



UK-RFD infrastructure and tooling preparation

Edward Stephen Jordan

on behalf of Crab Cavity collaboration

18th October 2018



Science & Technology
Facilities Council



The Cockcroft Institute
of Accelerator Science and Technology

Lancaster
University



Contents

- Current infrastructure capability at Daresbury Laboratory
- Planned development of infrastructure specifically for the RFD Cryomodule assembly.
- Procurement currently underway
- Future work

- Current infrastructure capability at Daresbury Laboratory
- Planned development of infrastructure specifically for the RFD Cryomodule assembly.
- Procurement currently underway
- Future work

Daresbury Lab Engineering Technology Centre (ETC), systems integration building

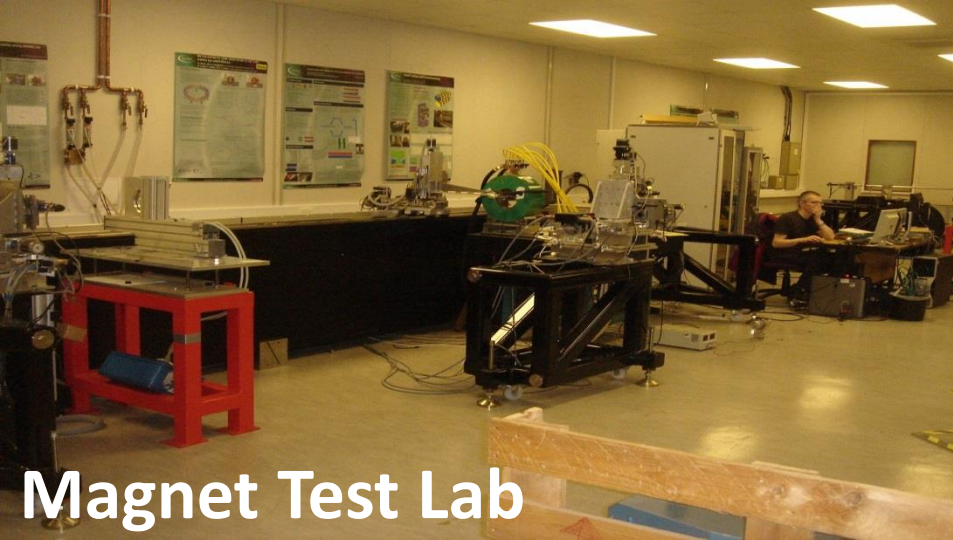




Machine Centre



Cleaning in Vacuum Lab



Magnet Test Lab



Ovens in Vacuum Lab



30 Tonne Crane

Assembly Hall



Assembly Hall



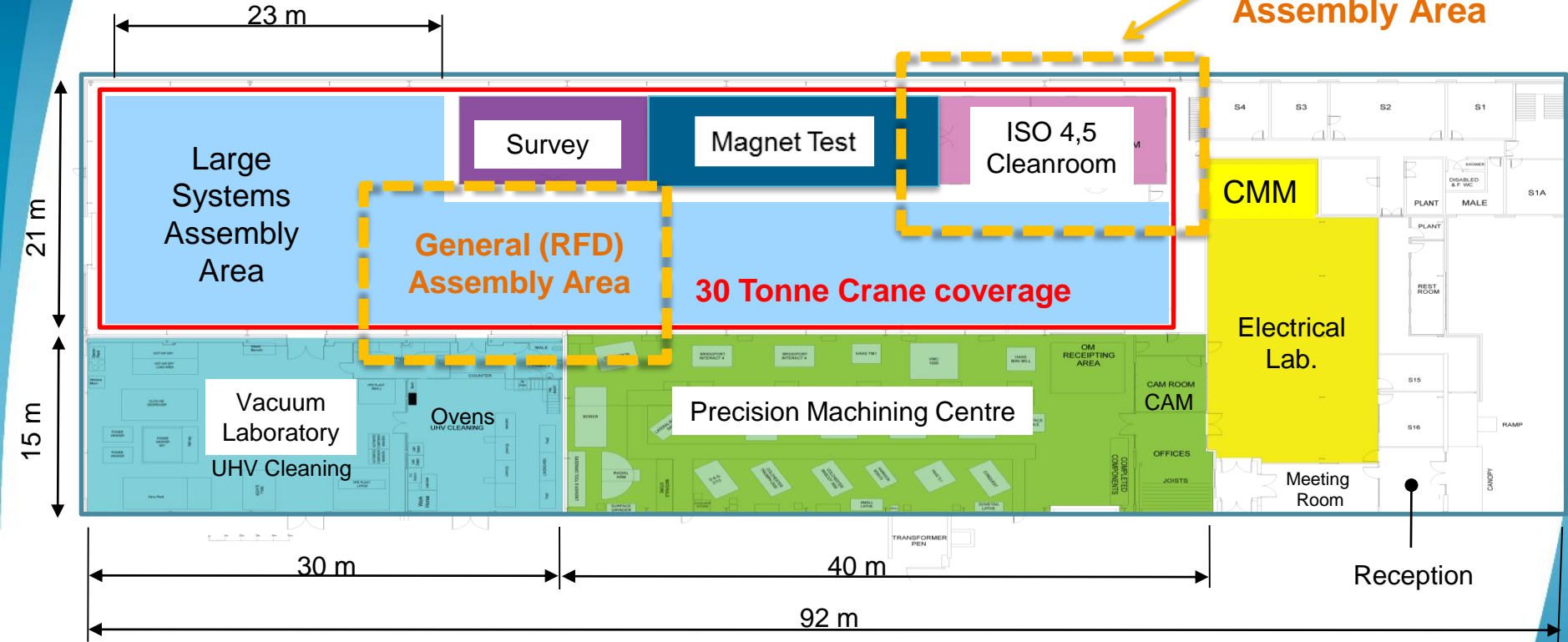
Softwall cleanroom



ISO 4 Cleanroom

ETC Floor Plan

Cleanroom
Assembly Area



- Current infrastructure capability at Daresbury Laboratory
- Planned development of infrastructure specifically for the RFD Cryomodule assembly.
- Procurement currently underway
- Future work

Engineering Technology Centre 3D Layout

General Assembly
area

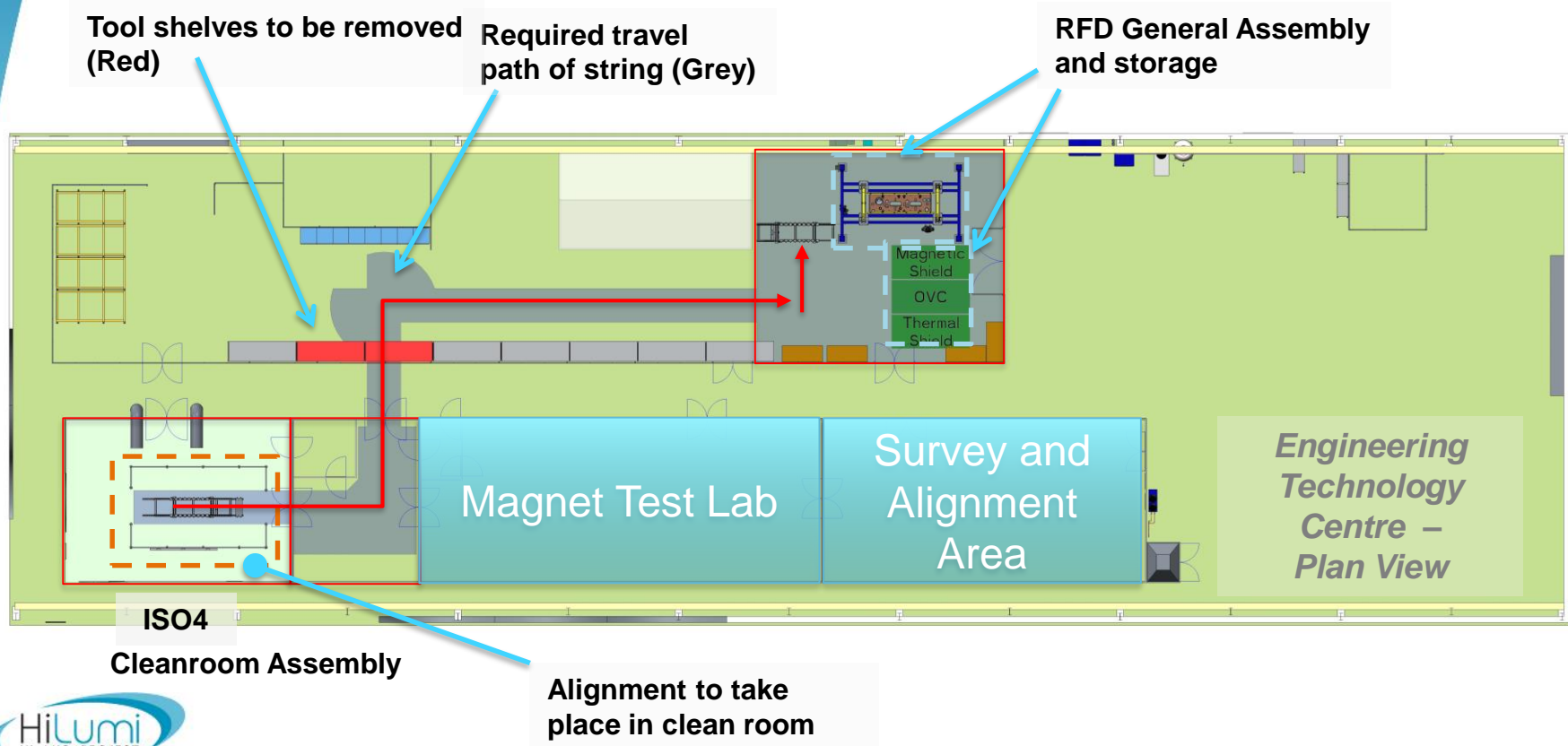
Approx. 100m²



Cleanroom Assembly
Area

ISO 4 interior

Cavity String Travel Path

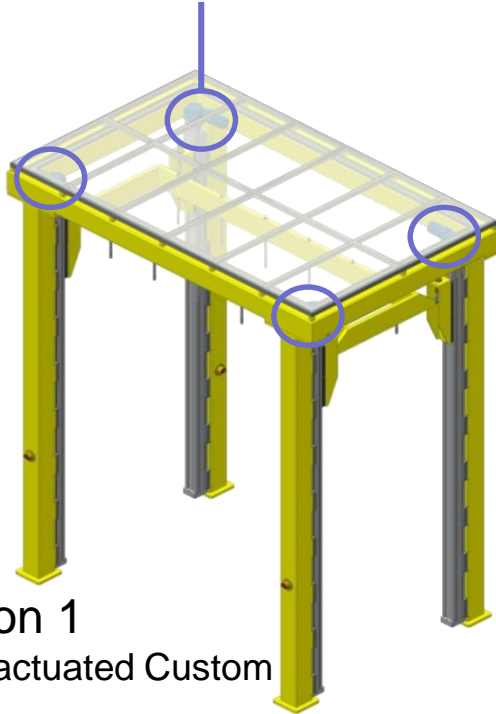


ETC ISO 4 Cleanroom



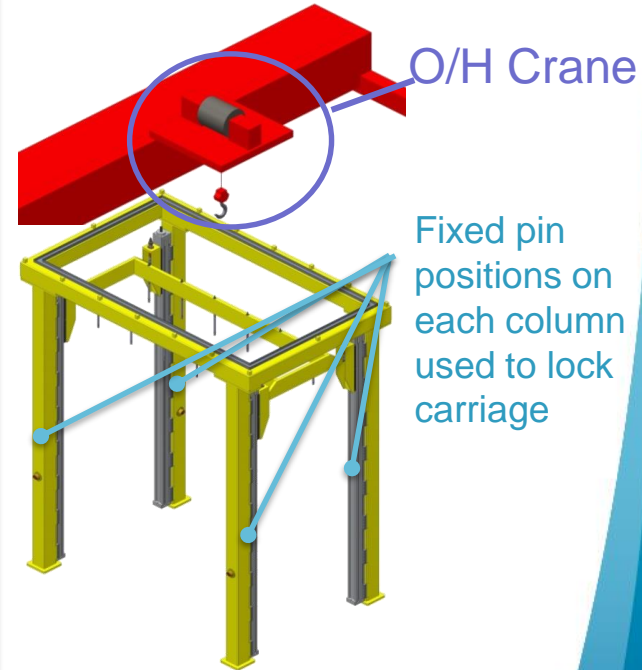
Cavity String lifter selection

4 x Servo Motor



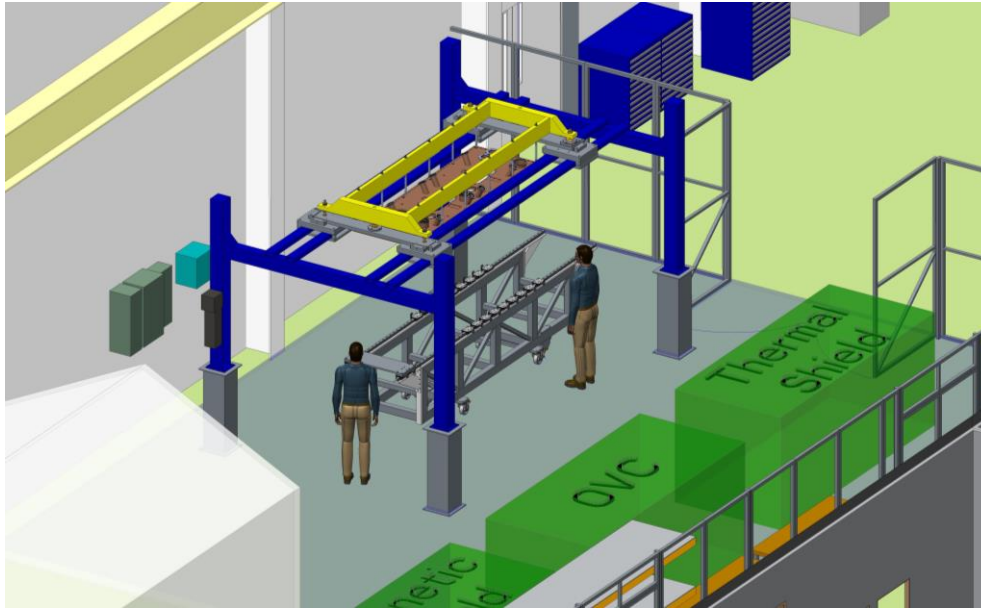
Option 1
Fully actuated Custom
lifter

Option 2
Modified commercial car lifter



Option 3
Use overhead crane and
guidance frame

General Assembly Area – String Lifter



Car lifter Cost \approx £5,000 - £10,000

Installation and Ancillary Components \approx £20,000 – £30,000

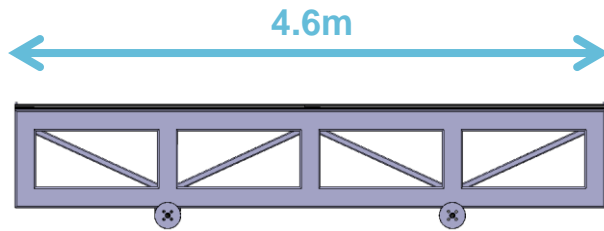
Total cost \approx £25,000 - £40,000

Significantly cheaper than option 1

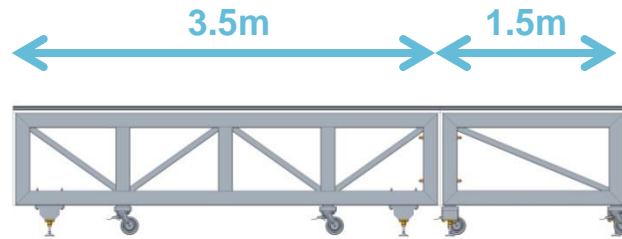
- Current infrastructure capability at Daresbury Laboratory
- Planned development of infrastructure specifically for the RFD Cryomodule assembly.
- Procurement currently underway
- Future work

Cavity String Mobile Frame (Trolley)

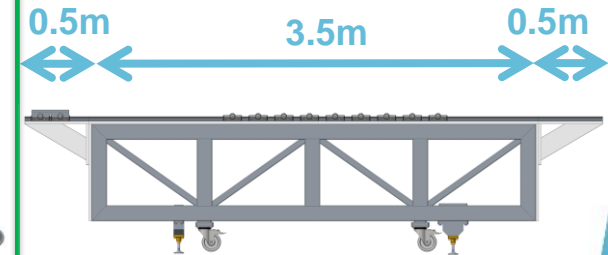
Cavity String Option 1



Cavity String Option 2

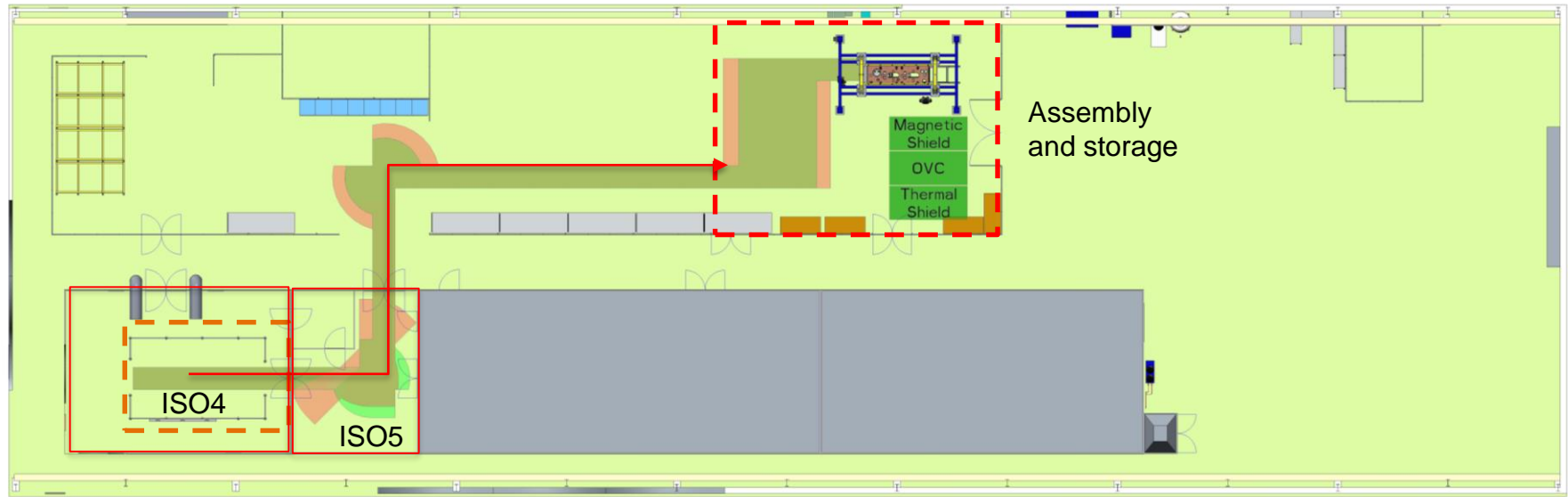


Cavity String Option 3



Now on order

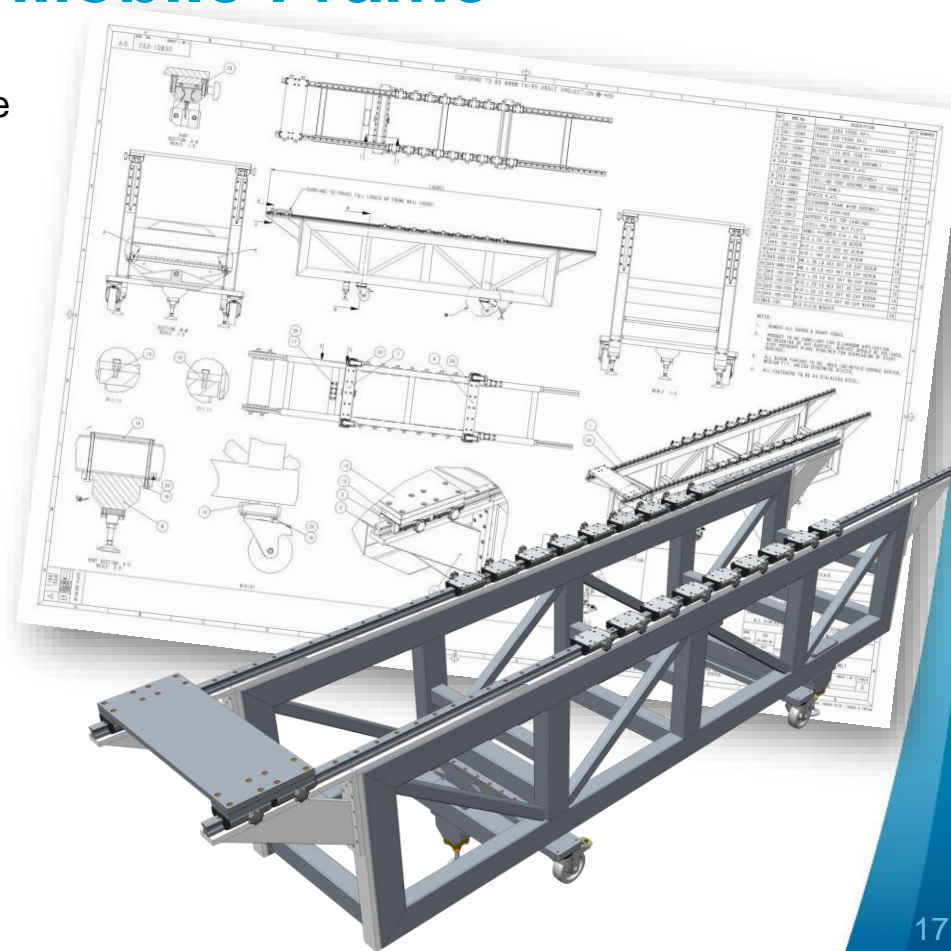
Cavity String Mobile (Trolley) - Travel Path



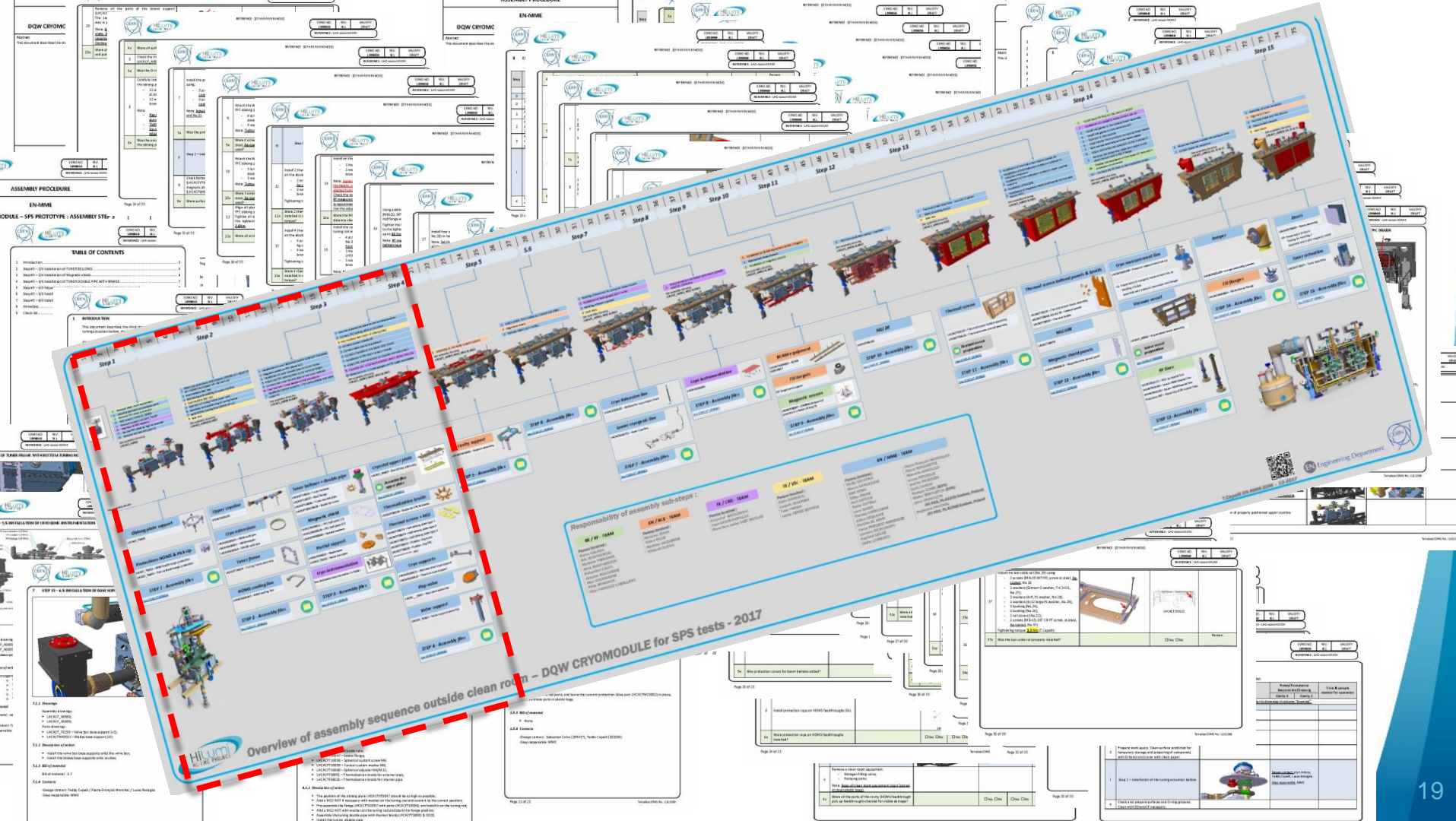
- Green route is for shorter trolley.
- Reduced turning area required, easier transport offers less risk of damage.
- A shorter trolley allows more working space around the string on the assembly frame.

Cavity String Mobile Frame

- 3.5 – 4.5 m Mobile Cleanroom Assembly Frame
- Contract Placed with ESE Engineering Aug '18
- Cost: £40k
- Expected Feb '19



- Current infrastructure capability at Daresbury Laboratory
- Planned development of infrastructure specifically for the RFD Cryomodule assembly.
- Procurement currently underway
- **Future work**



Summary

So far;

- Facility development at Daresbury has begun.
- Identified and reserved assembly area onsite.
- Placed order for RFD cleanroom assembly frame – under manufacture

Next Steps;

- Finalise design of augmented car lifter, and begin procurement. (immediate action)
- Begin the creation of an assembly sequence for the RFD. (ongoing action)



***Thank you for your attention,
Questions?***



**Science & Technology
Facilities Council**



The Cockcroft Institute
of Accelerator Science and Technology

**Lancaster
University**

