AUTODESK UNIVERSITY

CS502277 | Making VR's ROI a Reality

A Case Study on Hyper-Realistic Clinical Mockup

Flora Liu
Studio Lead

VIATECHNIK

Raney Sledge
VDC Coordinator

ROBINS & MORTON



Speaker Introduction

- Flora Liu is a Studio Lead at VIATechnik where she is responsible for delivering on large scale virtual design and construction projects across the country.
- Outside of work, Flora enjoys rock climbing, paddle boarding, painting & traveling.
- VIATechnik is a digital transformation leader in the AEC industry. Our firm seeks to transform the analog world of design and construction into a digital platform, enabling efficient design, industrialized construction, and a digital real estate service model.



Speaker Introduction

- Raney Sledge is a VDC Coordinator with Robins & Morton, specializing in healthcare construction and coordination.
- When not working on hospital projects, he has a passion for Alabama football, Roll Tide, and sailing.
- Robins & Morton is a privately held construction firm specializing in healthcare, hospitality and commercial work.



Learning Objective

- Learn about the ROIs of implementing virtual reality in health-care projects from a clinical team.
- Explore a successful VR mockup setup, process, and potential challenges.
- Explore the decision-making process of implementing next-generation VR for mockup from project team.
- Learn about relevant stakeholders and community engagement that will benefit from this new method.

Delivering on a Promise

Caring for Our Community



CARILION CLINIC

About

- Nationally ranked integrated health care delivery system
- 501c 3 not-for-profit
- $2.2 billion in annual revenue
- Headquartered in Roanoke, Virginia
- 1,100 employed providers (another 400 private practice)
- 13,600 employees
- 7 hospitals
- Children’s Hospital
- Urgent care facilities, home health agencies, retail pharmacies, wellness center, patient transportation
- Radford University Carilion
- Virginia Tech Carilion School of Medicine and Fralin Biomedical Research Institute at VTC
- Service area of 1 million people



Carilion Clinic Mission:

Improve the health of the communities we serve.

ROBINS & MORTON

ESa

Project Background:

Crystal Spring Tower & Expansion

- $350 Million
- 507,000 Sq Ft
- Parking Garage
- Emergency Department
- Cardiovascular Care

COLLABORATION COMMITMENT COMPASSION COURAGE CURIOSITY



Project Background



Physical Mockup



Tradition VR Mockup







AUTODESK UNIVERSITY

Benefits Overview

13x

Financial Saving

>175

Comments/Feedback

>500

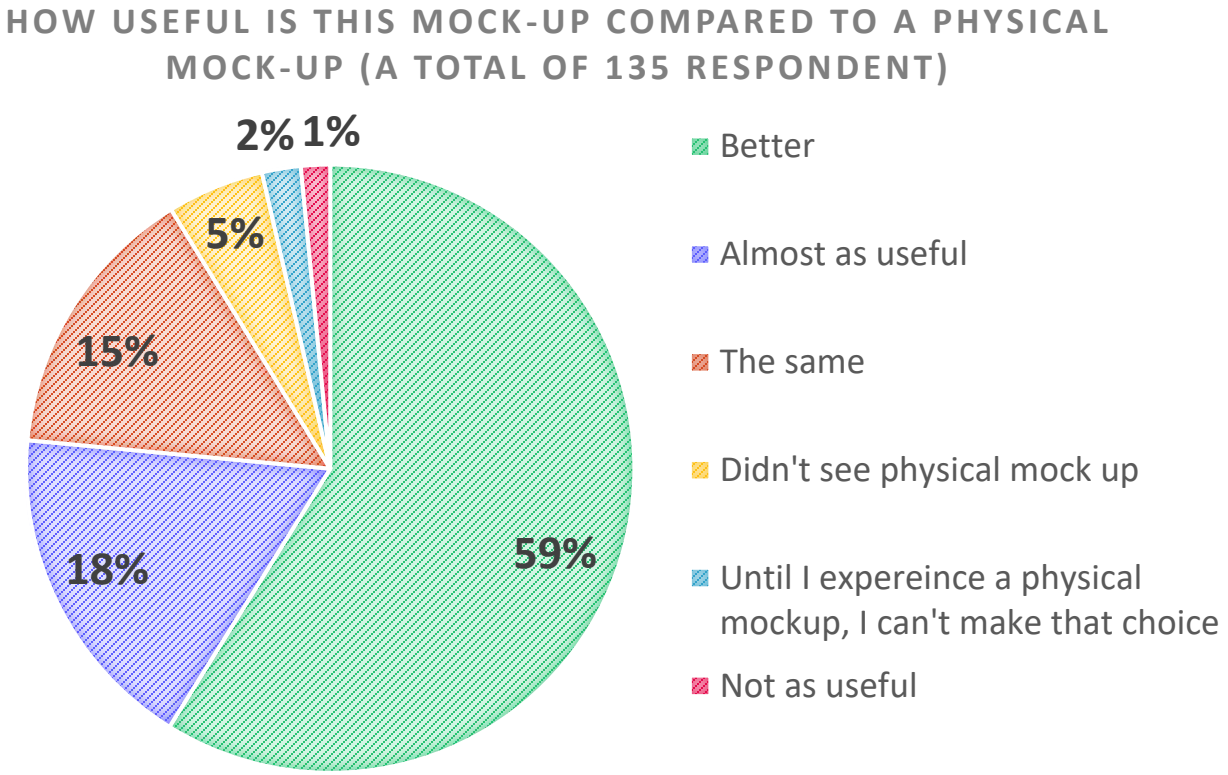
Viewers

6

Design iteration before IFC

User Survey

Data says it all



User Experience

- “I toured yesterday and it’s a gamechanger from a planning perspective! You feel like you are in the actual rooms bring all of the drawings and discussion to life”
- “Everyone was extremely complementary and blown away with VR experience: from navigating around the room to the insanely high-quality renderings”.
- “Some odd feeling VCT” ☺



Process of Development



Gather Design
set & Product Data



Build Digital Asset
& Environment



Build the scene



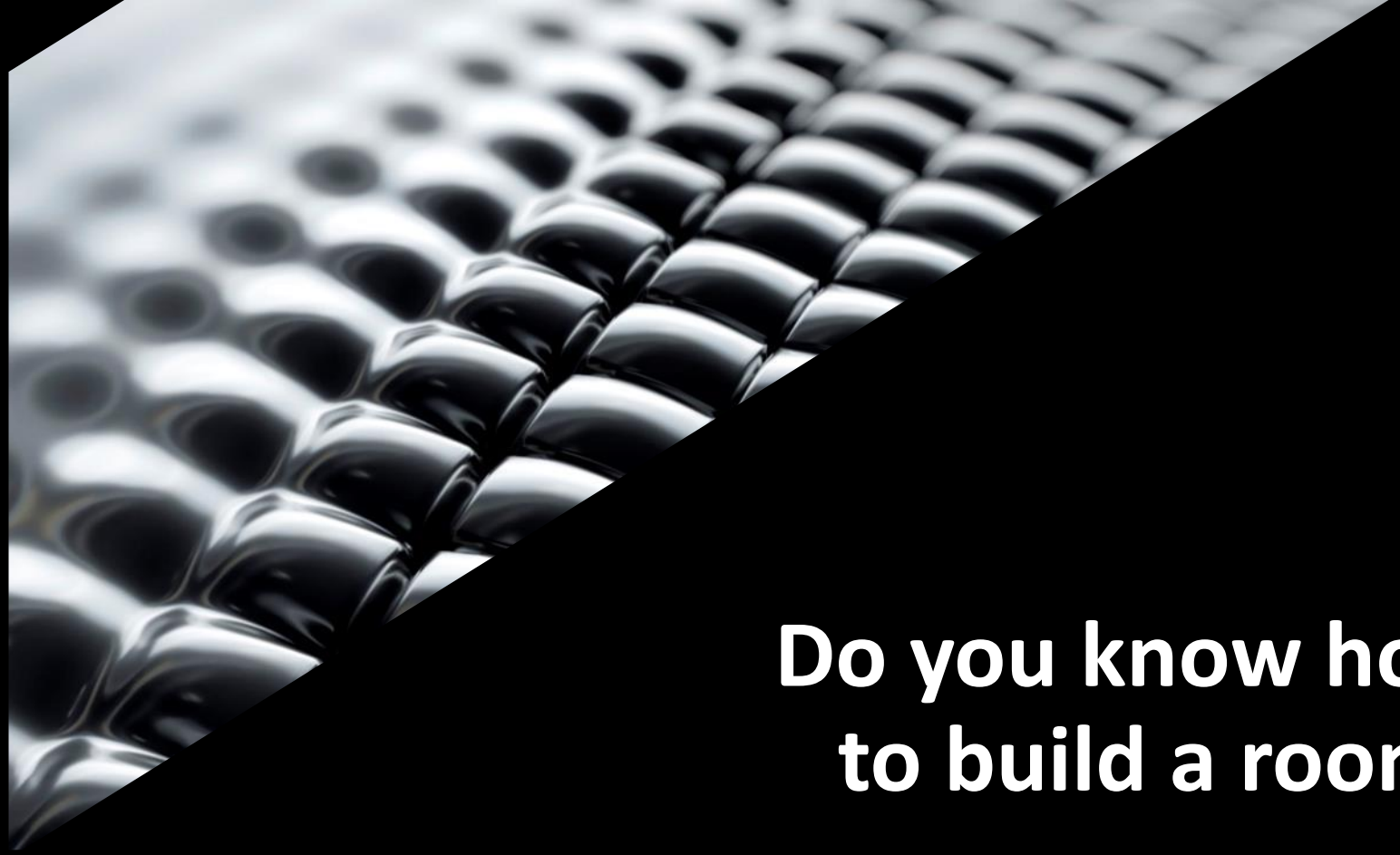
Immersive VR



Community Review

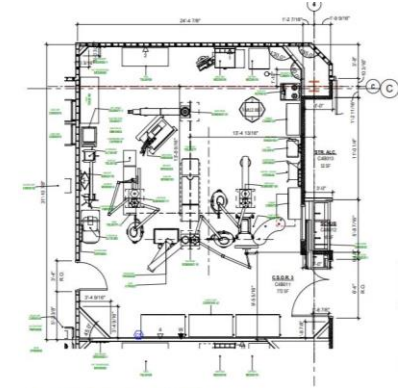


Design Iteration

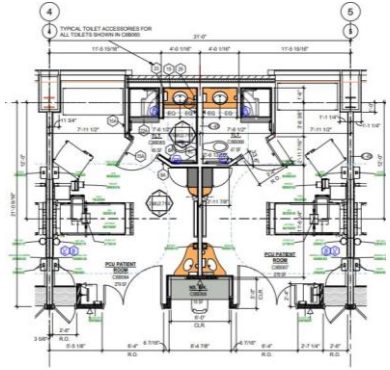


Do you know how to build a room?

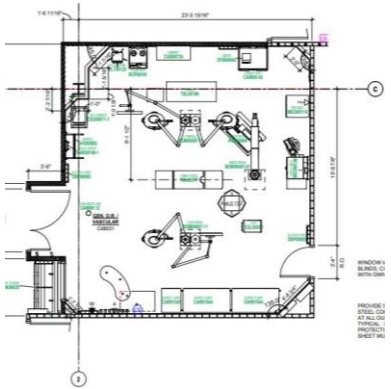
When 2D becomes 3D



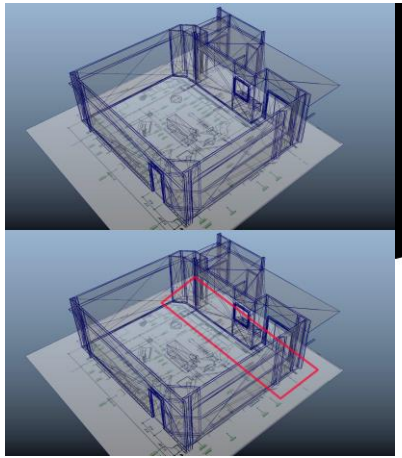
ENLARGED C.V. OR – MOCK-UP
SCALE: 1/4" = 1'-0"

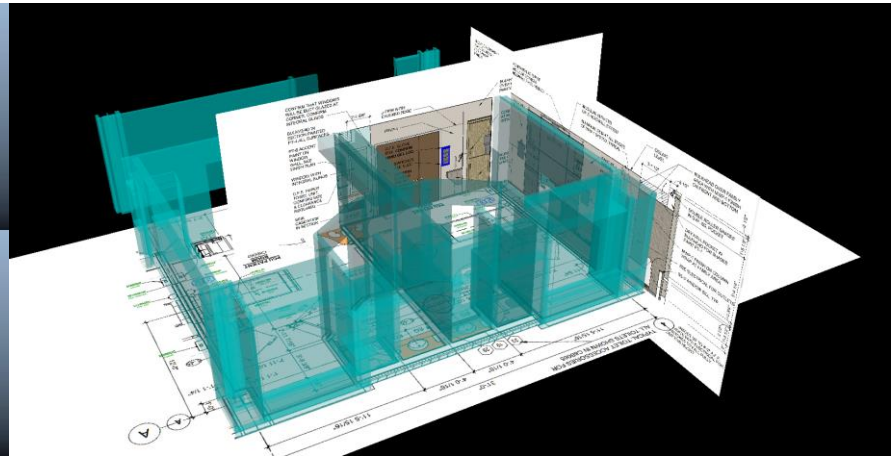


ENLARGED 8TH FLOOR PART B PATIENT ROOMS – MOCK-UP
SCALE: 1/4" = 1'-0"



C4B031 – GEN. O.R. / VASCULAR
SCALE: 1/4" = 1'-0"



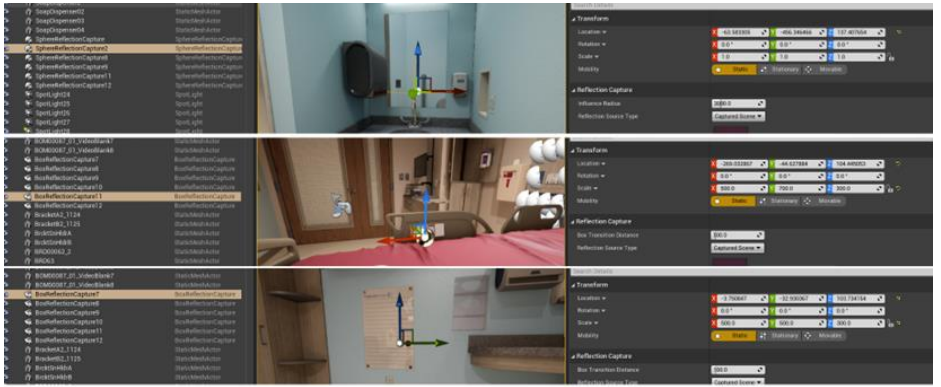


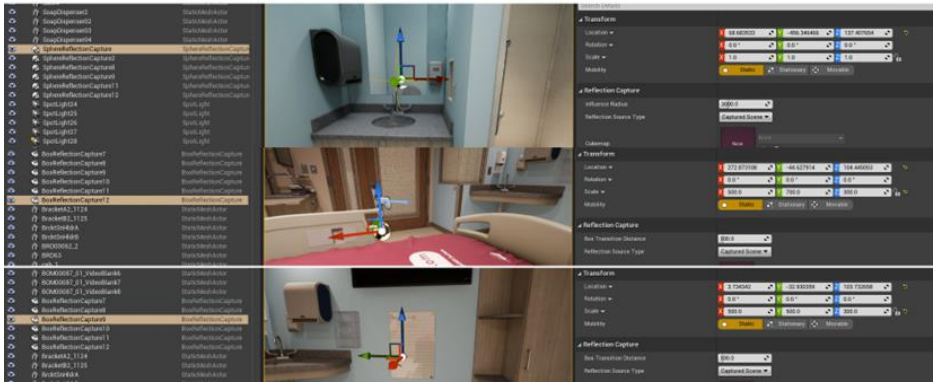
Apply details and put into perspective



Art is playing with lighting

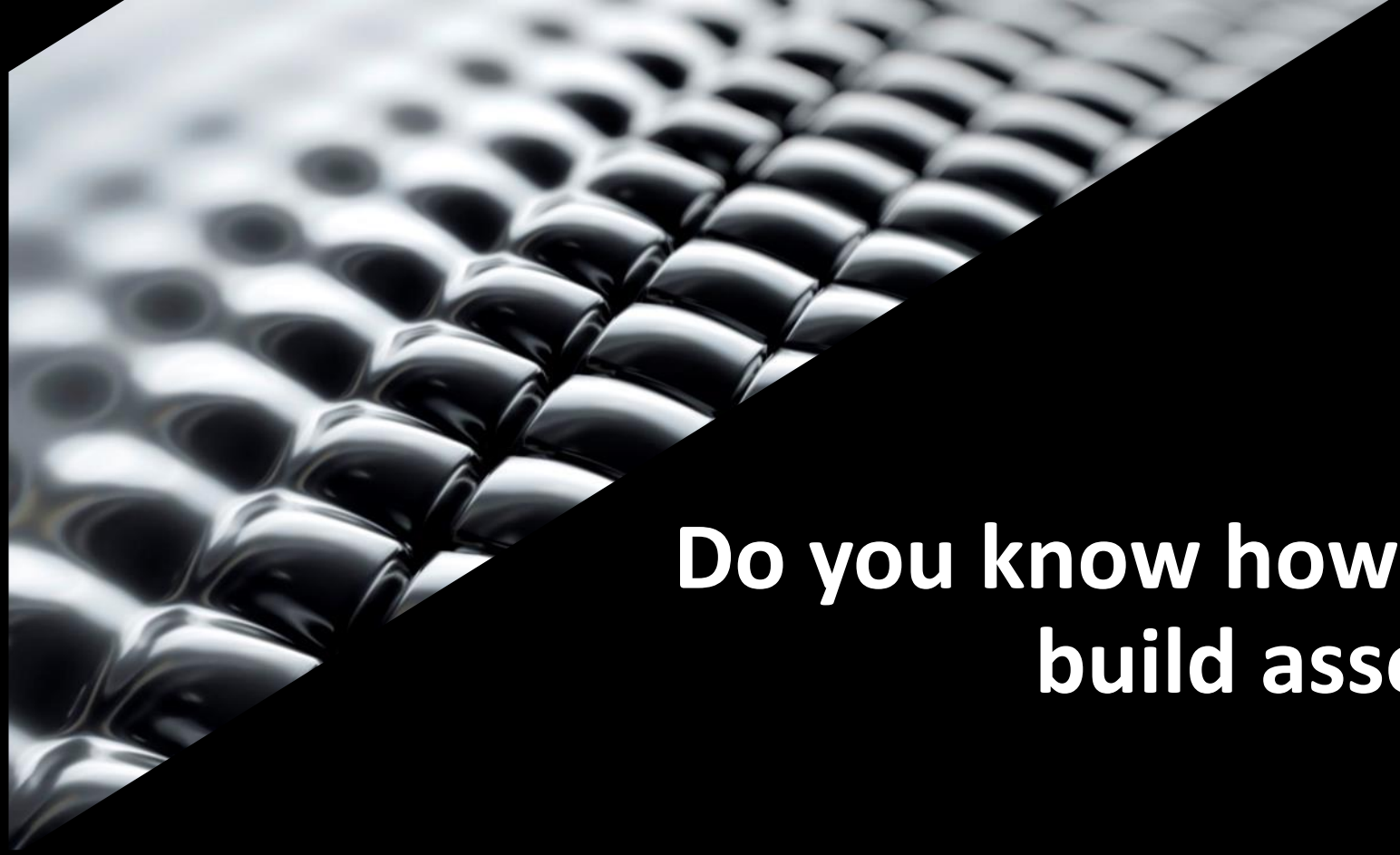






A nice touch!





Do you know how to build assets

Equipment shopping list

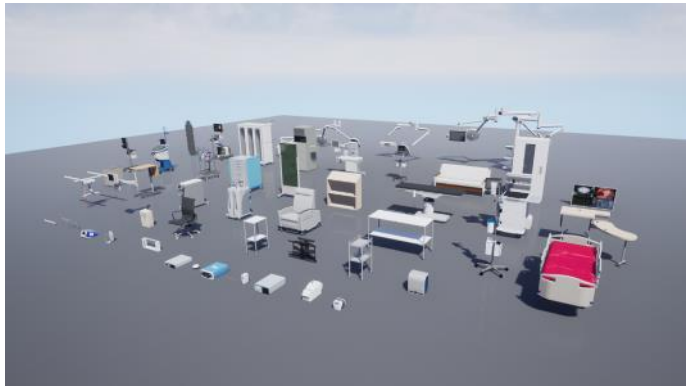
Room by Room Detail EquipWare™

Project Name: CRMH Tower Expansion

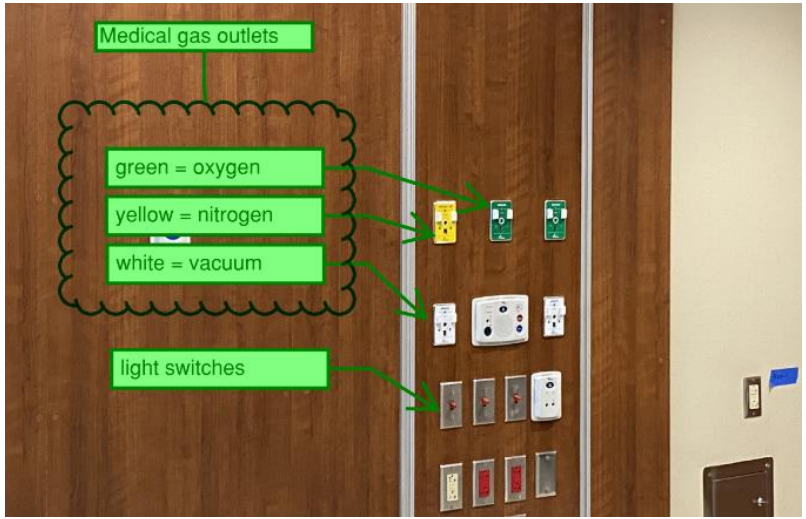
Facility Name: Carilion Roanoke Memorial Hospital Tower Expansion

Mock Up Rooms - Mock Up Rooms

Item #	N	E	F	L	Description	Manufacturer	Model	Resp	UM	Grp	PEM	Req #	Acc
Arch Room:	*C4B011 - CV OR Mock-up (Phase: Mock-up)*												*Alt Room #: OR*
ANL00011	1	0	0	0	Analyzer, Lab, Blood Gas, Portable, Wireless	Abbott Laboratories	i-STAT 1	OFOI	EA	2	Yes		No
ANL00180	1	0	0	0	Analyzer, Docking Station, iStat	Abbott Laboratories	i-Stat 1 Downloader/Recharger	OFOI	EA	2	Yes		No
ANS00049	1	0	0	0	Anesthesia Machine, General, Modular	Draeger Medical	Perseus A500	OFVI	EA	2	Yes		No
BOM00087-01	1	0	0	0	Boom, Anesthesia	Steris Corporation	HarmonyAIR	OFVI	EA	1	Yes		No
BOM00087-10	1	0	0	0	Boom, Equipment / Monitor / Light	Steris Corporation	HarmonyAIR	OFVI	EA	1	Yes		No
BOM00087-11	1	0	0	0	Boom, Monitor / Light	Steris Corporation	HarmonyAIR	OFVI	EA	1	Yes		No
BOM00087-20	1	0	0	0	Boom, Light / Monitor / Perfusion	Steris Corporation	HarmonyAIR	OFVI	EA	1	Yes		No
BRD00062	1	0	0	0	Board, Patient Transfer/Slider	AliMed	9-719	OFOI	EA	3	No		No
BRD00062-1	1	0	0	0	Bracket, Board, Patient Transfer/Slider	AliMed	939327	OFCI	EA	1	Yes		No
BRK00170	1	0	0	0	Bracket, Television, Wall, Articulating 46" - 90" Displays (Included w/ Banyan)	Peerless Industries	SA771PU	OFCI	EA	1	Yes		No
BRK00202	1	0	0	0	Bracket, Physiologic Monitor, Anesthesia Machine Mounted	GCX	WS-0012-24 / WS-0012-22 / GEM-0013-96	OFVI	EA	2	No		No
BUK00001	1	0	0	0	Bucket, Kick 12 Qt	Blickman, Inc.	7766SS	OFOI	EA	3	No		No
CAB00724	1	0	0	0	Cabinet, Storage, TEE Probe	MASS Medical Storage	TEE 2 Probe Wall Mounted Storage	OFVI	EA	1	Yes		No
CAB00737	1	0	0	0	Cabinet, Wall Mounted, 32.9"W x 24.5"H x 6"D	Carstens	WALLAroo 6680	OFCI	EA	1	Yes		No
CAM00075	1	0	0	0	Camera, In-Light	Steris Corporation	Harmony HD Camera Module	OFVI	EA	1	No		No
CAM00112	1	0	0	0	Camera, Ceiling Mounted, 1080p, PTZ (Included w/ Banyan)	Axis Communications	M5055	OFVI	EA	1	Yes		No
CAR00755	1	0	0	0	Cart, Cylinder, Oxygen w/E Cylinder	Paragon Medical	PX-1020-E	OFOI	Case	3	No		No
CAR01044	3	0	0	0	Cart, Catheter, Triple-Wide, Glass	InnerSpace (acquired by Solaire Medical)	SR3GD	OFOI	EA	3	Yes		No
CAR01045	1	0	0	0	Cart, Supply, Counter Height	InnerSpace (acquired by Solaire Medical)	Roam 1	OFOI	EA	3	Yes		No
CAR01060	1	0	0	0	Cart, Footstool, Stacking	Blickman, Inc.	8862SS-D	OFOI	EA	3	No		No
CEL00012	1	0	0	0	Autotransfusion Unit, General	LivaNova (formerly Sorin)	Xtra	OFOI	EA	2	Yes		No
CHR00122	1	0	0	0	Chair, Wide-Seat Anesthesia	Armstrong Medical Industries	AC-974	OFOI	EA	3	No		No



From 2D Sketches & images









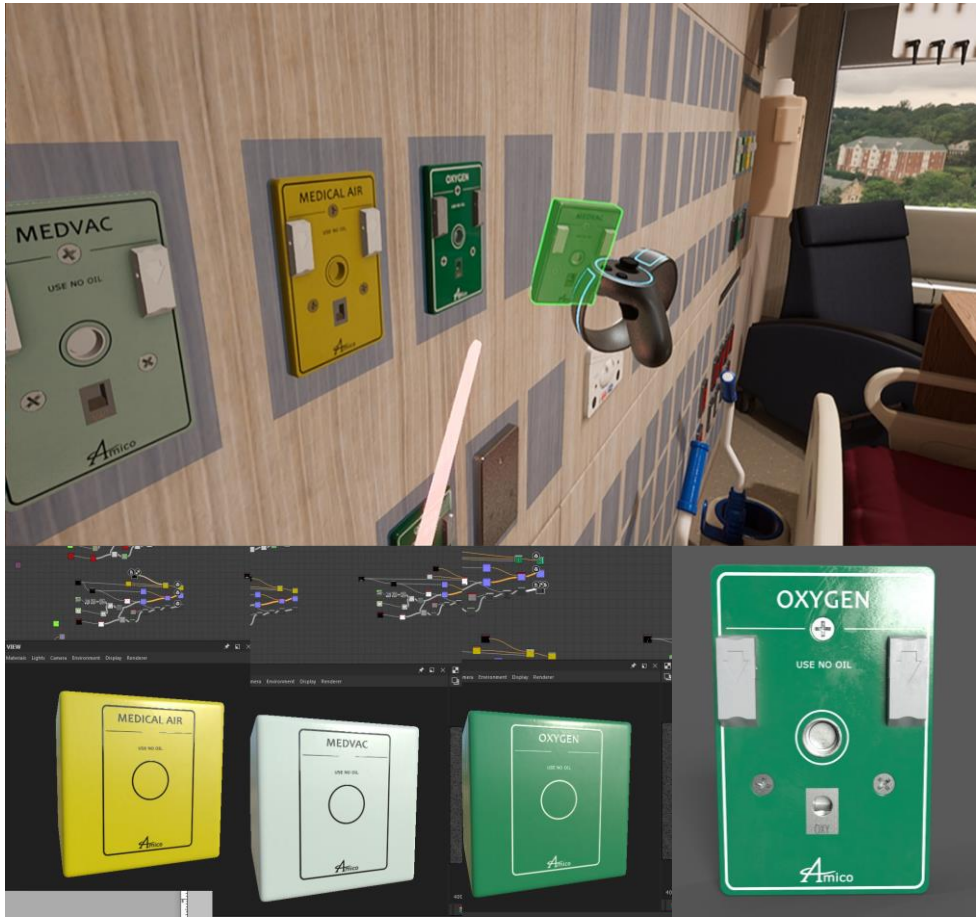






To realistic 3D Object

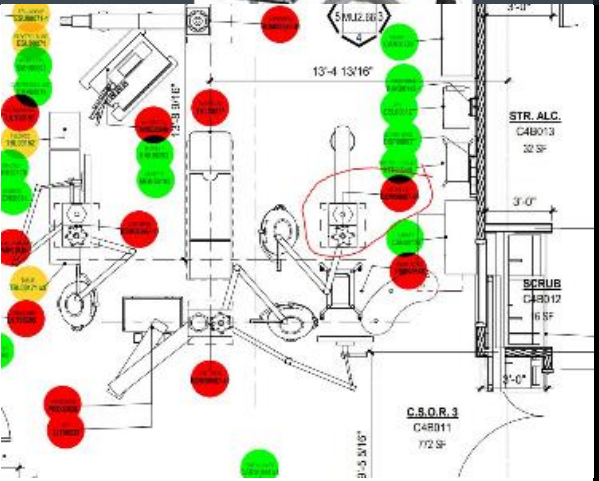
> *A medical outlet for the patient room headwall uses intricate details like scratches and fingerprints to create an appearance of photorealism*

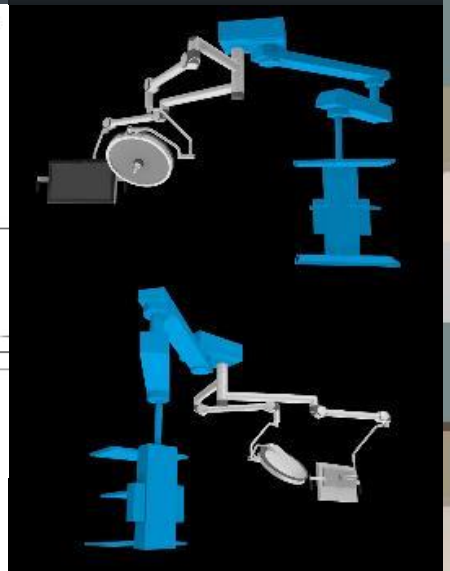


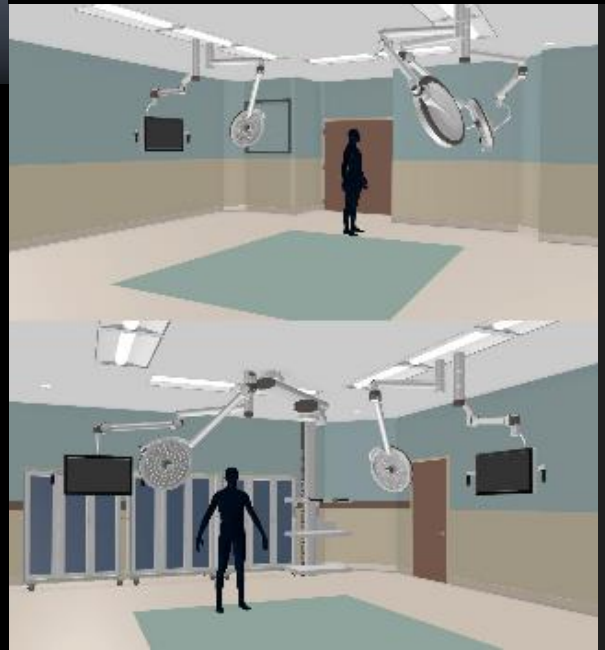




An equipment asset is modeled in Maya using reference cutsheet images

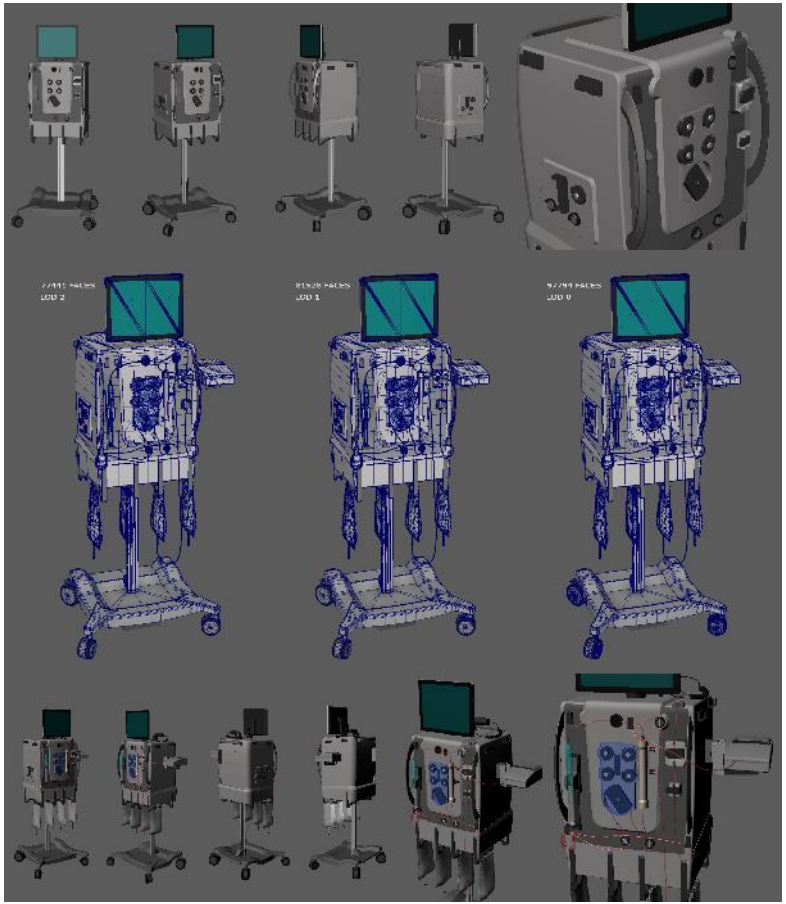


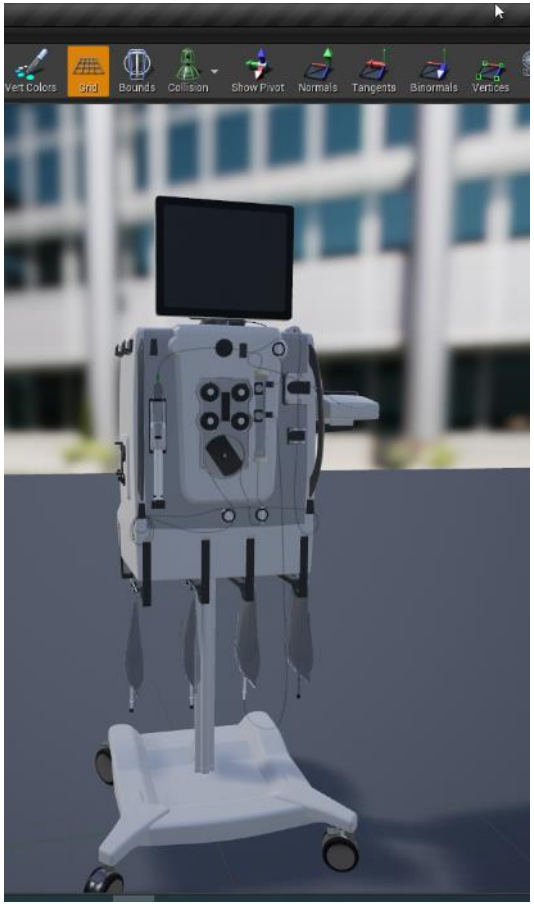


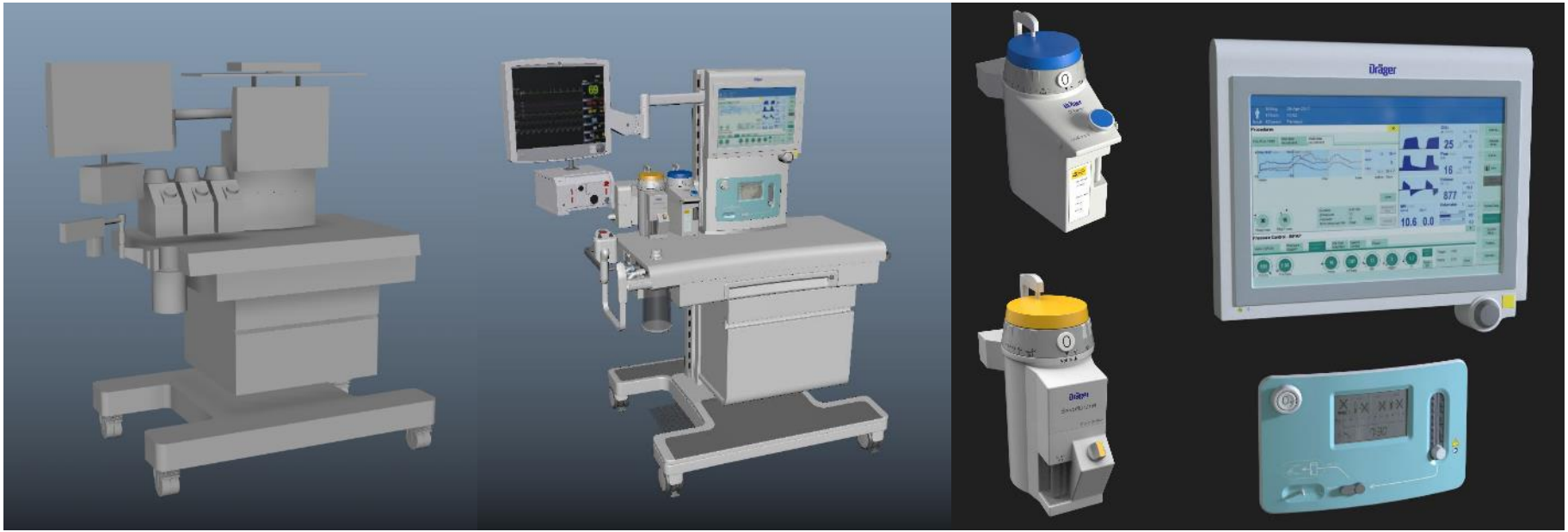




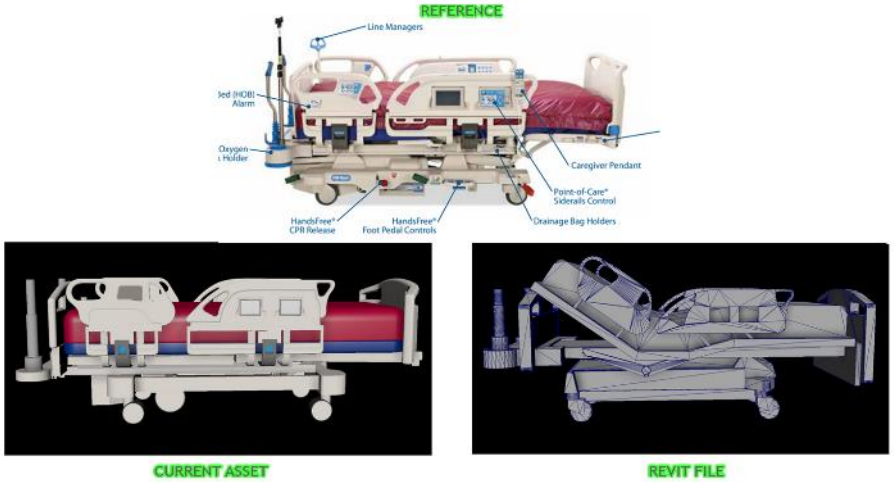





Vert Colors
Grid
Bounds
Collision
Show Pivot
Normals
Tangents
Binormals
Vertices

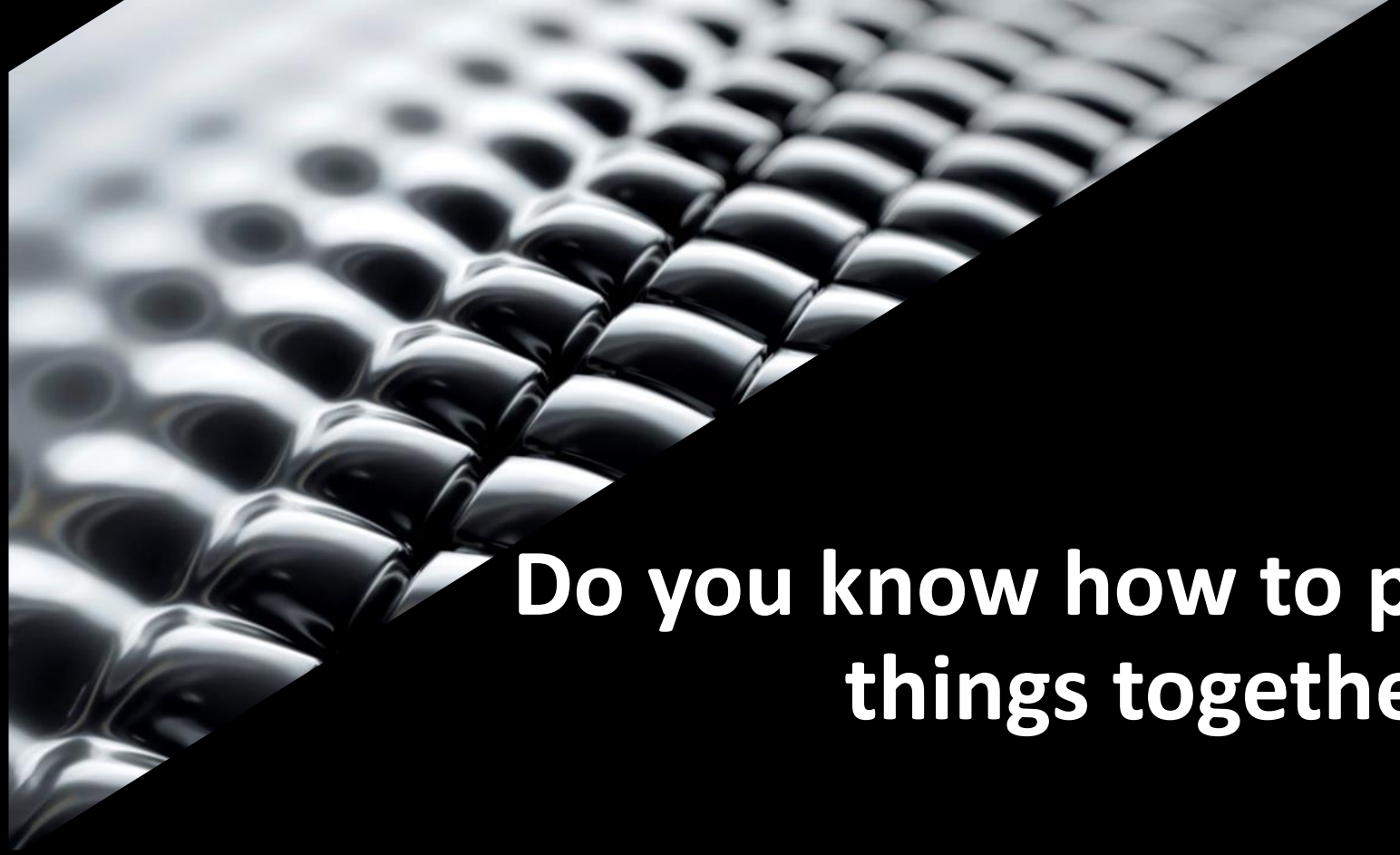

Dräger

Every object matters



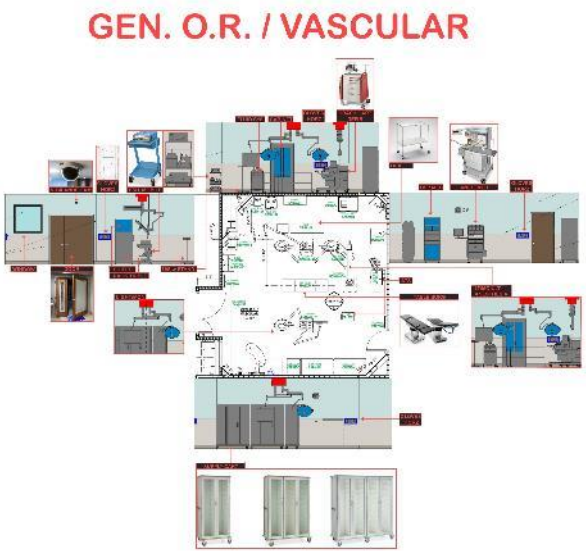
> *The operating table was a centerpiece of the review, and featured some of the most detailed geometry and materials, even incorporating branding*



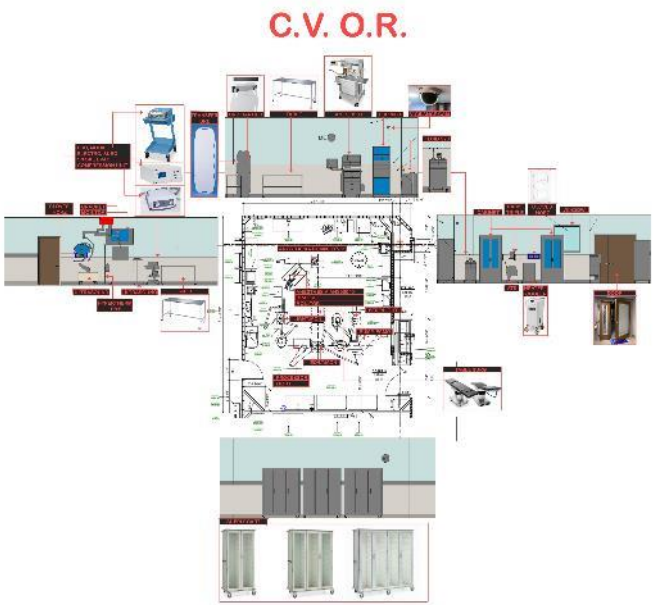


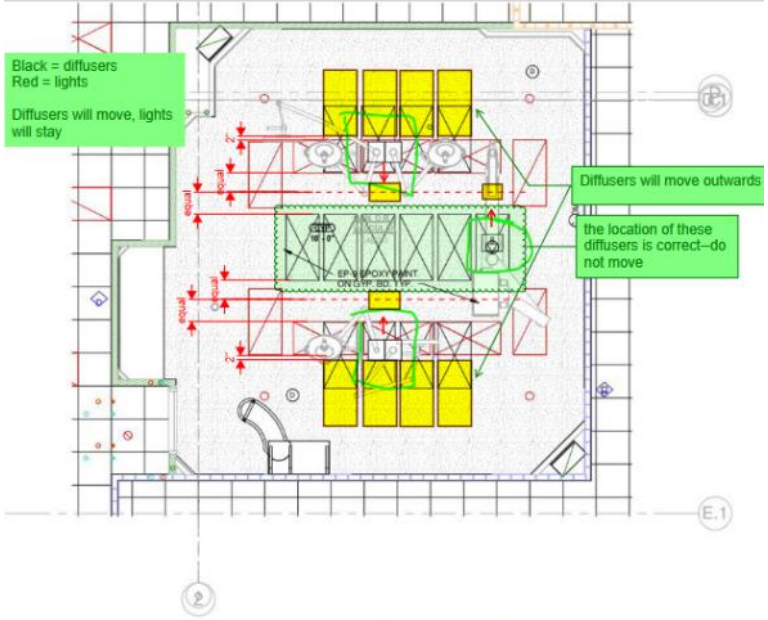
Do you know how to put things together?

Placement Board



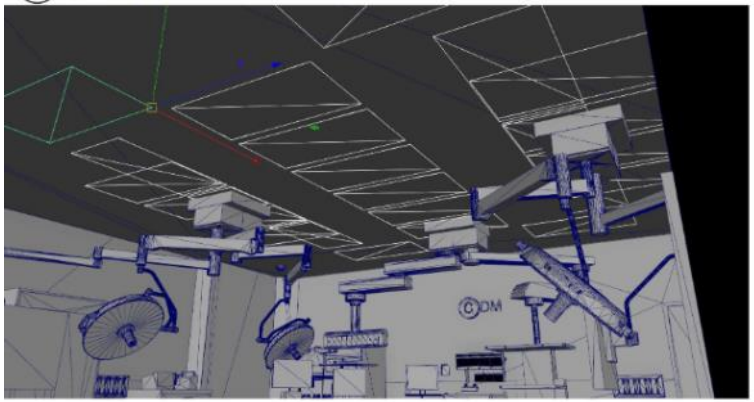






6 ENLARGED RCP PLAN - GEN O.R. VASCULAR - C4B031

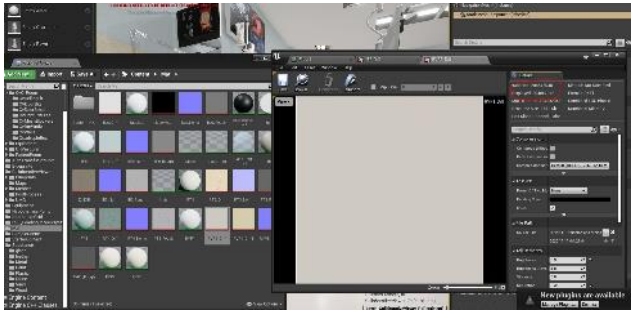
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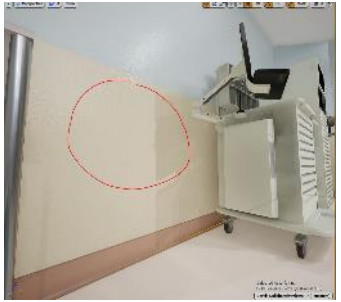




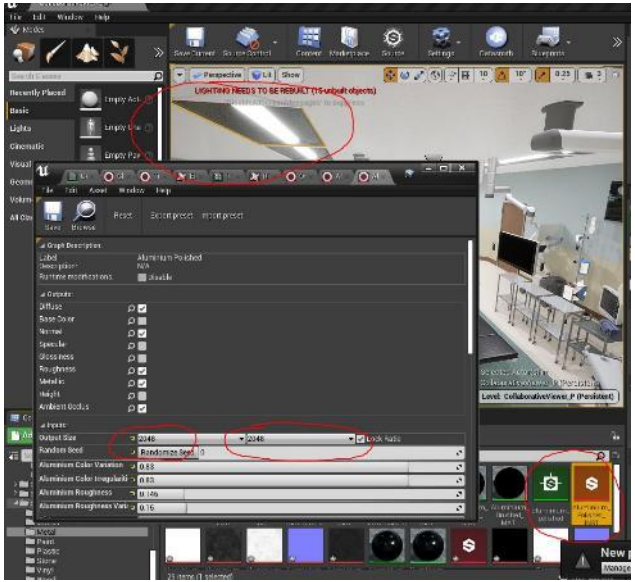
Do you know how to make lighting work the magic?

















> *Lighting on surfaces*



The Final Reveal





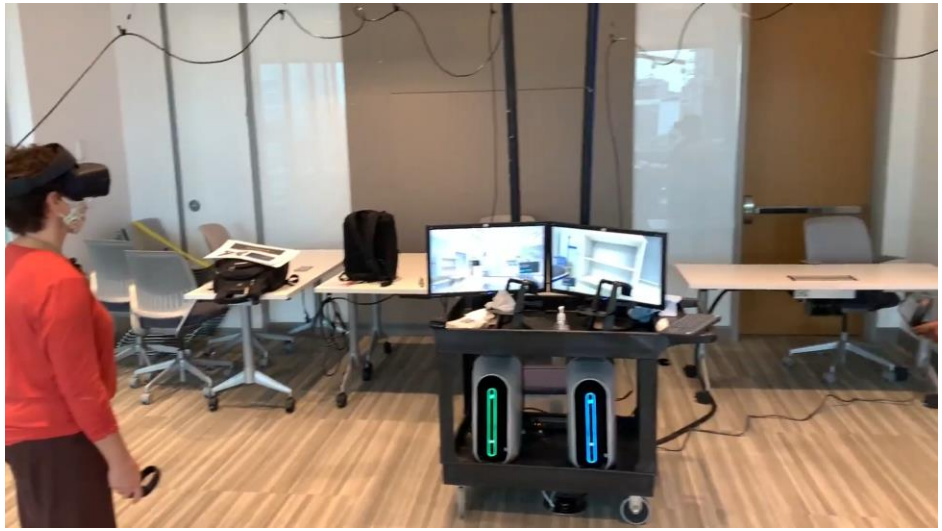




Test it out

Put a product into tests

- VR Set up
- Community Invitation
- Design Iteration



Design Iteration Progress



Final Takeaway



Interaction & human-scale are critical for VR adoption



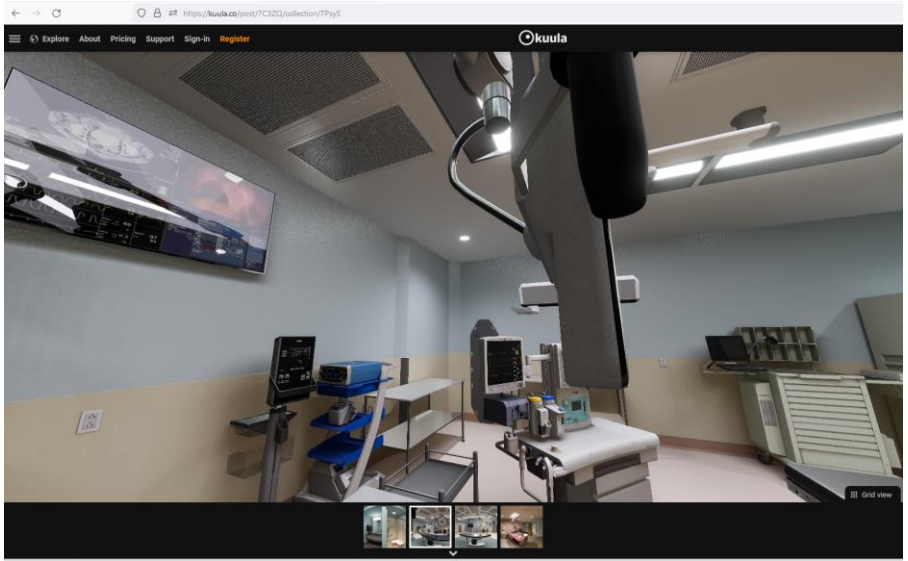
Not just about replacing old practices--VR will bring **new models of practice** that didn't exist before



Sometimes VR is about the **qualitative experience** and not just the numbers

Lesson Learned & Recommendation

- Have staff onsite to help with initial set up and support implementation
- Engage Design Team
- Develop general knowledge on room design and end user workflow
- Provide easy online access: https://kuula.co/post/7C3ZQ/collection/7PsyS



What we are excited about?

- Easier and efficient set up
- Significant shorter loading time for the VR App
- Create scanned VR asset library





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