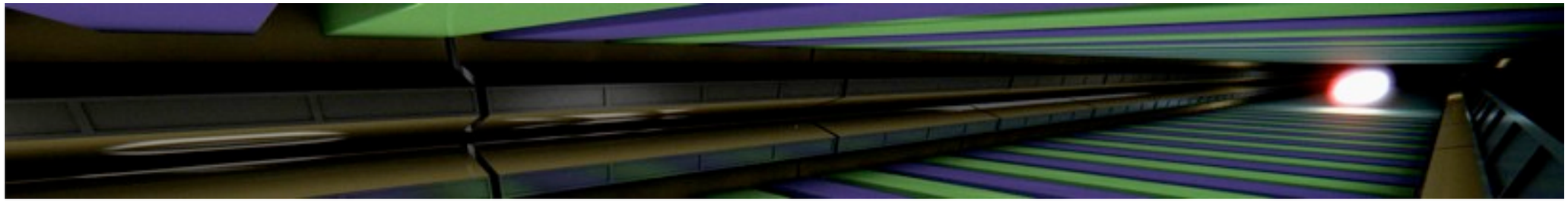


TC Report
(Photon Systems)

Tobias Haas
for the TC Team

TC Meeting
23 May 2012

European XFEL

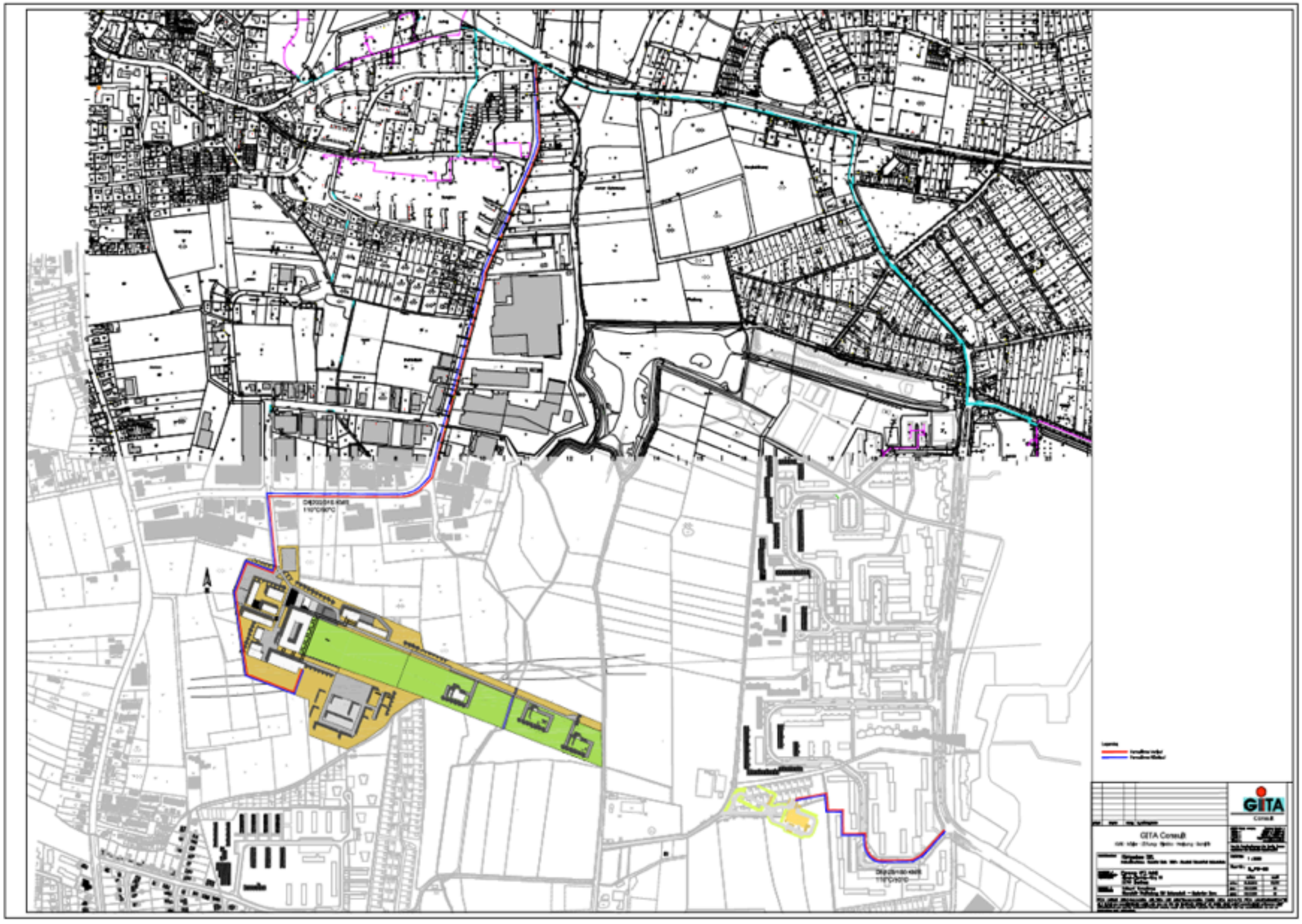
XTD10 and XTD9 yesterday

Topics

- XHQ and XHEXP1
  - Status District Heating CFT
  - Experimental Hall Layout
  - XHQ Labs
- Installation Planning XTDs and XHP (=XHEXP1)
- Next Steps

European XFEL

District Heating CFT

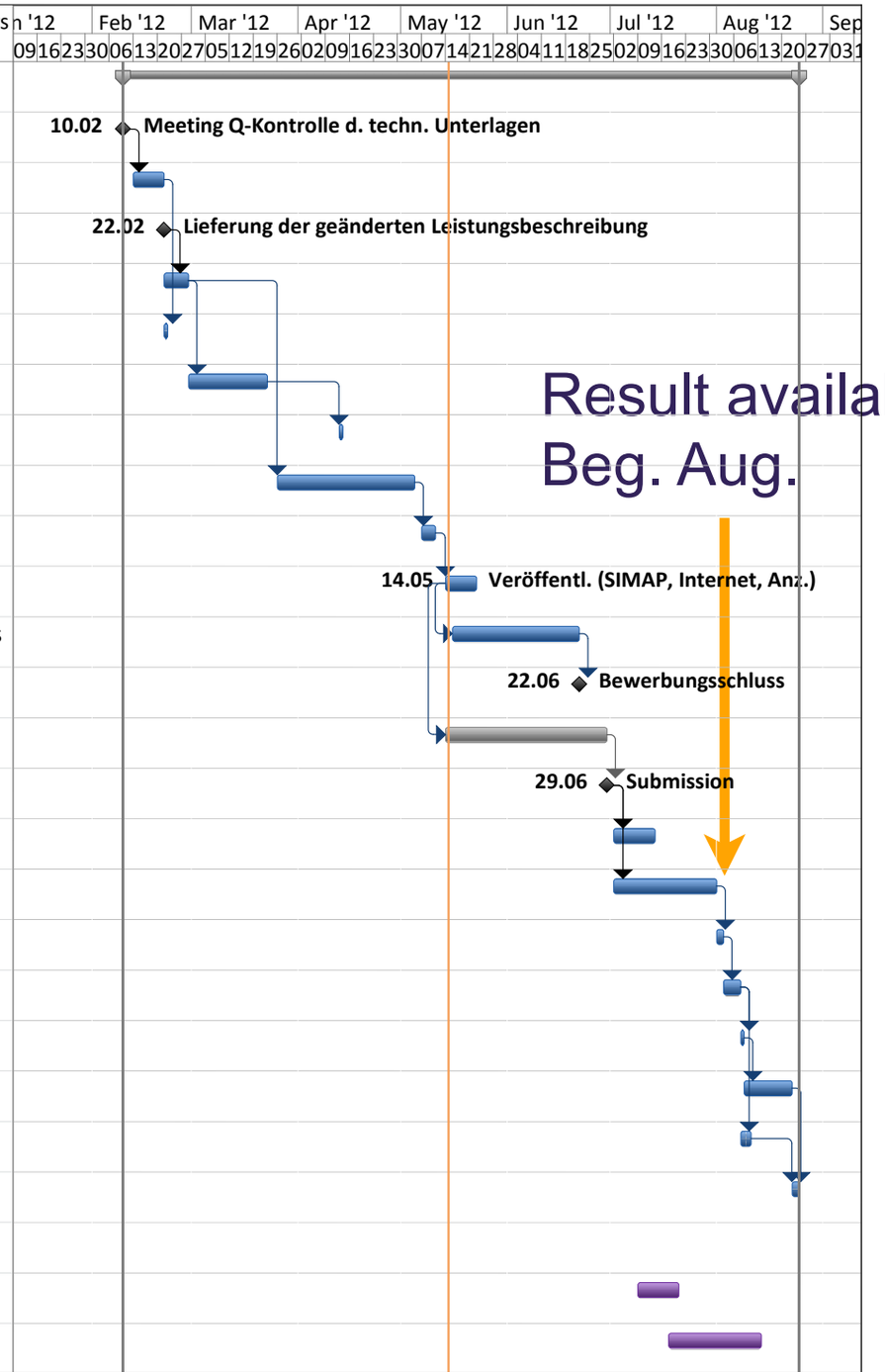


District Heating CFT

- Serves Schenefeld and Osdorf
- Three alternate scenarios:
  - A: connect in Schenefeld for both sites
  - B: connect in Osdorf for both sites
  - C: connect both in Schenefeld and Osdorf
- Options A&B require a connection between Schenefeld and Osdorf to be built by XFEL
- Option C needs two handover points but no connection
- Published on 14 May
- Dropped the BHKW option

Schedule

ID	Task Mode	Vorgangsname	Duration	Start	Finish	Predecessors
0		**XFEL Wärmeausschreibung, Var. Fernwärme**	**141 dys**	**Fri 10.02.12**	**Fri 24.08.12**	
1		Meeting Q-Kontrolle d. techn. Unterlagen	0 dys	Fri 10.02.12	Fri 10.02.12	
2		Änderung der Leistungsbeschreibung	7 dys	Mon 13.02.12	Tue 21.02.12	1
3		Lieferung der geänderten Leistungsbeschreibung	0 dys	Wed 22.02.12	Wed 22.02.12	
4		Prüfung der Leistungsbeschreibung	5 dys	Wed 22.02.12	Tue 28.02.12	3
5		Abstimmung Bewertungsmatrix	1 dy	Wed 22.02.12	Wed 22.02.12	2
6		Ext. Überarbeitung, interne Prüfung Leistungsbeschre	17 dys	Wed 29.02.12	Thu 22.03.12	4
7		Freigabe der Leistungsbeschreibung	1 dy	Fri 13.04.12	Fri 13.04.12	6
8		Vertragsentwurf, Ausschreibungsanschreiben	30 dys	Mon 26.03.12	Fri 04.05.12	4FS-5 dys
9		Abschließende Prüfung der Vergabeunterlagen	4 dys	Mon 07.05.12	Thu 10.05.12	8
10		Veröffentl. (SIMAP, Internet, Anz.)	7 dys	Mon 14.05.12	Tue 22.05.12	9
11		Versand der Unterlagen	27 dys	Wed 16.05.12	Thu 21.06.12	10SS+2 dys
12		Bewerbungsschluss	0 dys	Fri 22.06.12	Fri 22.06.12	11
13		Angebotserstellung (min. 45 KT bei elektr. Veröffentl.	35 dys	Mon 14.05.12	Fri 29.06.12	10SS
14		Submission	0 dys	Fri 29.06.12	Fri 29.06.12	13
15		Nachforderung von Unterlagen, Angebotsklärung	10 dys	Mon 02.07.12	Fri 13.07.12	14
16		Angebotsauswertung	22 dys	Mon 02.07.12	Tue 31.07.12	14
17		Vergabevorschlag	2 dys	Wed 01.08.12	Thu 02.08.12	16
18		Freigabe durch CfT-Board	3 dys	Fri 03.08.12	Tue 07.08.12	17
19		Absageschreiben	1 dy	Wed 08.08.12	Wed 08.08.12	18
20		Einspruchsfrist	10 dys	Thu 09.08.12	Wed 22.08.12	19
21		Freigabe Council	3 dys	Wed 08.08.12	Fri 10.08.12	18
22		Auftragserteilung	2 dys	Thu 23.08.12	Fri 24.08.12	20;21
23						
24		Abwesenheit TH	10 dys	Mon 09.07.12	Fri 20.07.12	
25		Abwesenheit FG	19 dys	Wed 18.07.12	Mon 13.08.12	

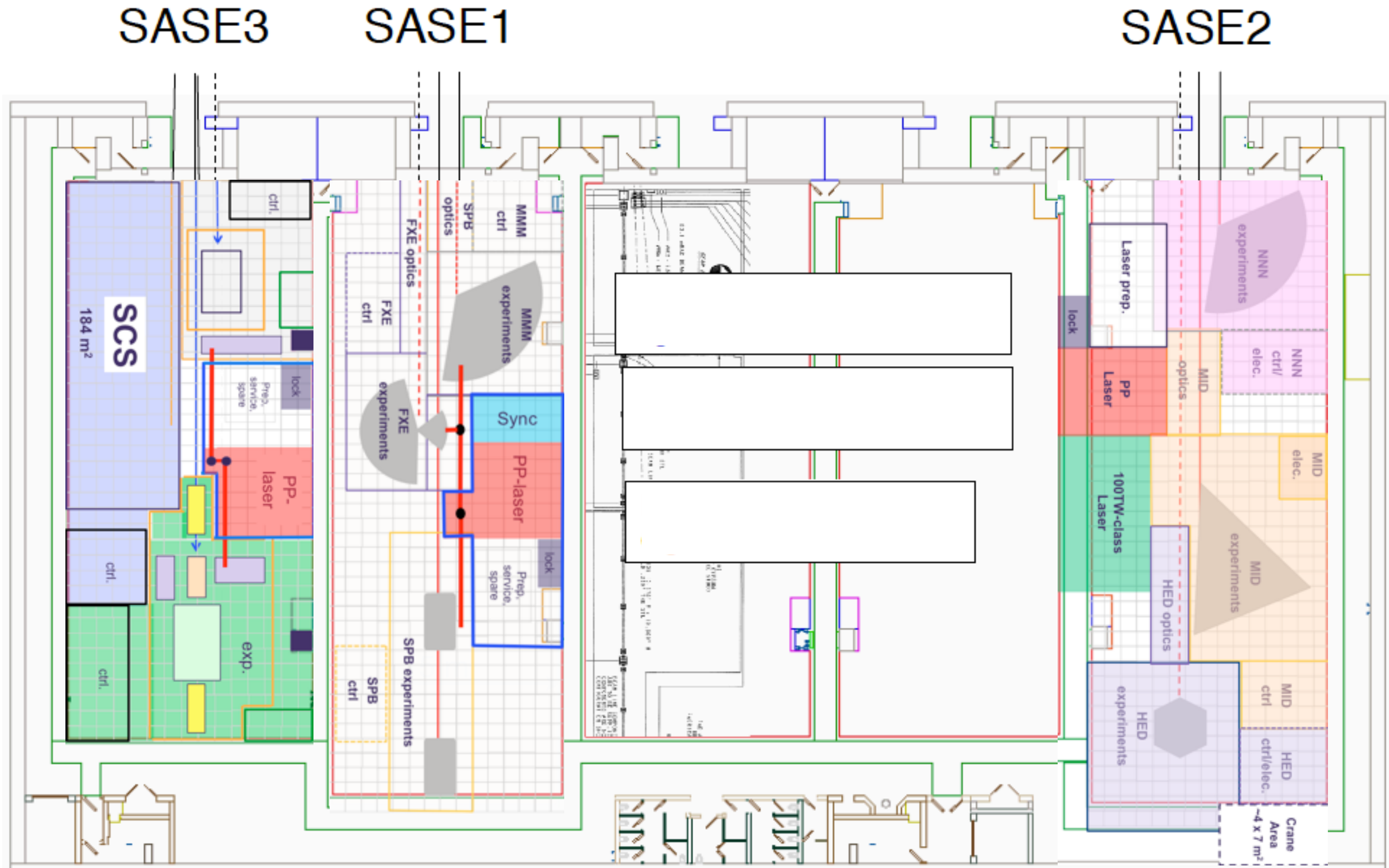


Result available:
Beg. Aug.

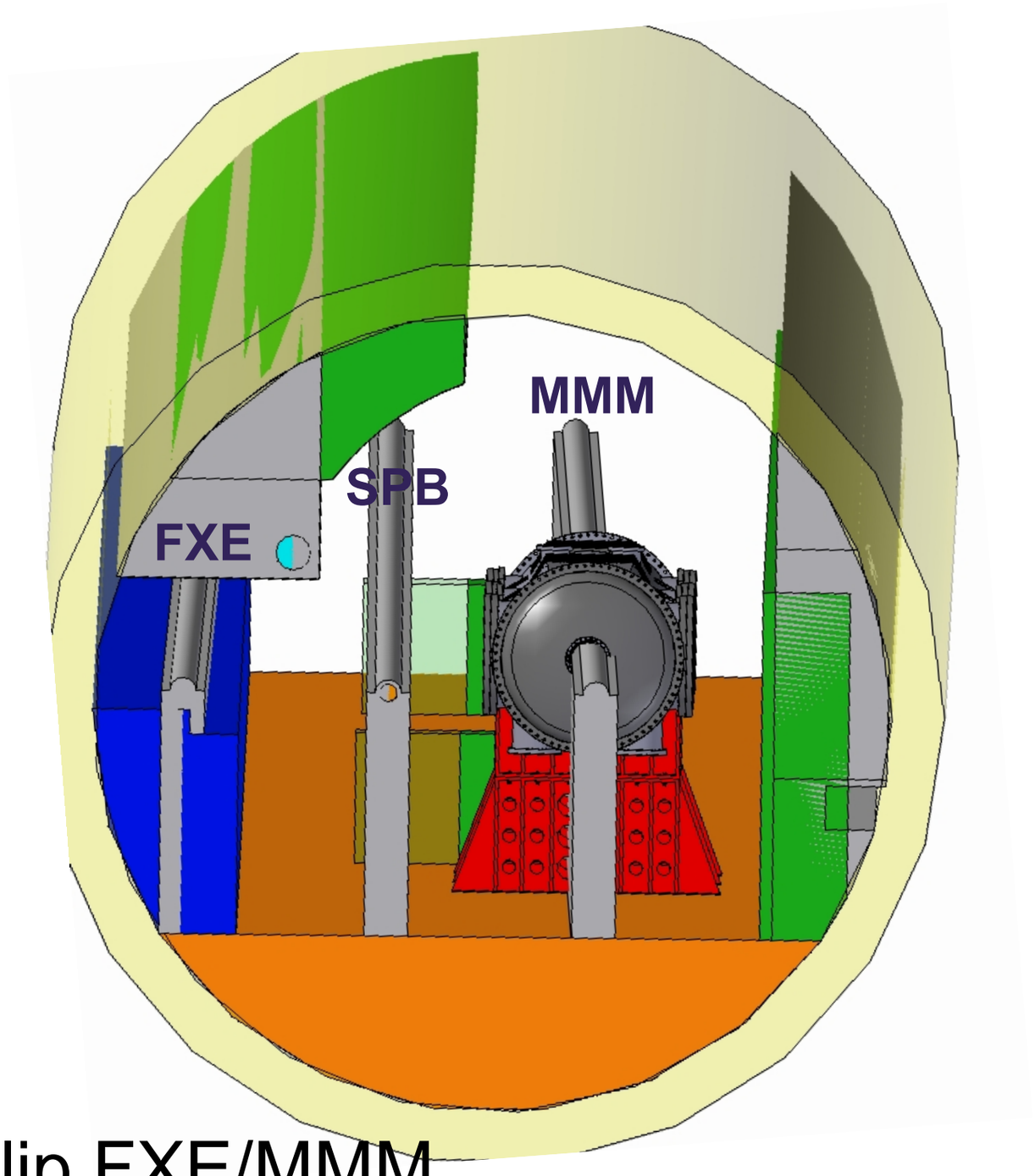
BHKW option

- Three necessary requirements
  - Plan approval order
  - Economics
  - Availability of gas
- If all three are satisfied:
  - CFT would be adapted to allow heat contracting via a BHKW
- None of the three requirements could be ascertained

Experiment Hall Layout



Tunnel Situation SASE 1



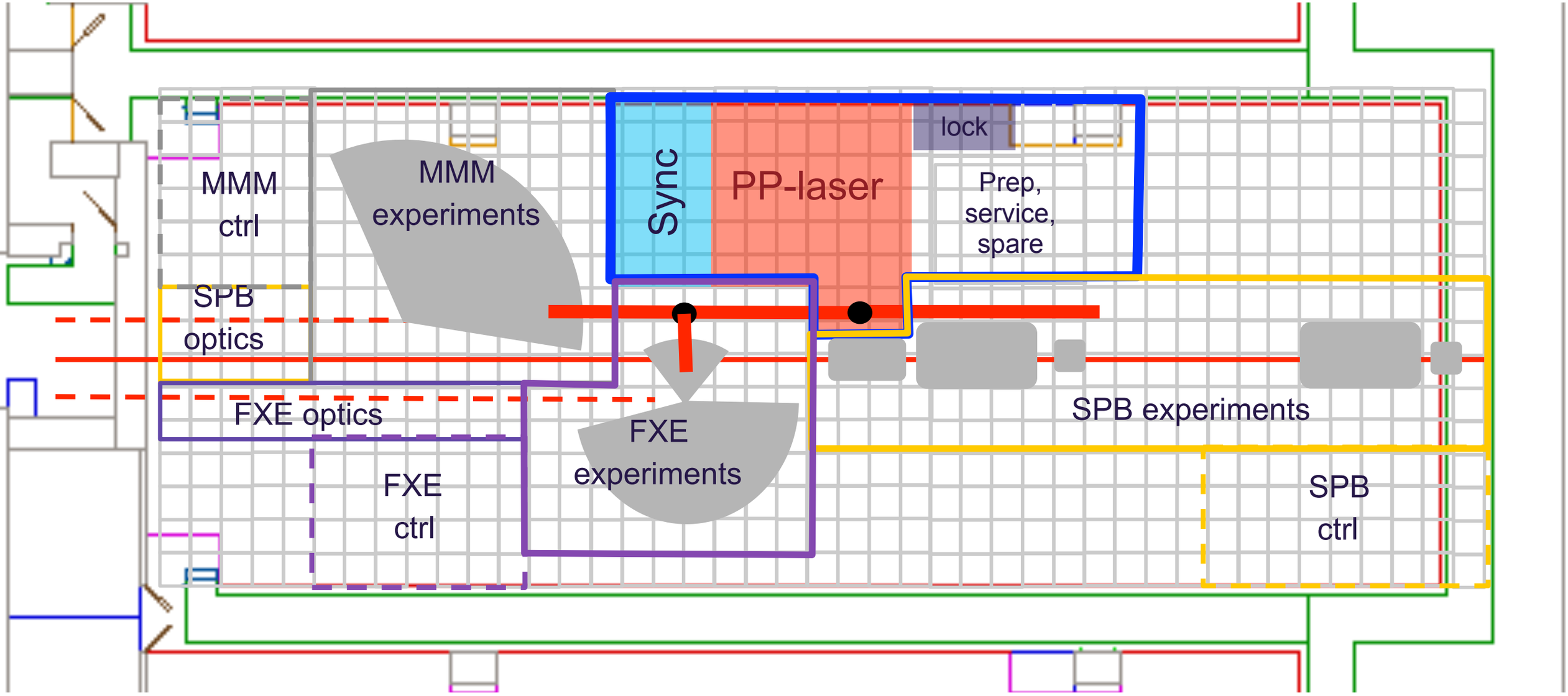
- Conclusion: Flip FXE/MMM

Conceptual floor plan for SASE 1 instruments

Version 27/2: **old distribution**

New/advantages:

Disadvantages: FXE has total 17 m inside XHEXP for FXE beam del. comp.; this might be just enough space for pacing mono, but too little for add. high-res-mono



Conceptual floor plan for SASE 1 instruments

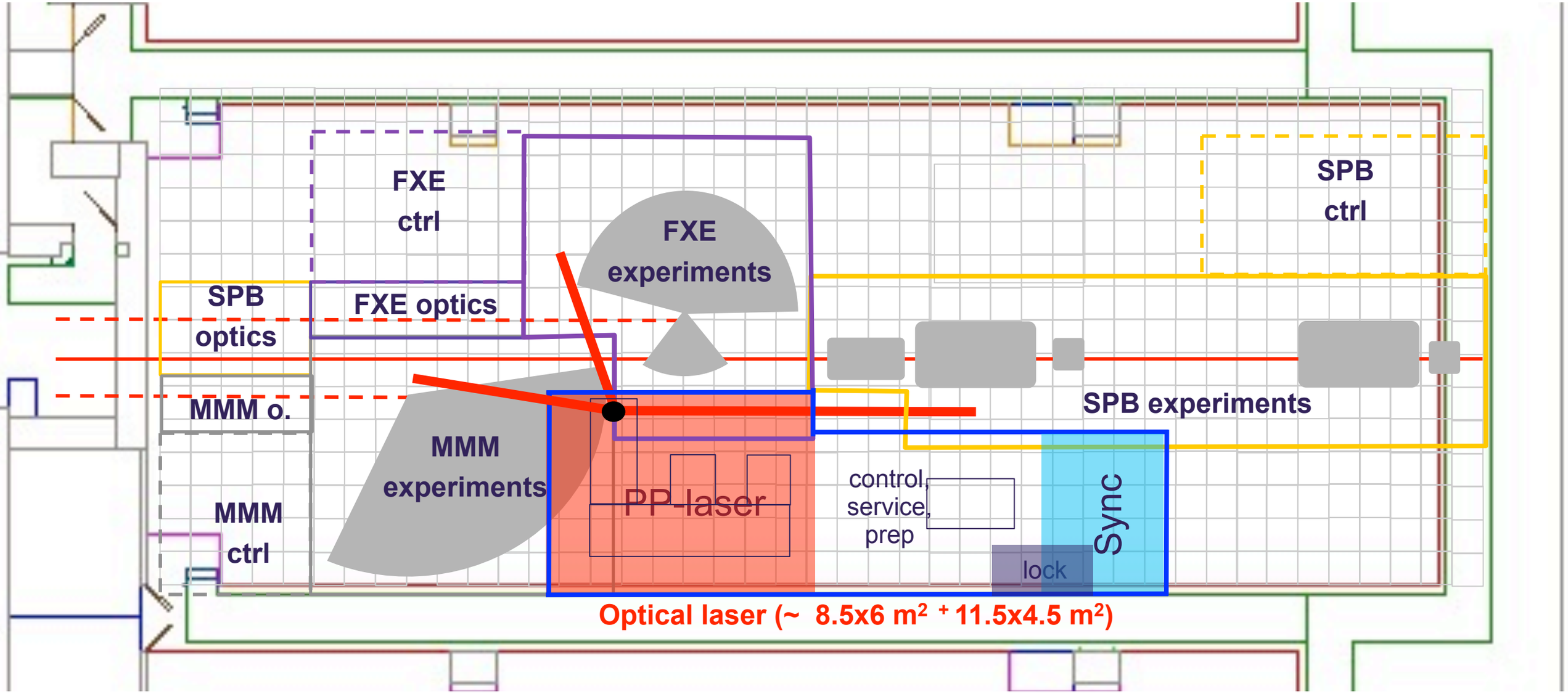
Version 28/4.1: flip entire area symmetric to central line, adjust for width; flip SPB opt.

Cut into MMM, FXE and SPB for space for laser hutch.

New/advantages: FXE gains access to placement of add. components inside XTD

Disadvantages: FXE has 5 m less for beam delivery, which go to MMM

OL footprint rather different. Possible ? **Beam del. to far SPB-station diff.**



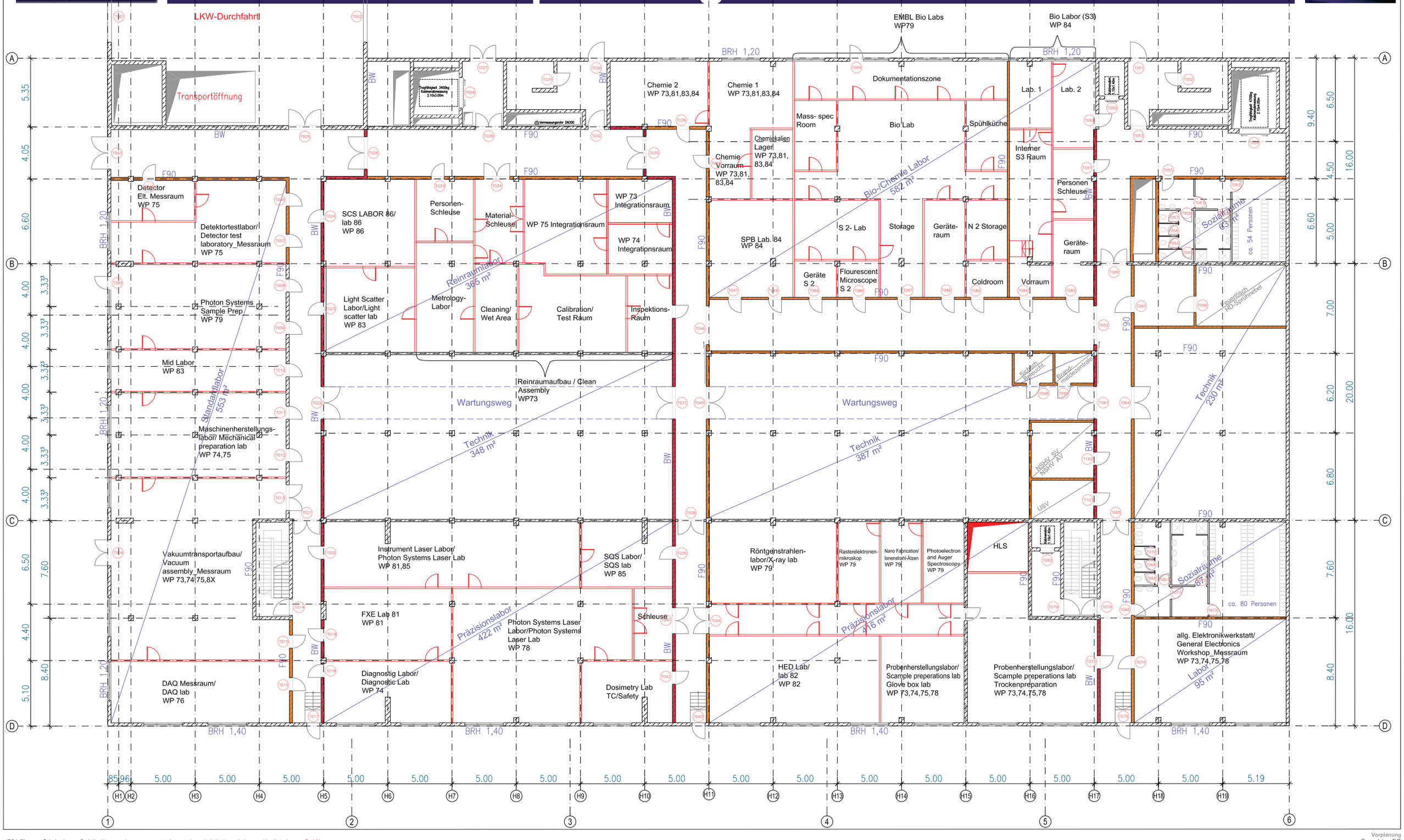
Status Floor Plan

- Beamport Allocation SASE1 will be flipped
  - FXE and MMM change sides
- Current floor allocation still problematic:
  - Laser hutches
  - Crane Access
  - ...
- Details to be worked out and finalized by 25 May
- Power and ventilation needs:
  - worked out in detail for SPB (SASE1)
  - next instrument is SQS (SASE3)
- Will have a room book with hutches and TGA numbers

Status XHQ

- TGA and Labs:
  - Feasibility Study (incl. cost estimate) was due 7 May
  - Delayed by two weeks
  - Current Planning
    - ➔Internal presentation: 25 May
    - ➔Public presentation: 15 June
    - ➔Start of Approval process (ZBAU): July
    - ➔Start of Civil Construction: Aug 2013
    - ➔Move-in: Early 2015

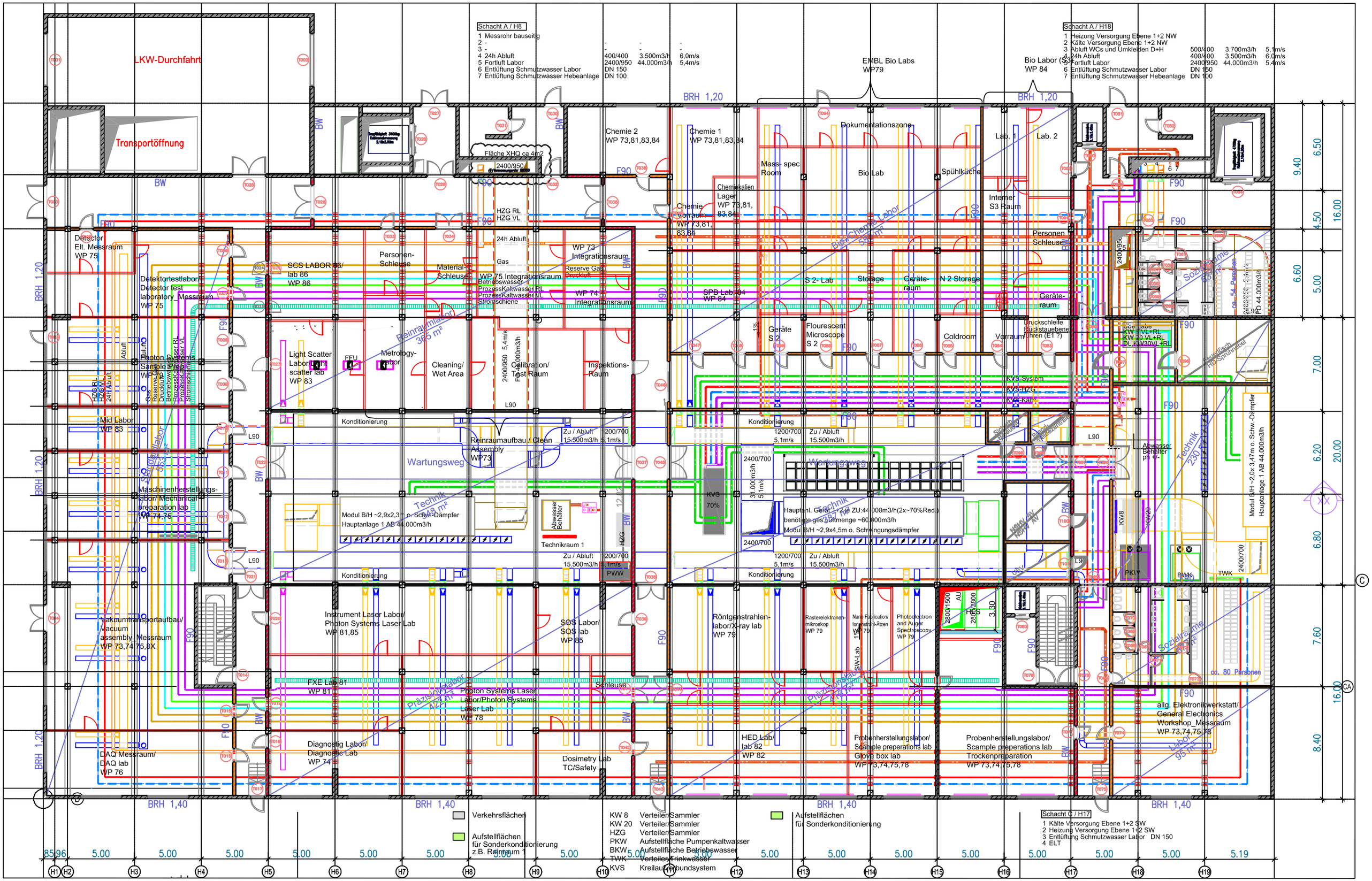
State of the lab planning



TGA-Planung: ScholzeJaeger GmbH - ibb Burrer & Deuring Ingenieurbüro GmbH - dr. heinekamp Labor- und Institutsplanung GmbH

Vorplanung
Grundriss EG

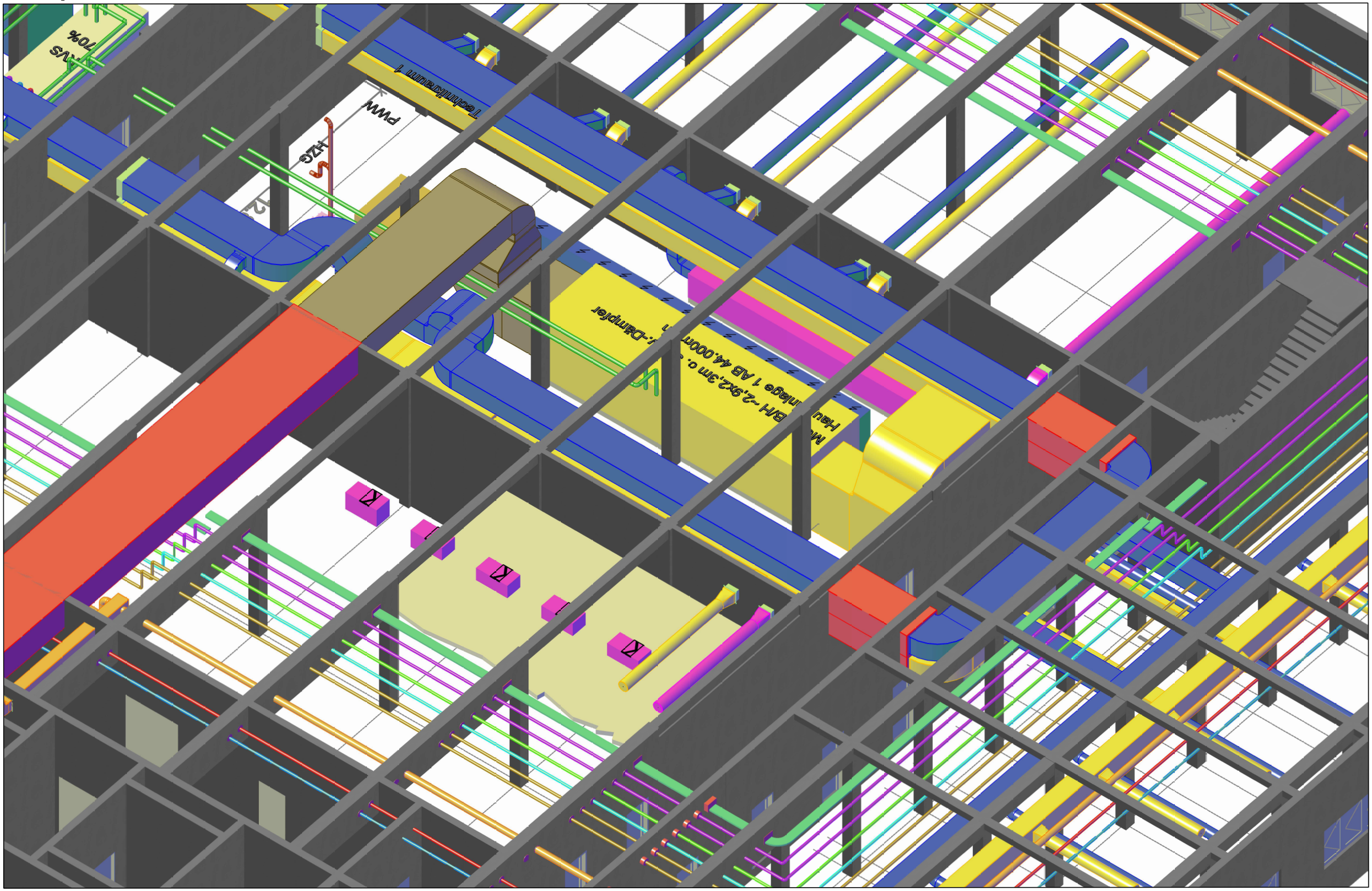
European XFEL GmbH - XHQ



TGA-Planung: ScholzeJaeger GmbH - ibb Burrer & Deuring Ingenieurbüro GmbH - dr. heinekamp Labor- und Institutsplanung GmbH

Vorplanung
E0 HLSK M 1:250
03.05.2012

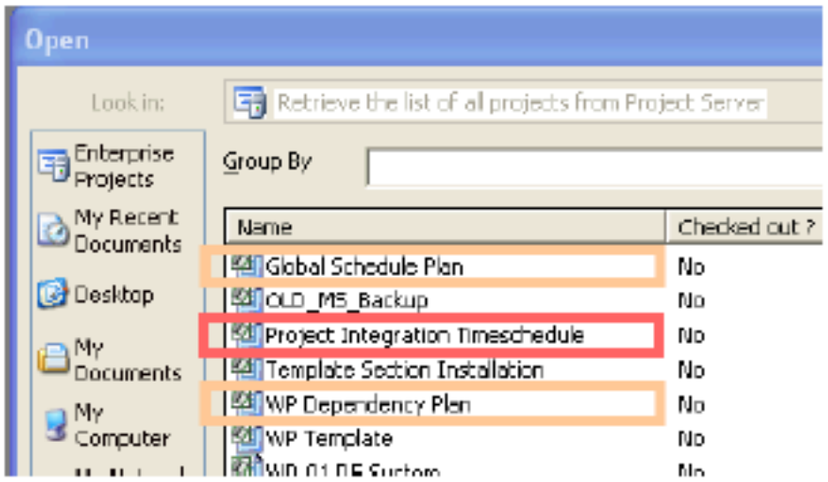
European XFEL GmbH - XHQ

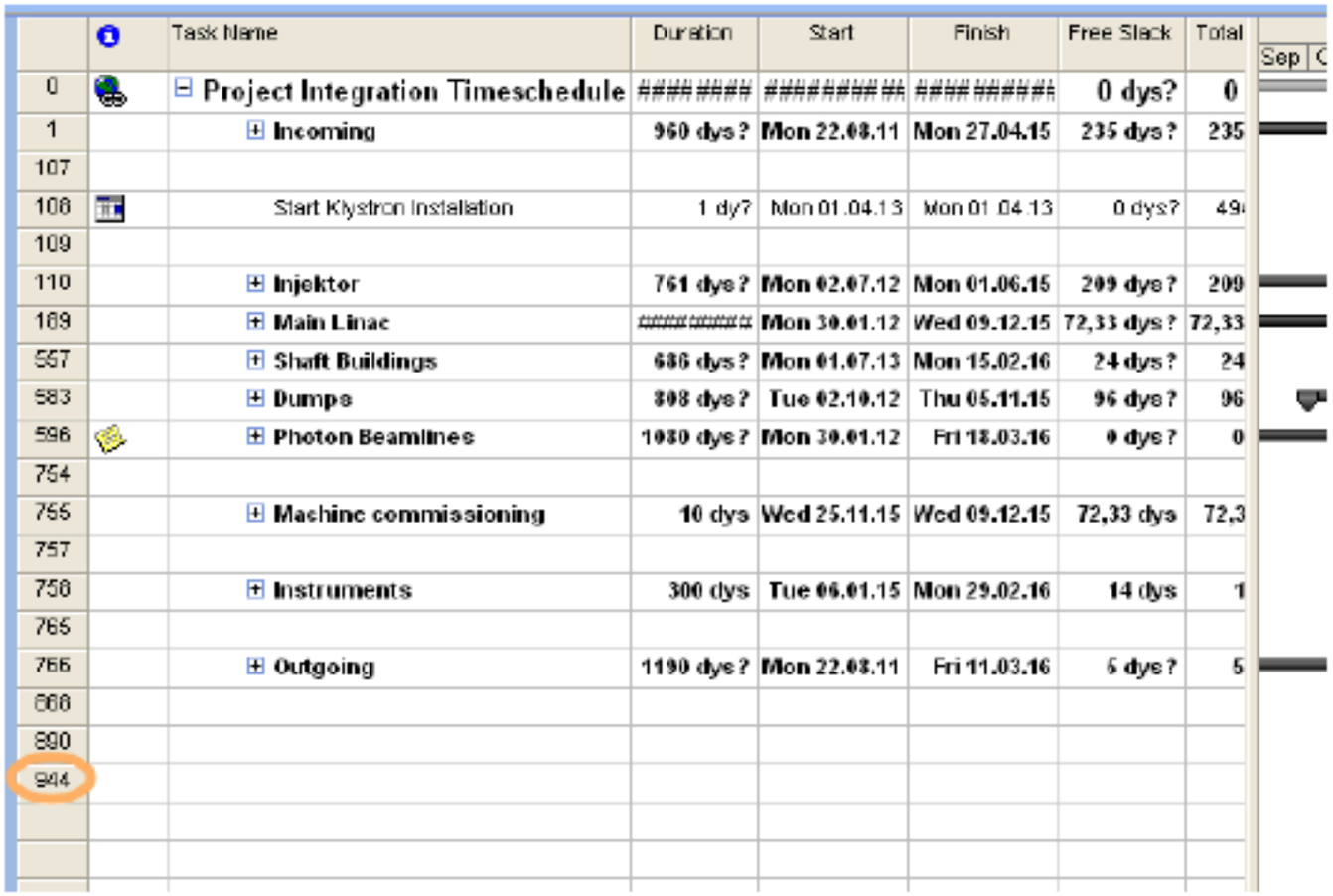


TGA-Planung: ScholzeJaeger GmbH - ibb Burrer & Deuring Ingenieurbüro GmbH - dr. heinekamp Labor- und Institutsplanung GmbH

Vorplanung
E0 ISO 1 M 1:100
12.04.2012

Project Integration Timeschedule PIT





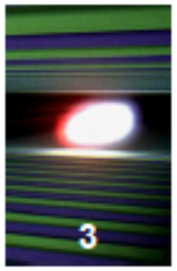
		Task Name	Duration	Start	Finish	Free Slack	Total
0		Project Integration Timeschedule	########	#########	#########	0 dys?	0
1		Incoming	960 dys?	Mon 22.08.11	Mon 27.04.15	235 dys?	235
107							
108		Start Klystron Installation	1 dy?	Mon 01.04.13	Mon 01.04.13	0 dys?	49
109							
110		Injektor	761 dys?	Mon 02.07.12	Mon 01.06.15	209 dys?	209
169		Main Linac	########	Mon 30.01.12	Wed 09.12.15	72,33 dys?	72,33
557		Shaft Buildings	686 dys?	Mon 01.07.13	Mon 15.02.16	24 dys?	24
583		Dumps	808 dys?	Tue 02.10.12	Thu 05.11.15	96 dys?	96
596		Photon Beamlines	1030 dys?	Mon 30.01.12	Fri 18.03.16	0 dys?	0
754							
755		Machine commissioning	10 dys	Wed 25.11.15	Wed 09.12.15	72,33 dys	72,3
757							
758		Instruments	300 dys	Tue 06.01.15	Mon 29.02.16	14 dys	1
765							
766		Outgoing	1190 dys?	Mon 22.08.11	Fri 11.03.16	5 dys?	5
888							
890							
944							

- to have an overview of the scheduling of all the different parts of the project
- to link the major / top level milestones to their constituent sub-projects

- not meant for detailed planning

- already 960 lines (944 + 16 top level milestones) in the PIT
  - incoming milestones ca.100
  - outgoing milestones ca. 180
  - 79 for Injector (90 m)
  - 388 for main Linac (2.1 km)
    - ca. 120 for infrastructure
    - ca. 230 for Linac
  - 150 for Photon beamlines
    - (ca. 10 per tunnel)

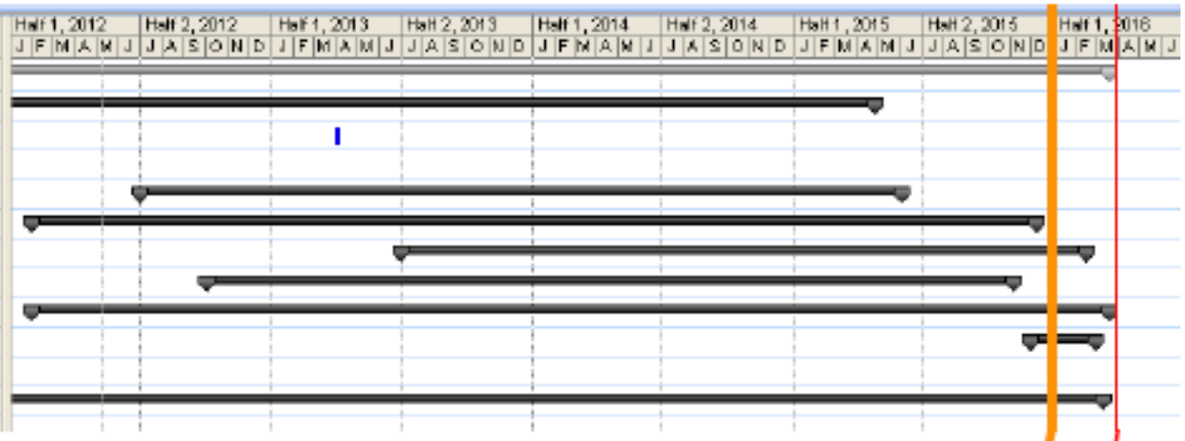
Shifting completion dates



Milestones and tasks should not be pushed further

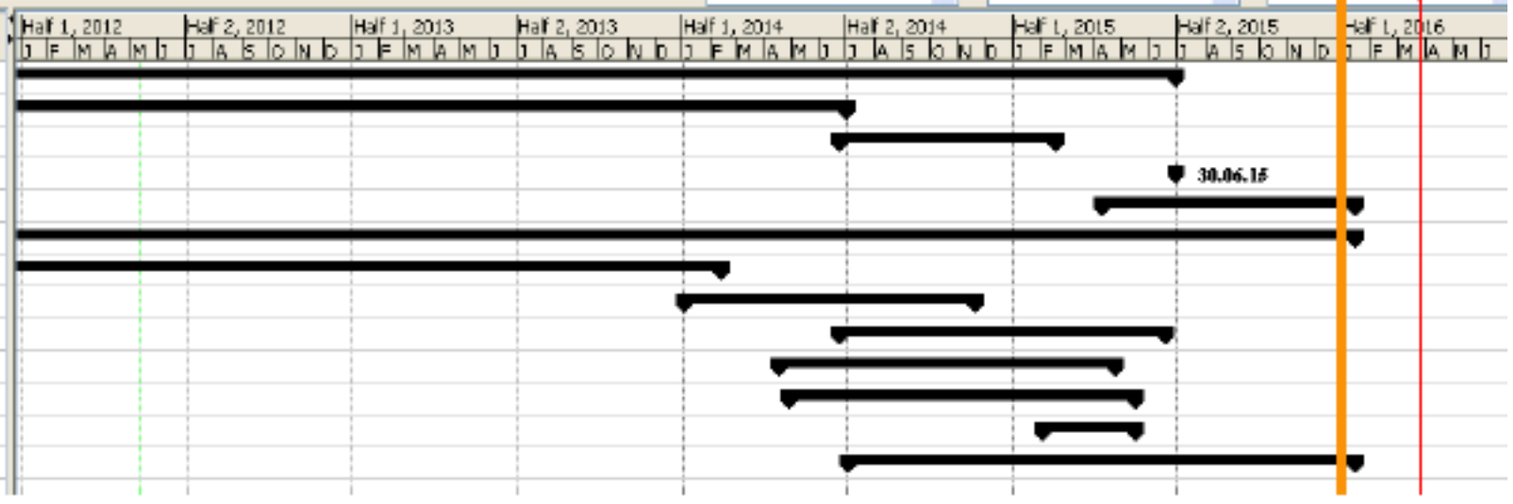
Current view of the PIT

	Task Name	Duration	Start	Finish	Predecessors
0	Project Integration Timeschedule	########	##########	##########	
1	Incoming	960 dys?	Mon 22.08.11	Mon 27.04.15	
100	Start Klystron Installation	1 dy?	Mon 01.04.13	Mon 01.04.13	
101					
102	Injektor	761 dys?	Mon 02.07.12	Mon 01.06.15	
181	Main Linac	##########	Mon 30.01.12	Wed 09.12.15	
549	Shaft Buildings	686 dys?	Mon 01.07.13	Mon 15.02.16	
575	Dumps	868 dys?	Tue 02.10.12	Thu 05.11.15	
588	Photon Beamlines	1080 dys?	Mon 30.01.12	Fri 18.03.16	
742	Experiments	66 dys?	Mon 30.11.15	Mon 29.02.16	
750					
751	Outgoing	1190 dys?	Mon 22.08.11	Fri 11.03.16	



PBS-Installation Plan from one year ago

	Name	Dauer	Start	Ende
1	Incoming Milestones	960 tage	25.10.11 08:00	30.06.15 08:00
2	Civil Construction	699 tage	25.10.11 08:00	30.06.14 08:00
23	Component Availability	171 tage	23.06.14 08:00	17.02.15 08:00
39	LINAC Milestones	0 tage	30.06.15 08:00	30.06.15 08:00
41	Outgoing Milestones	200 tage	08.04.15 17:00	13.01.16 17:00
46	Installation Activities	1.102 tage	25.10.11 08:00	13.01.16 17:00
47	Initial Survey	602 tage	25.10.11 08:00	12.02.14 17:00
59	Infrastructure	230 tage	02.01.14 08:00	19.11.14 17:00
69	Undulators	260 tage	23.06.14 08:00	19.06.15 17:00
78	Electron Beam Line	267 tage	17.04.14 08:00	24.04.15 17:00
87	Photon Beam Lines	274 tage	29.04.14 08:00	15.05.15 17:00
91	Photon Diagnostics	74 tage	03.02.15 08:00	15.05.15 17:00
95	XHEXP1	400 tage	03.07.14 08:00	13.01.16 17:00



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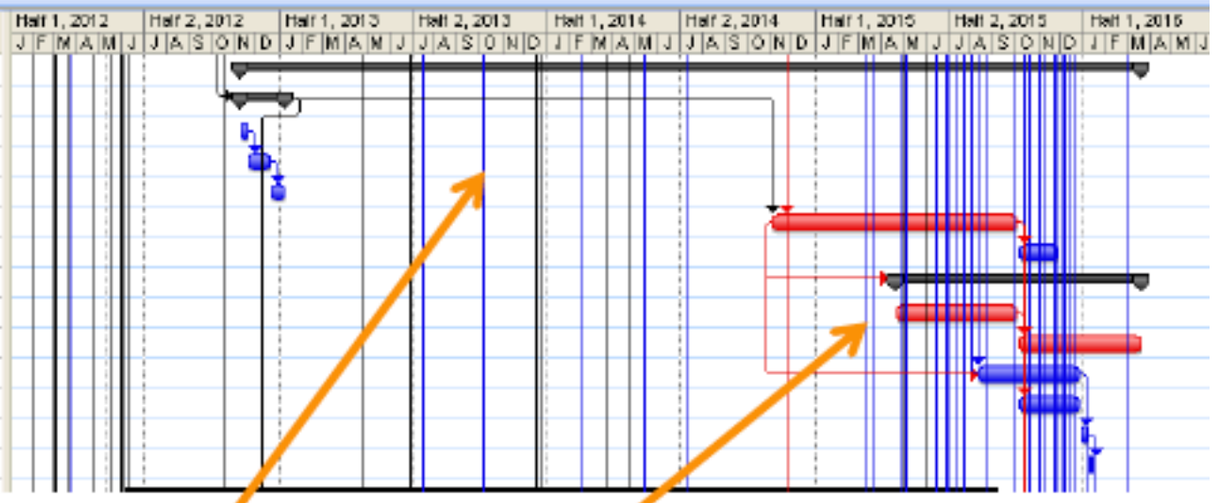
Current Critical Path

A recent look at the critical path in the PIT

	Task Name	Duration	Start	Finish	Predecessors
669	**XTD6 (SASE2) for (MID/HED)**	**876 dys?**	**Fri 09.11.12**	**Fri 18.03.16**	
670	**initial survey (WP32)**	**42 dys**	**Fri 09.11.12**	**Mon 07.01.13**	37
671	mounting of reference marks	7 dys	Fri 09.11.12	Mon 19.11.12	
672	1st passage	22 dys	Tue 20.11.12	Wed 19.12.12	671
673	2nd passage	13 dys	Thu 20.12.12	Mon 07.01.13	672
674	Infrastructure installation (WP34)	12 mons	Mon 03.11.14	Fri 02.10.15	670,73
675	Personnel Interlock (WP-38)	40 dys?	Mon 05.10.15	Fri 27.11.15	674
676	**DAQ installation (SASE2)**	**240 dys**	**Mon 20.04.15**	**Fri 18.03.16**	**674SS+6 mons**
677	minimal system	6 mons	Mon 20.04.15	Fri 02.10.15	
678	preoperational system	6 mons	Mon 05.10.15	Fri 18.03.16	677
679	PBL sase2 Inst. WP-73	20 wks	Mon 10.08.15	Fri 25.12.15	ys;674SS+10 mons
680	PB dwg	60 dys?	Mon 05.10.15	Fri 25.12.15	674
681	PB tests and commissioning	10 dys	Mon 28.12.15	Fri 08.01.16	679
682	-	1 dy	Mon 11.01.16	Mon 11.01.16	681



long pauses between activities

even arbitrarily introduced overlaps don‘t slacken the situation

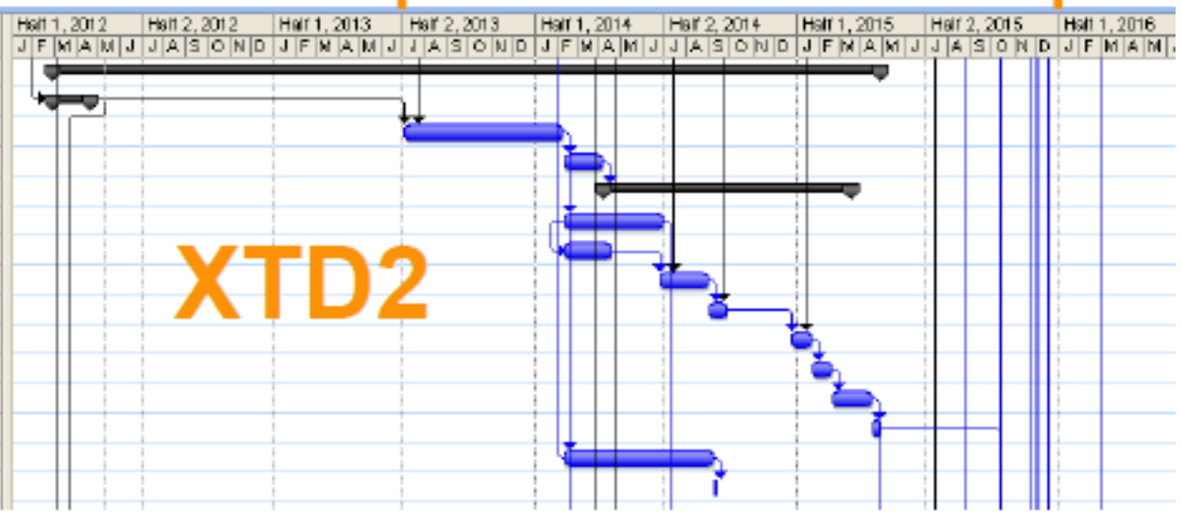
European XFEL

SASE 1: XTD2 and XTD9

SASE 1

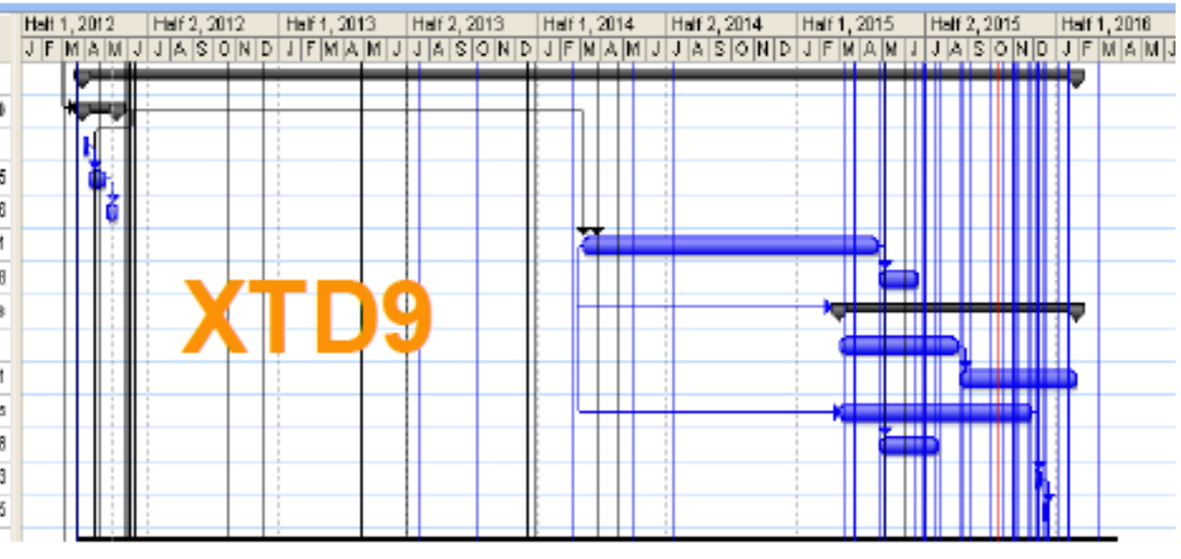
electron beamline

	Task Name	Duration	Start	Finish	Predecessors
609	**XTD2 (SASE1) (Undu)**	**826 dys?**	**Wed 29.02.12**	**Wed 29.04.15**	
610	**initial survey (WP32)**	**38 dys**	**Wed 29.02.12**	**Fri 20.04.12**	33
614	Infrastructure Installation (WP34)	6 mons	Mon 01.07.13	Fri 07.02.14	610,70
615	Personnel Interlock (WP-38)	40 dys?	Mon 10.02.14	Fri 04.04.14	614
616	**DAQ Installation (SASE1)**	**247 dys**	**Mon 07.04.14**	**Tue 17.03.15**	**615**
619	Machine Installation	6 mons	Mon 10.02.14	Fri 27.06.14	614
620	EB magnets sase1	50 dys?	Mon 10.02.14	Fri 18.04.14	619SS
621	intersections sase1	50 dys?	Mon 23.06.14	Fri 29.08.14	78,620
622	EB vac sase1	20 dys?	Mon 01.09.14	Fri 26.09.14	621,80
623	Undulators (SASE1)	1 mon	Thu 25.12.14	Wed 21.01.15	622,87
624	Undulator Alignment (SASE1)	1 mon	Thu 22.01.15	Wed 18.02.15	623
625	Undulator Test of Control Syst. (SASE1)	2 mons	Thu 19.02.15	Wed 15.04.15	624
626	Machine test & commissioning XTD2	10 dys	Thu 16.04.15	Wed 29.04.15	625
627	WP-73 PBL sase1 Inst. (XTD2/XS3)	30 wks	Mon 10.02.14	Fri 05.09.14	614
628	-	1 dy	Mon 08.09.14	Mon 08.09.14	627



photon beamline

	Task Name	Duration	Start	Finish	Predecessors
703	**XTD9 (SASE1) for (SPB/FXE)**	**1001 dys?**	**Fri 30.03.12**	**Fri 29.01.16**	
704	**initial survey (WP32)**	**34 dys**	**Fri 30.03.12**	**Wed 16.05.12**	**40**
705	mounting of reference marks	5 dys	Fri 30.03.12	Thu 05.04.12	
706	1st passage	18 dys	Fri 06.04.12	Tue 01.05.12	705
707	2nd passage	11 dys	Wed 02.05.12	Wed 16.05.12	706
708	Infrastructure Installation (WP34)	15 mons	Mon 03.03.14	Fri 24.04.15	704;71
709	Personnel Interlock (WP-38)	40 dys?	Mon 27.04.15	Fri 19.06.15	708
710	**DAQ Installation (SASE1)**	**240 dys**	**Mon 02.03.15**	**Fri 29.01.16**	**708SS+13 mons**
711	minimal system	6 mons	Mon 02.03.15	Fri 14.08.15	
712	preoperational system	6 mons	Mon 17.08.15	Fri 29.01.16	711
713	PBL sase1 installation WP-73	39 wks	Mon 02.03.15	Fri 27.11.15	708SS+13 mons
714	PB diag sase1 WP-74	60 dys?	Mon 27.04.15	Fri 17.07.15	708
715	tests & Commissioning	10 dys	Mon 30.11.15	Fri 11.12.15	713
716	-	1 dy?	Mon 14.12.15	Mon 14.12.15	715



Time Planning

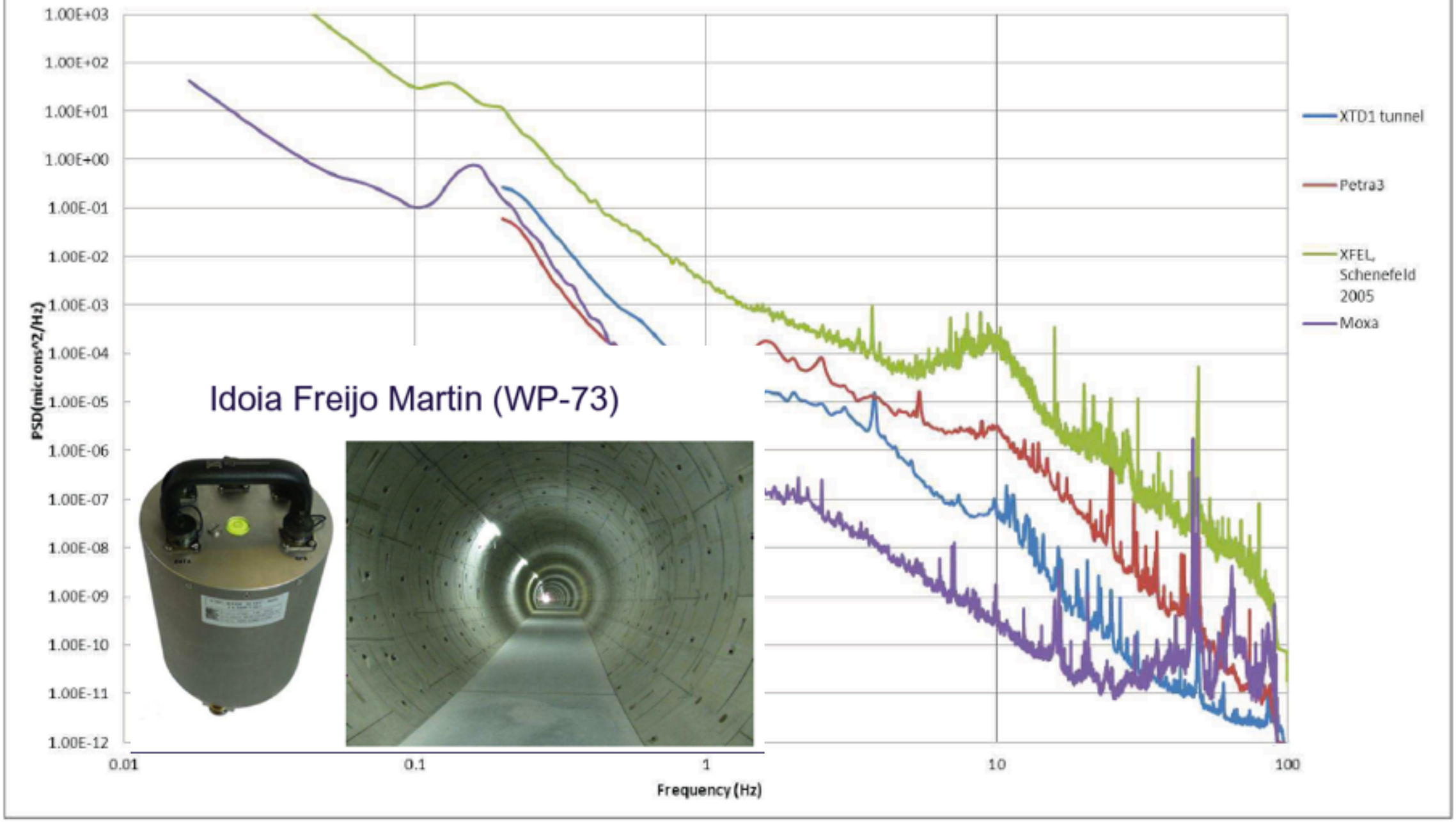
- Large gaps between availability of buildings and start of infrastructure installation
- Will work on the details of this in the next months
  - S. Cunis will come around and discuss this with the respective WPLs

Next (big) Steps

- Finalize floor layout in XHEXP1 and fill the room books
- Work on the details of time planning
- Engineering Team Instruments
  - One engineer hired
  - Need a team leader and four more (interviews end of May)
- Cable Planning
  - KDS planner to be hired (interviews in June)
- Strengthen the TC team
  - Advertise additional positions
- Agree on the use of DACHS for XFEL
- PRR undulator intersections
  - Formal agreements on assembly and installation
- Vibration baseline measurement

European XFEL

Analysis of the measurements



Power spectral density of vertical ground motion, quiet period at the XTD1 tunnel. Petra-3 2011 experimental floor (Gerd Wellenreuther), Schenefeld 2005 .Moxa (reference for an extremely quiet location). *http://vibration.desy.de/sites_measured/*

EDMS Nr.: D0000000002832491 Rev: A Ver: 1 Status: Released Dat.: 27. Apr 2012