



EUROPEAN
SPALLATION
SOURCE

Neutron Guide Shielding Concept

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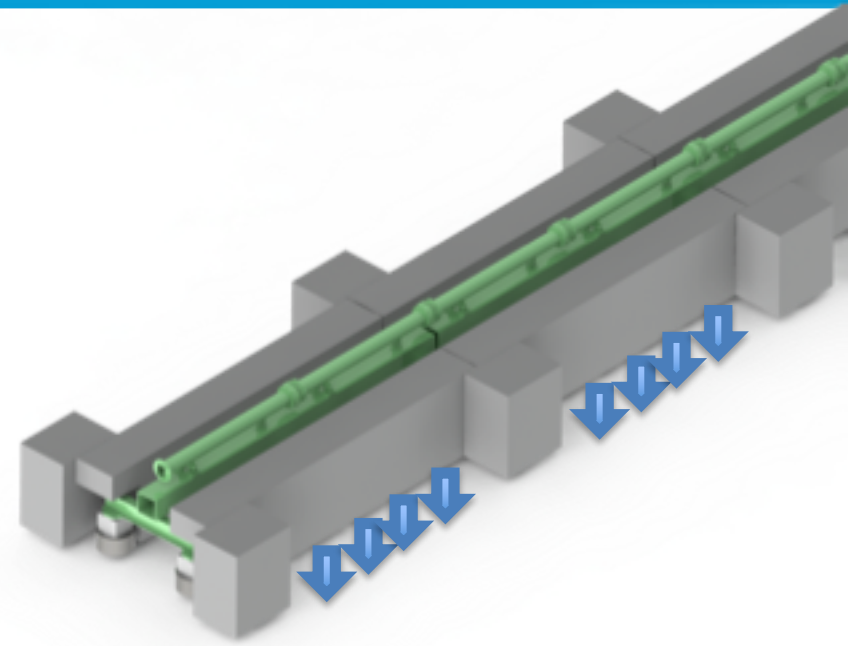
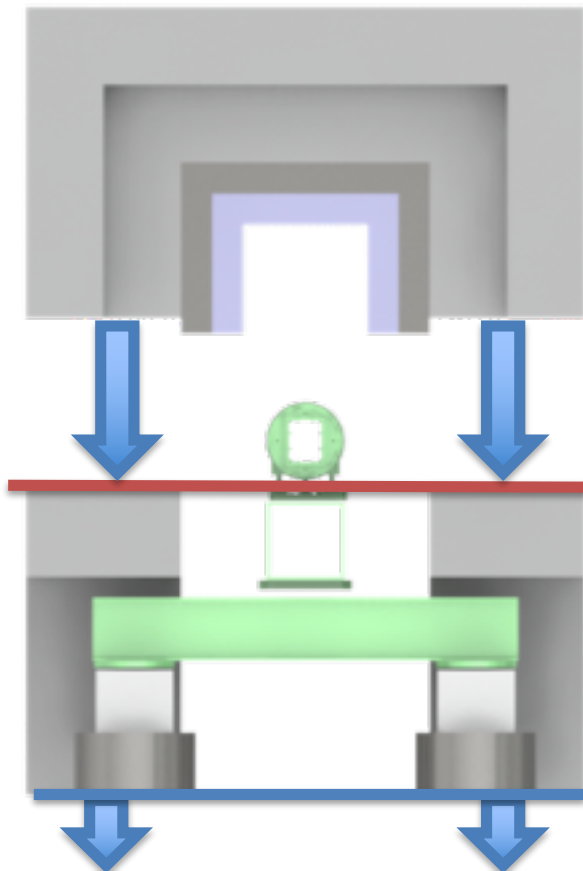
12.09.2018

<https://confluence.esss.lu.se/display/SPD/Instrument+shielding>

- Radiation:
 - Safety requirement for environmental radiation
 - Contact dose
 - Dose contribution
 - Instrument background requirement
- **Structural/Construction**
 - **[Eurocode 1](#): Actions on [structures](#) (EN 1991)**
 - **[Eurocode 2](#): Design of concrete structures (EN 1992)**
 - **[Eurocode 3](#): Design of [steel](#) structures (EN 1993)**
- **Logistics**
 - **Maximum Weight of a block: 5 ton (E02)**
 - **Maximum size of a block (volume): 3000 x 1500 x 1500 mm**
- **Survey**
 - **Easy access for the guide alignment features to verify position**

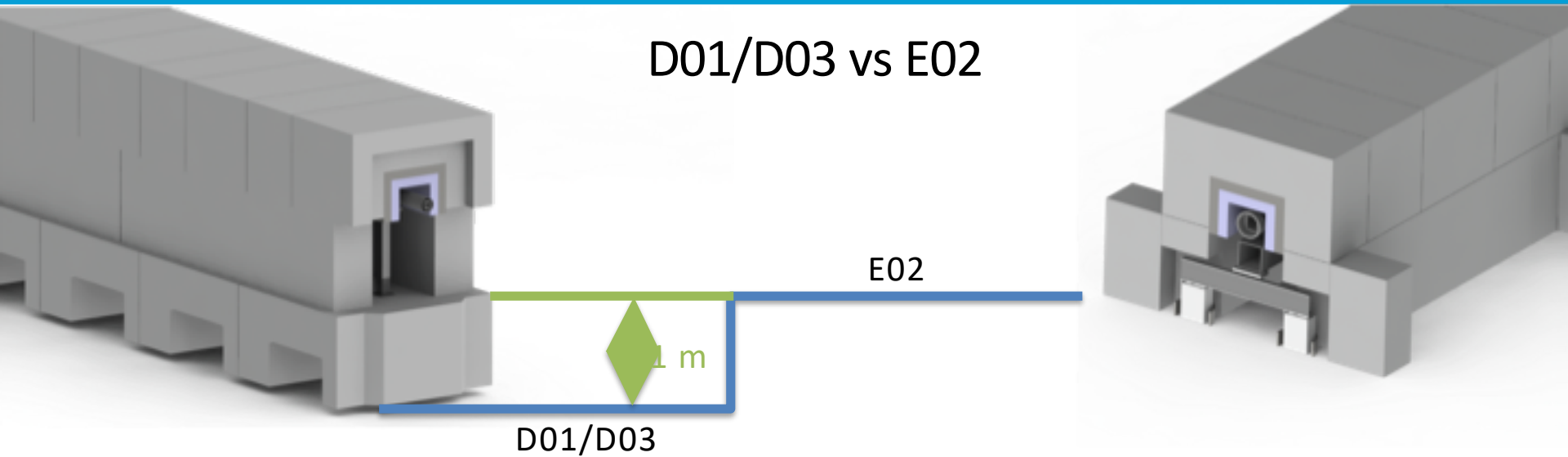
- Designed to be installed / maintained

Concrete load $\approx 6.6 \text{ t / m}$
Steel load $\approx 1.4 \text{ t / m}$

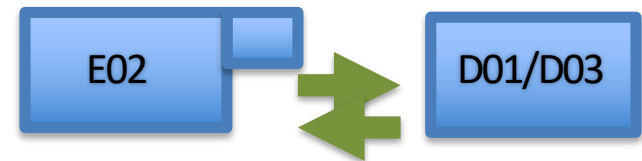


Separated loads

- Lower shielding is static (not removed for maintenance)
- Minimising the load removal effects on miss/re/alignment

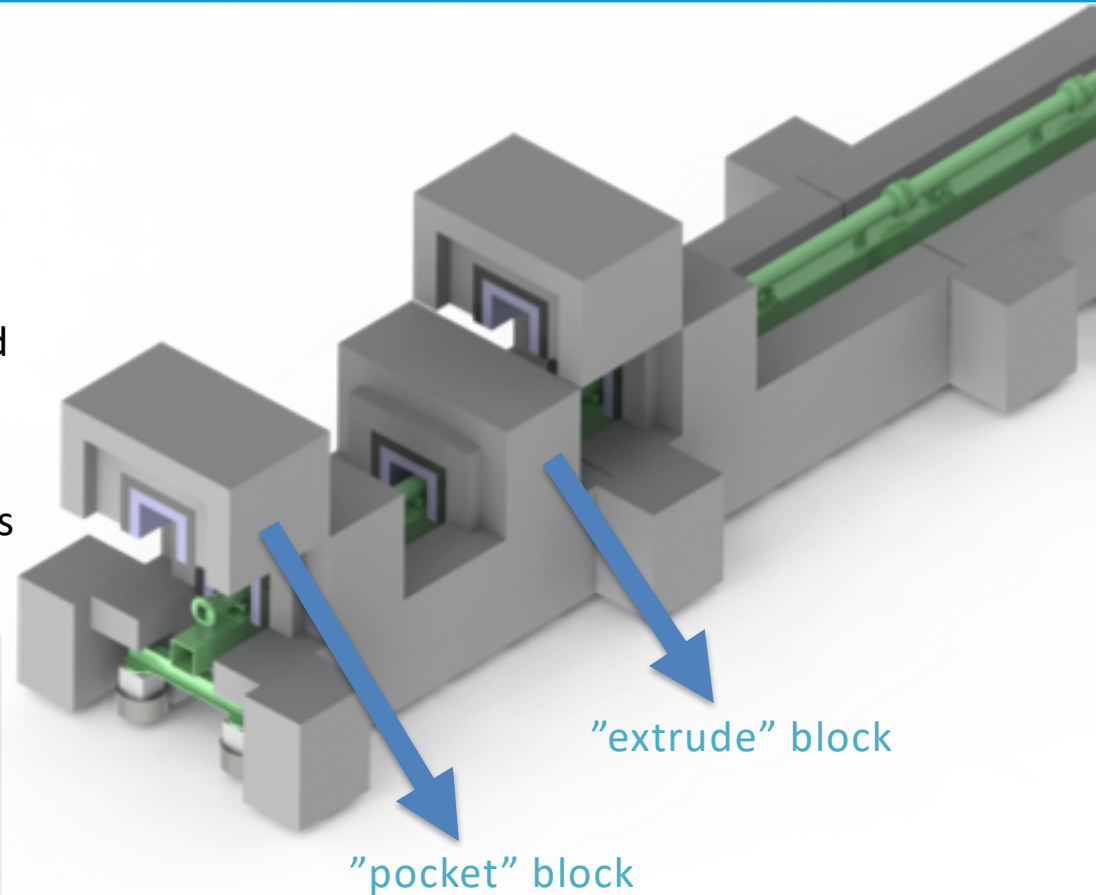


- Identical upper shielding blocks in D01/D03 and E02
- Similar lower shielding blocks in D01/D03 and E02
- Cutouts in supporting blocks will allow cable routing below instruments in D01/D03



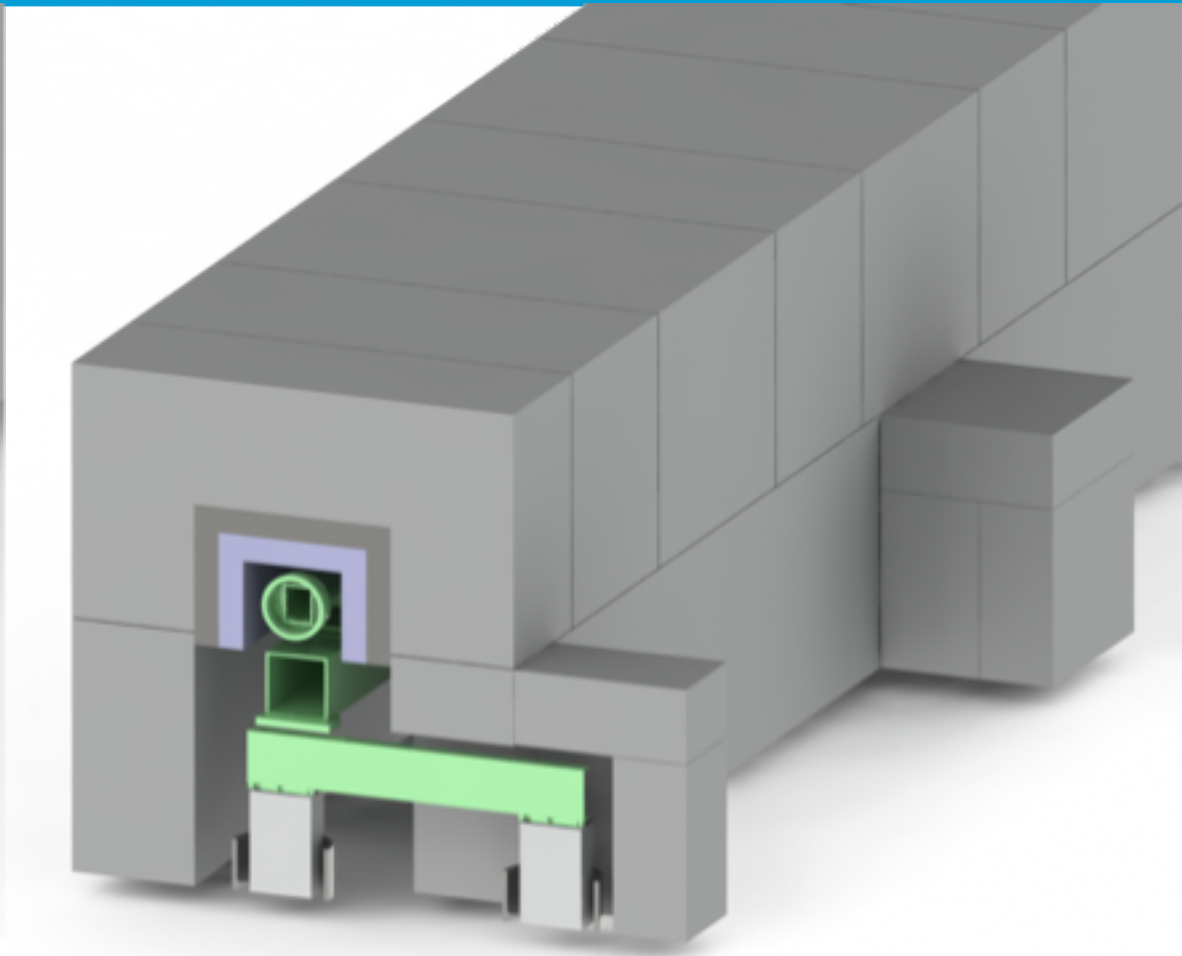
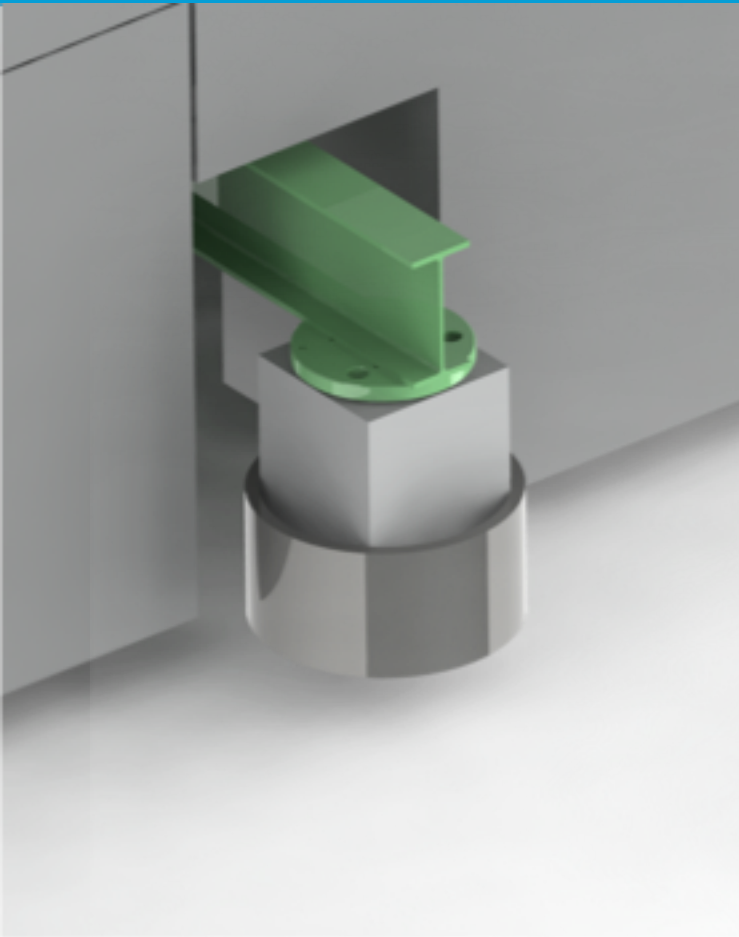
Lifting optimisation

- Blocks designed in a way to place "pocket" blocks in line with the piles
- Providing this, only ONE lift needed to access alignment features
- "Extrude" blocks used as the guides



Structural/Construction

Guide far from the beamport axis



- Bricking outside the piles by blocks with configured length or more same blocks
- D01/D03 Lower blocks can be used on the guide side

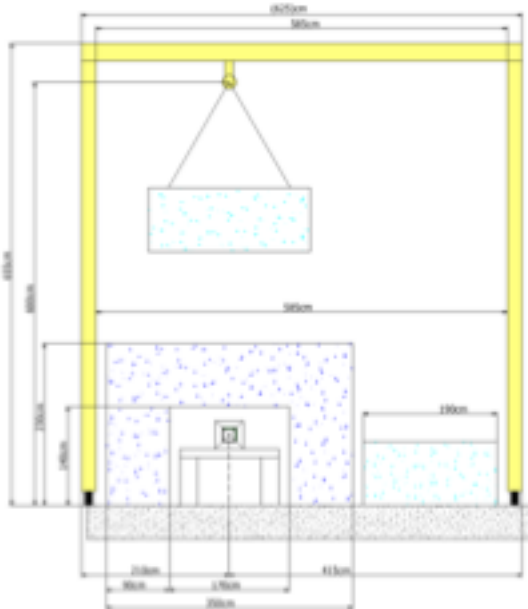
Logistic

<https://confluence.ess.lu.se/display/SPD/Mobile+Cranes+in+E02>

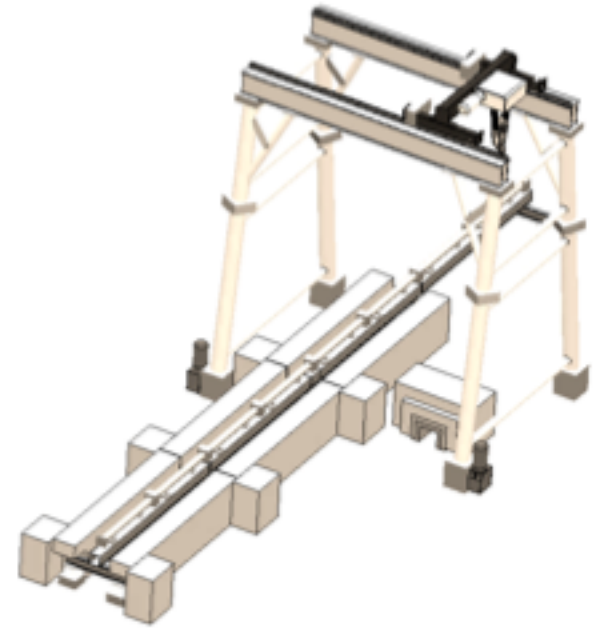
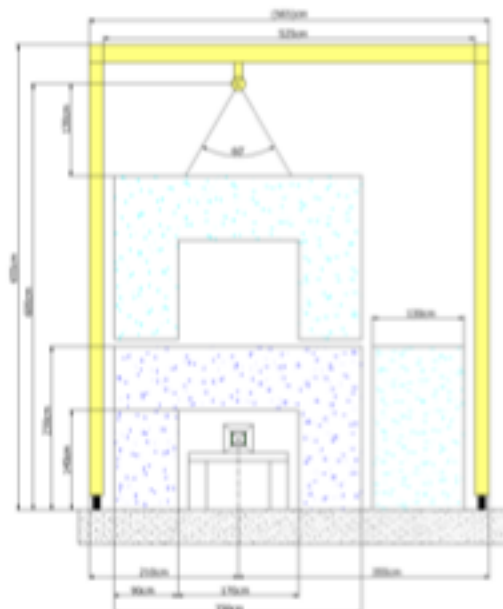
Easy and comfortable installation

- Moving shielding blocks along the beam without rotation

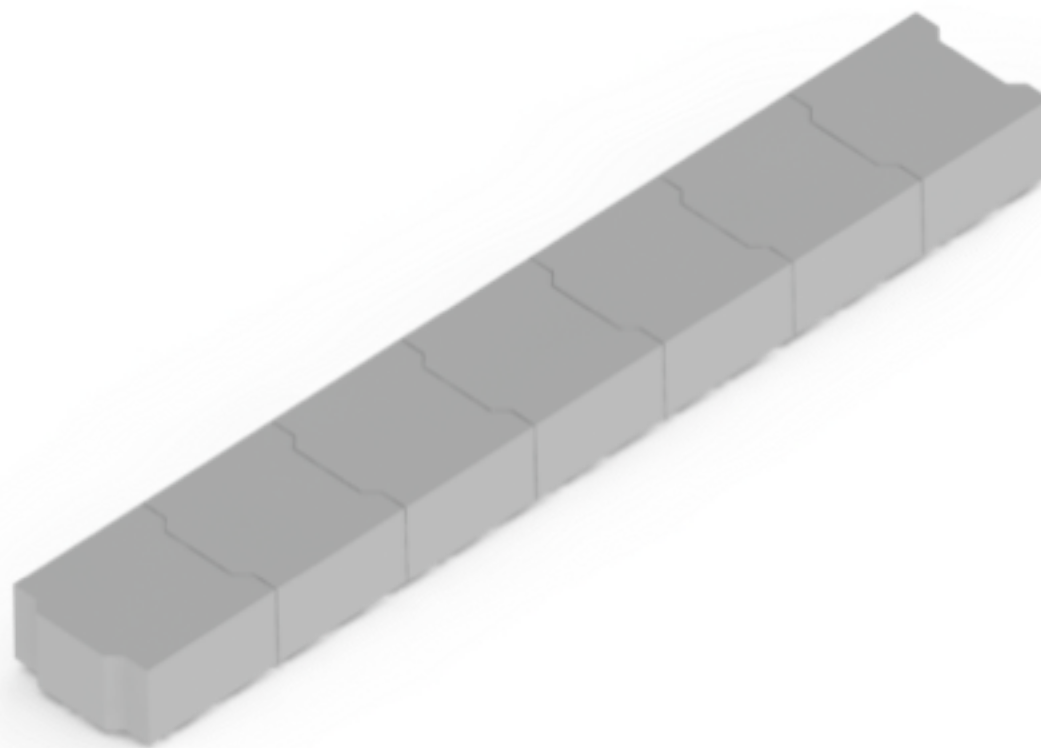
Worst case



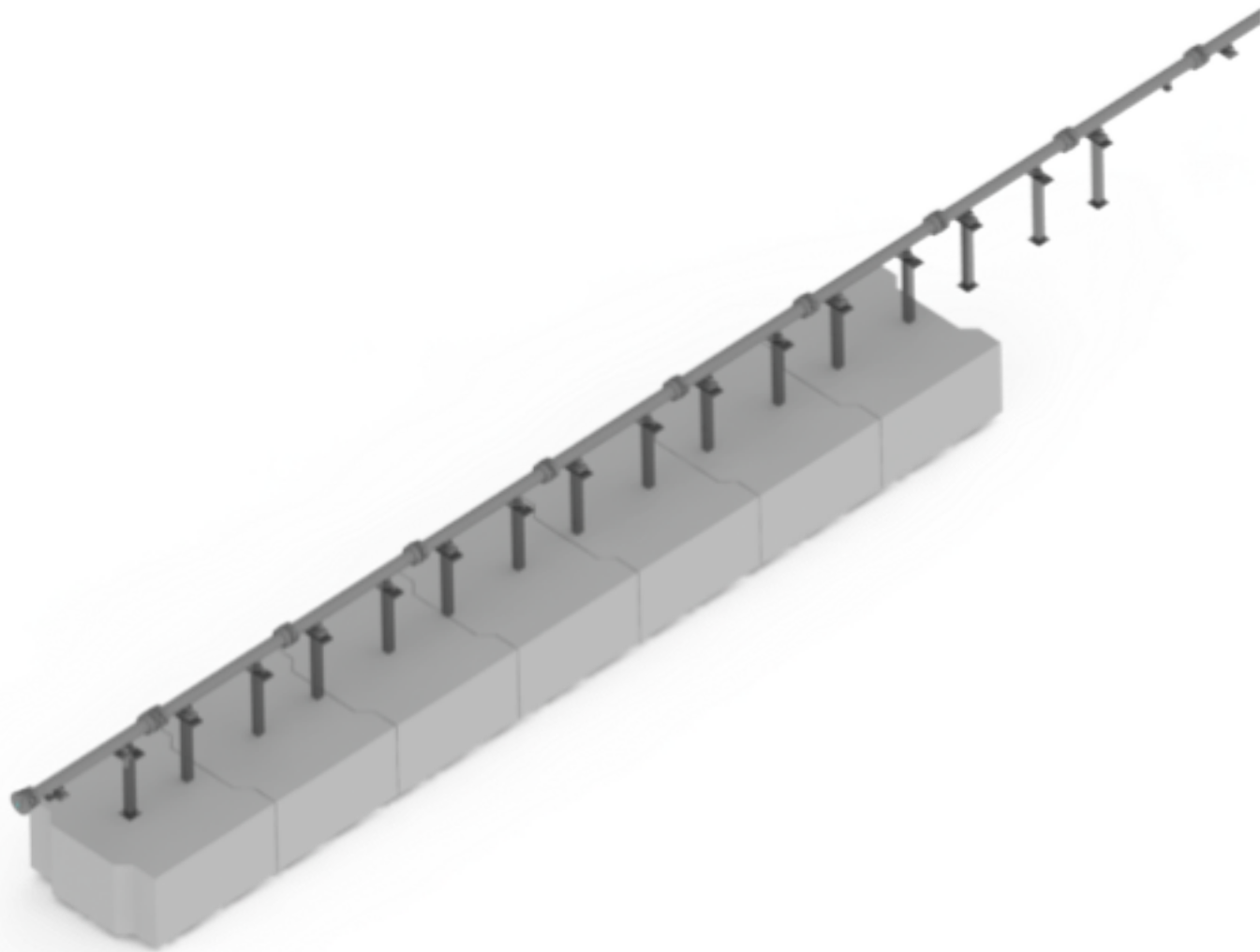
and second worst case



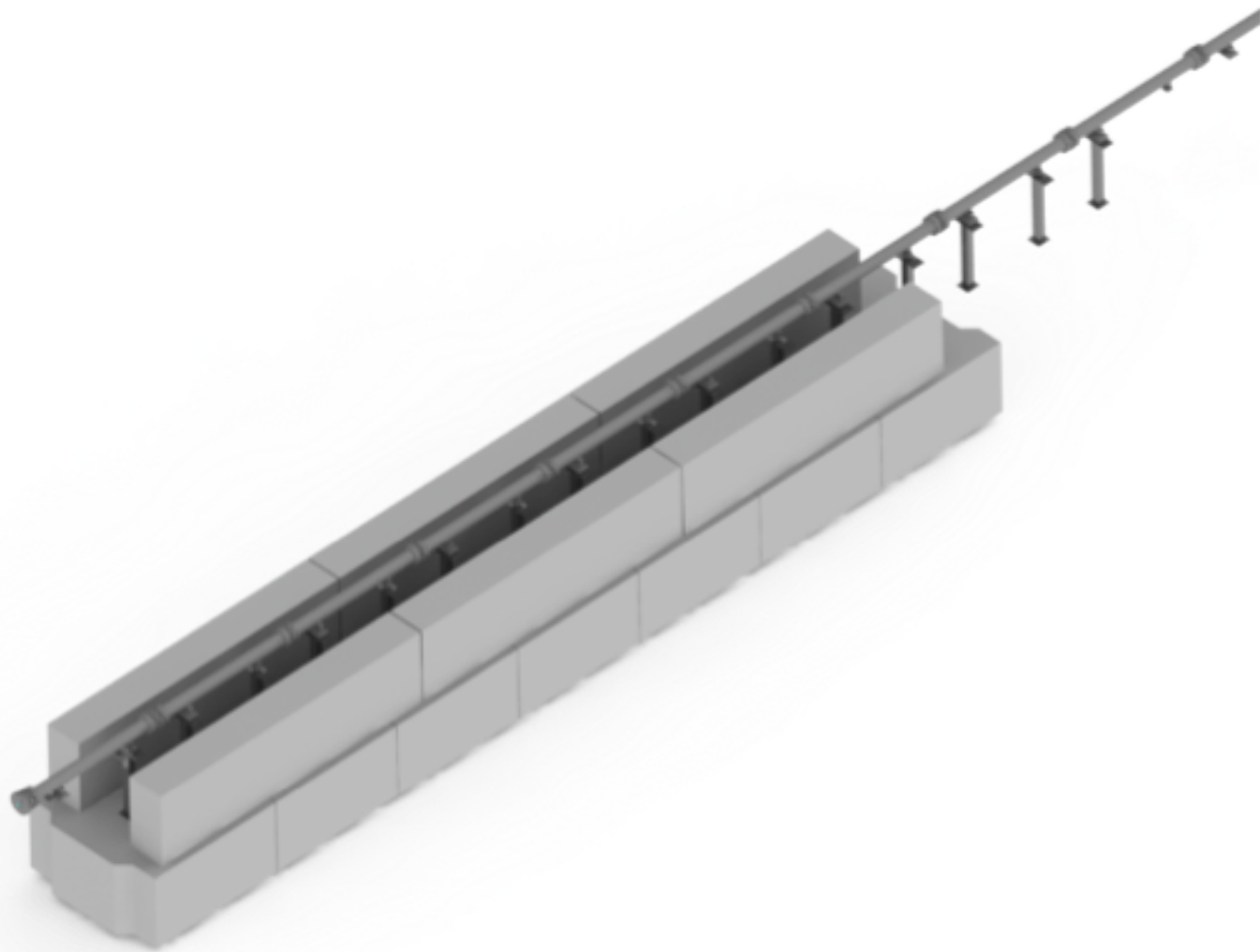
Installation sequences



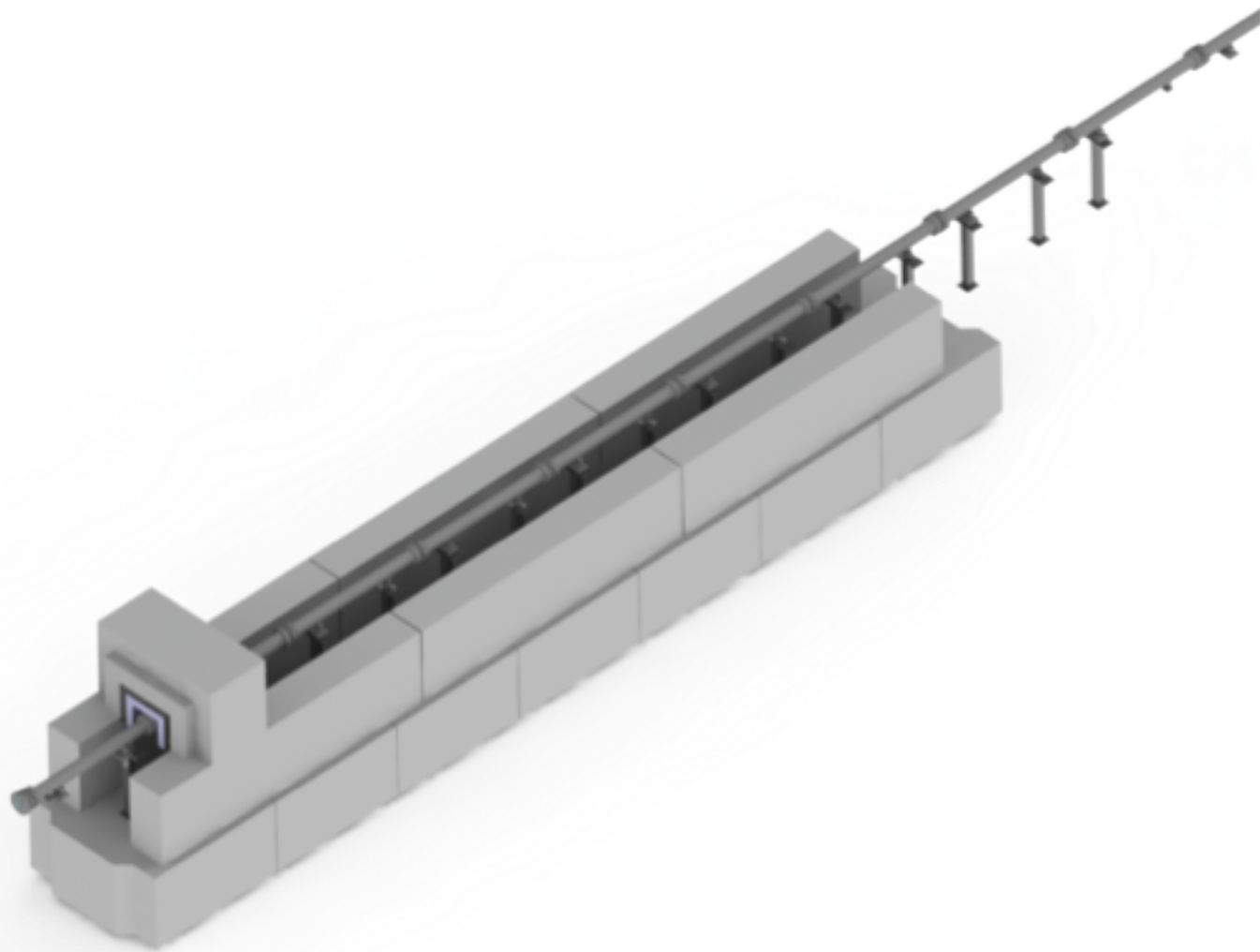
Installation sequences



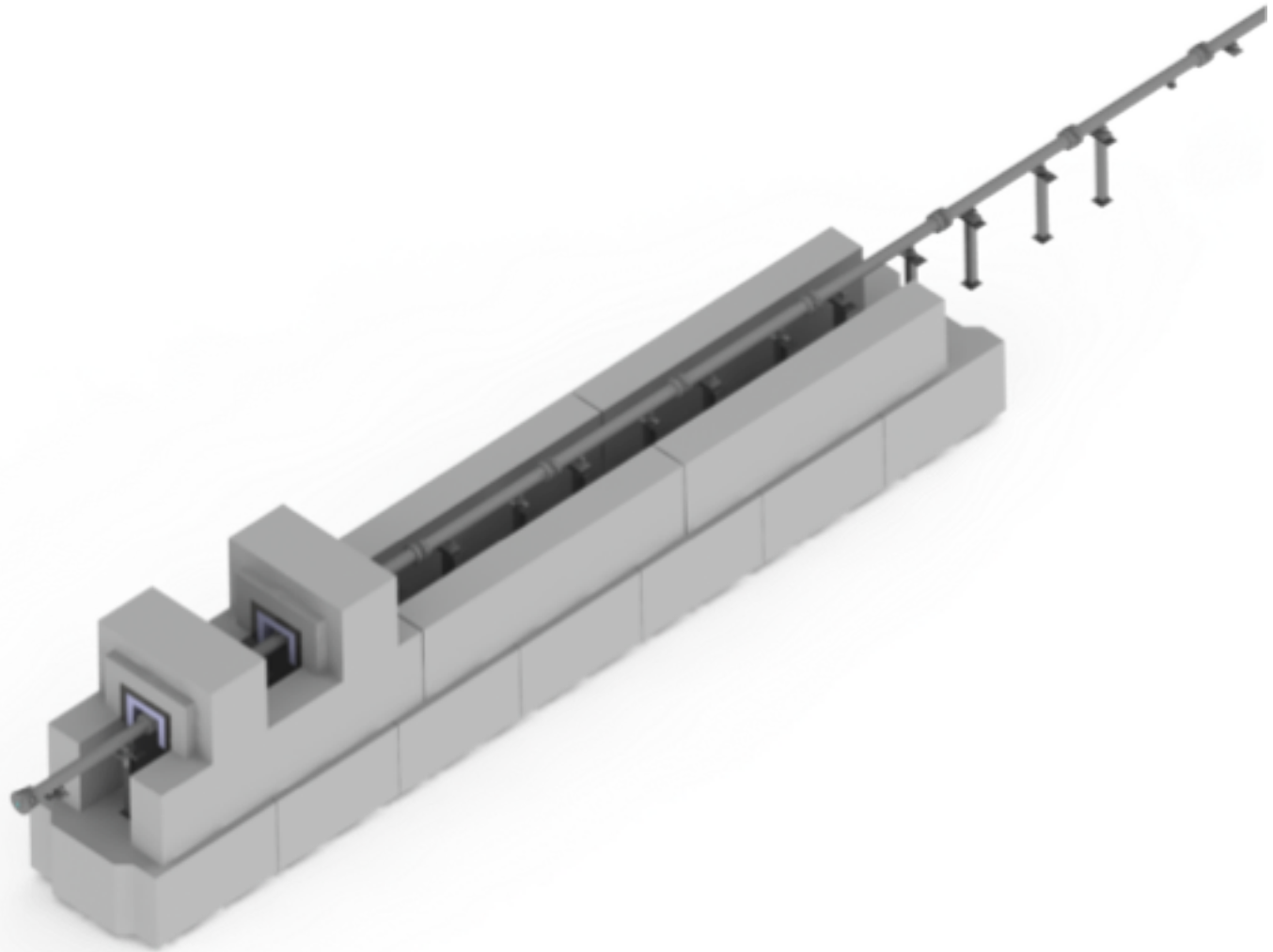
Installation sequences



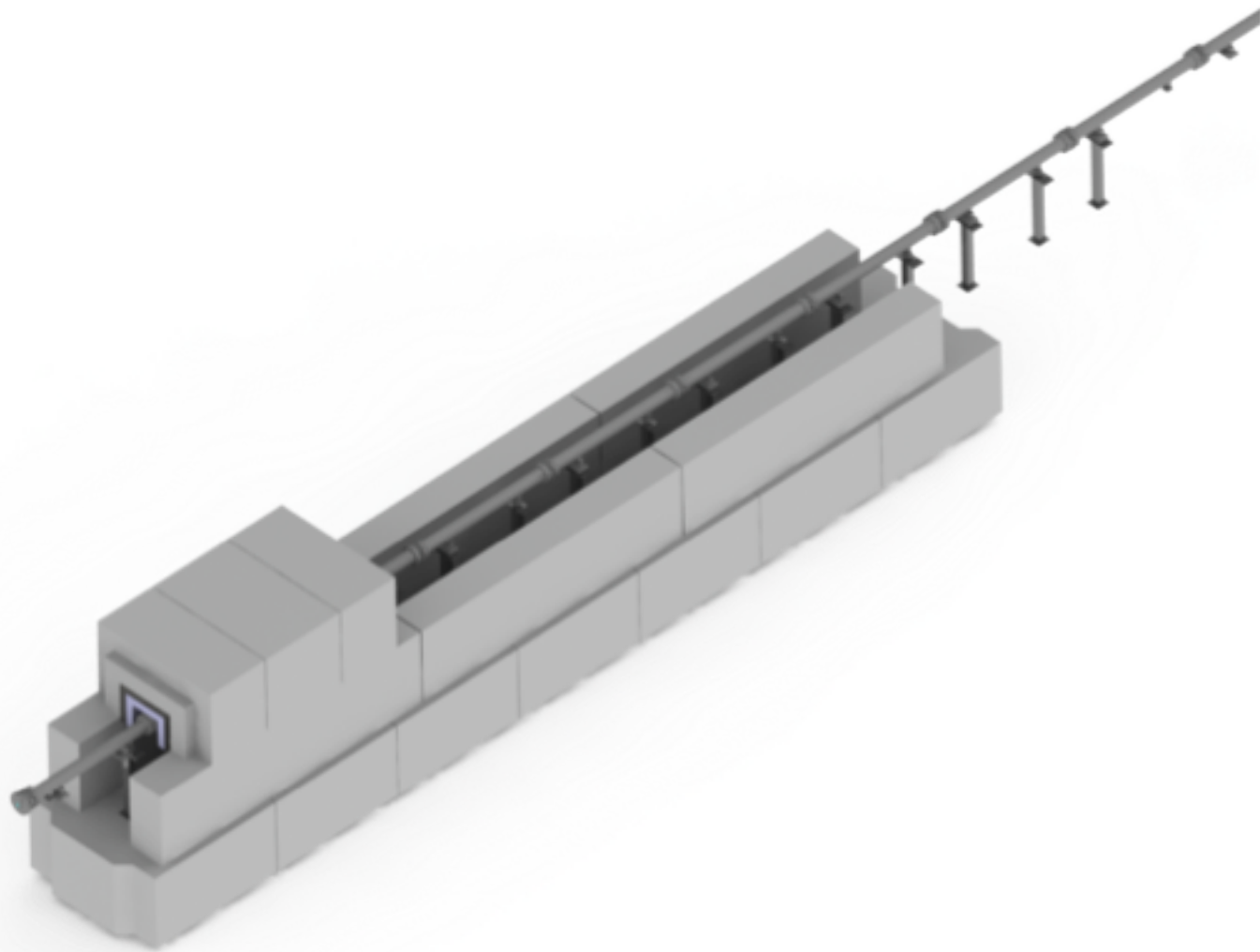
Installation sequences



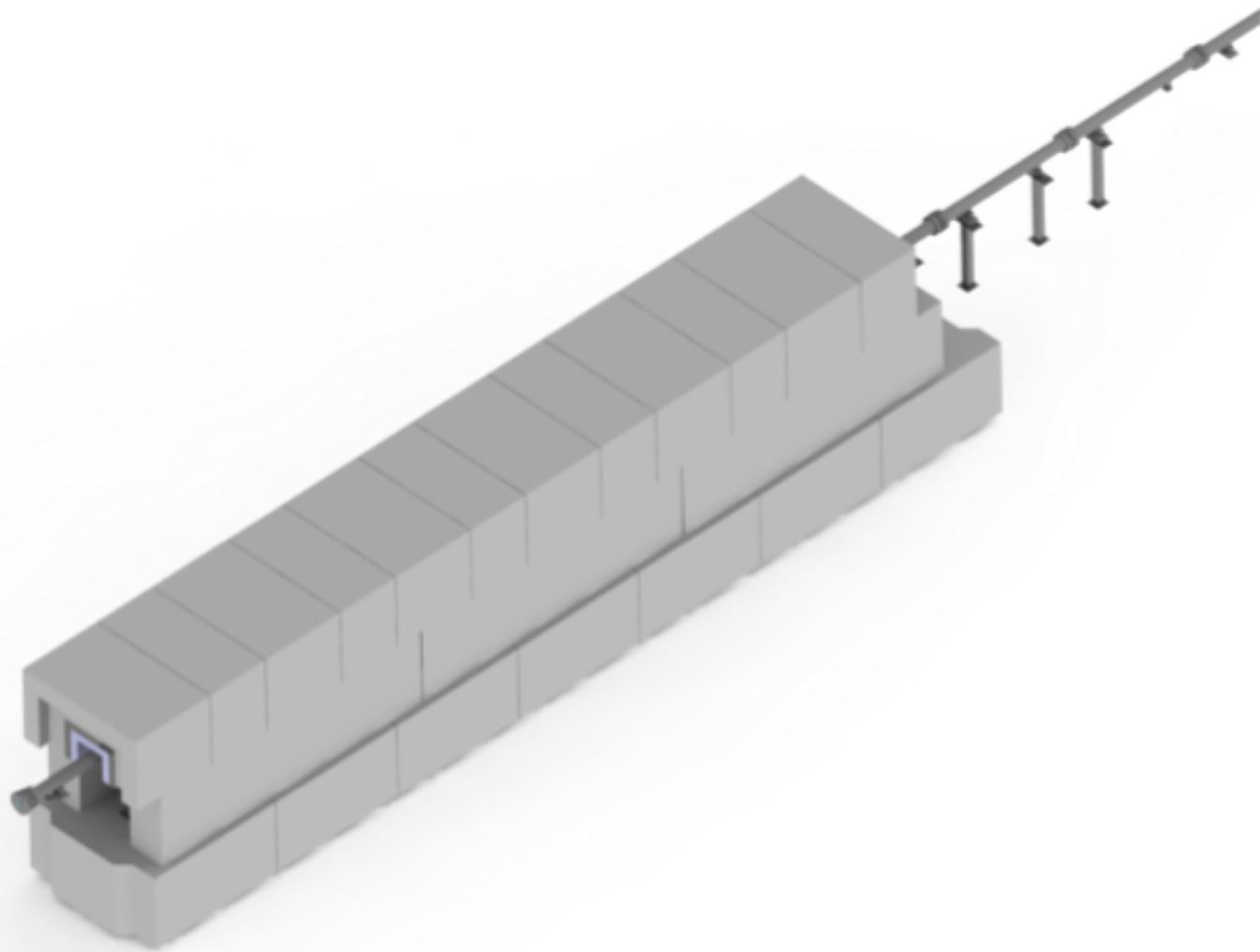
Installation sequences



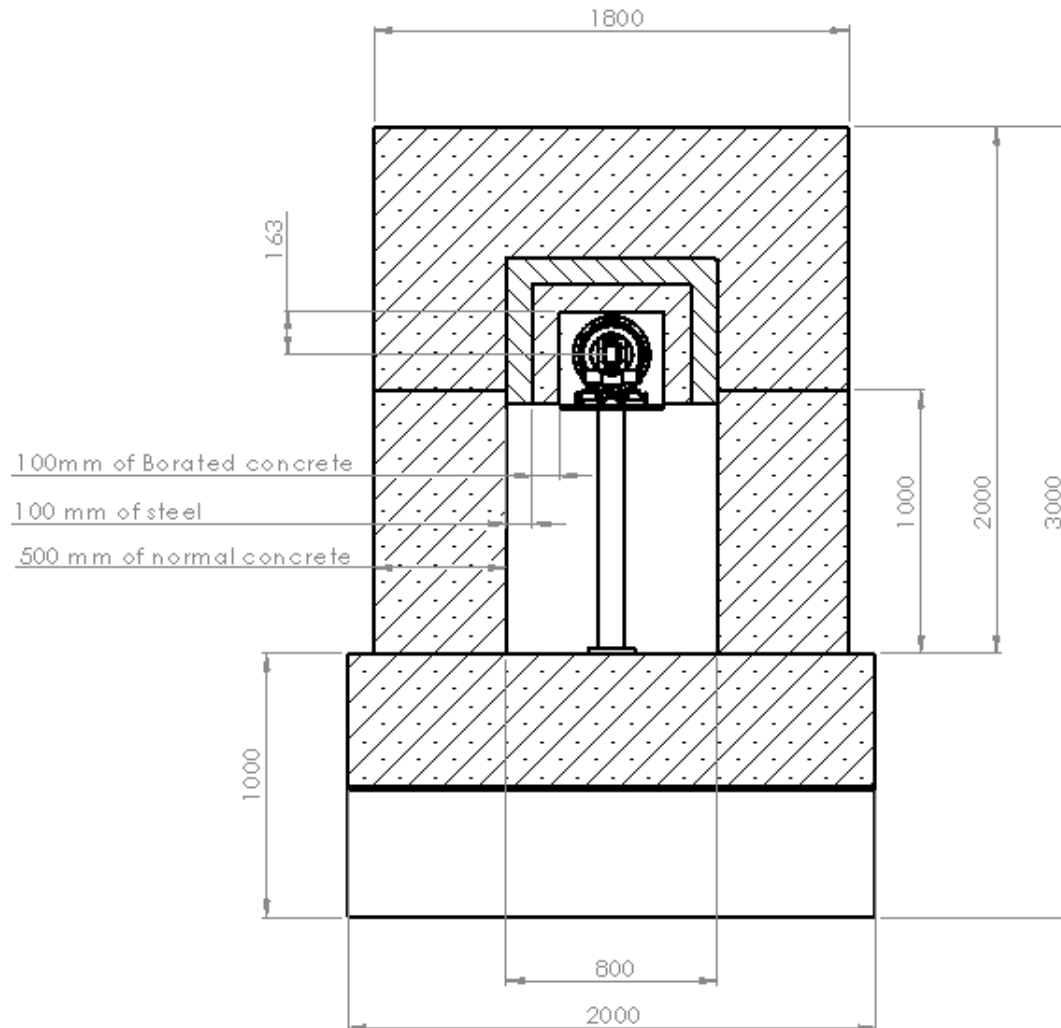
Installation sequences



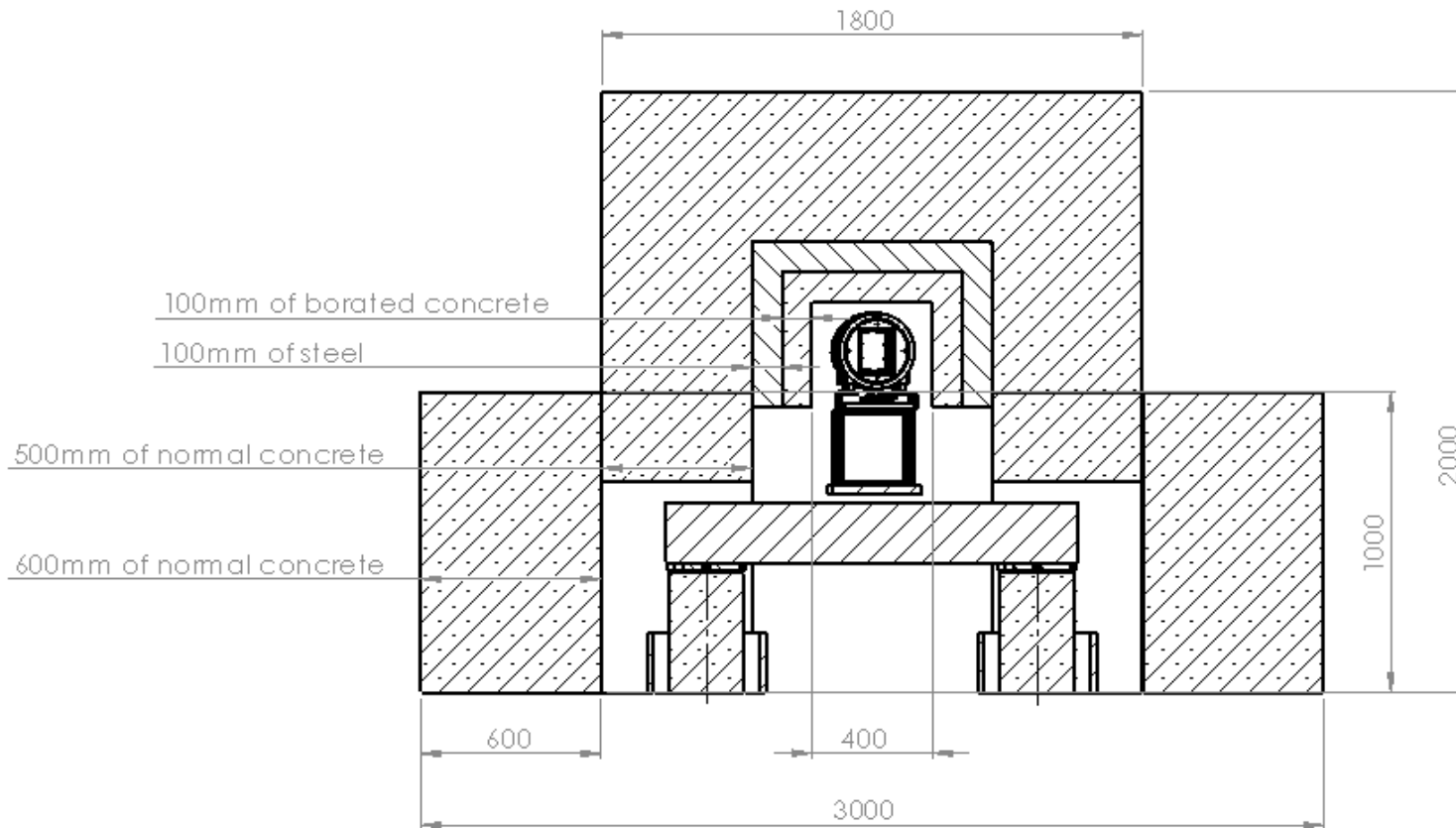
Installation sequences



Dimensions



Dimensions



Thank you for your attention.

Questions?