

Status of the Water Tank

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Technical Specifications

<i>Position</i>	<i>Elevation</i>
Inner diameter	9980 mm
Shell height	8400 mm
Total height	8900 mm
Roof	Conical + cupole
Bottom	Flat
Total weight	38 000 kg

Operational Specifications

Position	Elevation
Design pressure/depressure	+80 -30 mBar
Design temperature	+6 ÷ +30 °C
Operating pressure	30 mBar
Operating temperature	~ 12 °C
Water height	8500 mm H2O
Water recirculation	30 m ³ /h
Emptying procedure	Gravity + N pressurization. Draining hole DN 300
Load on the roof	350 kg/m ²
Statical verification	API Std 650
Seismic verification	Yes- Eurocode 8
Wind verification	No

Specifications (2)

- Roof and Shell

Roof conical 6⁰. Inner part cupole with central hole DN 1200 to allow insertion of cryostat. Centering ring and sealing device included (if standard).

Shell Sheet metal plates coupling at ground level then lift with crane *etc.*

“In The mantle as reported in the a project drawing (ref) an “hole” will be left in order to allow the insertion of the cryostat *etc.* After that the aperture will be closed”.

Bottom Plate Dimensioned following API prescriptions (superimposed weldings) .

In the central part (R ~ 2500 mm) it will be dimensioned to keep both the idrostatic load and the cryostat load (**70 t TB verified**). In this region the metal plates will be head soldered and welding flattened.

(Inclinazione for emptying?).

Insulation layer included (**TBD**)

Accessories

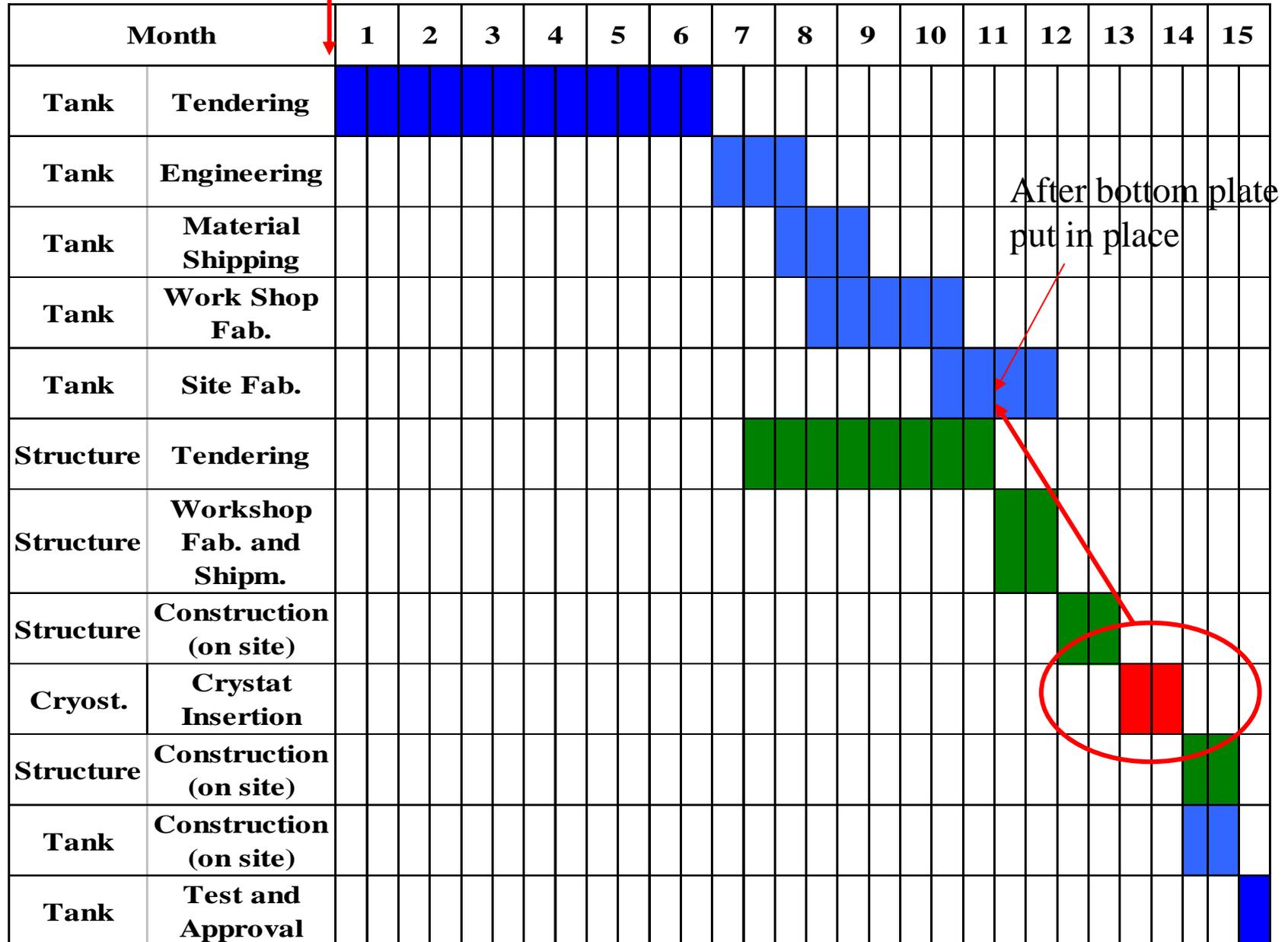
- N.1 manhole in the mantle
- N.1 manhole in the roof (DN 500)
- N.2 Safety valves (pressure/depressure) DN 200 to prevent tank integrity during operation (mainly emptying) (in the roof).
- N. 2 Level sensor
- N.1 connection for N inlet
- N. 2 flanges DN300 to empty the tank
- N.2 (top and bottom) Connection net fit DN 80 for water recirculation
- N.1 DN 1200 flange in the roof with sealing for cryostat neck.
- N. 4-6 DN250 flanges (for PM chimneys).
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Mounting procedure

- Explicitely mentioned in many point of tendering document the insertion of cryostat after mantle WT assembly.
- We have now the chance to modify the procedure but is the last one.
If yes we have to do it now ! And then fix it.
- **Most important: when and for how long the WT construction has to be stopped**
- **Cleaning (TB agreed): manually**
- **Verifications (as in Borexino)**
- **Mounting of PM fixing structures (when) ?**

25/11/2005

Timing of WT and Structure



WT Time schedule

Water Tank Time schedule		
Extimated schedule for the WT tender and Wt construction	Gussed schedule	Actual schedule
Not included unexpected events, from the commisioner side,from GERDA side,relevant modification to the exist		
Tender Published on Gazzetta Ufficiale	27-31 January 2006	
Prequalifying phase (minimum 19 days from publishing)	23-gen	
Mailing of invitation letters	23 gen- 31 gen	
INFN mails the invitation letters to the interested companies.		
First meeting of the tender commission (C. Cattadori, P.Martella, G.Pepato)		7 february
verifica documentazione di prequalifica e spedizione delle lettere di invito alle imprese qualificate (max 120 gg dalla data di pubblicazione del bando su gazzetta ufficiale)		
no imprevisti su documenti		
Interested companies visit LNGS to receive a copy of the def	1 feb - 23 feb	
Deadline for companies to send offers	24-feb	15 March
Preliminar declaration of the winning company.	27 feb - 03 mar	20 March
Second meettee of the commettee		
verifica offerte e verbali		
no imprevisti su documenti		
Tender documentation is sent to INFN central administration	6 mar-10 mar	
The INFN central admin. verify that the tender has been performed properly and that the company is formally in th		
Definitive declaration of the winning company (?????????)	15-mag	15-30 May
WT WORKS		
Executive project (45 dd)	15 mag - 30 giu	240 days
Material purchase	15 giu - 30 lug	
Work at the company site	30 giu - 30 set	
Mounting at LNGS	15 set - 15 nov	
Cryostat and third skin insertion (???? just exercise)	15 nov - 15 dic	
montaggio presso laboratori	1 gen - 30 gen 2007	
collaudi	30 gen - 28 feb 2007	
	285 gg compresi 15 gg di fermo a natale e 15 ad agosto	

Proposed chimneys for μ -veto cables

03/10/06 pg

4 chimneys for cables

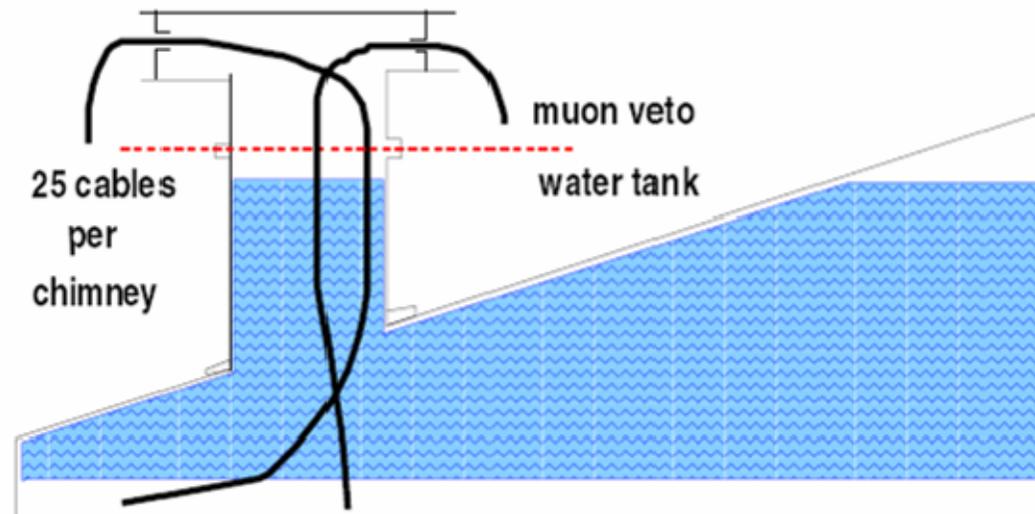
DN250 area: 491 cm²

DN100 area: 79 cm²

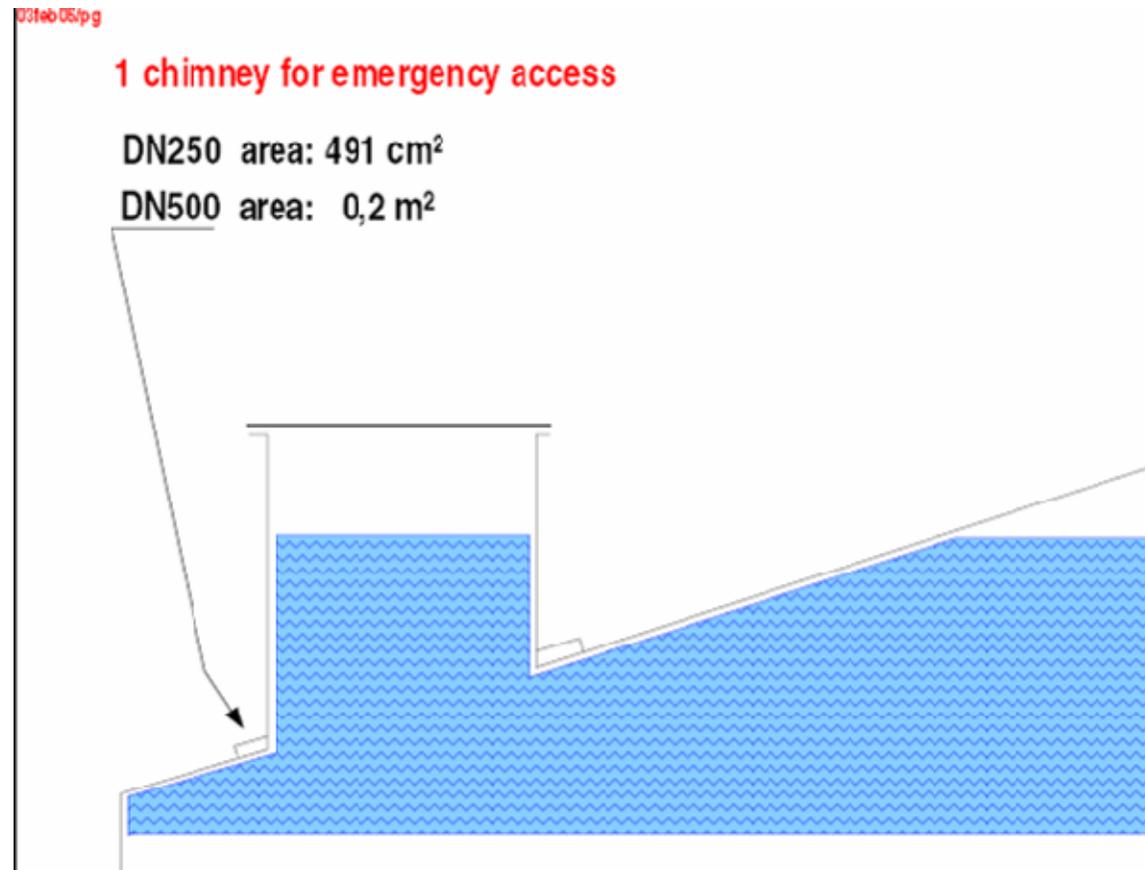
cable: 11mm, 0,95 cm²

holder: 30mm, 7,1 cm²

25 x 7,1 cm² = 178 cm²



Proposed chimneys for manhole access

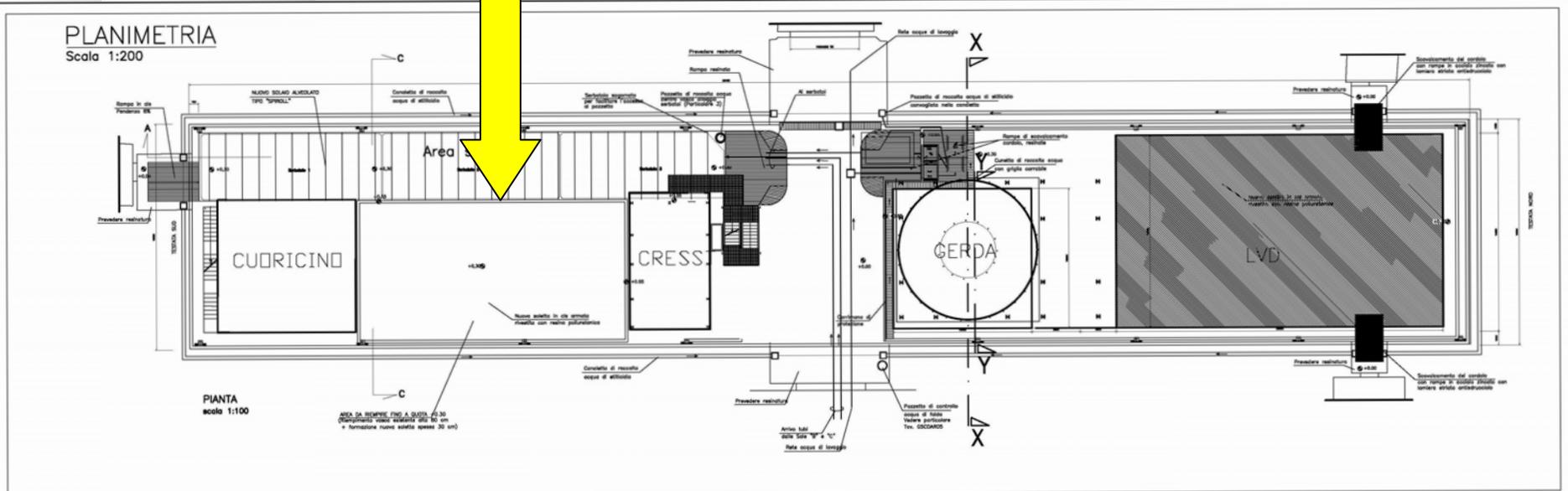


Conclusions

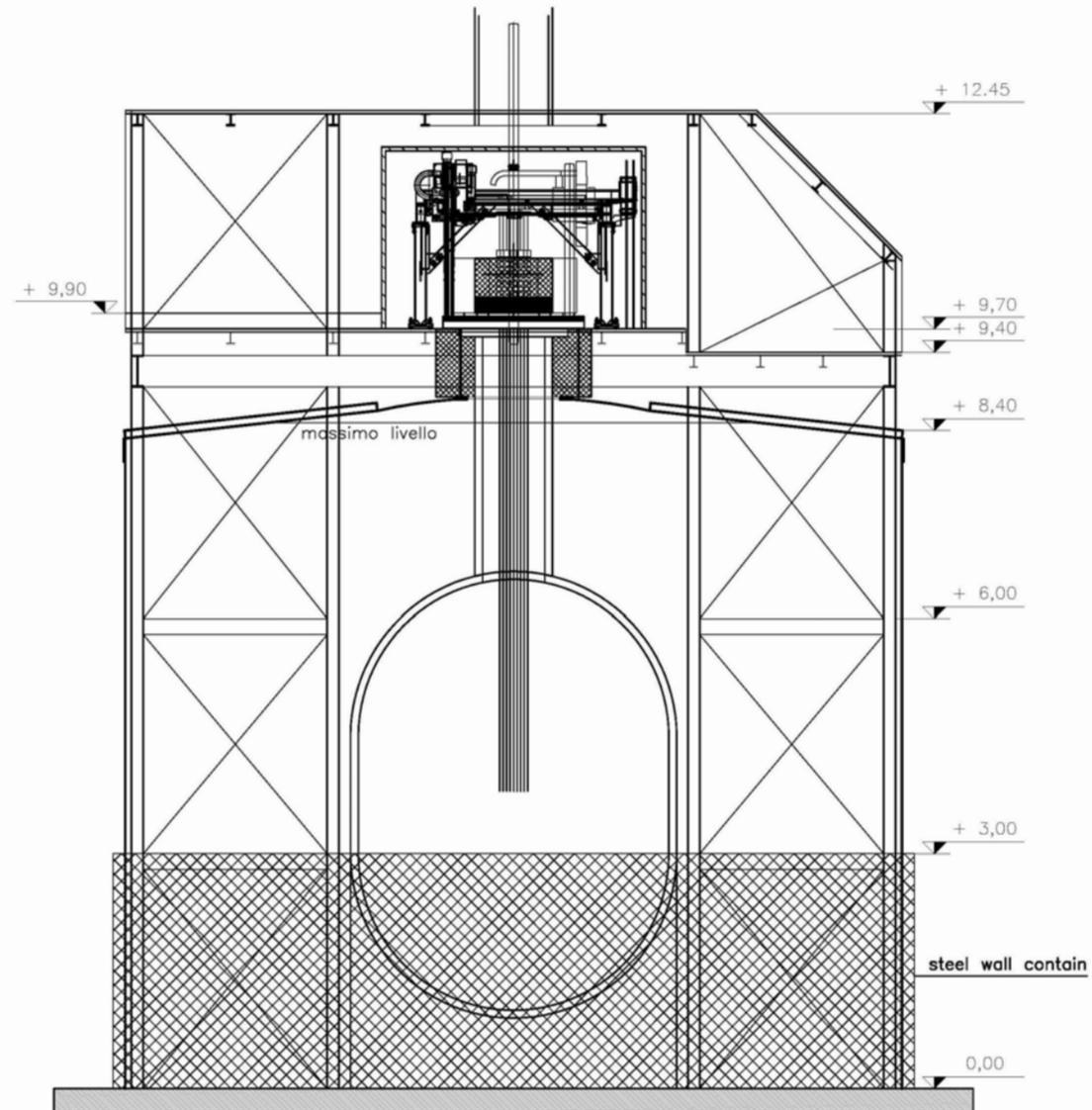
- WT tendering procedure is going on as foreseen.
- T0 (of schedule presented in June 2005 in Dubna) = 25 November 2005
- WT interface to LNGS and site are under control (anchorage, water drain, water inlet etc).
- Water Recirculation plant : to be dimensioned (M. Balata, E. Castagna)
- We need to define in a realistic and reasonable way the WT and cryostat schedules.
- If we keep the showed schedule the WT is in advance compared to the foreseen (50% CL probability) cryostat delivery date (November 2006)?
What about the other 50% ? Possible to slow down the WT tender path.
- But there are limitation on how many months we can keep the working site suspended.

GERDA Location in Hall A

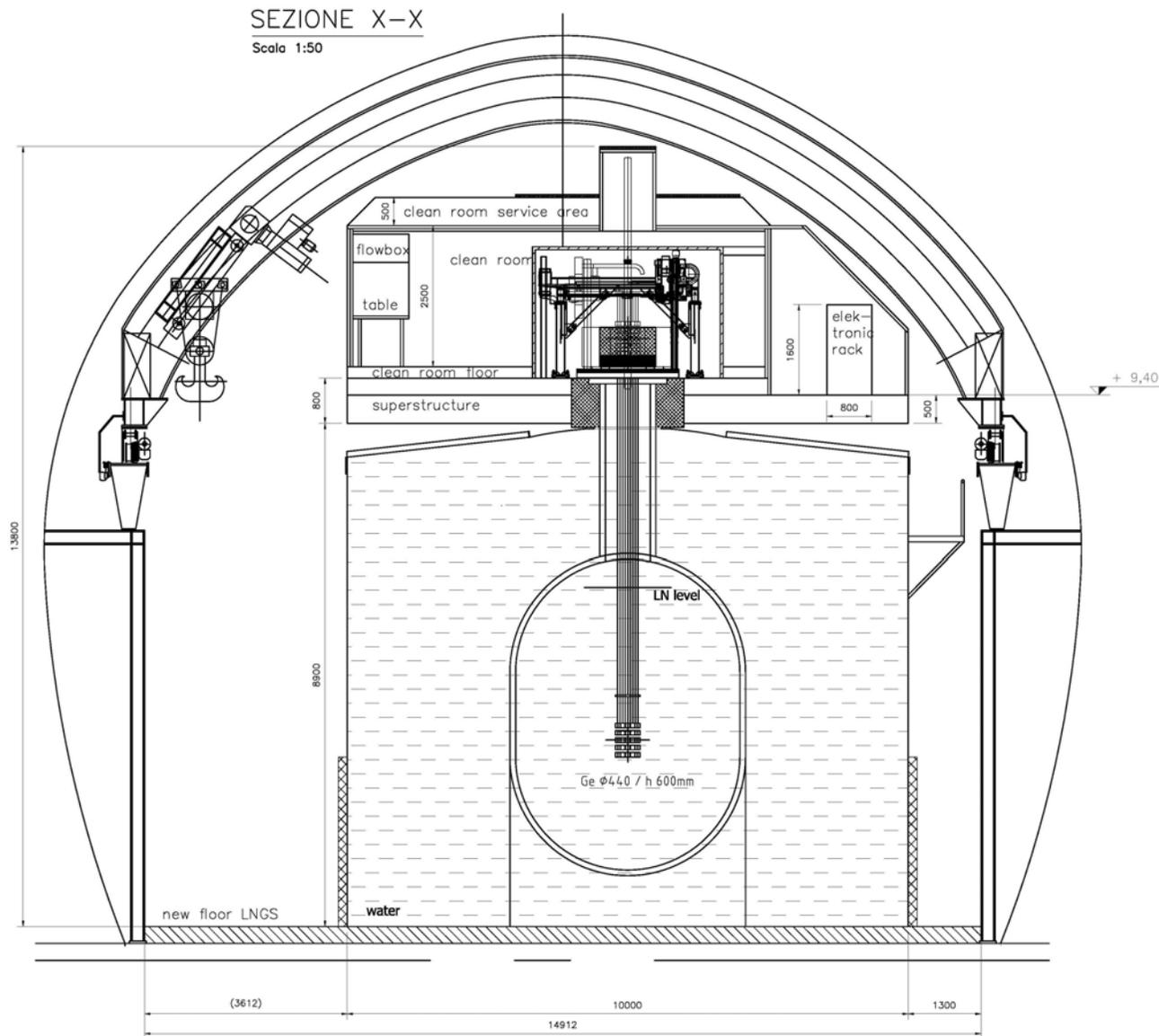
Service space for assembly.
Interference with CUORE assembly
possible in case of severe delay of
GERDA



Tank and service structures



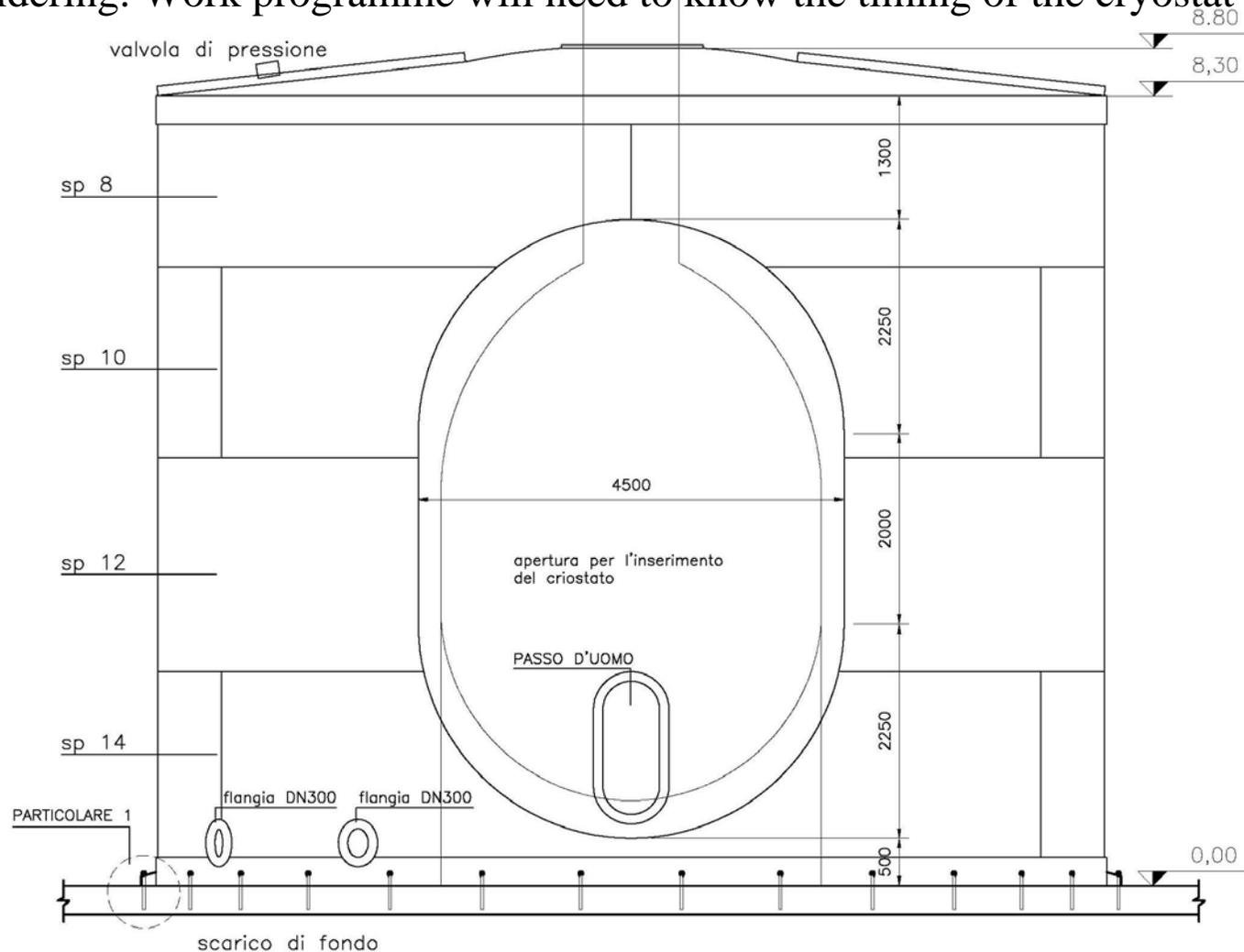
Tank and service structures



cylindrical watertank; ϕ 10m; H 8,9m

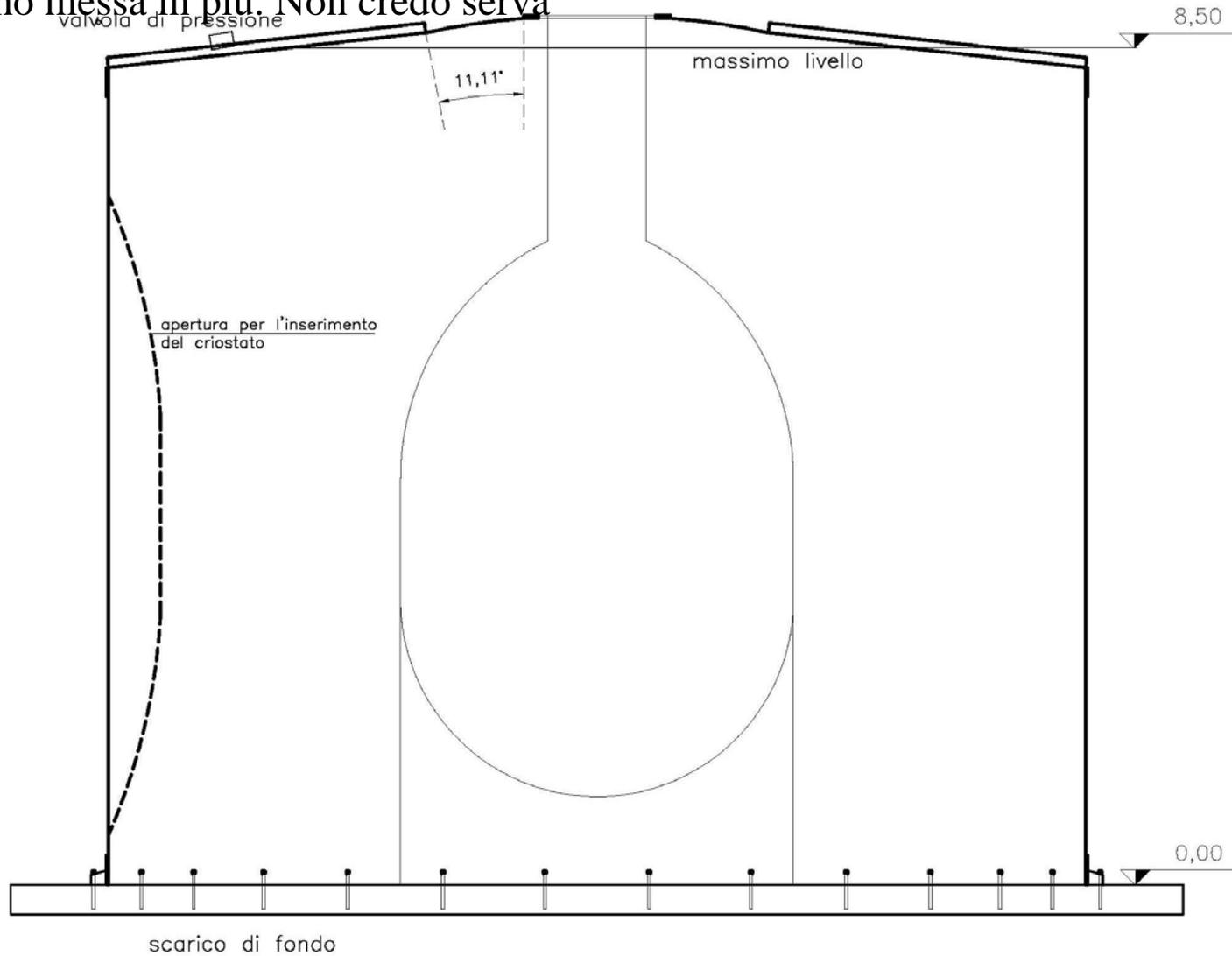
The provisional opening

WT construction plan foresees to leave a part open (the shape may be that shown or simply rectangular) for insertion of the Cryostat. The construction of the tank will then be completed by final soldering. Work programme will need to know the timing of the cryostat



Provisional opening (Section)

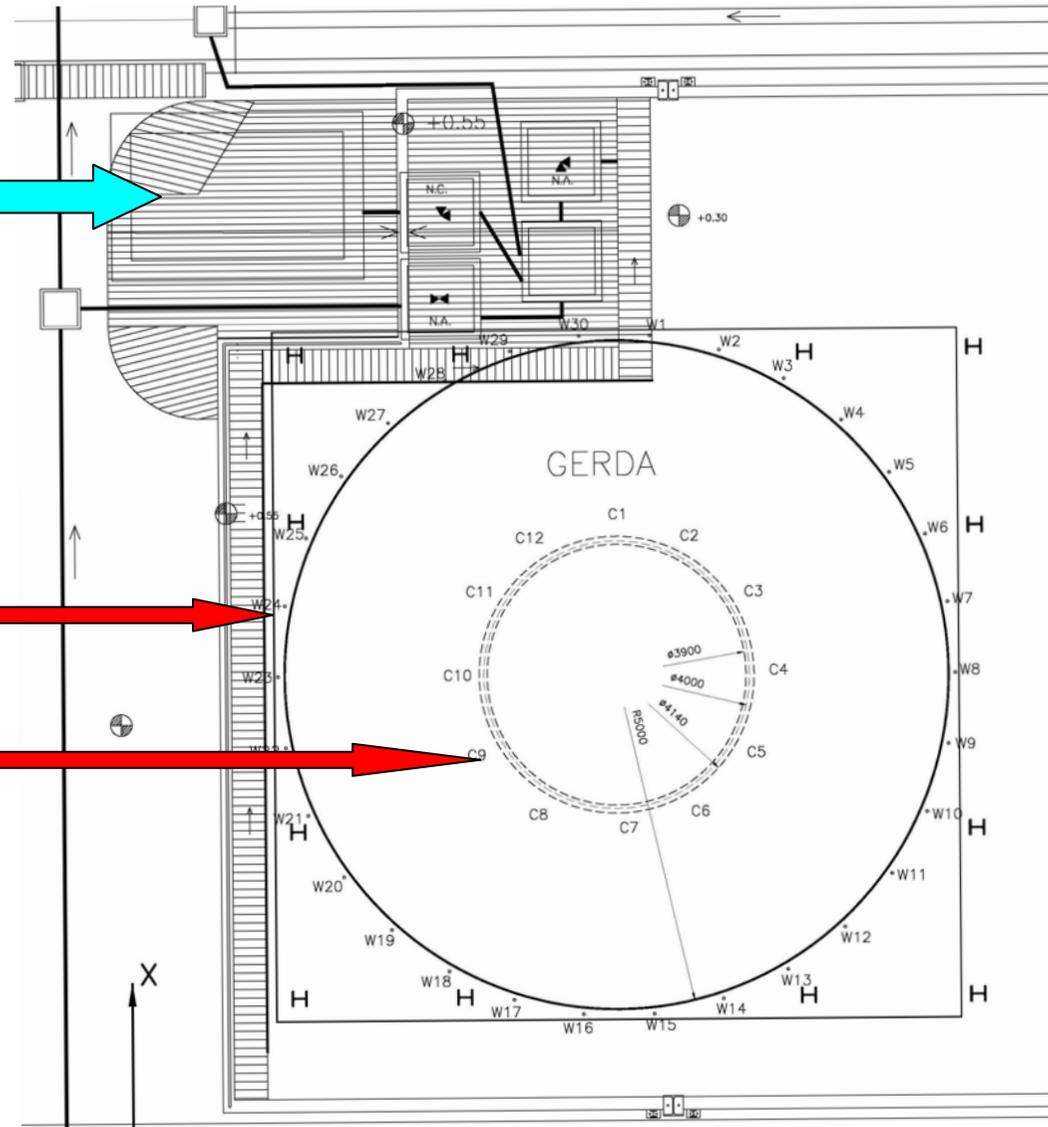
questa l'ho messa in più. Non credo serva



Footprint on the floor

The interference with the Commissary civil works shown in the drawing have been solved changing the civil works design

The positions of the fixing pins in the floor both of the WT and of the cryostat has been be frozen and will be realized in next 2 monthes by Commisioner companies.



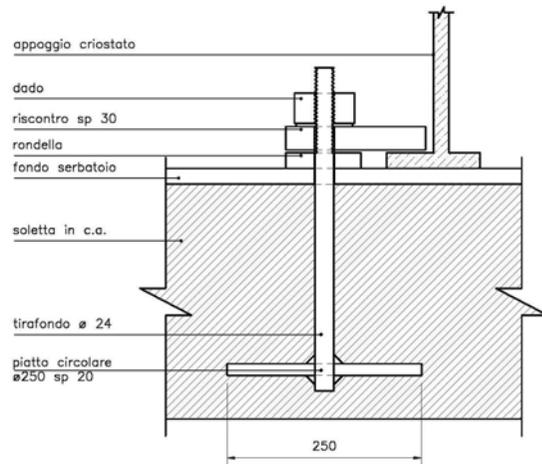
Anchorage pins

For the Cryostat

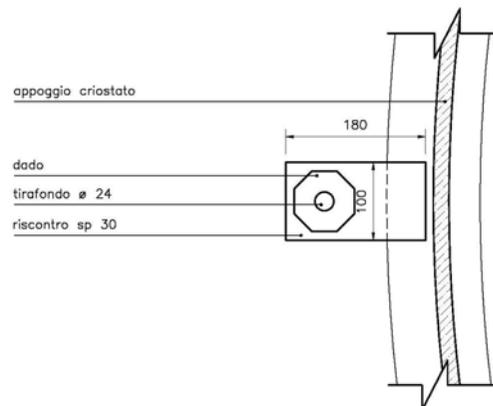
PARTICOLARE 2
ANCORAGGIO CRIOSTATO

Scala 1:5

SEZIONE



PIANTA

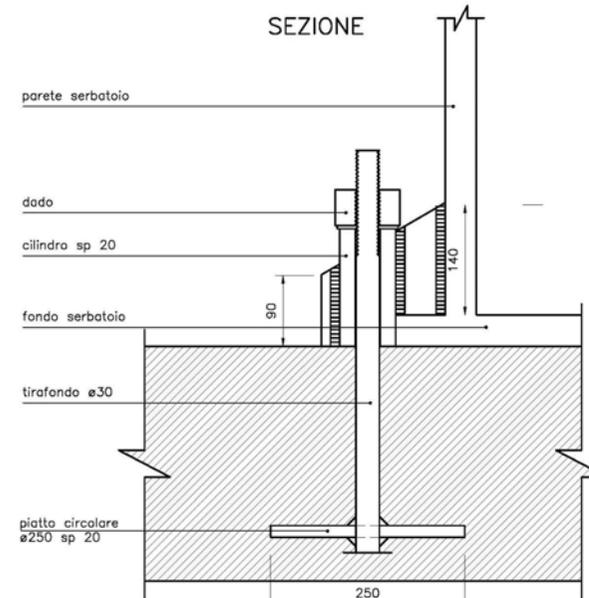


For the Water Tank

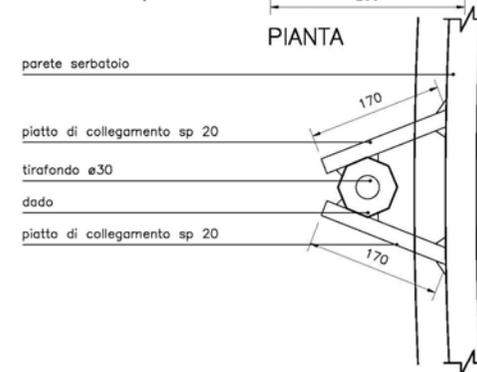
PARTICOLARE 1
ANCORAGGIO WATER TANK

Scala 1:5

SEZIONE



PIANTA



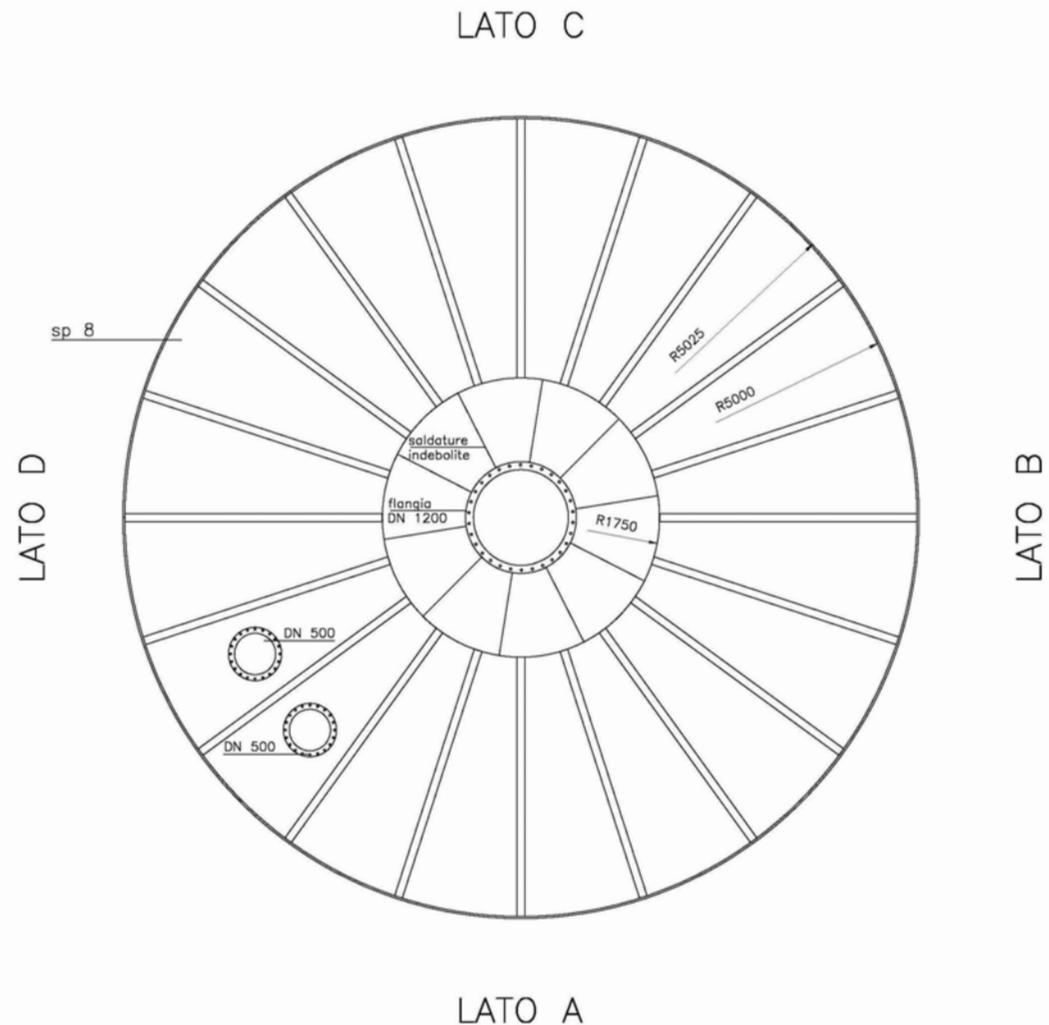
The Roof

In this version weak soldering are foreseen in the central sectors. Should break in case of LN spill in water and consequent explosion

The Laboratory request of triple containment of LN may request a change of this detail

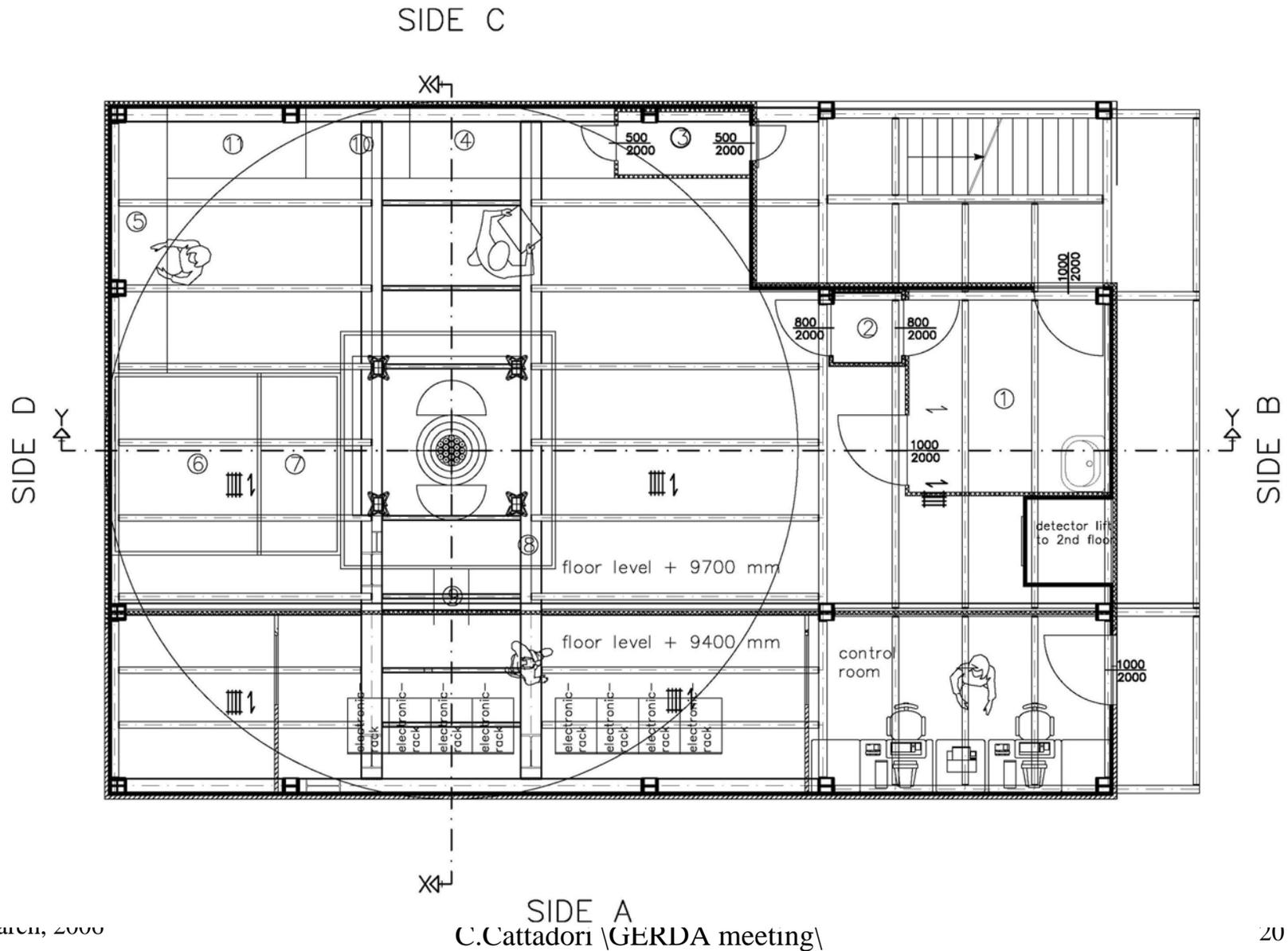
Presumably N₂ in gas phase escaping from the WT or from the cryostat will be guided to a specially built heat exchanger and then to the exhaust duct foreseen in the Commissary works

PIANTA LIVELLO COPERTURA (a quota + 9,70)



Plant of the 3rd floor

PLAN FLOOR 3 (level +9400/9700 mm)



WT&Structure Construction Programme

End construction of the structure

End construction of the tank

Construction of the structure

Insertion of Cryostat

Construction of the WT leaving the opening for cryostat

