

2nd BrightnESS Best Practice Workshop: Installation aspects of large-scale In-Kind projects

# Installation Coordination Target Division

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June 2017

# Overview

- Overview of Target Building
- Target division Critical Path
- Target division Site Organization
- Challenges during installation

# Site view last week





# Active Cell - Rebars





# Active Cell –Liner Beam Installation



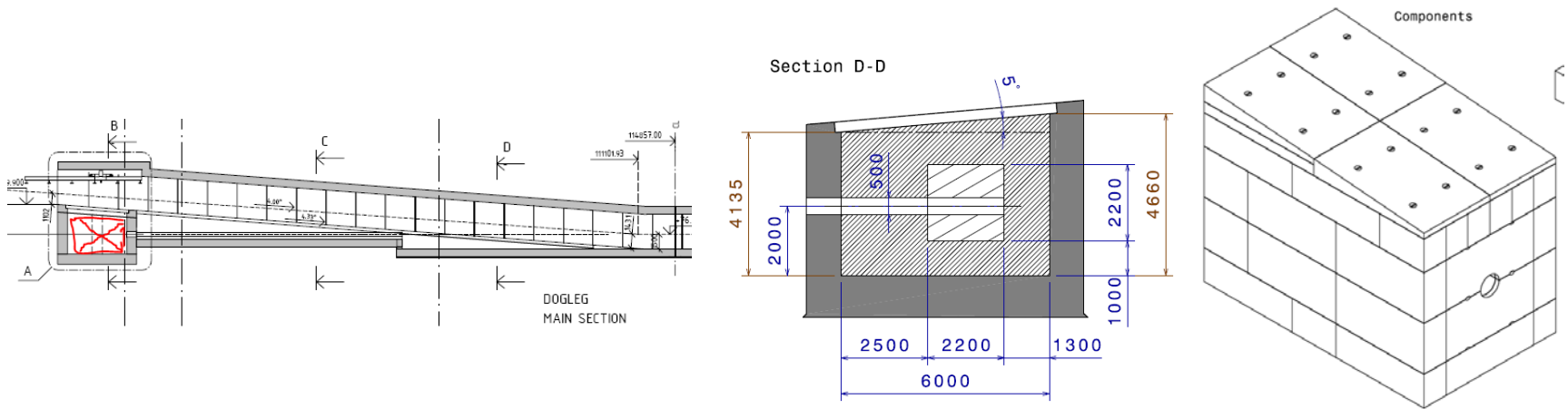


# Proton beam pipe (in future)

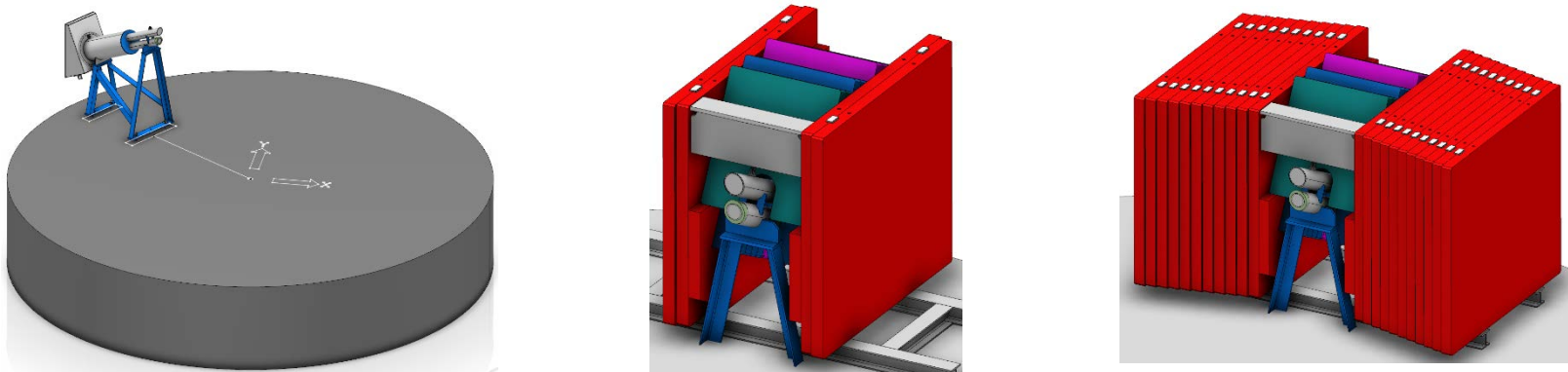


# Target first installations

- Beam Dump Concrete Shielding - **November 2016**

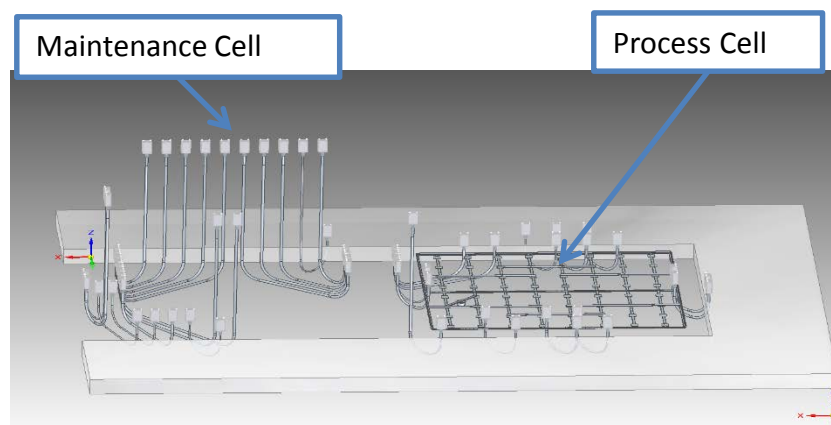


- ECHIR - **December 2016**

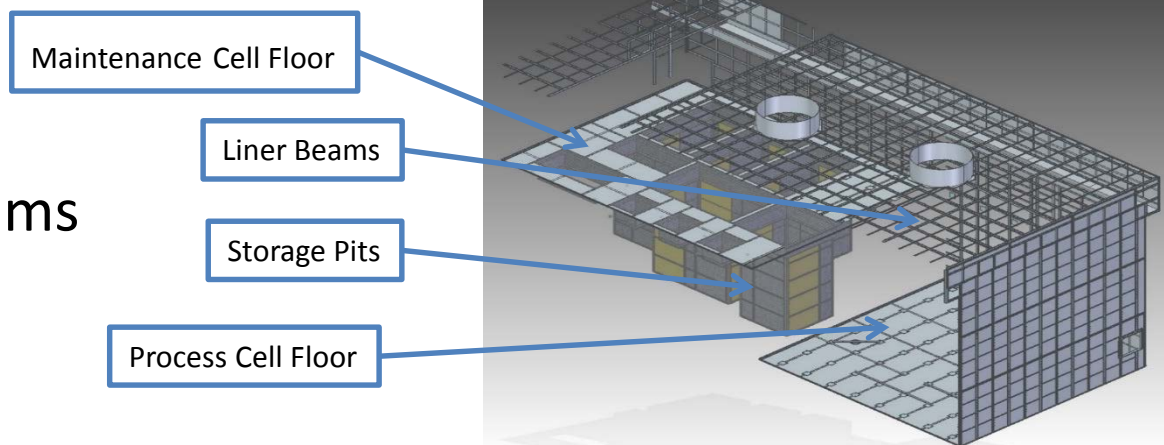


# Targets first installations

## Active Cells Conduits - March 2017

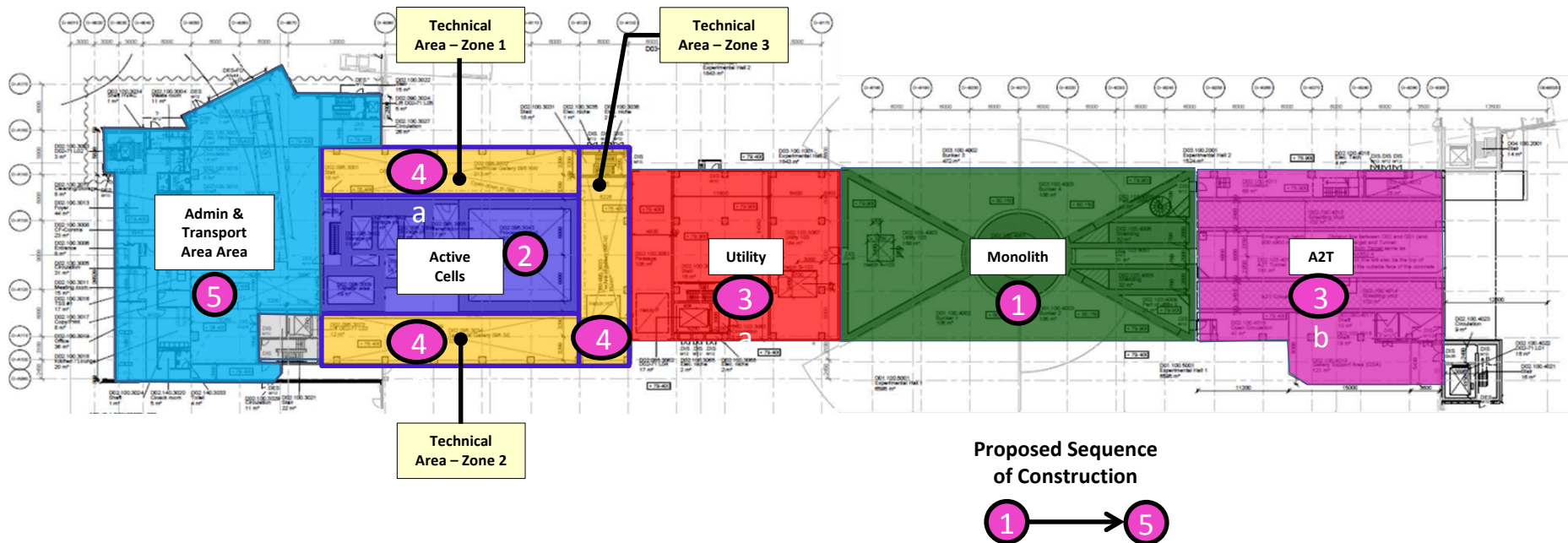


## Active Cells Liner Beams May 2017





# Building sequence driven by Target – Priorities for access to D02



**Parallel Contractor** refers to an external contractor, employed by ESS Division other than CF that will carry out works on the site, before SEC's completion of works and final handover to ESS. In many instances the completion of the Parallel Contractors works will be required prior to SEC being in a position to complete their own scope of works. The Parallel Contractor's works do not form part of SEC's scope of works nor are SEC responsible for managing or delivering these works, unless a scope transfer is performed from the ESS Division to SEC/CF. Parallel works relates to the period of time that the Parallel Contractor will be performing works, concurrently to SEC.

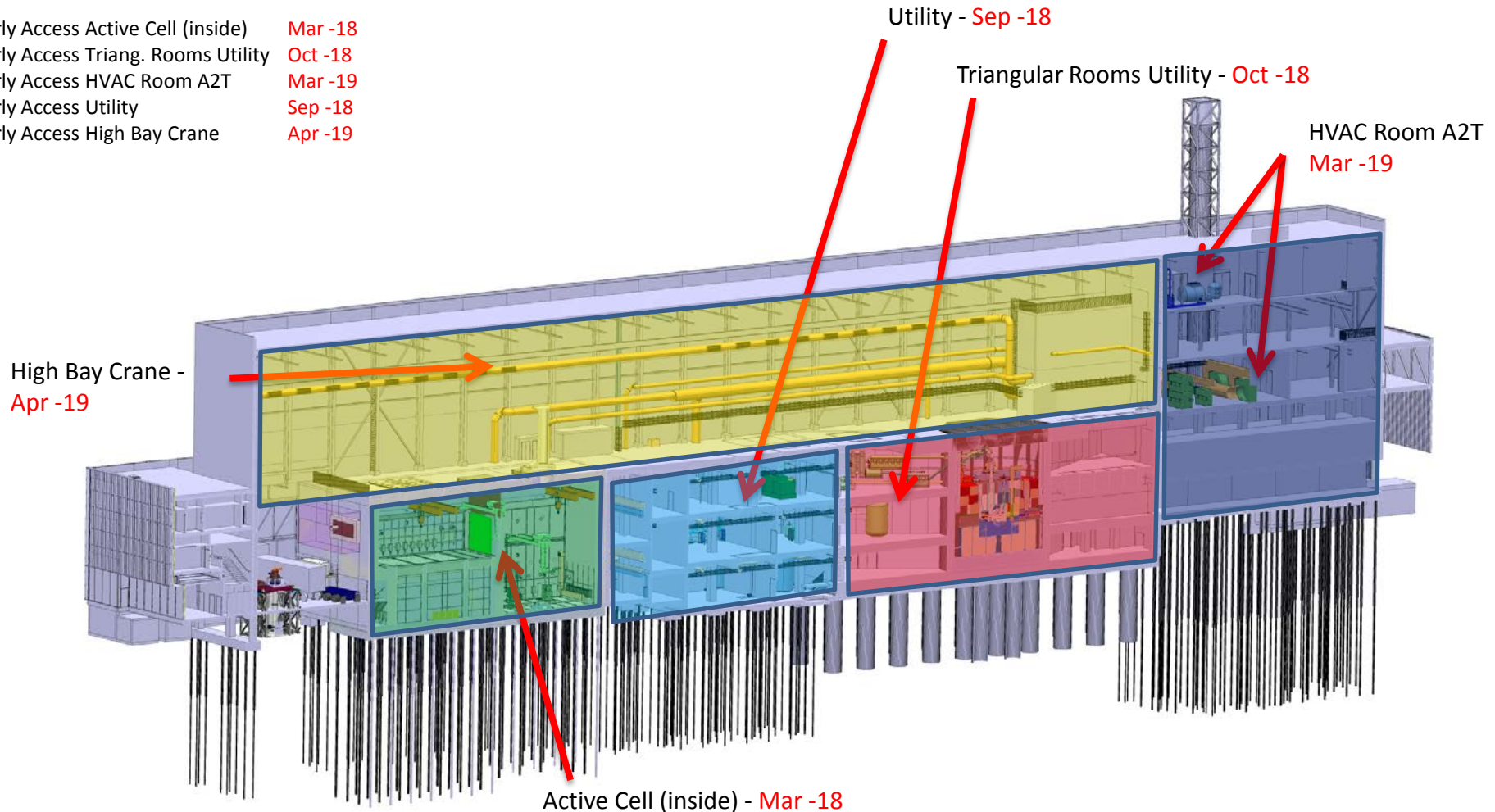
**BAS-U:** The building work environment coordinator for construction (Skanska)

# Impact on Target Installations

## Early Access Dates

### New Key Milestone dates proposed by Conv. Facilities:

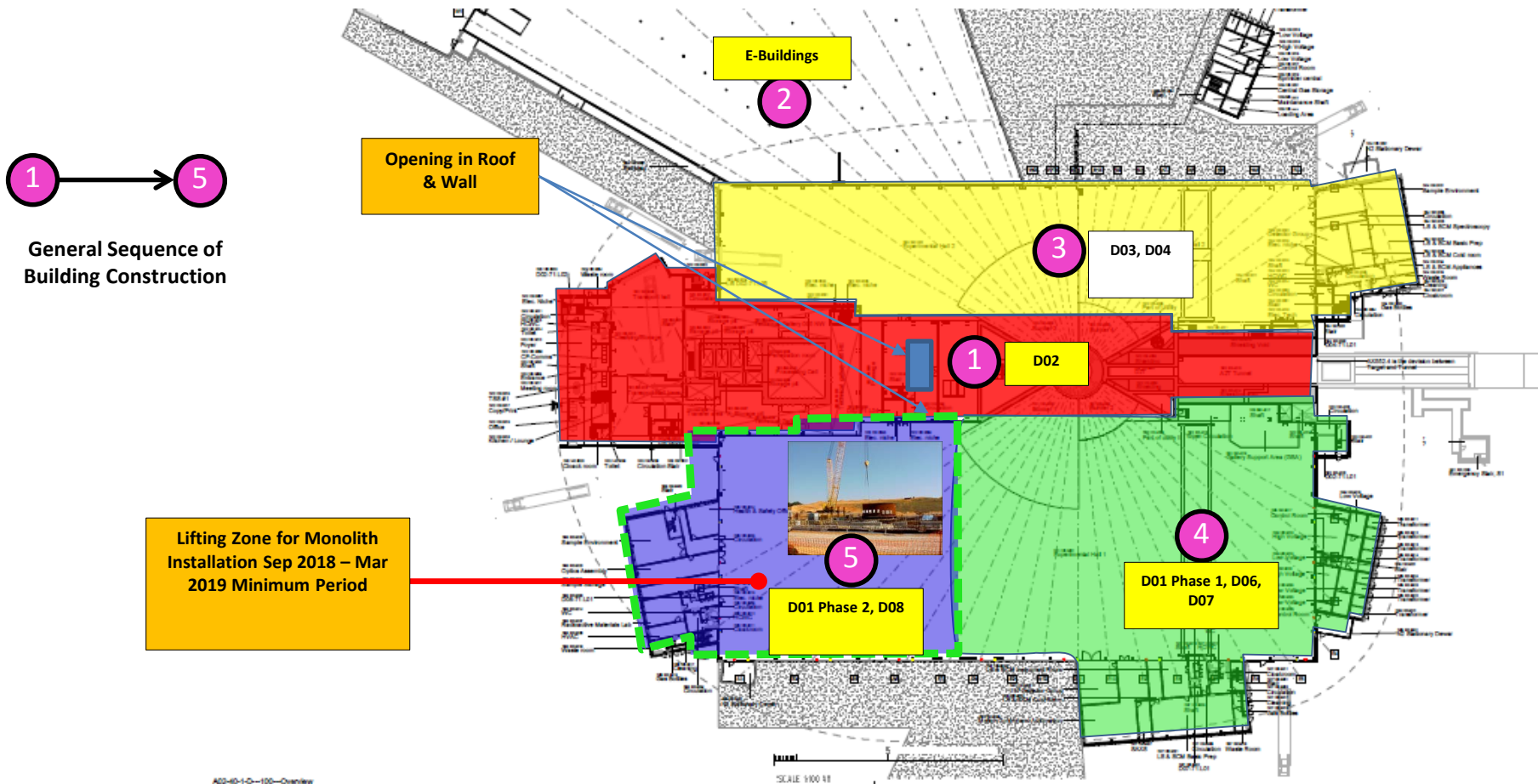
Early Access Active Cell (inside)	Mar -18
Early Access Triang. Rooms Utility	Oct -18
Early Access HVAC Room A2T	Mar -19
Early Access Utility	Sep -18
Early Access High Bay Crane	Apr -19





# Impact on Target Installations

## Mobile Crane solution

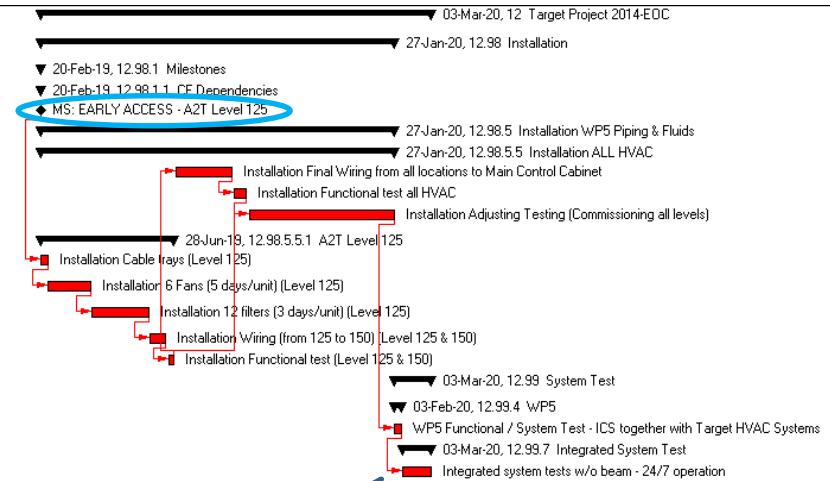


# Critical Path WP 5

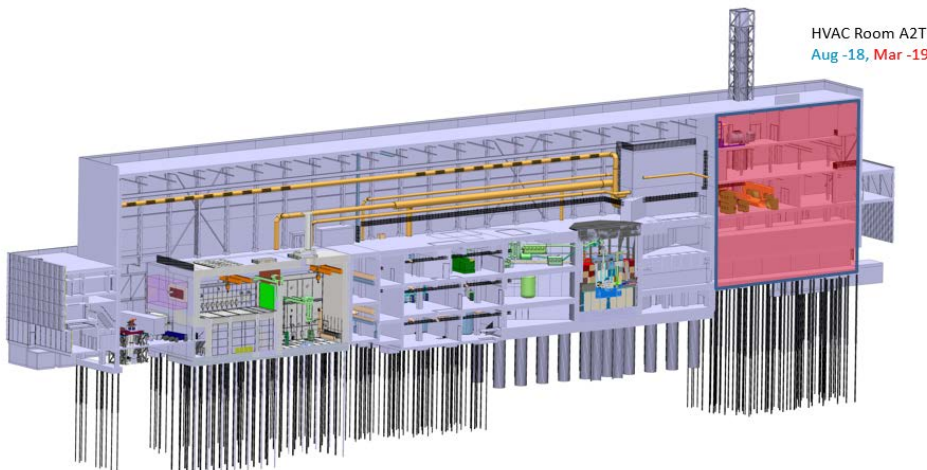
## HVAC in A2T

### 0 Days Float

12 Target Project 2014-EOC		232	20-Feb-19	03-Mar-20
12.98 Installation		206	20-Feb-19	27-Jan-20
12.98.1 Milestones		0	20-Feb-19	20-Feb-19
12.98.1.1 CF Dependencies		0	20-Feb-19	20-Feb-19
A82840	MS: EARLY ACCESS - A2T Level 125	0	20-Feb-19*	
12.98.5 Installation WP5 Piping & Fluids		206	20-Feb-19	27-Jan-20
12.98.5.5 Installation ALL HVAC		206	20-Feb-19	27-Jan-20
A20164872	Installation Final Wiring from all locations to Main Control Cabinet	20	01-Jul-19	23-Aug-19
A20164873	Installation Functional test all HVAC	10	26-Aug-19	06-Sep-19
A20164875	Installation Adjusting Testing (Commissioning all levels)	90	09-Sep-19	27-Jan-20
12.98.5.5.1 A2T Level 125		86	20-Feb-19	28-Jun-19
A20164930	Installation Cable trays (Level 125)	5	20-Feb-19	26-Feb-19
A20165060	Installation 6 Fans (5 days/unit) (Level 125)	30	27-Feb-19	09-Apr-19
A20165070	Installation 12 filters (3 days/unit) (Level 125)	36	10-Apr-19	04-Jun-19
A20165080	Installation Wiring (from 125 to 150) (Level 125 & 150)	10	05-Jun-19	20-Jun-19
A20165090	Installation Functional test (Level 125 & 150)	5	24-Jun-19	28-Jun-19
12.99 System Test		26	28-Jan-20	03-Mar-20
12.99.4 WP5		5	28-Jan-20	03-Feb-20
A20157140	WP5 Functional / System Test - ICS together with Target HVAC Systems	5	28-Jan-20	03-Feb-20
12.99.7 Integrated System Test		21	04-Feb-20	03-Mar-20
A20149170	Integrated system tests w/o beam - 24/7 operation	21	04-Feb-20	03-Mar-20

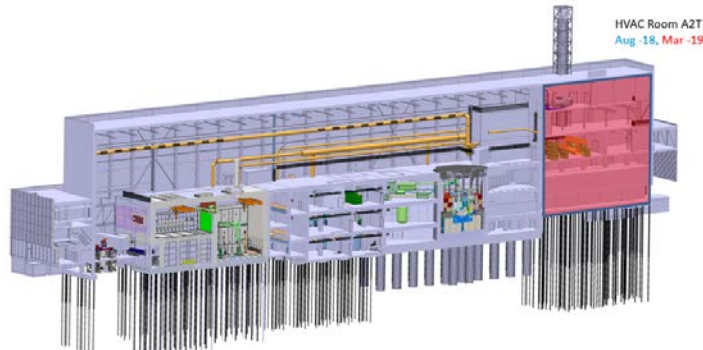
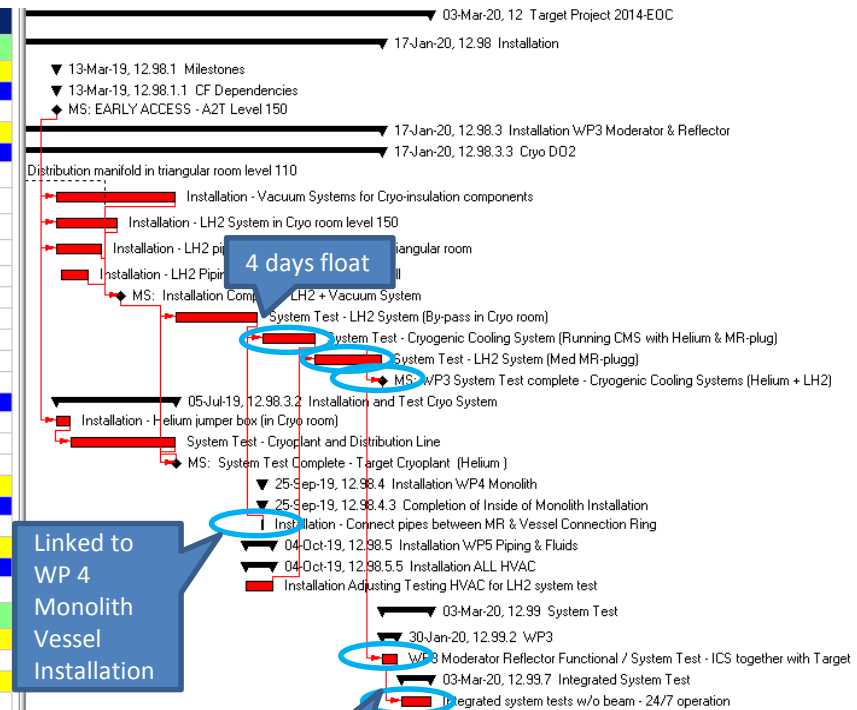


Critical path  
No float



# Critical Path WP 3, Moderator & Reflector Cryo installation 2 Days Float

12 Target Project 2014-EOC		311	18-Oct-18	03-Mar-20
12.98 Installation		278	18-Oct-18	17-Jan-20
12.98.1 Milestones		0	13-Mar-19	13-Mar-19
12.98.1.1 CF Dependencies		0	13-Mar-19	13-Mar-19
A82860	MS: EARLY ACCESS - A2T Level 150	0	13-Mar-19*	
12.98.3 Installation WP3 Moderator & Reflector		278	18-Oct-18	17-Jan-20
12.98.3.3 Cryo D02		278	18-Oct-18	17-Jan-20
A20159110	Installation - LH2 Distribution manifold in triangular room level 110	10	18-Oct-18	31-Oct-18
A84380	Installation - Vacuum Systems for Cryo-insulation components	75	13-Mar-19	04-Jul-19
A20157470	Installation - LH2 System in Cryo room level 150	40	13-Mar-19	10-May-19
A20159100	Installation - LH2 piping between Cryo room and triangular room	30	13-Mar-19	25-Apr-19
A20159120	Installation - LH2 Piping installation in connection cell	20	18-Mar-19	12-Apr-19
A20157480	MS: Installation Complete - LH2 + Vacuum System	0	13-May-19	
A20157490	System Test - LH2 System (By-pass in Cryo room)	35	05-Jul-19	19-Sep-19
A20157510	System Test - Cryogenic Cooling System (Running CMS with Helium & MR-plug)	35	26-Sep-19	13-Nov-19
A20159130	System Test - LH2 System (Med MR-plugg)	35	14-Nov-19	16-Jan-20
A20157520	MS: WP3 System Test complete - Cryogenic Cooling Systems (Helium + LH2)	0	17-Jan-20	
12.98.3.2 Installation and Test Cryo System		75	13-Mar-19	05-Jul-19
A20159020	Installation - Helium jumper box (in Cryo room)	10	13-Mar-19	26-Mar-19
A20157450	System Test - Cryopant and Distribution Line	65	27-Mar-19	04-Jul-19
A20157460	MS: System Test Complete - Target Cryopant (Helium)	0	05-Jul-19	
12.98.4 Installation WP4 Monolith		2	24-Sep-19	25-Sep-19
12.98.4.3 Completion of Inside of Monolith Installation		2	24-Sep-19	25-Sep-19
A20153650	Installation - Connect pipes between MR & Vessel Connection Ring	2	24-Sep-19	25-Sep-19
12.98.5 Installation WP5 Piping & Fluids		20	09-Sep-19	04-Oct-19
12.98.5.5 Installation ALL HVAC		20	09-Sep-19	04-Oct-19
A20164877	Installation Adjusting Testing HVAC for LH2 system test	20	09-Sep-19	04-Oct-19
12.99 System Test		33	17-Jan-20	03-Mar-20
12.99.2 WP3		10	17-Jan-20	30-Jan-20
A20157110	WP3 Moderator Reflector Functional / System Test - ICS together with Target	10	17-Jan-20	30-Jan-20
		21	04-Feb-20	03-Mar-20
		21	04-Feb-20	03-Mar-20

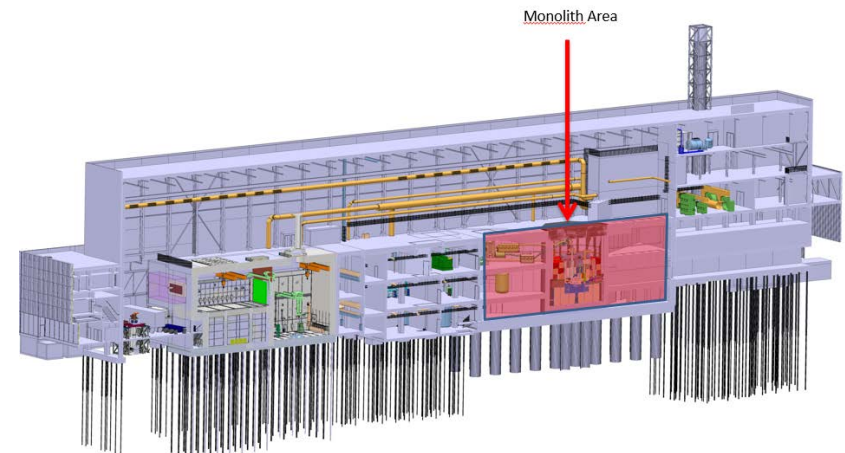
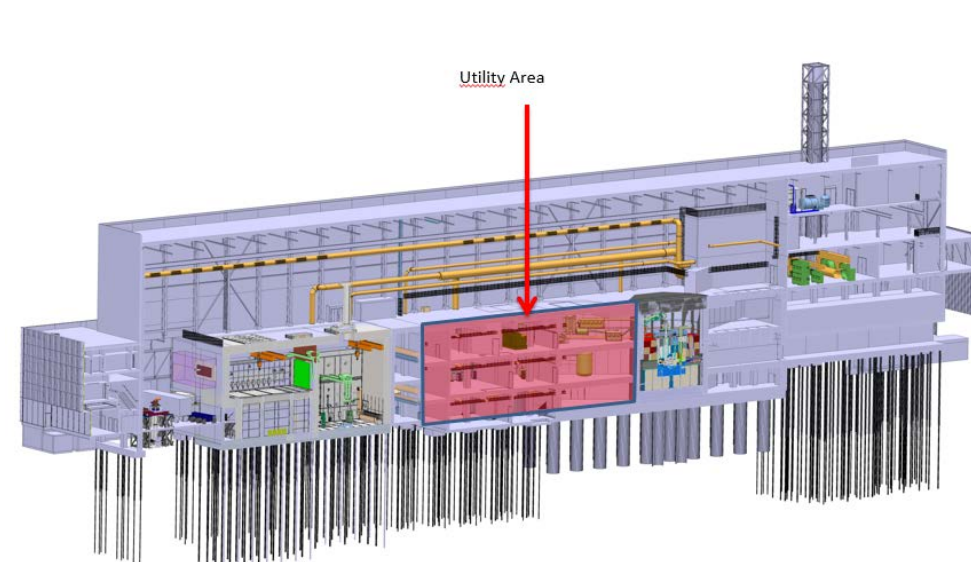
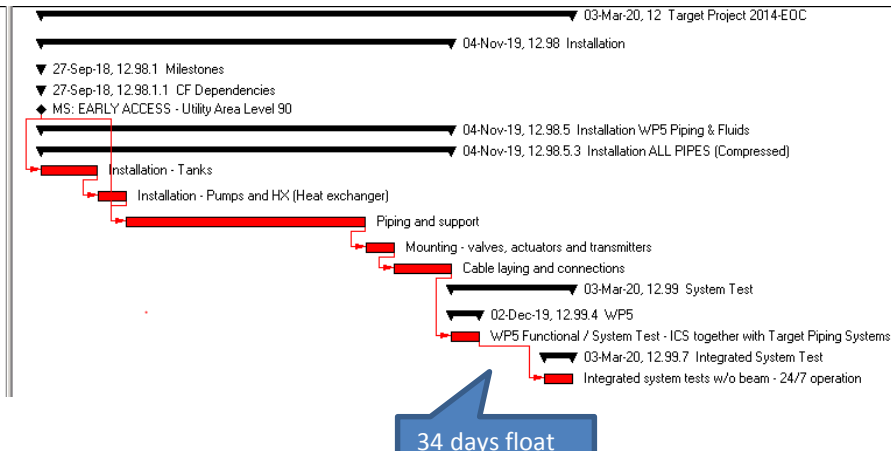




# Critical Path WP 5, Fluid System Piping

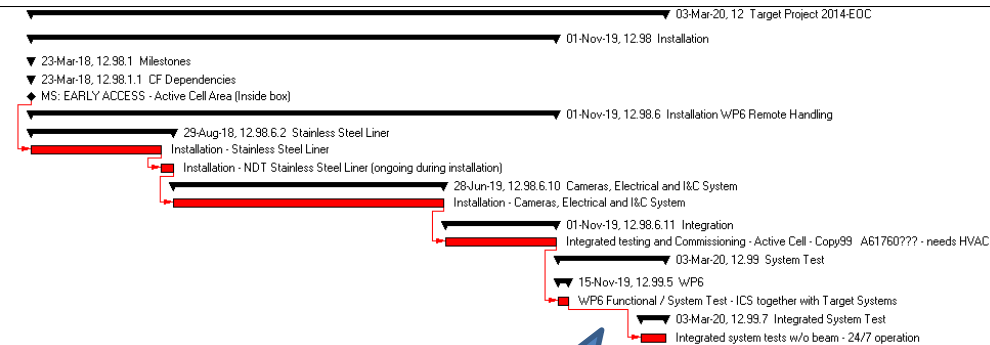
## 34 Days Float

12 Target Project 2014-EOC	326	27-Sep-18	03-Mar-20
12.98 Installation	251	27-Sep-18	04-Nov-19
12.98.1 Milestones	0	27-Sep-18	27-Sep-18
12.98.1.1 CF Dependencies	0	27-Sep-18	27-Sep-18
A20141230 MS: EARLY ACCESS - Utility Area Level 90	0	27-Sep-18*	
12.98.5 Installation WP5 Piping & Fluids	251	27-Sep-18	04-Nov-19
12.98.5.3 Installation ALL PIPES (Compressed)	251	27-Sep-18	04-Nov-19
A83520 Installation - Tanks	40	27-Sep-18	21-Nov-18
A83530 Installation - Pumps and HX (Heat exchanger)	20	22-Nov-18	19-Dec-18
A20141180 Piping and support	131	20-Dec-18	12-Aug-19
A20141190 Mounting - valves, actuators and transmitters	20	13-Aug-19	09-Sep-19
A83560 Cable laying and connections	40	10-Sep-19	04-Nov-19
12.99 System Test	75	05-Nov-19	03-Mar-20
12.99.4 WP5	20	05-Nov-19	02-Dec-19
A20157130 WP5 Functional / System Test - ICS together with Target Piping Systems	20	05-Nov-19	02-Dec-19
12.99.7 Integrated System Test	21	04-Feb-20	03-Mar-20
A20149170 Integrated system tests w/o beam - 24/7 operation	21	04-Feb-20	03-Mar-20

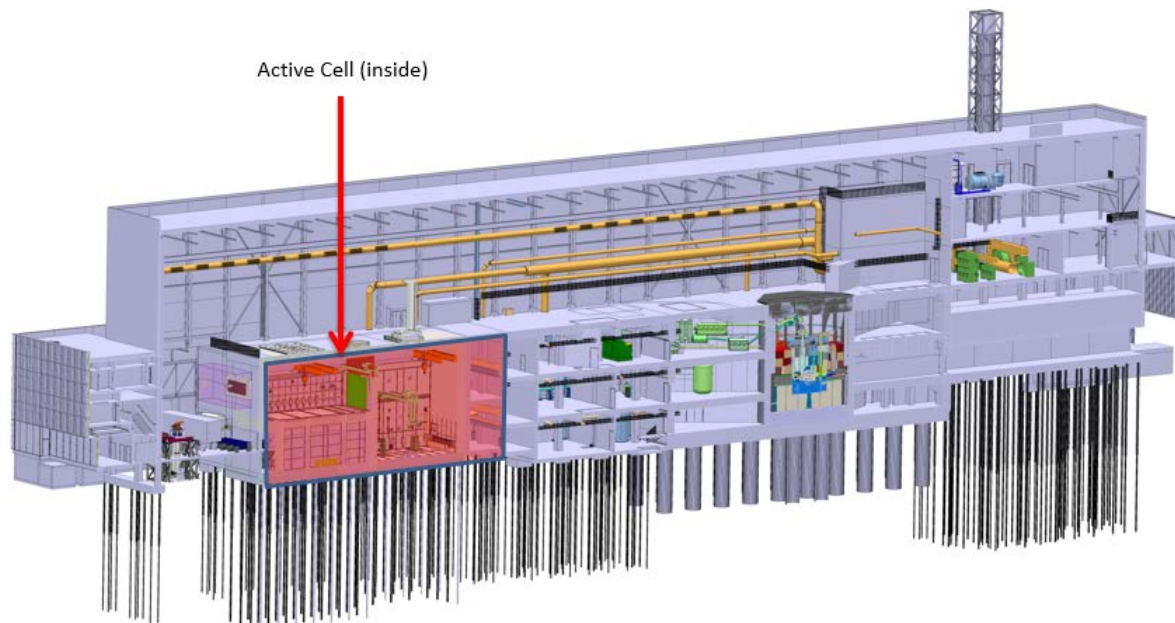


# Critical Path WP 6, Remote Handling Confinement 45 Days Float

12 Target Project 2014-EOC	436	23-Mar-18	03-Mar-20
12.98 Installation	360	23-Mar-18	01-Nov-19
12.98.1 Milestones	0	23-Mar-18	23-Mar-18
12.98.1.1 CF Dependencies	0	23-Mar-18	23-Mar-18
A20157310 MS: EARLY ACCESS - Active Cell Area (Inside box)	0	23-Mar-18*	
12.98.6 Installation WP6 Remote Handling	360	23-Mar-18	01-Nov-19
12.98.6.2 Stainless Steel Liner	90	23-Mar-18	29-Aug-18
A82910 Installation - Stainless Steel Liner	80	23-Mar-18	15-Aug-18
A83810 Installation - NDT Stainless Steel Liner (ongoing during installation)	10	16-Aug-18	29-Aug-18
12.98.6.10 Cameras, Electrical and I&C System	200	30-Aug-18	28-Jun-19
A83940 Installation - Cameras, Electrical and I&C System	200	30-Aug-18	28-Jun-19
12.98.6.11 Integration	70	01-Jul-19	01-Nov-19
A82920 Integrated testing and Commissioning - Active Cell - Copy99 A61760??? - needs HVAC	70	01-Jul-19	01-Nov-19
12.99 System Test	76	04-Nov-19	03-Mar-20
12.99.5 WP6	10	04-Nov-19	15-Nov-19
A20157320 WP6 Functional / System Test - ICS together with Target Systems	10	04-Nov-19	15-Nov-19
12.99.7 Integrated System Test	21	04-Feb-20	03-Mar-20

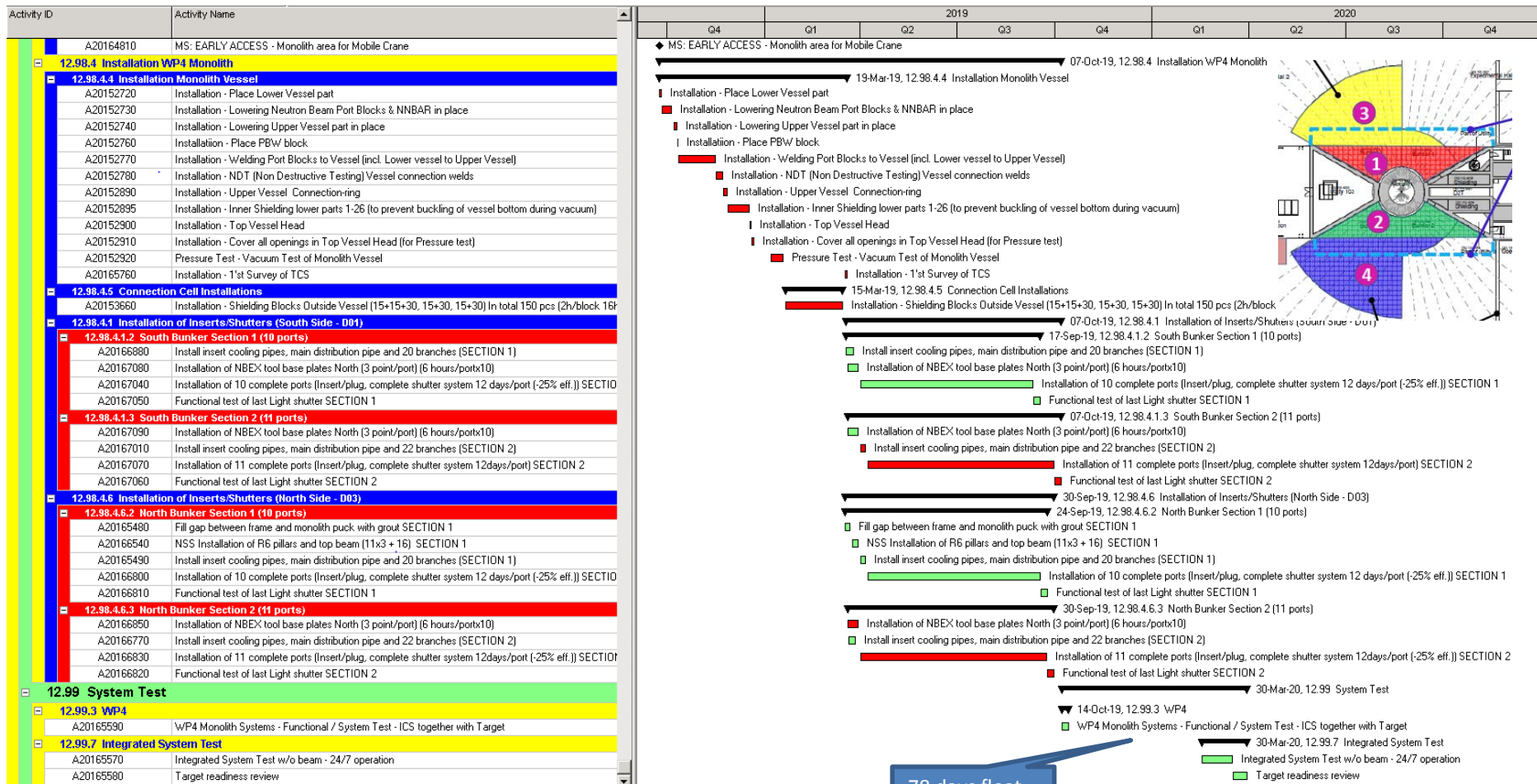


45 days float



# Critical Path WP 4, Monolith Systems Inserts & Light shutters (Bunker Area)

## 78 Days Float ?????

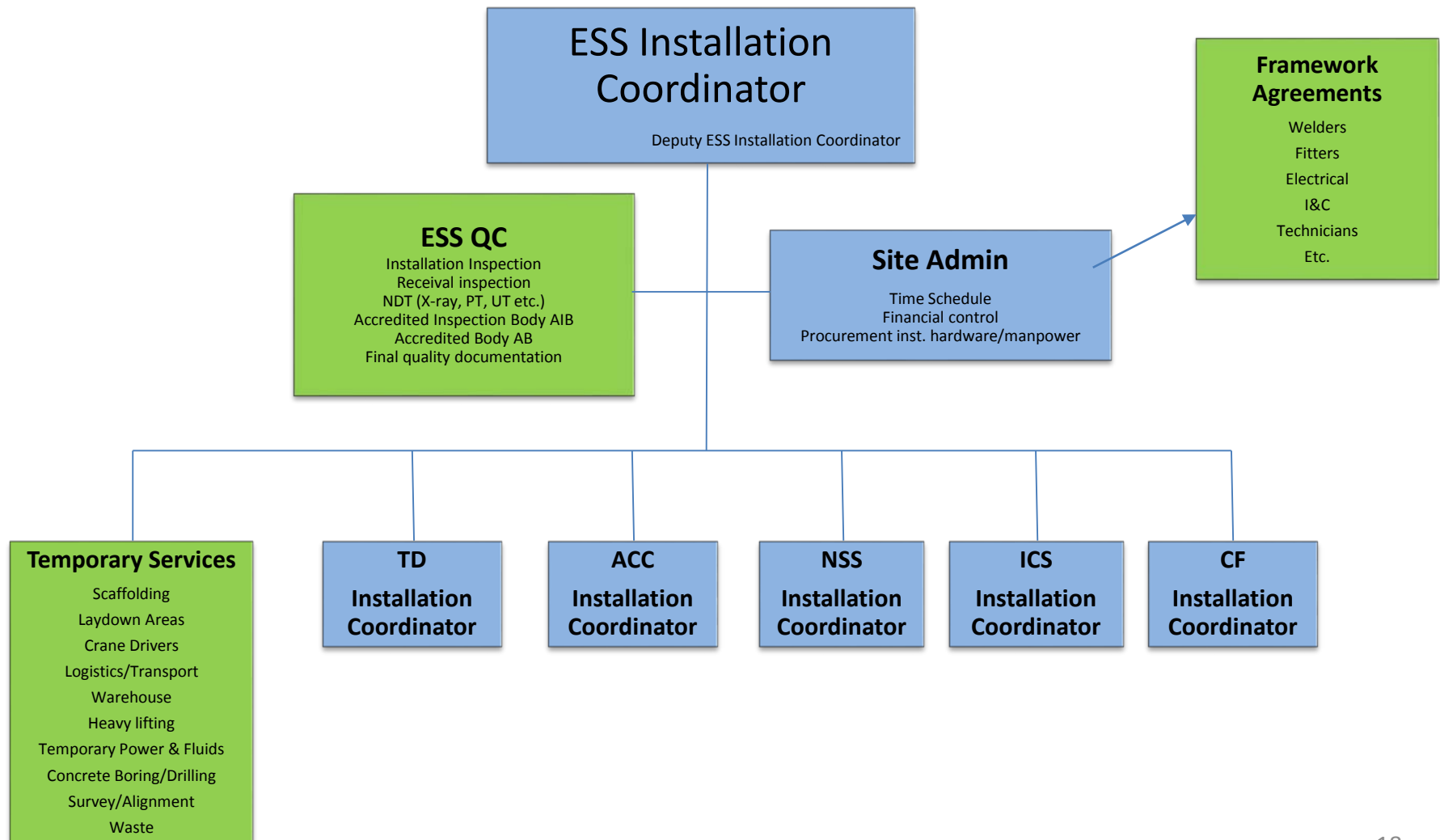


78 days float



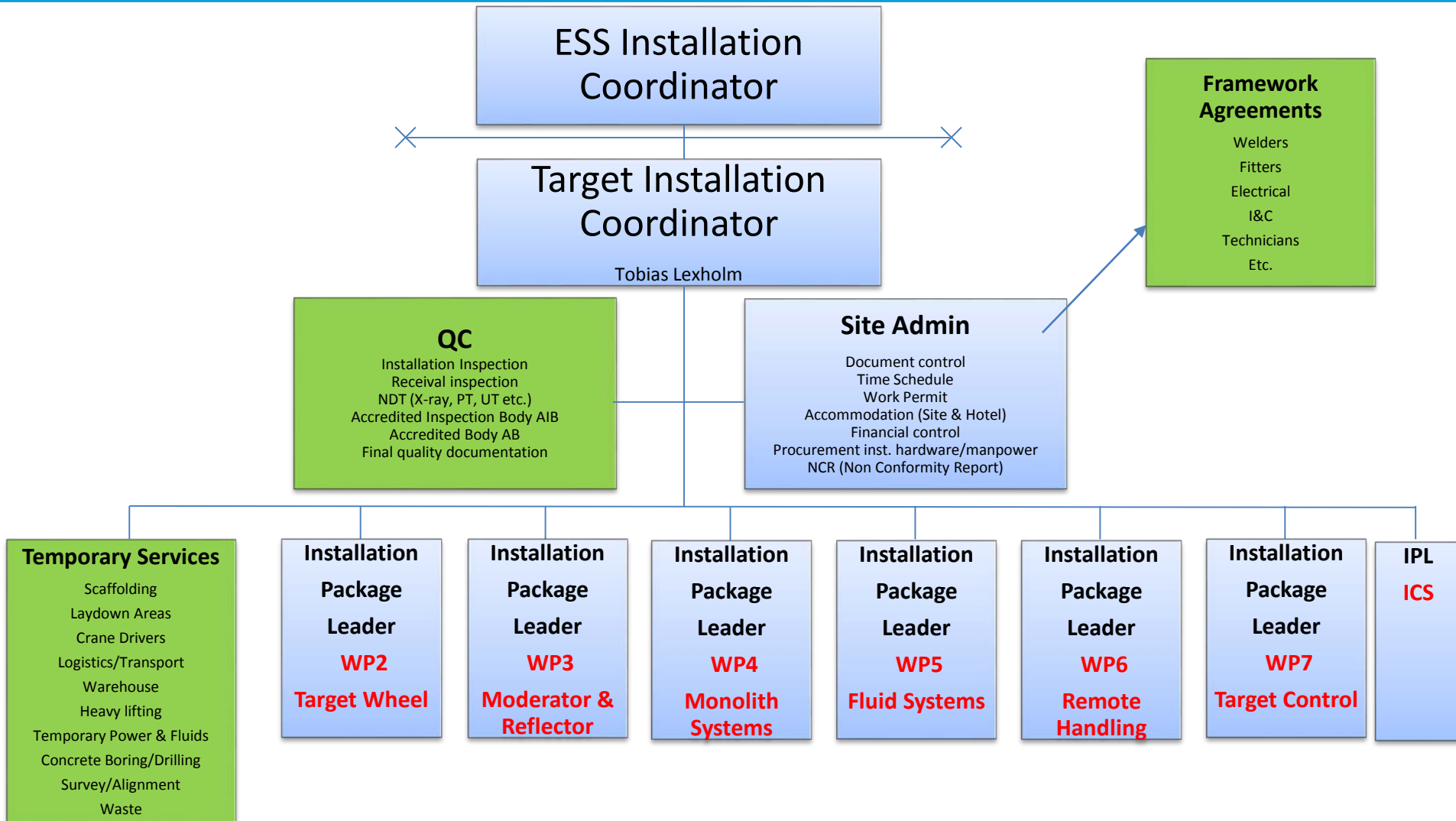
# Organization

## Over all site organization



# Organization

## Target project site organization



# Challenges during installation

- Greenfield site
- Tolerances / Communication
- Responsibility / Delivery limits during installation
- Who is paying for temporary services? Contractor / IK / ESS / Skanska?
- Late deliveries to site -> Impact on installation sequence
- Orphan scope
- Schedule changes (Workers from abroad) delay costs?
- Parallell activities (Skanska / TD/ AD / ICS / NSS). Agressive schedule
- "Clean installations" in parallel with construction work (vacuum environment)