

**ARE YOU
READY
FOR THE
FUTURE?**



Learning Objectives

- Understand the critical nature of early engagement of all stakeholders and what key factors should be considered when doing new buildings, expansion, or renovation.
- Learn how we are designing space for efficiency and flexibility and how each can be incorporated in plans.
- Identify innovative technologies that are being considered and how to implement them into a facility.
- Learn how prefabrication/integrated systems are creating efficiencies and how they differ from traditional construction.
- Understand alternative financing and how to implement in a project.

Rachel Hendrickson

AIA, NCARB, LEED AP
Healthcare Principal

Rachel is a Principal and Architect at Wold Architects and Engineers with a passion for healthcare. With over 23 years of healthcare experience in design, planning, real estate development and construction, Rachel brings creativity and a collaborative spirit to creating the best delivery models for our communities. Her expertise includes leading healthcare projects through Lean Methodology to bring innovative and sustainable design solutions that provide an exemplary experience for all. Rachel also currently serves as a board member at Allina Health United Hospital – Hastings Regina Hospital.



Jon Vollmer

LEED AP

Price Ultrasuite + Climate Representative

With 20 years of experience in the HVAC system sales and design build mechanical contracting, Jon has a unique understanding of manufacturing and design, engineering, and construction. For much of his career Jon has been working to find the highest value for customers by understanding needs, project scope, and most importantly real time costs. Jon graduated from UW-Madison with degrees in Electrical Engineering and Computer Sciences. He spent 10 years working for Harris Mechanical in Preconstruction and has spent the last 3 years working for TMS Johnson, a manufacturer's representative, dedicated the majority of his time to Operating Room product development..



Mark Mineau

Sales Representative

Mark attended The University of Wisconsin – Madison, earning a degree, followed by a MBA at Cardinal Stritch University. He has 20+ years of experience working for Stryker in infrastructural design around surgery, emergency departments, intensive care units, Endoscopy departments, ambulatory surgery centers, and really anywhere else needed. His focus has been on maximizing infrastructure design and implementation all in an effort to add safety, efficiencies, and simplicity to surgery. He has a strong passion for making sure people have access to healthcare so that sickness, injury, disease, or accidents don't keep them from life's daily experiences for very long if at all possible. He's motivated professionally by all of the nurses & surgeons he works with on a daily basis, allowing their strong passion for care rub off on him personally, his design principles, and life as a whole.



Brian Evan

PE, ASSOCIATE

Mechanical Engineering Principal

Brian graduated from the University of Minnesota – Duluth with a degree in Mechanical Engineering. Brian's passion for design started when he was a kid, designing and building all kinds of contraptions in his grandfather's woodshop. He has taken that passion and channeled it over the past 13+ years to partner with clients to create efficient and cost-effective facilities to meet the needs of their community best. Brian's experience gives him a deep understanding of sustainable and seamless mechanical systems' high-level expectations. His healthcare knowledge leads to the design of efficient and reliable systems that create comfortable environments for patients, their families, and staff. Healthcare is a universal need, and he aims to design state-of-the-art healthcare facilities where he would feel very comfortable sending his own family members for care.



Sitha Chhum

PE, ASSOCIATE

Electrical Engineering Principal

Wold Architects and Engineers: Sitha graduated from the University of Minnesota with a degree in Electrical Engineering. A science kit gift and playing the Oregon

Trail on an Apple II computer hooked Sitha into the world of software and electronics. The need to figure out how things work and always wanting to learn more

has led to an 18+ year career collaborating on dynamic solutions for each client's unique needs. He

has experience designing electrical distribution, generators, lighting, voice/data, nurse call, security and fire alarm systems for high performing healthcare facilities. Sitha understands that reliable and scalable

systems are a requirement in a world where connected technology, demand for more power and managing the unexpected are the norm.



PLANNING

SYSTEM

INTEGRATION

ROBOTICS

MECHANICAL +

ELECTRICAL

INFRASTRUCTURE

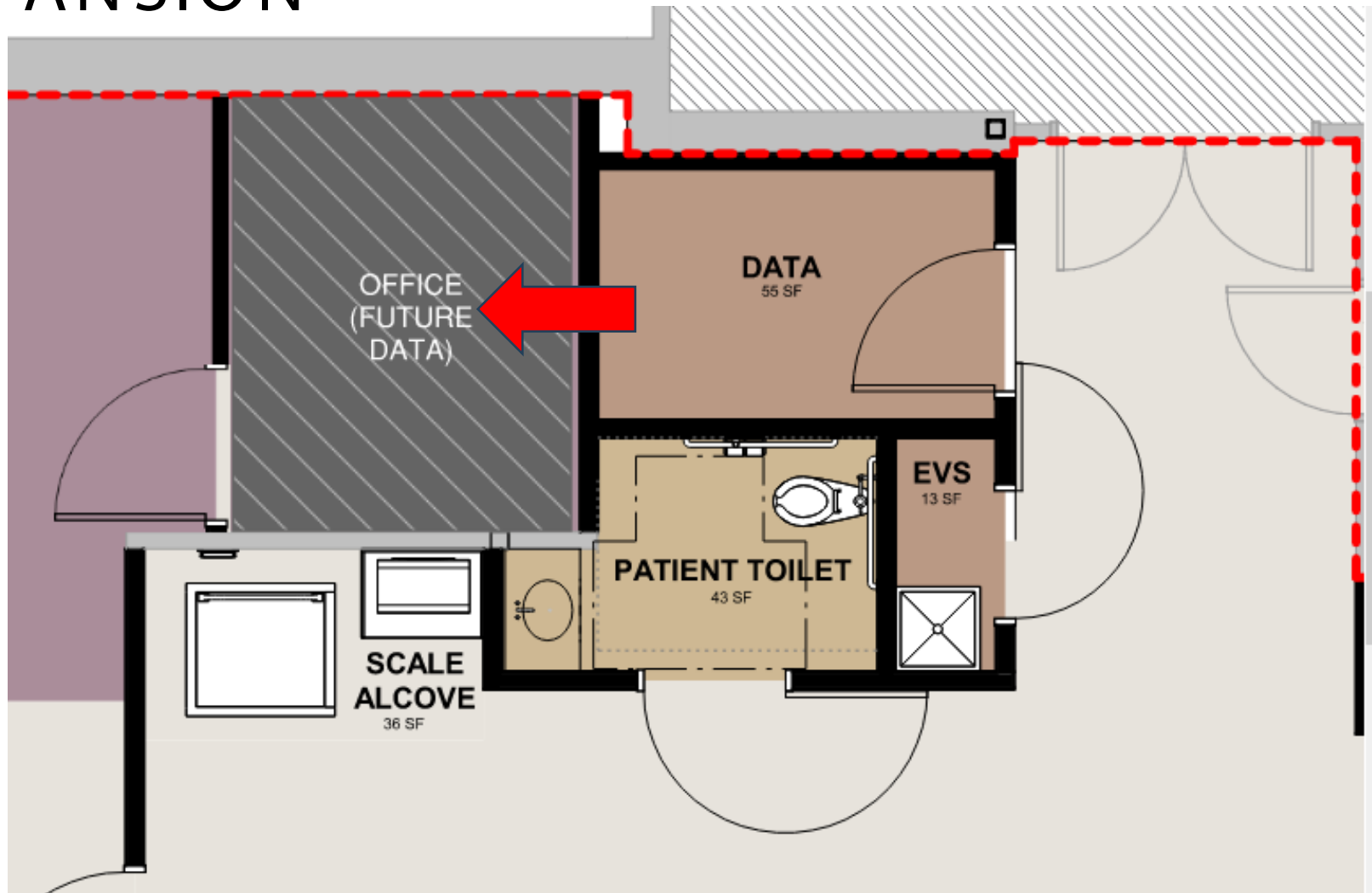
FINANCING



PLANNING

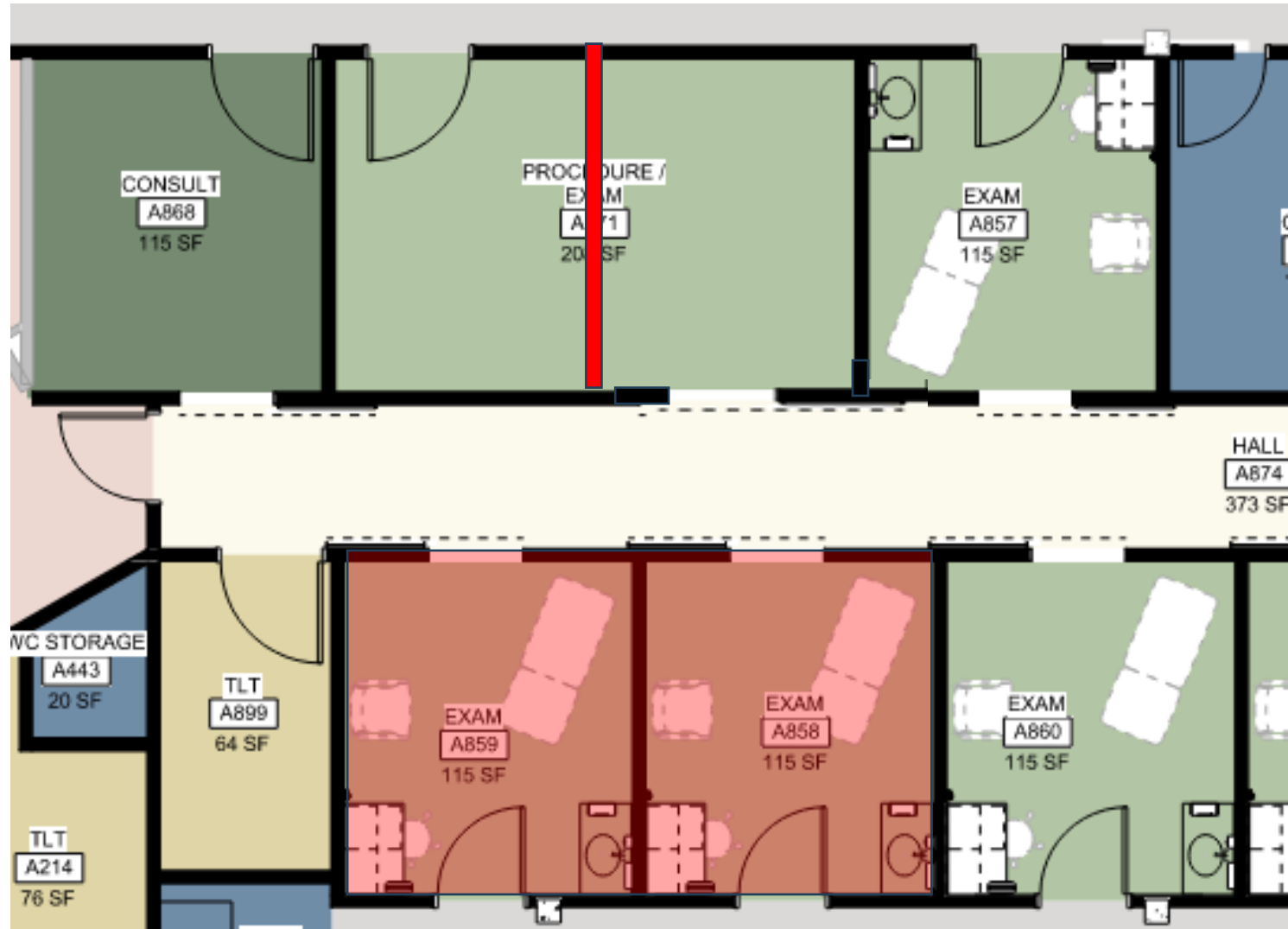
PLANNING – Flexible Spaces

DATA EXPANSION



PLANNING – Flexible Spaces

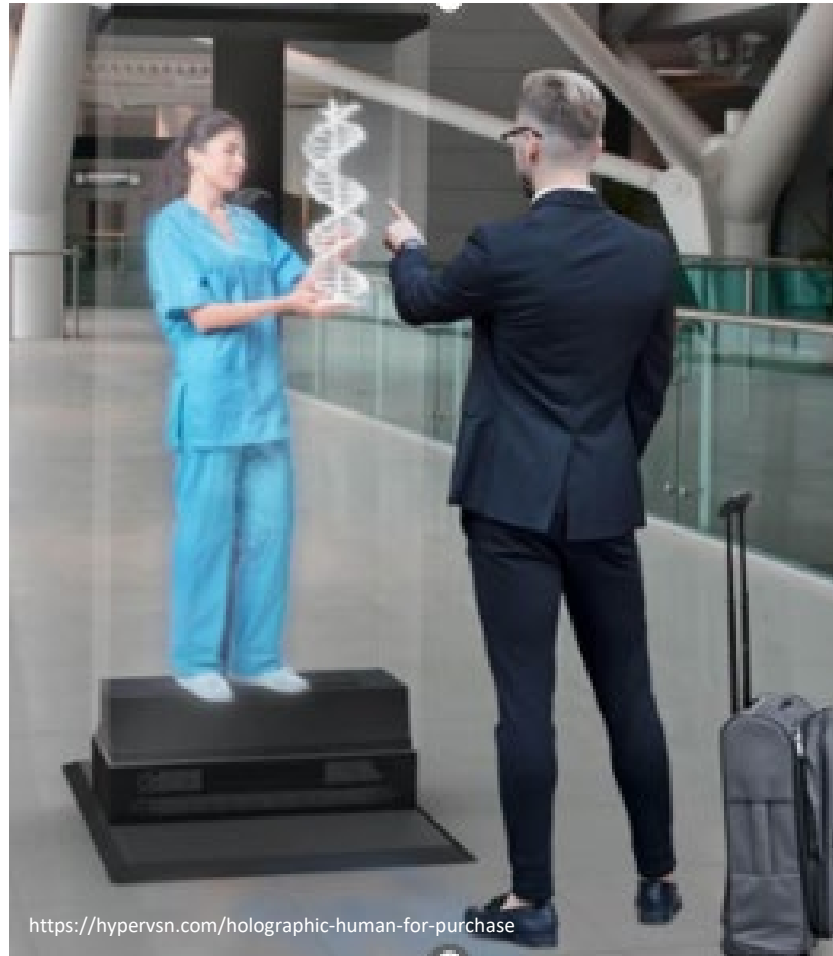
ROOM FLEXIBILITY



PLANNING-Modular Wall Systems



PLANNING-Space Needs



PLANNING-Space Needs

CentraCare First in World to Use 4D Hologram Technology to Successfully Complete Structural Heart Procedure

Published Jun 23, 2021 in Heart & Vascular, Media Releases

Author: CentraCare

EchoPixel's pre-planning and intra-operative technologies reduced complex heart procedure time while improving quality of outcomes



CentraCare, one of the largest health systems in Minnesota, has successfully completed the first structural heart procedure in the world

<https://www.centracare.com/blog/2021/june/centracare-first-in-world-to-use-4d-hologram-tec/>

Texas hospital introduces hologram for doctor-patient visits

- HoloBox projects lifesize hologram of doctor for real-time patient consults
- The device's goal is to replace in-person visits, reduce patient wait times
- Hospital CEO: Holograms are more engaging than a Zoom or a telehealth call



Stephanie Holmes
Updated: JUL 3, 2024 / 08:12 AM CDT

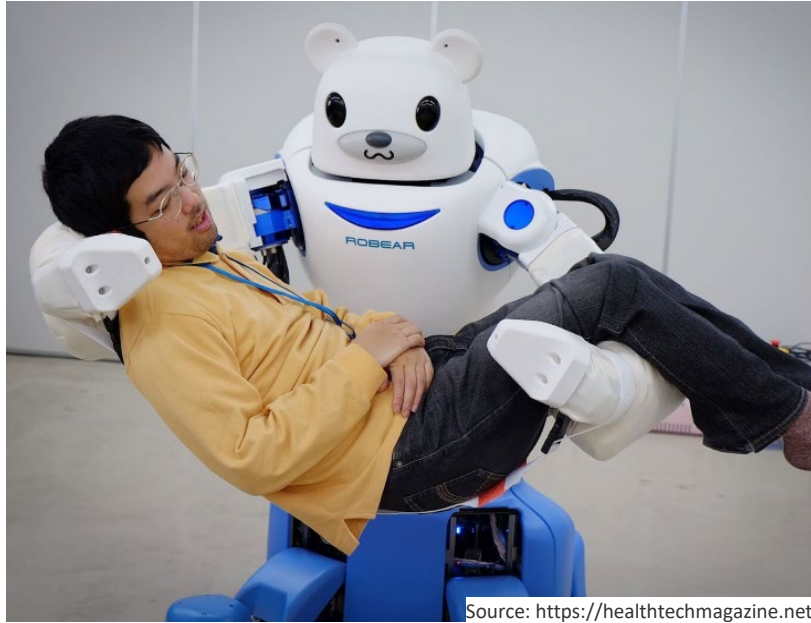
<https://abcnews.go.com/Health/texas-hospital-reportedly-1st-us-holograms-doctor-patient/story?id=111435198>

https://memory-alpha.fandom.com/wiki/The_Doctor



“ Welcome to the future!”
*-Dr. Lewis Zimmerman
Chief Medical Officer USS
Voyager-A*

PLANNING - Got Staff Issues?



Source: <https://healthtechmagazine.net>



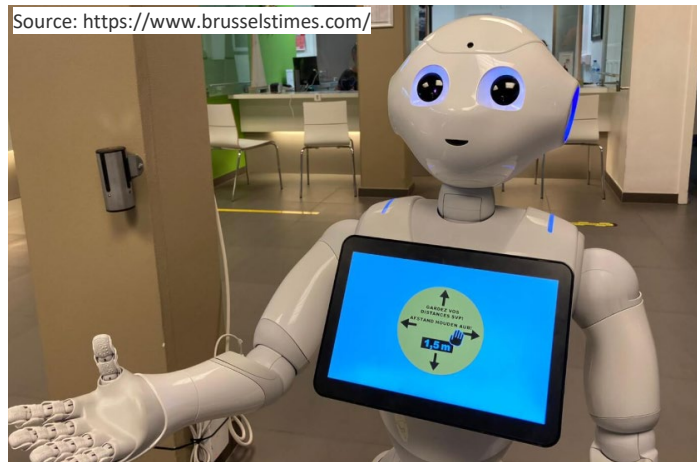
<https://www.med.stanford.edu/news/all-news/2019/11/robots-join-the-workforce-at-the-new-stanford-hospital-.html>



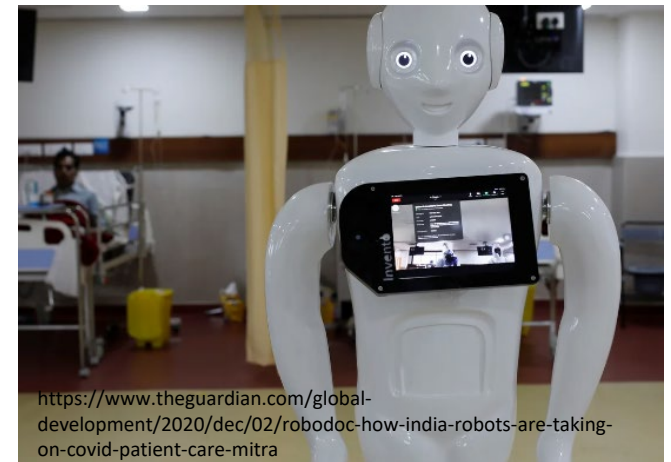
Source: <https://healthtechmagazine.net>



www.rankred.com



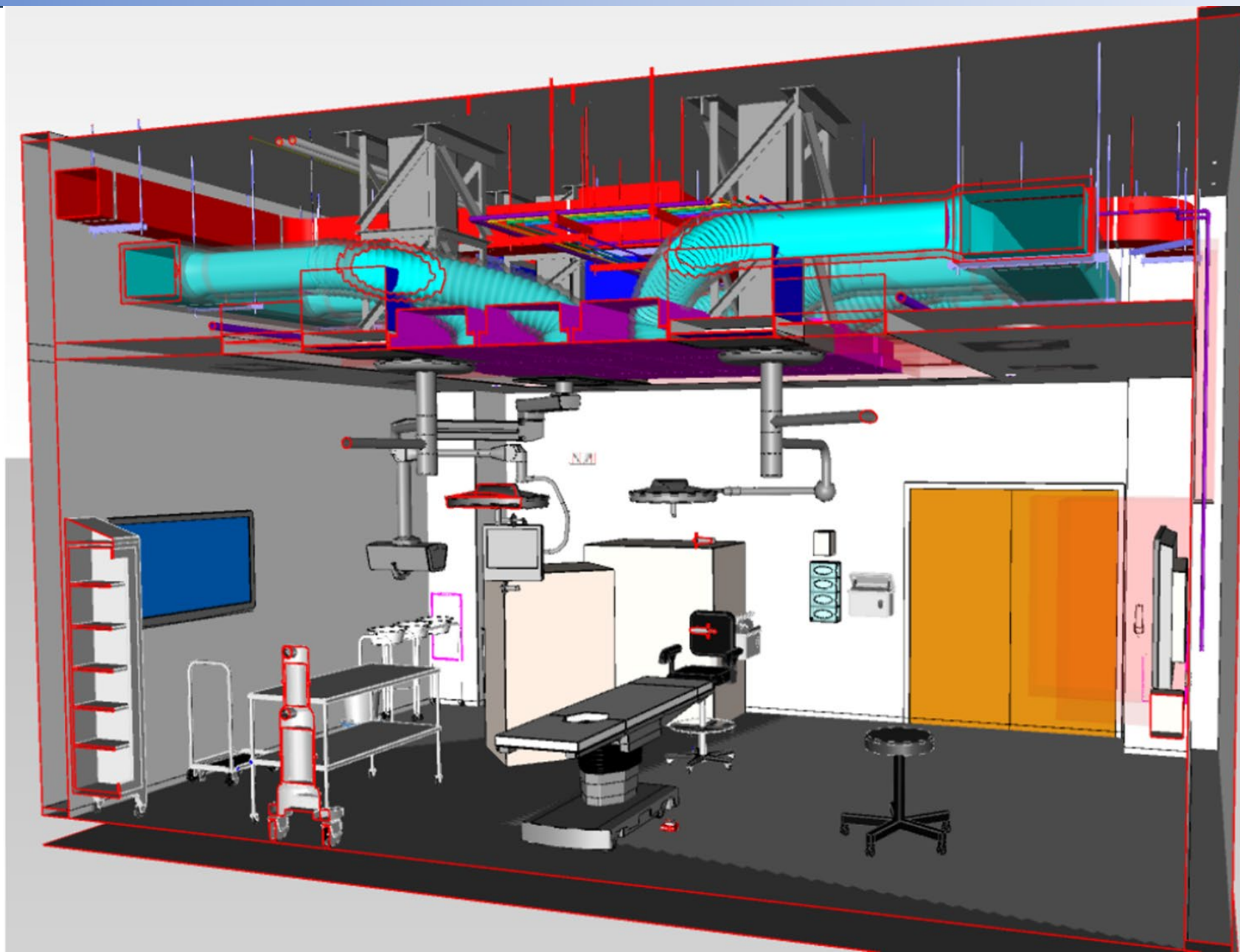
Source: <https://www.brusselstimes.com>



<https://www.theguardian.com/global-development/2020/dec/02/robotoc-how-india-robots-are-taking-on-covid-patient-care-mitra>

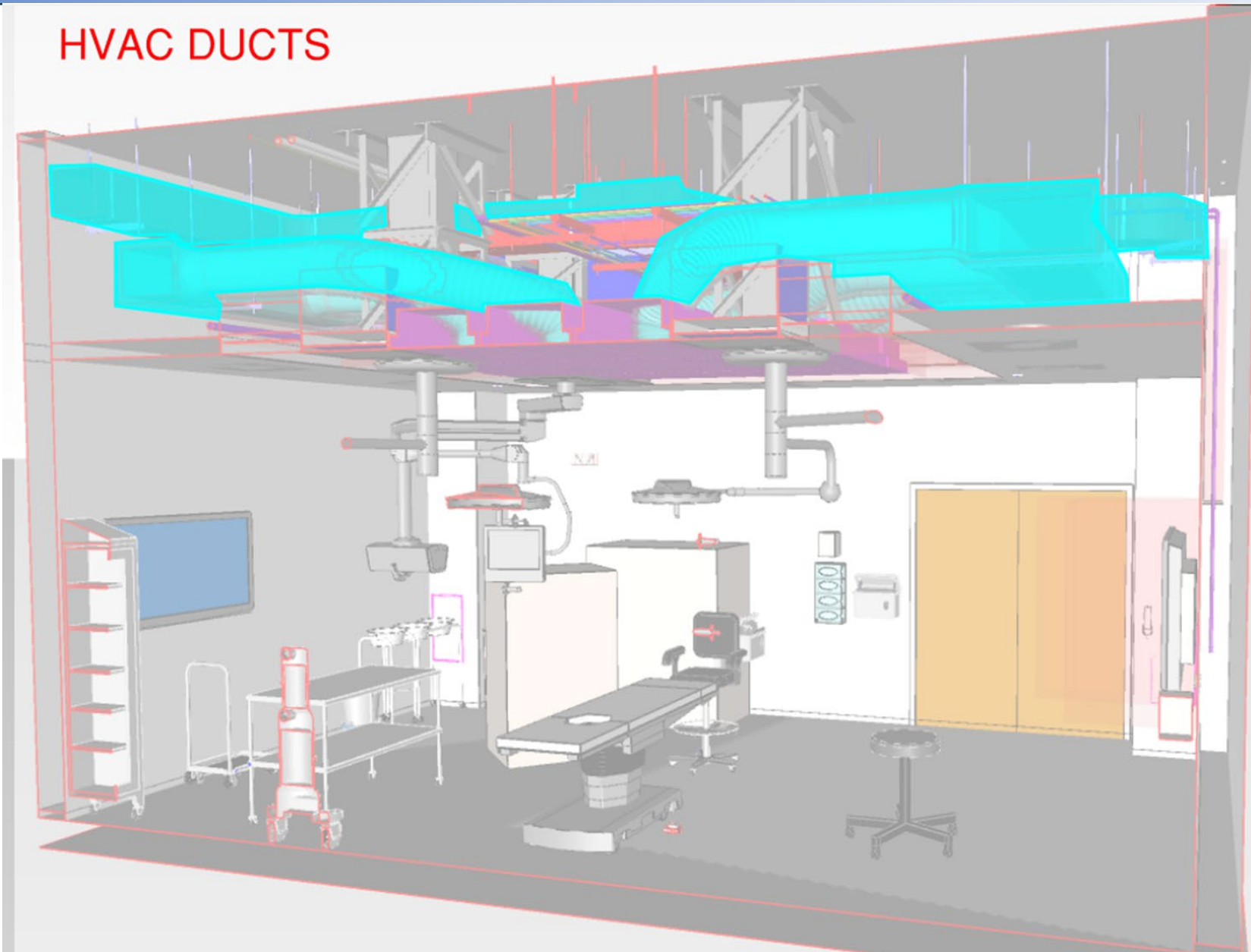
SYSTEM INTEGRATION

SYSTEM INTEGRATION



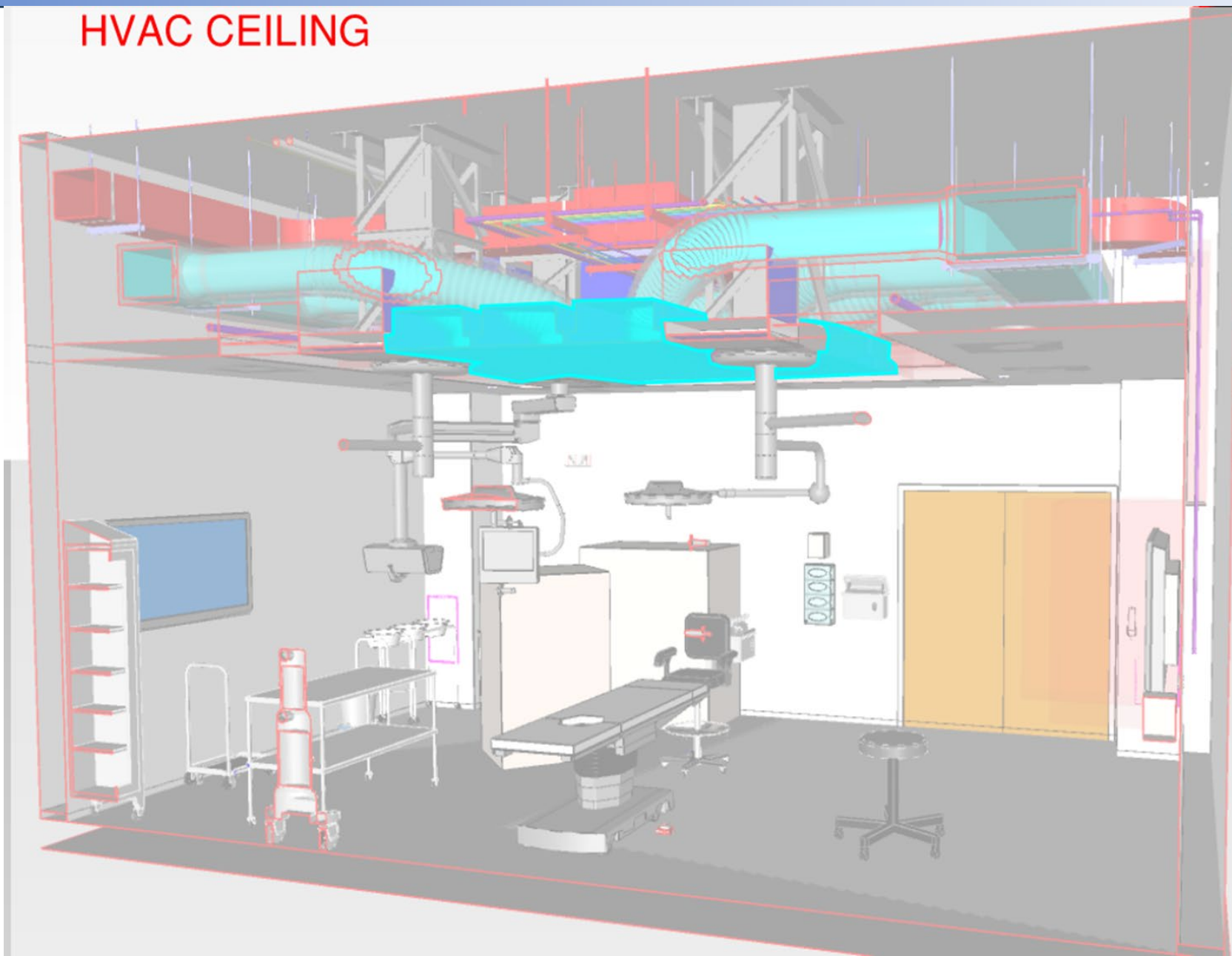
SYSTEM INTEGRATION

HVAC DUCTS



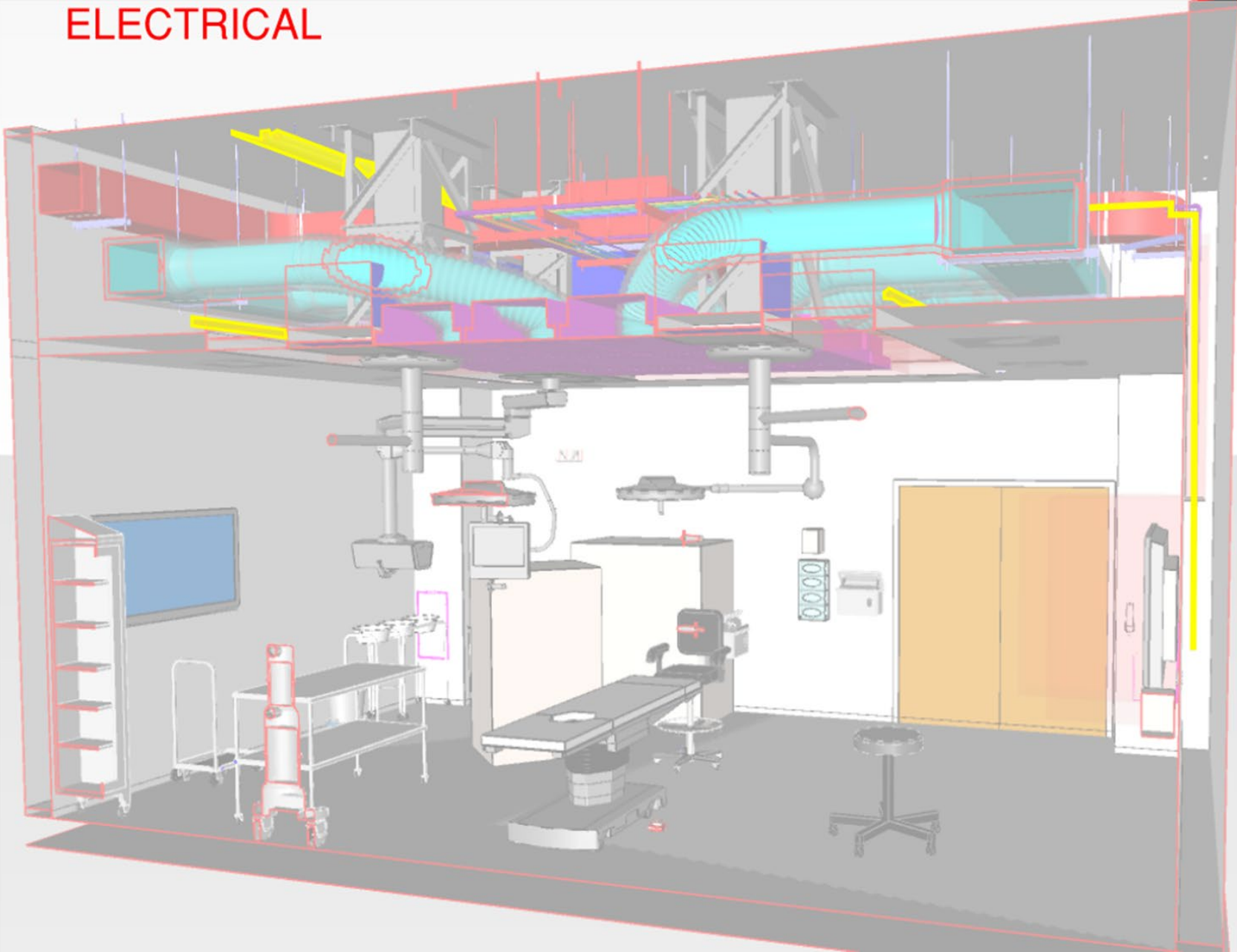
SYSTEM INTEGRATION

HVAC CEILING



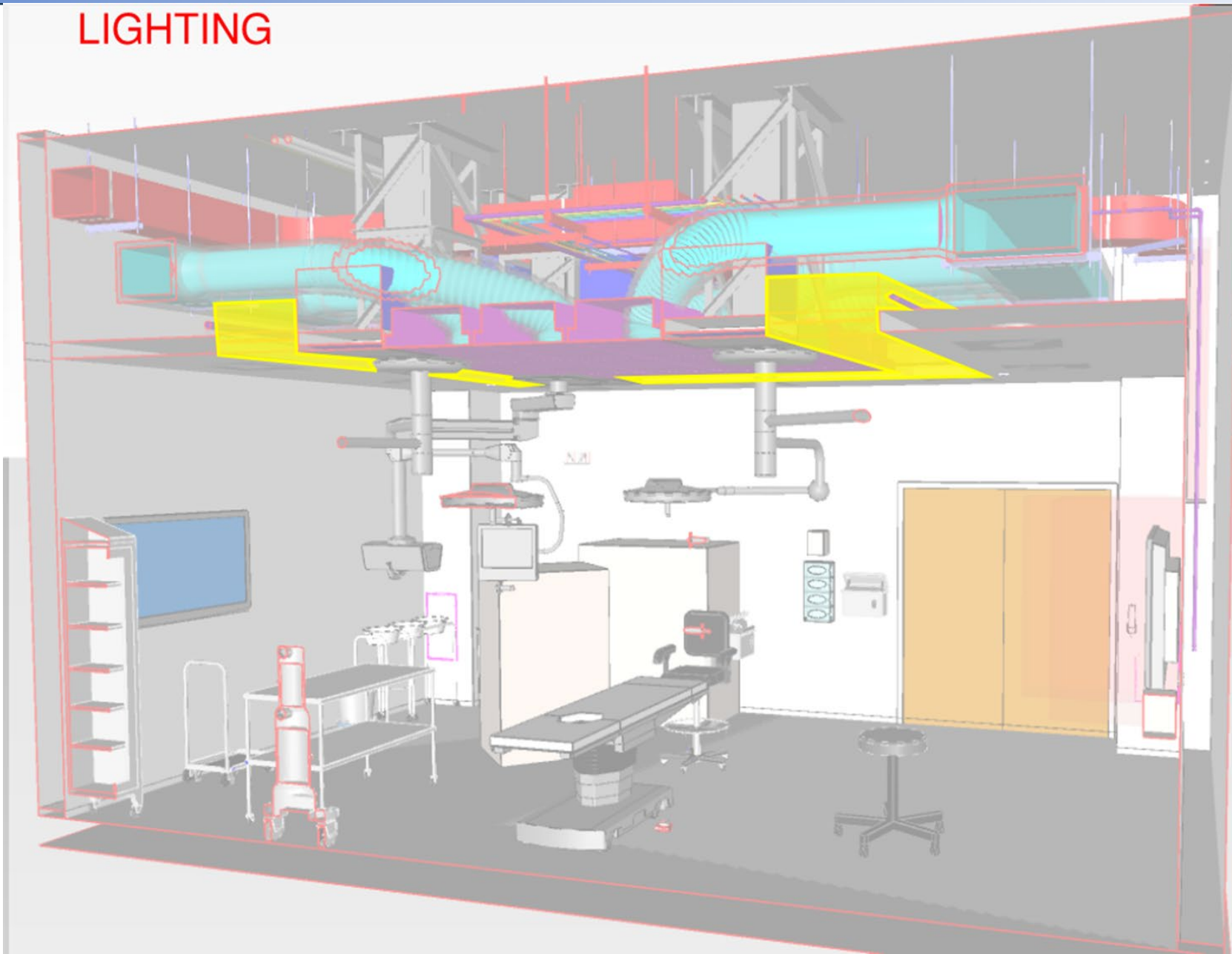
SYSTEM INTEGRATION

ELECTRICAL



SYSTEM INTEGRATION

LIGHTING



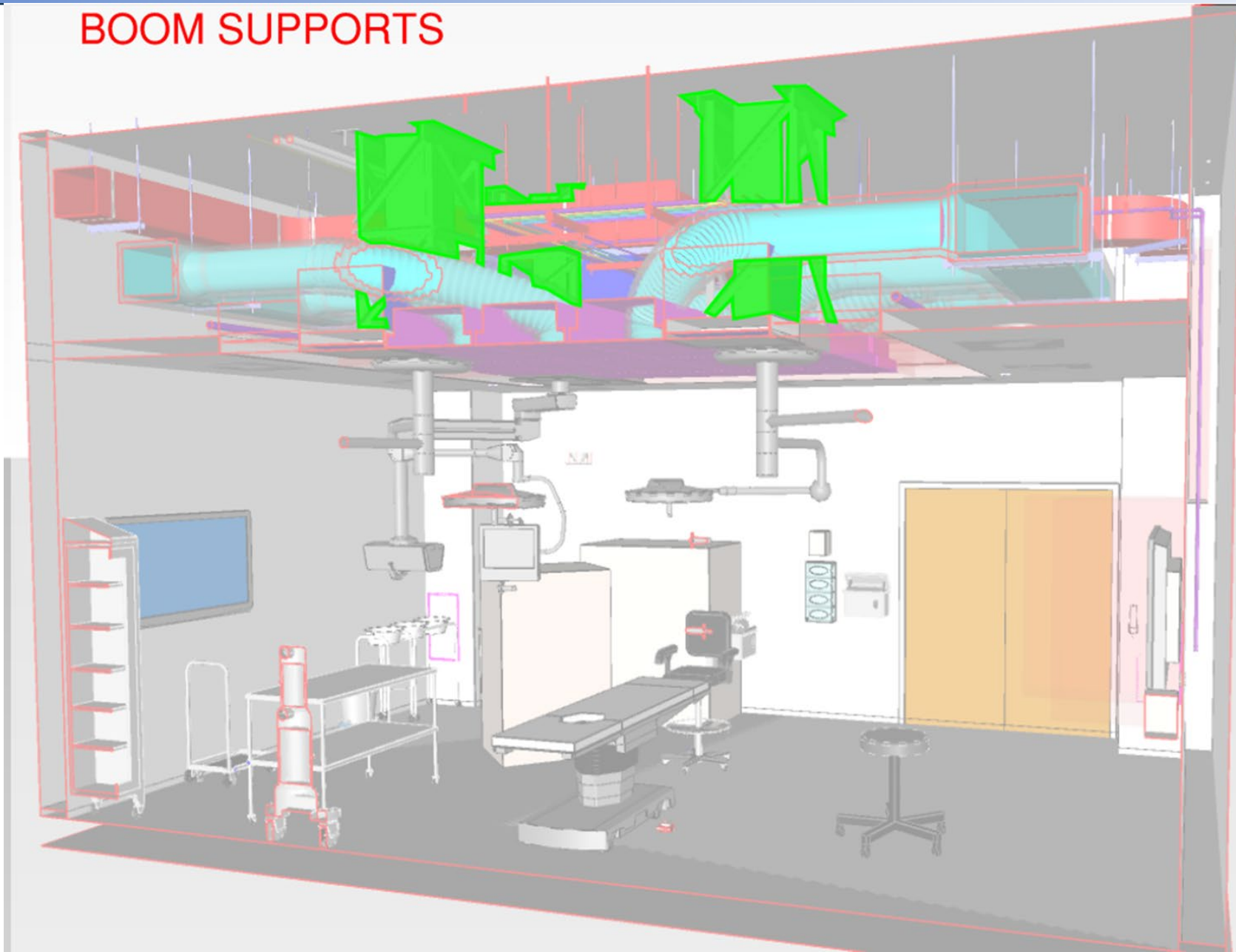
SYSTEM INTEGRATION

CEILING



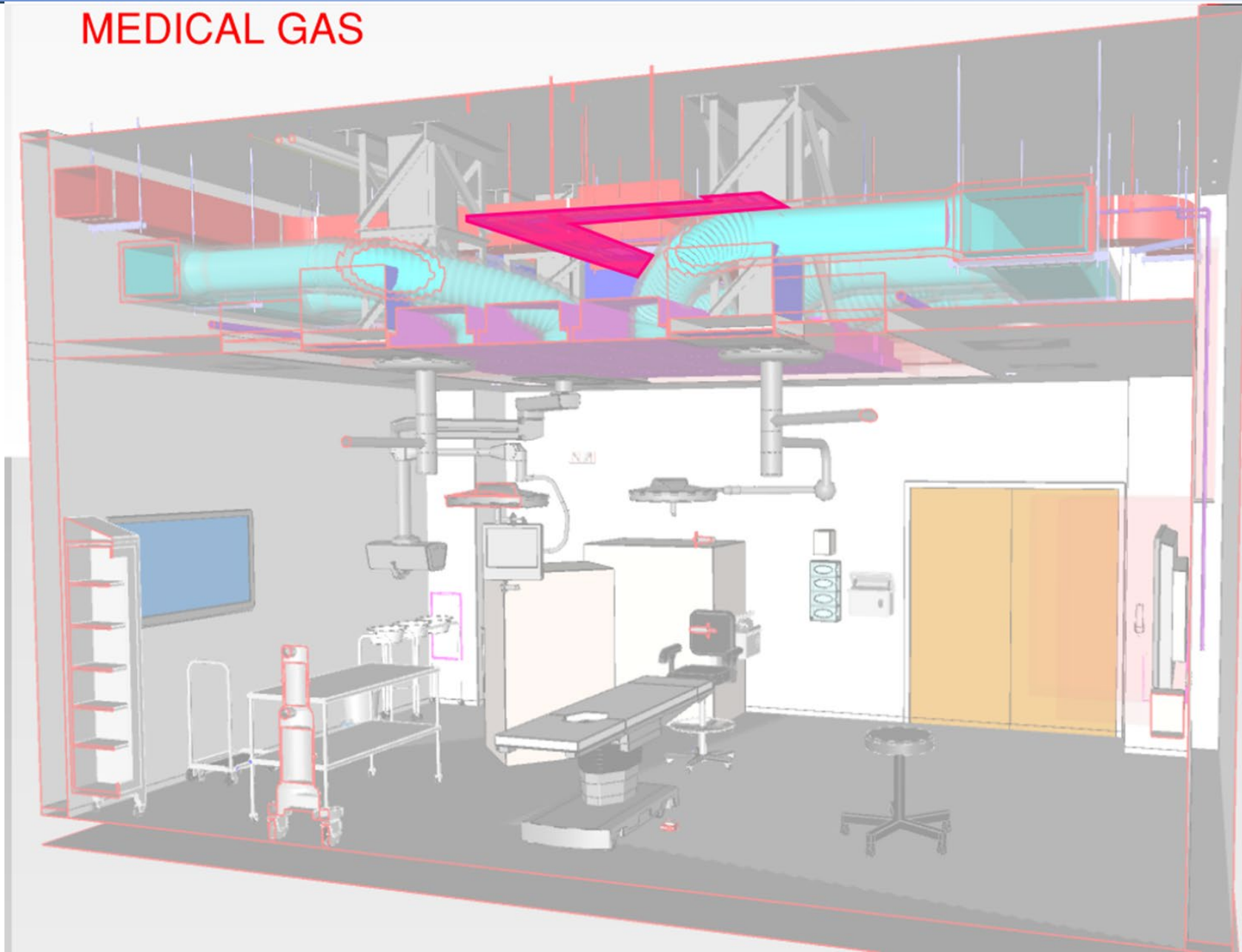
SYSTEM INTEGRATION

BOOM SUPPORTS



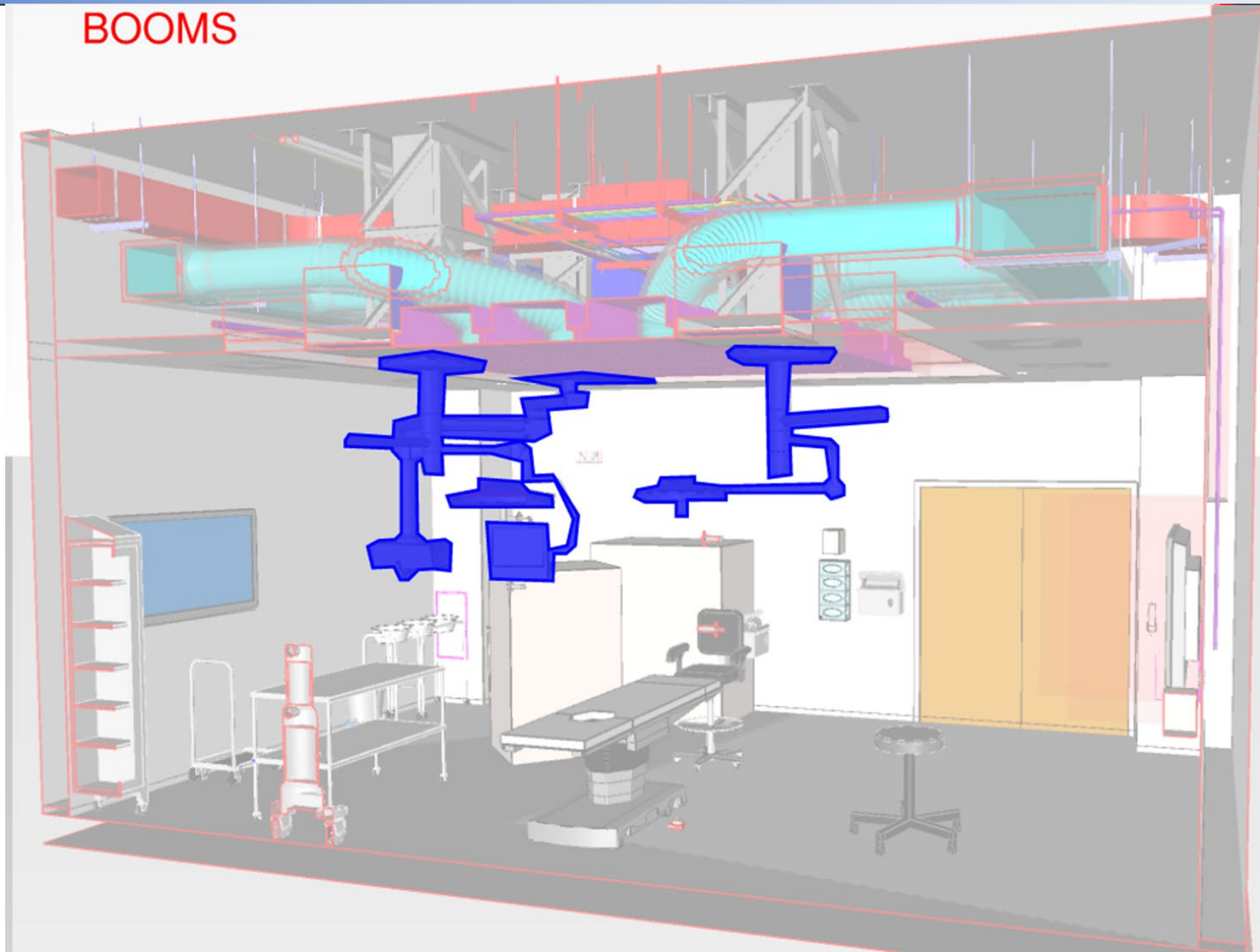
SYSTEM INTEGRATION

MEDICAL GAS



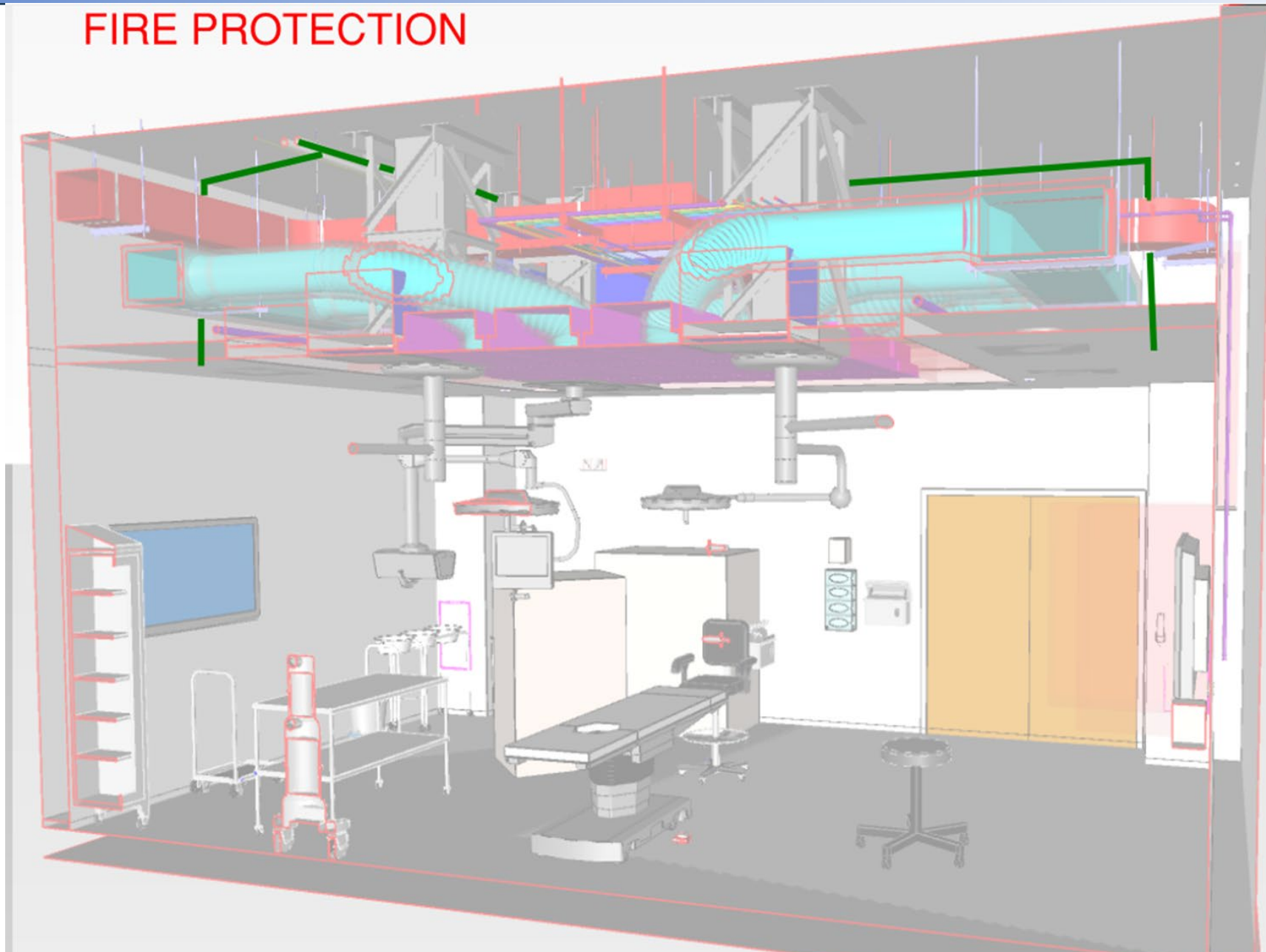
SYSTEM INTEGRATION

BOOMS



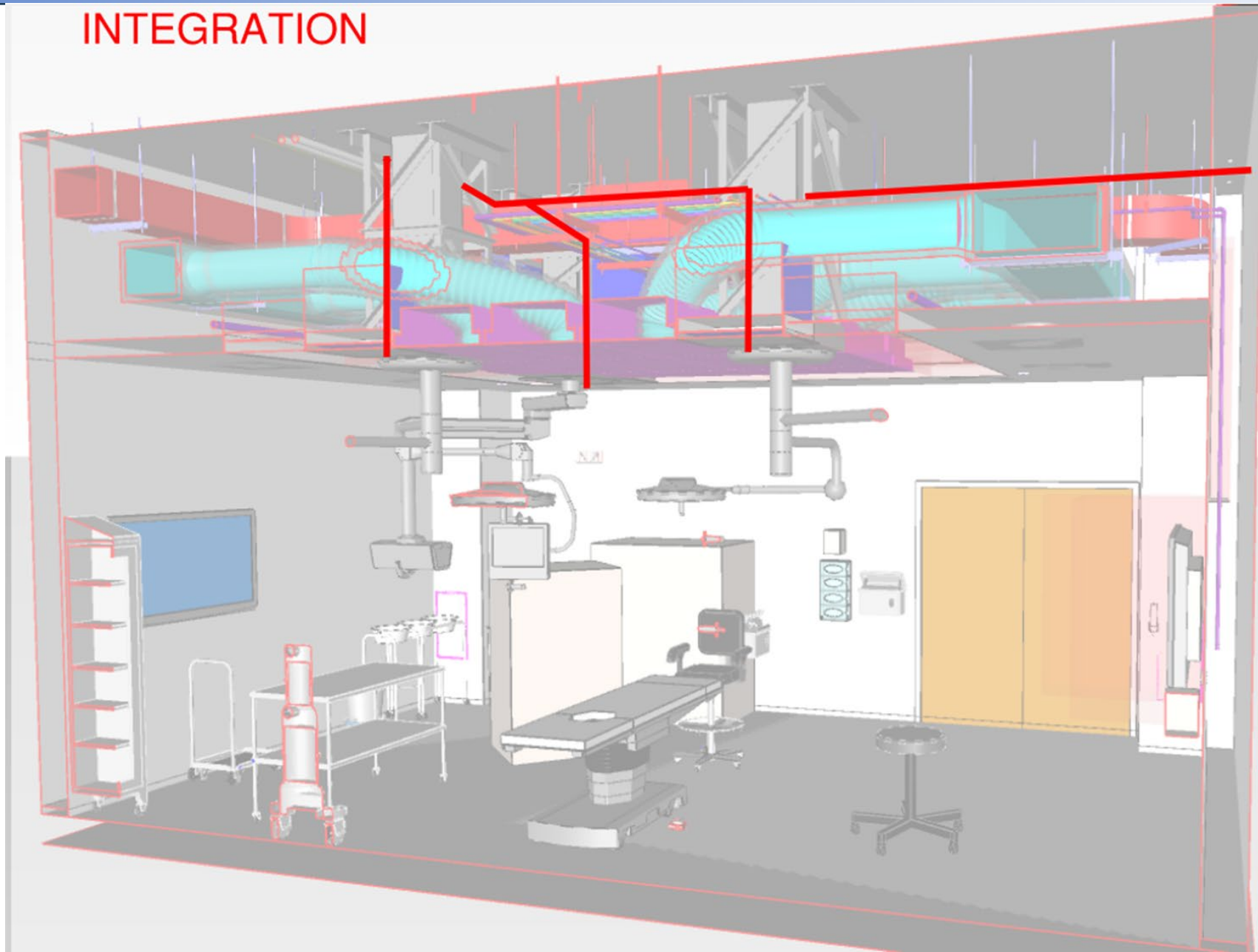
SYSTEM INTEGRATION

FIRE PROTECTION



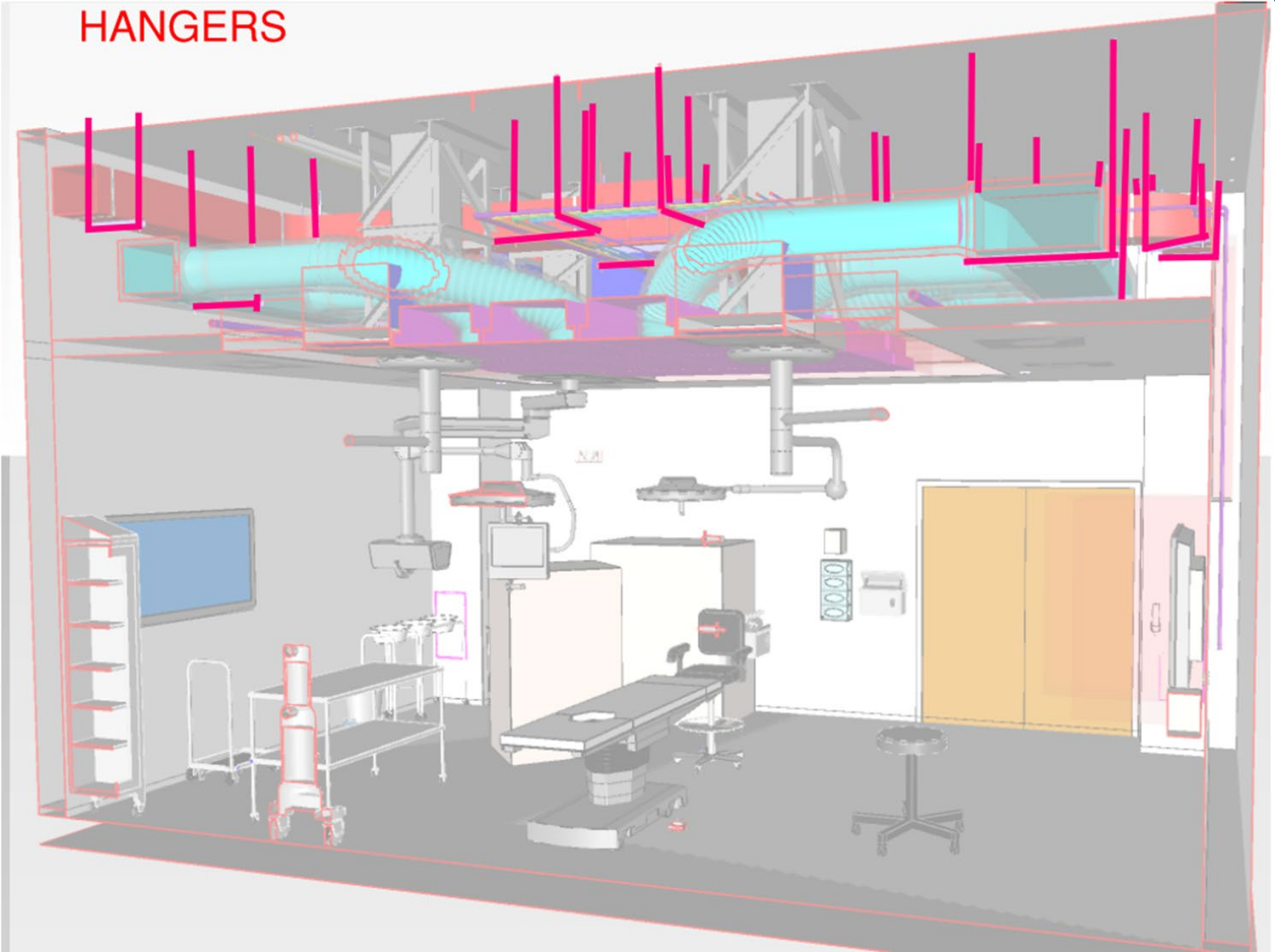
SYSTEM INTEGRATION

INTEGRATION



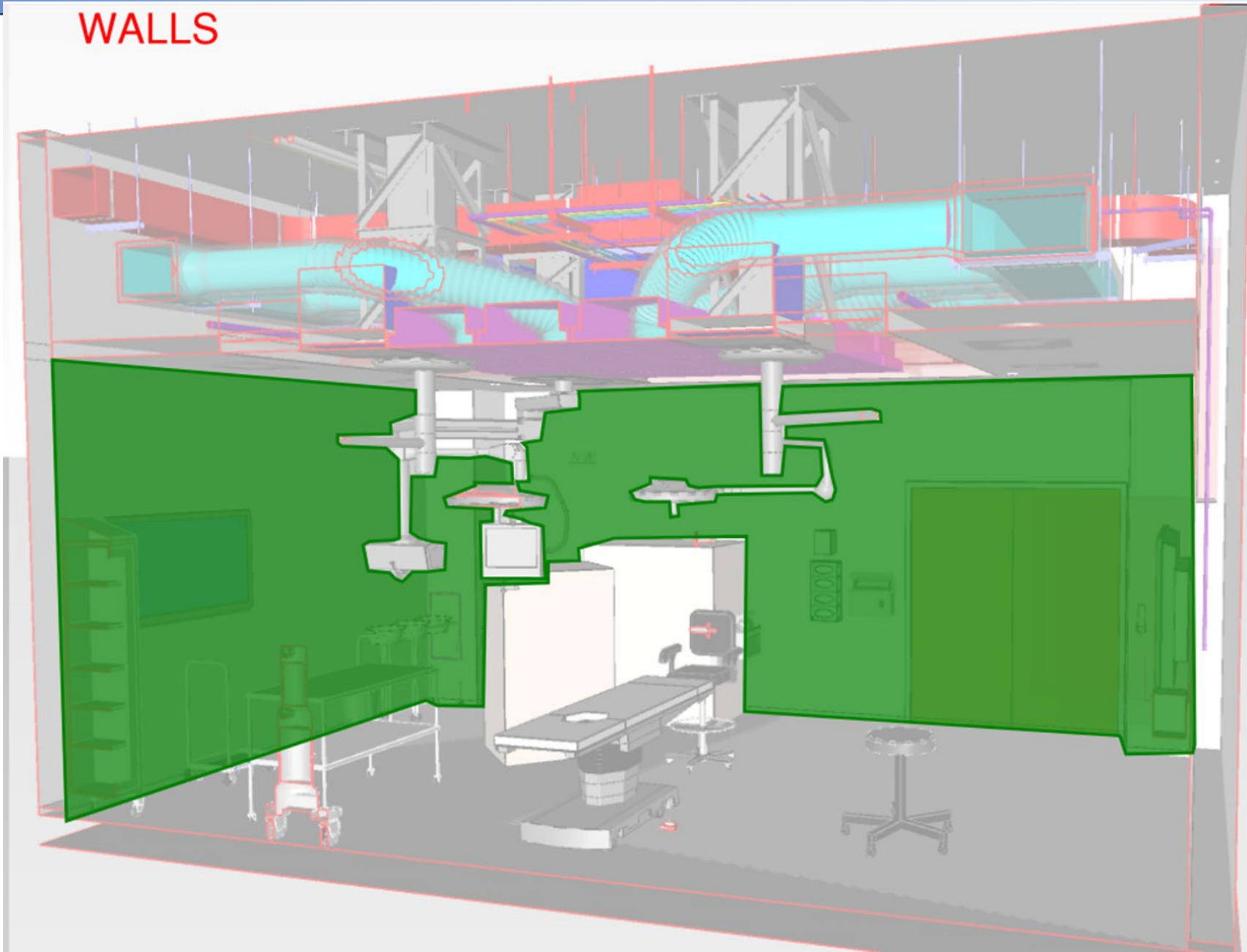
SYSTEM INTEGRATION

HANGERS



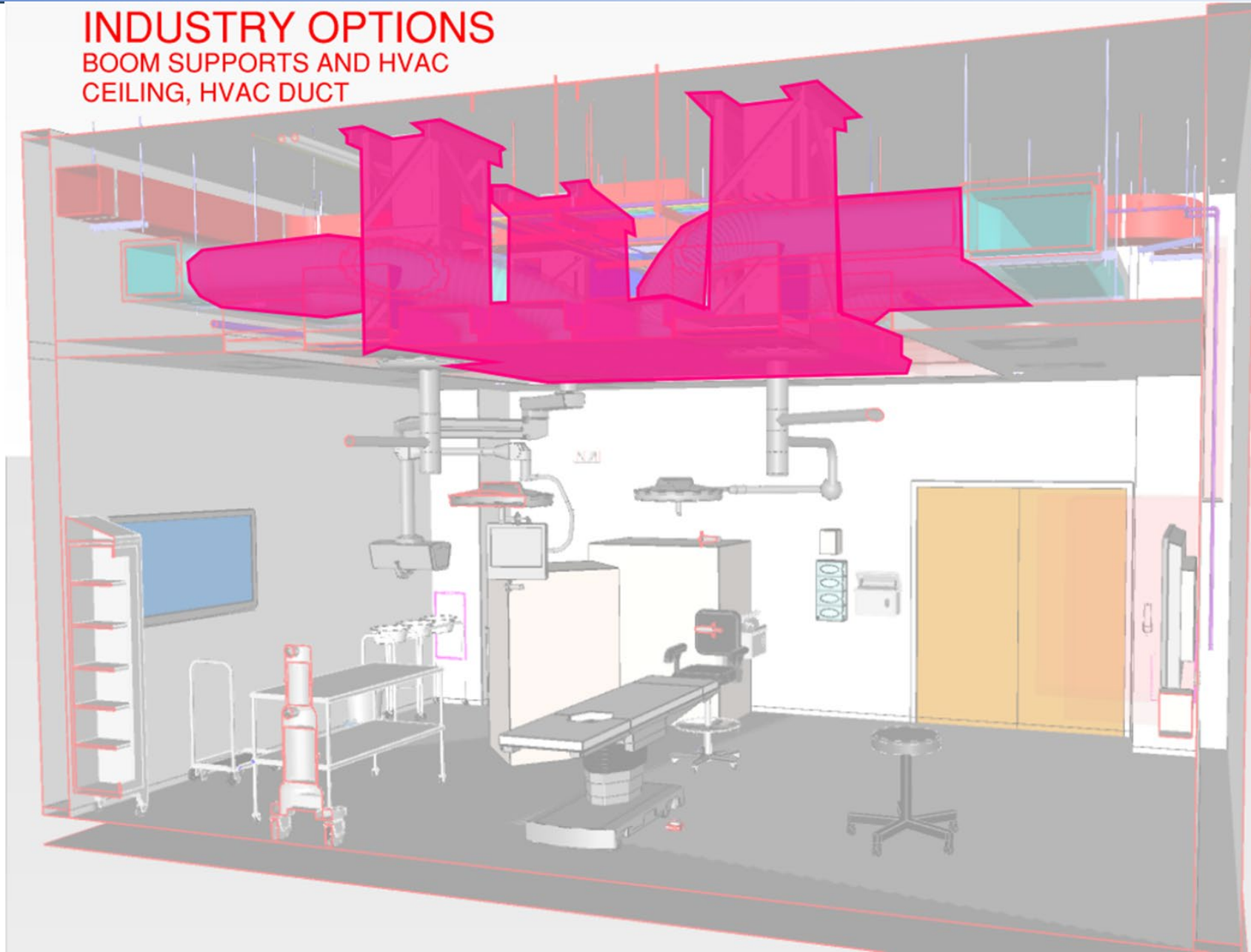
SYSTEM INTEGRATION

WALLS



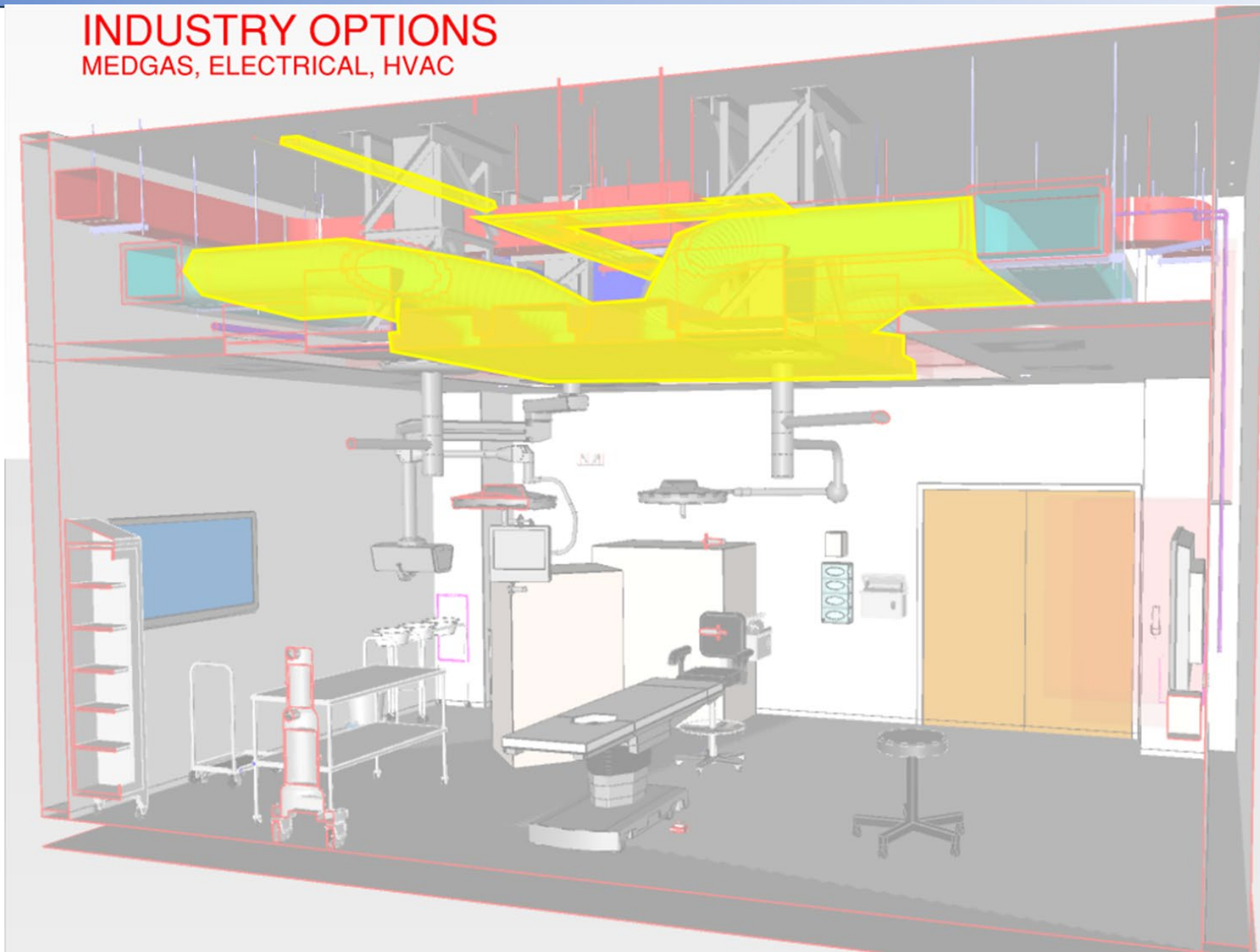
SYSTEM INTEGRATION

INDUSTRY OPTIONS
BOOM SUPPORTS AND HVAC
CEILING, HVAC DUCT



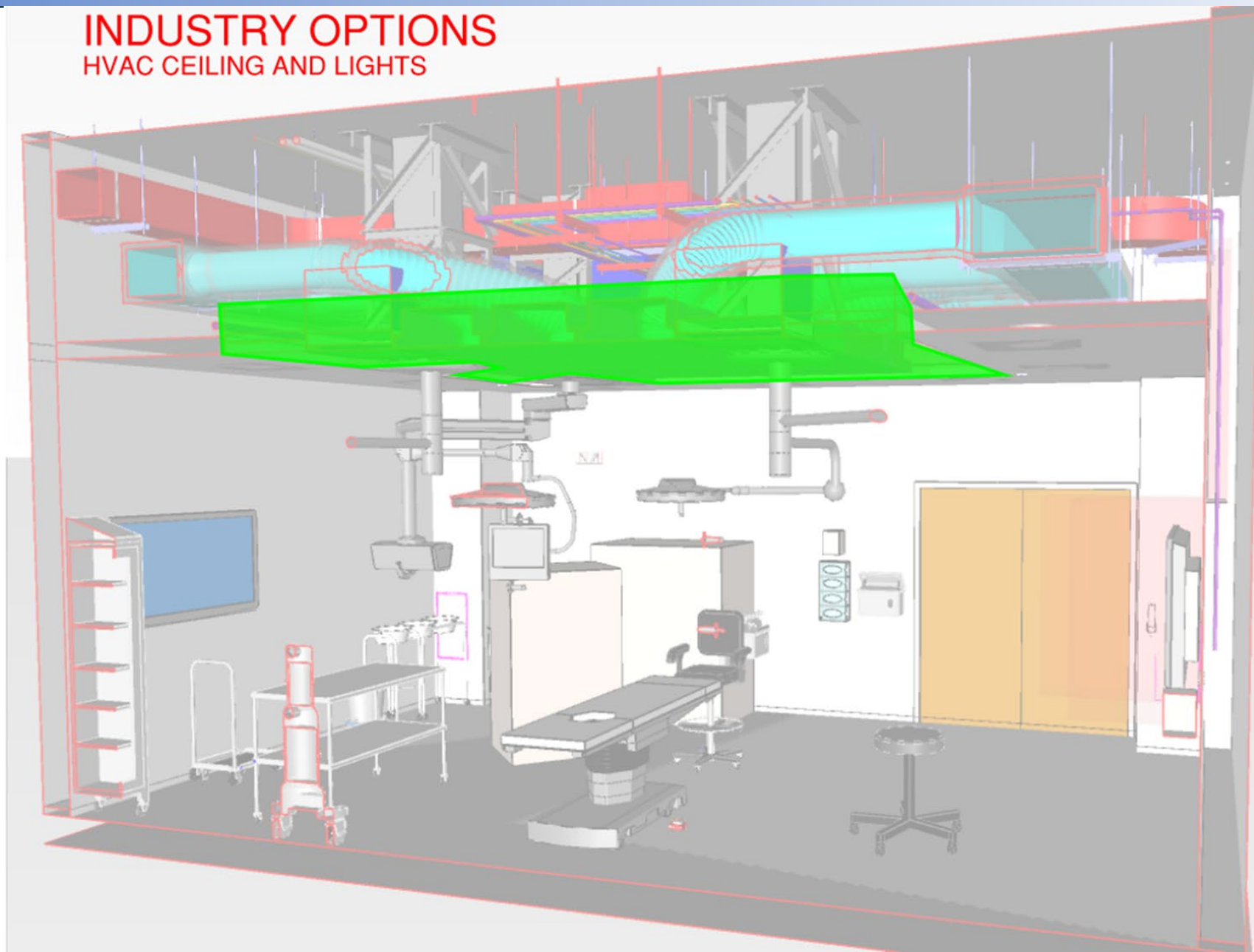
SYSTEM INTEGRATION

INDUSTRY OPTIONS
MEDGAS, ELECTRICAL, HVAC



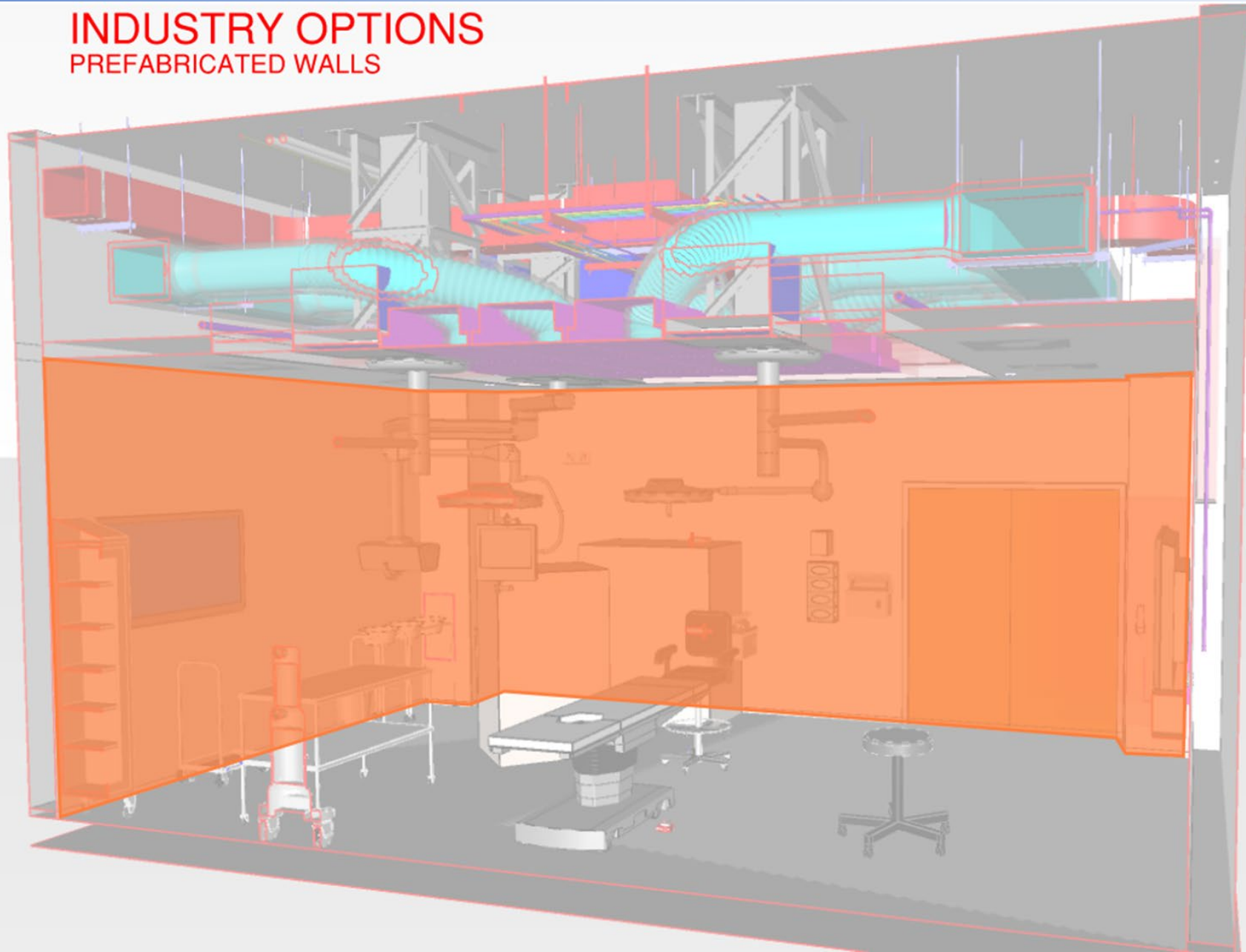
SYSTEM INTEGRATION

INDUSTRY OPTIONS HVAC CEILING AND LIGHTS



SYSTEM INTEGRATION

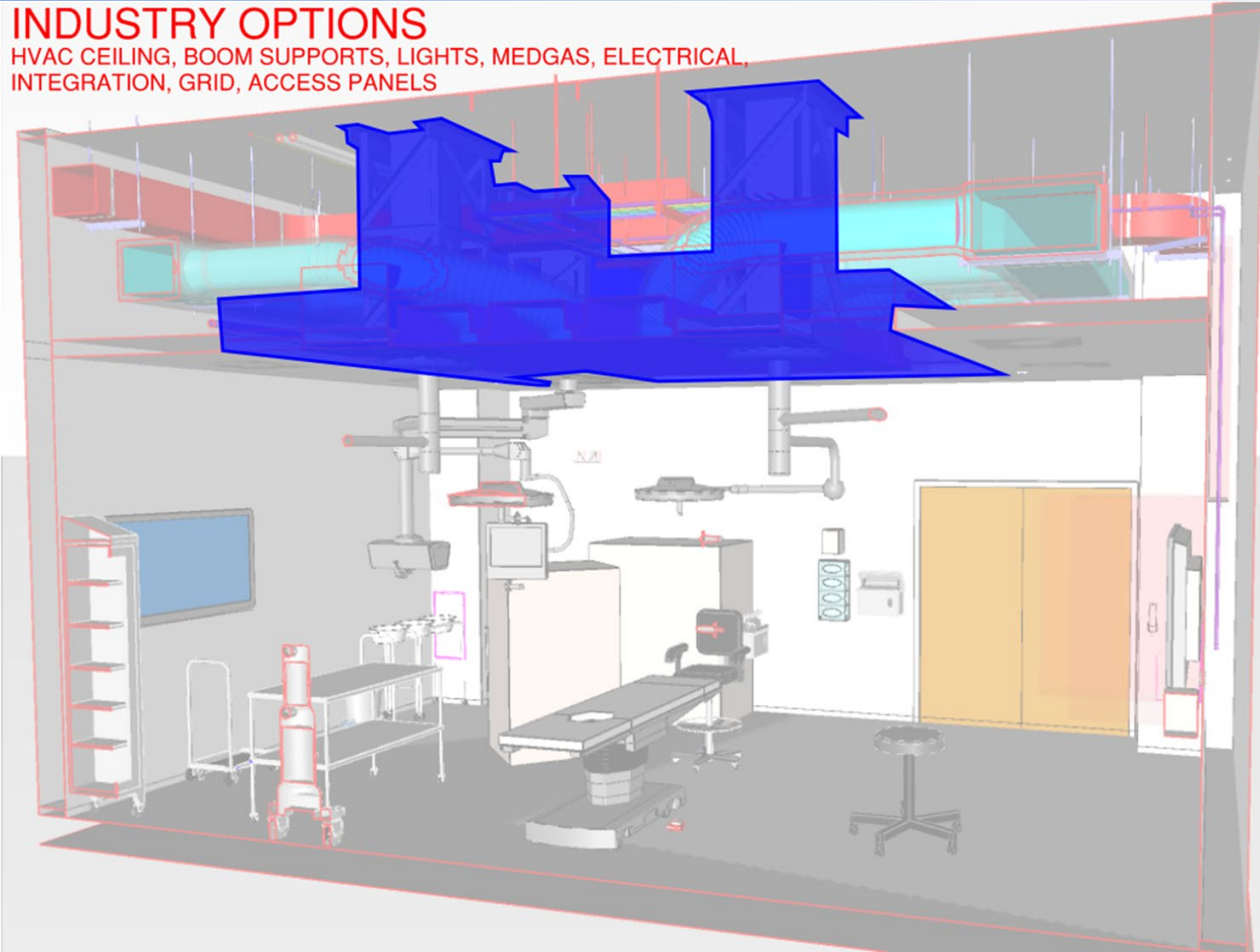
INDUSTRY OPTIONS
PREFABRICATED WALLS



SYSTEM INTEGRATION

INDUSTRY OPTIONS

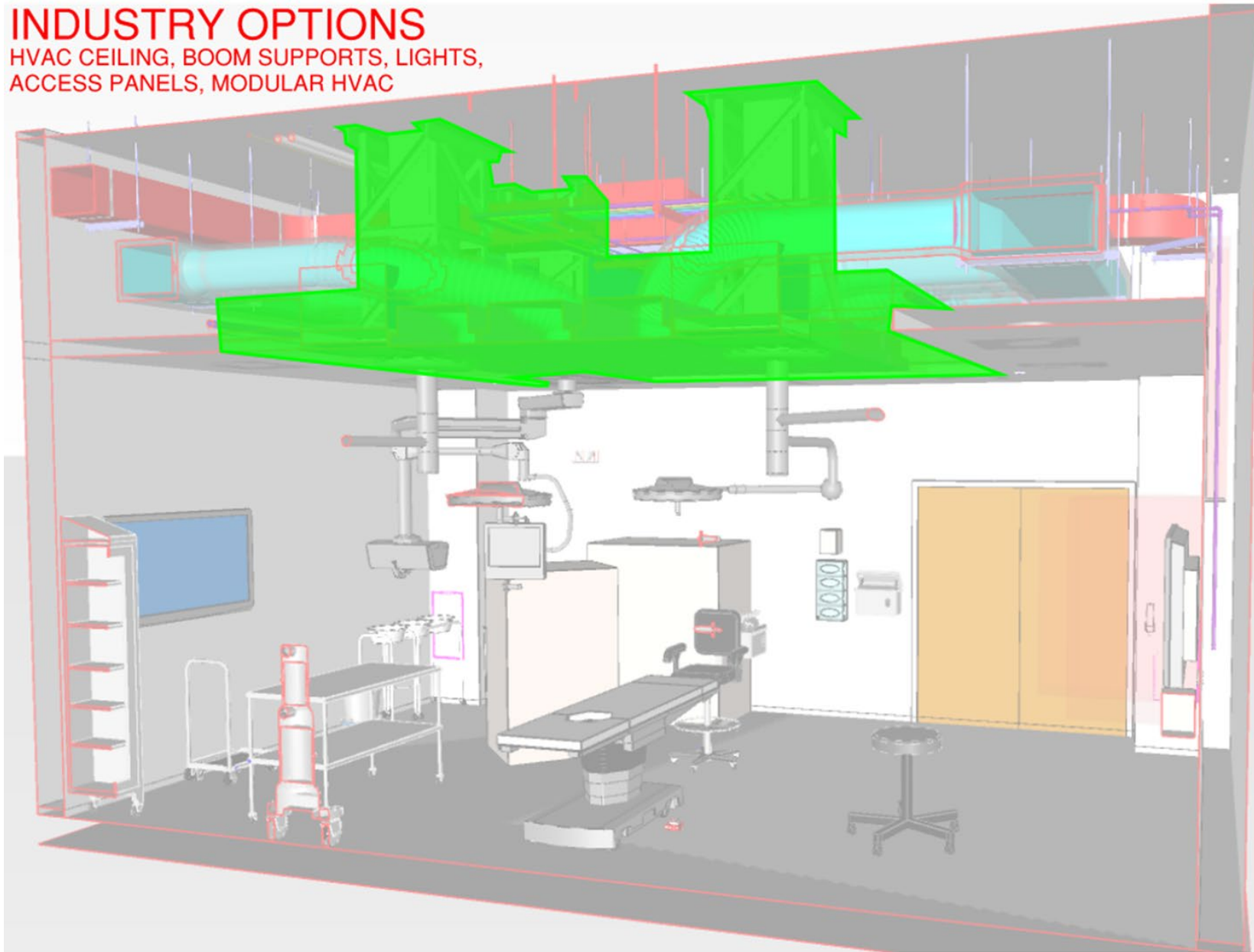
HVAC CEILING, BOOM SUPPORTS, LIGHTS, MEDGAS, ELECTRICAL,
INTEGRATION, GRID, ACCESS PANELS



SYSTEM INTEGRATION

INDUSTRY OPTIONS

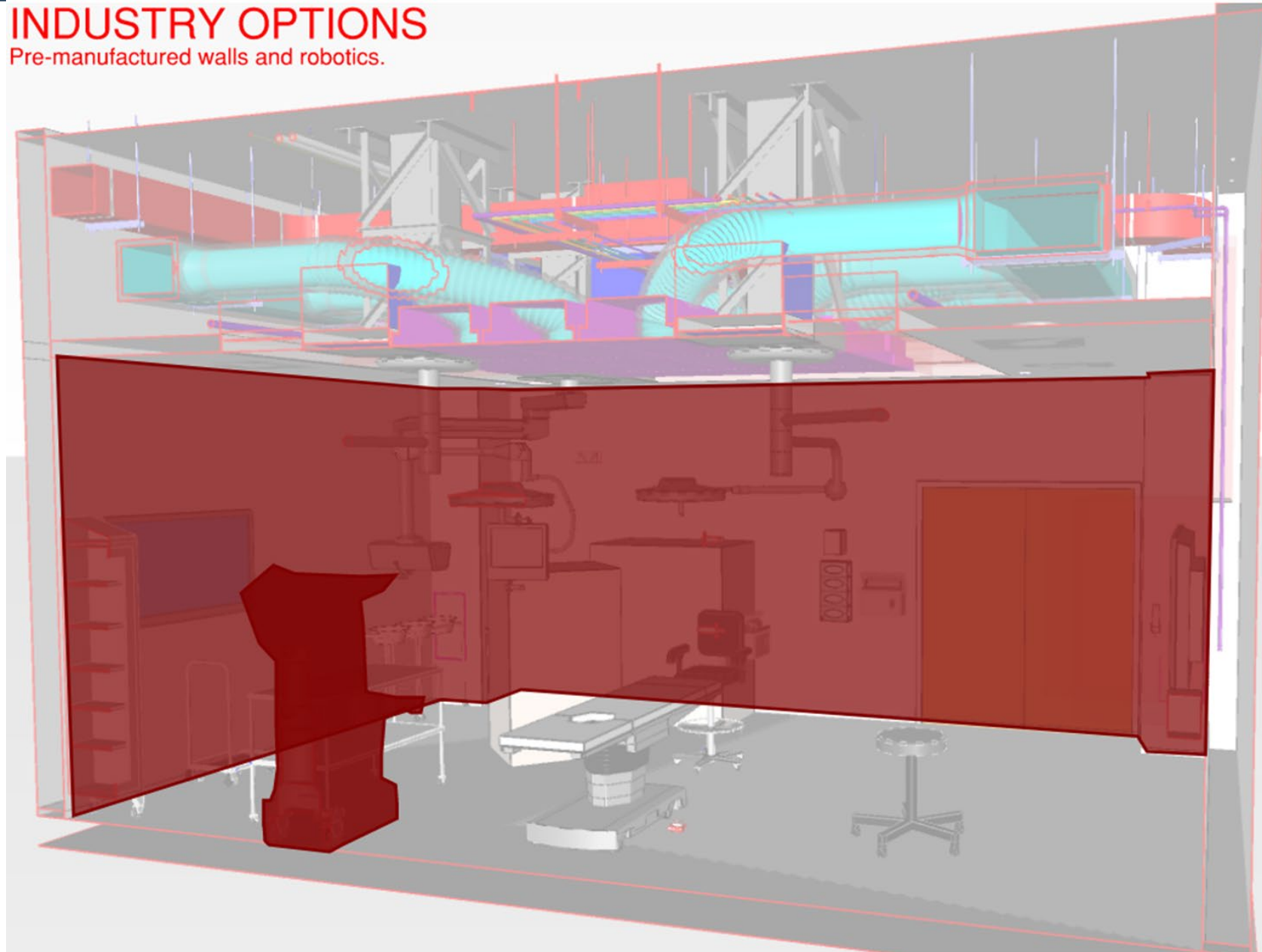
HVAC CEILING, BOOM SUPPORTS, LIGHTS,
ACCESS PANELS, MODULAR HVAC



SYSTEM INTEGRATION

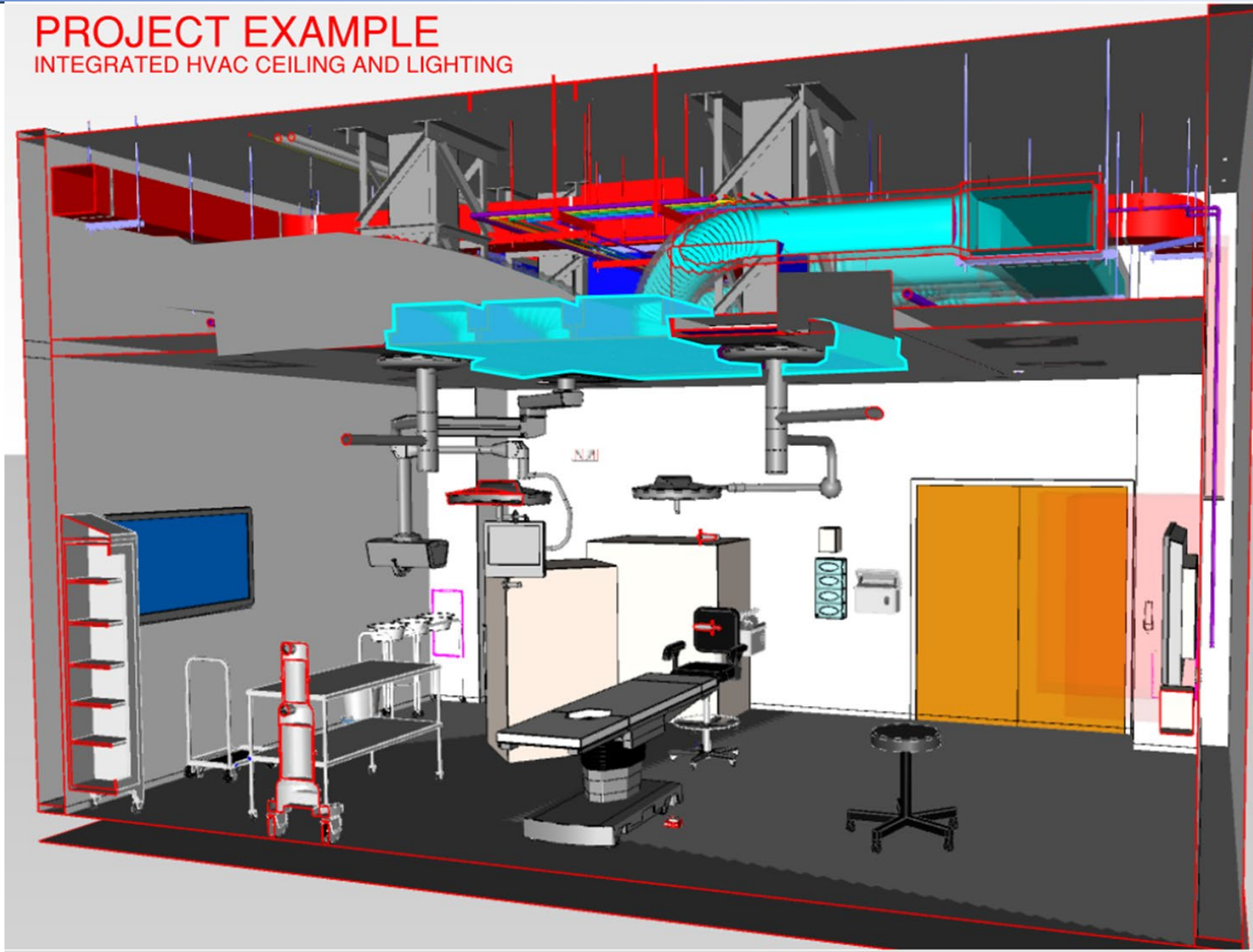
INDUSTRY OPTIONS

Pre-manufactured walls and robotics.



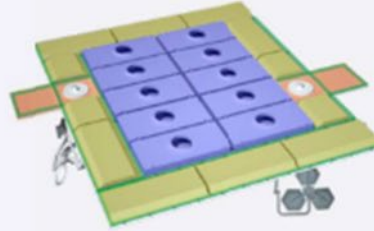
SYSTEM INTEGRATION

PROJECT EXAMPLE INTEGRATED HVAC CEILING AND LIGHTING

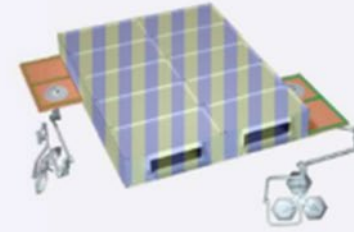


SYSTEM INTEGRATION

Factory Pre-welded Grid, Laminar Flow Diffusers, Perimeter Drywall



System, Perimeter Drywall



Total Installed Cost	\$45,643	\$46,981
Total Install Time	144 Hours	48 Hours
Welded Grid (shown in green)	\$4,736 (172 sq. ft.)	\$446 (8 sq. ft.)
Flush Ceiling Panel (shown in orange)	\$390 (4 panels)	\$390 (4 panels)
Air Distribution Product (shown in blue)	\$4,457 (10 LFD diffusers)	\$40,625 (80 sq. ft. Ultrasuite)
Surgical Lighting (shown in yellow)	\$19,500 (10 Surgical 2 ft. x 4ft. lights)	N/A
Drywall Installation	\$2,760 (24 hrs)	\$2,760 (24 hrs)
Mechanical Installation	\$9,200 (80 hrs)	\$1,840 (16 hrs)
Electrical Installation	\$4,600 (40 hrs)	\$920 (8 hrs)

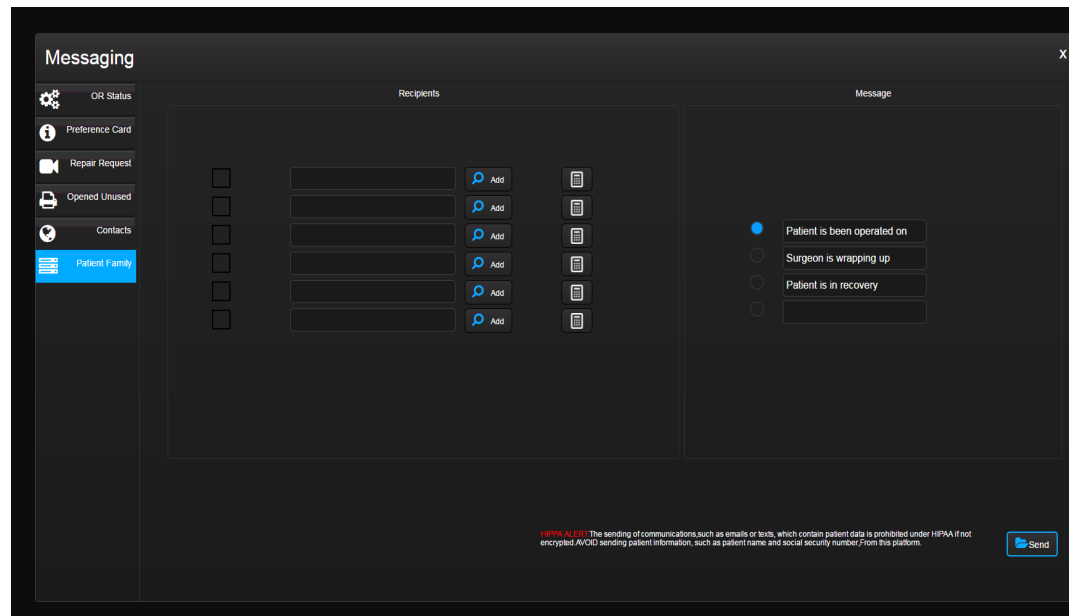
ROBOTICS

ROBOTICS - SURGERY

Workflow: Intra-op

Messaging:

- Repair Notifications
- Preference Card
- SPD/EVS
- Family



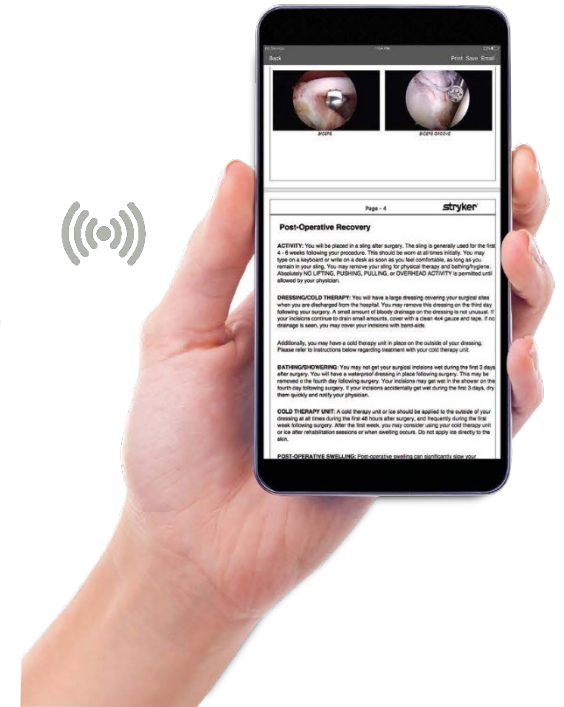
Status Cameras:

- Improved visibility into any area of hospital
- Monitor patient care environments to help minimize room turnover time



ROBOTICS - SURGERY

Workflow: Patient Engagement



ROBOTICS - SURGERY

Design: **Clinical/Robotic**



ROBOTICS - SURGERY

Fortress

Modular wall system



Built with **your future in mind**



Powder coat

- Full sheet
- Wainscot (top 60% of wall)
- Multiple color options



Murals

- Half panel with facility logo
- Screen printed murals



Stainless steel

- Full panel 304 SS
- 1.22mm thickness

ROBOTICS - SURGERY

Fortress **customization**

Fortress makes it easy to customize your OR with options such as flush-mounted screens, glass panel whiteboards, ElectraView, and more.

Gaskets

- Multiple color options
- Watertight



Recessed monitors

- Installed flush with the wall



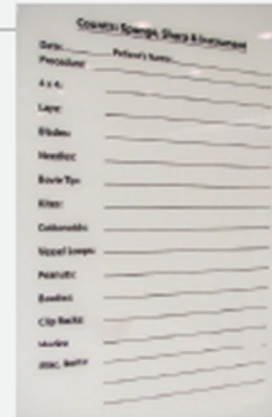
ElectraView privacy glass

- Automated blinds
- Fogging



Additional add ons

- Whiteboard
- Perioperative checklist
- Half-panel magnetic glass

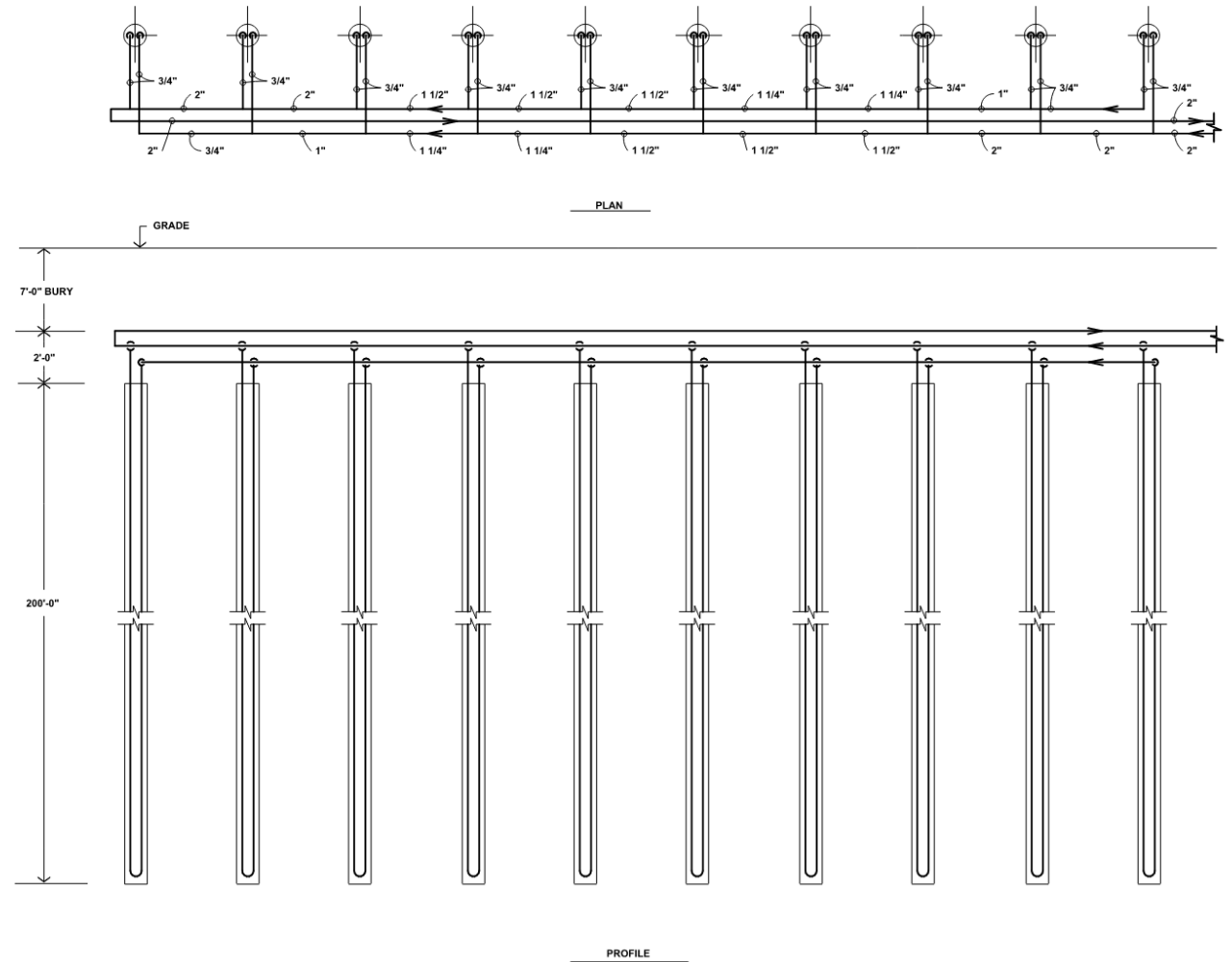
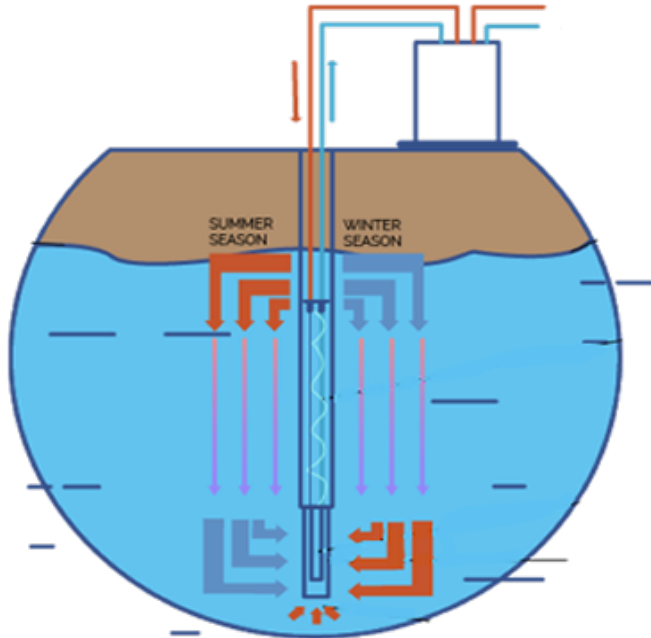


MECHANICAL &
ELECTRICAL
INFRASTRUCTURE

MECHANICAL

Campus Infrastructure:

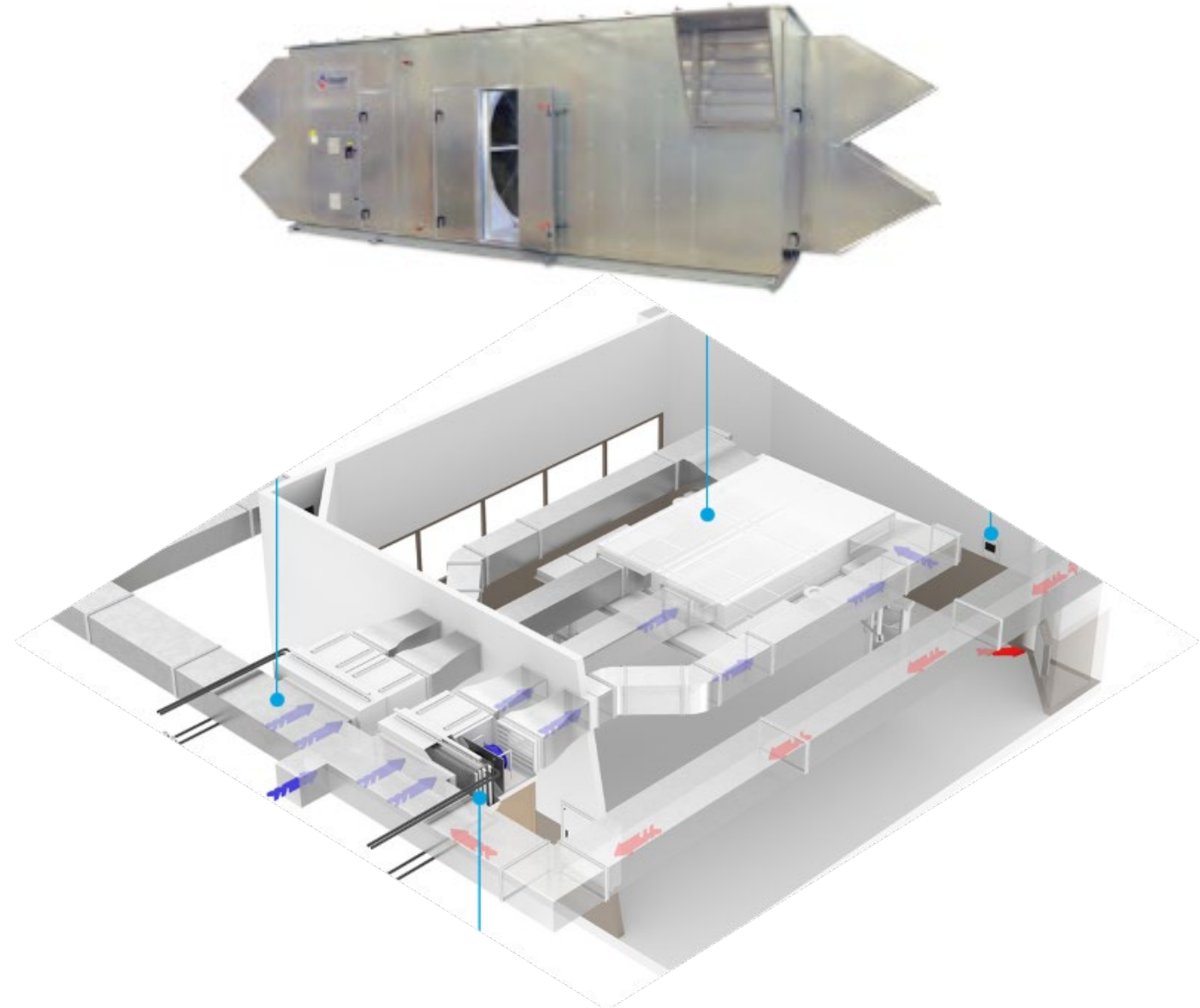
- Hospital HVAC systems
 - Continued shift towards energy-efficient products
 - Implementation of systems that operate on natural energy sources



MECHANICAL

Surgery Infrastructure:

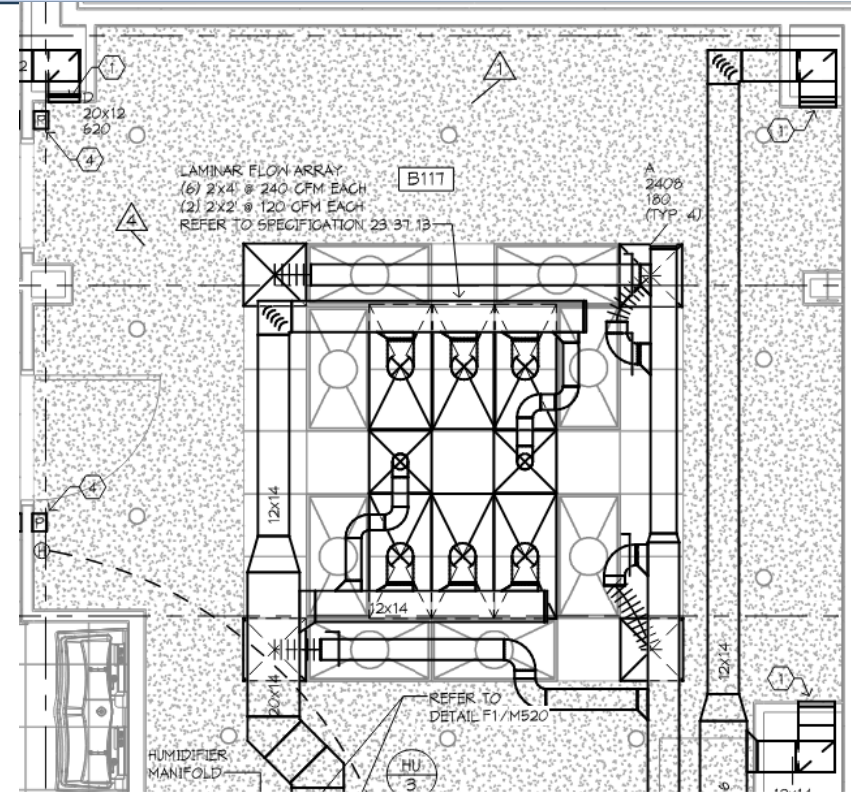
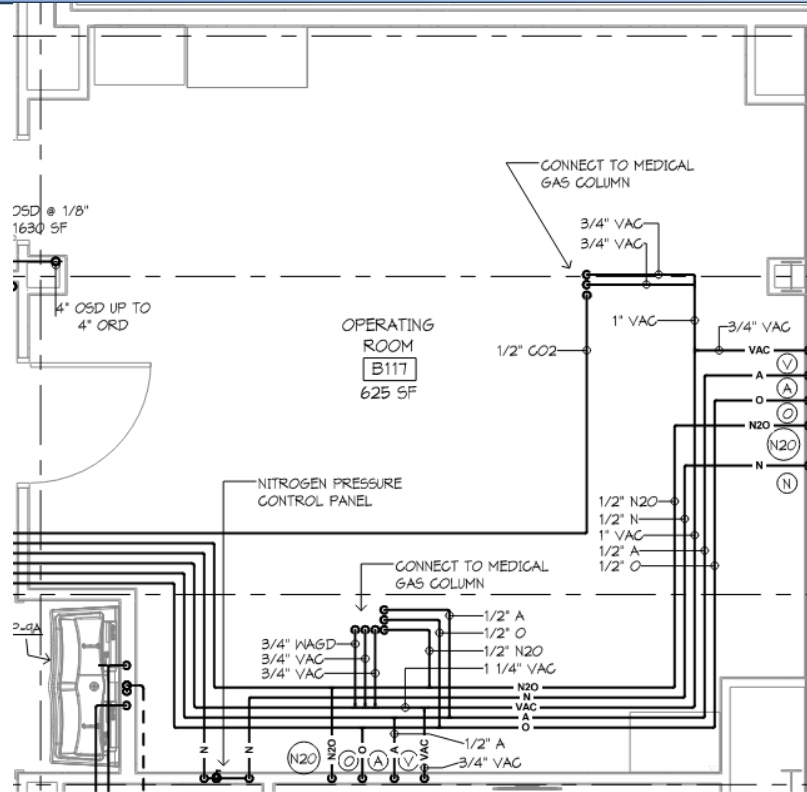
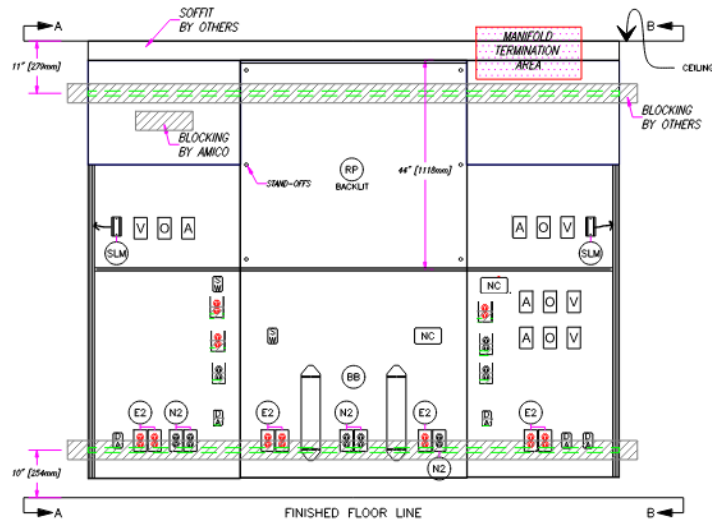
- Mechanical Capacity
 - OR Robotics – require precise temperature and humidity levels
 - Existing HVAC systems may not be capable of maintaining safe temperature and humidity levels
 - Dessicant dehumidifiers can help remove moisture from the air and prevent condensation
 - Fan coil retrofit potential lower cost alternative



MECHANICAL

Infrastructure:

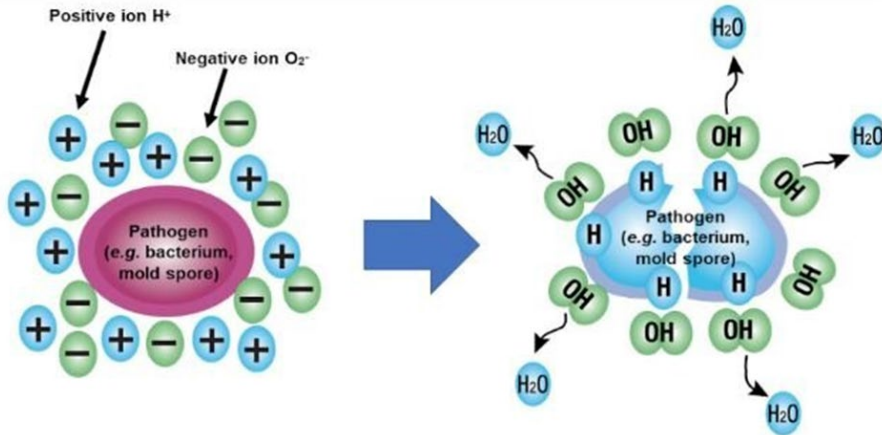
- Wall space
 - Nitrogen control panel
 - Med gas outlets
 - Low return registers
 - Pressure monitors



MECHANICAL

Infection control Infrastructure:

- AHU enhanced filtration options
- Ultraviolet (UV) lights
- Needle point bipolar ionization



MERV Rating	Average Particle Size Efficiency in Microns	Filtration Level
1-4	3.0 - 10.0 less than 20%	Low filtration
5	3.0-10.0 less than or equal to 20%	Basic filtration
6	3.0-10.0 less than or equal to 35%	Basic filtration
7	3.0-10.0 less than or equal to 50%	Basic filtration
8	1.0-3.0 less than or equal to 20% 3.0-10.0 less than or equal to 70%	Good filtration
9	1.0-3.0 less than or equal to 35% 3.0-10.0 less than or equal to 75%	Good filtration
10	1.0-3.0 less than or equal to 50% 3.0-10.0 less than or equal to 80%	Better filtration
11	0.30-1.0 less than or equal to 20% 1.0-3.0 less than or equal to 65% 3.0-10.0 less than or equal to 85%	Better filtration
12	0.30-1.0 less than or equal to 35% 1.0-3.0 less than or equal to 80% 3.0-10.0 less than or equal to 90%	Better filtration
13	0.30-1.0 less than or equal to 50% 1.0-3.0 less than or equal to 85% 3.0-10.0 less than or equal to 90%	Best filtration
14	0.30-1.0 less than or equal to 75% 1.0-3.0 less than or equal to 90% 3.0-10.0 less than or equal to 95%	Best filtration
15	0.30-1.0 less than or equal to 85% 1.0-3.0 less than or equal to 90% 3.0-10.0 less than or equal to 95%	Best filtration
16	0.30-1.0 less than or equal to 95% 1.0-3.0 less than or equal to 95% 3.0-10.0 less than or equal to 95%	Best filtration
HEPA	0.3 at least 99.97% ⁵	Best filtration

ELECTRICAL

Infrastructure:

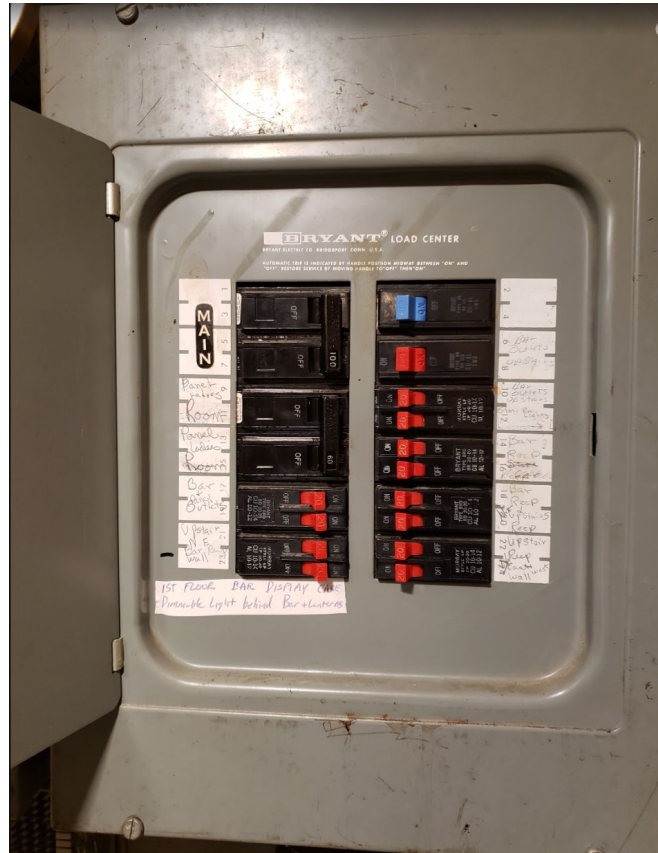
- Is there capacity?



ELECTRICAL

Infrastructure:

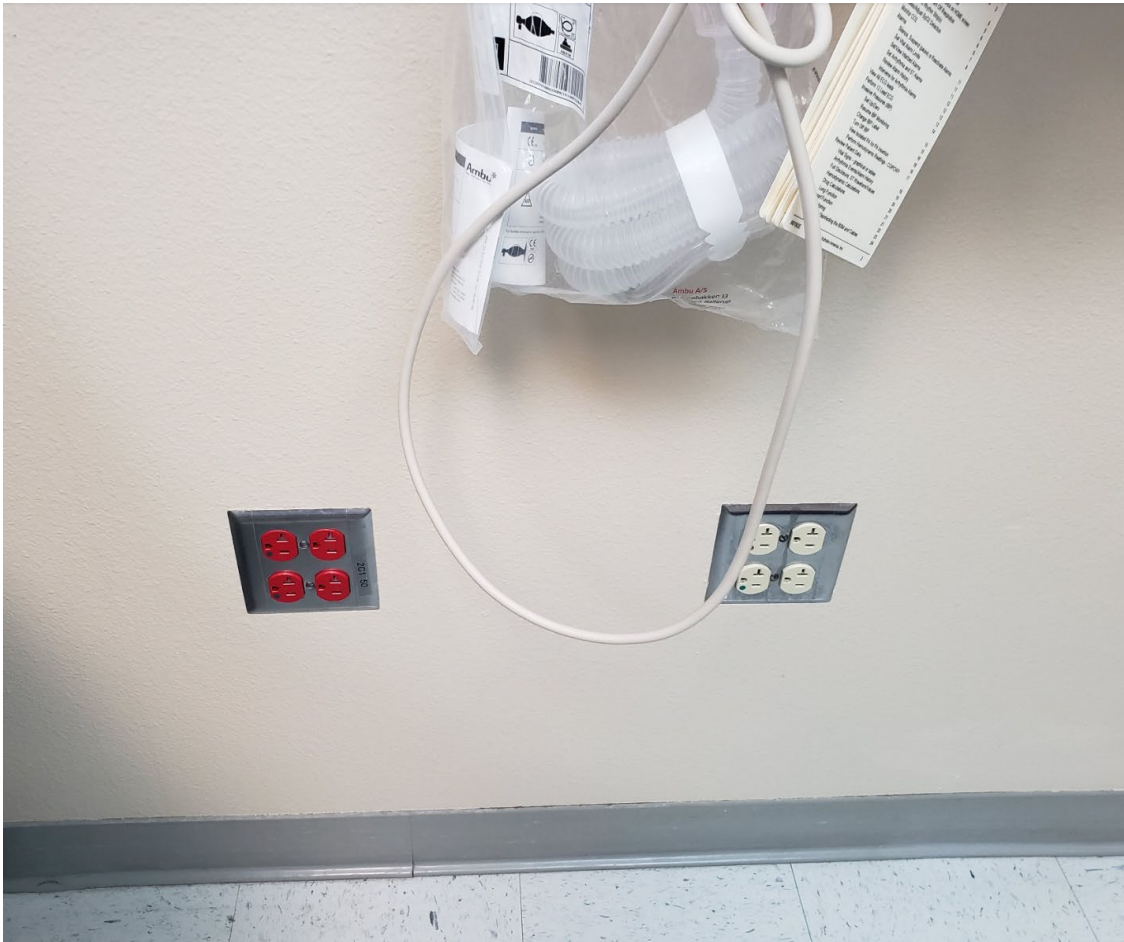
- Normal, Critical, Equipment and Optional branches
- Space for receptacles, lighting, isolation panels and mechanical units



ELECTRICAL

Infrastructure:

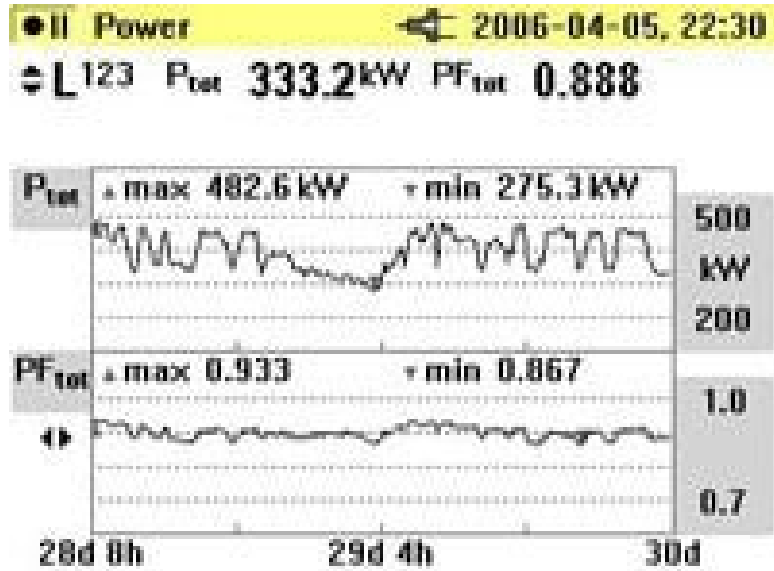
- Opportunity to revisit standards



ELECTRICAL

Infrastructure:

- Metering may be needed to determine capacity



ELECTRICAL

Infrastructure:

- Are code required upgrades needed?



ELECTRICAL

Infrastructure:

- Generator distribution panel.



ELECTRICAL

Infrastructure:

- ATS in dedicated room



ELECTRICAL

Infrastructure:

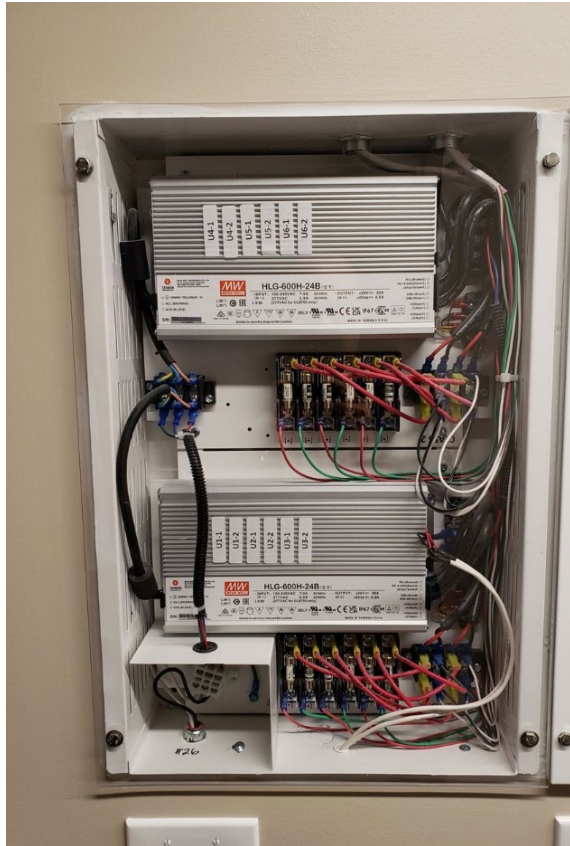
- Portable generator docking station



ELECTRICAL

Infrastructure:

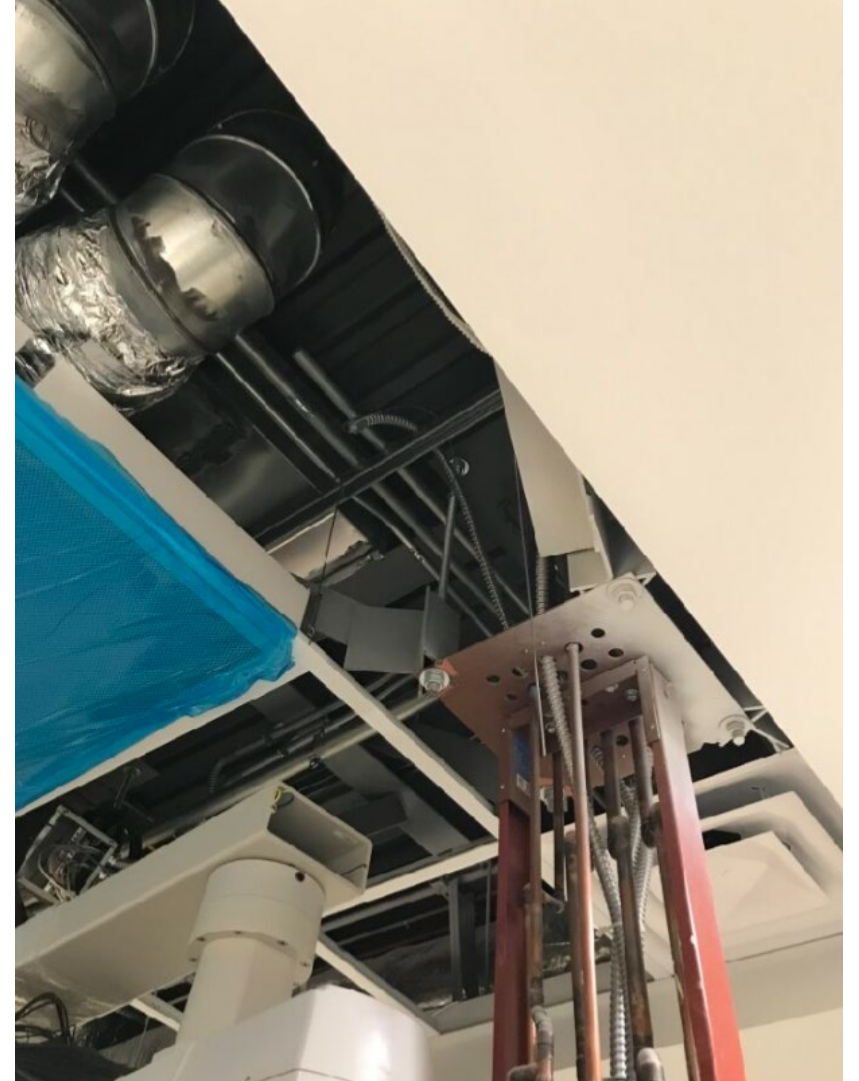
- Multiple isolation power panelboards.
- Dimming panel for integrated laminar flow diffuser.



ELECTRICAL

Infrastructure:

- Coordination with architectural, mechanical, structural and medical equipment



ELECTRICAL

Infrastructure:

- Data/Audiovisual Cabinet Location and Cooling Needs



ELECTRICAL

Other Considerations:

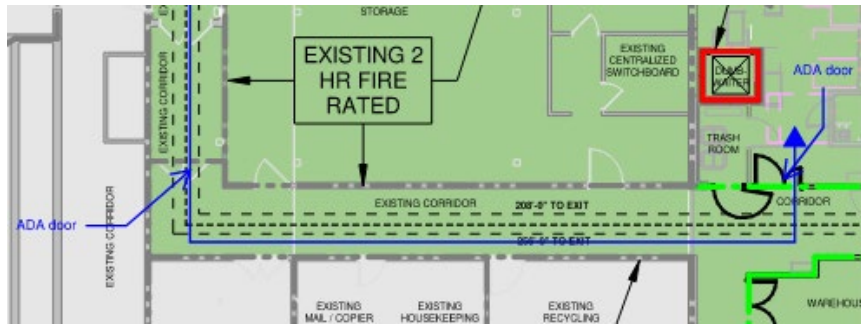
- Above Ceiling – low voltage wiring issues and space



ELECTRICAL

Other Considerations:

- Vendor Drawings

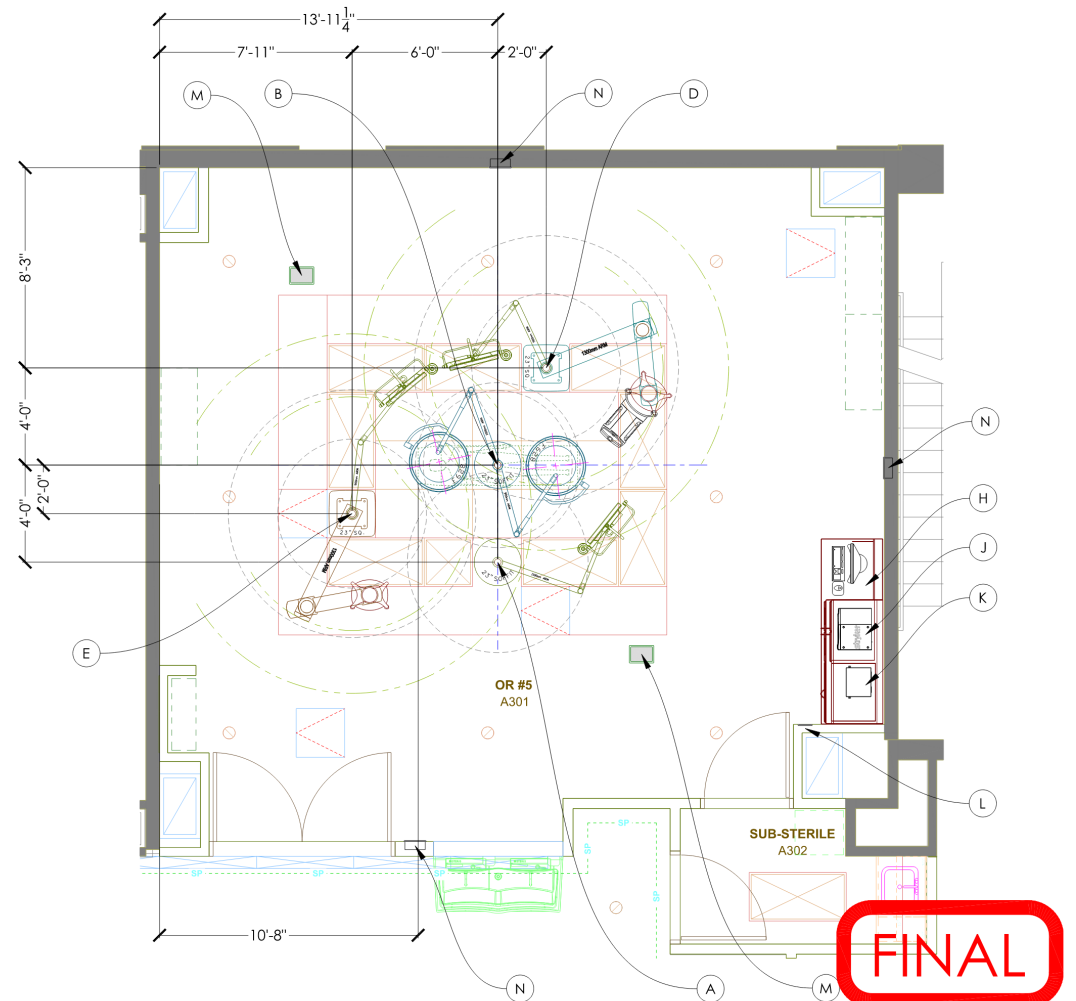


NOTES: (UNLESS OTHERWISE SPECIFIED)

EQUIPMENT SCHEDULE		
KEY ITEM	NAME	QTY
A	CHROMOPHARE SINGLE FLAT PANEL (1100)	1
B	CHROMOPHARE F628 SURGICAL LIGHT (1000) / F628 SURGICAL LIGHT (900)	1
D	TELETOM TP-622-C/TC EQUIPMENT BOOM (1300) / SINGLE FLAT PANEL (900)	1
E	TELETOM TM-612-C/TC ANESTHESIA BOOM (1300) / SINGLE FLAT PANEL (900)	1
H	2-BAY NURSE DOC STATION W/ EXTENSION COUNTERTOP - SPI3 TOUCH PANEL, SDC3 & PRINTER - HOSPITAL PROVIDED PACS PC & NURSE PC	1
J	SWITCHPOINT INFINITY 3	1
K	CHROMOPHARE SK ENCLOSURE	1
L	CHROMOPHARE WALL CONTROL PANEL (RECESSED)	1
M	FLUSH RECTANGULAR CEILING SPEAKER	2
N	WALL PLATES FOR AUX VIDEO CONNECTIONS	3

CONDUIT SCHEDULE		
CONDUIT RUN ITEM - ITEM	CONDUIT QTY	CONDUIT SIZE
A - J	1	1 1/4"
B - K	2	1"
D - J	1	1 1/4"
D - J	2	2"
E - J	1	1 1/4"
E - J	1	2"
L - K	1	1"
K - *	1	1"
M - J	1	3/4"
N - J	1	2"

* - NEAREST ELECTRICAL PANEL

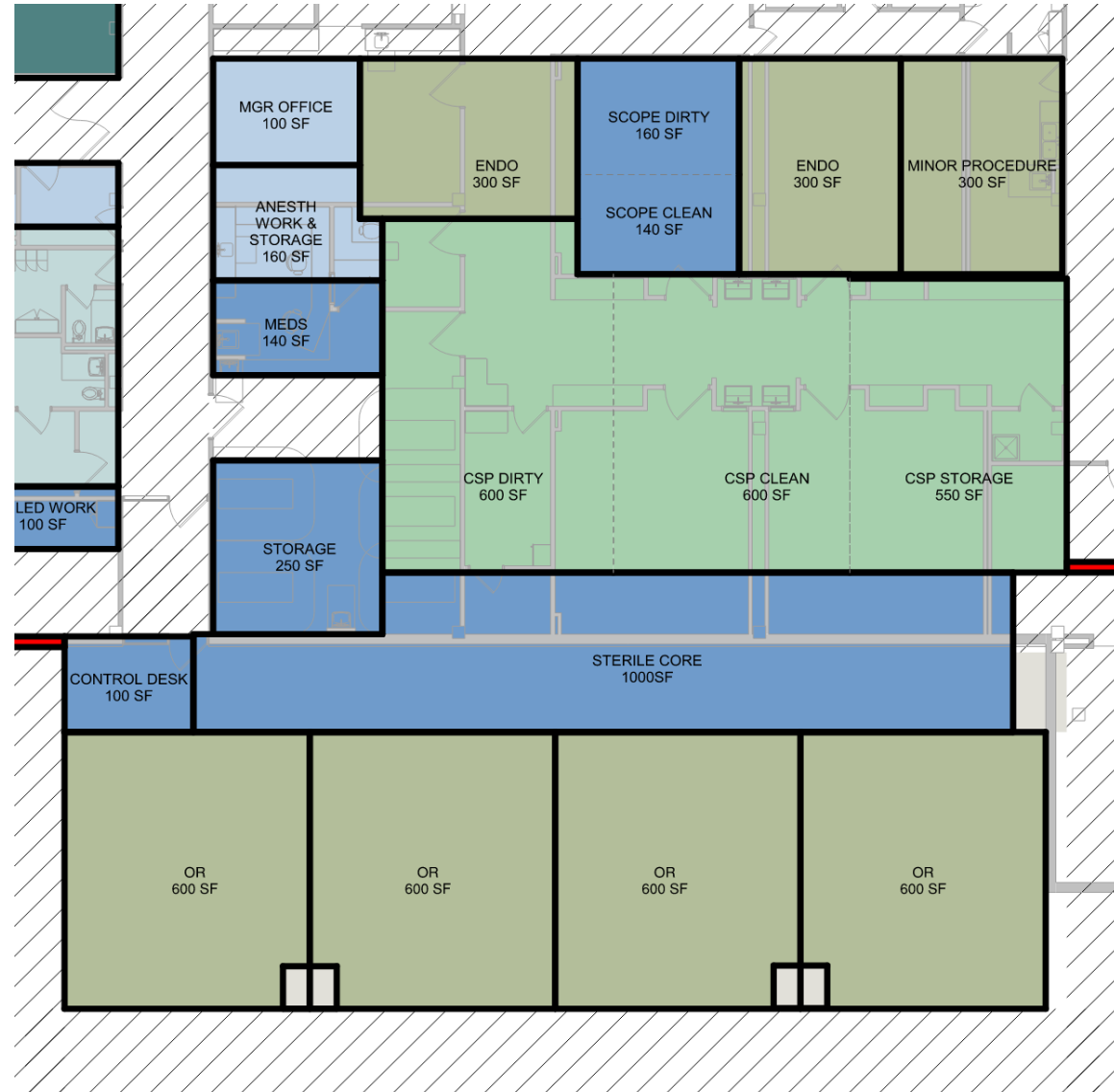


SCALE: 1/2" = 1'

ELECTRICAL

Other Considerations:

- Phasing



CREATIVE FINANCING

CREATIVE FINANCING

Financing:

- How can I afford this?



CREATIVE FINANCING

Inflation Reduction Act Tax Credits:

- Lighting, HVAC, building envelope.
- Energy savings measured against the latest ASHRAE standard (90.1-2019)
- If local prevailing wages are paid and apprenticeship requirements are met deductions are increased.
- The domestic content bonus credit if equipment built with certain percentages of manufactured products that were produced or manufactured in the United States.



CREATIVE FINANCING

Rebates:

- Energy Design Assist (EDA) programs with utility incentives
 - Organizations include Willdan, Focus on Energy.
 - Find cost effective solutions to reduce energy and save money.
 - Prescriptive - specific rebates
 - Custom – Energy model based on selected systems. Evaluate design options for efficiency, costs and incentives. Incentive rebated based on estimated first year energy savings.
 - Paid by the utility as part of legislation in order to reduce energy, enhance economic development and expand usage of energy efficient products.



CREATIVE FINANCING

NHREFCO

The National Healthcare,
Research, and Education
Finance Corporation



<https://thehappinessindex.com/blog/can-money-make-you-happy/>

**ARE YOU
READY?**

YOUR FUTURE STARTS NOW