

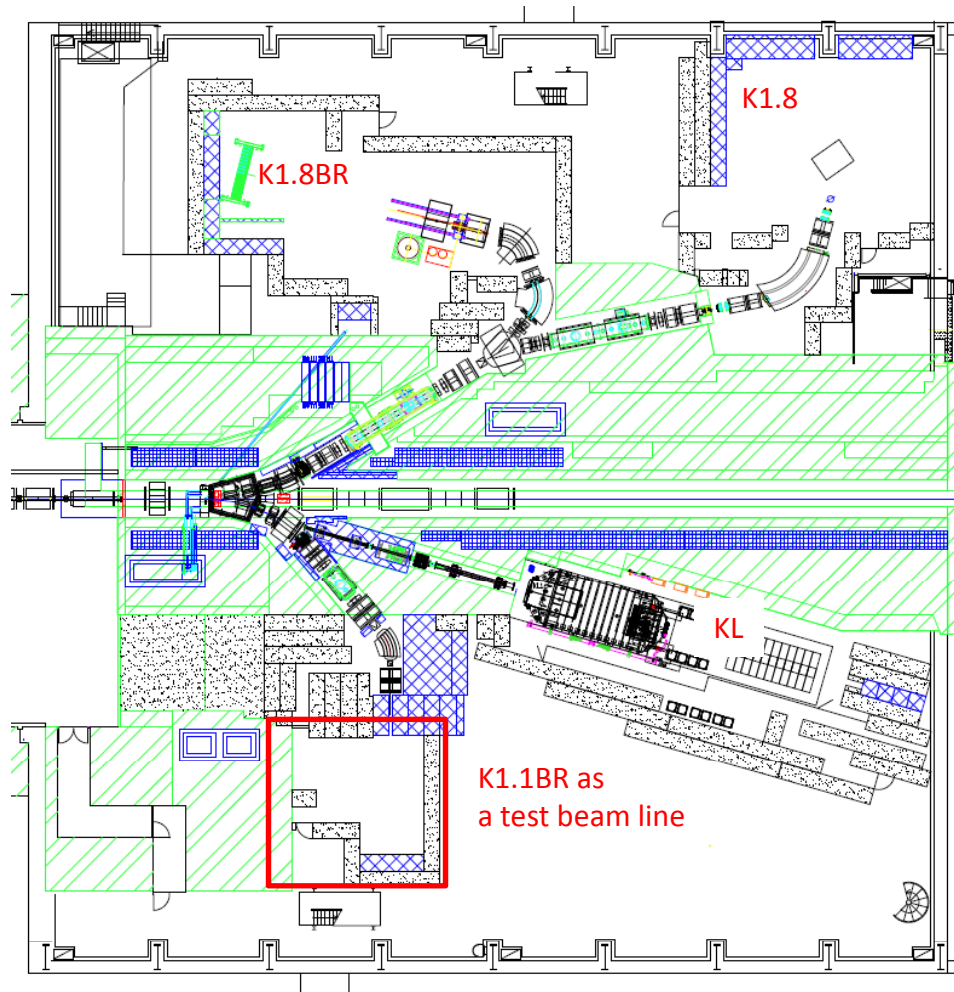
# The new “ $\pi$ 1.0 test beam line” in J-PARC Hadron Hall

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# Current layout of Hadron Hall



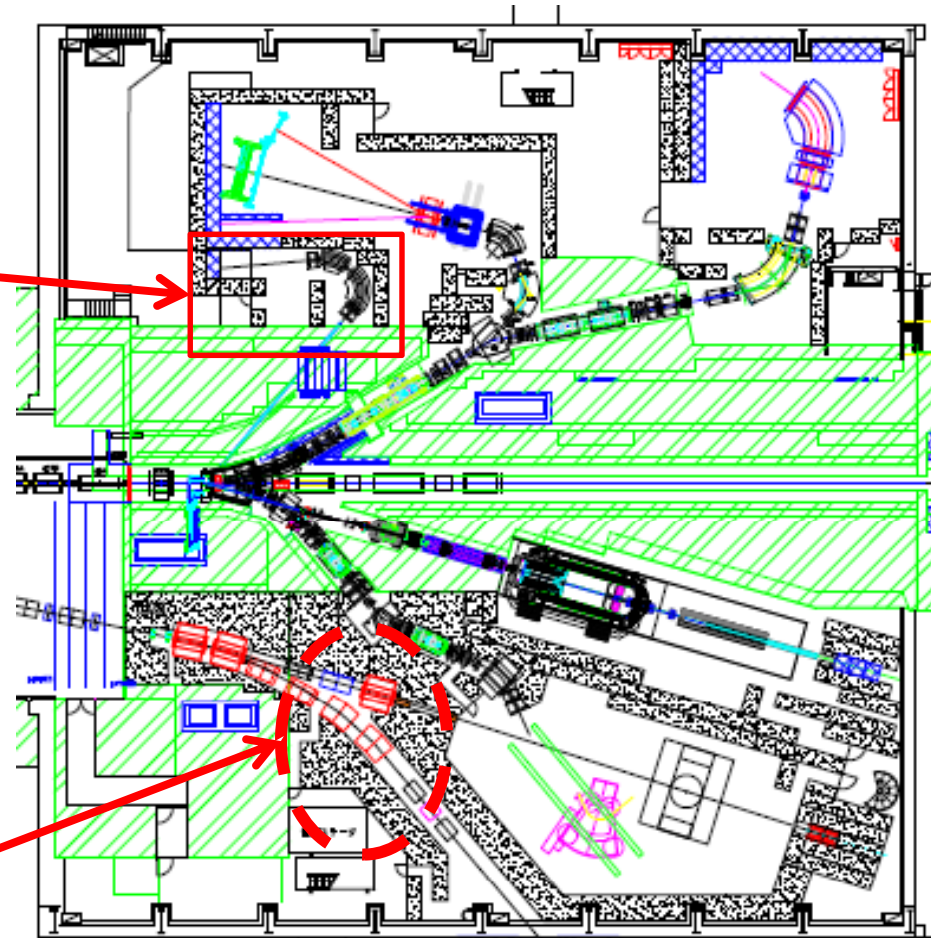
- K1.1BR as a test beam line
  - Max. momentum: 1.1 GeV/c
  - Separated beam line
  - Max. intensity:  $<10^7$  PPP
  - Area size:  $4\text{m}^W \times 7.5\text{m}^L$

# List of Test experiments @ K1.1BR

No.	Spokesperson	Affiliation	Title of the experiment
T25	S. Mihara	KEK	Proposal for Extinction Measurement of J-PARC Proton Beam at K1.8BR
T32	A. Rubbia	ZTH Zurich	Towards a Long Baseline Neutrino and Nucleon Decay Experiment with a next-generation 100 kton Liquid Argon TPC detector at Okinoshima and an intensity upgraded J-PARC Neutrino beam
T37	K. Inami	Nagoya U.	Test of TOP counter for B-factory upgrade
T38	H. Nanjo	Kyoto U.	Proposal for Measuring Hadron Response at K1.1BR for KOTO Experiment
T43	K. Aoki	RIKEN	Test of Hadron Blind Detector and GEM Tracker for the J-PARC E16 Experiment
T44	T. Koike	Tohoku U.	Study of in-beam performance of Hyperball-J Ge detector units with the current beam structures at the K1.1BR beam line
T47	Y. Aranaki	RIKEN	Test of Lead-glass EMC and GEM Tracker for the J-PARC E16 Experiment
T48	A. Toyoda	KEK	Test of Aerogel Cherenkov counter for the J-PARC E36 experiment

# Location of the $\pi 1.0$ test beam line

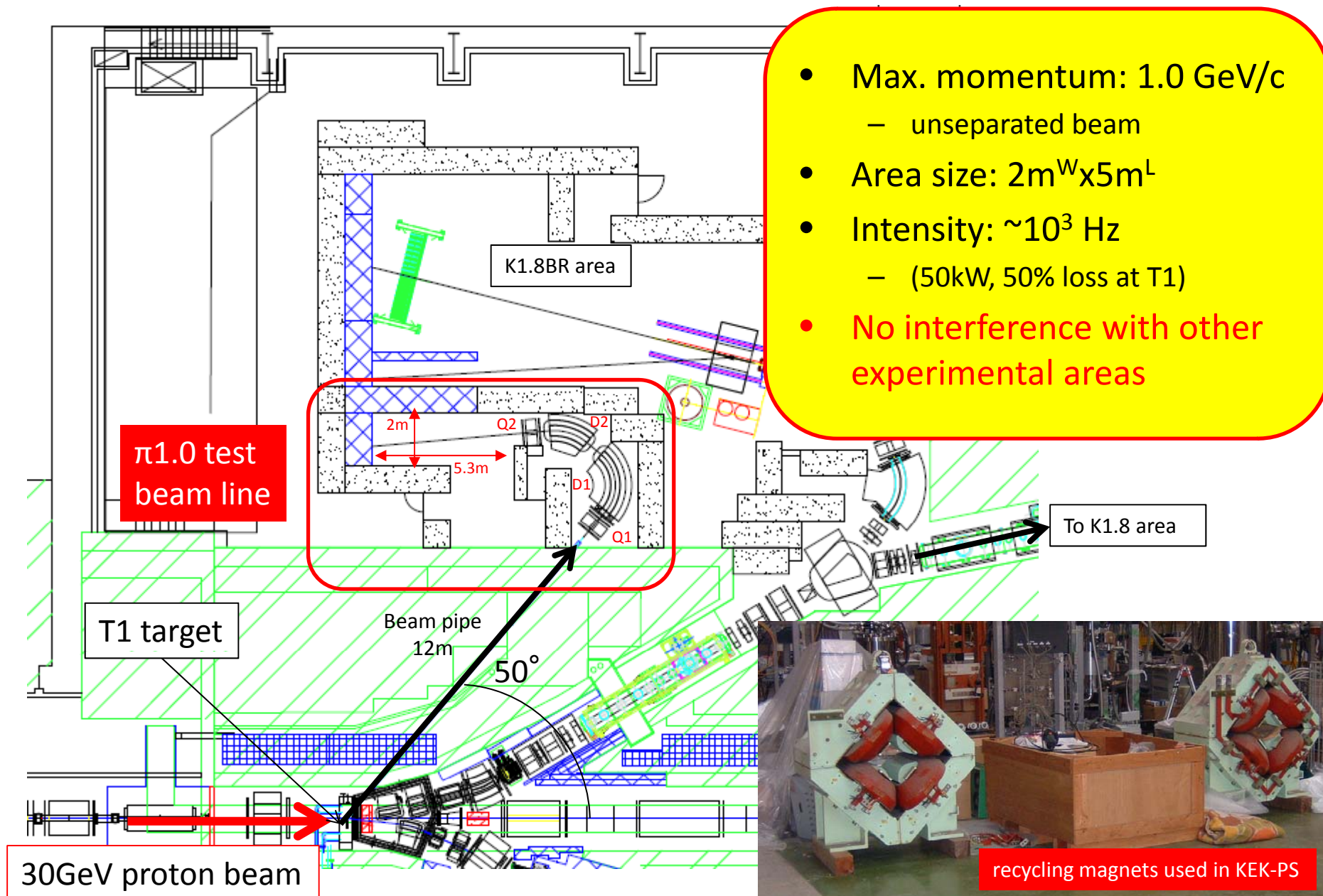
$\pi 1.0$  test beam line near K1.8BR



K1.1BR area will be shut down when High-p and COMET beam lines are constructed.

REMARK:  
A layout plan in the south area is just a "planning" one.

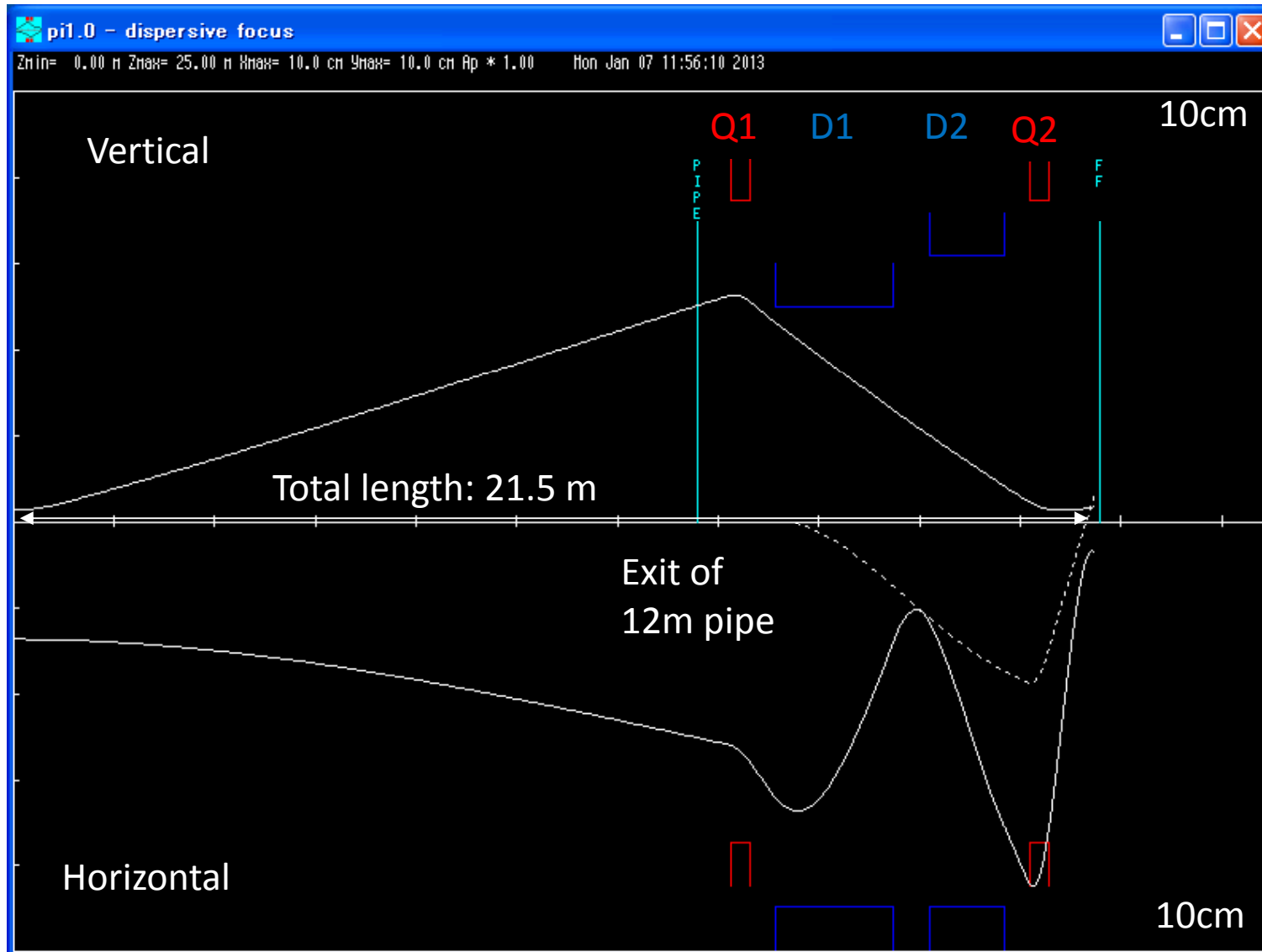
# A layout plan of the $\pi 1.0$ test beam line



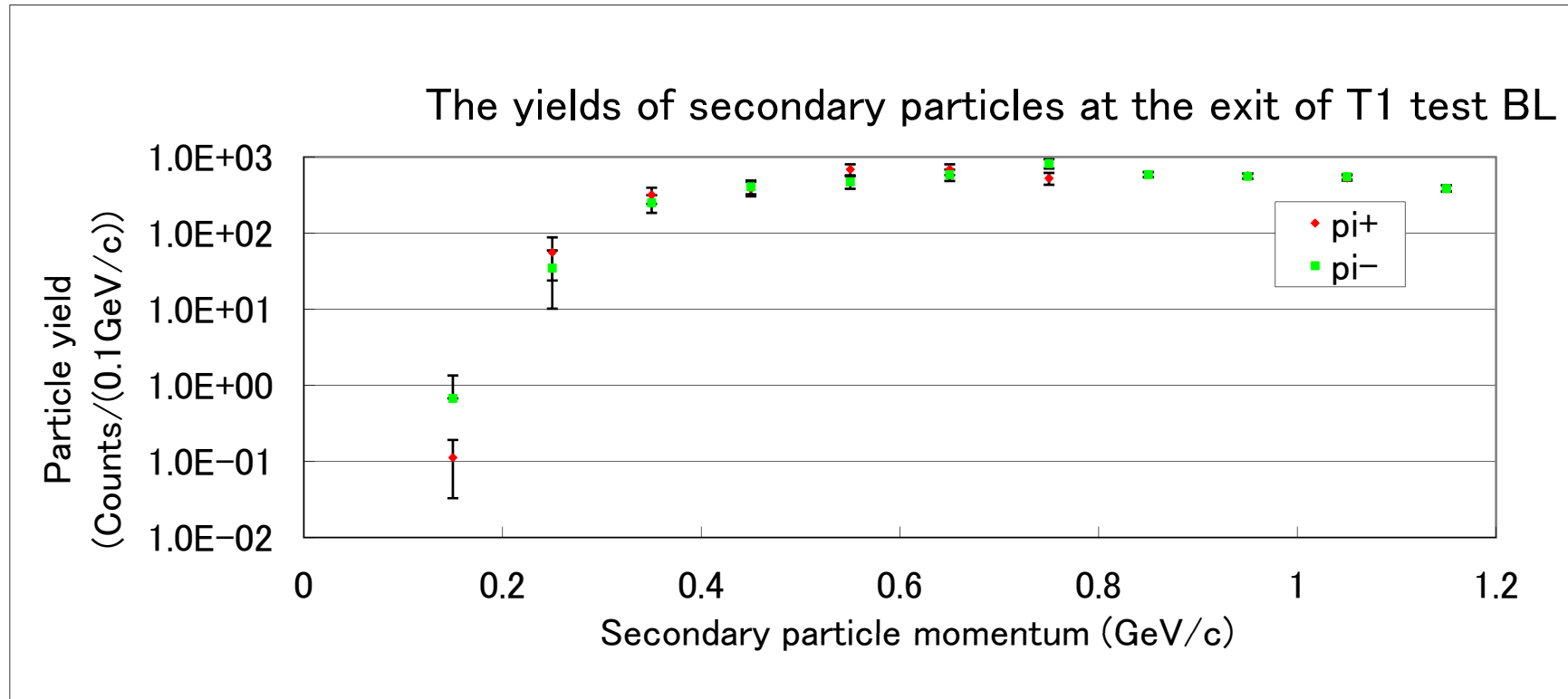




# Beam optics of $\pi 1.0$ test beam line



# Yield estimation of the $\pi$ 1.0 test beam line



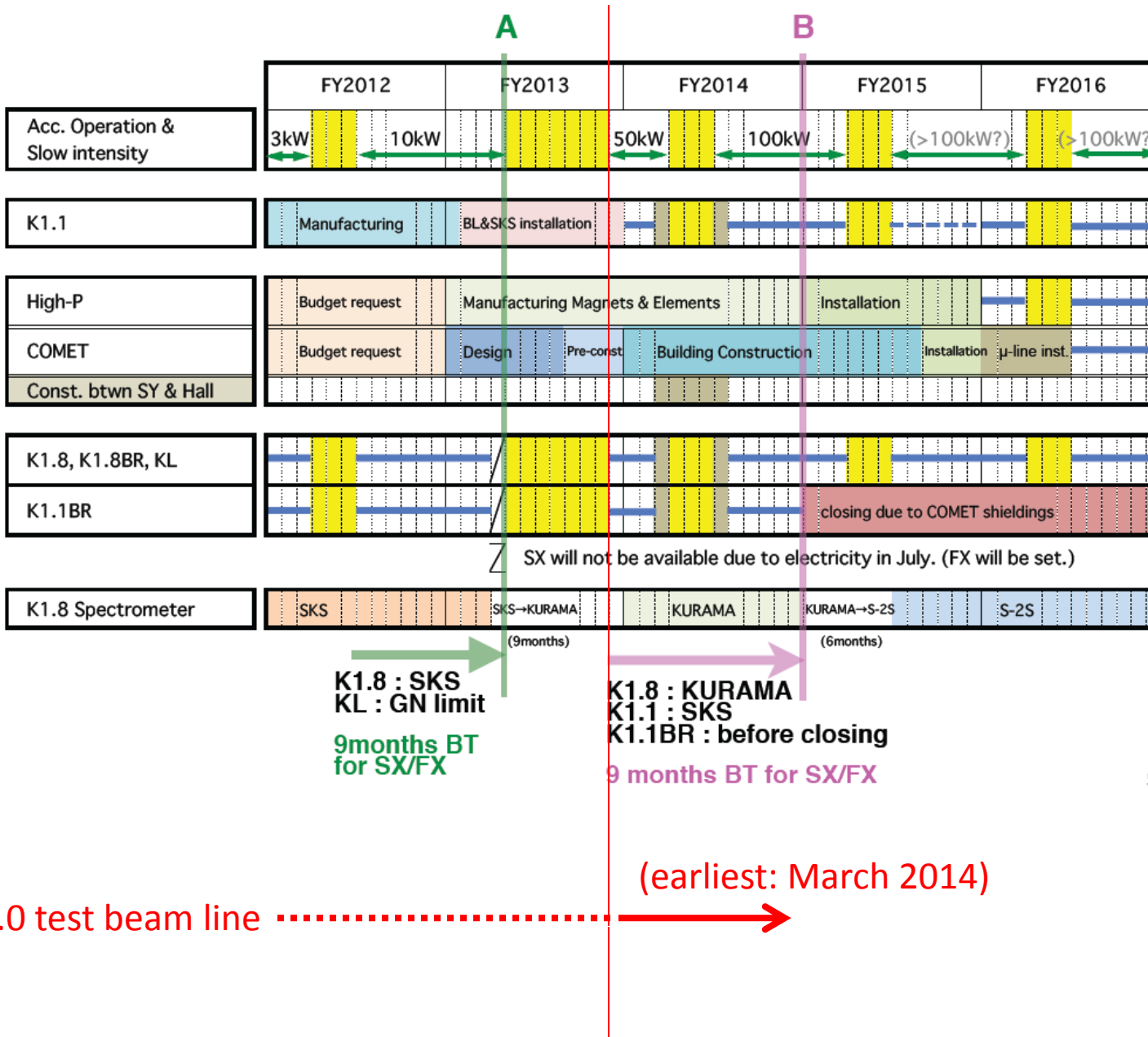
- Yield estimation based on the Sanford-Wang formula
  - Primary proton energy: 30GeV
  - Primary proton intensity:  $6.0E+13$  ppp (50kW, 50% loss at T1 target)
  - Extraction angle:  $50^\circ$
  - Solid angle: 0.043 msr
- Material effect around T1 target is included, based on MARS15 simulation



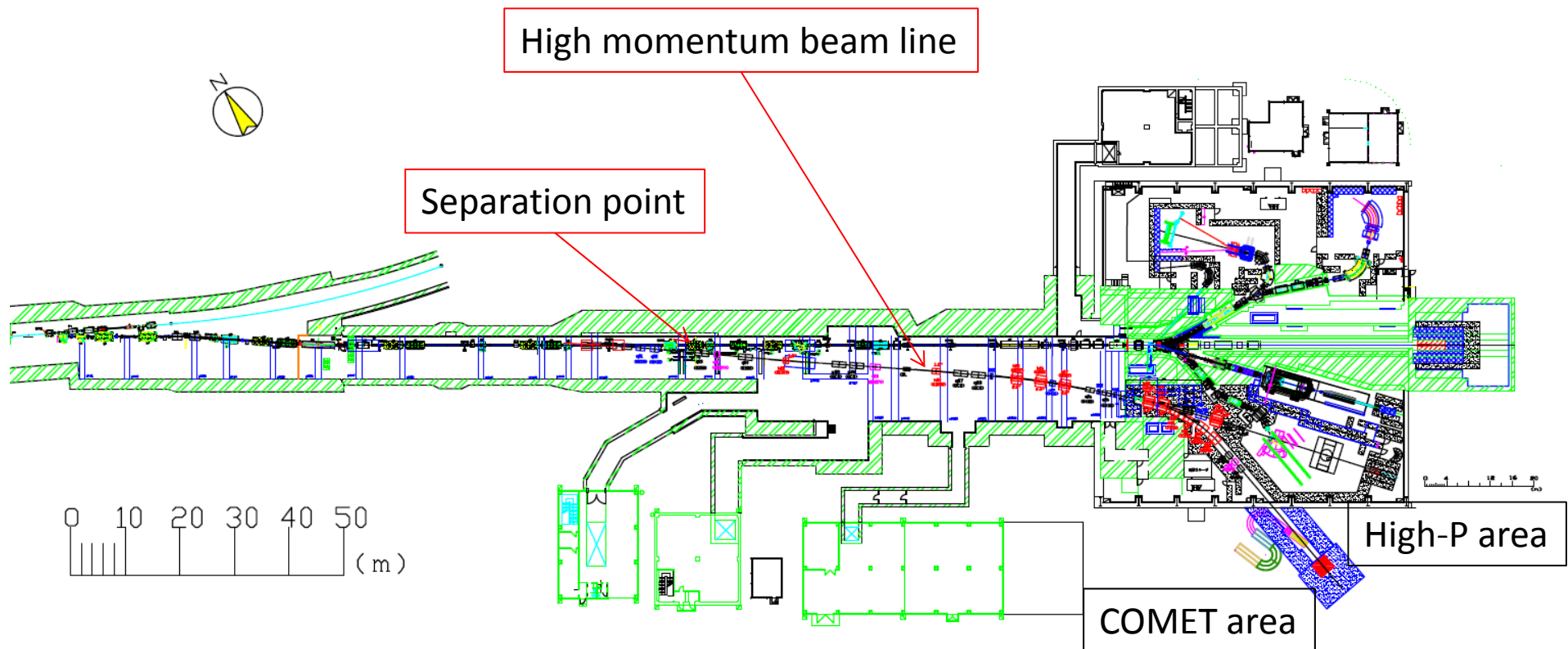
# List of components

- Magnets
  - 2 dipole and 2 quadrupole magnets, second-handed ones used in KEK-PS, will be modified and transferred from KEK Tsukuba Campus.
- Power supplies
  - 4 power supplies, second-handed ones used in KEK-PS, will be transferred from KEK Tsukuba Campus.
- Beam shutter
- Shielding enclosure
- Personnel Protection System (PPS)

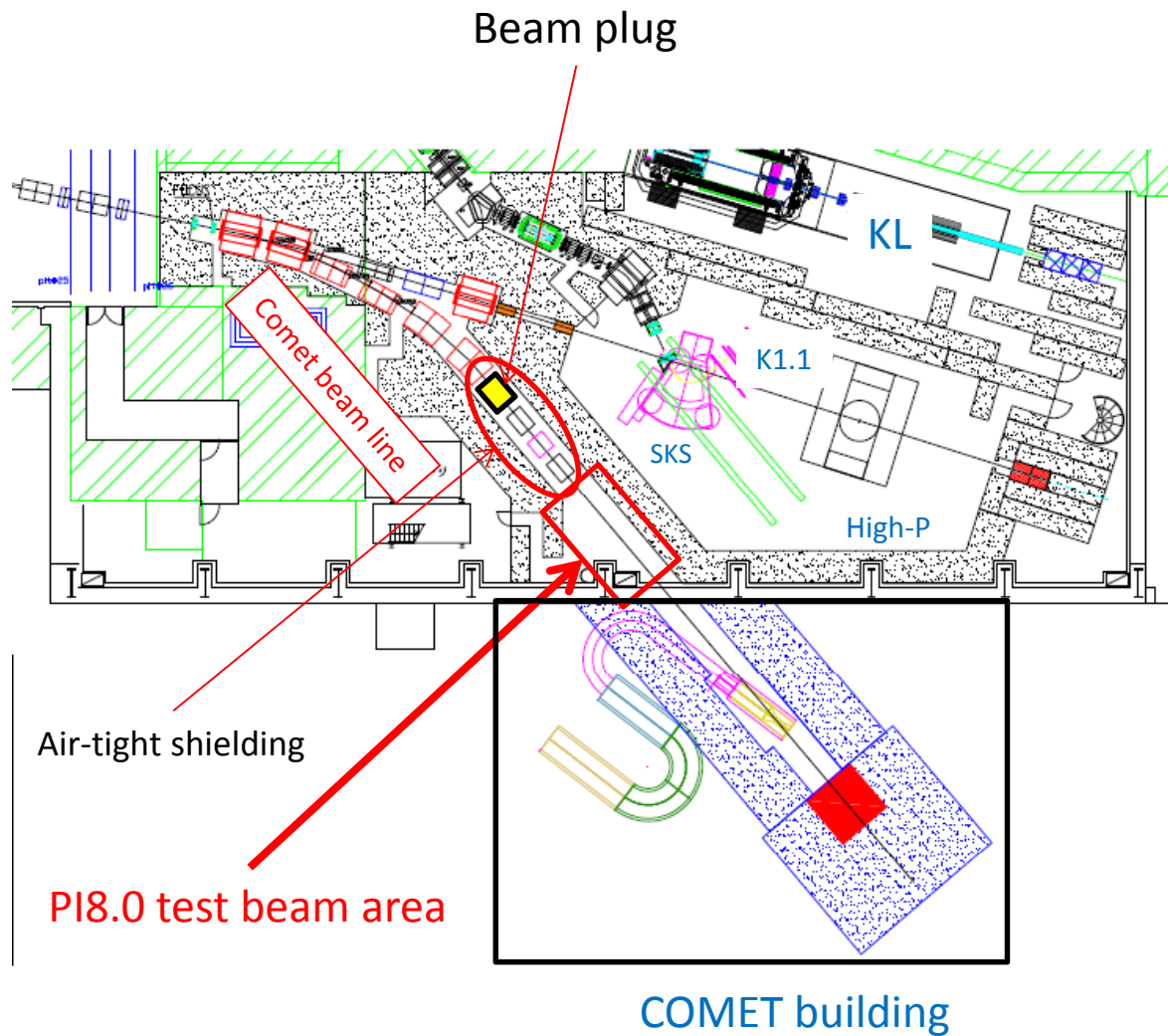
# Construction & Beam time



# An overall layout plan of Hadron Facility with High-P and COMET beam lines



# PI8.0 test beam area in COMET beam line



- Max. momentum: 8 GeV/c
  - unseparated
- Max. intensity:  $\sim 10^3$  PPP
- Area size: 1.5m<sup>W</sup> x 6m<sup>L</sup>
- Components
  - Thin production target
  - Polarity changer for power supplies
  - Monitors
  - Personnel Protection System
  - Beam plug and shielding (air-tight)
- Interference with COMET
- No interference with K1.1 and KL area

# Summary

- Current K1.1BR as a test beam line will be shut down when High-p and COMET beam lines will be constructed.
- The new “ $\pi$ 1.0 test beam line” can be constructed near K1.8BR area without interfering other experiments.
- Max. intensity is  $\sim 10^3$  Hz (50kW, 50% loss), and beam size is 1.0 cm(H) and 0.5 cm(V) at FF.
- $\pi$ 1.0 test beam line will be available from March 2014 in the earliest case.
- In future, a new “PI8.0 test beam area” can be available when High-P and COMET beam lines will be constructed.