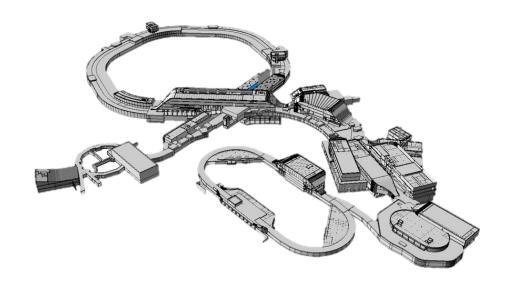


FAIR Building Construction – Status and Outlook



Harald Hagelskamp – Site Manager

February 28th, 2018



Site Management at FAIR

Integration of Civil Construction and Machine Installation.

Scope Definition.

Interface Coordination.

Time Scheduling.

Resource Planning.





Groundbreaking ceremony on 4. July 2017





Progress January 2018





Excavation 1st section of SIS 100

January 2018

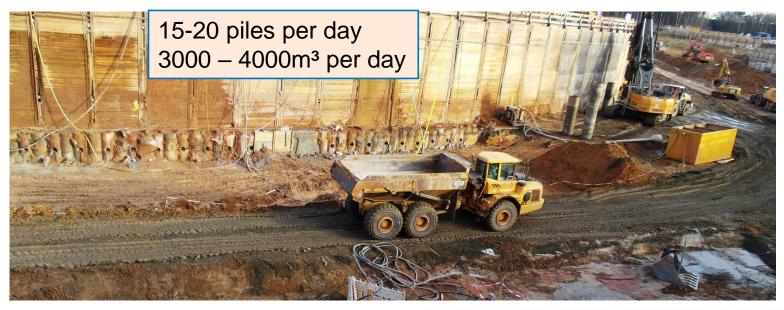


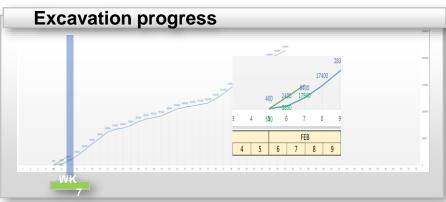


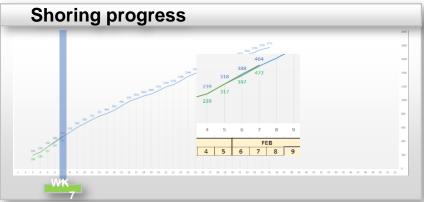
Excavation Transferbuilding

January 2018













Excavation 1st section of SIS 100

January 2018

FAIR Project Progress - Civil Construction





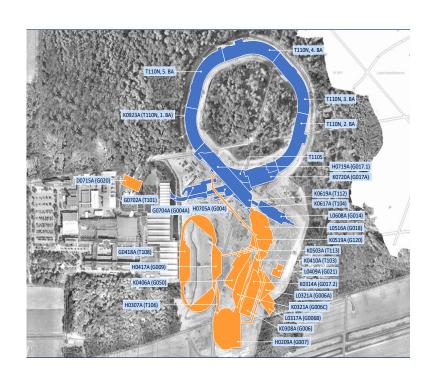
Transformers North connected on 23.02.2018

Transformers South delivered and installed - connection in May 2018.





Civil Construction - Outlook



Civil Construction Field North Contract Award 01-2018 Start of Work 07-2018

Civil Construction Field South Contract Award 03-2019 Start of Work 07-2019

Building Technology Contract Awards 06-2019 Start of Work 08-2019



SIS 18 in direction of pLinac: Preparation of western transfer channel (WTK)





GAF project (GSI connection to FAIR)



Northern Edge of SIS 18: Preparation of retention wall to support soil shield



SIS 18 completion 04-2018 Start of beam time 05-2018

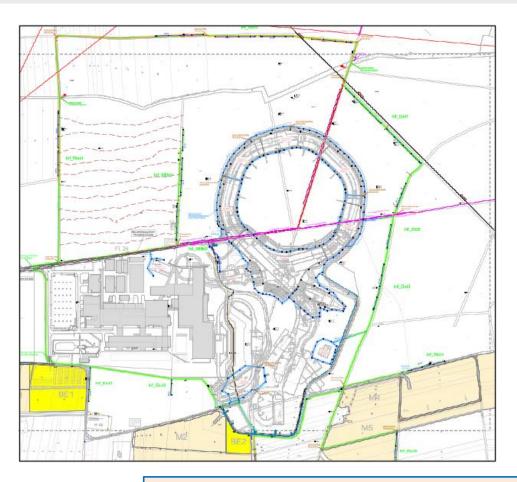


Electrical building on top of SIS 18



GAF project (GSI connection to FAIR)





168 Pump Wells

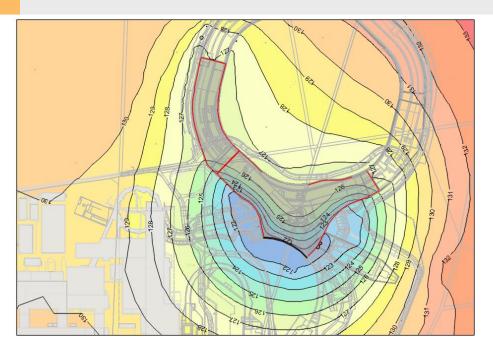
- Diameter = 400 mm
- Depth up to 20 m
- Extraction Rate = 1 to 5 m³/h

74 Recirculation Wells

- Diameter = 800 mm
- Depth up to 25 m
- Infiltration = 8 to 11 m^3/h
- 35.000 m³/a

Ground Water Management





The Ground Water Table will be lowered by approx. 10m

Ground Water Management

Settlement tanks: water purification before return to riverine.



Site Management



- Training and awareness for office staff, workers and visitors – everybody entering site.
- Rules of safe behavior on site.
- Creating awareness for risk potentials on site.
- Wearing of PSE (personal safety equipment) is mandatory.



Site Policy - Zero Incidents

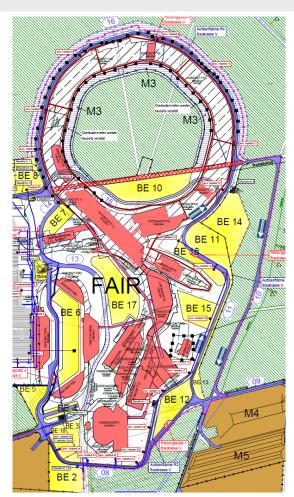
 Several "rescue island" are positioned on site and provide first aid equipment, fire extinguishers and stretchers for transportation and rescue of injured persons. (Managed by the Service Provider for Site Logistics)



EHS Management



- Security and access control 1200 people per day.
- coordination of traffic to site 300 heavy trucks per day.
- Coordination of traffic on site 600 heavy truck moves.
- Control of deliveries to site material flow.
- allocation and coordination of storage areas for contractors.

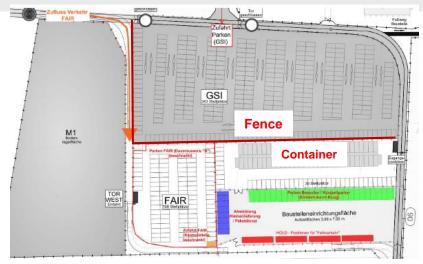


Site Logistics Management



Scope 2:

- FAIR site office; including construction suprvisors from planning offices.
- Parking for FAIR on site.
- Parking for GSI in 2018/19.
- Infrastructure at main entrance.
- Office and social containers for contractors.
- Office containers for installation teams and in-kind providers.
- water management
- cleaning services
- facility management





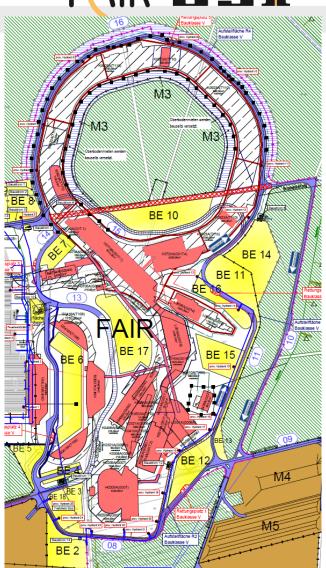
FAIR Site Office 2018/25

Site Logistics



Scope:

- Four main sub stations.
- Main Power Feed from Transformer Field SOUTH.
- Maintenance of Power Supply System.
- Control and Coordination of all connections performed and provided for Contractors.



Site Power Supply



- Site Management and GSI Procurement have started to develop a logistic concept for the intermediate storage of machine components.
- For some machine systems the components are being delivered already (ie HESR and SIS100) and are placed in storage in GSI Facilities (Betriebshof) and external facilities.
- GSI have rented approx. 4500m² storage in Weiterstadt.
- Handover to a logistics service provider to manage the intermediate storage facilities for the machine components on behalf of GSI:
 - material receiving,
- storage,
- Loading and delivery for testing purposes.
- loading and delivery to site.
- The service is planned to start by June 2018.

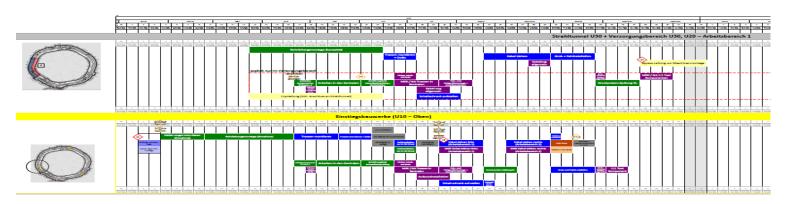


Logistics Concept for Machine Component Deliveries



Workshops for Process Planning for Technical Building Installations:

- Started in October 2017 –bi-weekly meetings.
- Site Management, Civil and Technical Contractors and Machine representatives (electrical; HVAC; cooling water etc.).
- Install Technical Packages before and parallel to the Machine Installation.
- To plan and agree the best sequence of installation for all systems.
- To optimize the durations required for each technical system.
- Parallel installation of 6 accelerator and 4 experiment systems in 24 different buildings.



Prozess Analysis and Process Planning

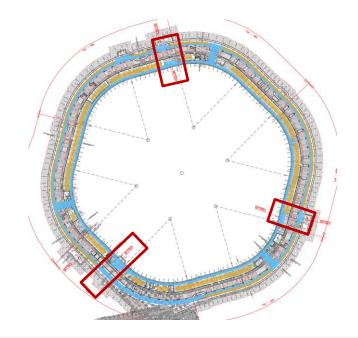


Internal Site Logistics

A working group to develop concepts for organizing and managing the logistics processes and interfaces inside the buildings for the installation of the technical building equipment and Machine Components

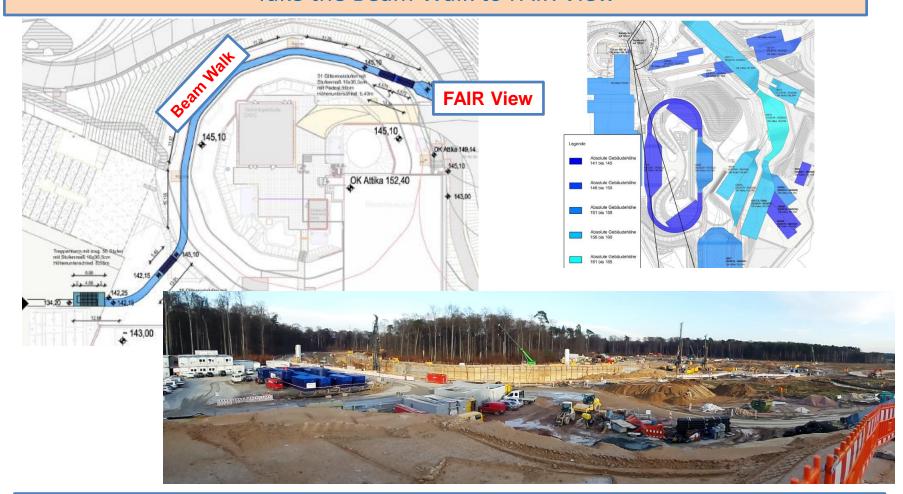
- Planning of transportation and escape routes.
- Planning and estimate of temporary storage areas.
- SIS100 Tunnel three entrances only.
- Planning of access capacities cranes, lifts and hoists.
- Estimation of material quantities and dimensions/weights.

	Übersicht Lagerflächen-Transportwege für TGA-Einbaumaterial und Beschleunigerkomponenten, Einbringöffnungen, Fördermittel u.a.m. (1982)A (1110), TGA-Achtelabereiche Abl 1 - 6												
												aufgestellt: CAM/09.02.	.2018
ВА	Segment	Geschoß	Achsen von/bis	Konzeptplanungen	Angaben, Anmerkungen, Hinweise	Berechnungen							
					Arbiteborsich B = cs. 2,20 m Fill B = 2,20 m Lagerifisch ST B = cs. 2,30 m Lagerifisch ST B = cs. 2,00 m (zs. 5/bzca) is obtace Abosp (7) as' #HVEID but Lagerifisch in Abotted von cs. 10 m cisco Derekgung für dan Trassport von Komponación fürd Invocat	Strahitunnel ST (Adono F/E and VM4)				Versorgungstunnel VT (Advan A-C and H44)			
AB 1	S 4.1/4.2	U30	zw. 73/74 und 96/97	- 111		Lagerfläche	m*	Transportfläche (teilw. = FuR)	m×	Lagerfläche	mª	Transportfläche (teilw. = FuR)	m²
				TO Be	Achzebstead in Baroich Beanline co. I M 7,05 m	[(i.M.7,35 x 2,30) x 23] - 45,00	343,82	[(7,35 x 2,30) x 23] + 45,00 (Schwenkbereich Labyrinth)	388,82	[(7,35 x 5,00) x 14] - 9,50	505,01	(6,25 × 2,30) × 23	330,63
				4				(Labyrinth) 8,00 x 20,00	160,00	8,00 x 10,00	80,00		
					VT: Doppelbiden en: Achren 82:07 und 50:06								
				1 1700									
						Zw-Summe	343,82	Zw-Summe	648.82	Zw-Summe	585,01	Zw-Summe	330,63
AB 2	S 5.1/5.2	U30	2W. 96/97 und			Lagerfläche	m²	Transportfläche	m²	Lagerfläche	m²	Transportfläche	m°
			404		ST: Im Bareich der Nitebonöffnungen (Achten 36/37 - 100 und 106- 107/108) Durchgungefflicken für Einbringungen planen	40,00 × 2,30	92,00	(teilw. = FuR) 40,00 x 2,30	92,00	[(6,25 × 5,00) × 5] - 4,38	151,87	(teilw. = FuR) (6,25 × 2,30) × 25	359,38
					usmittelbar im Eisbringbereich von Gebörde HOTSNA (GOT7.1) großfflichig Plate für Transport auch rochte und linke planer, teilw. Jahrs oder wasig temportire knagerfliche			55,00 × 6,00 LM.	330,00	(15,00 x 5,00) - 2,19	72,81	9,00 × 5,00	45,00
								(7,35 x 6,00) x 11	485,10	13,50 x 5,50		(25,00 x 9,00) x1/2 (Bereich Einbringöffnung)	112,50
				- Alle	VT: Doppelböden ew. Achsen 106-112 und 116-120					(18,00 x 5,00) - 2,19	87,81		
						Zw-Summe	92,00	Zw-Summe		Zw-Summe	386,74	Zw-Summe	516,88





Take the Beam Walk to FAIR View



Visitor's Platform will be installed in May/June 2018

