

GE2/1 PRODUCTION SITE  
READINESS

# FRASCATI REPORT

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# INTRODUCTION

- Frascati participated in the GE1/1 production. All chambers fully validated and tested
- personnel participated twice to a GE2/1 pre-production test at CERN assembling two M4 modules
- For GE2/1 Frascati as the commitment to assemble 38 modules



Happy people after having tested the last  
GE1/1 chamber

# MAN POWER AVAILABLE

- Three technicians (Alessandro, Daniele and Luciano) all trained and expert after GE1/1 production and GE2/1 pre-production assembly
- Three Physicist (Luigi, Stefano and Davide)
- One additional physicist (recruiting just started) with a position for two years will join the group most likely at the end of November
- All personnel have the skills to follow all production phases, from production up to all QCs
- GE1/1 chamber production time 1 day (in the morning kit preparation, in the afternoon chamber assembly)

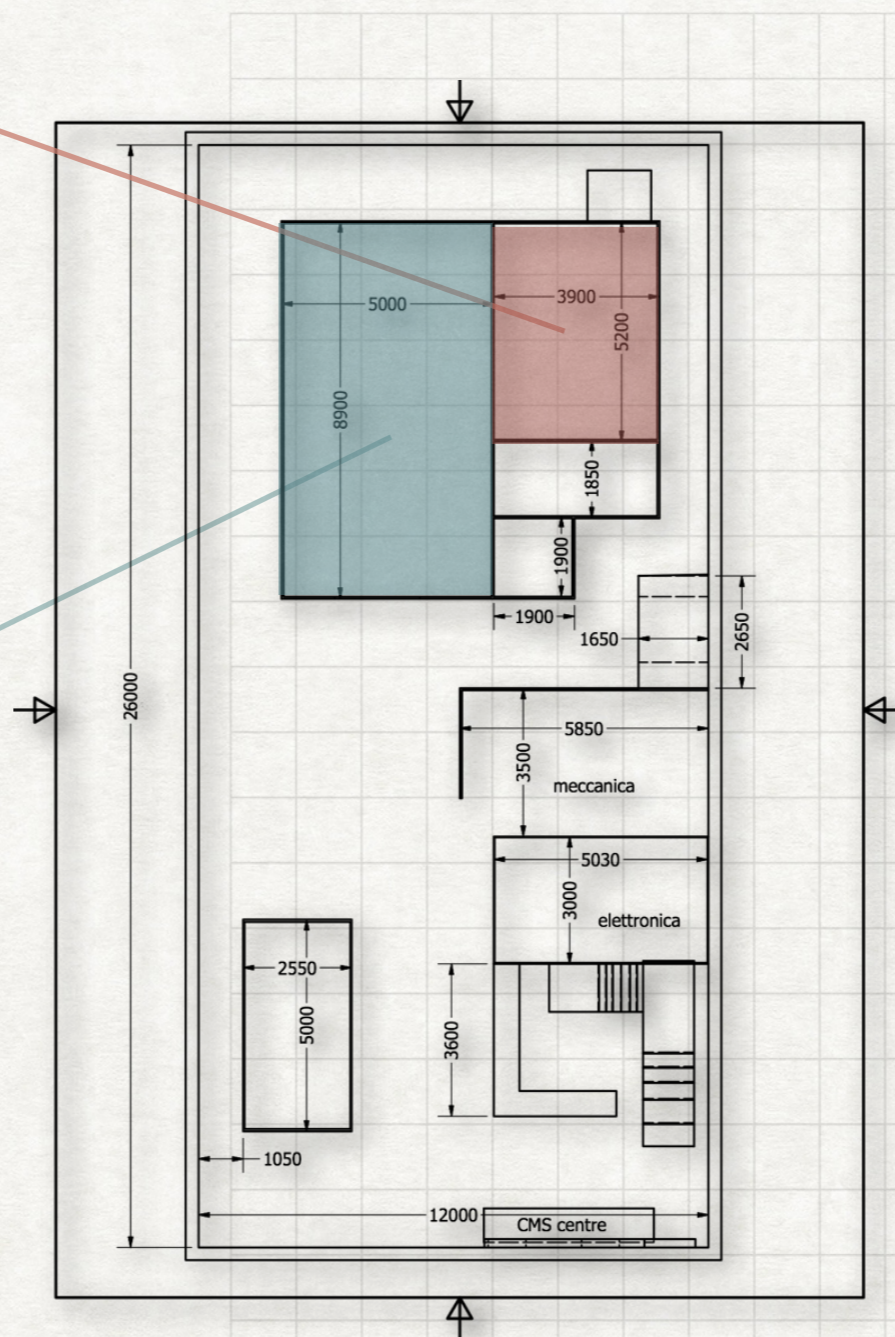


# INFRASTRUCTURE READINESS

## Clean Room

- Clean room class 100 used to assemble GE1/1 chamber fully equipped with cleaning tools, screw drives, tapes, Megger. In the clean room there are also one marble table and one optical table and gas box for QC2 short test for three GEM foils simultaneously (if needed can be updated easily in a QC2 long station)

- For GE2/1 we will have the possibility to use a clean room class 10000 as storage area. This area is accessible from the assembly clean room via an internal door. This is a big improvement since the number of chamber to be assembled is much larger the GE1/1 production (this room is 7X5 m<sup>3</sup>)

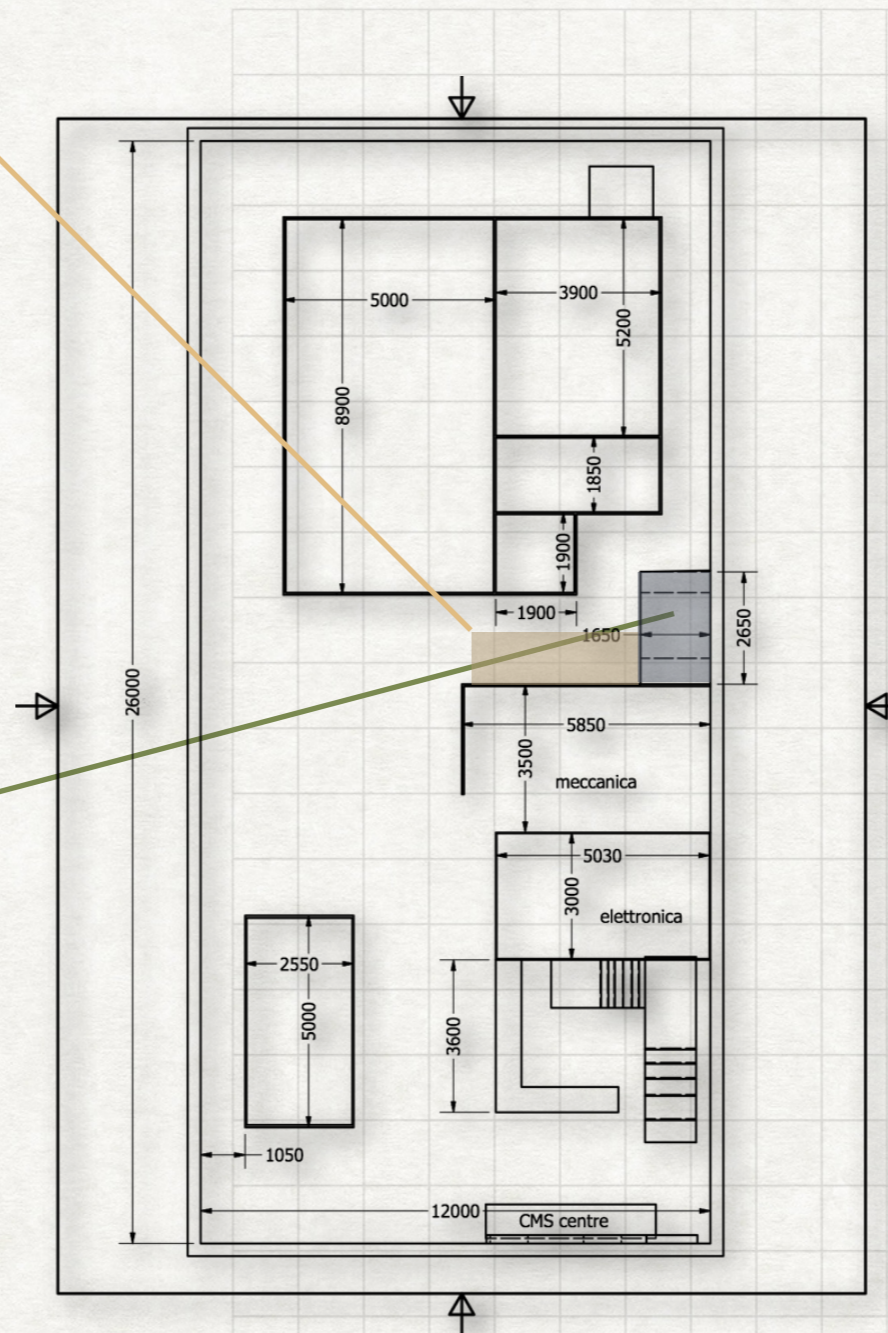


# INFRASTRUCTURE READINESS

## QC stations

- QC3 and QC4 station are located in the same area. The area is served by both Ar/CO<sub>2</sub> and pure CO<sub>2</sub> (for QC4). The gas system is currently under refurbishing and will be out under test for gas tightness in the next weeks. The readout is done via a ADC24 bit by Pico Technologies. Chamber pressure as well as atmospheric pressure, temperature and RH are continuously monitored during all test

- QC5 effective and uniformity map stations are located in a bunker with two entrance. The bunker dimensions are 2X3.5 m<sup>3</sup>. The shielding during x-ray gun operation is provided by the bunker walls done by a al-lead-al sandwich (2mm each thickness). The bunker accommodate the mini-X ray Ar source, the signal shaping electronics and the SRS system. The bunker is equipped with Ar/CO<sub>2</sub> gas mixture and internal and external environmental parameters are continuously monitored during operation



The whole GE2/1 is located in a experimental hall in which are also available a small mechanic and electronic workshop

# QC READINESS

- QC3: gas system under refurbishing. Gas pipes have been changed, replaced the gas filters (2 X 4  $\mu\text{m}$  filters). The readout software updated to the news version which will allows immediate import into excel format to match the GE2/1 standard
- QC4: under price enquire a HV system from CAEN dedicated to GEM chambers, HiVolta (DT1415ET) with the idea to use it in GE2/1 production.
  - 8 channels desktop module
  - 220 V/110 V AC operation
  - 1 kV / 1mA (0.6W) output ranges
  - Floating Channels
  - SHV coaxial output connectors
  - Floating return up to 5kV
  - Low Ripple (Typ: < 5mVpp differential)
  - 20 mV Vset resolution
  - 20 nA Iset esolution
  - 1 nA Imon resolution (Imon-Zoom: 100 pA)
  - Under/over-voltage alert, overcurrent protection
  - Programmable ramp-up / ramp-down (1-100 V/s)
  - 2.8" color touch screen
  - Local and Remote control (USB2.0/Ethernet)
  - Interlock logic for board enable and Individual channel kill
  - Software Tool for easy channel management
- QC5 effective: ready
- QC5 uniformity: bought new PC for the SRS controls. OS installed as previous one but waiting to proceed to align to GE2/1 production community. For the Panasonic-to-VFAT3 adapter we would like to follow the same approach we used for the Panasonic-to-LEMO adapters asking a local company to produce it since the CERN price is quite high. For this we need the drawing of the already produced at CERN

# CONCLUSIONS

- Frascati site is ready to start GE2/1 production
- Personnel well trained. Already participated to GE1/1 production and assembled two M4 modules at CERN
- Infrastructure ready and even improved w.r.t to GE1/1 with the addition of a very large and clean storage area for the 38 chambers
- QCs almost ready. Only missing the HRS-to-Panasonic adapters