IR 4 available space and incoming requests

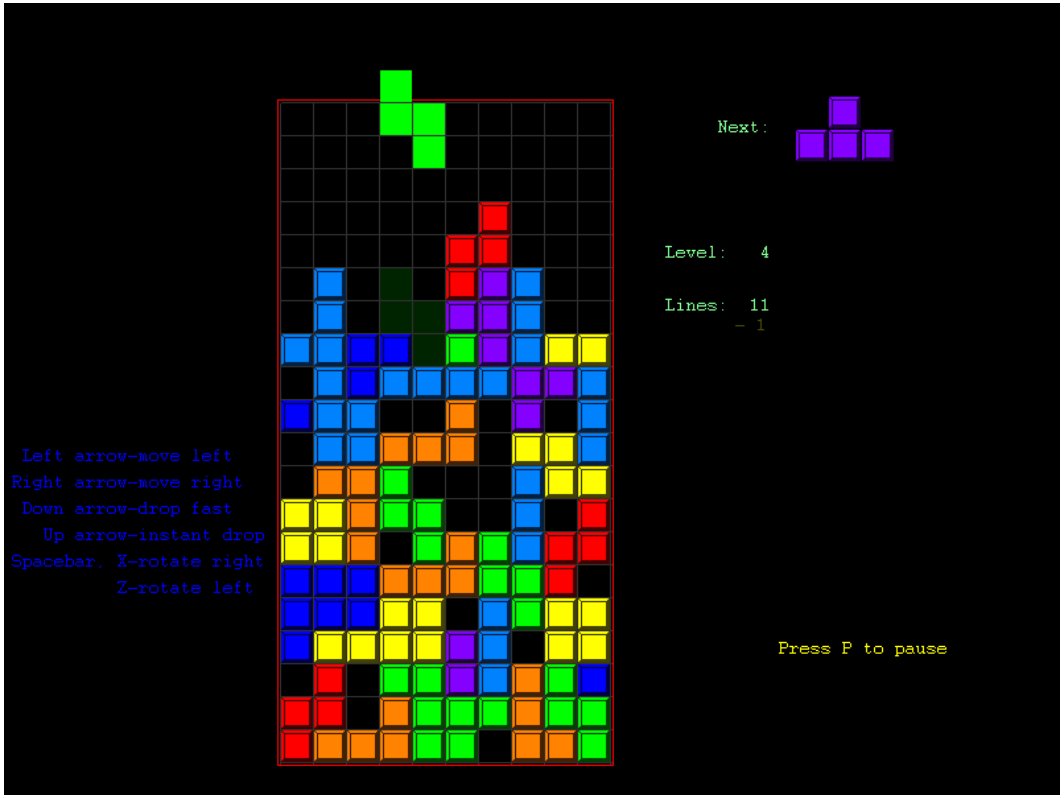
C. Collazos, P. Fessia, S. Chemly
Input from
R. Calaga, W. Hofle,R. Jones, J. Jowett,
S. Redaelli and others

Optics vs. Layout

- We need to fix a “status” on which we define and release an official lay-out
- This will be decoupled from the optics, freezing one specific optic
- We should target to freeze the picture probably in February for release in April

Summary

- IR 4 space status on paper
- The space reservation
- The requests
- A tetris test



IR 4 status on paper

- The status of space reservation come from the cross checks of 3 different source of information
  - The CDD lay-out drawings of the LSS
    - LHCLSX__007
    - LHCLSX__008
  - The extraction (under excel format) from the lay-out database of the equipment installed on each beam
  - The lay-out 2 beam drawings coming from the lay-out database
- The space reservation are not dynamically linked to these 3 sources. Therefore gap (in space and in time) could exist

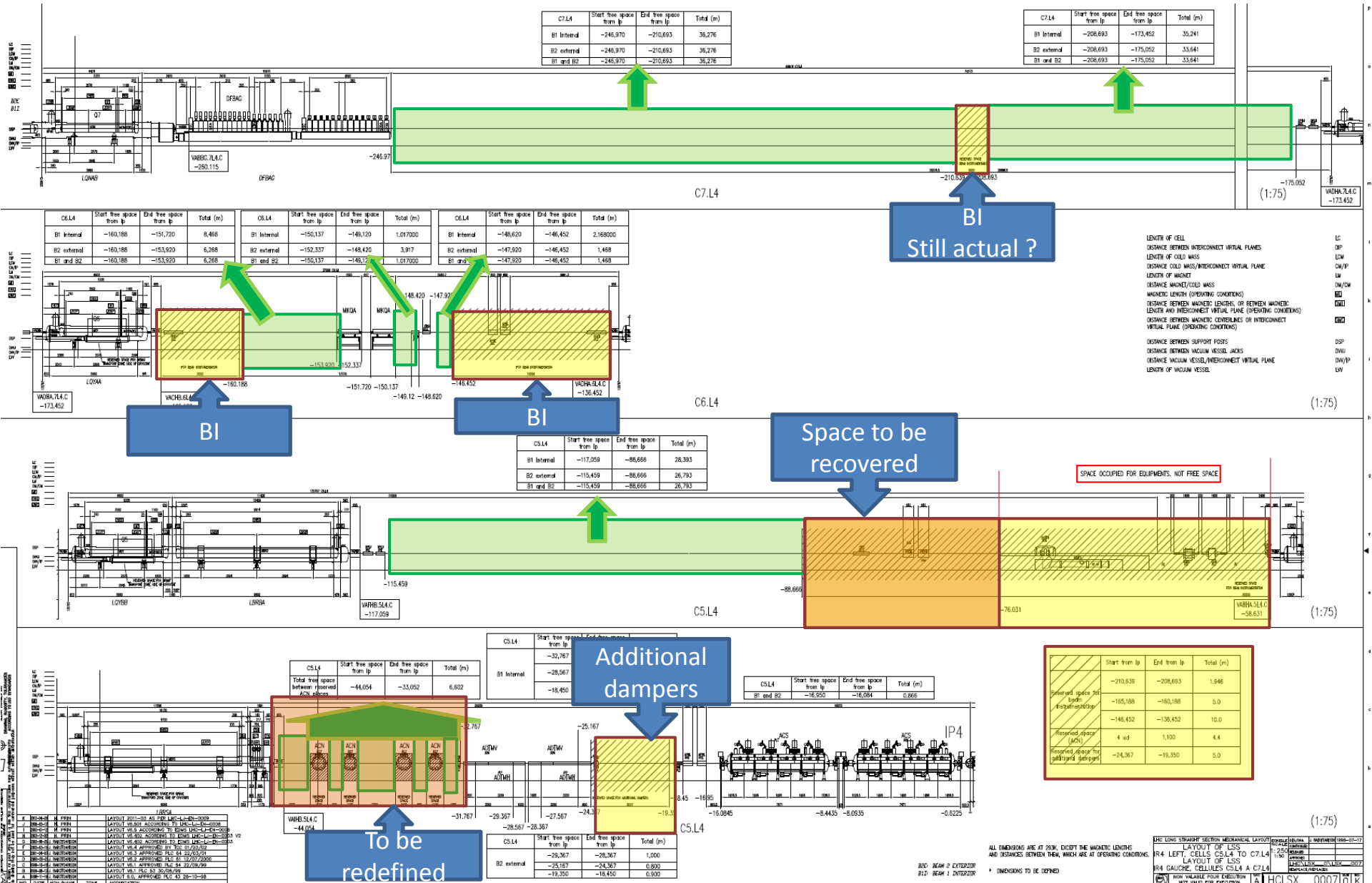
Space reservations

- The specific content
  - Space reservations in IR 4 shall be reviewed critically as soon as possible because
    - Few of them shall be resized: i.e. BGV
    - Few of them need to be challenged:
    - Few of them are obsolete: ACN
- We need to review space reservation process for HL-LHC
  - Document: it is a good opportunity to start using functional specs
  - Approach and approval: we need to establish a formal approval in addition to EDMS like bringing them periodically in front of a body. I.E. PLC. In order to make them as most credible as possible and make the work of everyone easier they should target as best the real space to be used
  - Tracking we need to have better tool to track them and link the documents (functional spec) with the materialization of the machine. Possibly we need to introduce them I nteh lay-out as special type of equipement

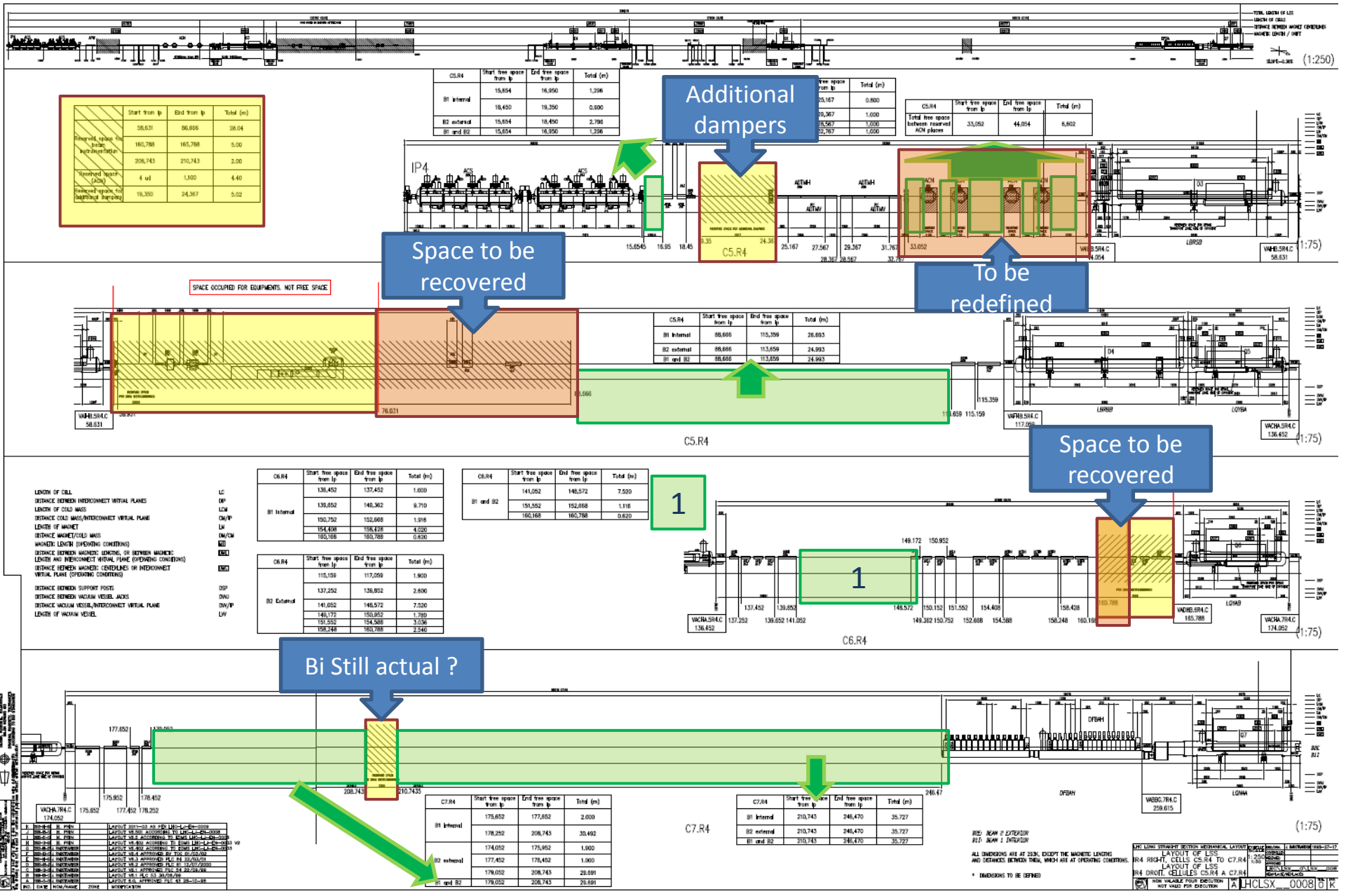
- Excel file with space available for 1 cell

#	DCUM	start free space from Ip	End free space from IP	After element	start free space	end free space	Length free space	Before element	code length	start	end
C5.R4											
208	10020.963	7.6635	23.882	ACSGA.5R4.B2	10004.7447	10020.9632	16.2185	BPMWA.A5R4.B2	long	E	E
Space reserved for additional dmpers		19.350	23.882				4.5				
Space ACS		7.664	15.654				8.0				
Space reserved for BPAWT		18.450	19.050				0.6				
Free space		15.654	18.450				2.796				
		19.050	19.350				0.300				
						TOTAL free space	3.096				
218	10025.648	27.567	28.567	ADTMH.A5R4.B2	10024.6482	10025.6482	1.0	ADTMH.B5R4.B2	long	E	E
Space reserved for beam instrumentation							0.0				
Free space		27.567	28.567				1				
						TOTAL free space	1.000				
224	10029.848	31.767	32.767	ADTMH.B5R4.B2	10028.848	10029.848	1	BPMWA.B5R4.B2	long	E	E
Space reserved for beam instrumentation							0.0				
Free space		31.767	32.767				1				
						TOTAL free space	1.000				
229	10041.135	33.052	44.054	BPMWA.B5R4.B2	10030.133	10041.135	11.002	VAHB.5R4.C	long	E	IE
Space reserved for ACN							4.4				
						TOTAL free space	6.602				
243	10058.497	58.916	61.416	BPMWLA5R4.B2	10055.997	10058.497	2.5	BGIV.5R4.B2	long	E	E
Space occupied for equipments. Not free space		58.916	61.416				2.5				
Free space							0				
						TOTAL free space	0.000				
		64.816	80.566	BGIH.5R4.B2			15.75	VAEHK4.B2	long	E	E
Space occupied for equipments. Not free space		64.816	76.031				11.2				
Space reserved for beam instrumentation		76.031	80.566				4.5				
						TOTAL free space	0.000				
		81.211	113.659	VAEHK.B2			32.448	BQSH.5R4.B2	long	E	E
Space reserved for beam instrumentation		81.211	88.666				7.5				
Free space		88.666	113.659				24.993				
						TOTAL free space	24.993				
283	10114.14	115.159	117.059	BQSH.5R4.B2	10112.24	10114.14	1.9	VAFHB.5R4.C	long	E	IE
Space reserved for beam instrumentation							0.0				
Free space		115.159	117.059				1.9				
						TOTAL					

IR 4 L


BI
Still actual ?
BI
BI
Space to be recovered
Additional dampers
To be redefined

IR 4 R


Additional dampers
Space to be recovered
To be redefined
Space to be recovered
1
1
Bi Still actual ?
C5.R4
C6.R4
C7.R4
IP4
(1:250)
(1:75)

Beam instrumentation I *(guess in italics)*

Eq. name	IR side	B1	B2	Length [mm]	Position	Remarks
BGV	L	X		10000	Between Q6 and Q7	44 m reserved by ECR
BGV	R		X	10000	Between Q6 and Q7	44 m reserved by ECR
BGV	L	X		10000	Between Q6 and Q7	44 m reserved by ECR
BGV	R		X	10000	Between Q6 and Q7	44 m reserved by ECR
BSRT	L				Already installed	Bring the optical line in UA (feasible? Transport ? Civil engineering)
BSRT	R				Already installed	Bring the optical line in UA (feasible? Transport ? Civil engineering)
Extra BPM	R		X		between Q5 and Q6	Close to BPLX
Extra BPM	R		X		between Q5 and Q5	Close to BPLX

Beam instrumentation II *(guess in italics)*

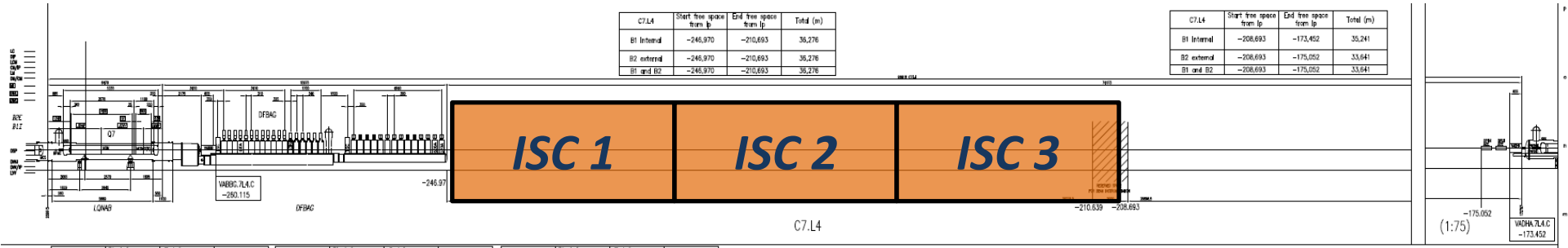
Eq. name	IR side	B1	B2	Length [mm]	Position	Remarks
Halo e lenses	L	*X*		6000	Near D3 after ondulator	
Halo e lenses	R		*X*	6000	Near D3 after ondulator	

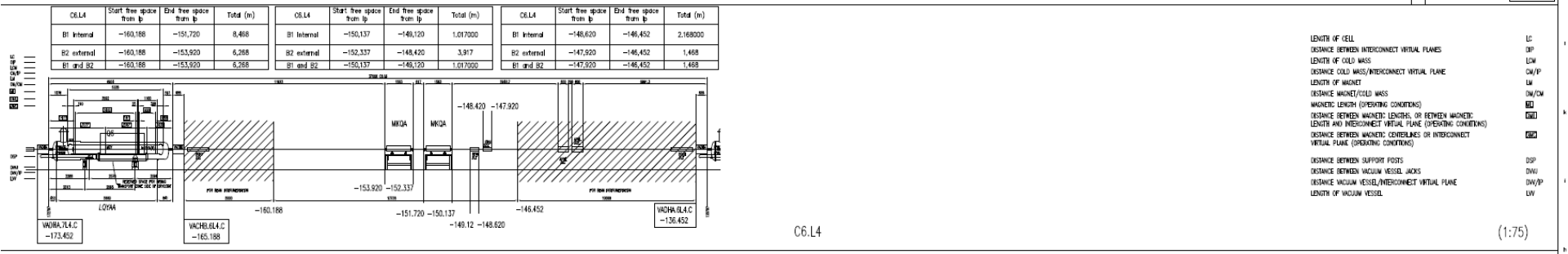
RF very preliminary estimates *(guess in italics)*

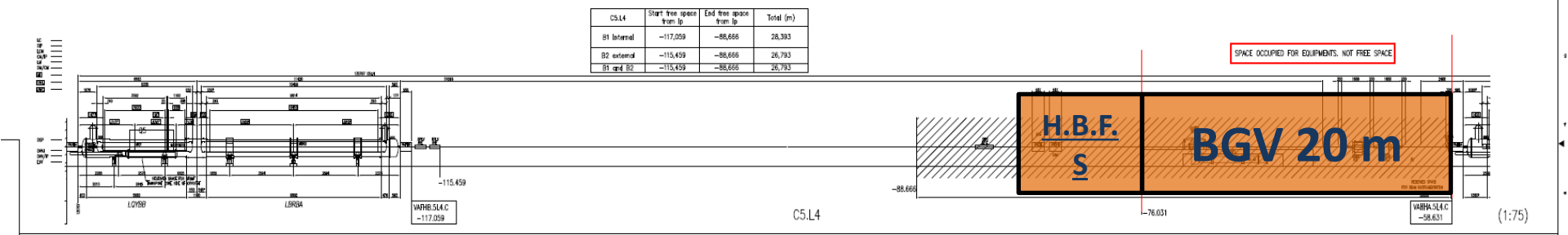
Eq. name	IR side	B1	B2	Length [mm]	Position	Remarks
800 MHz	L	*X*		15000 +/- 3000	In the area or present ACN	
800 MHz	R		*X*	15000 +/- 3000	In the area or present ACN	
200 MHz	L	*X*		8000	possibly replace one 400 MHz ACS module	
200 MHz	R		*X*	8000	possibly replace one 400 MHz ACS module	

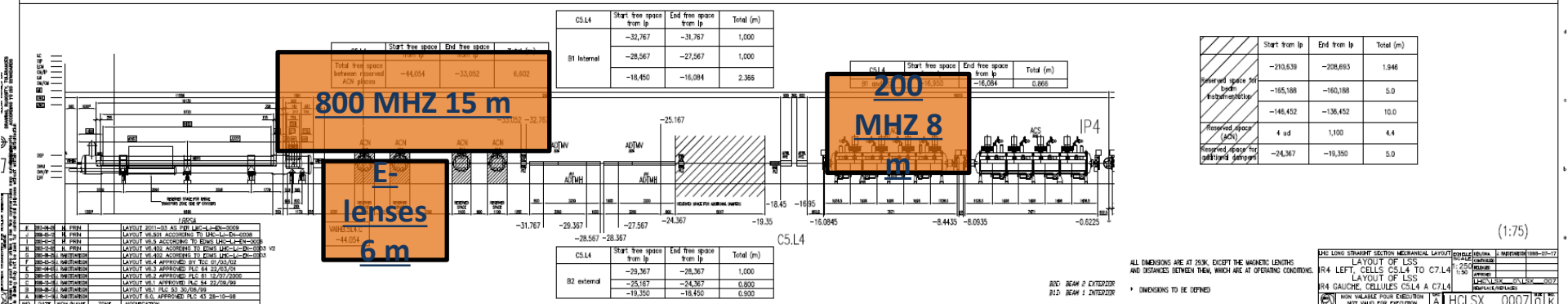
Eq. name	IR side	B1	B2	Length [mm]	Position	Remarks
Ion stochastic cooling (ISC)	L	*X*		3X12000	To de defined	12000 mm for each plane, not necessarily contiguous
Ion stochastic cooling (ISC)	R		*X*	3X12000	To de defined	12000 mm for each plane, not necessarily contiguous
ISC pick ups		*X*		*n*X500	IR 2 or IR3	Connect with optical fibres to IR4
ISC pick ups			*X*	*n*X500	IR 5 IR 6	Connect with optical fibres to IR4
High Bandwidth Transv system	L	*X*		6000-7000 ?		Possible useful space also in part with less beam separation to be investigated
High Bandwidth Transv system	R		*X*	6000-7000 ?		Possible useful space also in part with less beam separation to be investigated

IR 4 L, tetris

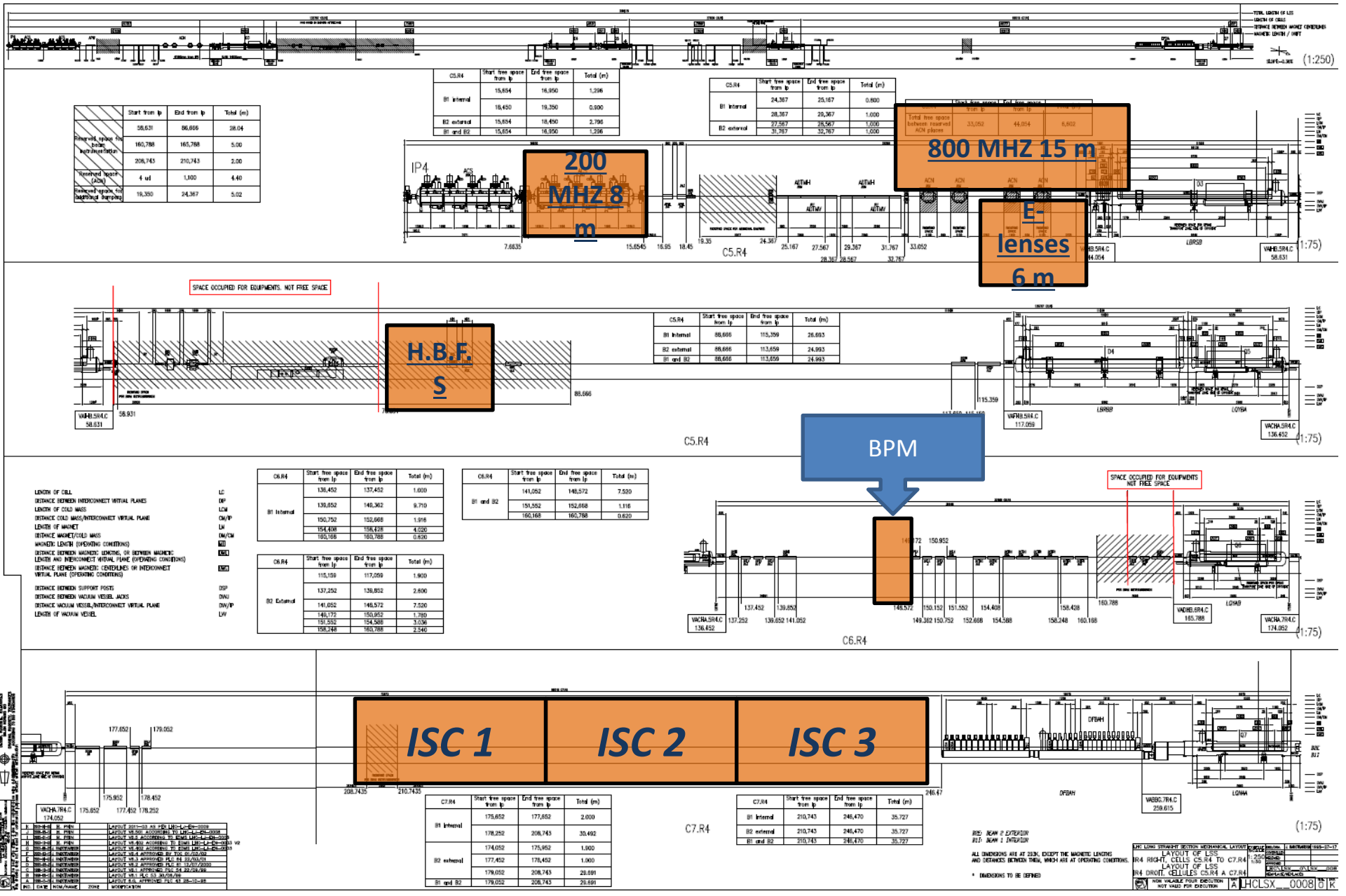

ISC 1
ISC 2
ISC 3
C7.L4
(1:75)


C6.L4
(1:75)


SPACE OCCUPIED FOR EQUIPMENTS, NOT FREE SPACE
H.B.F.S
BGV 20 m
C5.L4
(1:75)


800 MHZ 15 m
E-lenses 6 m
200 MHZ 8 m
C5.L4
(1:75)

IR 4 R, tetris


200 MHZ 8 m
800 MHZ 15 m
E-lenses 6 m
H.B.F.S
BPM
ISC 1
ISC 2
ISC 3
IP4
C5.R4
C6.R4
C7.R4

Conclusions

- We need to complete equipment survey for IP4
- We need to revise the reservations
- We need to re-reserve equipment space with adequate procedure to prepare ourselves at next 10 years of changes with HL-LHC