Magnetic Mitigation Baseline - Contents

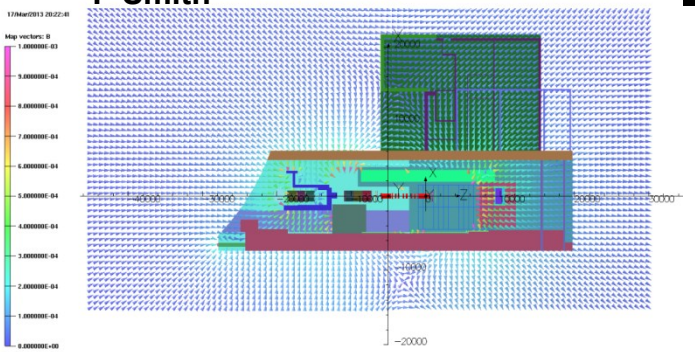
Jason Tarrant – Integration Engineering

- Magnetic Mitigation General
- West Wall Compressors
- Rack Room 2

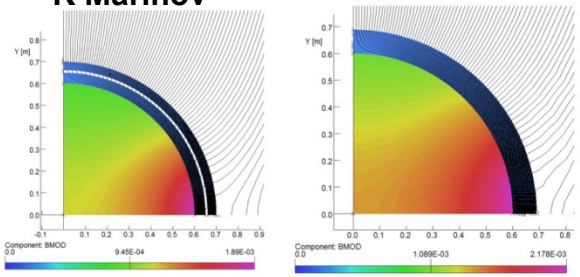
Magnetic Mitigation - General

- Parallel approach up to now
  - Baseline [UK led]
    - Move and/or shield equipment in areas of high risk (compressor move, external rack room & local shielding)
  - Parallel option [US led]
    - Single ‘yoke’ solution (PRY)
    - Requires some UK resource for integration

P Smith



K Marinov

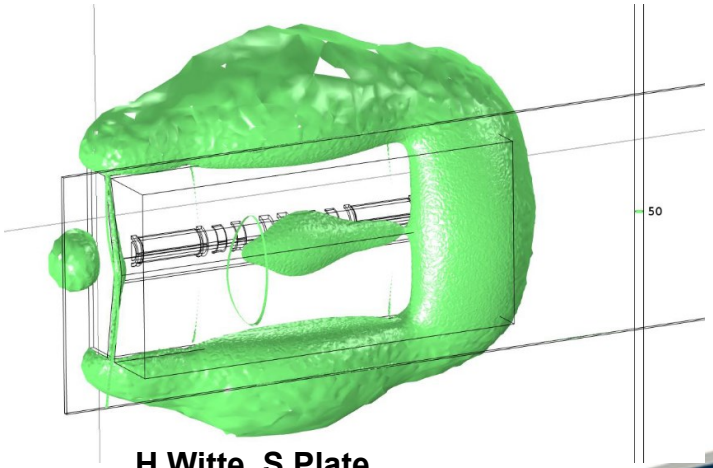


5 cm-thick “can”, 1 cm air gap, 4cm steel

Solid 9 cm-thick “can” acting alone

L Fry, C Macwaters

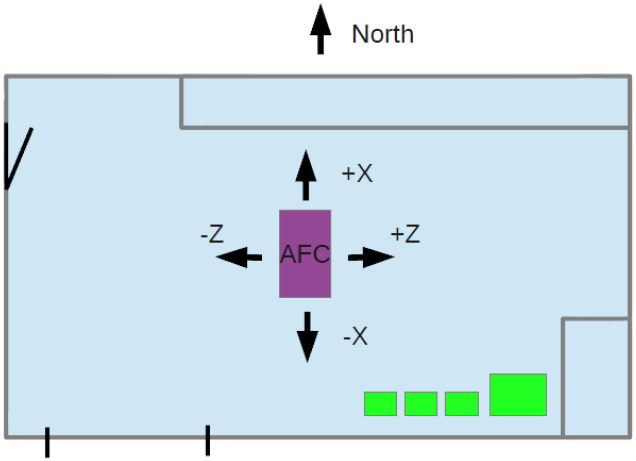
Item No.	Object	Location	System	System Owner
L3	Yoke Station 23	North Wall	General Power	Jan Multicanne
L4	MAW Shield Wall	North Wall	Magnetic Mass	n/a/a
L6	MQ4-5	North Wall		Mike Courtholdt
L6	MD1	North Wall		Mike Courtholdt
L6	MQ1-3	North Wall		Mike Courtholdt
L6	Beam Chopper Rack	North Wall	ISIS	Alan Stevens
L7	Rack	North Wall	Decay Solenoid	Vicky Bayliss/Mike Courtholdt
L8	Solenoid Rack	North Wall	Decay Solenoid	Vicky Bayliss/Mike Courtholdt
L9	Air Con Units East	North Wall	Air Conditioning	John Govans
L10	Air Con Units West	North Wall	Air Conditioning	John Govans
L11	Cranes	Global		Stewart Greenall
L12	Air Con Unit	Behind Beam Dump	Air Conditioning	John Govans
L13	HV Rack	South Wall	General Power	Ian Multicanne
L14	Compressor (Sumitomo)	South Shield Wall	Tracker	Craig Macwaters
L15	Linde Helium Fridge	South East Corner	Decay Solenoid	Vicky Bayliss/Mike Courtholdt
L16	Tracker Racks	Central	Tracker	Craig Macwaters
L17	Chiller	South Mezz	Air Conditioning	Craig Macwaters
L18	LH2 Gas Panel	South Mezz	LH2	Stephen Watson
L19	Spectrometer Solenoid	Cooling Channel	Spectrometer Solenoid	Roy Preece
L20	AFC	Cooling Channel	AFC	Tom Bradshaw
L21	Spectrometer Solenoid 2	Cooling Channel	Spectrometer Solenoid	Roy Preece
L22	RL	Cooling Channel	RL	Ludovico Tortora
L23	EMR	Cooling Channel	EMR	Ruslan Asfandiarov
L24	TOF2	Cooling Channel	TOF2	Maurizio Bonesini
L25	RF System	Cooling Channel	RFCC	Alan DeMello
L26	RF Tiers	Cooling Channel	RFCC	Alan DeMello
L27	Global Vacuum System	Global	Global Vacuum	Vishal Francis
L28	RFCC Control Rack X7	North Wall	RFCC	Alan DeMello
L29	RFCC Control Rack X2	Upstream CC	RFCC	Alan DeMello
L30	Tracker Cryocooler	SS1	Tracker	Craig Macwaters
L31	Tracker Cryocooler	SS2	Tracker	Craig Macwaters
L32	Compressor (cryomech)	South Shield Wall	LH2	Stephen Watson

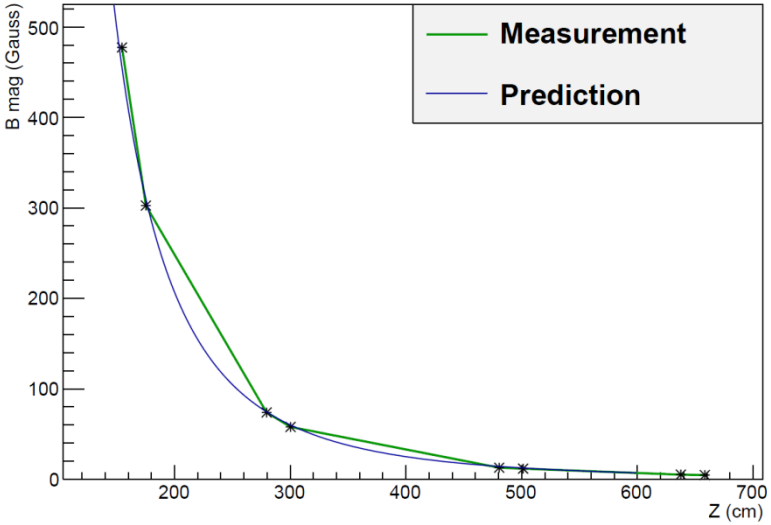


H Witte, S Plate

Magnetic Mitigation - General

- Validation of Analysis in UK
  - AFC Field Mapping in Building R9 @ RAL
  - Opera Modelling
  - Compare Measurements & Modelling
    - Including penetration of field into cabinets

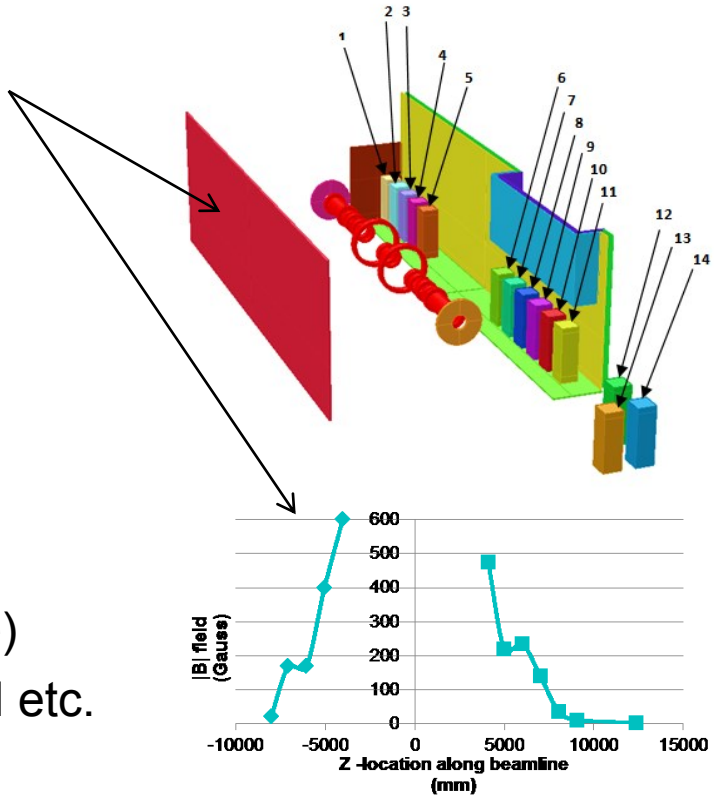




I Taylor, C Pidcott, M George

West Wall Compressor Move

- Why
  - Compressor location under south mezzanine in high magnetic field
  - Length limit of ~30/40 m on He hoses (compressor to cold heads) so unable to place outside MICE Hall
  - West wall relatively uncluttered + opportunity to build mezzanine platform



- Requirements
  - ~30m hose lengths (+10 m for maintenance)
  - Platform to support compressors, personnel etc.
  - Safe personnel access
  - Safe compressor handling & installation
  - Equipment delivery & assembly space for MICE experimental devices

V Bayliss, M Courthold

Existing West Wall

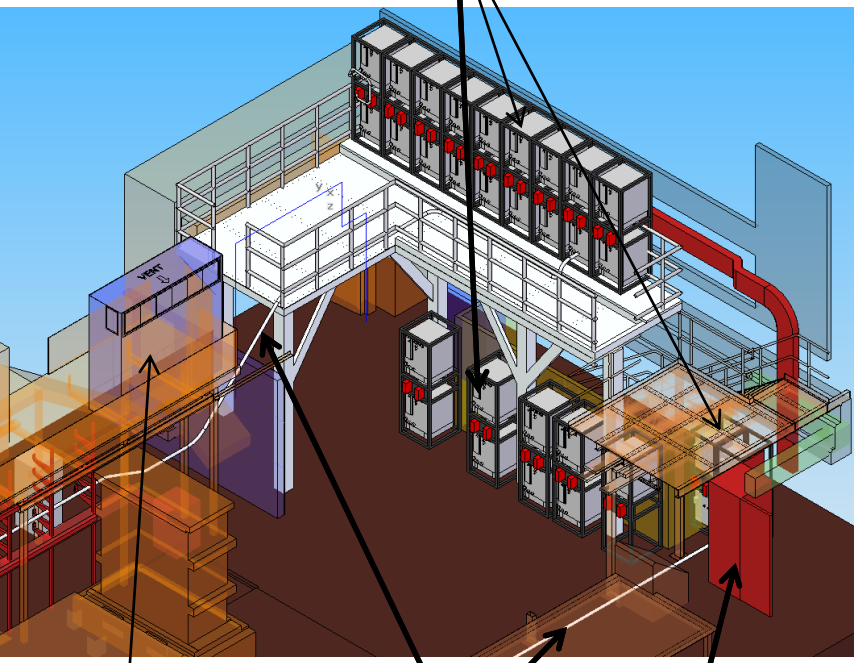
West wall mezzanine will be at this level between the existing services

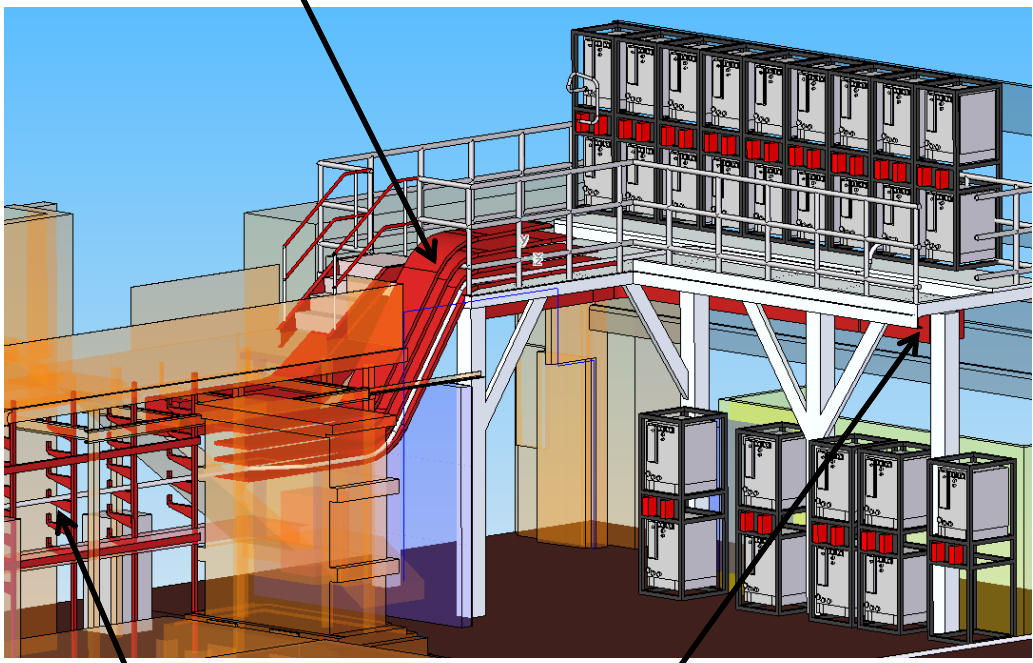
Existing high power cable to be shielded

PPS system trunking

Services to be moved or bridged by the west mezzanine

Platform, Compressor & Services



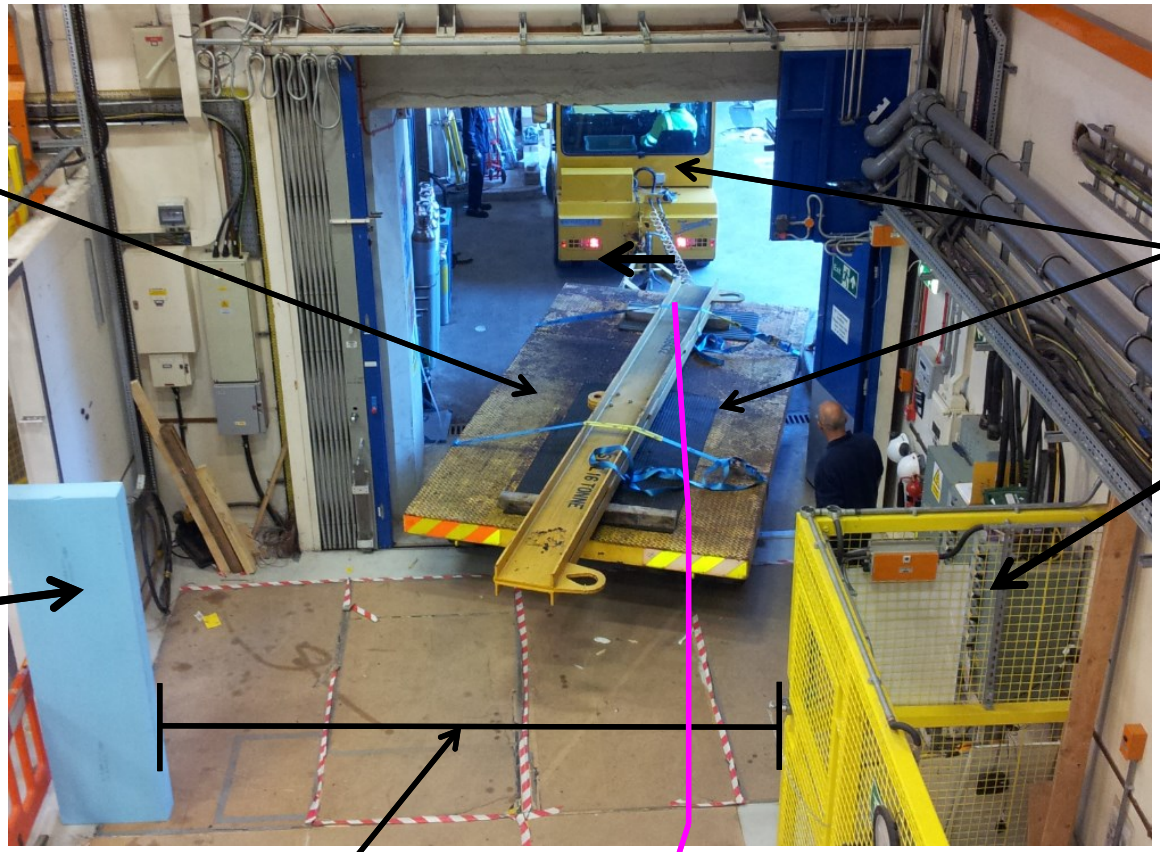


West Wall Compressor Move

- What
  - ~~Distribution board move~~
  - ~~Design, structural engineering and approval~~
  - ~~South west air-con & supply services~~ (apart from power)
  - Auxiliary equipment crane move ← **Imminent**
  - Mezzanine platform build on west wall of MICE Hall ← **SS handling issues**
  - Water services, including water plant relocation ← **Space issues**
  - Services installation & management
  - Some related infrastructure changes
    - Lighting
    - PPS
    - Power cables
  - Compressor stands with integrated power
  - Compressor & services installation

West Wall Compressor Move

SS Handling Issues



Heavy gang only confident to get truck to here & that was w/o SS!

Locally available trailer and truck

PPS Cage & Stairs

Mock-up of west mezz leg position

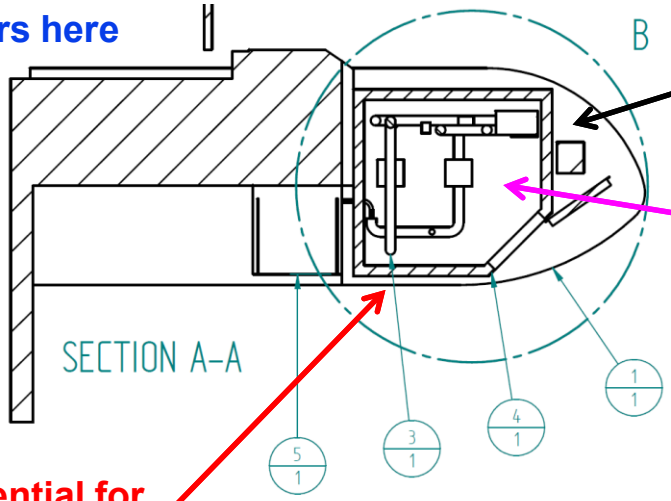
Width > door width

Path needed to be taken with pictured truck and trailer ready for dual lift

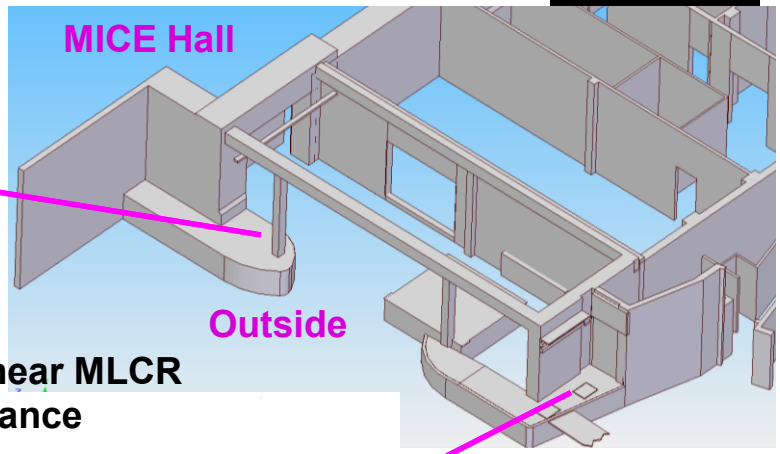
West Wall Compressor Move

Water Services Move

Compressors here

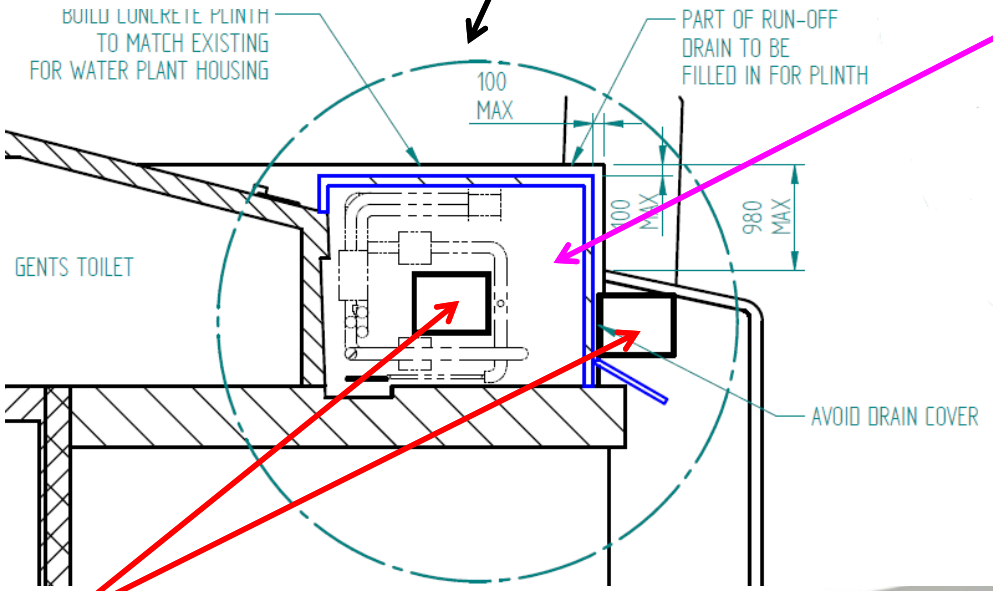


Position outside main delivery door



Position near MLCR entrance

Potential for clash with equipment being delivered (ISIS)



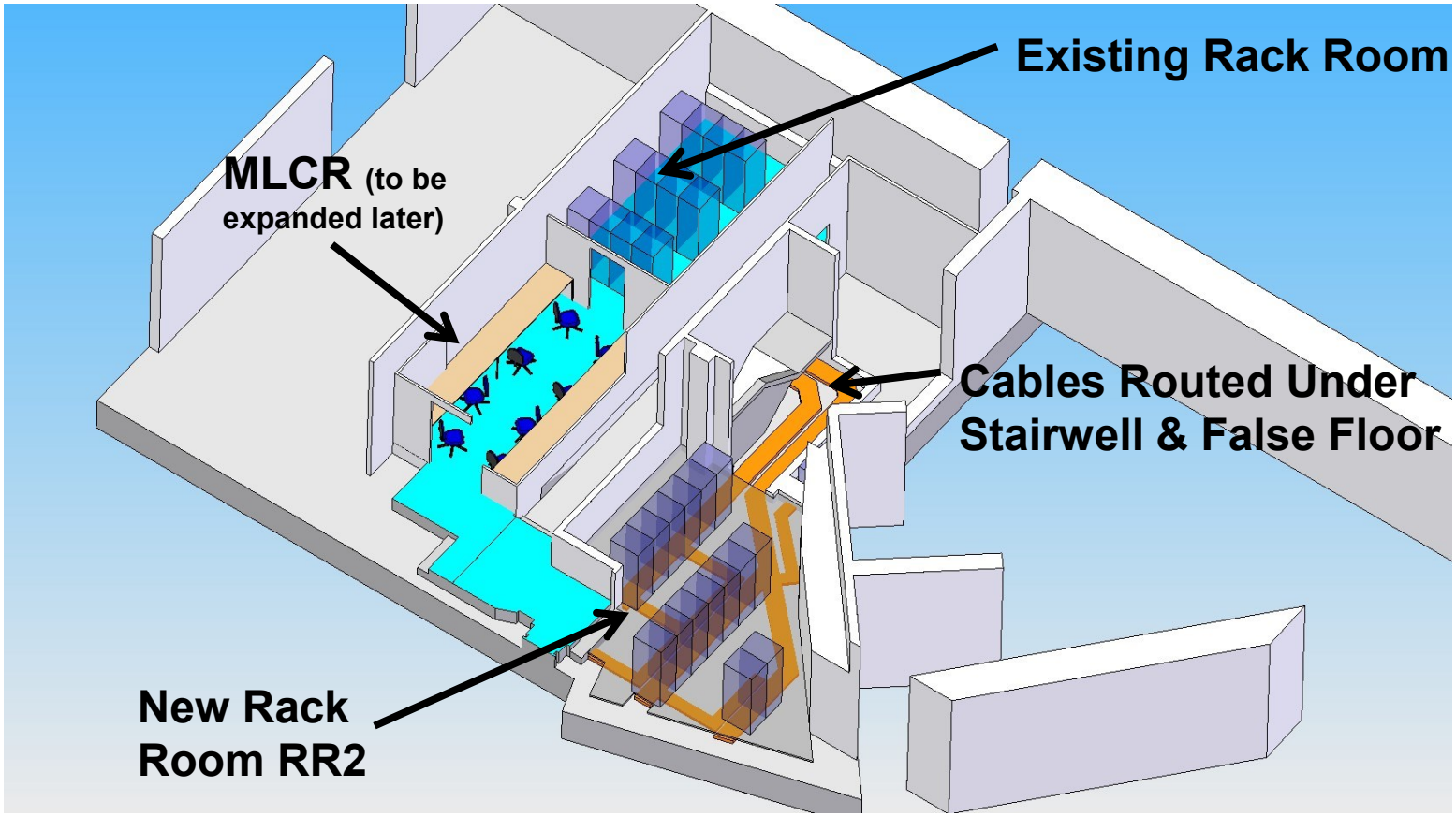
Potentially blocks access to drain covers (Site Maintenance)

RR2

- Why
  - Same magnetic field problem as compressors but longer services length, therefore move out of Hall to new Rack Room 2 (RR2)
  - Allows operational changes without breaking PPS or disrupting running

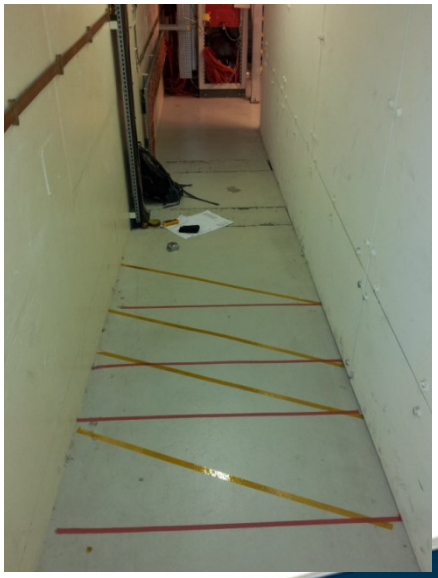
- Requirements
  - Capacity in RR2 to eventually house all racks for Step VI
  - Minimal change to building (cost related + will be returned to ISIS)
  - Fire safe, including services runs
  - Safe access to racks
  - Manage climate: Thermally for RR2

RR2 & MLCR Reconfiguration



RR2

- What
  - Asbestos removal work (undertaken as required when drilling floors)
  - ~~Design, structural engineering & approval~~
  - Cable ways through walls and cable management ← **Awaiting ISIS heating move and OK from Rad Protection Officer to start drilling**
  - Building (doors, apertures, walls)
  - Air management & temperature control
  - Install services, power distribution & electrical
  - False Flooring (rack room and main walkway) cable trays
  - Rack installation



Conclusion

- West Wall Mezz
  - Slower progress than expected due to SS handling issues & water plant relocation issues
  - Still required even with Magnetic Shielding Partial Return Yoke (PRY) as space under the south mezzanine platform where compressors were will be taken up physically by the PRY.
- RR2
  - Slower progress than expected due to ISIS requirement to remove old heating before moving locker room and the caution over wall drilling w.r.t X-rays from the MICE Hall
  - Still required even with PRY, this is so racks can be accessed and tweaked during running without experimental shut-down to access the Hall
- General Schedule
  - None of the above schedule delays should impact on installation of the PRY or Step IV running in 2015