

Tecnologie per la sostenibilità al Tecnopolo di Bologna

27/05/2025

La Biodola

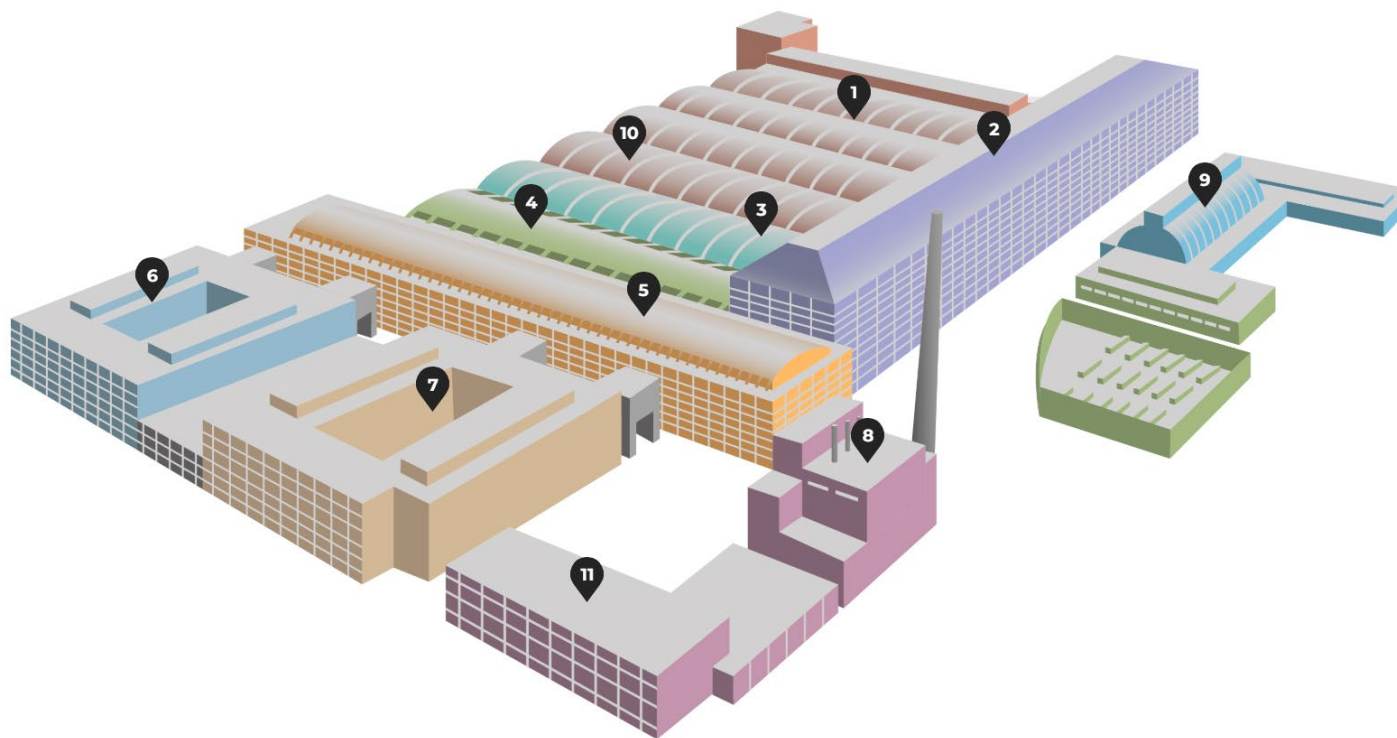
Luigi Scarponi

INFN-CNAF



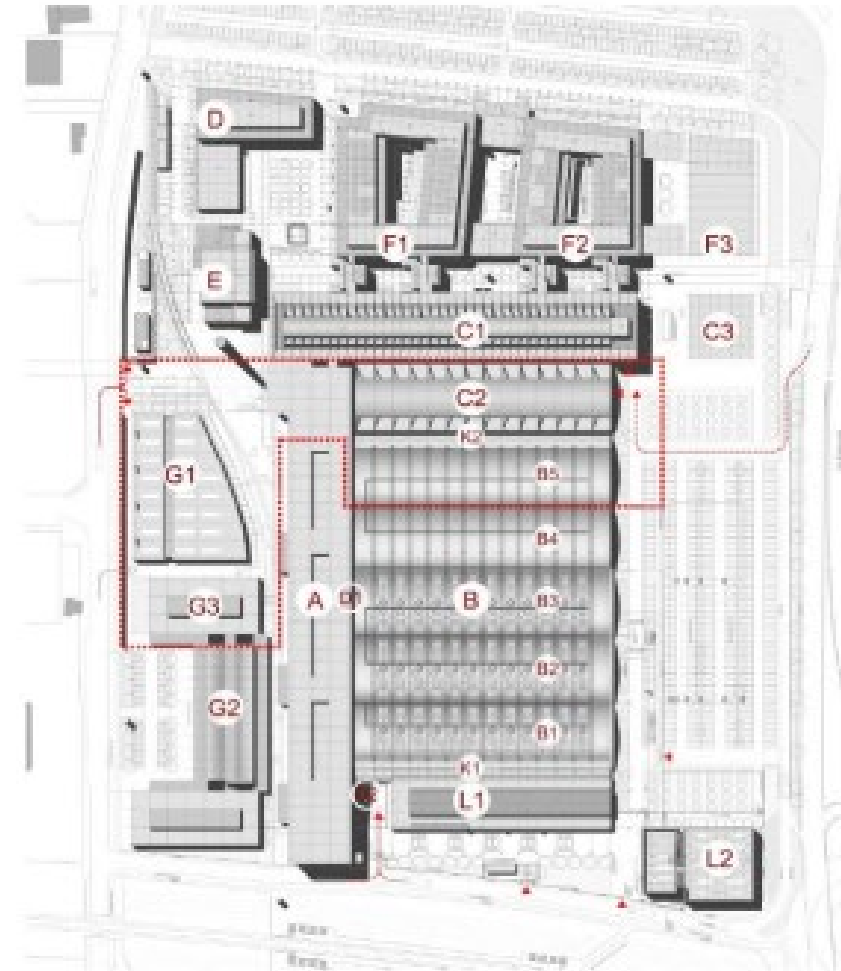
TECNOPOLO DATA MANIFATTURA EMILIA-ROMAGNA

1. ECMWF
2. Hub ricerca e imprenditorialità
- 3. INFN-CNAF**
4. CINECA
5. ENEA
6. Area della ricerca internazionale
7. ART-ER, Clust-ER, IOR
8. Piazza del Tecnopolo
9. Area congressi
10. Botte B4
11. Citizen Science

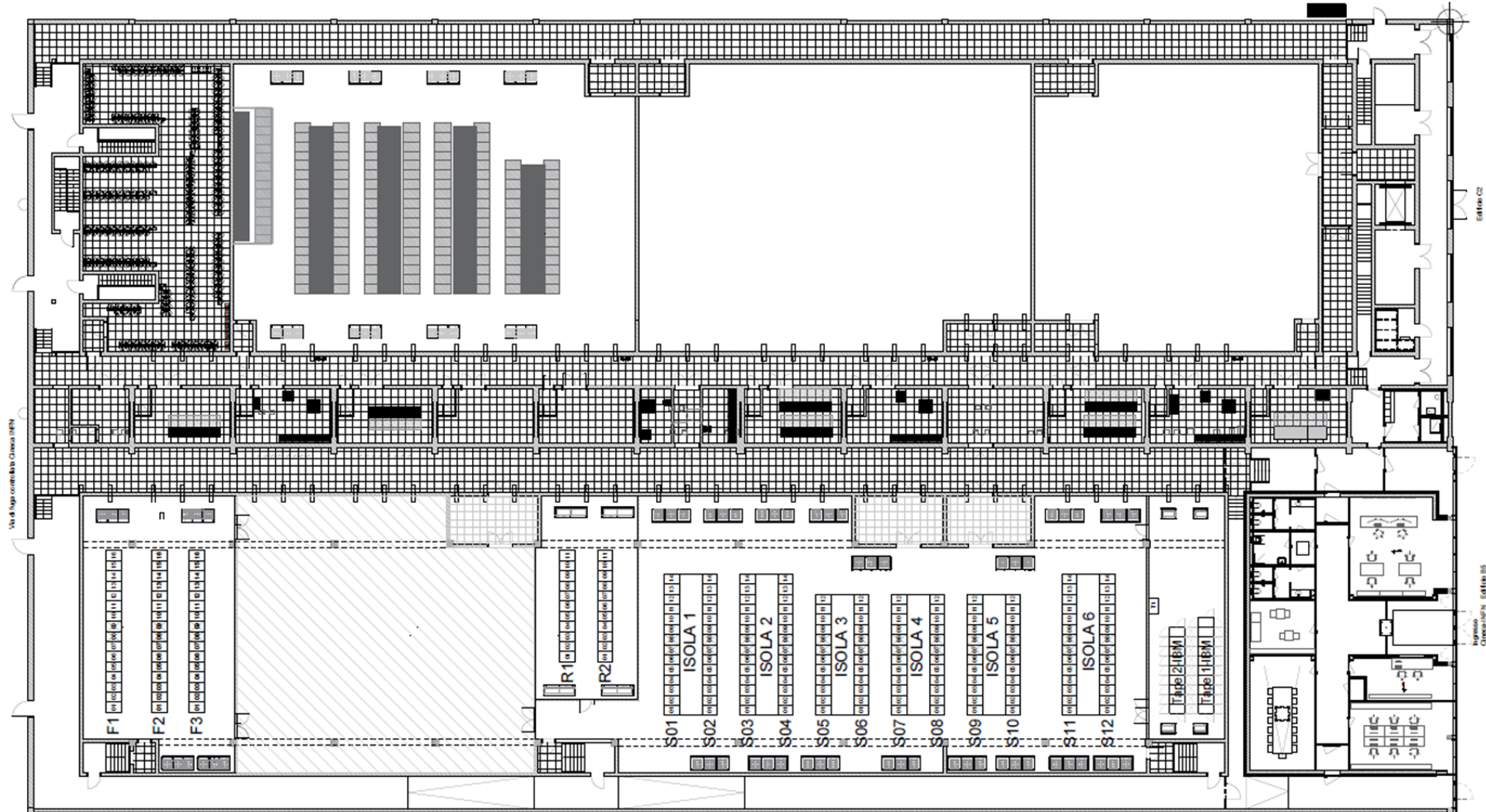


Area totale 10.000 m²

Sale dati 4.000 m²







2 cabine di consegna in MT da 10 MW ciascuna

Quattro rami (ridondanza 3+1)

POTENZA IT **10MW** + POTENZA AUSILIARI IT **3 MW**

Per ogni ramo:

Piano primo C2

1 Q MT

4 Trafo 2500 kVA + 1 di riserva

2 UPS da 1 MW

**FASE 2 possibilità
di raddoppiare**

G1 – Centrale Frigorifera

1 Q MT

1 Trafo 2500 kVA + 1 di riserva

1 UPS da 250 kW (batterie 6 min.)

G3 – Edificio gruppi elettrogeni

1 GE 2.500 kW

1 serbatoio stoccaggio giornaliero (1.000 lt)

1 serbatoio interrato 20.000 lt

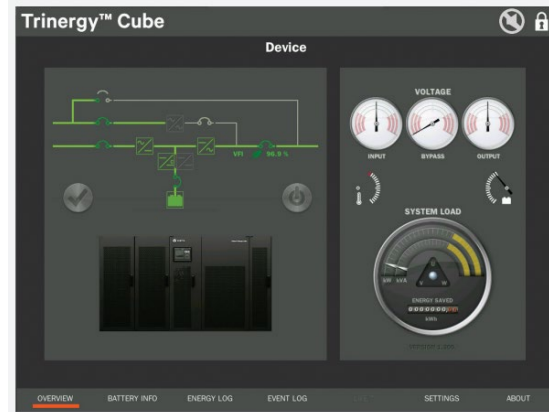
Impianto elettrico – Edificio G3



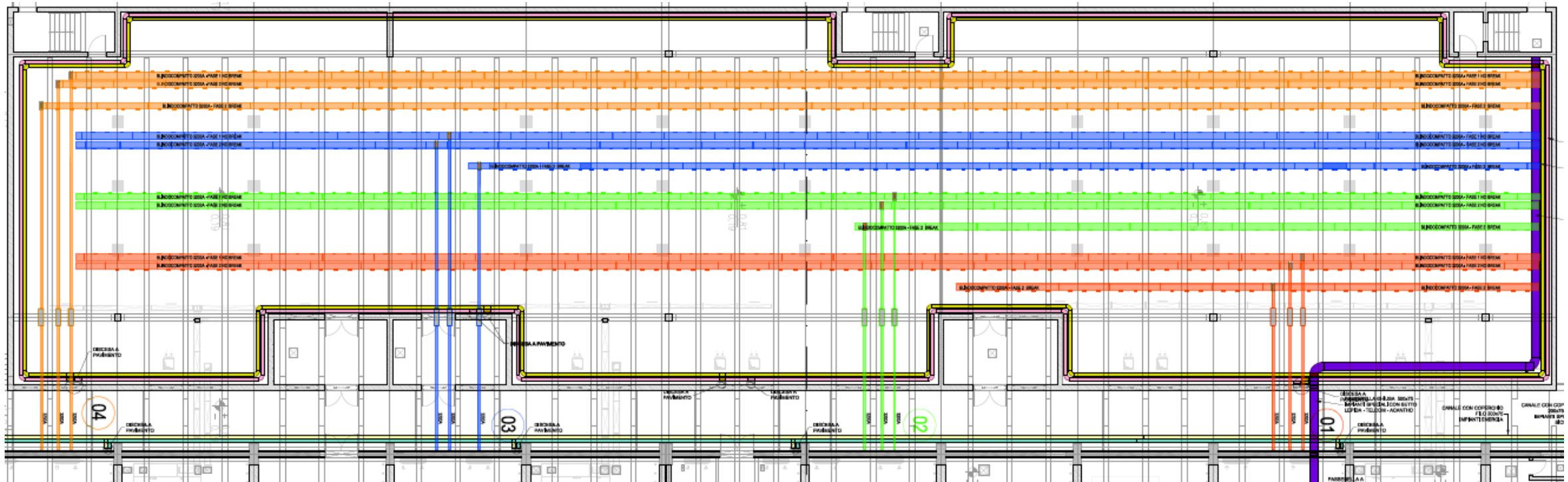
Impianto elettrico – Edificio C2



UPS Vertiv-Trineergy Cube 1 MW
Pacco batterie a litio (autonomia 10 min.)

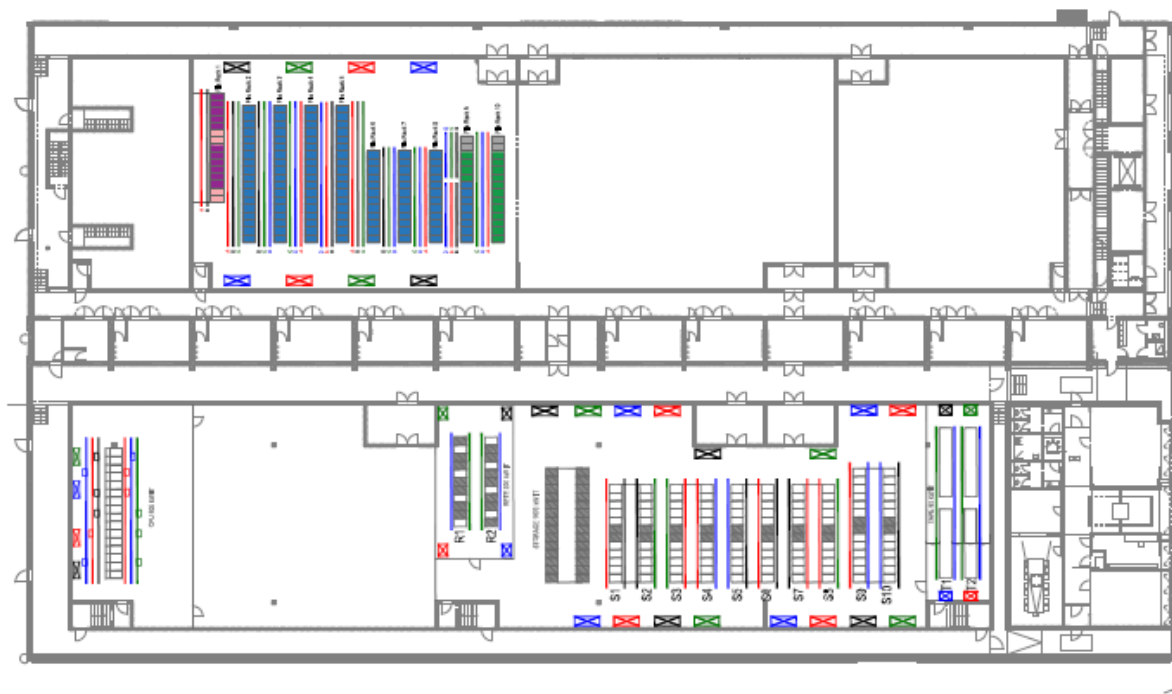


Distribuzione elettrica primaria - B5



Distribuzione elettrica secondaria - B5

- Potenza IT disponibile 3 MW
- Su ogni fila di rack due blindo da 1000 A
- Ogni rack dotato di due PDU 32 A Trifase (22 kW)
- Monitoraggio dei consumi sulle singole PDU



Centrale frigorifera - Edificio G1

4 centrali identiche (3+1)

- acqua refrigerata 19-26 °C

Chiller da 2 MW a levitazione magnetica, condensati ad acqua (2 smaltitori adiabatici)

Possibilità di Free-cooling indiretto totale/parziale

- Acqua temperata 36-46 °C

Raffreddatori adiabatici da 2,25 MW

Sistema a doppio anello mandata e ritorno

FASE 2 possibilità di raddoppiare circuito acqua refrigerata

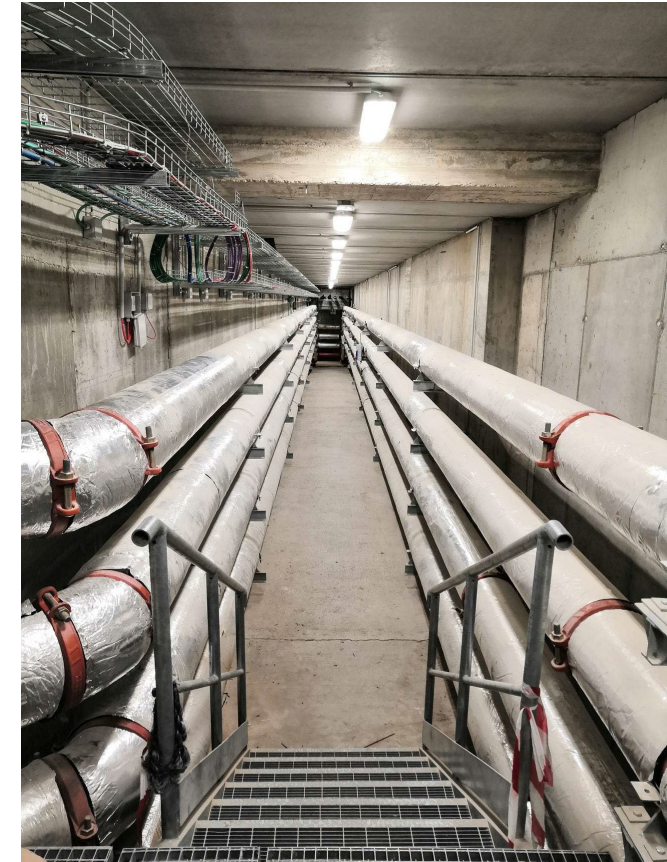
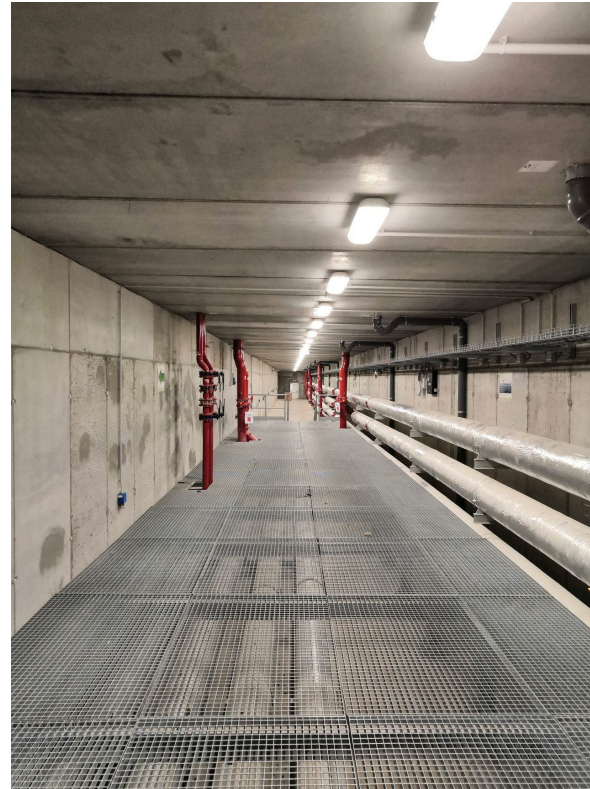
Centrale frigorifera - Edificio G1



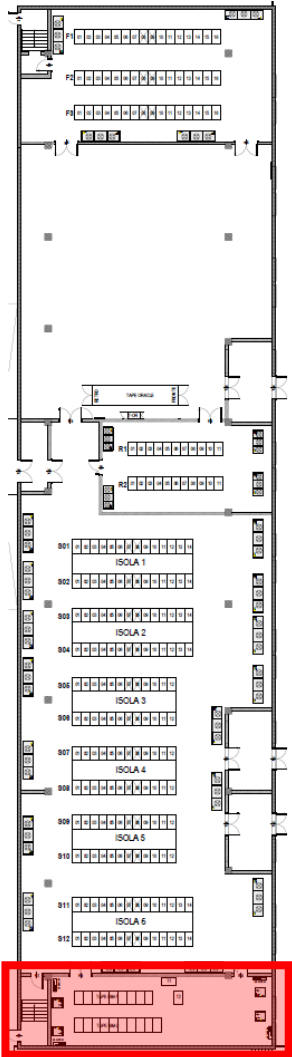
Centrale frigorifera - Edificio G1



Tunnel



Raffreddamento sale B5

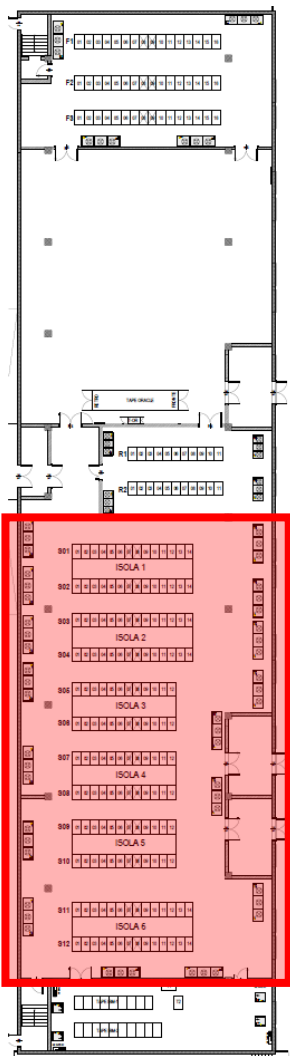


SALA TAPE LIBRARY (170 m²)

- 4 CRAH 25 kW
- T sala 23°C

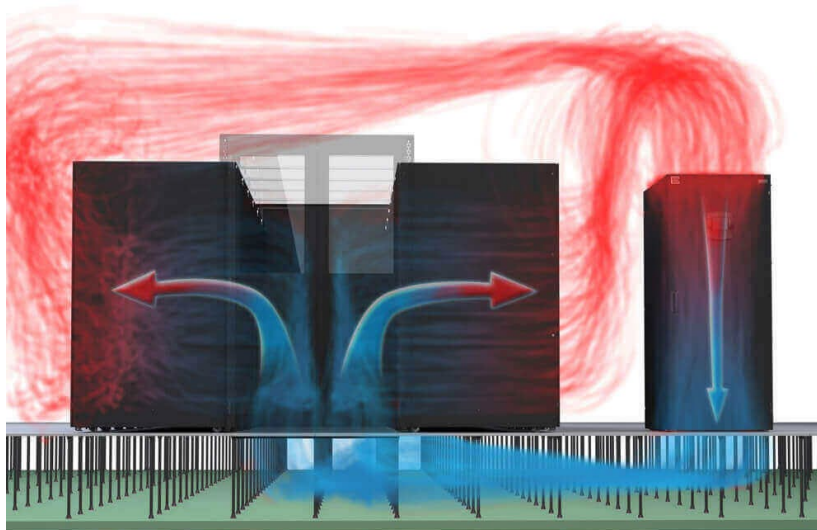


Raffreddamento sale B5

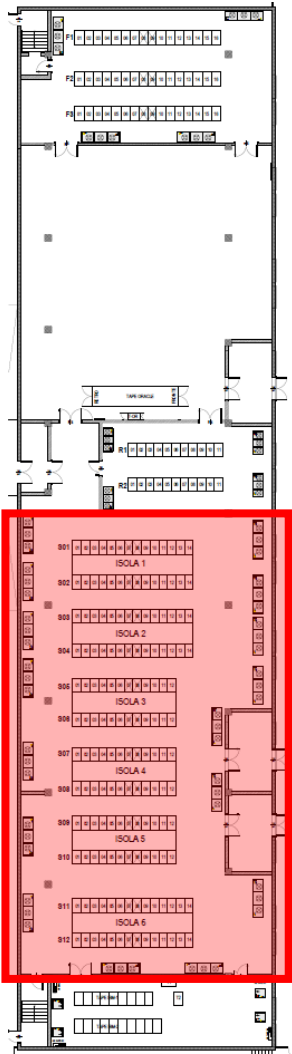


SALA BASSA DENSITÀ (740 m²)

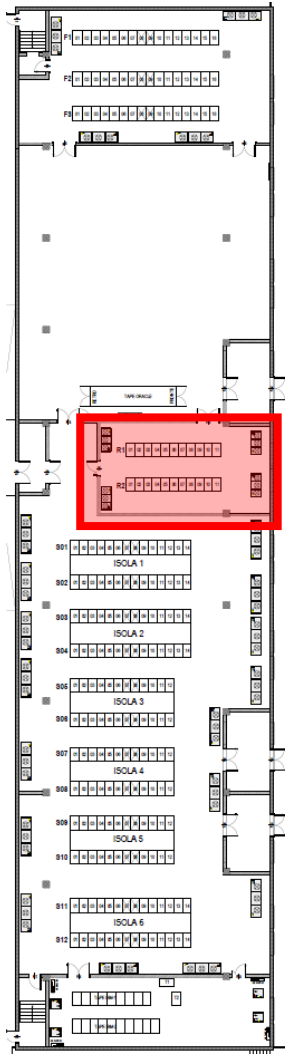
- 156 rack
- 6 isole (corridoio freddo)
- 16 CRAH 185 kW
- 16 kW/rack



Raffreddamento sale B5



Raffreddamento sale B5



SALA RETE (120 m²)

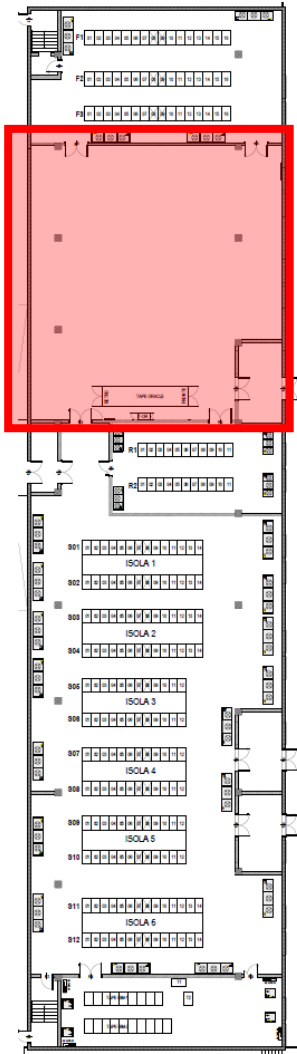
- 22 rack
- 4 CRAH 75 kW



Tipologia cavo	metri stesi
MPO-12-OS2	5.600
MPO-12-OM5	5.600
LC-LC OM5	5.300
LC-LC SM OS2	300
UTP cat 6a	19.600

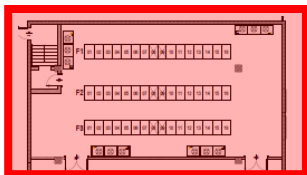


Raffreddamento sale B5



ZONA ESPANSIONE (460 m²)
Acqua refrigerata/temperata



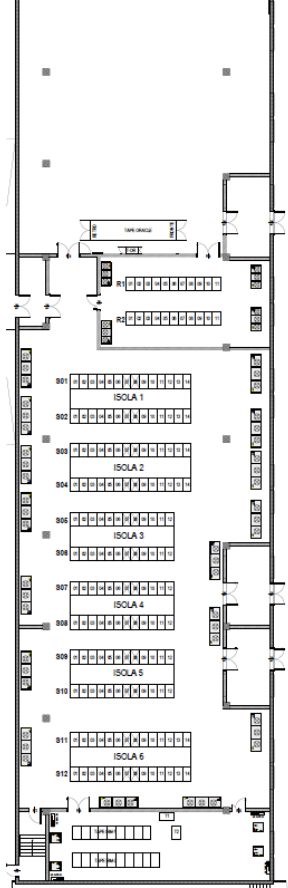
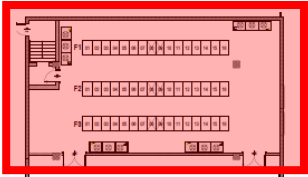


SALA ALTA DENSITÀ (200 m²)

- Predisposizione per DLC fino a 3 MW
- 3 file di rack
- CRAH perimetrali per 600 kW (20% del DLC)
- 6 rack con raffreddamento rear door (40 kW/rack)

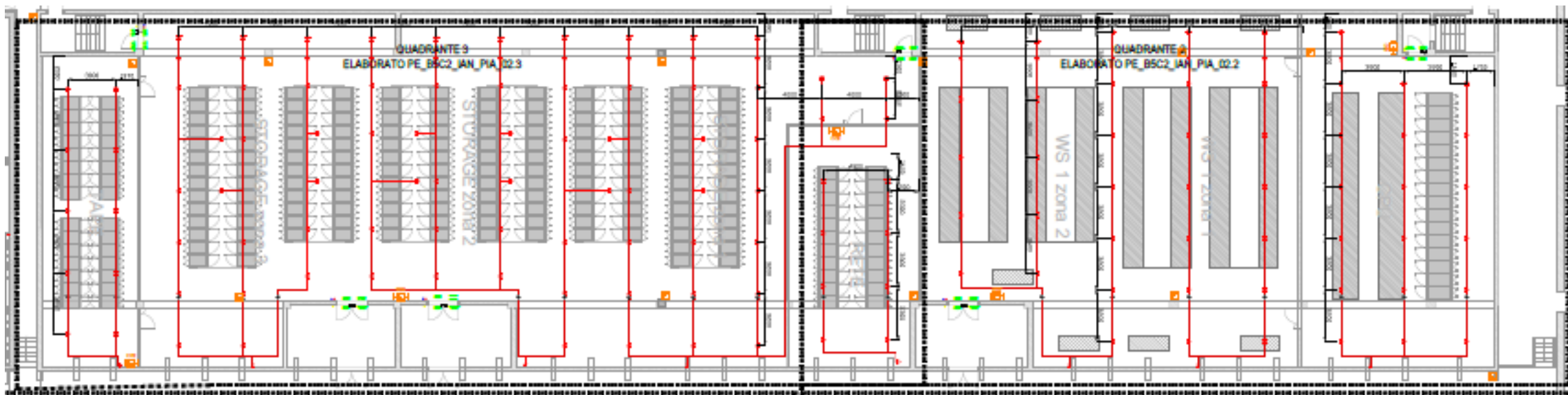
Raffreddamento sale B5

SALA ALTA DENSITÀ (200 m²)



Impianto antincendio

Spegnimento a gas inerte IG-55 (Argonite)
Locali B5 C2 G1



Spegnimento ad acqua nebulizzata
Locali G1 G3

- PUE Tecnopolo ≈ 1.2
- PUE INFN ≈ 1.4
- Impianto per 3 MW (espandibile in futuro)
- Sistemi eterogenei
- Alta temperatura acqua
- Recupero termico per riscaldamento (necessità di utenze)
- Parametri DLC molto vari
- Gestione INFN-CINECA

2021

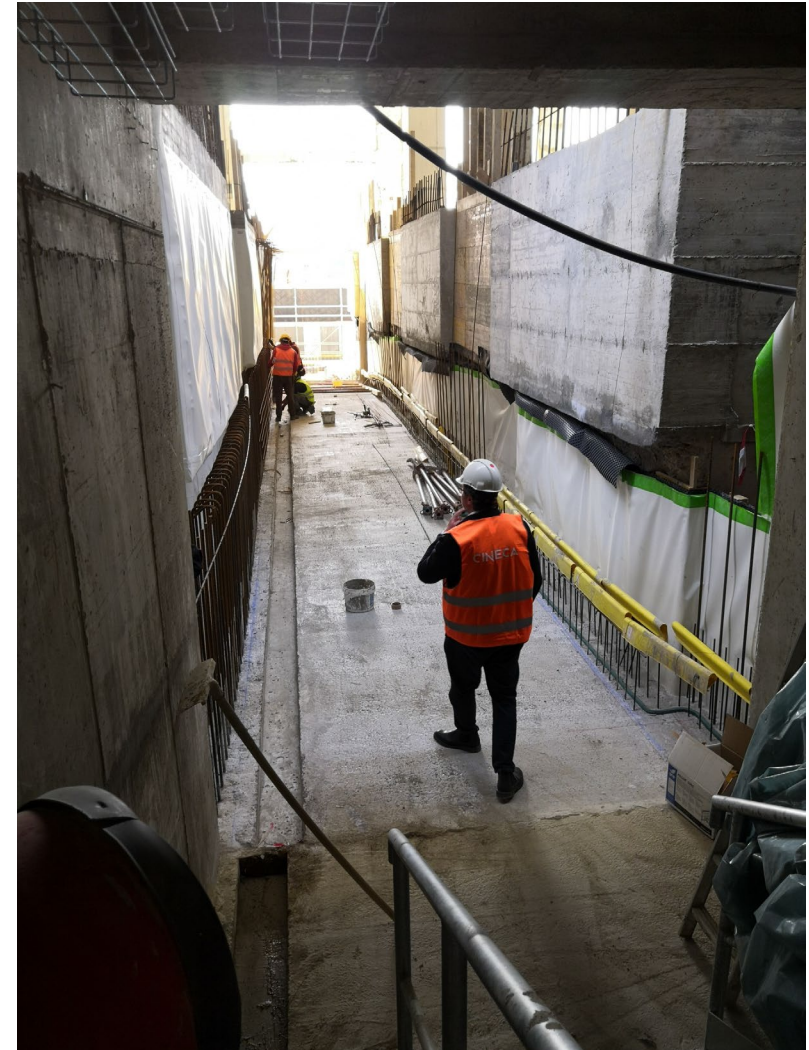


2021

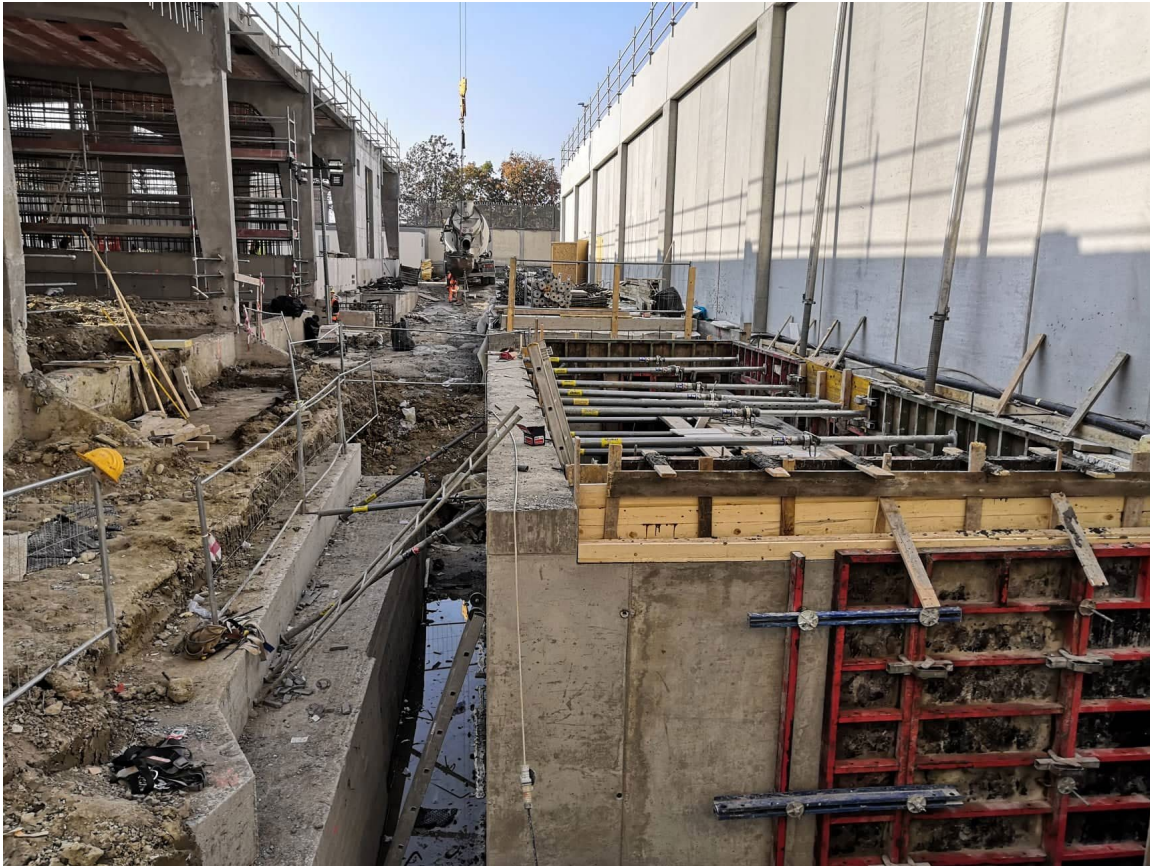


2022











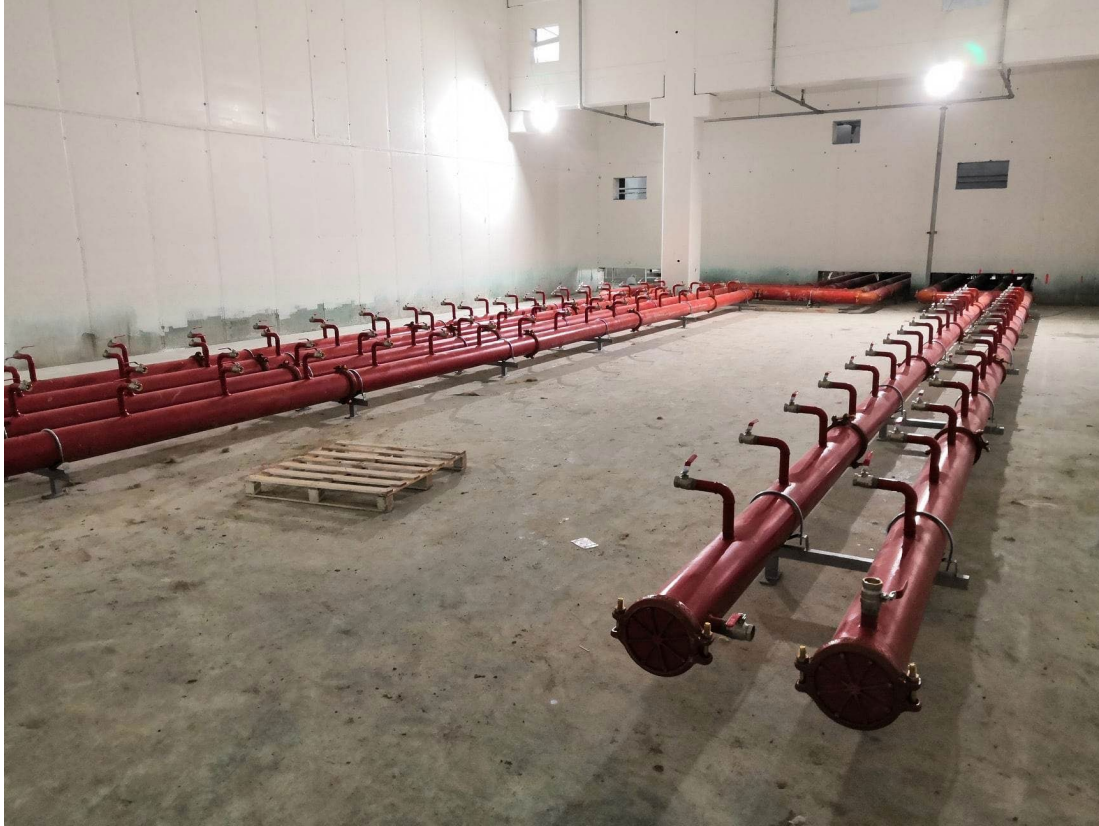


2022

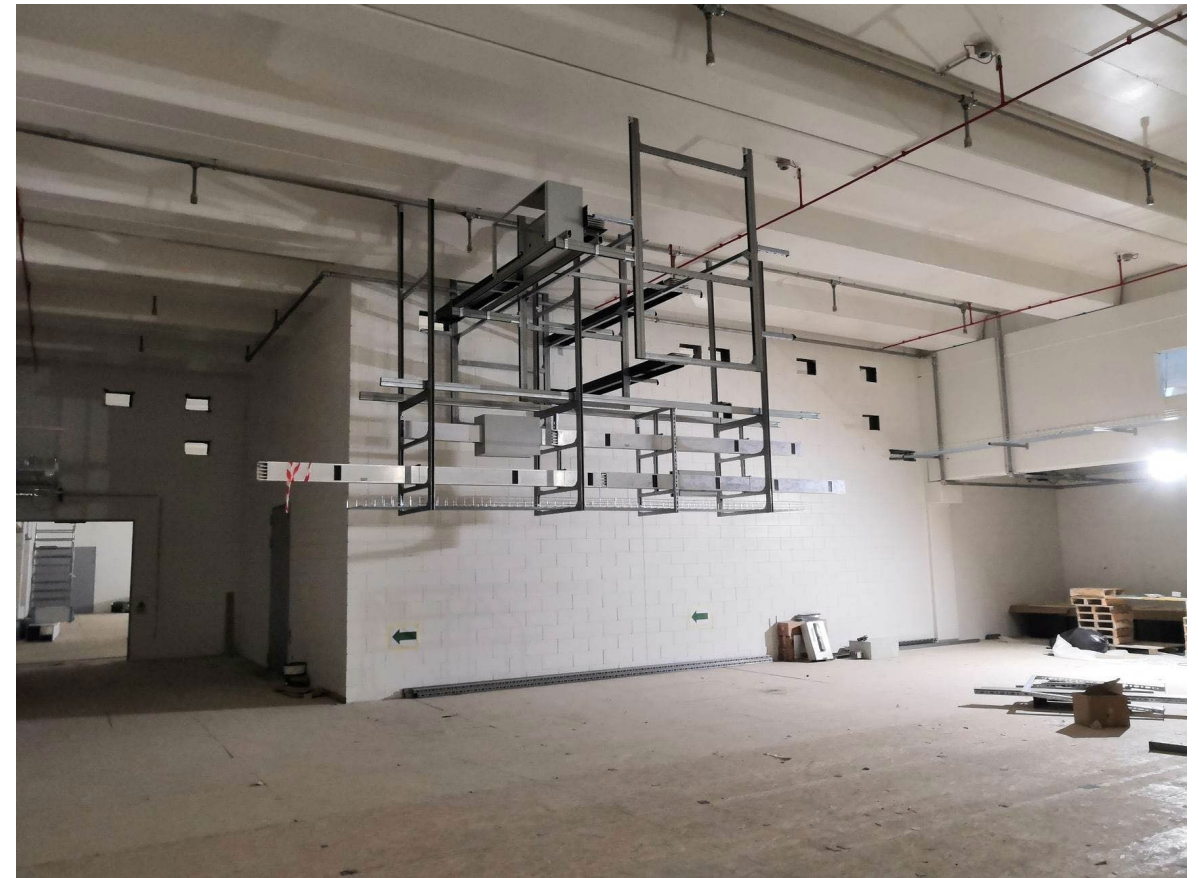
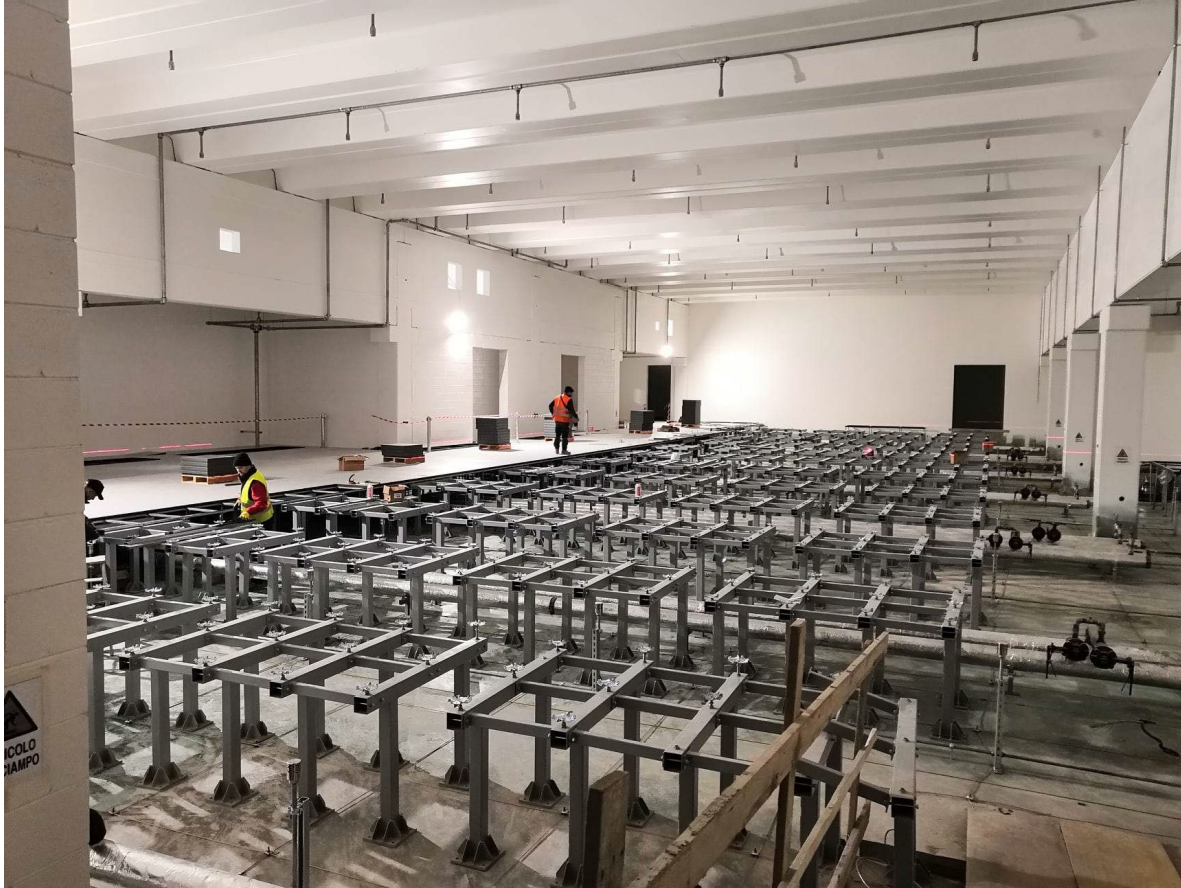




2023



2023



2023







Grazie per l'attenzione