

An Approach To Adaptable Operating Theatre Design

2019

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O'Connell Mahon Architects |

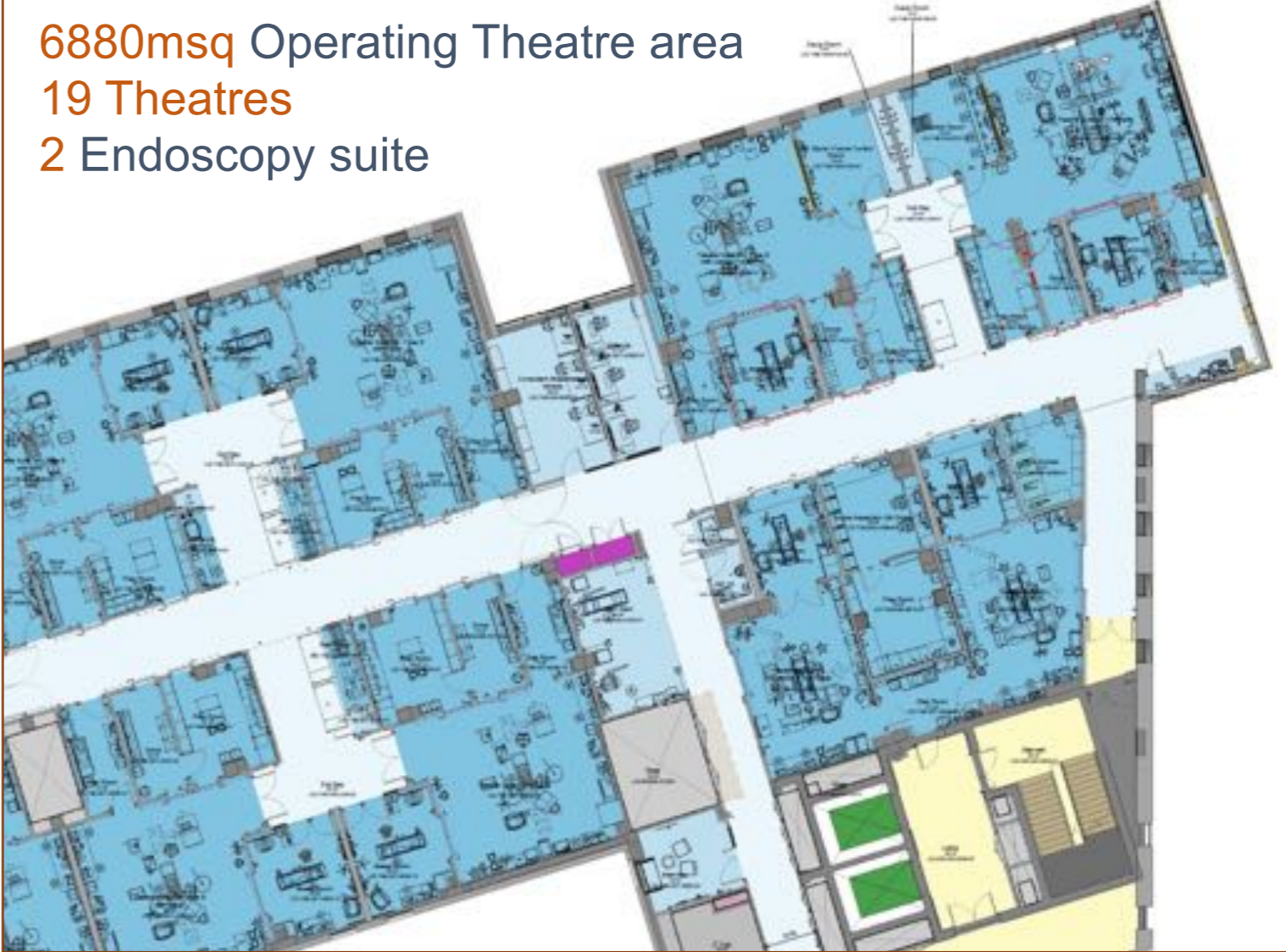


National Children's Hospital- Dublin, Operating Theatres

BDP. and O'Connell Mahon Architects



6880msq Operating Theatre area
19 Theatres
2 Endoscopy suite



This is a hospital - by Julia aged 8





The Problem?



The Research

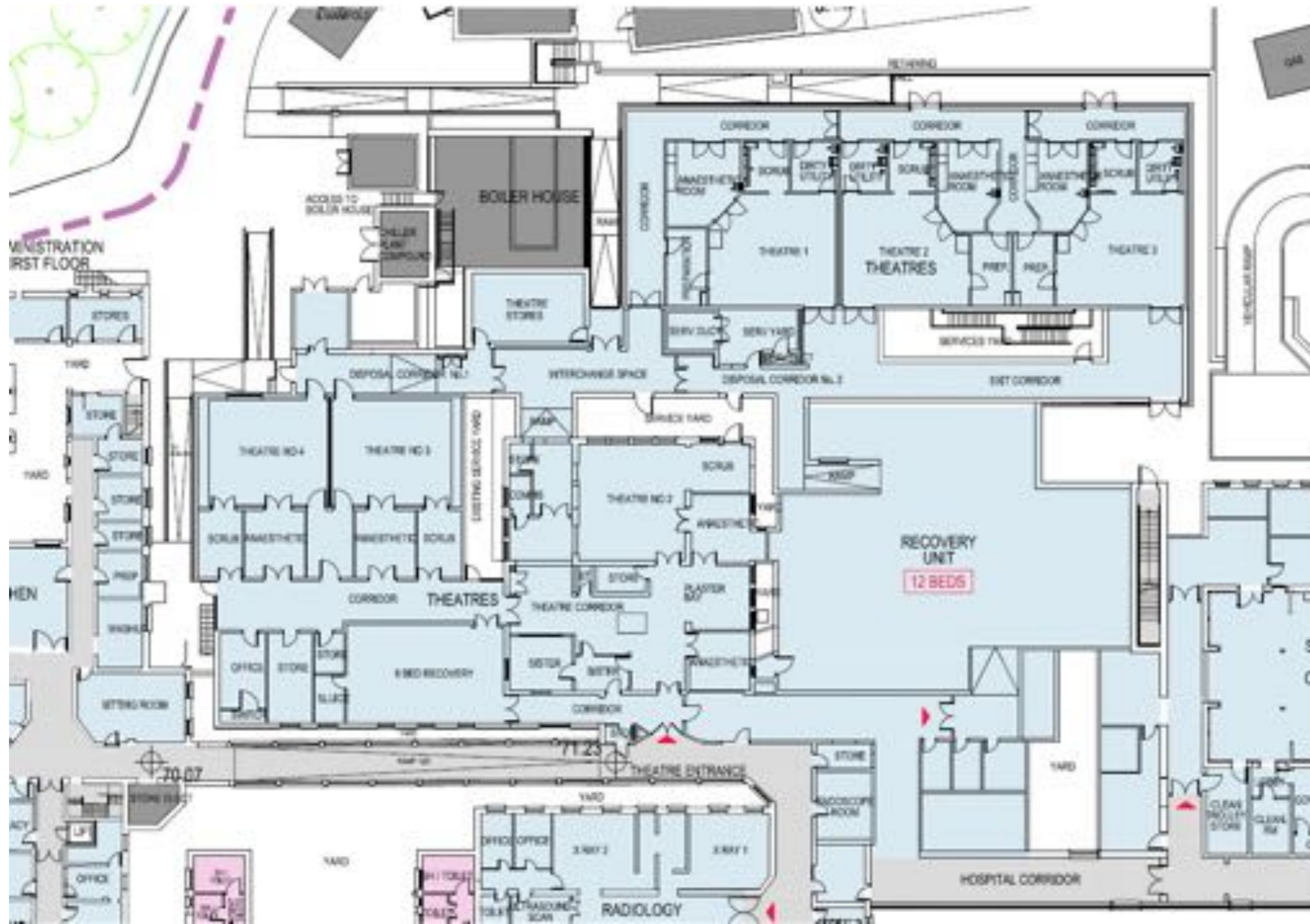


The Results



A Proposal

Ad-hoc operating theatre development





What is the Resultant Problem?

“Built Catastrophes”

“...Hardly Ever Functional”

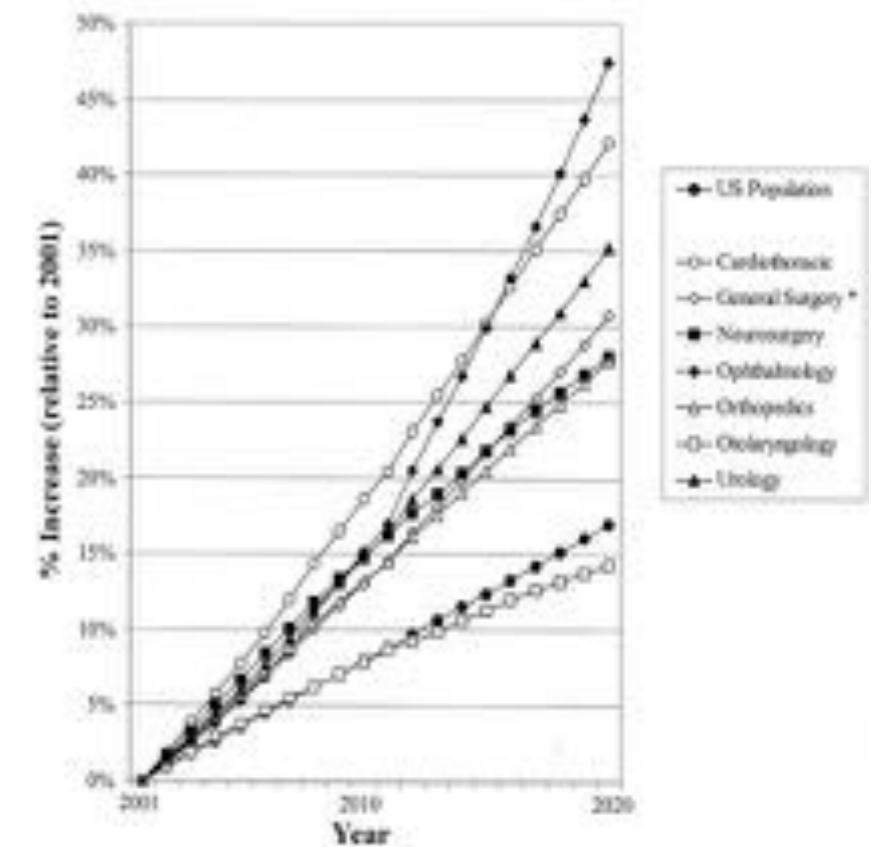
Wagenaar, 2006



The Challenges of Predicting Theatre Numbers And Types?



1. Capacity Planning
2. Demographics
3. Epidemiology – the changing pattern of disease
4. Technological advancement
5. Demand, policy and expectation
6. Time



Forecast increase in US surgical work by specialty (Etzioni et al, 2003)



Percutaneous Coronary Interventions trends (NICOR, 2017)

The Challenges To Predicting Theatre Numbers And Types?



Capacity Planning

- a. Decision making
- b. Clinical opinion
- c. Building design and physical infrastructure
- d. Data
- e. Political influence
- f. Separated funding streams
- g. Misunderstanding of terminology



The Research Subjects



Ulster Hospital inpatient ward Block (IWB), Dundonald, Opened April 2017



South West Acute Hospital, Enniskillen, Opened June 2012



Tullamore General Hospital, County Offaly, Ireland. Opened 2008



Mater Misericordiae University Hospital, Dublin, Opened April 2012



St Vincent's Private Hospital, Dublin, Opened November 2010



Royal Stoke Hospital, Stoke on Trent, Opened December 2012



Royal Victoria Hospital, Belfast Phase 2b 2015



Victoria Hospital Kirkcaldy, Fife Opened in 2012



Queen Elizabeth Hospital, Birmingham Opened in 2010



Tunbridge Wells Hospital, Pembury, Opened January 2011



The Royal London Hospital, Opened in February 2012



St Bartholomew's Hospital, London, Opened in June 2016



Southmead Hospital, Brunel Building Bristol, Opened May 2014

The Results



62%
CHANGE

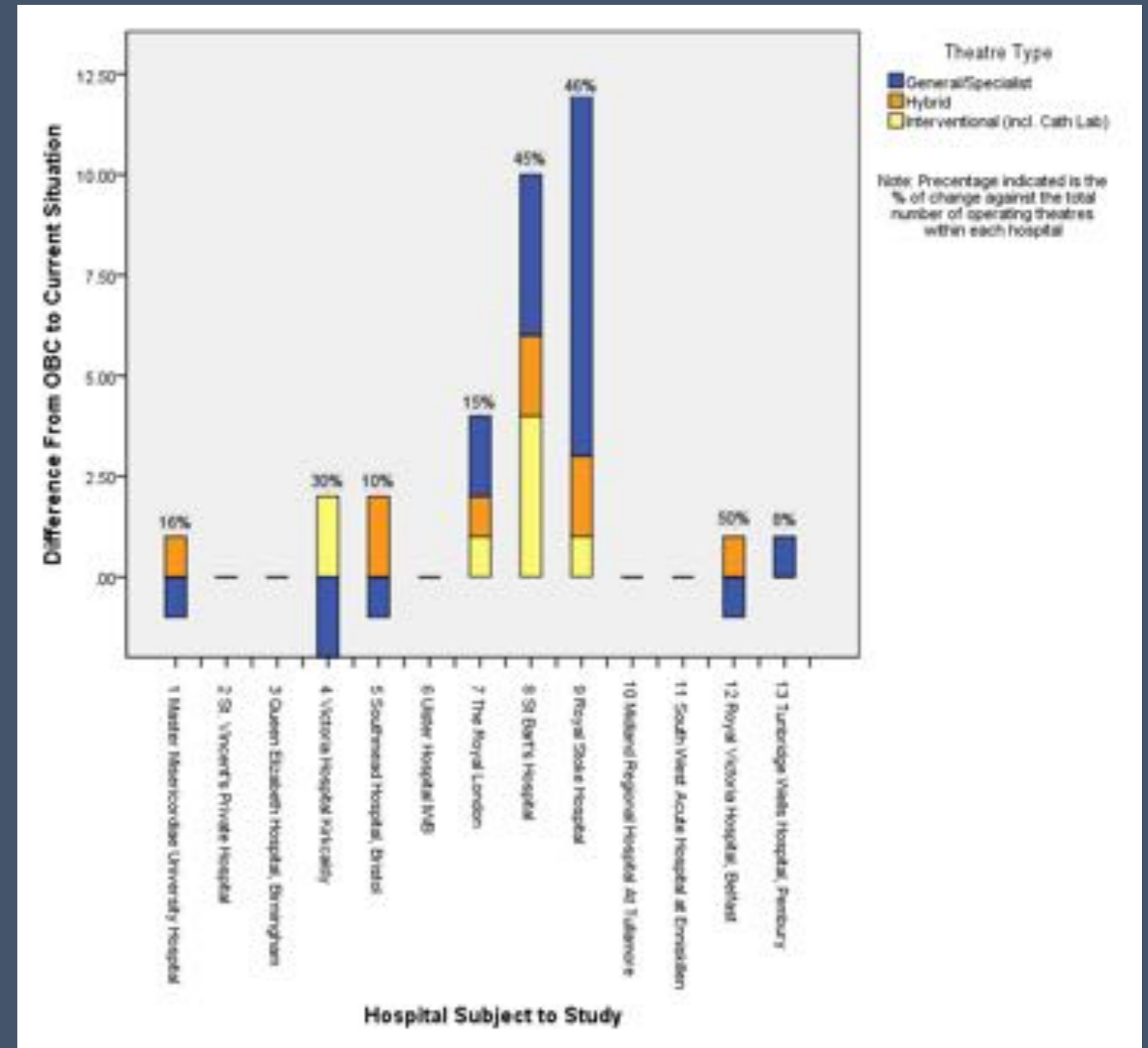
±6
YEARS

+4 -2

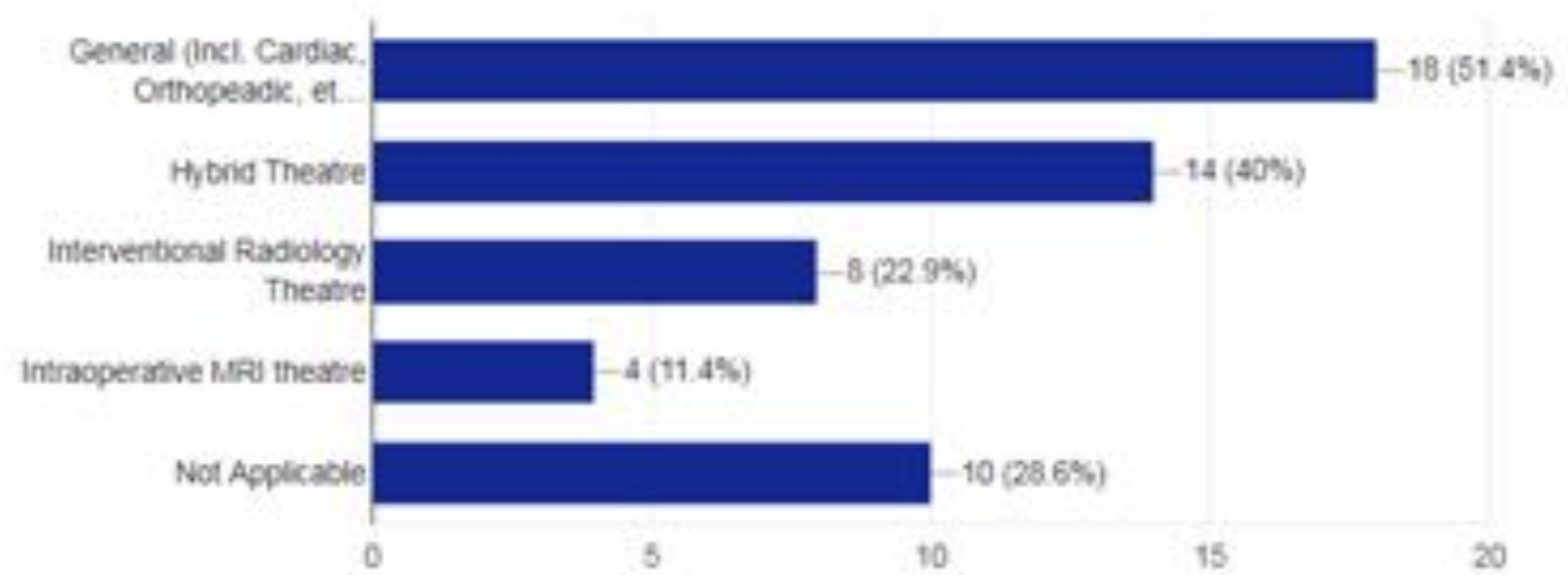
STATISTICALLY



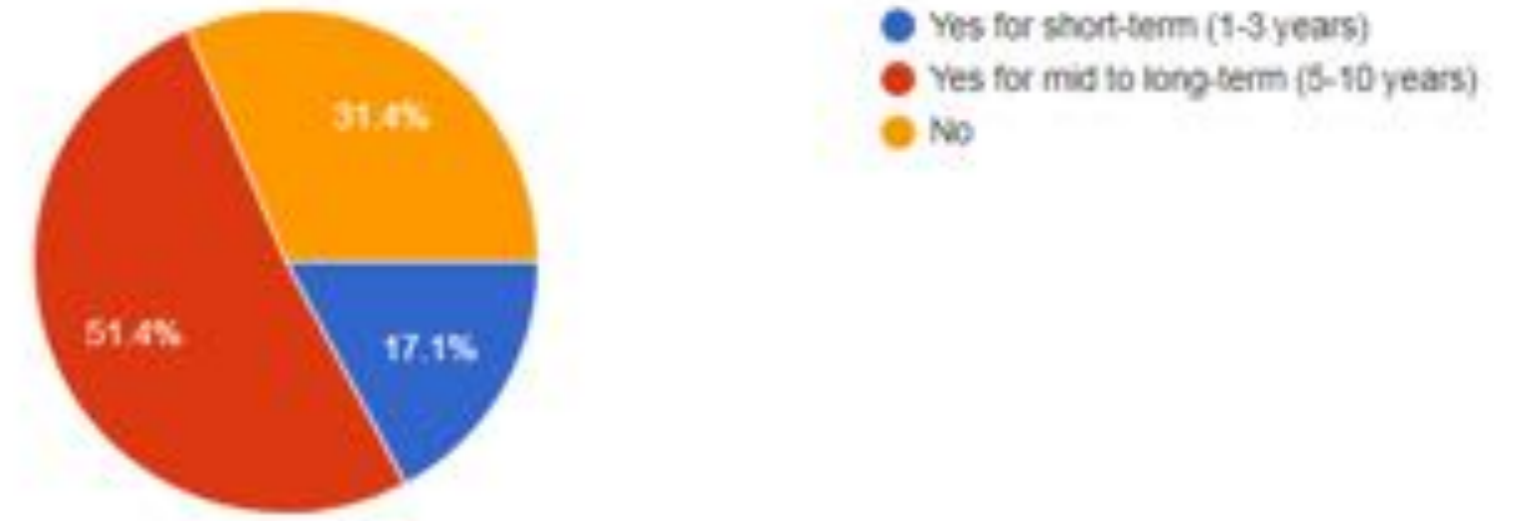
GENERAL THEATRES



The Qualitative Study



More???



Do you have the skills to forecast strategic or tactical needs of your operating theatre?

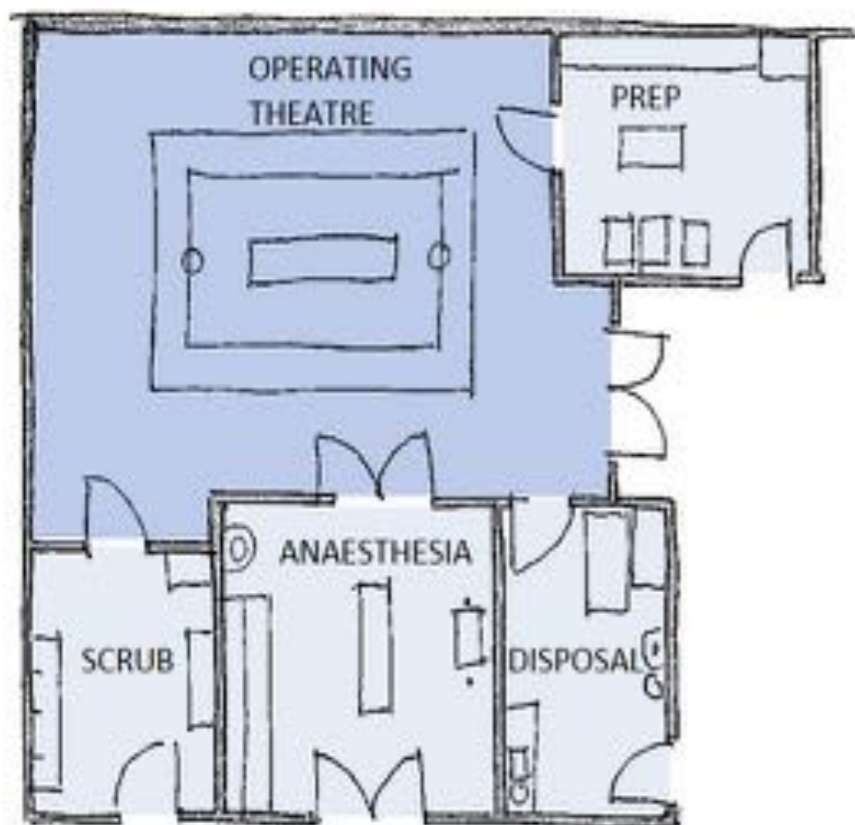
Current Guidance



- General and Emergency Theatres
- Ortho, Nuero and Cardiac Specialist Theatres
- Endoscopy suites
- Hybrid Theatres
- Cath Labs and Interventional suites



Current Guidance- Health Building Note (HBN) and alternatives



Current HBN 26 (2004)
Operating Theatre layout

Operating Theatre suite accommodation requirements by type									
General Operating Theatre (DOH, 2004)		Specialist Theatres; orthopaedic, neurological, cardiovascular		Catheter laboratory (DOH, 2013)		Hybrid Operating Theatre		Intra-operative MRI suite	
Room	Area m ²	Room	Area m ²	Room	Area m ²	Room	Area m ²	Room	Area m ²
Operating theatre	55	Theatre	55 ¹ 70-75 ²	Catheter lab.	50	Theatre	70-90 ³	Theatre	55 ¹ 70-75 ²
Anaesthetic room	19	Anaesthetic room	19	Anaesthetic room	19	Anaesthetic room	19	Anaesthetic room	19
Preparation room	12	Preparation room	12	Preparation room	9	Preparation room	9	Preparation room	12
Dirty utility room	12	Dirty utility room	12	Dirty utility room	12	Dirty utility room	12	Dirty utility room	12
Scrub-up: 3 places	11	Scrub-up: 3 places	11	Scrub-up: 2 places	7	Scrub-up: 2 places	7	Scrub-up: 3 places	11
Storage	1	Storage	1	Storage	4	Storage	4	Storage	1
				Computer room	10	Computer room	10	Computer room	10
				Control room	12	Control room	12	Control room	12
								Intra-operative MRI	42 ⁴
Totals (maximum figures taken)	110		130		113		163		184

- 1 HBN 26 and HBN 01-01 suggest that Orthopaedic (Ultra-clean) and Cardiac theatres should be sized at 55msq, similar to general theatres (DOH, 2004), however recent operating department briefs have included specialist theatres up to 85msq in area.
- 2 Area as recommended area by the American Society of Anesthesiologists, (Block and Helfman, 2012)
- 3 Area as recommended HBN 6, Facilities for Diagnostic Imaging and Interventional Radiology (DoH, 2001)
- 4 Area as recommended by Siemens AG, (Siemens, 2015), Nollert et al (2012), Block and Helfman, (2012), Kpodonu (2010)

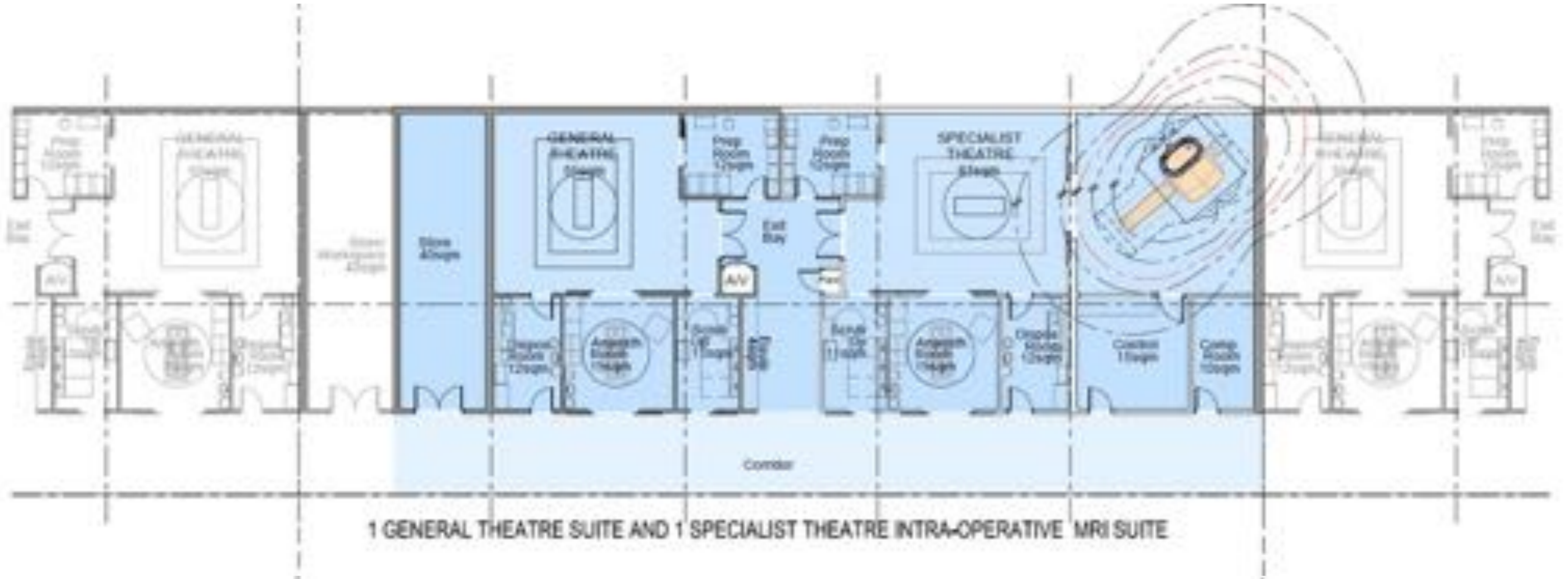
A Case of Flexibility and Adaptability



“there are simply too many parameters that are unknowable” (Rachel et al. 2009)

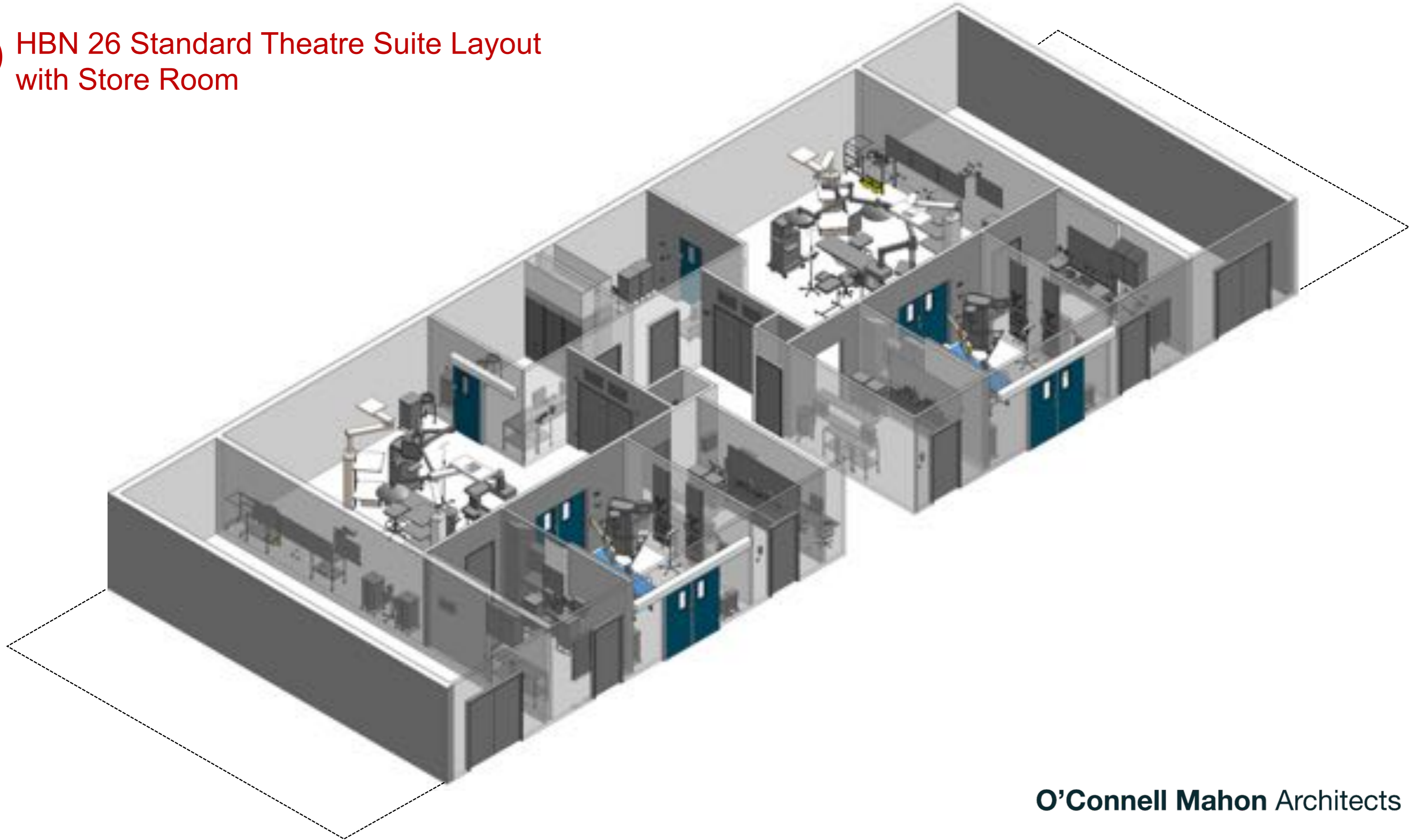
We need a different mindset and approach

A new approach and mindset?





HBN 26 Standard Theatre Suite Layout with Store Room



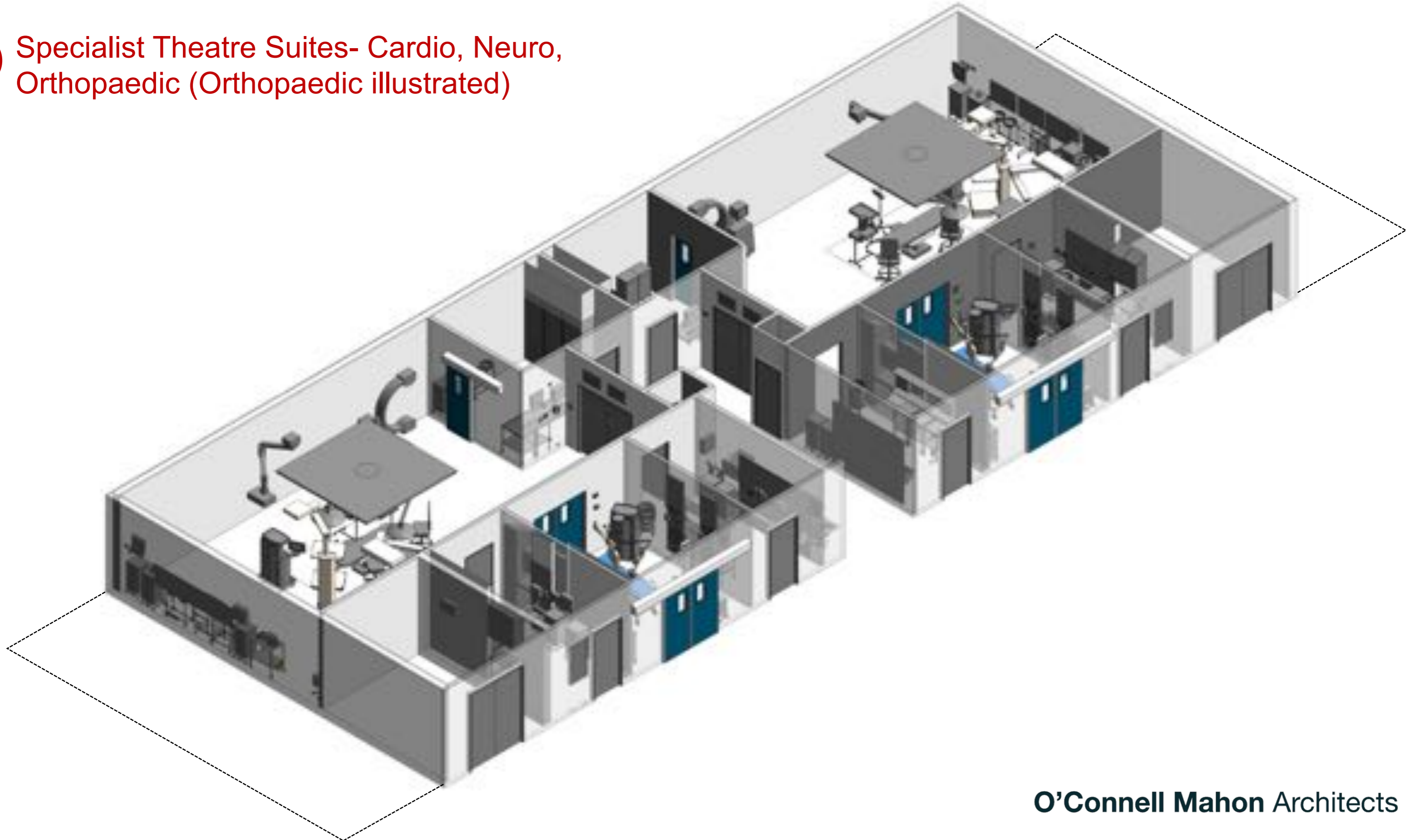


HBN 26 Standard Theatre Suite Layout with
Store Room – Dirty/ Clean Corridor separation



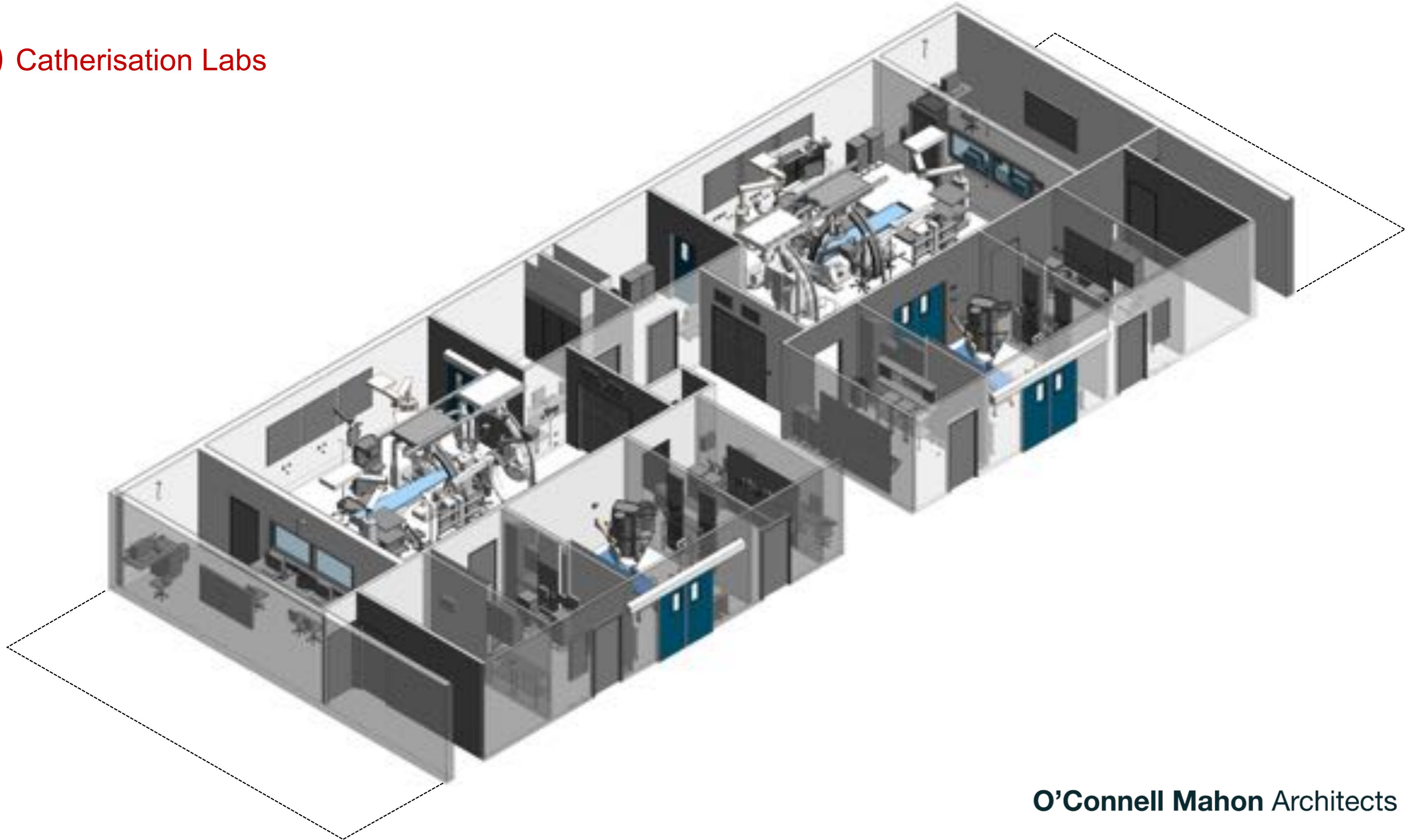


Specialist Theatre Suites- Cardio, Neuro,
Orthopaedic (Orthopaedic illustrated)

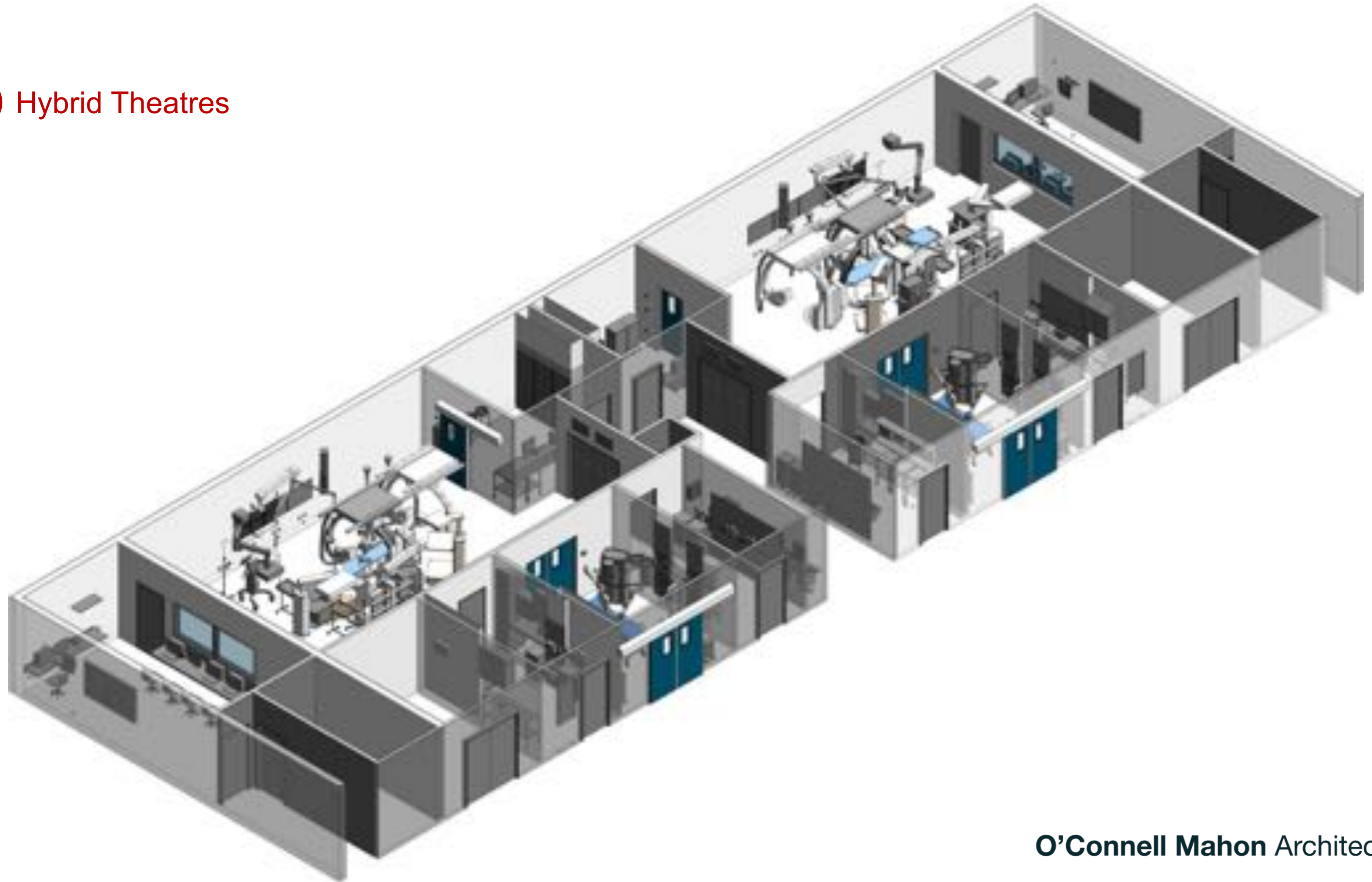




Catherisation Labs

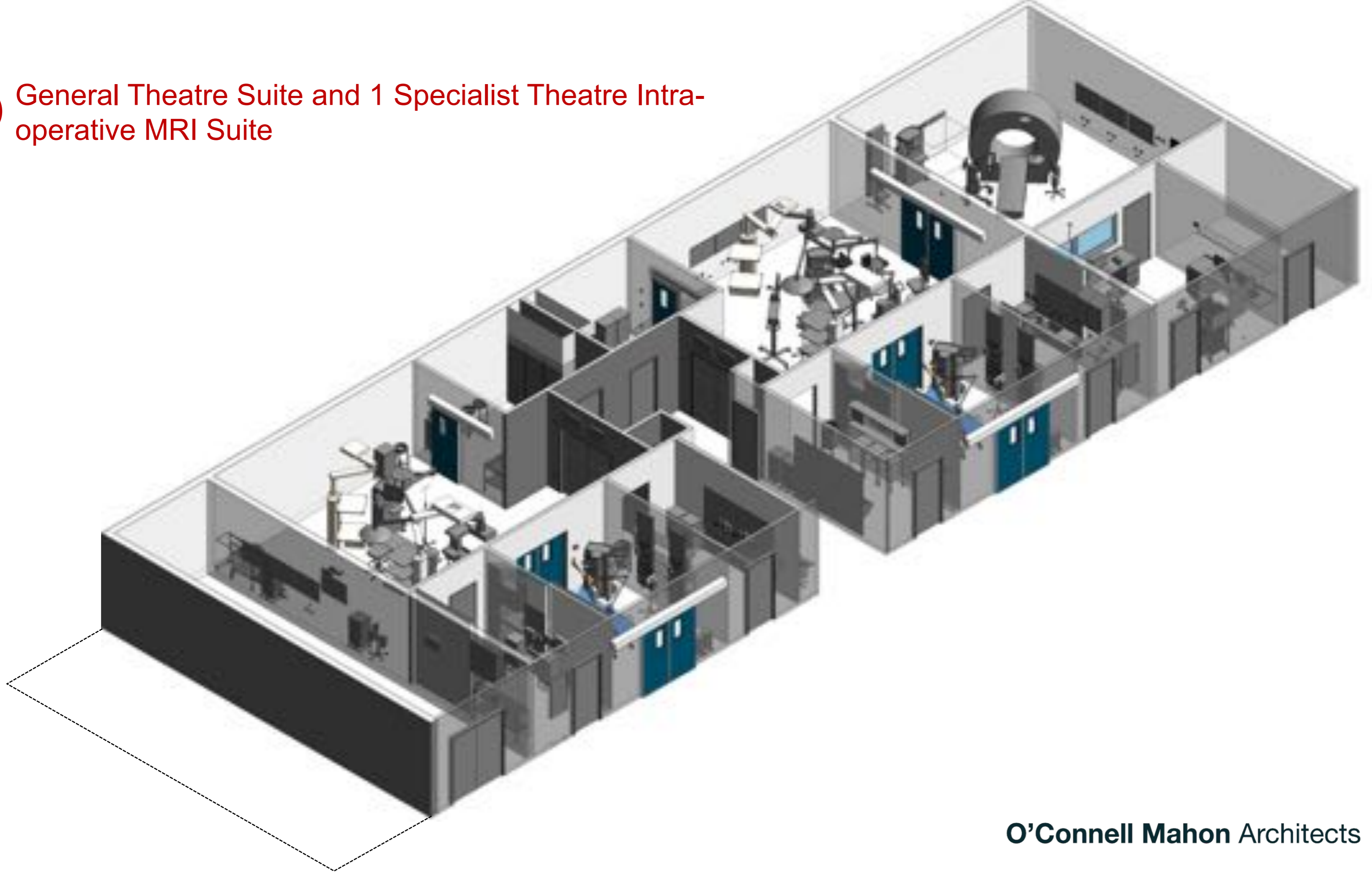


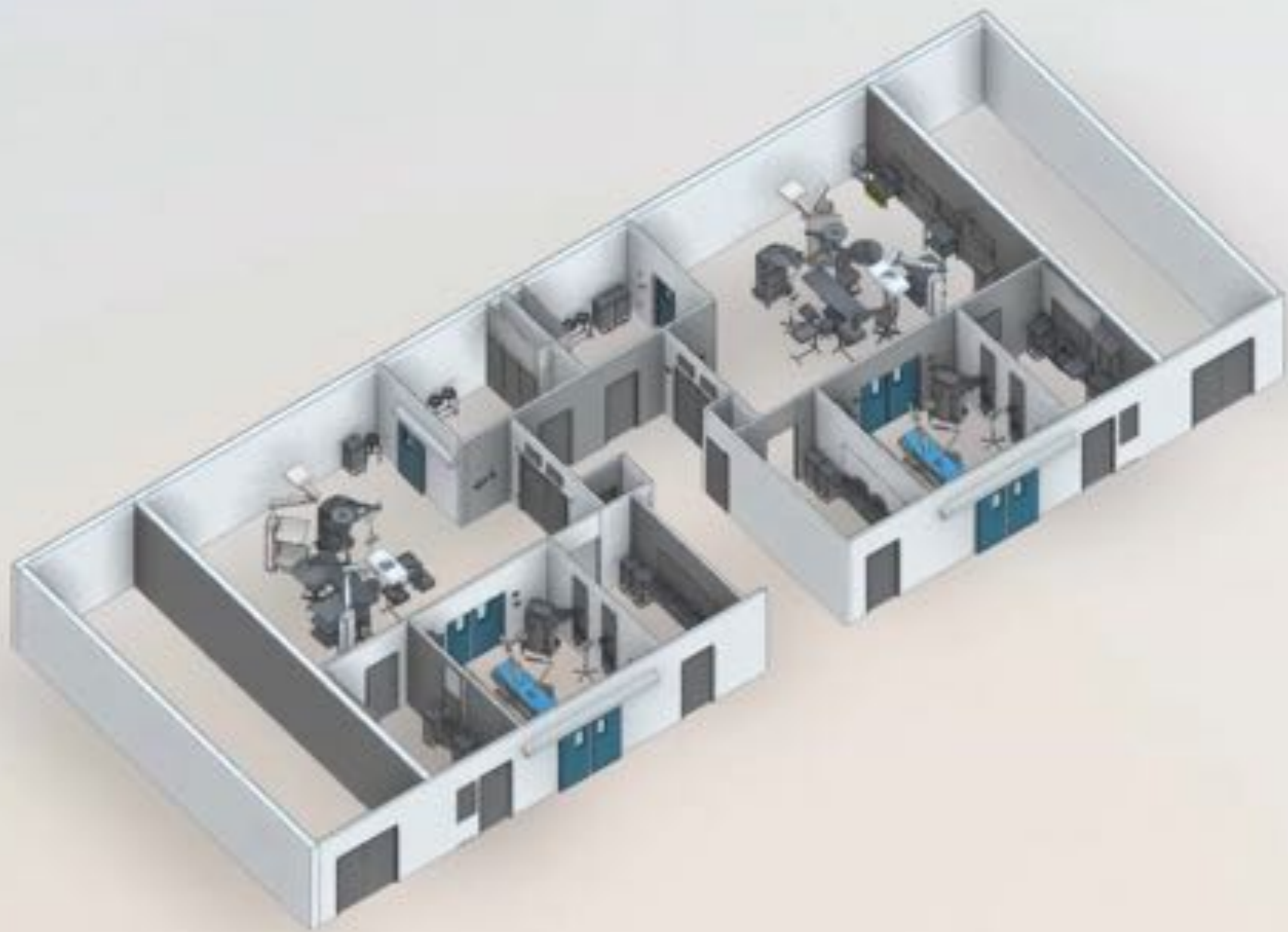
Hybrid Theatres





General Theatre Suite and 1 Specialist Theatre Intra-operative MRI Suite





THANK-YOU

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