CLEX (CLIC Experimental Area)

Status and plans

G.Geschonke for Hans Braun

CERN

CTF3 objectives

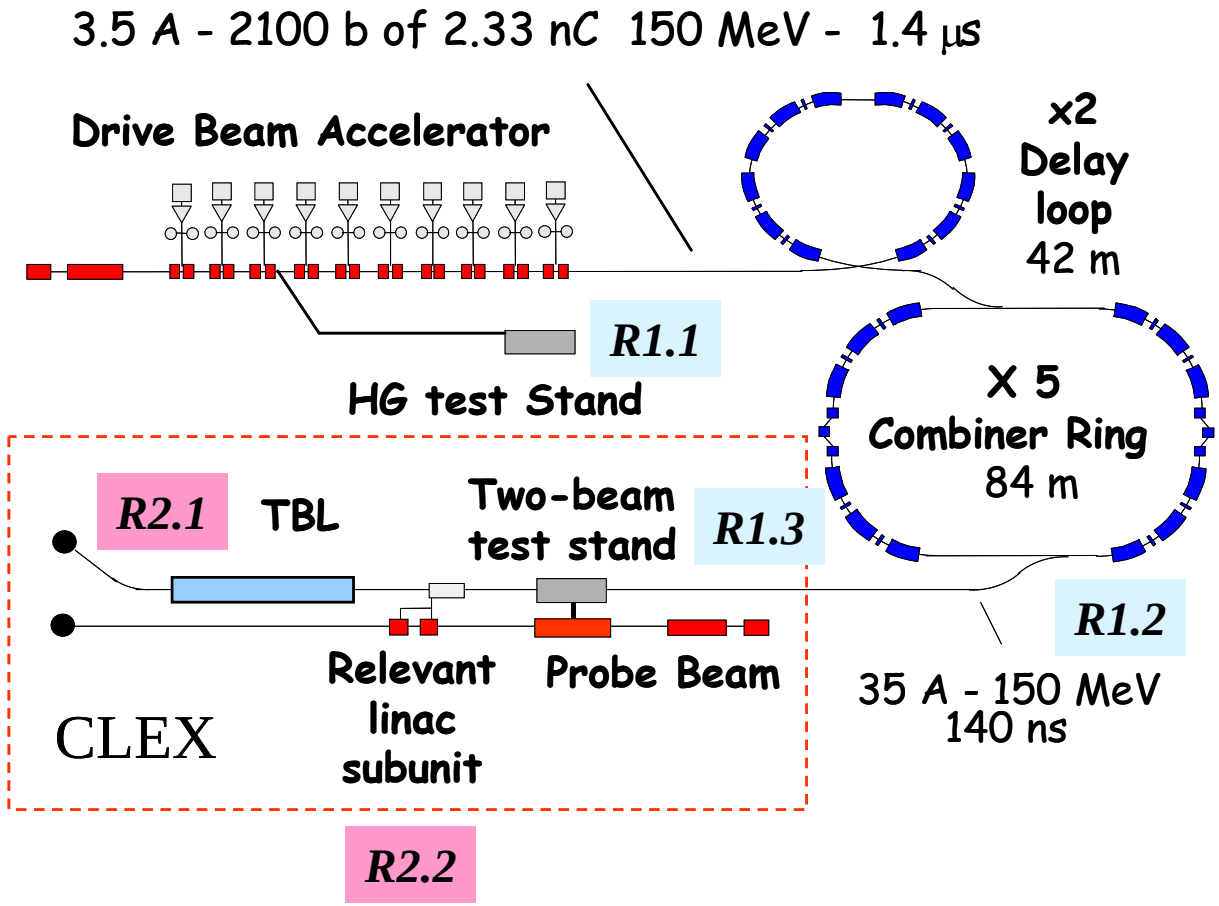
R1.1 CLIC accelerating structure,

R1.2 Drive beam scheme with a fully loaded linac

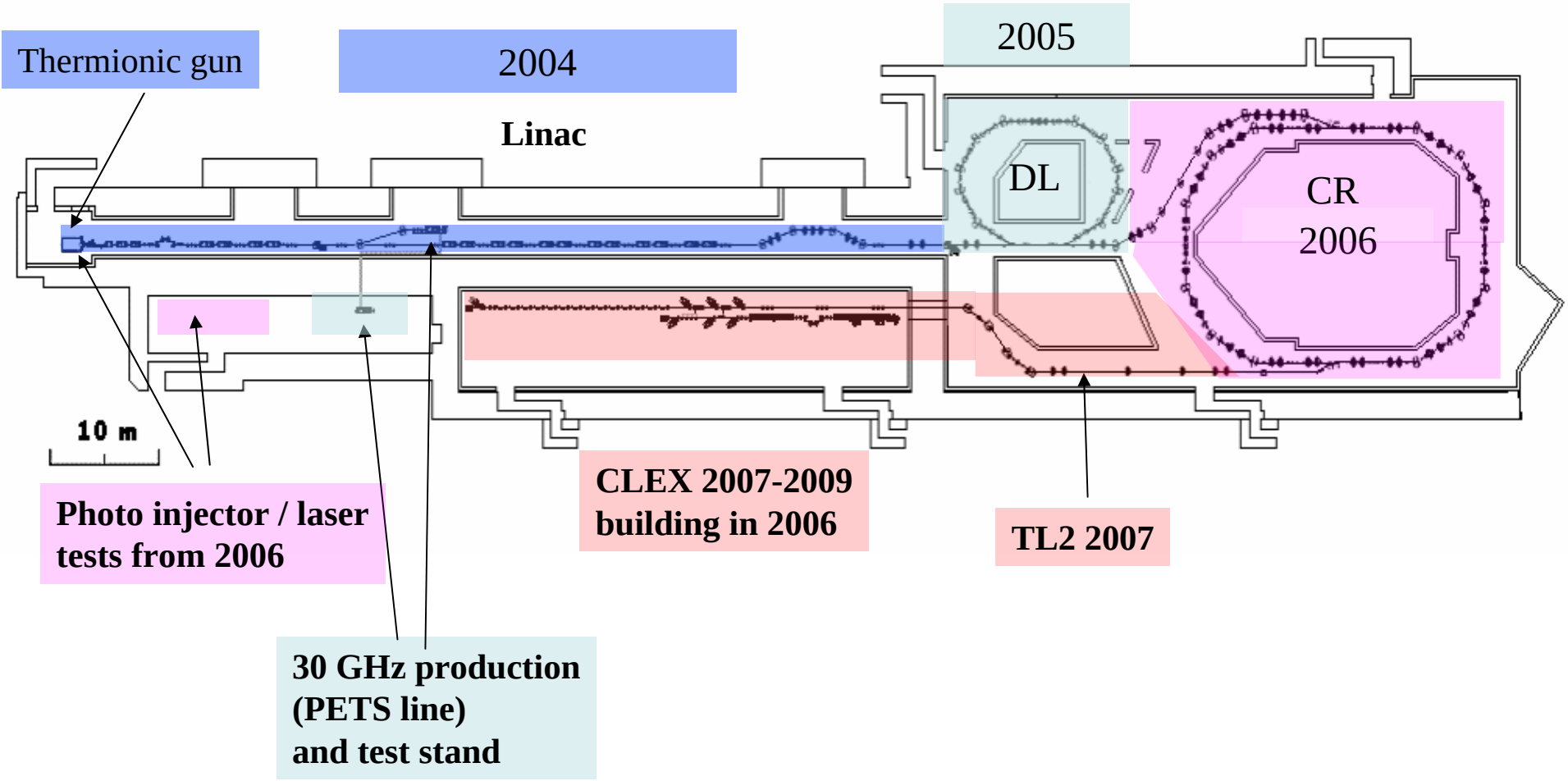
R1.3 Power-Extraction Structure (PETS)

R2.1 stability and losses in the drive beam decelerator,

R2.2 Test of a relevant linac sub-unit with beam

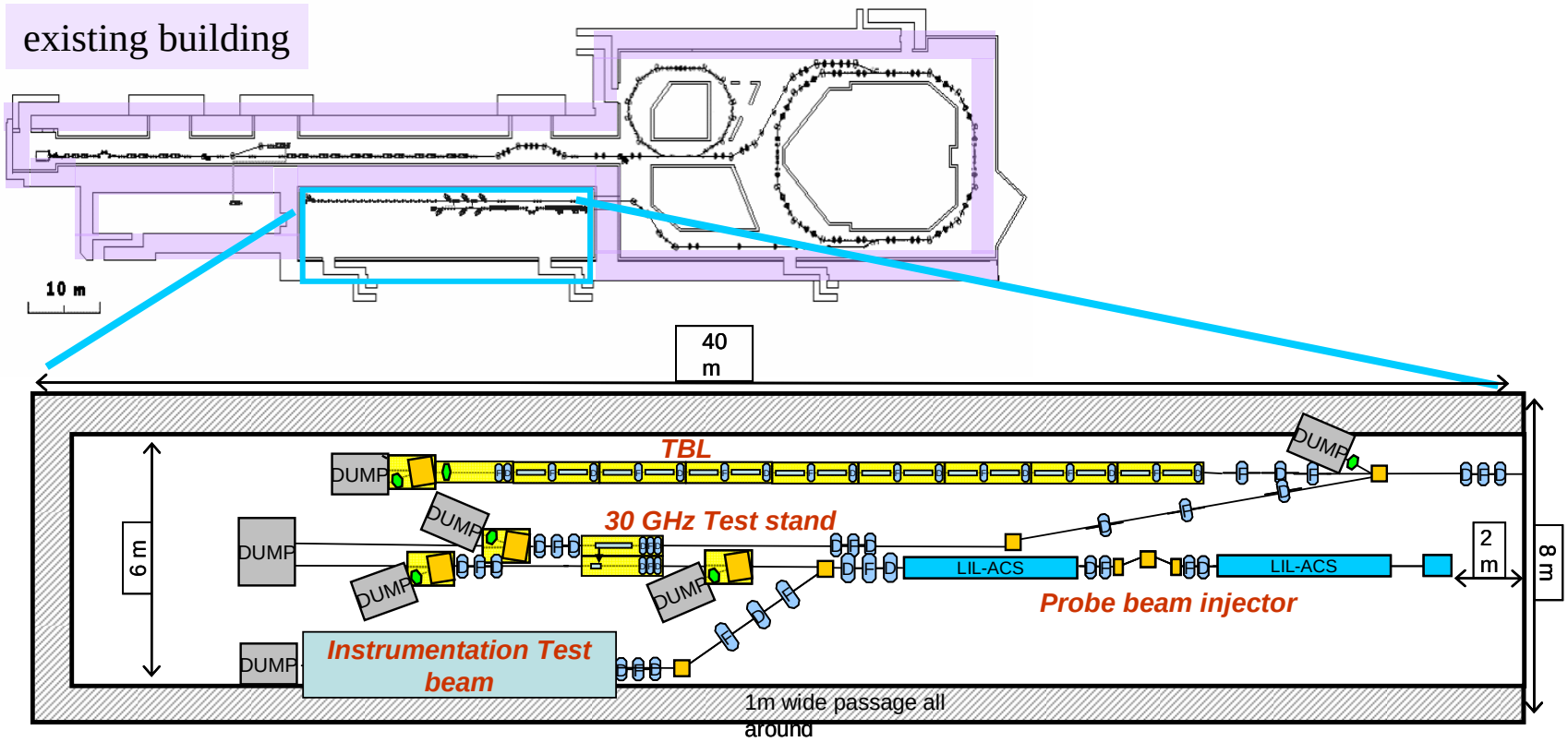


CTF3 programme



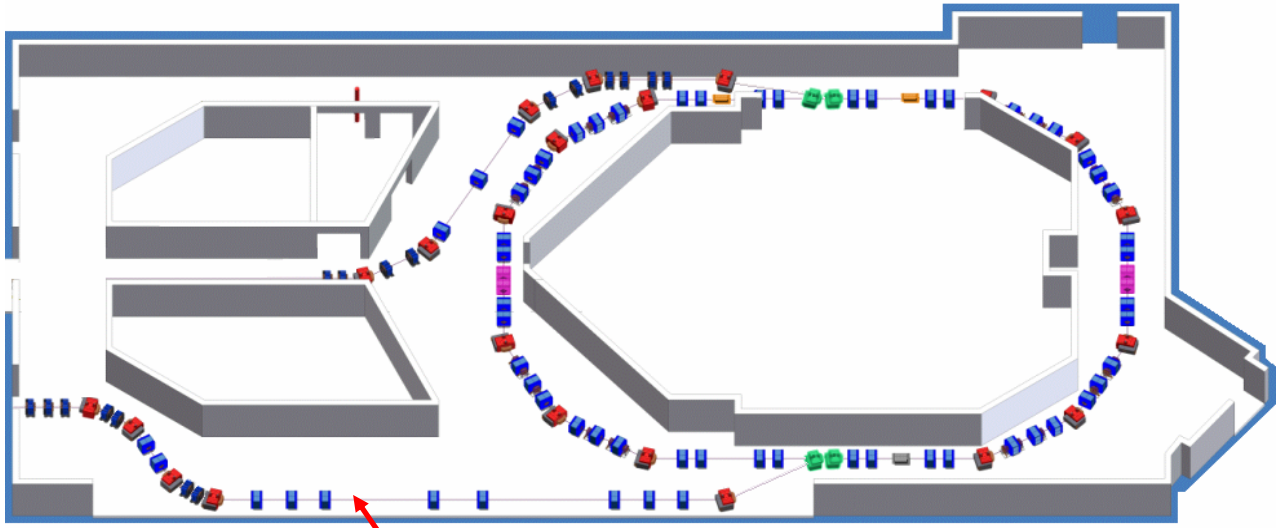
CLEX

existing building



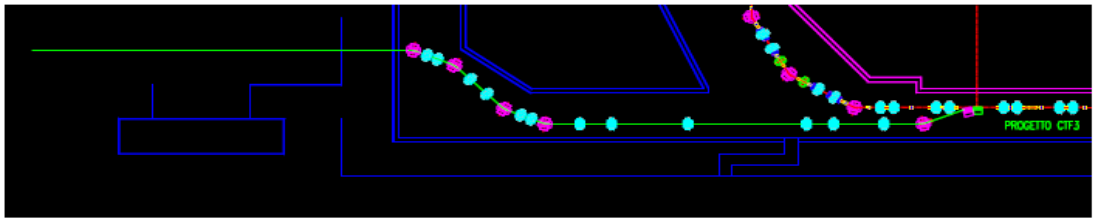
Construction during 2006
installation of equipment from
2007 - 2009

Transfer Line TL2

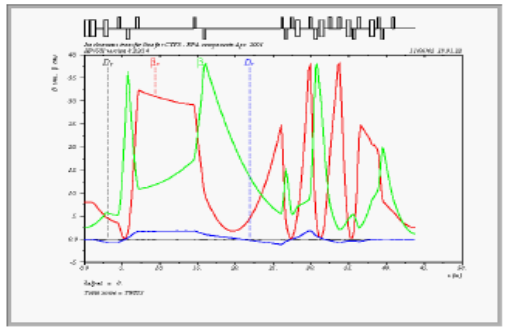


TL2 : Transfer Line
- Match twiss Parameters
- Bunch compressor
- Vertical displacement (floor in CLEX 50 cm lower)

Transfer Line TL2



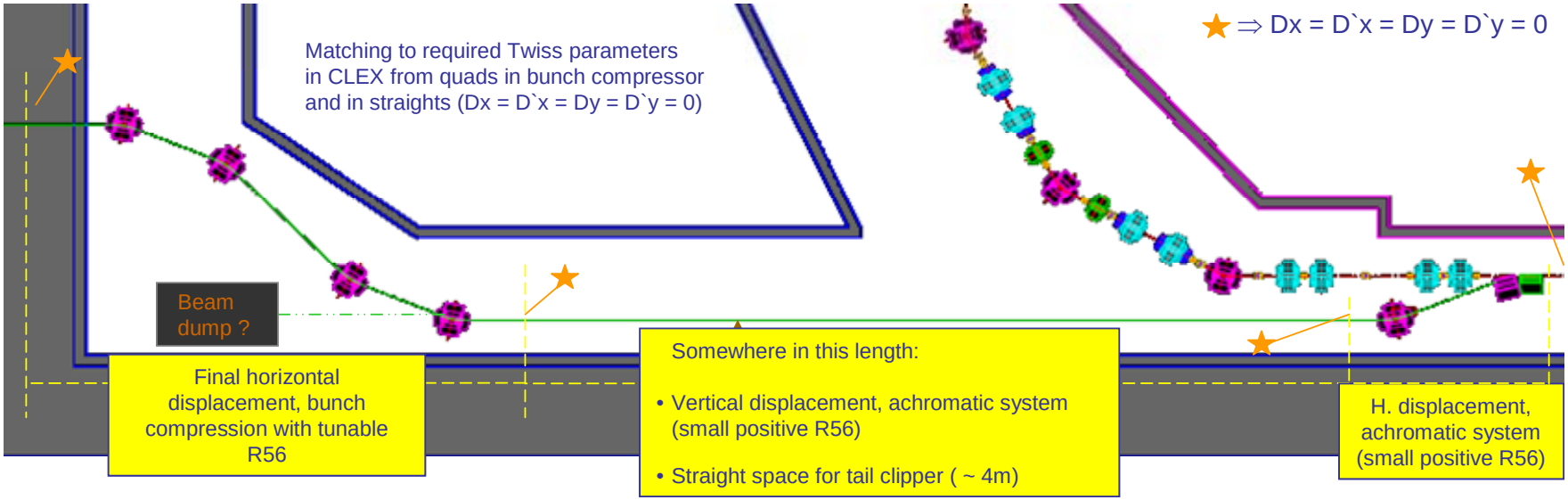
4 dipoles - chicane
- isochronous
- tunable $R_{56} \sim \pm 15$ cm
(compensates also for extraction dipoles contribution)



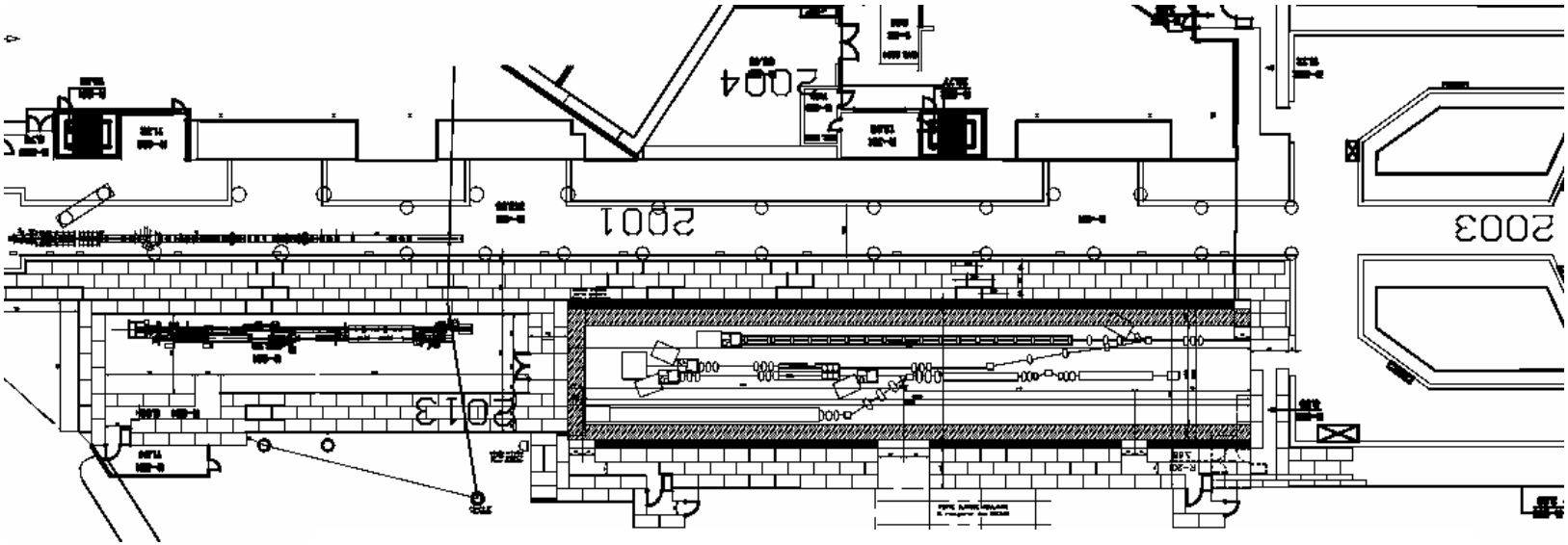
Preliminary design from LNF

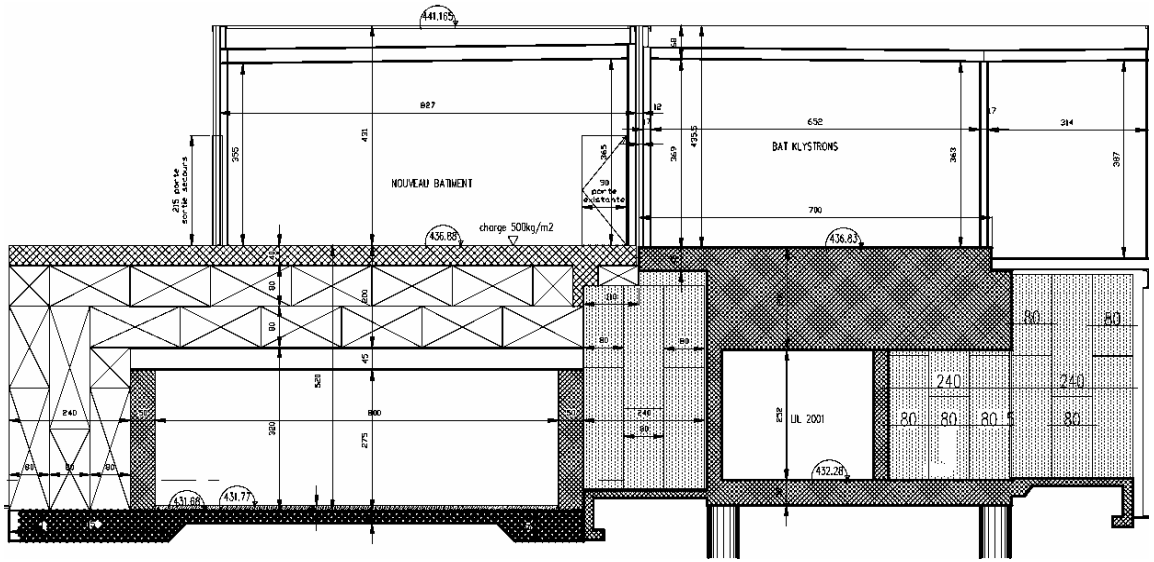
Expression of interest and additional design studies from CAT/Indore

Sufficient number of quadrupoles and sextupoles already available ?
Bend magnet design (CERN)



CLEX building





CLEX building

- ***Building***
- **Status**
- Inside dimensions specified to be 40 x 8 x 2.75 m
- No pillars inside building !
- Preliminary construction design and cost estimate completed
- Draft specification for infrastructure requirements
  (electricity, cooling, ventilation, ~700 kW electrical power dissipated in various components)
- Equipment gallery 20 x 8 x 3.55 m
- **Schedule**
- Construction finished by end 2006

Floor and Beamline Heights

Due to difference in construction technique CLEX floor is
50 cm lower than combiner ring building and DB Linac building

Beam height above floor DB Linac, delay loop, TL1 and combiner ring 135 cm

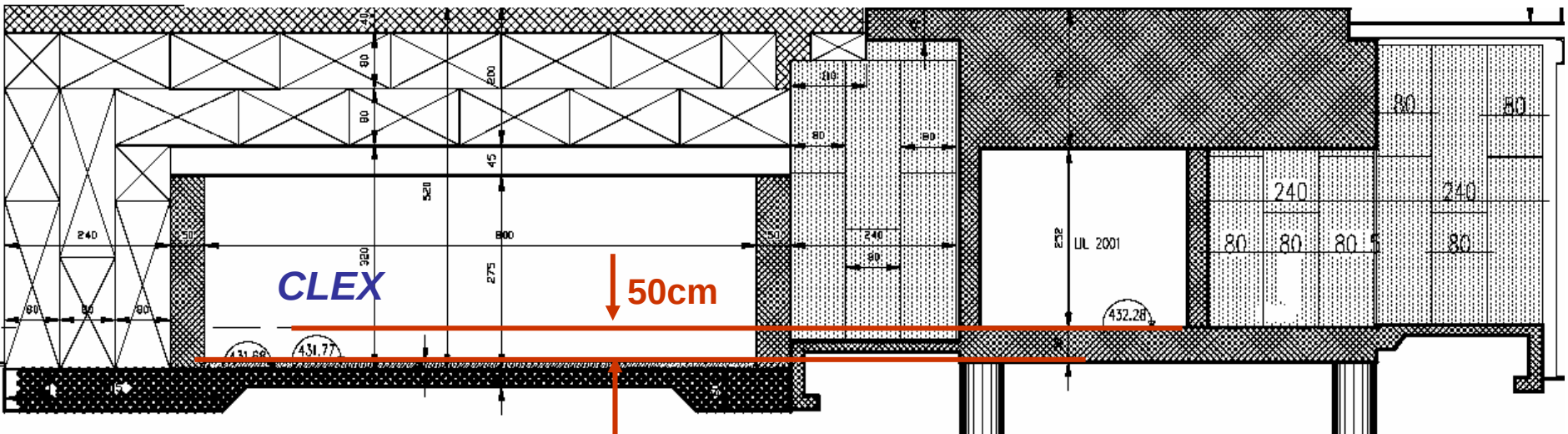
135 cm + 50 cm=185 cm *seems to much*

⇒ Vertical bends needed in TL2

⇒ Beam height drive beam in CLEX 135 cm

Probe beam at 125 cm to allow crossing of beam lines ?

What's best for two beam test stand ?

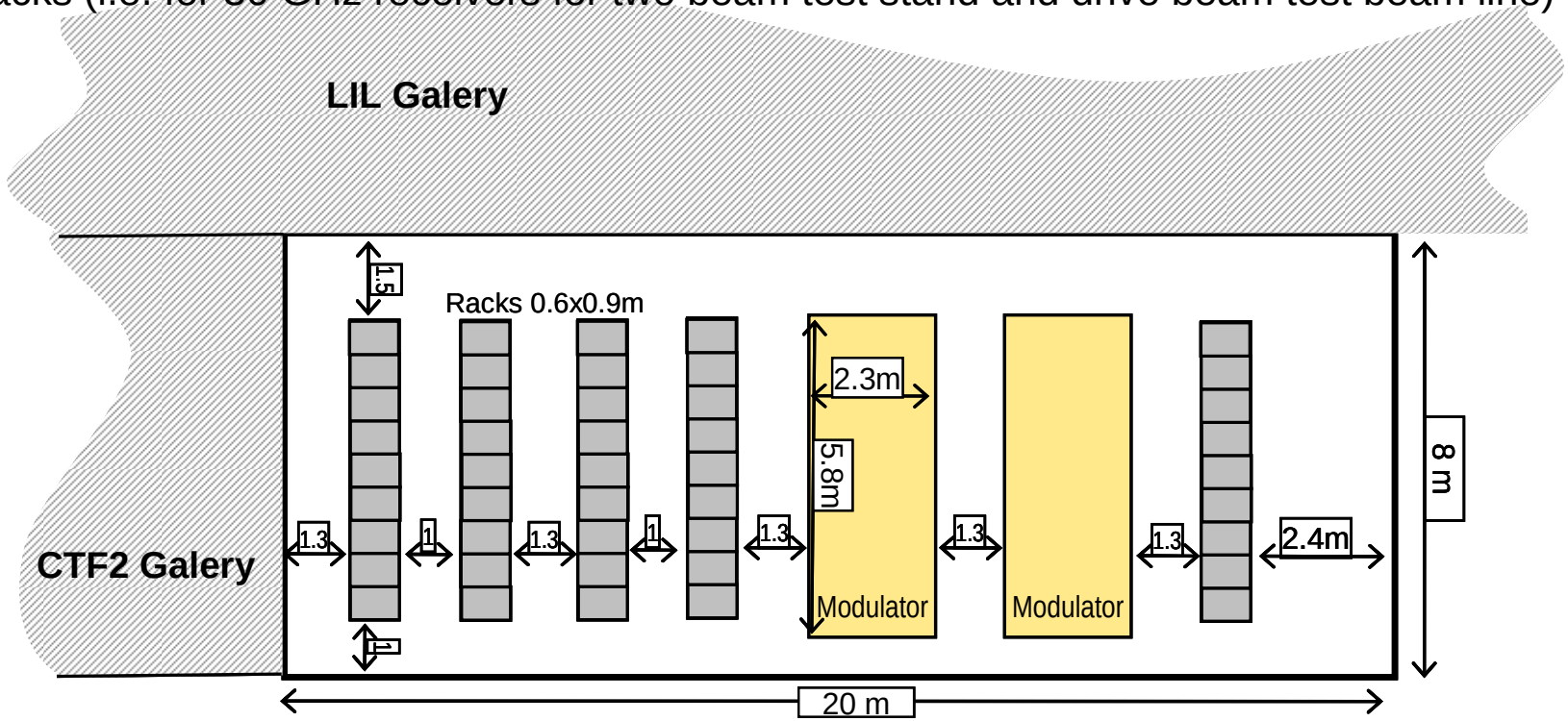


CLEX gallery

Enough space for all power supplies, vacuum, controls and beam diagnostics racks needed for CLEX beam lines

Space for two S-band modulators and klystrons for probe beam

Neighboring CTF2 gallery has space for one or two more modulators and klystrons and for more electronic racks (i.e. for 30 GHz receivers for two beam test stand and drive beam test beam line)



arrangement of racks and modulators in CLEX-G

CLEX gallery

Equipment type	Number of racks
Magnet power supplies	27
Ion pump power supplies	5
Vacuum gauges, valves and interlock controls	4
Low power 3 GHz RF	4
Modulator mains distribution	2
Controls, beam diagnostics, timing	3
Total racks	45

Power dissipation [kW]

	Demineralised water		Stabilised water		Air condition / ventilation	
	CLEX-A	CLEX-G	CLEX-A	CLEX-G	CLEX-A	CLEX-G
Magnets	400				12	50
3 GHz Modulators, Pulse compression and structures	4	93	20	2		30
30 GHz structures			3			
Beam dumps					4	
Ambient light					2	1
VME crates						6
40 ion pumps					1	3
8 turbo pumps					6	1
Vacuum bake-out					10	10
Miscellaneous					20	20
Total	404	93	23	2	55	121
Grand total	497		25		176	

Electrical power requirement

	CLEX-A	CLEX-G
Magnets		462
3 GHz Modulators, Pulse compression and structures		120
Ambient light	2	1
VME crates		6
40 ion pumps		4
8 turbo pumps	6	1
Bake out equipment	10	
Miscellaneous	20	20
Total	38	614
Grand total	**652**	

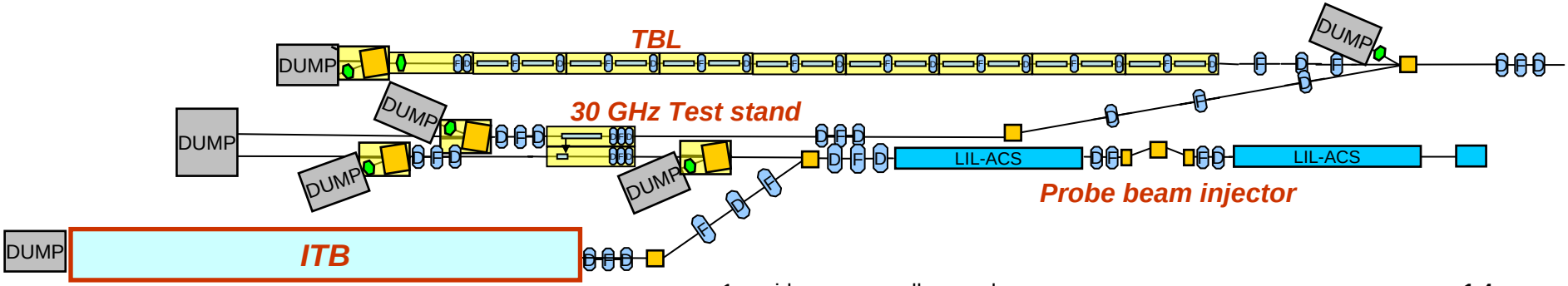
Beam-Lines

Probe beam
Preliminary design from DAPNIA & LAL
Problems: overall length, beam loading, laser configuration

TBL
Preliminary design for quadrupole magnets (CERN) transferred to CIEMAT
Design of support tables with X/Y movers / CIEMAT
Design considerations for PETS (I. Syratchev and D. Schulte, PAC'05), CIEMAT
BLM's NWU Chicago
Expression of interest for BPM's by IFIC and TU Barcelona

Two beam test stand
Uppsala University

ITB
draft proposal from John Adams Institute



1m wide passage all around

Conclusion

Building design well advanced
construction in 2006
(Christmas celebration in new building)

Start installation in 2007

more collaboration required