decision-making dynamics
 - (iii) improving actions to reduce risk and increase resilience (build-the-new with more advanced techniques and standards, strategically plan settlements), strengthen awareness of the relevance of the relational dimension
 - (iv) enhance the capacity to respond to disasters (also at a socio-economic and legal level)
- New technological research infrastructure able to support multidisciplinary and experimental scientific activity
 - Opportunities for study that cannot be developed in other existing laboratories
 - Scale factor of the project to make STIRC attractive (strategic opportunities in sectors still not sufficiently covered in Italy and Europe)



A – Experimental Laboratory for new and enhanced constructions

B – Geophysics Laboratory

C - Computational and Data Processing Laboratory

D - Advanced chemical-physical laboratory for innovative materials

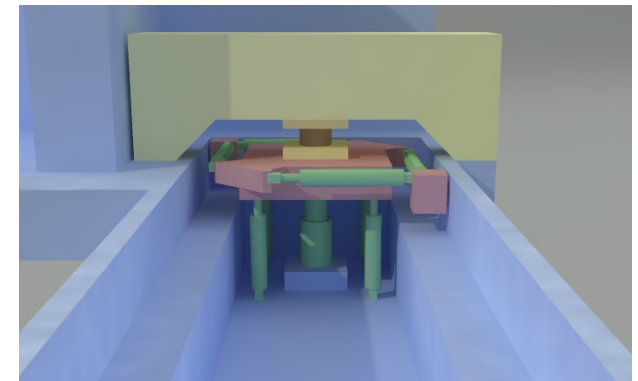
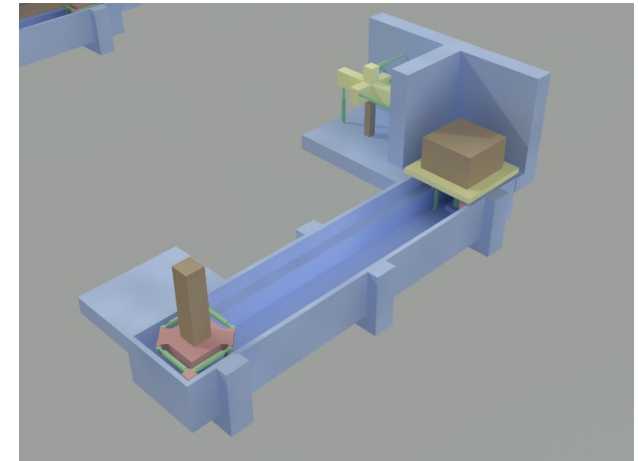
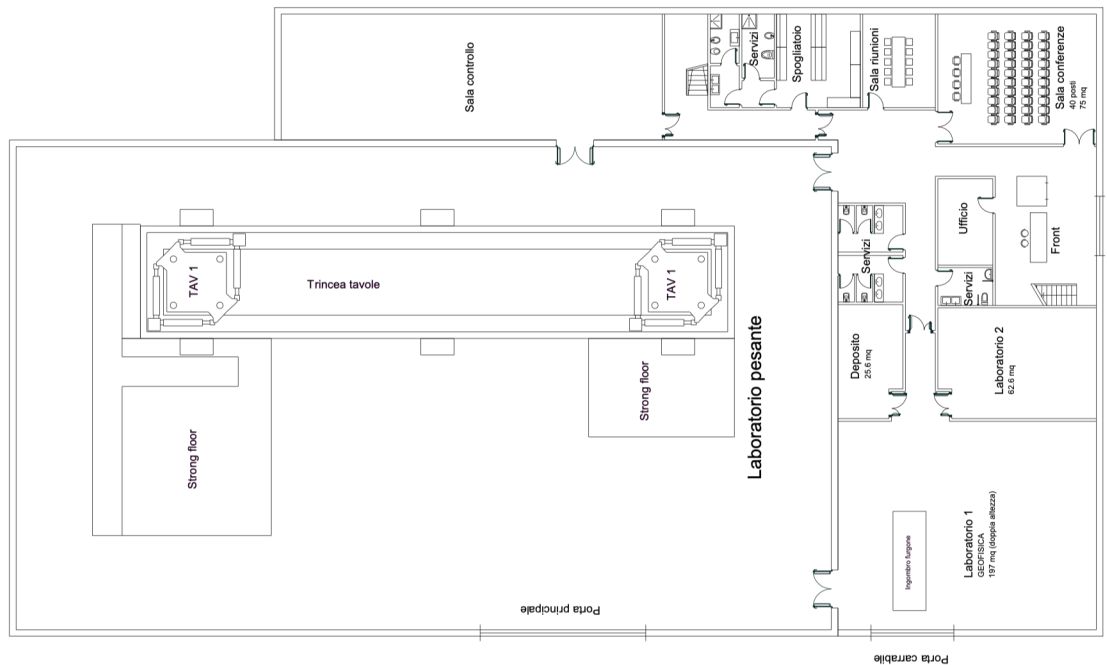
E - Multidisciplinary humanistic laboratory

F - Laboratory for the enforcement of disaster mitigation and management policies

Synergy with other partner laboratories (UNIVPM, UNIPG, UNIVAQ, UNICH)

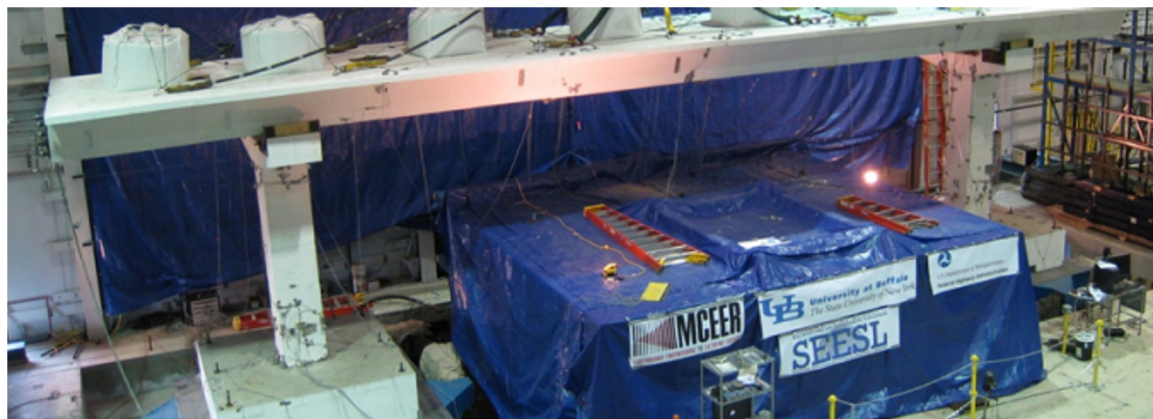
- 2 shaking tables for dynamic tests on full-scale structures

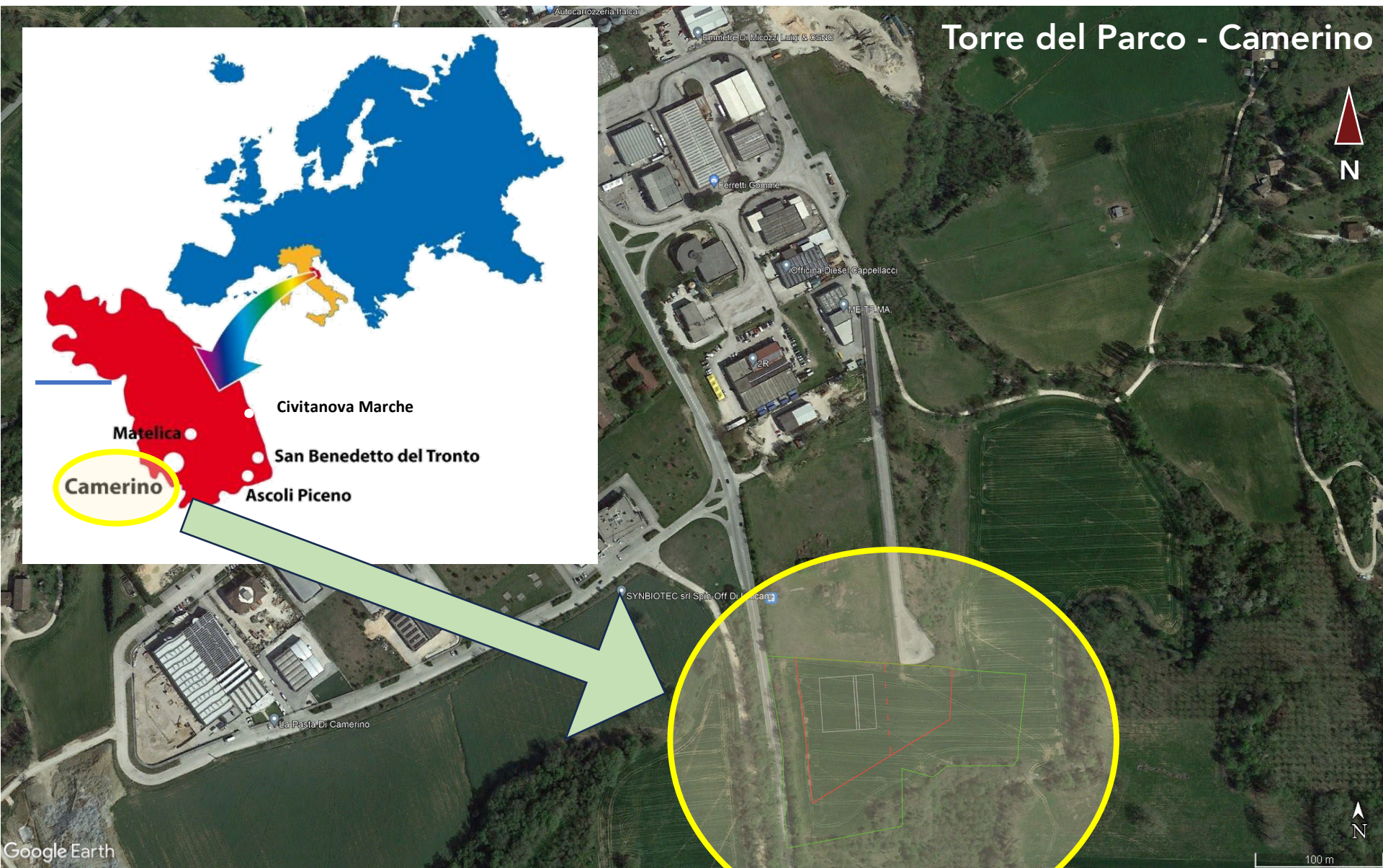
Preliminary design



Potentialities

- Double shacking table, one fixed and one movable (up to 30m distance, unique in Europe)
- Full-scale 2D frames
- Full-scale bridges and large structures (non-synchronous seismic action)
- Testing of very large specimens
- Synchronous and independent tests on both the tables for direct comparisons





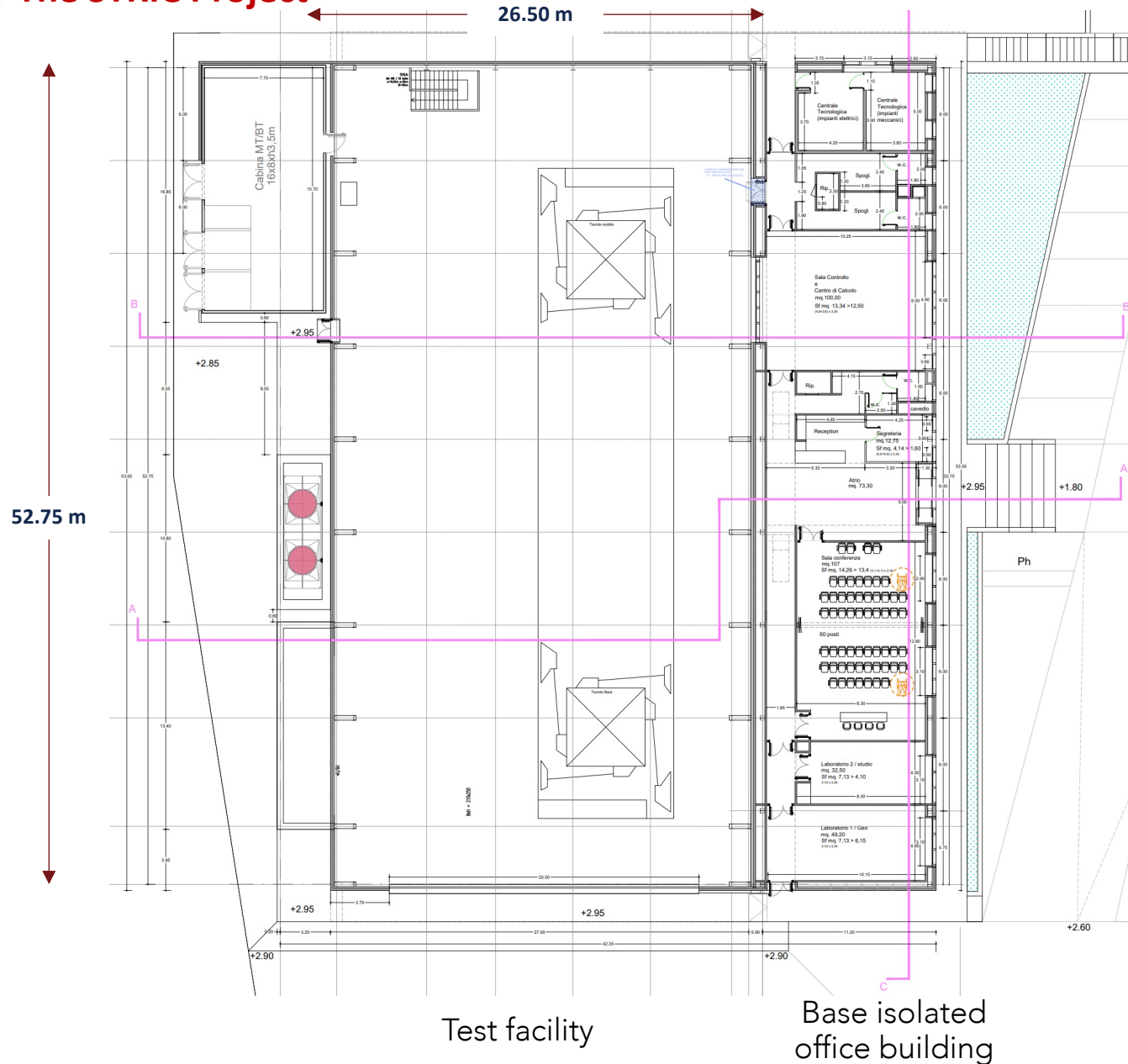


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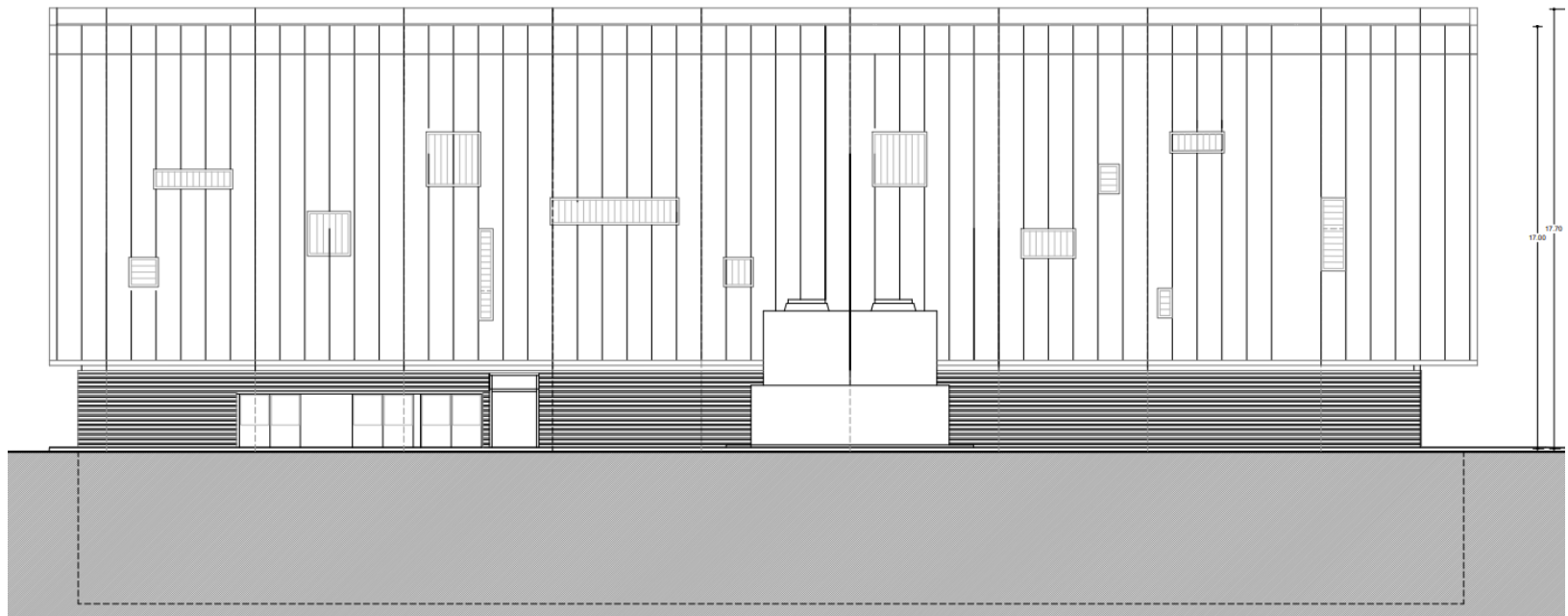
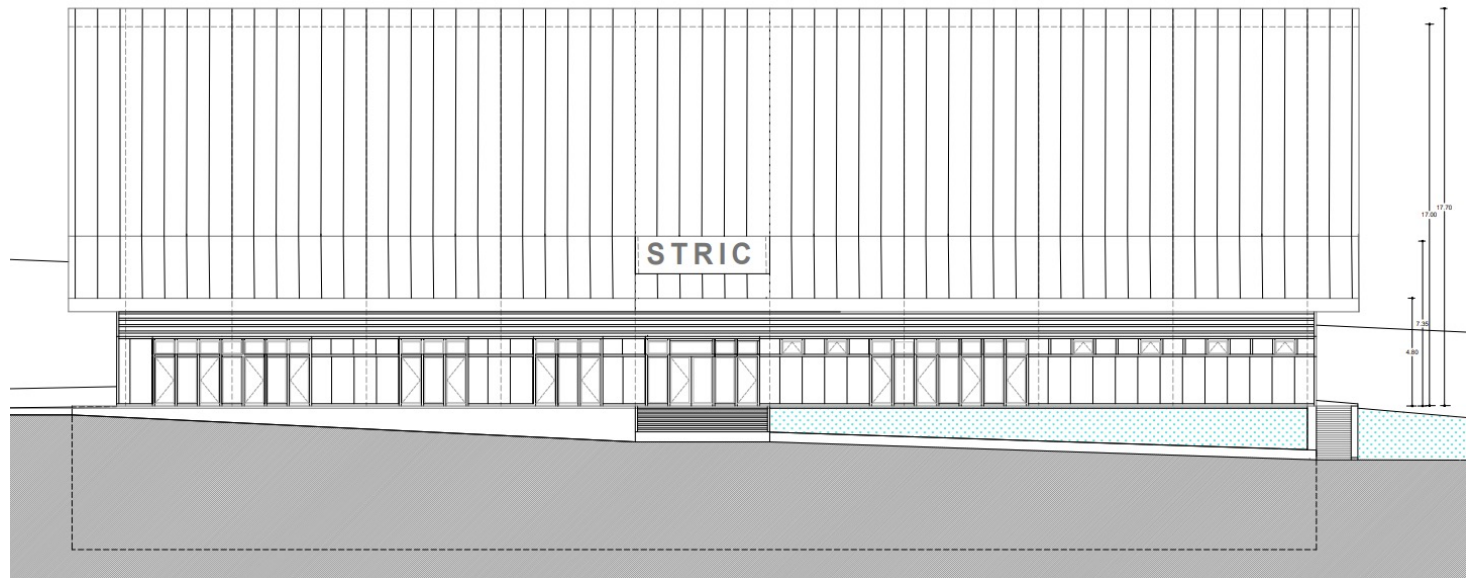
Current project

The STRIC Project

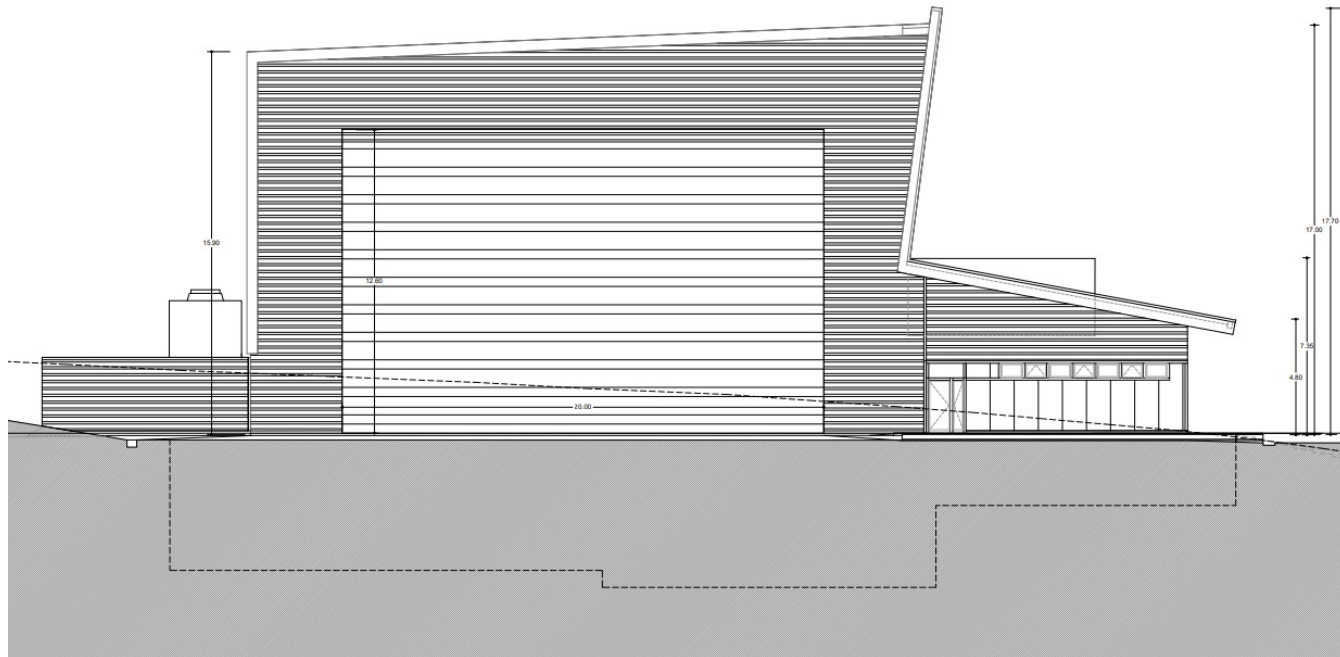
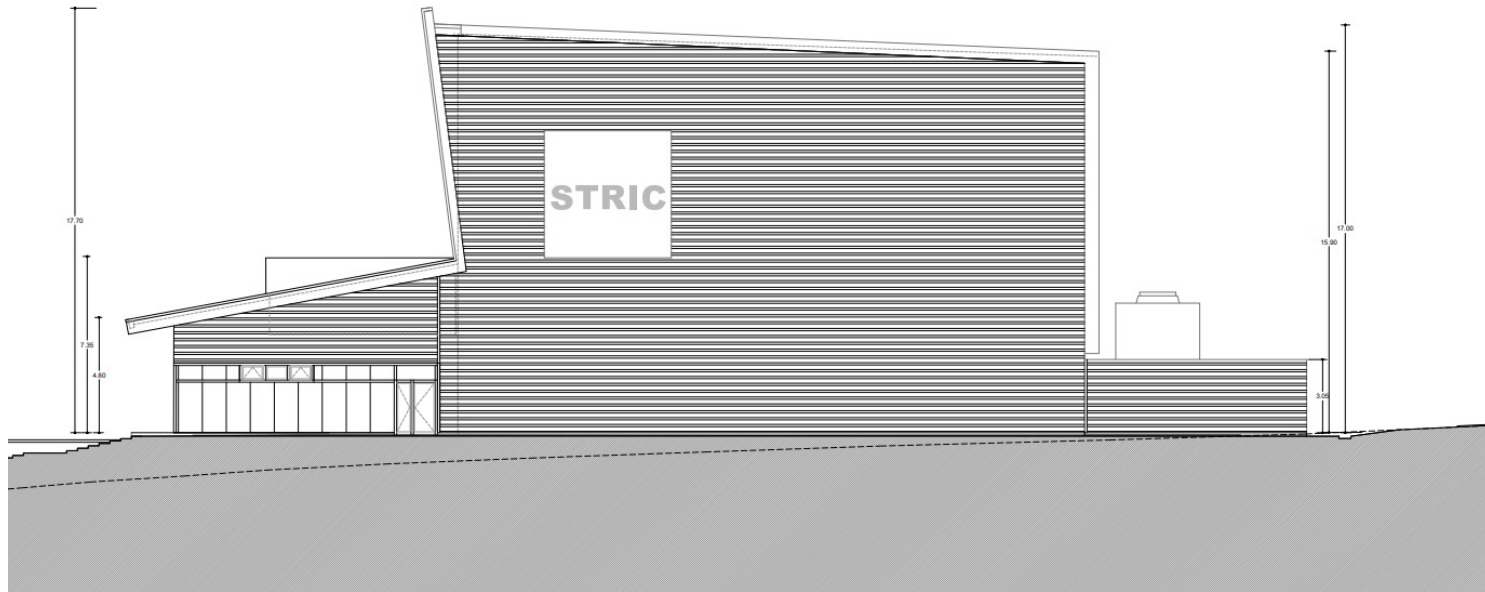




Current project



Current project



Plan view

PIANTA FONDAZIONE E PARETI C.A. Q.-4.90

sc.1:100 - misure in cm

RIF. ALTIMETRICO RELATIVO: Q.+0.000=PAV. FINITO PIANO TERRA - V. sezione
(PER RIF. ALTIMETRICO ASSOLUTO V. ELABORATI ARCHITETTONICI)

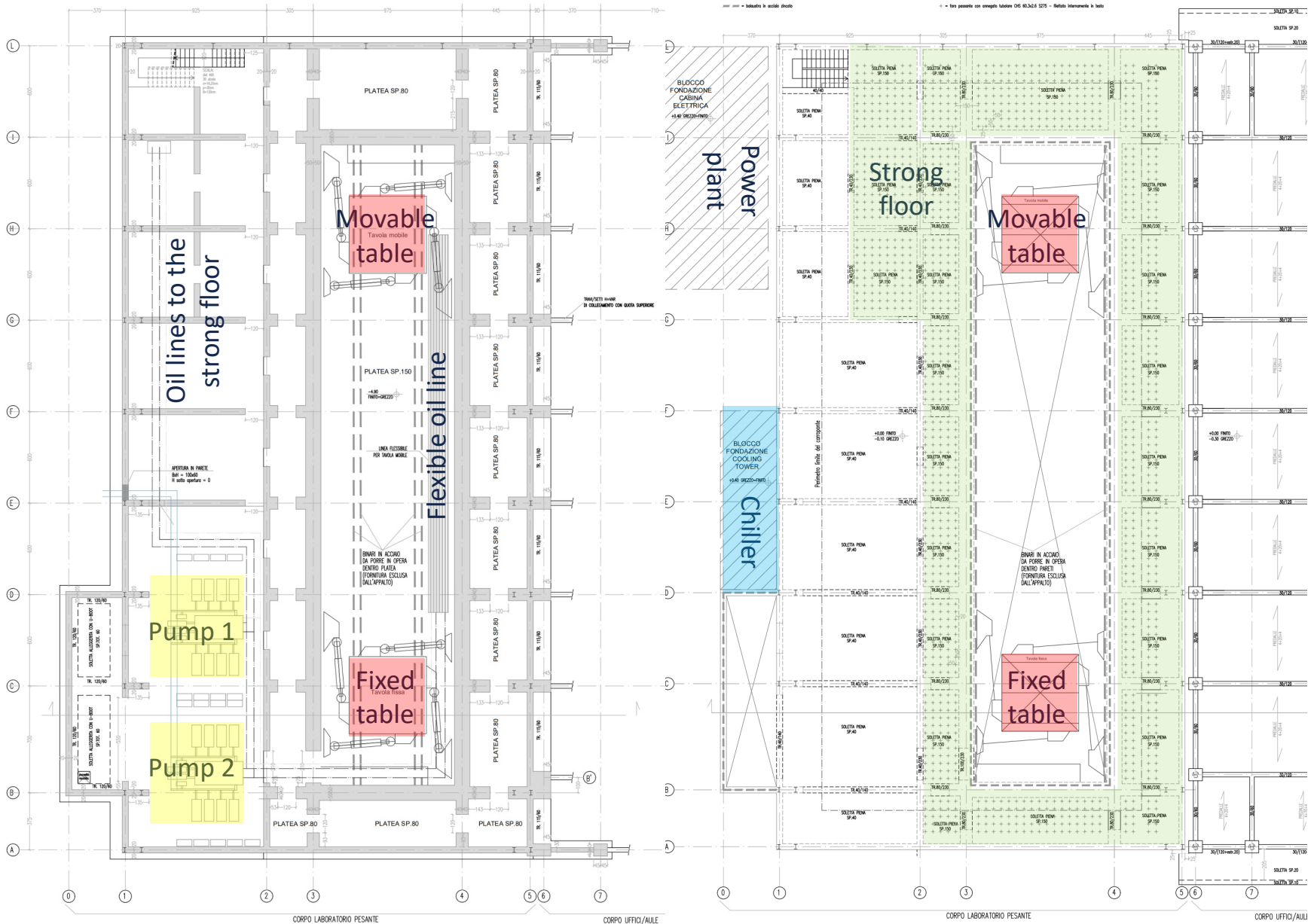
4,90 m

PIANTA IMPALCATO Q.+0.00

sc.1:100 - misure in cm

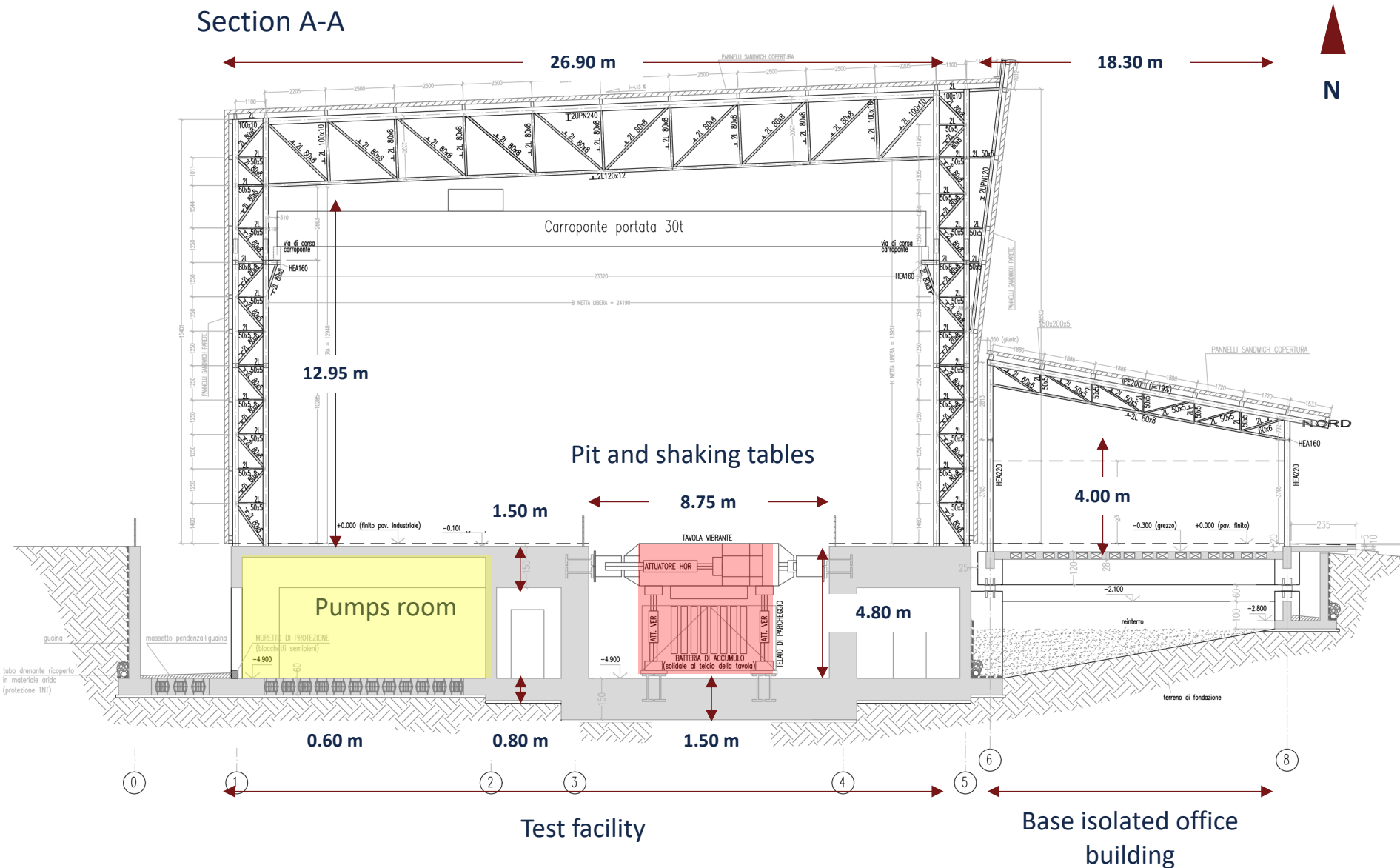
RIF. ALTIMETRICO RELATIVO: PAV. FINITO PIANO TERRA=Q.+0.00; GREZZO= Q.-0.10/-0.30 - V. sezione
(PER RIF. ALTIMETRICO ASSOLUTO V. ELABORATI ARCHITETTONICI)

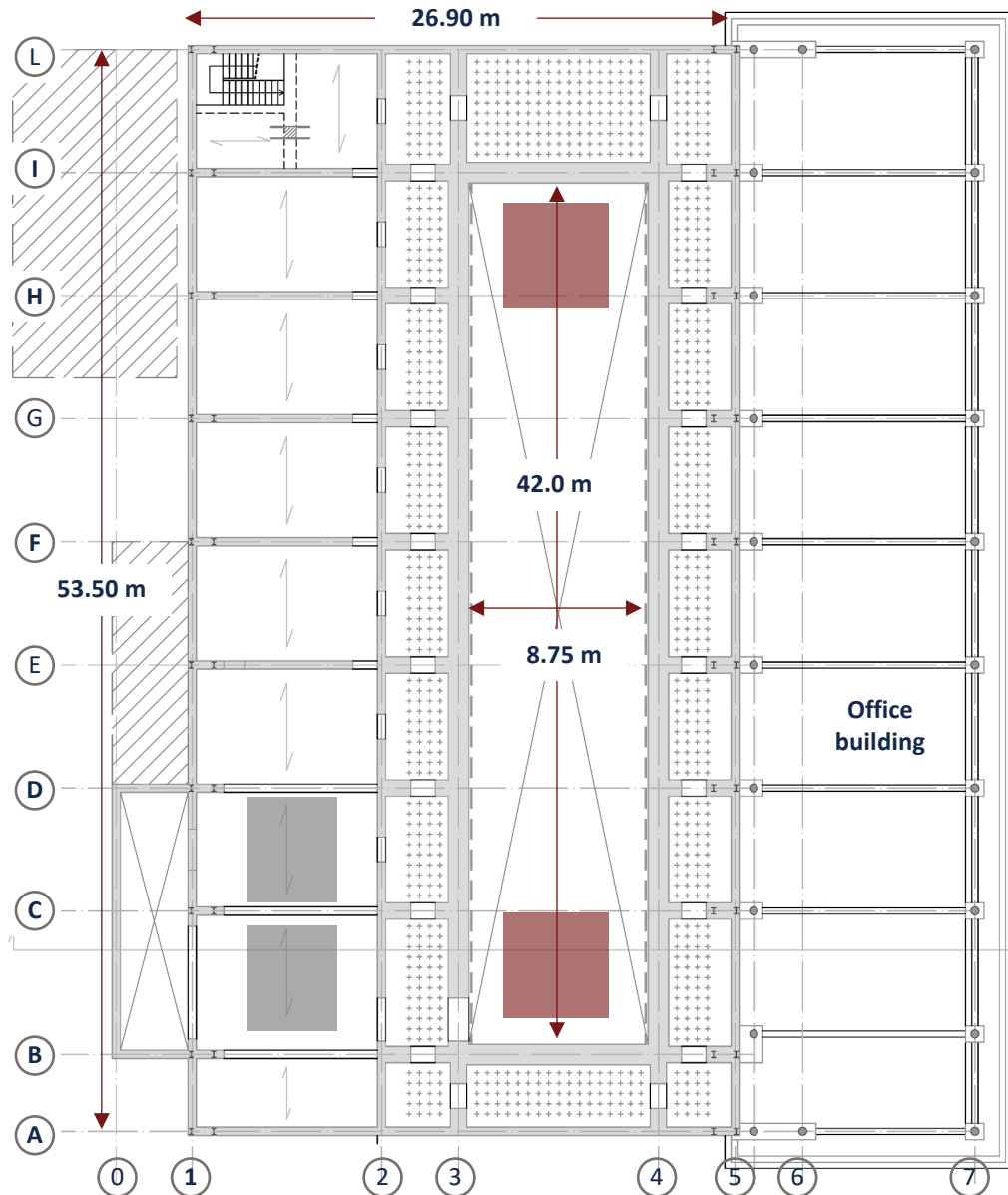
0,00 m



Structural section

Section A-A



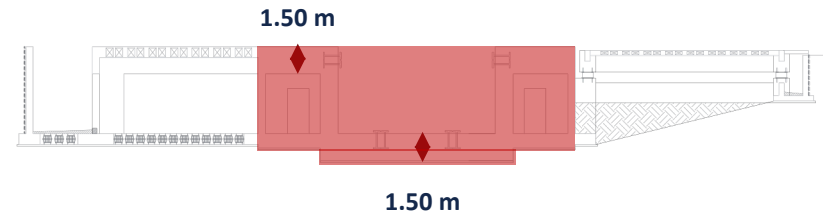


Seismic mass structural detailing

MAST 6 DOF - 5 m x 5 m weight 30t each
payload 60t each

Hydraulic power system

Estimated mass ratio: 20 (without considering the mass of the thinner underground concrete structure)



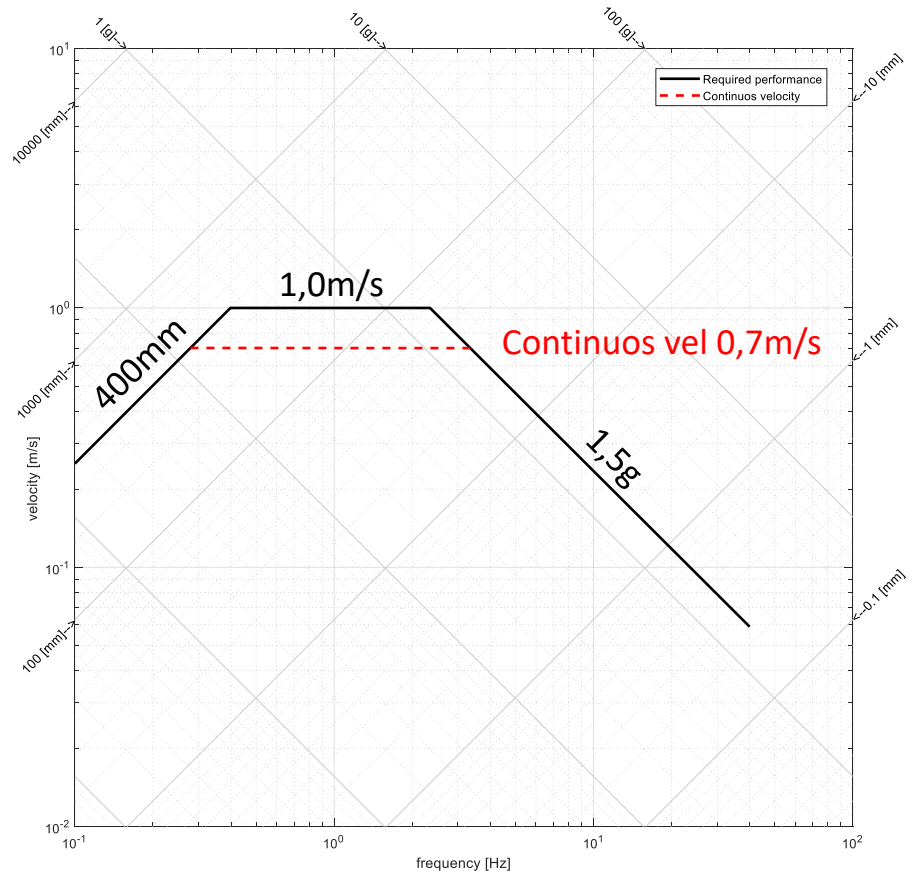


N	Parameter	Performance
P01	Shake Table Size	Surface 25mq (5mx5m)
P02	Degrees of freedom	6
P03	Maximum specimen mass (payload)	60t
P04	Maximum weight of the individual board	<300kN
P05	Maximum overturning moment	100% payload (kN) x 3.0m
P06	Massimo bias moment	100% payload (kN) x 0.75m
P07	Frequency range	0.1Hz-80Hz for 65% of the payload
		0.1Hz-50Hz for 100% of the payload
P08	Input signal	Sine Wave, Impulsive, Seismic, Random
P09	Control system	Digital control
P10	Peak Shift	+/-40cm horizontal in all directions
P11	Peak speed for 7s one-way sine signal, with 65% of the payload	+/-20cm in vertical direction
		+/-120cm/s in all horizontal directions in the frequency range 0.5Hz-2.0Hz
		+/-100cm/s in the vertical direction in the frequency range 1.0Hz-2.0Hz
P12	Peak speed for 7s one-way sine signal, with 100% of the payload	+/-100cm/s in all horizontal directions in the frequency range 0.4Hz-2.0Hz
		+/-80cm/s in the vertical direction in the frequency range 0.7Hz-2.0Hz
P13	Peak speed for continuous one-way sine signal, with 100% payload	+/-70cm/s in all horizontal directions in the frequency range 0.3Hz-3.0Hz
		+/-60cm/s in the vertical direction in the frequency range 0.5Hz-3.0Hz
P14	Peak acceleration with 100% payload	+/-1.5G in all horizontal directions
		+/-1.2g in vertical direction
P15	Continuous working capacity of the hydraulic system	72 hours
P16	Natural board frequencies	>120Hz

For the movable table: capability to be positioned at any distance from the fixed table



Horizontal



Vertical

