

# EP facility at KEK

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# 1. Why EP facility at KEK?

1. Critical facility to electro-polish the inner surfaces of cavities for high gradient ( 35 to 45MV/m ) .
- 2 . Desirable to consolidate all relevant surface treatment facilities at KEK, for consistent and reliable cavity performance.
- 3 . EP facility at KEK allows us to maintain a clean room and HPR in a close neighborhood for reliable cavity system performance after assembly.
- 4 . We would like to construct the model system as a new EP Show-case on EP to industrialize manufacturing of cavities.
- 5 . More issues for future , for example performance, safety, management and improvement are discussed among staff in KEK. → Establishment of EP committee

## 2. Concept of EP facility at KEK

- Safety as number one priority. Compliance to all national, local government and KEK-internal regulations.
- Treatment of chemicals:
  - Acid waste → out-sourcing
  - Waste water → at KEK
  - Exhausted gas → at KEK with scrubber
- Floor level, no pit
- R&D prototype
- Model-room / Show-case of EP
  - Scale = lab.level (i.e. not industrial mass-capacity), but
  - Latest technologies and equipment
  - Clean atmosphere
  - Semi-automated procedures

### 3. Cavities to be processed at this new EP Facility

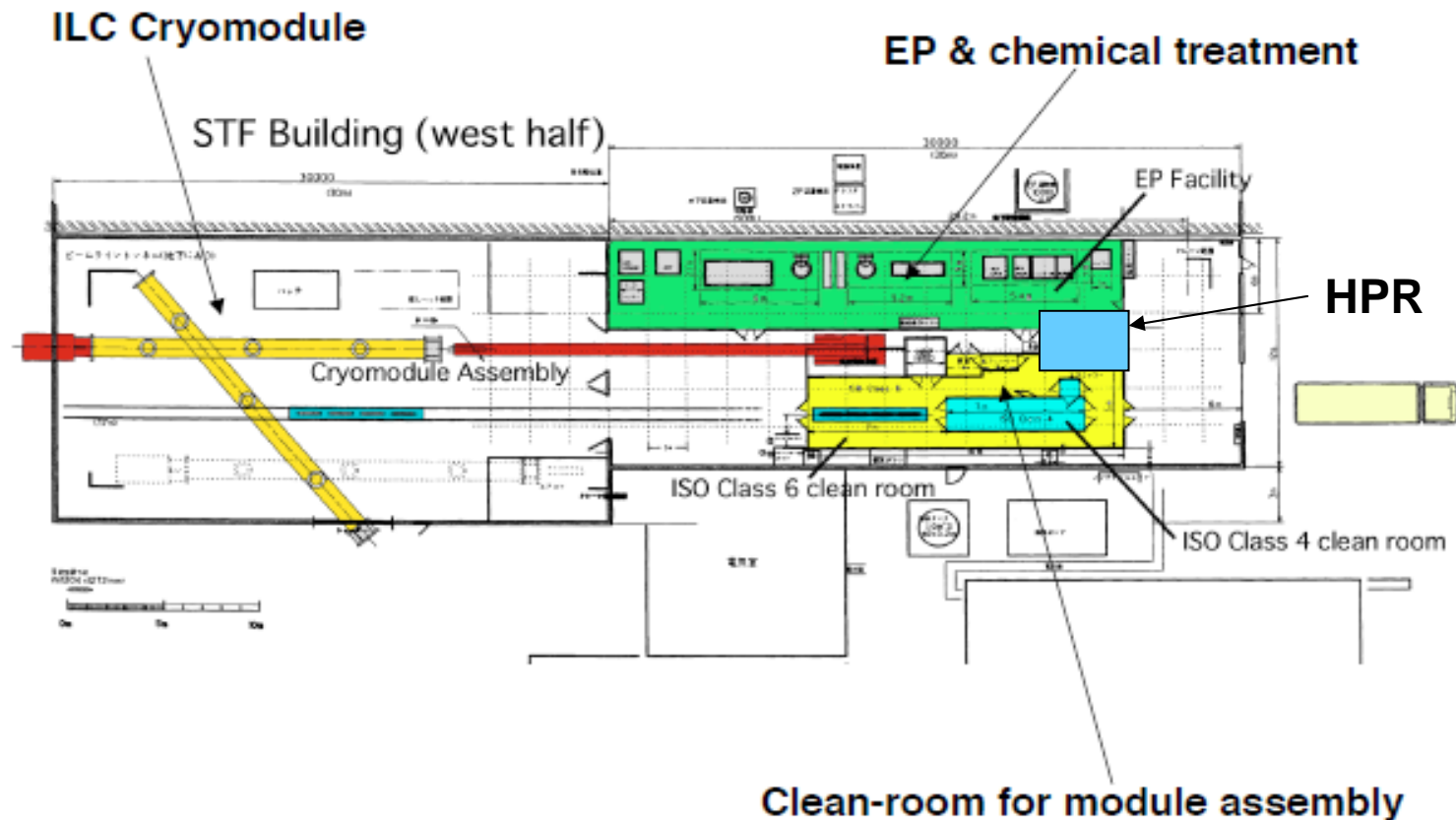
Cavities to EP-process --Blue items are ILC cavities

1. Single cell Nb cavity & parts of cavities
2. 9-cell Nb cavity ILC1300MHz 1300mm×Φ210mm
3. Single cell Nb cavity 500MHz 800mm×Φ520mm
4. Crab Nb cavity 1500mm×Φ520mm

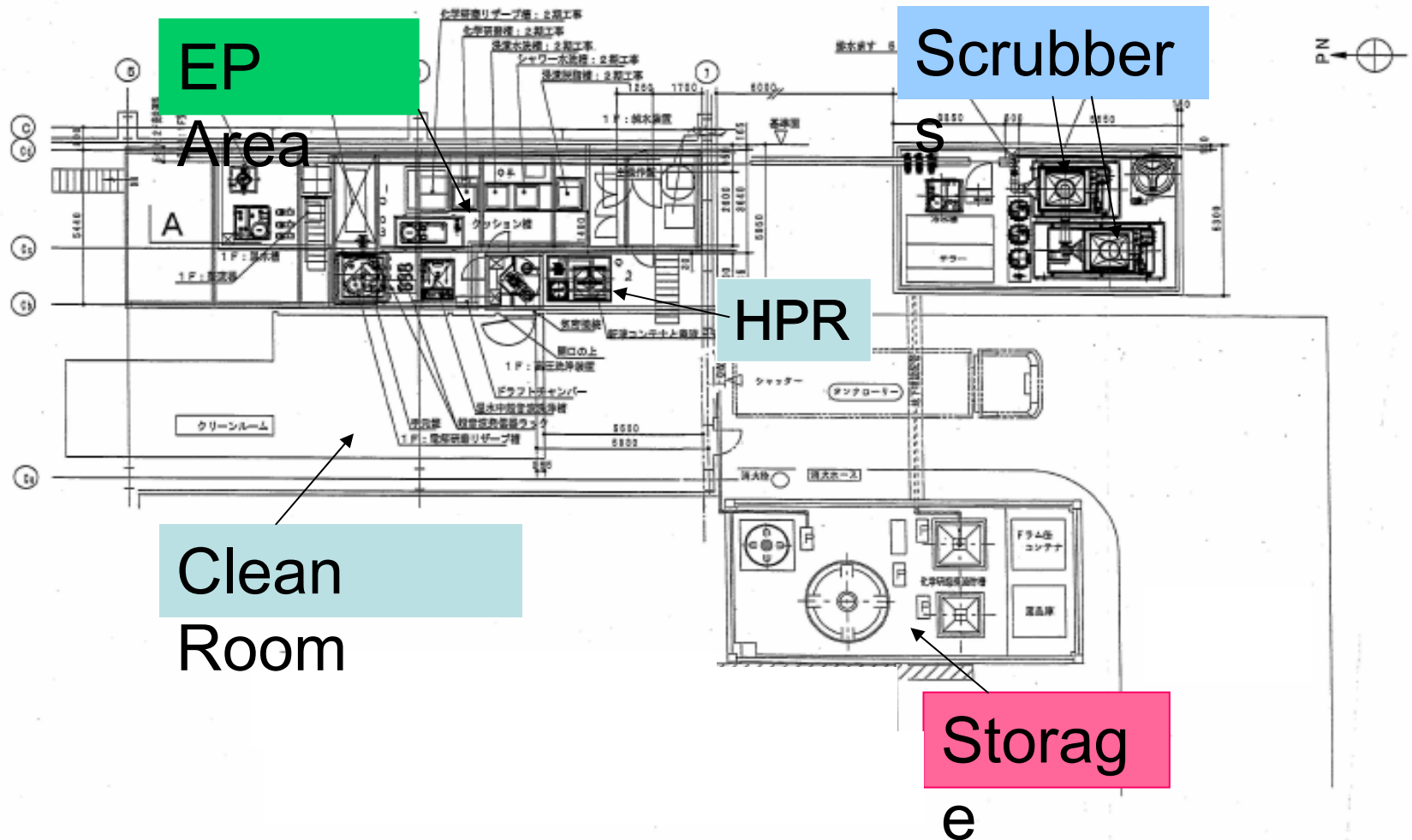
Target capacity = one cavity per week, by 2008

# 4 . Layout of Electro-polishing (EP), Clean room and High-Pressure Rinsing (HPR)

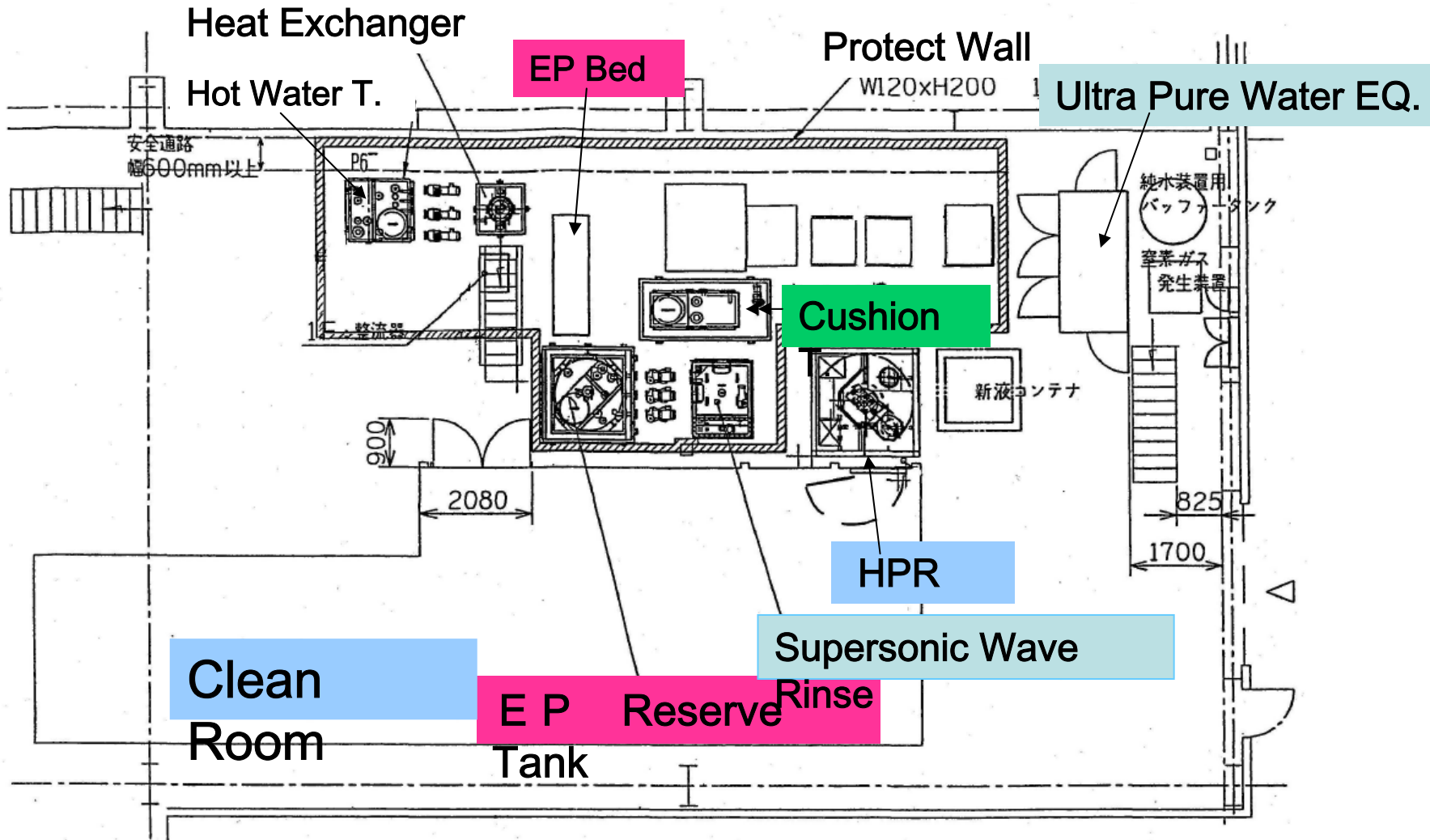
West side of STF Building



# 4. EP Layout --Overview

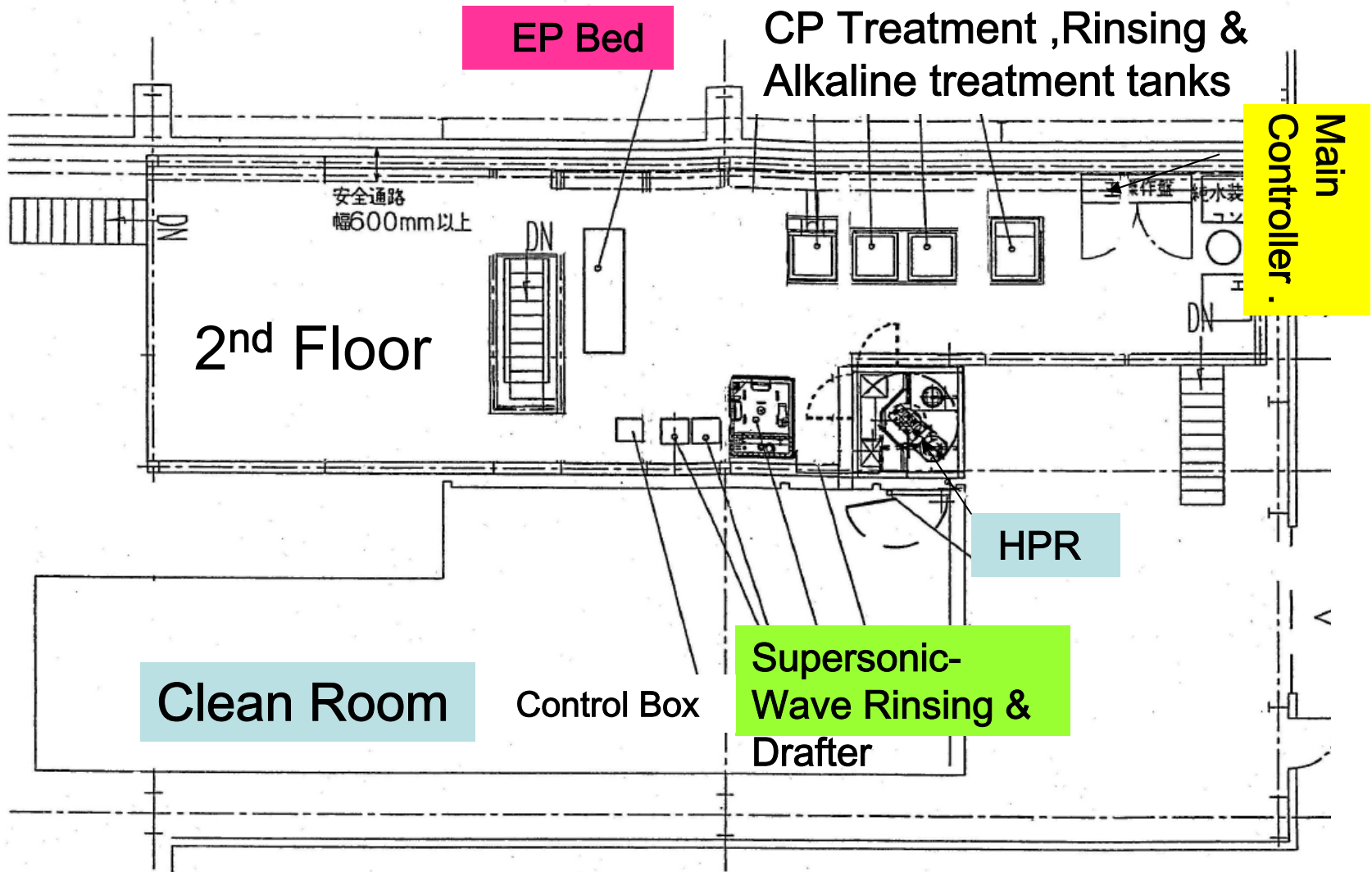


# 4. EP Layout—1<sup>st</sup> Floor

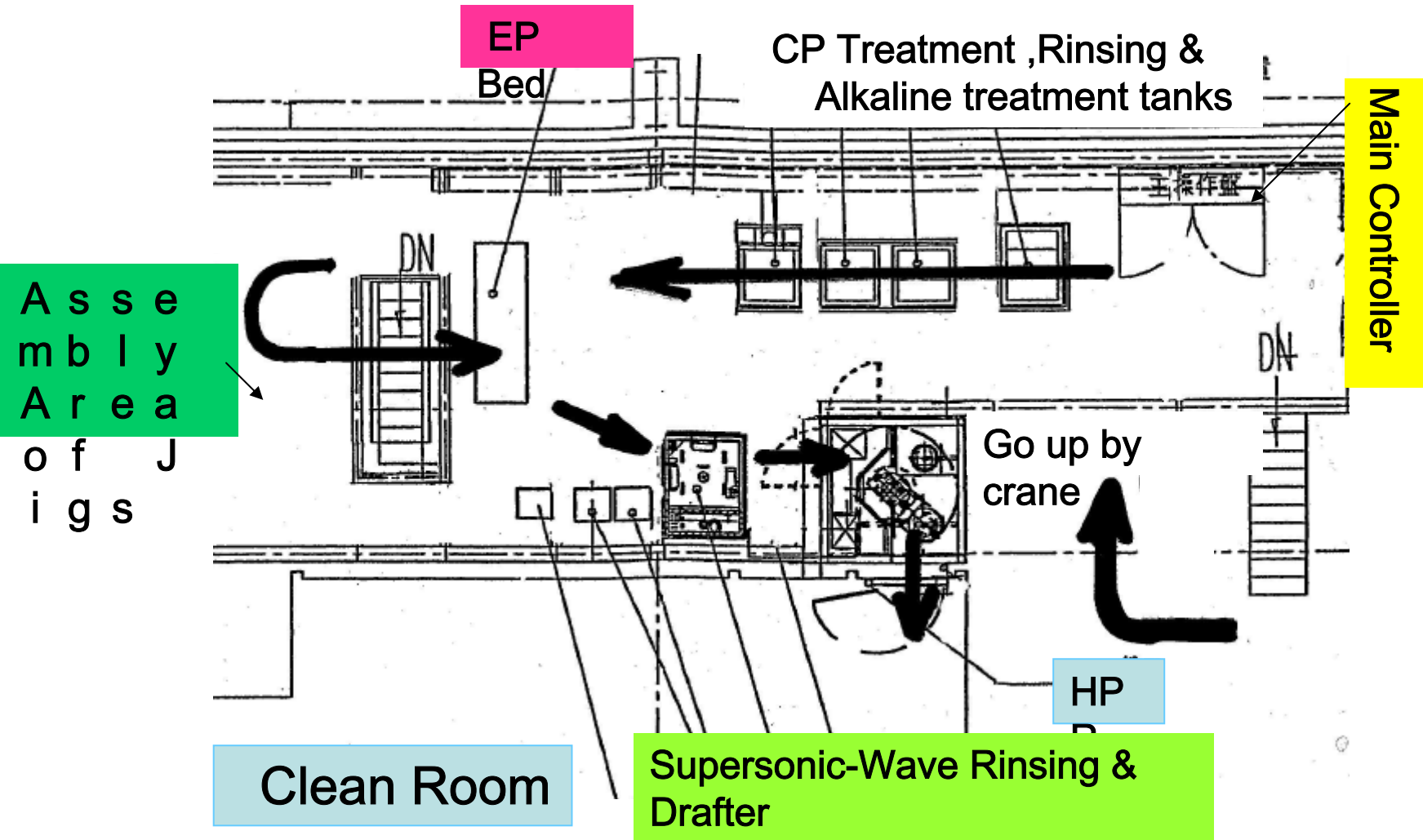




## 4. EP Layout—2<sup>nd</sup> Floor



# 5. Cavity Flow—2<sup>nd</sup> Floor



## 5. Carry in Place of Cavity from outside



## 5. 2<sup>nd</sup> Floor & EP Bed



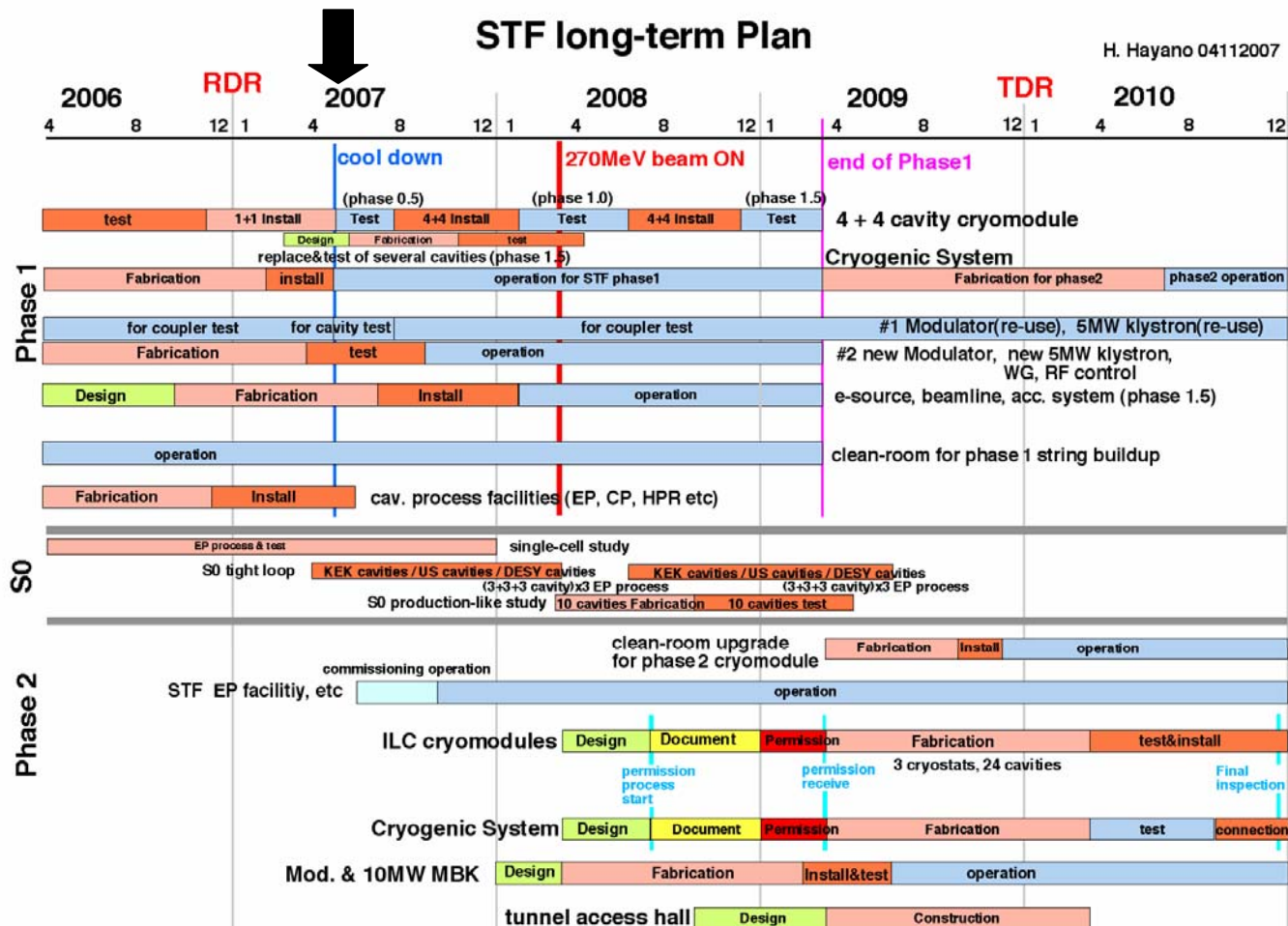


# 5. EP Bed & Rectifier

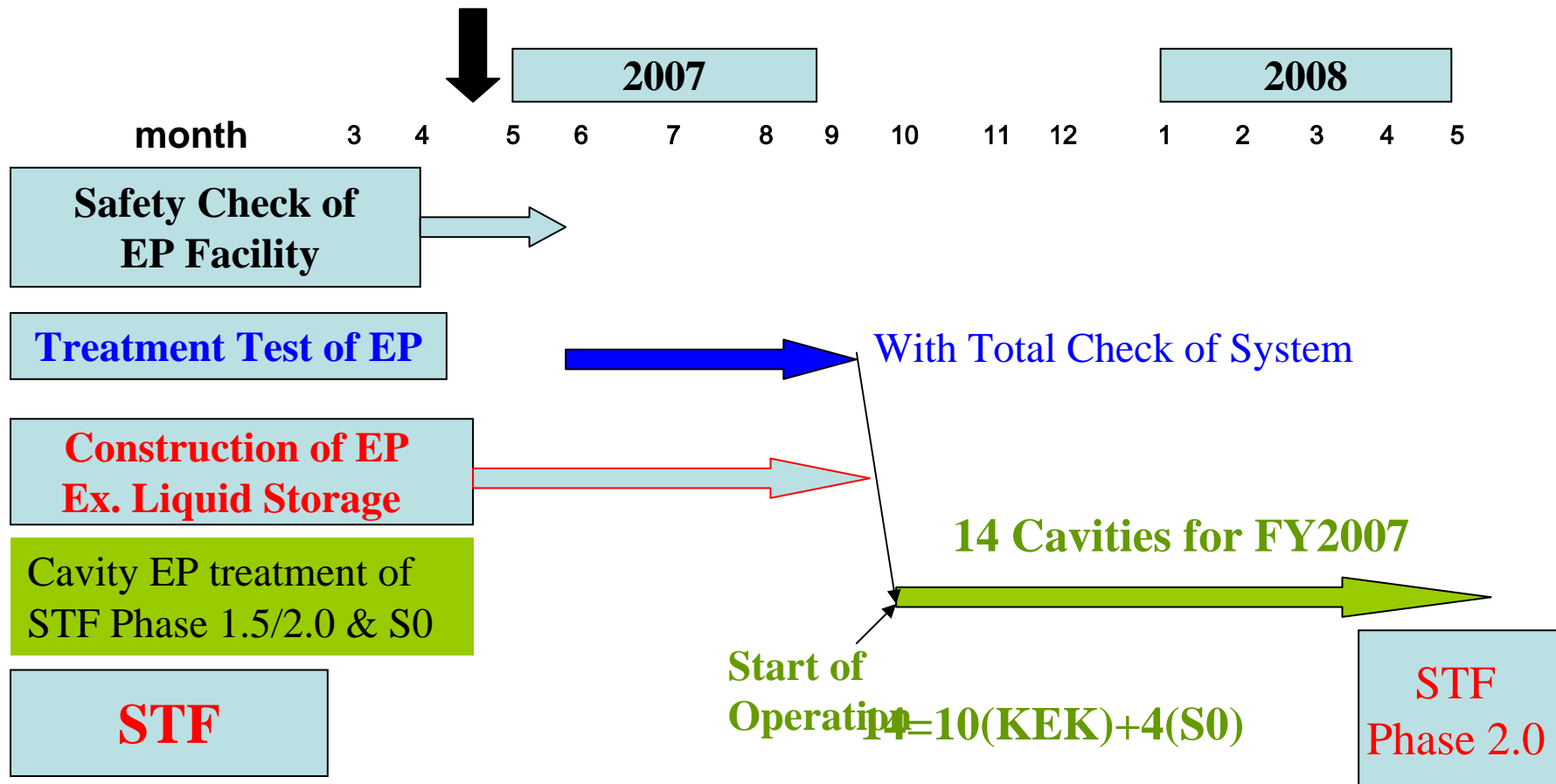
Rectifier at 1<sup>st</sup> floor : 1 0 0 ~ 1 0 0 0 A、5 ~ 5 0 V



# 6. Master Schedule of STF



# 6. Schedule of EP system (draft)



# 7. Ultra Pure Water Equipment

Capability : 0 . 6 m<sup>3</sup> ( 1 5 °C ) /H、Resistance > 18.0MΩ

Number of particles<10 p /cc : size 0.1μm

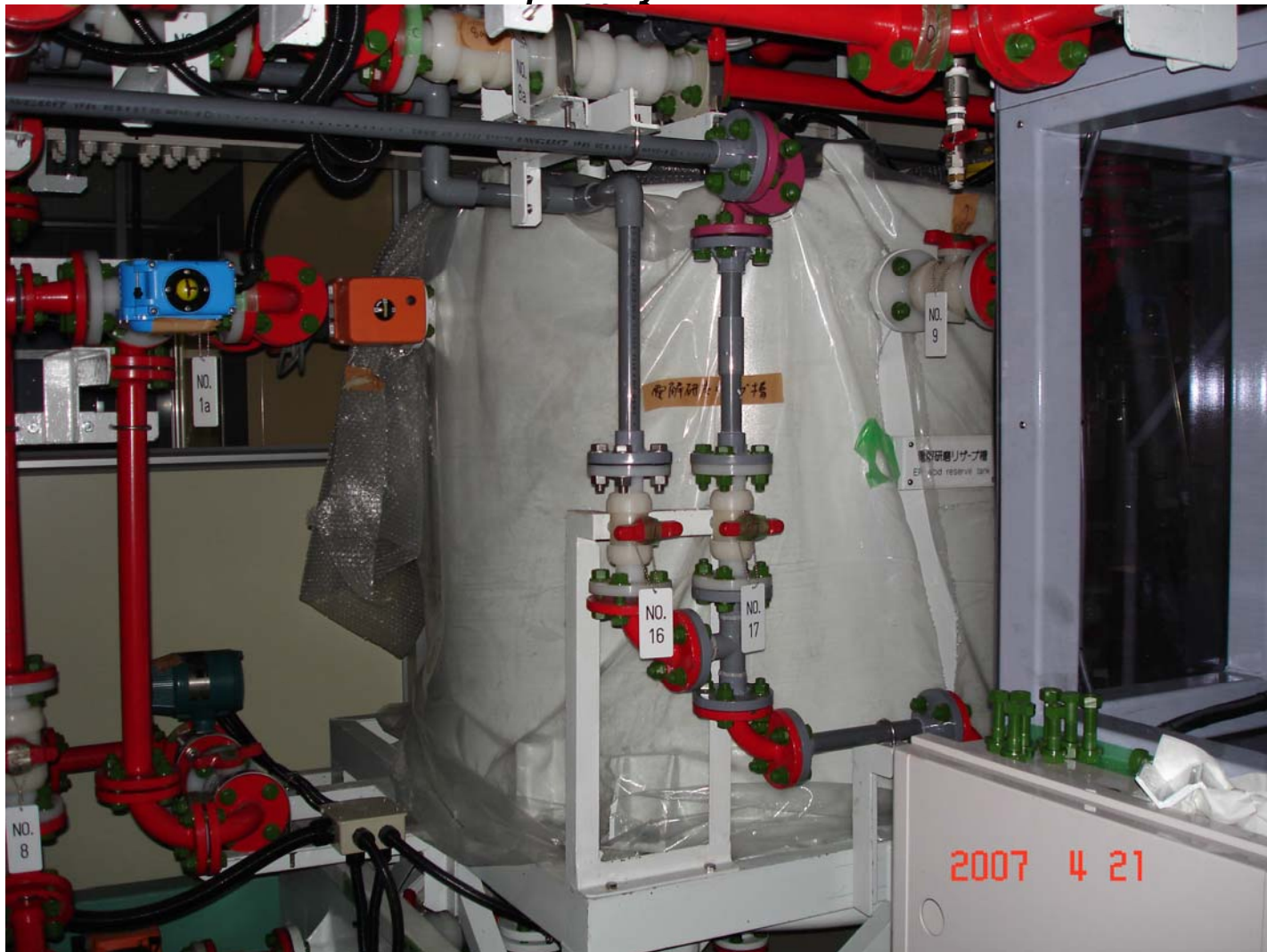
Number of bacteria<5p/cc,TOC10μgC/ℓ





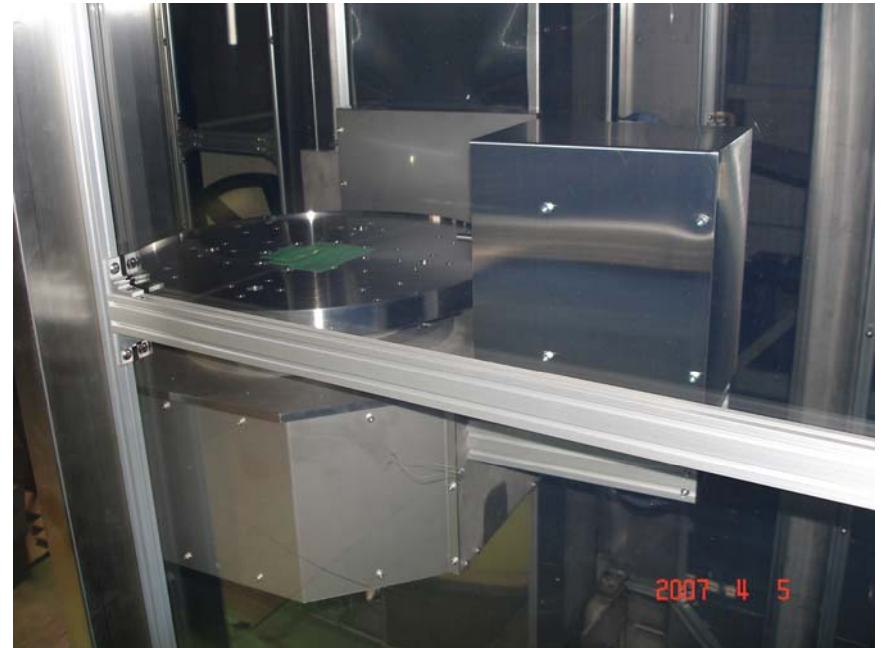
# 7. E P Reserve Tank — Height 1 5 0 0 mm、

Base height 5 0 0 mm、 Diameter 1 3 0 0 mm, Capacity 1 .



# 7. H P R & the tilting table

HPR—— 2 m× 2 m× 5 mHeight、 Class of clean room: 1 0  
0



# 7 . Scrubber & Cold water tank

—Space of layout : 5 . 3 m × 1 0 m    capacity: 2 5 m<sup>3</sup>  
/min

Gas of HF    SO<sub>x</sub>    NO<sub>x</sub>



# 8. Summary

- We have reported the concept and construction status for
  - The new EP system at KEK
  - The HPR that associated with the EP system.
- These facilities are expected to serve as
  - Work forces for the ILC-related cavity related activities at KEK, and as
  - A model room for facilitating industrialization of the cavity manufacturing process.