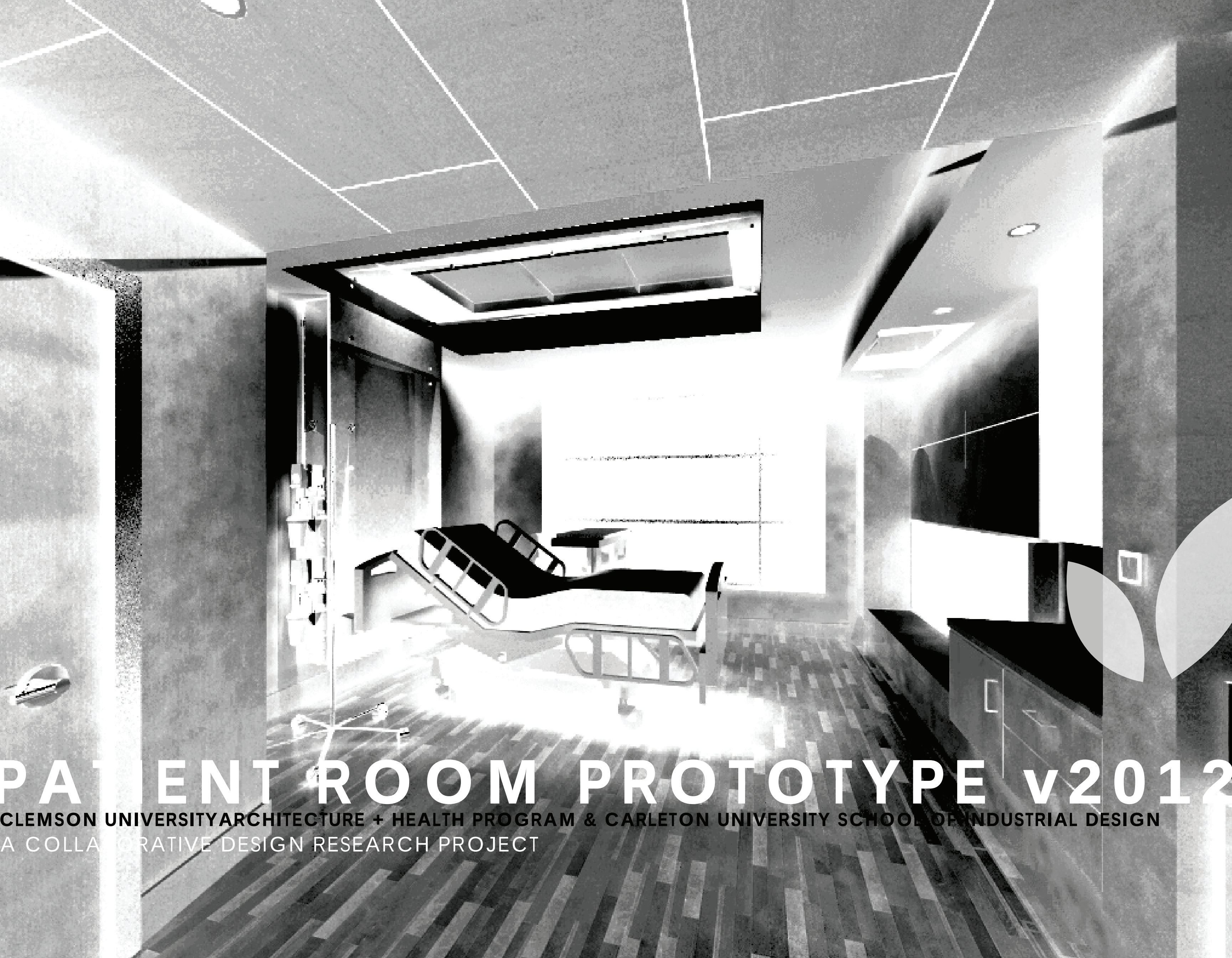

PATIENT ROOM PROTOTYPE v2012

CLEMSON UNIVERSITYARCHITECTURE + HEALTH PROGRAM & CARLETON UNIVERSITY SCHOOL OF INDUSTRIAL DESIGN

A COLLABORATIVE DESIGN RESEARCH PROJECT

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PATIENT ROOM PROTOTYPE v2012

AN INTERDISCIPLINARY DESIGN-RESEARCH COLLABORATION WITH THE SPARTANBURG REGIONAL HEALTHCARE SYSTEM

03

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INTRODUCTION

This project involves the detailed design and prototyping of elements on the headwall and footwall to be employed in either acute care patient rooms or acuity adaptable/universal patient room designs. It represents a new cycle of an iterative design-fabrication-research process involving a collaborative team of healthcare architects, industrial designers, an interior designer, students, healthcare equipment companies and their personnel, healthcare providers, along with periodic consultants and experts in several other disciplines. It involved professionals in each primary discipline working as and with faculty and students at two Universities in two Countries and served as both a design research and teaching/learning experience. This submission builds on a series of earlier design concepts, prototypes, testing and evaluation cycles including formal research studies involving simulation and informal observational and feedback from clinicians on elements employed in an actual healthcare facility. Four separate cycles of research/design/fabrication/evaluation culminating in prototypes built in 2003, 2006, 2007 and 2009 led to the results of the prototype design features included in this 2012 submission.

This proposal also benefits from lessons learned from work by others at the primary submitting institution on a concept room for the year 2020, which also built on the earlier work mentioned above. However, instead of envisioning what might be possible in 10 or more years, this submission was charged with exploring what might be possible and feasible today, or tomorrow, in terms of clinical practices, regulation, affordable technologies and market ready products in an era of increasingly constrained resources in healthcare. It looks at a two to five year window of application. The features included in the proposal are being explored to bring to market with collaborating partners who are recognized leaders in the healthcare furnishings and equipment market.

The underlying charges of the proposal have not changed dramatically over each iteration, but have been reframed as the healthcare context has changed and new information was learned in each cycle of research, design, fabrication, evaluation and redesign. The underlying premise is to optimize health, comfort and control for patients, staff and families by:

- Providing a setting that is safe, therapeutic, green and sustainable
- Providing a setting that supports positive patient/family/staff centered experiences
- Enabling efficient and effective clinical care and health outcomes
- Providing an adaptable setting that accommodates changing needs over time

The proposed headwall and footwall elements were each envisioned as a plug and play kit of parts that could be adapted or interchanged over the life of the room, or used in various ways over the life of a patient stay. The intent was to design features that would allow adaptation and design variation for both function and appearance in each application initially and over time.

KHULOOD ALAWADI

Khulood is originally from Dubai, UAE, and she is in her 4th year at Carleton University, where she studies Industrial Design. Her 4th year major project is on "Household Anaerobic digester: A clean energy solution for sub-Saharan Africa." She is particularly interested in cultures and family interactions and how socially responsible design can influence these relationships. She has experience in hospital rehabilitation engineering and urban design. She has worked at Masdar City with Foster+Partners.

DAVID ALLISON_PROFESSOR

David Allison FAIA, ACHA is Professor & Director of Clemson's Graduate Program in Architecture + Health. His teaching and scholarship involves the integrated design and research of health care settings. He was a founding member of the American College of Healthcare Architects and Coalition for Health Environments Research. He is a member of the AIA Academy of Architecture for Health where he served as a National Advisory Board member. He was selected in 2007 as one of "Twenty Making a Difference" and identified again in 2009 and 2010 by Healthcare Design Magazine as one of the twenty-five most influential people in healthcare design.

JOHN BARTLETT

John is originally from Virginia. He graduated from James Madison University with a degree in Kinesiology. John has held numerous management positions in the construction industry. His last position was the director of plant operations at a psychiatric residential treatment center.

JUDITH CREWS

Judith is originally from Chattanooga, Tennessee. She graduated from Clemson University in May 2011 with a B.A. in Architecture. Judith has had summer internships working as a model builder for Elemi Architects and TWH Architects, both located in Chattanooga. She studied abroad in Genoa, Italy in the spring semester of 2010 and was able to travel throughout Europe during that time.

THOMAS GARVEY_PROFESSOR

Dr. Thomas Garvey is from Ottawa, Canada. He received his Bachelors of Interior Design from Carleton University. He also has a M.Science from NY and a Ph.D from Tokyo. He is currently serving as an Associate Professor and the Director of the School of Industrial Design at Carleton University. He also has experience in graphic design, architectural planning, space station interior design , furniture design, and residential and commercial interior design. He is particularly interested in products for extreme and minimal environments.

YU (ECHO) JIANG

Yu received her Bachelor of Engineering in Interior Architecture in 2004 and Master in Architecture History in 2008 from Chongqing University, China. Yu worked in China for CTDI Engineering Corporation on local and overseas projects. She spent eight months working in Africa, where she decided to continue her education and career through the Architecture + Health graduate program at Clemson University in 2011.

2012 CORE PROJECT MEMBERS

MINGLU (LUNA) LIN

Minglu, who goes by the name Luna at Clemson, is originally from China. She was born in Fujian, Fuzhou, which is in the southeast part of the country. She received her Bachelor of Architecture from China's Southeast University.

LISA MARCHI

Lisa, originally from Scottsdale, Arizona, graduated with a B.A. in Architectural Studies within the Art & Art History Department at Colgate University in 2009. She studied abroad in London with the Studio Art Program offered by Colgate University in 2007. While abroad, she traveled to Spain, France, Italy, and Ireland. Last summer Lisa worked as an intern at KMD, a design firm in San Francisco, California.

ANDREW PARDUE

Andrew is originally from Heath Springs, South Carolina. He studied technical resolutions in architecture for two years at Midlands Technical College in Columbia, SC. He graduated with a B.A. in Architecture from Clemson University in May 2011. Andrew has worked for McMillan Pazdan Smith in Greenville, SC and has been contracted to build scale models. He studied in Charleston on a design-build project with the Fluid Campus.

TAMARA PHILLIPS

Tamara is originally from Ottawa, Canada. She is a Professor of Interior Design at Algonquin College and a registered Interior Designer. Tamara remains active in the professional community while teaching courses in corporate and healthcare design. She is working toward a degree in Professional Arts in Communications at Carleton University.

SHUO YANG

Shuo is originally from Shenyang, a city in northeast China. In 2006, he graduated from North China University of Technology with a Bachelor degree in architecture. Shuo has worked as an architectural designer for the Lawrence Group and Henn Architekten in Beijing. He began Clemson's graduate program in Architecture + Health in 2011.

JESSICA YIU

Jessica is originally from Pretoria, South Africa, and she is in her 4th year at Carleton University. She is studying Industrial Design. Her major project is "Smart Collaborative Seating for Individual Work Spaces. Jessica is interested in the importance of design and how it can enhance patient recovery within care giving environments. She has experience in woodworking and cabinetry fabrication.


SITE VISITS/CLINICAL STAFF ENGAGEMENT


MOCK-UPS


FABRICATION

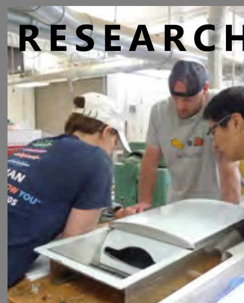

LECTURES


CHARRETTES


TESTING

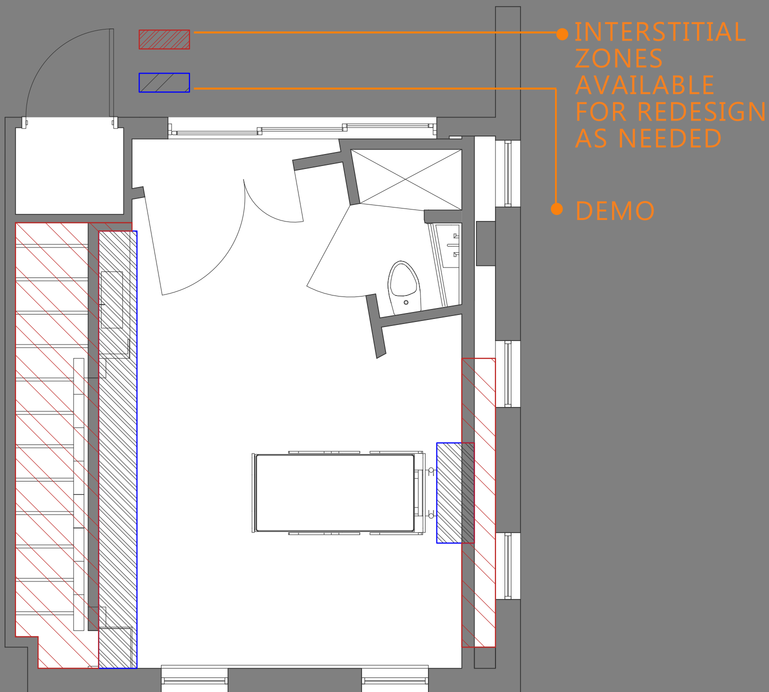

COLLABORATIVE TECHNOLOGY


VIRTUAL STUDIO


RESEARCH

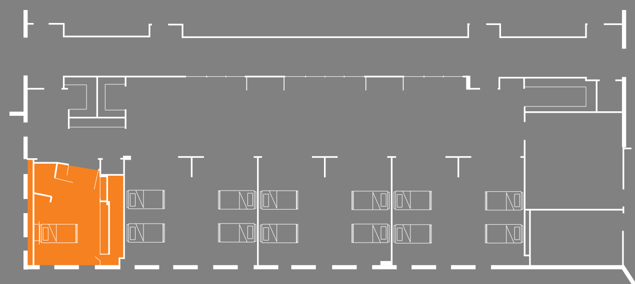
The charge in this cycle was to work within the project "site" of the basic prototype room footprint developed and refined in earlier cycles and focus design revisions and refinements on two primary features of the patient room: the headwall and footwall. Two sites were envisioned. One was the refined 2007 prototype as built in a simulation lab on a healthcare campus and the second is a mock-up within a "black-box" room last refined in 2009 in a clinical simulation training facility in a school of nursing. The actual fabrication was to be built in the "black box" room on campus. The team had to design elements that would fit within both prototype room sites. All elements of both versions of the patient room were to remain except the headwall and footwall elements.

The fabrication in the black box room in the **C**linical **S**imulation **T**raining **L**ab(**CLRC**) in the School of Nursing provides access to nursing faculty, students and a full compliment of inpatient care clinical equipment. The black box room is a space that can be demolished and rebuilt to the building structure. The overall lab is used simulation training for nursing students and the prototype room is used for teaching when not undergoing redesign, fabrication and research studies.



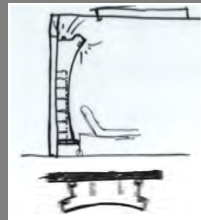
Clinical Simulation Training Lab

Clinical Simulation Training Lab



PROCESS



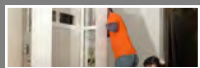



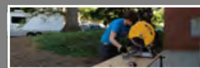

BUILD CALENDAR

2-Mar	5-Mar	7-Mar	9-Mar	12-Mar	14-Mar	16-Mar	19-Mar	21-Mar	23-Mar	26-Mar	28-Mar	30-Mar	2-Apr	4-Apr	6-Apr	9-Apr	11-Apr	13-Apr	16-Apr	18-Apr	20-Apr	23-Ap	25-Apr	27-Apr
Fri	Mon	Wed	Fri	Mon	Wed	Fri	Mon	Wed	Fri	Mon	Wed	Fri	Mon	Wed	Fri	Mon	Wed	Fri	Mon	Wed	Fri	Mon	Wed	Fri

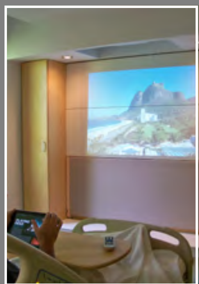
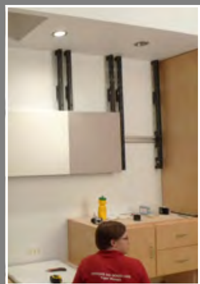
PRODUCT: DEMO

PRODUCT: FRAMING





PRODUCT: BUILD

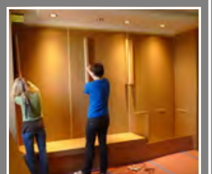




SEMESTER CALENDAR

MAY+summer | APRIL | MARCH | FEBRUARY | JANUARY

REVIEW DATES

Final Review

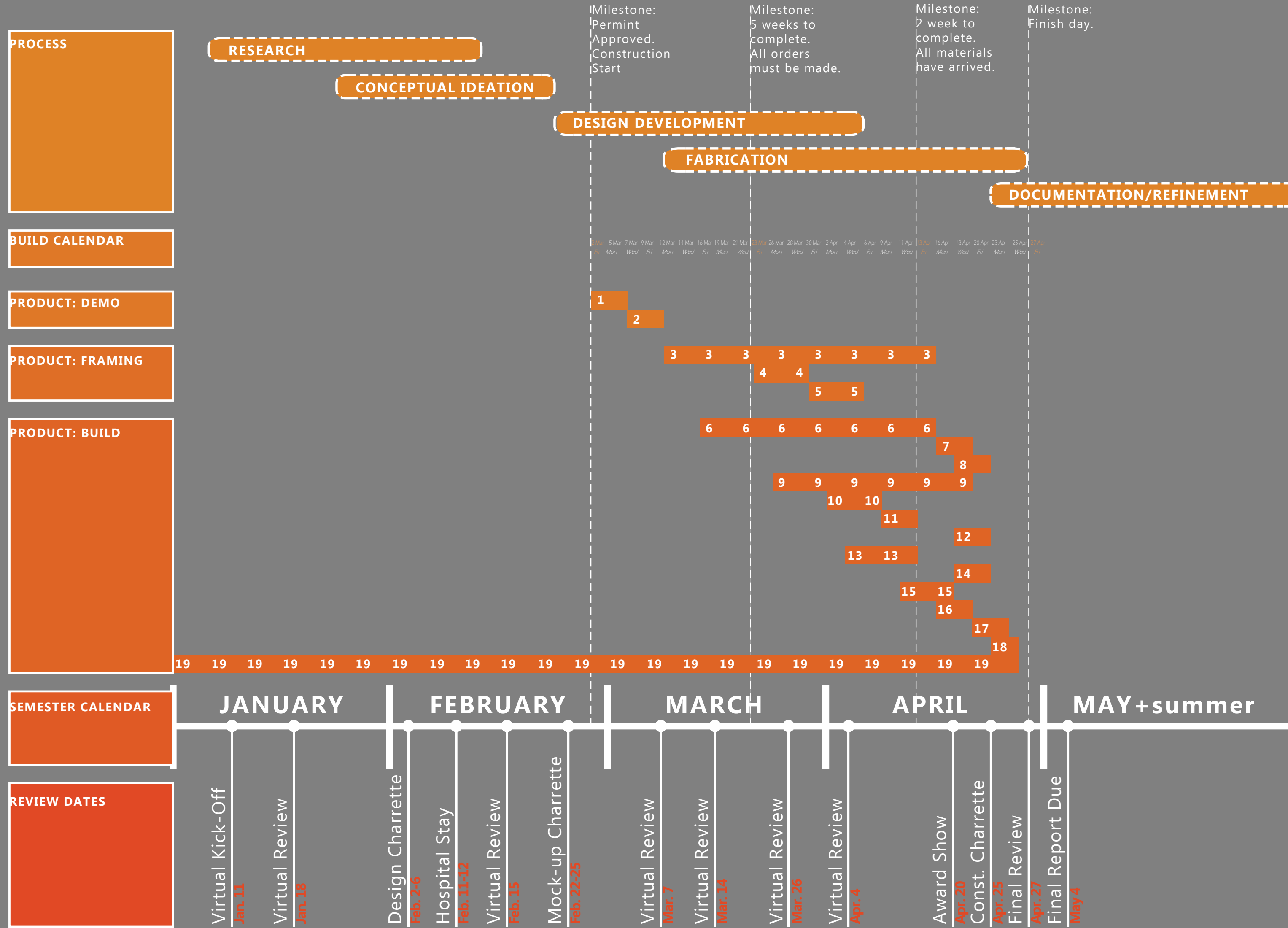


Charrette

Charrette

Virtual Kick-Off

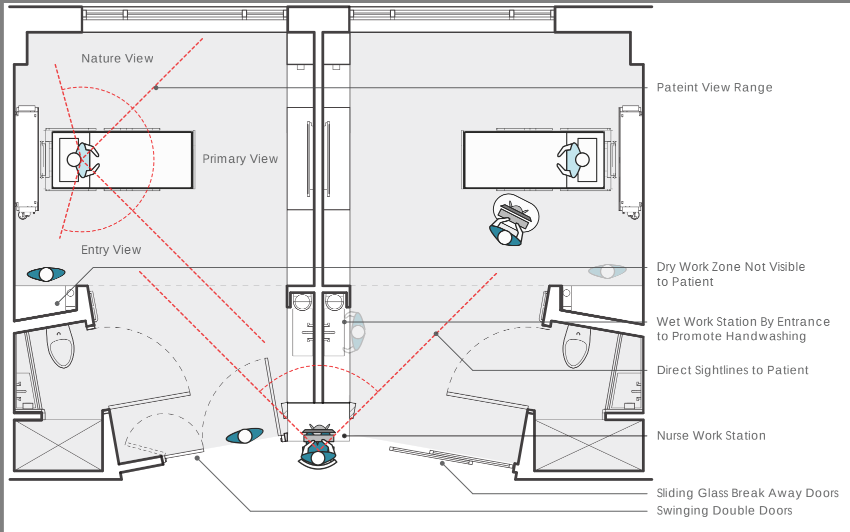
PROJECT TIMELINE



Patient Room Prototype v2012 | 1.0 Project Scope and Background

A COLLABORATIVE RESEARCH + DESIGN PROJECT

CLEMSON UNIVERSITY + CARLETON UNIVERSITY

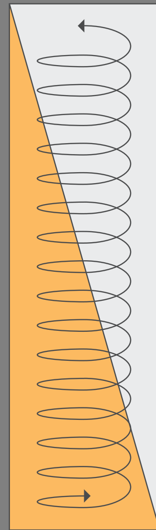


Patient Room layout Research & Design; Clemson University/NXT

COLLABORATIVE - INTERDISCIPLINARY - DESIGN - RESEARCH - PROCESS

RESEARCH - Design

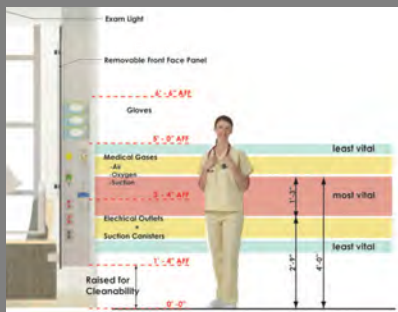
- Literature review
- Case study review
- Healthcare facilities visits
- Healthcare equipment visits
- Seminars by industry experts
- Overnight admission and stay
- Design hypotheses and concepts
- Preliminary mock-ups and evaluation by design team
- Design concept mock-up evaluation by hospital staff: nursing, housekeeping, infection control, respiratory therapy and administration
- Empirical research design
- Task analysis: headwall and bathroom
- Overall nursing task analysis
- Headwall experiment [simulation study]
- Bathroom usability evaluation [simulation studies]
- *Overall room assessment [simulation study]*
- *Operational beta studies of room in hospital*



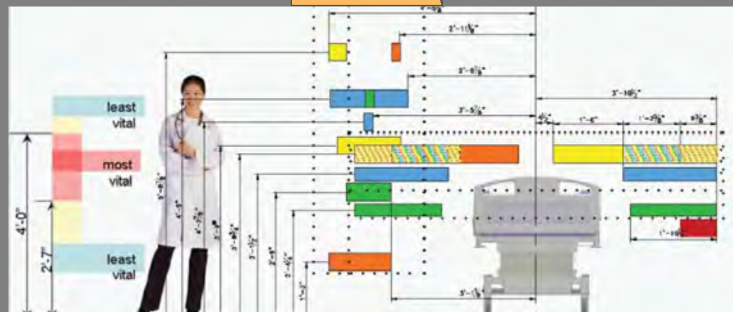
DESIGN - Research

- Pre-conception design studies
- Establish assumptions and constraints
- Define design goals and objectives
- Design brainstorming
- Mock-up at Hill Rom
- 1st Design charrette - develop options
- Develop competing options
- 2nd Design charrette - critique refinement
- Build rough mock-up in CLRC
- Select/develop final conceptual direction
- Detailed development of key room elements: headwall, footwall, bathroom, entry, ceiling and over-bed table
- Identify room finishes, fixtures and fittings
- Construct/fabricate final CLRC mock-up
- Refine bathroom, headwall, footwall details
- Construct detailed construction mock-up
- *Finalize design refinements, details and materials for actual hospital [beta] room*

3-Form Chroma
http://www.3-form.com/materials/chroma/



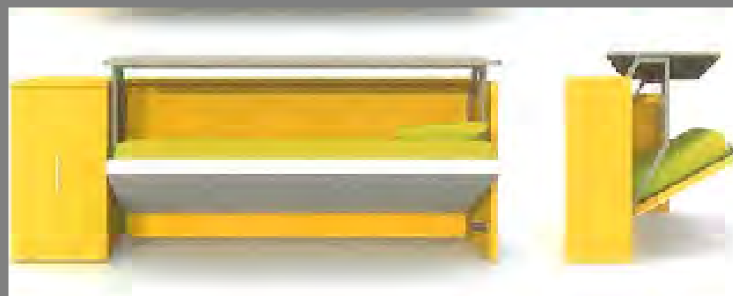
Medical gas design study



Medical gas placement study in one hospital

Herman Miller; Compass system

http://www.hermanmiller.com/products/systems-furniture/healthcare-systems/compass-system.html



Sanya Arts Space: Cabrio In
http://www.instablogsimages.com/images/2006/09/26/cabrio_in_2.jpg

LITERATURE PRECEDENT & MATERIAL RESEARCH

At the start of the project process, the design team engaged in a two-week research period as a way to begin thinking about innovative practices and products within healthcare practice and design. These studies looked at literature, research studies, technologies, products, applications and fields outside of healthcare and healthcare design but continued to focus around unique findings, solutions and developing trends that could be applied to the headwall and footwall elements.

A series of case studies provided examples of recent proposals for changes to the traditional headwall and footwall elements. A pediatric patient room by Perkins & Will presented an interesting design of a multi-media footwall that incorporated storage, personalizable space, and notification board displays to encourage interaction between visitors, patients, and care providers. An Anshen and Allen project revealed a headwall design inspired by the 2006 Patient Room developed by Clemson and Carleton Universities. The headwall unit extends to the ceiling in this prototype and bridges the connection to the patient lift.

In addition to a review of literature and case studies, a number of materials, systems, and technologies were researched for their use both in and outside of healthcare. These elements were informative for their innovation in responding to design conditions. Examples were chosen that reflected various aspects of the project objectives, such as efficiency, adaptability, patient comfort, or therapeutic environment. Particular attention was paid to materials and products that were "green" and sustainable, durable, applicable, cleanable and non-institutional.

Green Patient Lab 3.0 Acute Care PrototypeAnshen + Allen

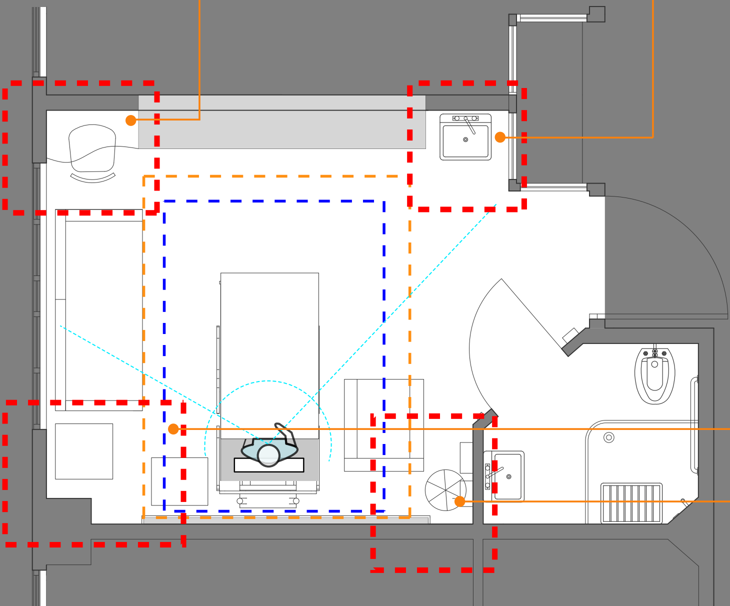
typical patient room: Clearance and Zone Issues

Family Zone

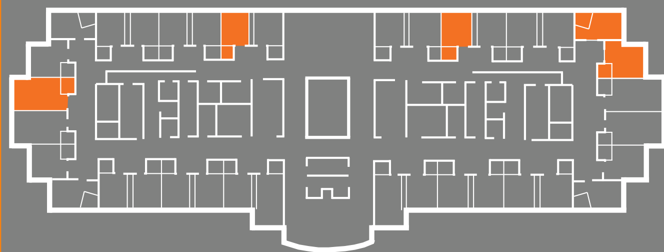
Staff Zone

Dead Space

Nurses Work Area



Greer Memorial Hospital: Typical Patient Room Layout: 250 SQFT



Facility layout and rooms where students stayed

HOSPITAL STAY

Multiple members of the design team spent the night in a patient room to better understand first hand how the built environment impacts patients and patient care. Team members were able to tour a local acute care unit at Greer Memorial and stay 24 hours as patients. Nurses and medical staff contributed to the experience by answering our questions and describing design features that worked and did not work. They gave demonstrations to show how patients used certain equipment and moved around in the patient rooms. The physical therapist, for example, had us practice moving into the bathroom with walkers and IV poles. Throughout the stay, we were monitored on the typical nurse's schedule, had our vital signs taken, and ate the food. The hospital stay was a valuable exercise in understanding the patient's experience in a hospital room. The design team came away with a better knowledge of design issues and noted staff and patient dissatisfaction with inaccessible equipment, crowded furniture, dusty crevices, and awkward placement for display in the footwall.

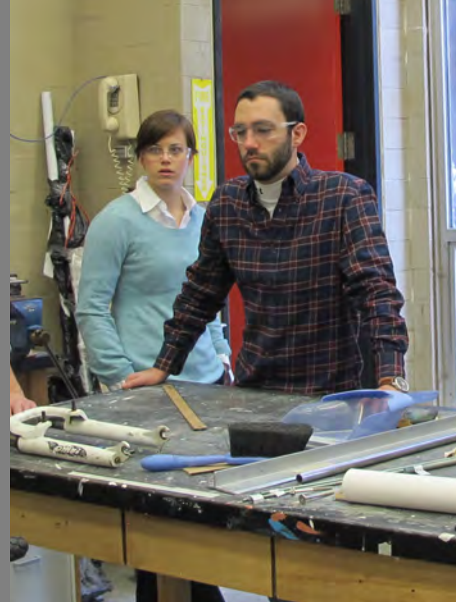
Experiencing physical therapy

Floor Clearances & issues

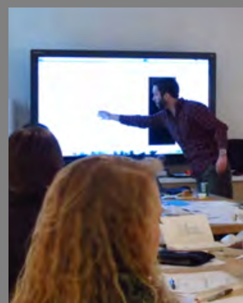
Patient zone clearances & issues

24-Hour Patient experience








INTERDISCIPLINARY/COLLABORATORY

Virtual meetings allowed interdisciplinary design team members located in two countries to communicate remotely throughout the duration of the project. Team members in each location prepared presentations to share their progress and new ideas with the other team. These meetings gave everyone the opportunity to critique the evolving concepts and design. Participants could ask questions and discuss possible alternatives to the design propositions. These virtual meetings also provided an opportunity to connect with outside experts and ask for their advice on certain aspects of the headwall or footwall. Video conferences took place on January 11 & 18, February 15, March 7, 14 & 26, and April 4, 2012.

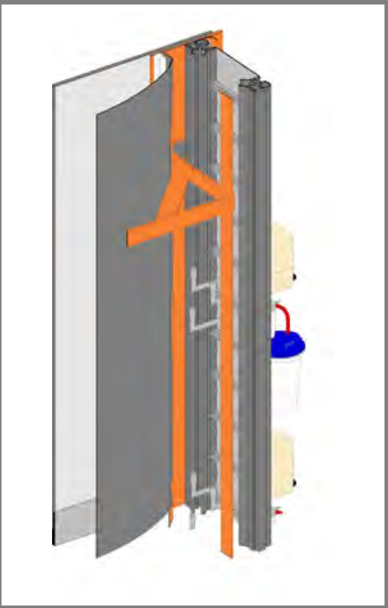
The architecture team met with the industrial design team at their location in early February to present research findings and kick off the design phase of the project: **Conceptual Ideation**. Team members broke into **two groups**, one for headwall and one for footwall, which continued throughout the rest of the design phases. Both groups conducted a series of **collaborative work sessions** to develop key concepts and goals for each of the room elements.

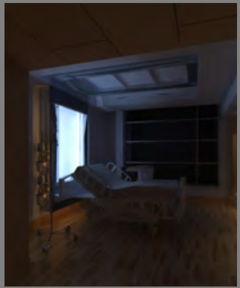
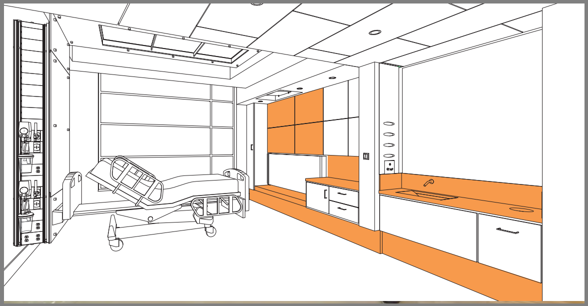
By the end of the charrette, the two teams produced clear design strategies for the headwall and footwall, based on both research findings and group explorations. The collaboration marked an important transition from research to applying what was learned to the 2012 project. Other trip activities included **tours** of the industrial design fabrication facilities and meetings with industry experts.

The design charrette hosted at the architect's workspace brought together students, faculty, and outside professionals in a collaborative series of **brainstorming and educational sessions**. The students **toured** Greer Memorial Hospital and Village at Pelham Hospital and visited the 2007 Prototype Room and Lab in Pelham, where charrette participants were updated with process **presentations**.

One day was dedicated to meeting with guest experts and exploring the design proposal in further detail. Headwall and footwall teams worked to prepare **mock-up designs** for mock-up. Meanwhile, other team members were involved in the demolition of the existing. A **cardboard mock-up** was built the final day to reflect design changes made during the charrette and to discuss further refinements to the proposal.



DESIGN GOALS & CONCEPTS

In response to the project charge and objectives, the 2012 team developed a set of design goals to implement in the final proposals for the headwall and footwall. These goals were developed throughout the process of conceptual ideation and represent abstract qualities or strategies that are manifested in the physical design. They reflect the needs of patients, family members, and staff. At the same time, the goals aim to incorporate the multitude of functions that the headwall and footwall embody.

The goals also help clarify the holistic project mission that unifies both the headwall and footwall elements. They guided design decisions at all level of details, from the overall room level aesthetic down to the scale of a corner finish detail.

Overall, the 2012 Patient Room Prototype project goals provide a clear, concise message of the team's overarching design intentions.

2.0 DESIGN GOALS & CONCEPTS 16-35

Safety and Sanitation
_cleanability_non-toxic

Adaptability
_personalization_interchangeable

Comfort and Control
_choice_ergo-

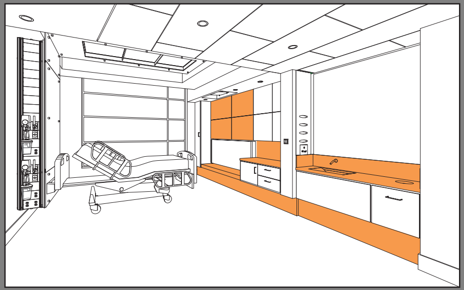
Efficiency
_multi-functional_convenience

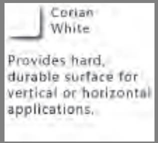
Modularity
universal_standardized

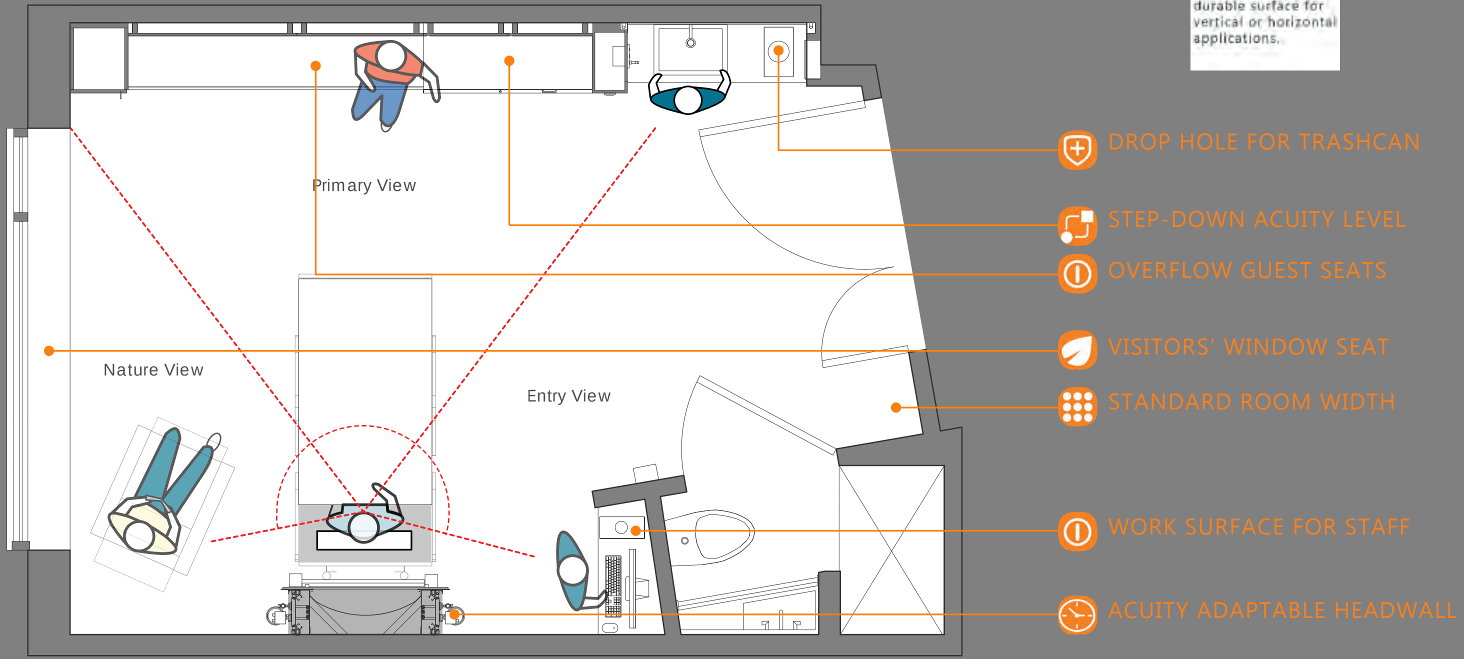
Therapeutic Environment
non-institutional_healing

a cohesive room layout through headwall & footwall design

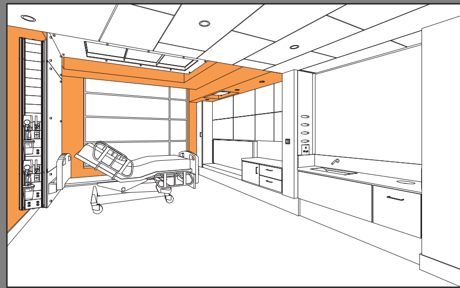
The final design of the 2012 Patient Room Prototype was a collaborative effort among team members following the same goals and objectives. The design refinement process required the design team to consider aspects ranging from functional use to structural details to overall aesthetics. Together, the headwall and footwall are important features that directly impact the experience of patients, family, and staff. They represent the opportunity to bring greater innovation and personalization into the typical patient room.

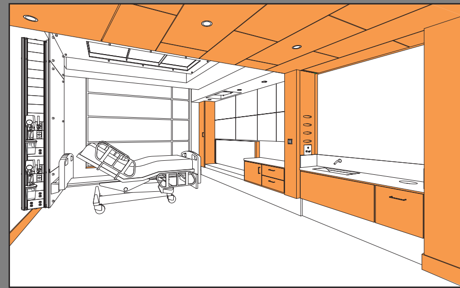






ROOM OVERVIEW





Acoustic Fabric
Light Grey

Balances hard materials and reduces noise levels in the room.

Paint
White

Creates "floating" effect with components raised off the floor.

Plywood
Maple

Defines entryway and unites casework elements framing the footwall.

Aluminum
Grey

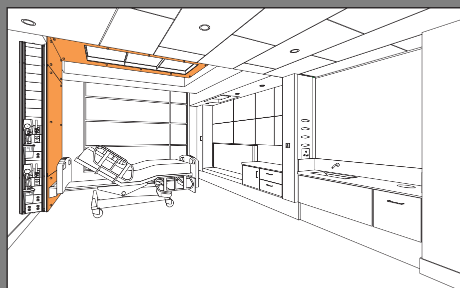
Forms strong structural frame for interchangeable headwall panels.

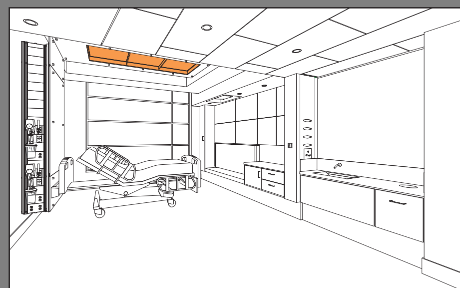
3-Form
Pure White

Allows backlighting options to control color effects in the room.

Sky-Factory

Creates views of natural scenery and other environmental settings





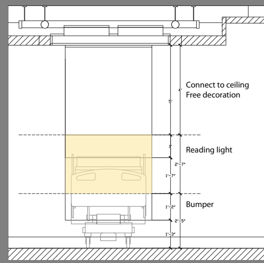
HEADWALL

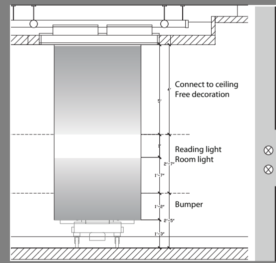
Physical Needs:

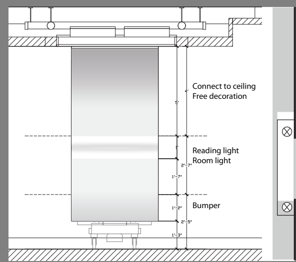
-Gas outlets
  -2 Air (one on each side)
  -4 Oxygen (two on each side)
  -4 Vacuum (two on each side)
-2 suction bottle slides
-Electrical outlets
  -3 duplex outlets on each side
  (2 are duplex emergency on staff side)
-Connectors near floor
  -Bed power
  -Multi-pin
  -Data interface
-Nurse call button to staff station
-Phone jack
-Good lighting
  -Night lighting
  -Task lighting (near gases)
  -Ambient lighting
  -Color lighting (environmental)
-Staff and patient controls
  -Lighting
  -Digital Interface to control room settings
-Sharps disposal in patient care area
-Linen disposal/hamper nearby

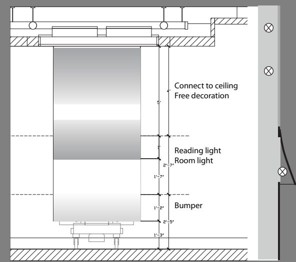
Quality Considerations:

-Cleanability
  -Minimize nooks, crevices, etc.
-Durability
  -Account for impact of bed on headwall
  -Quality of materials, finishes, and construction
-Accessibility to utilities
  -Optimal range of 2’ to 5’ from floor
  -Gas connections through ceiling?
-Adaptability
  -Accommodate different acuity levels
  -Accommodate new and changing technology or equipment
  -Plug and play options
-Integration of various functions
-Efficiency and simplicity
-Aesthetically pleasing









Headwall materials should be durable & maintainable.

Headwall should various light settings and enviromental controls.

Gases should be acuity adaptable.

Headwall should be easily accessable.

Enviromental settings and views

NEEDS & CONSIDERATIONS

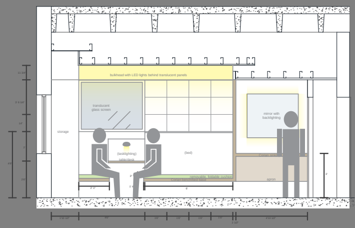
FOOTWALL

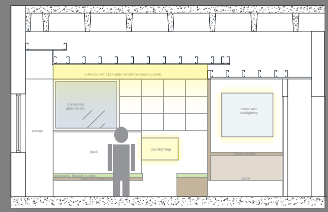
Physical Needs:

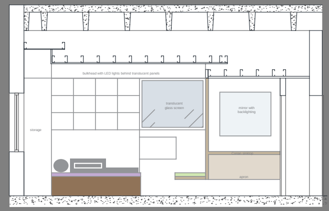
-Sink and hand-washing station
    -Soap dispense
    -Alcohol/Sanitizer dispense
    -Paper towel dispense
    -Gloves
    -Mirror (patient visibility)
    -Power outlets?
-Locked storage
    -Patient
    -Visitors
    -Staff
-Family zone
    -Overflow seating from window area
    -Bench bed for overnight visitors
    -Desk/work area
    -Task lighting
    -Power outlets
-Environmental controls
-Technology screen

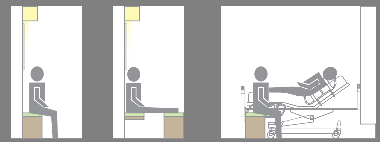
Quality Considerations:

-Cleanability
-Durability
-Efficiency and simplicity
-Ability for personalization by patient
    -Displays of personal effects
-Adaptability
    -Plug and play options
    -Modular components
    -Fixed and mobile elements
-Comfort and reduction of stress
    -Reduction of visual clutter
-Aesthetically pleasing









1 docked bench seat
2 undocked ottoman
3 undocked mobile seat

Antimicrobial & Durable materials

Seamless connections between materials

Modular/interexhangable systems

Environmental settings

bench/bed

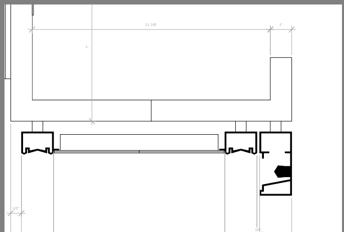
Multi-functional interfaces

Undermounted night lighting

headwall evolution through design

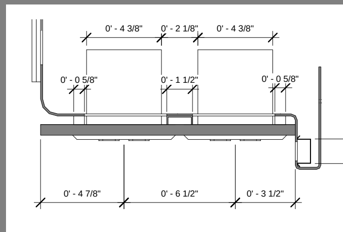
EVOLUTION 1:

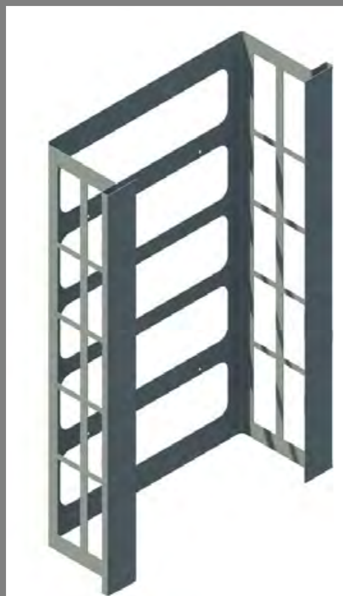
Kit of parts Idea:
-frame/chassis
-side panels
-front panels



EVOLUTION 2:

-refinement of frame design for side panel evolution.





EVOLUTION 3:

-Introduction of interchangable panel system.
-Development of internal parts

EVOLUTION 4:

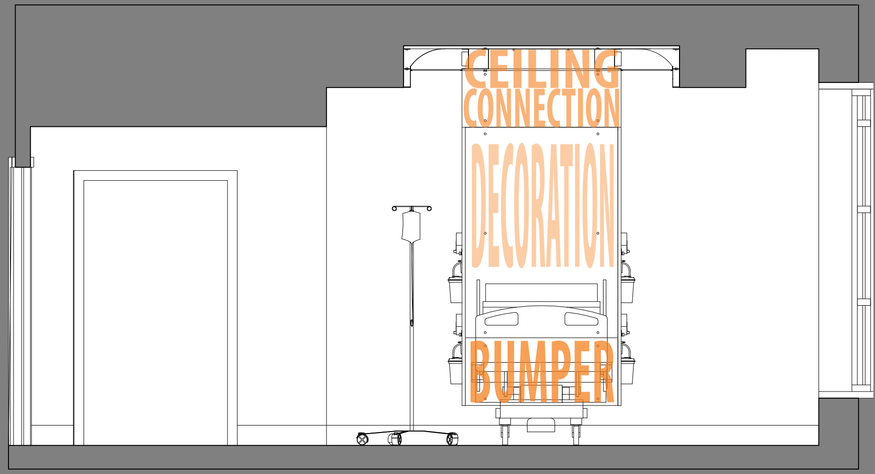
-Refinement of framework with side/front panels
-Refinement of front panel connections and parts

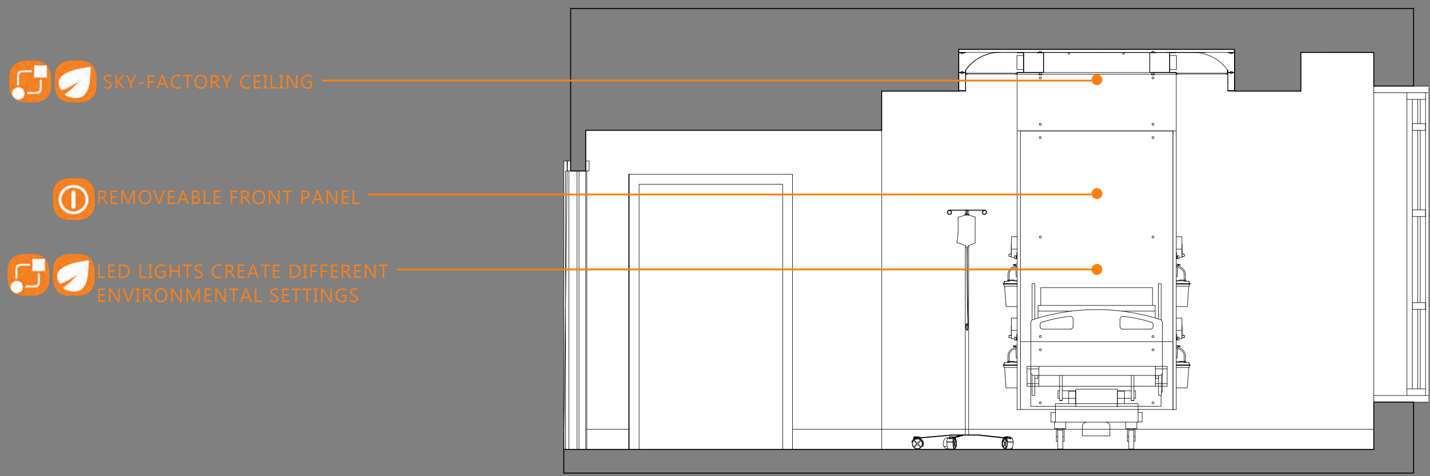
HEADWALL CONCEPTS

ACCESS TO INTERNAL PARTS AND ERGONOMICS

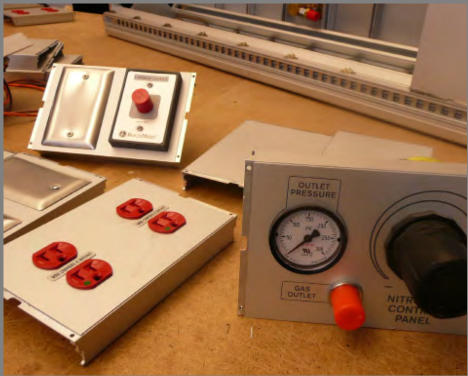
The headwall serves as a primary patient care interface for staff and patient. It provides the umbilical cord service connections used by care providers in patient care and serves as the interface to the room and its environmental conditions for bedbound patients. It is typically presents an institutional image for patients and families and is often not functional for staff. The challenge was to improve its functionality for both staff and patients while minimizing its institutional appearance. It was envisioned as a sort of iPhone or iPad of the patient room. It is envisioned as a plug and play kit of parts where the functional elements can be reconfigured and the visual appearance can be tailored to the specific context of the hospital, it's patient population and it's care needs.

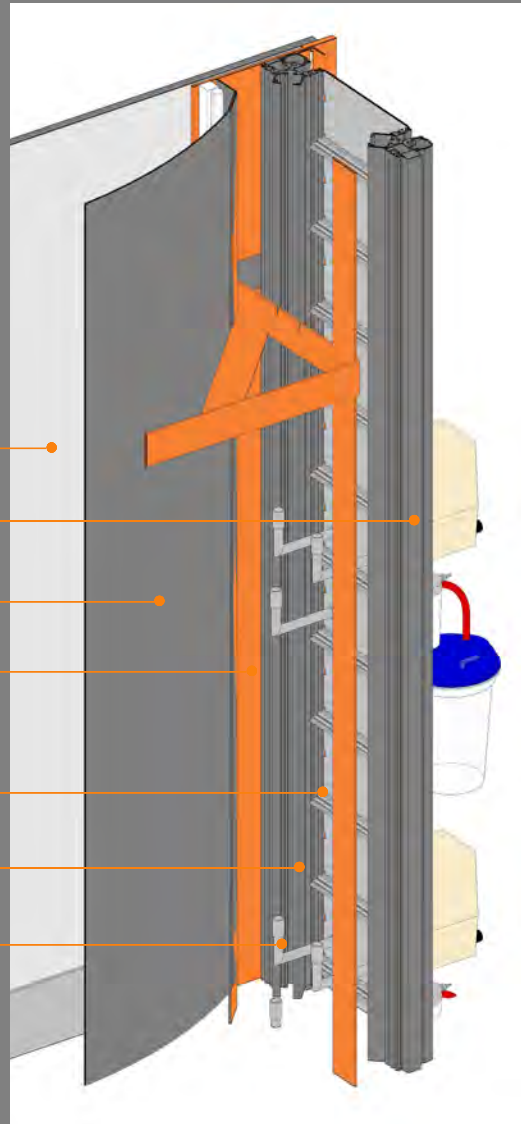
Easy access and ergonomics are main points in the side panel design. Previous research studies define the primary range of nurse activity between 2 and 6 feet off the floor. Compared to overbed outlets, equipment on side panels is more accessible and appreciated by nurses.





headwall evolution with kit-of-parts

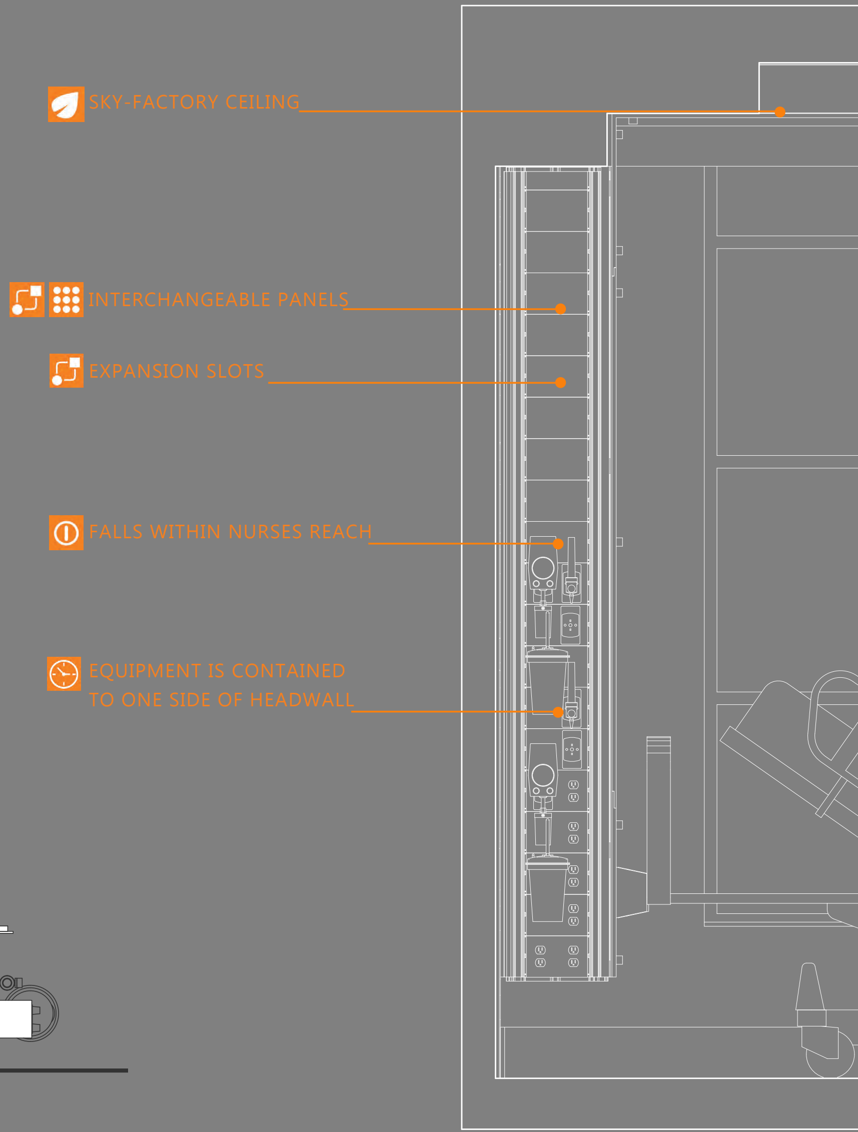


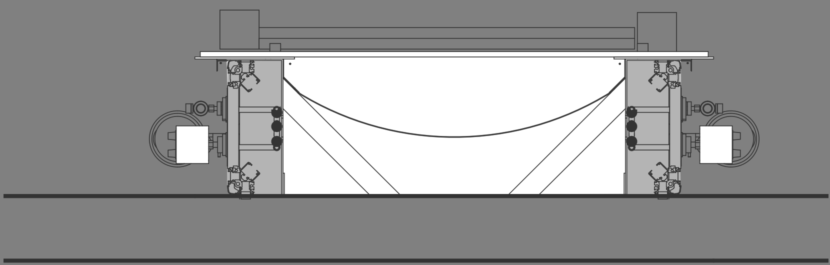


HEADWALL DESIGN

PLUG AND PLAY SIDE PANEL

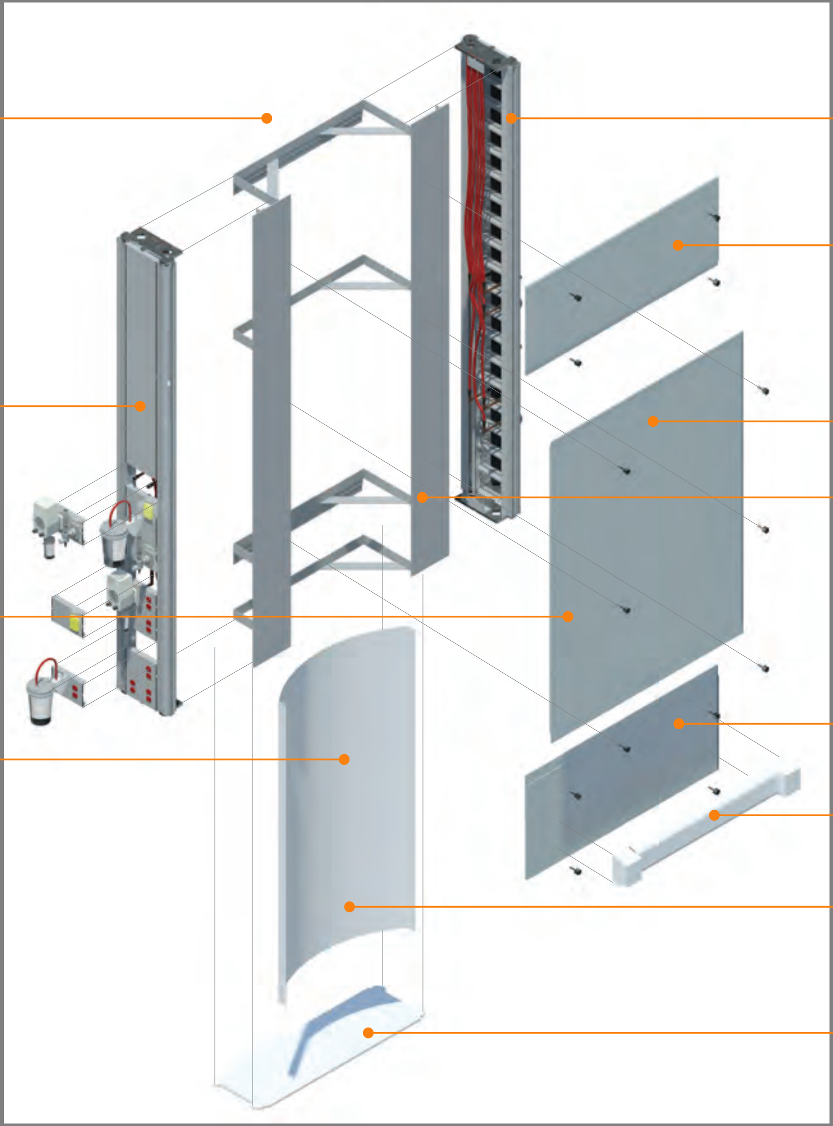
Cooperating with the Trumpf© system, the side panel was designed as a "plug and play" system. Based on the acuity, different rooms could have different mountings. In addition, with the use of a simple tool, the panels could be replaced to adapt to changing functions and adding new technology.



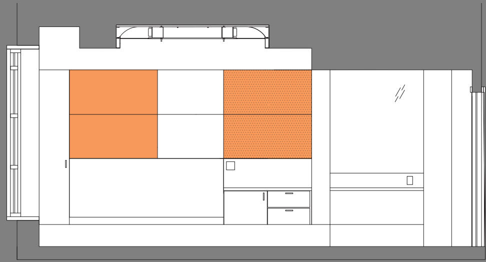


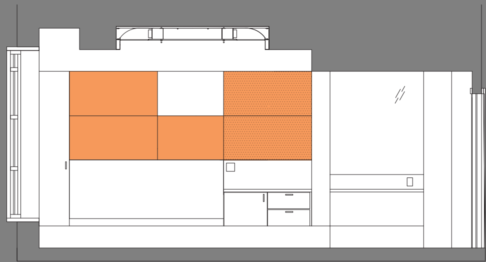
environmental room settings with mood lighting controls

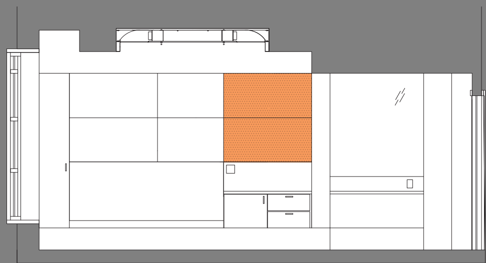
HEADWALL DESIGN

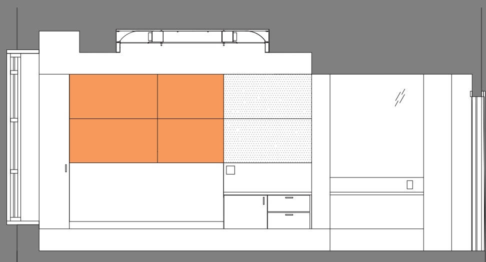


footwall evolution through design









INTERCHANGEABLE WALL PANELS

Various wall panels can be plugged into the modular system and provide opportunities for adaptability and personalization. These panels can be interchanged with different materials such as acoustical fabric, a solid surface for projections, transparent or translucent glass, a whiteboard, wood, or a number of others.
The panels can support different technologies and lighting, from undermounted strip lighting to soft colored backlighting that filters through transparent panels. Based on the hospital or patient's preference, they can be easily rearranged or replaced to form endless configurations of different sizes, placement, and aesthetic of the panels.

FOOTWALL CONCEPTS

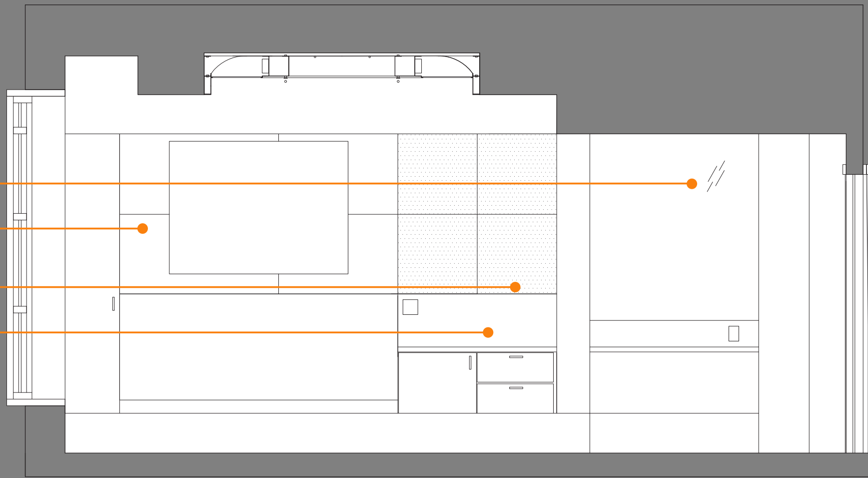
The footwall serves distinct and at time conflicting functions in the patient room. It is the primary focal point of view for the patient, it is a space usable by the family, and provides a highly accessible and visible staging area for staff as they move into and out of the room. The kit of parts envisioned for the footwall is designed to fit into a standard patient room footprint. It relies in part on a modular structure that supports a variety of panels in different materials and uses. Safety and sanitation are two important qualities that emerge in the lighting, materiality, and seamless connections between materials. Creating a more therapeutic environment through display and acoustical elements is another primary goal, as is efficiency in determining the arrangement of subparts. The footwall also offers greater comfort and control through its interchangeable

MIRROR TO VIEW PATIENT FROM HAND-WASH STATION

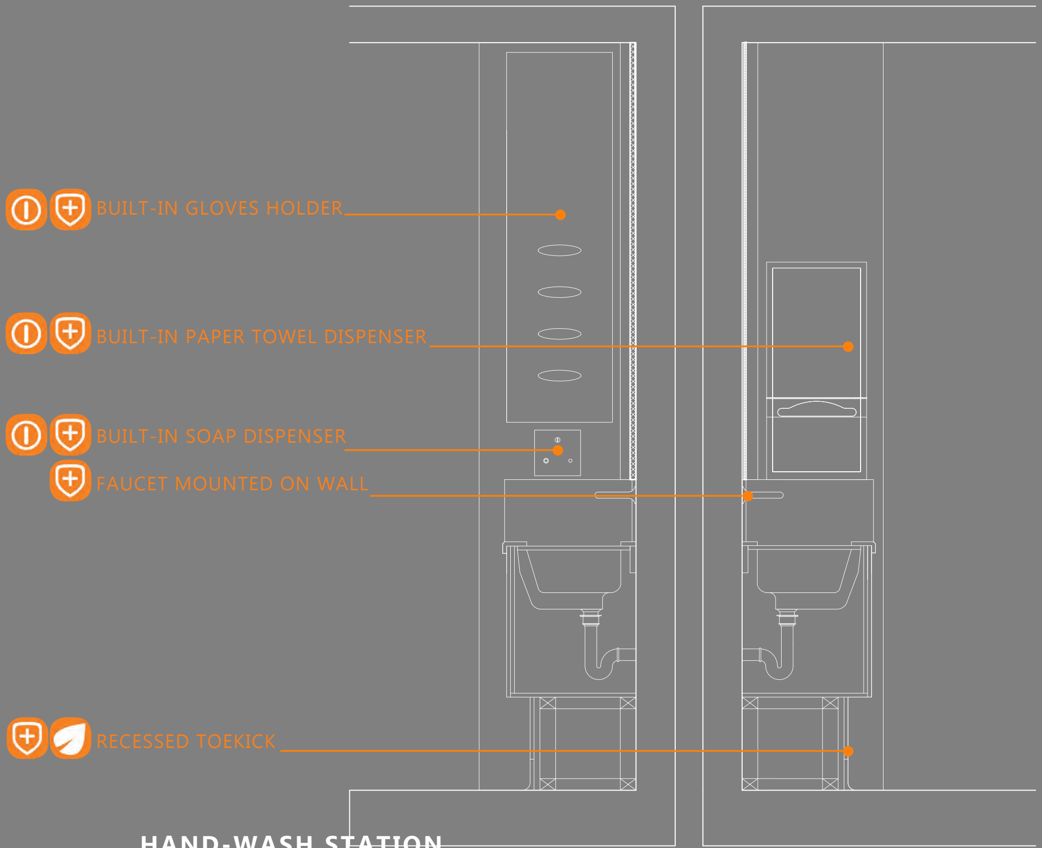
CORIAN PANELS

ACOUSTIC PANELS

WRITING SURFACE



hand-washing station refinement ideas



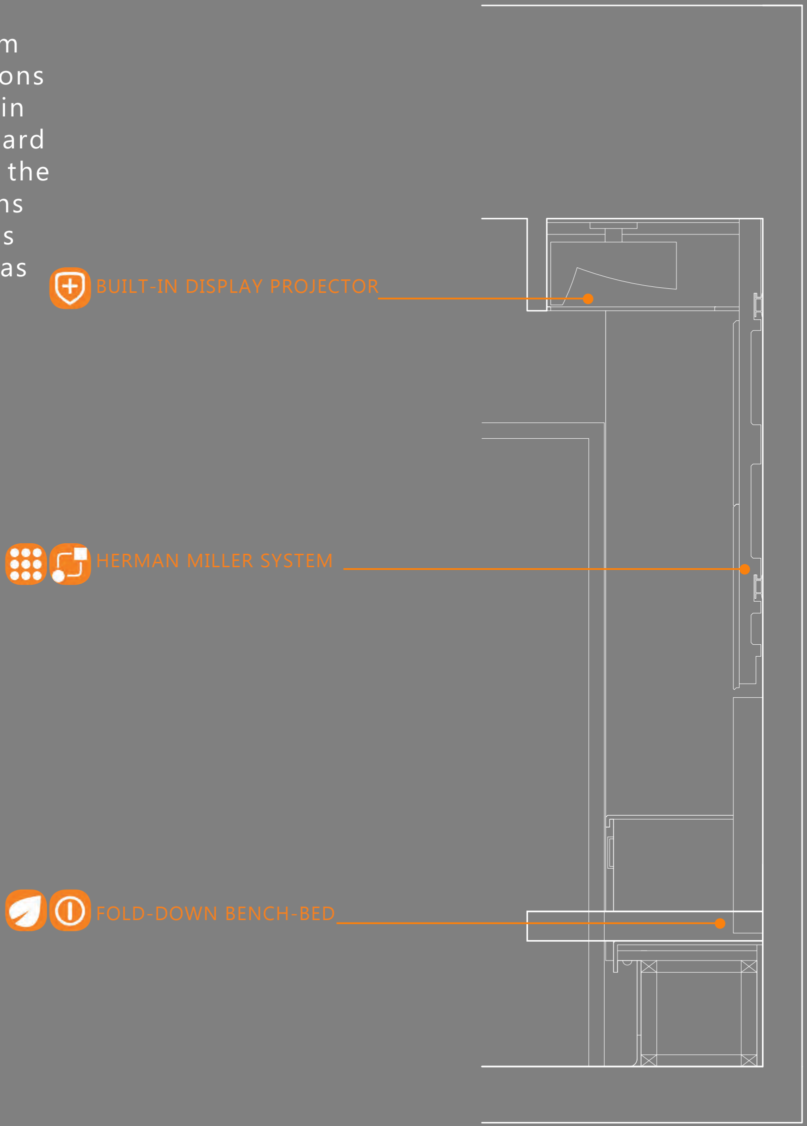
HAND-WASH STATION

The sink area is located at the immediate entry to the room. Intended primarily for staff use, it features elements that are designed for sanitation and safety control. The large mirror allows staff to see the patient while they wash hands. The faucet, gloves, soap, paper towels, and waste can are all built into the casework. This eliminates crevices that could become an infection issue and keeps the area more efficient and hands-free.

FOOTWALL DESIGN

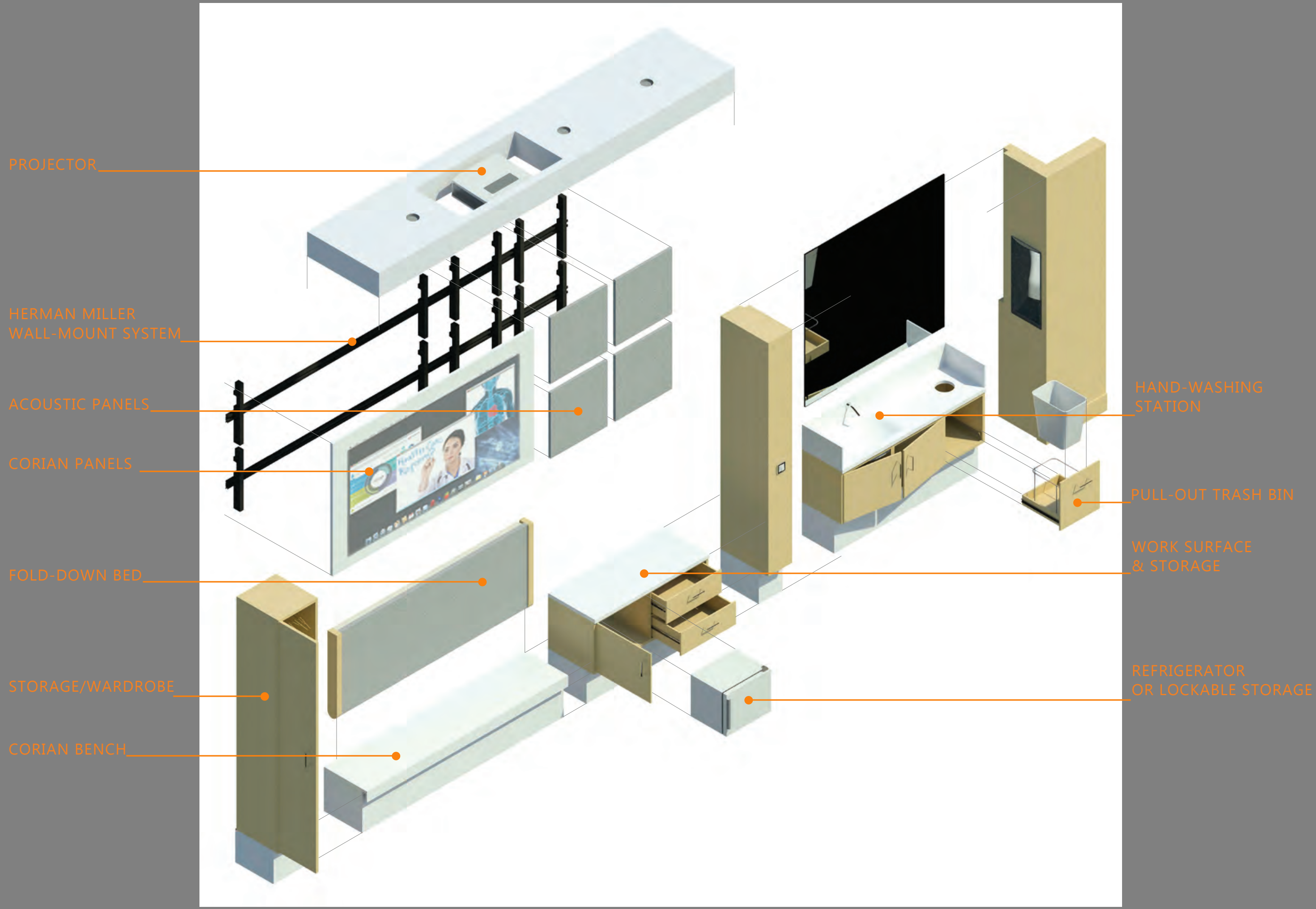
BENCH AND FOLD-DOWN BED

The bench is a Corian surface that functions as a firm surface for sitting or resting objects. Foldable cushions can be placed on the bench or removed and stored in the adjacent cabinets. The bed is the size of a standard mattress (30"W by 80"L) and easily folds down from the wall. For safety reasons, it is lightweight and contains as few open pockets as possible in the detailing. It is backed with an acoustical panel that also functions as a backrest for people sitting on the bench.



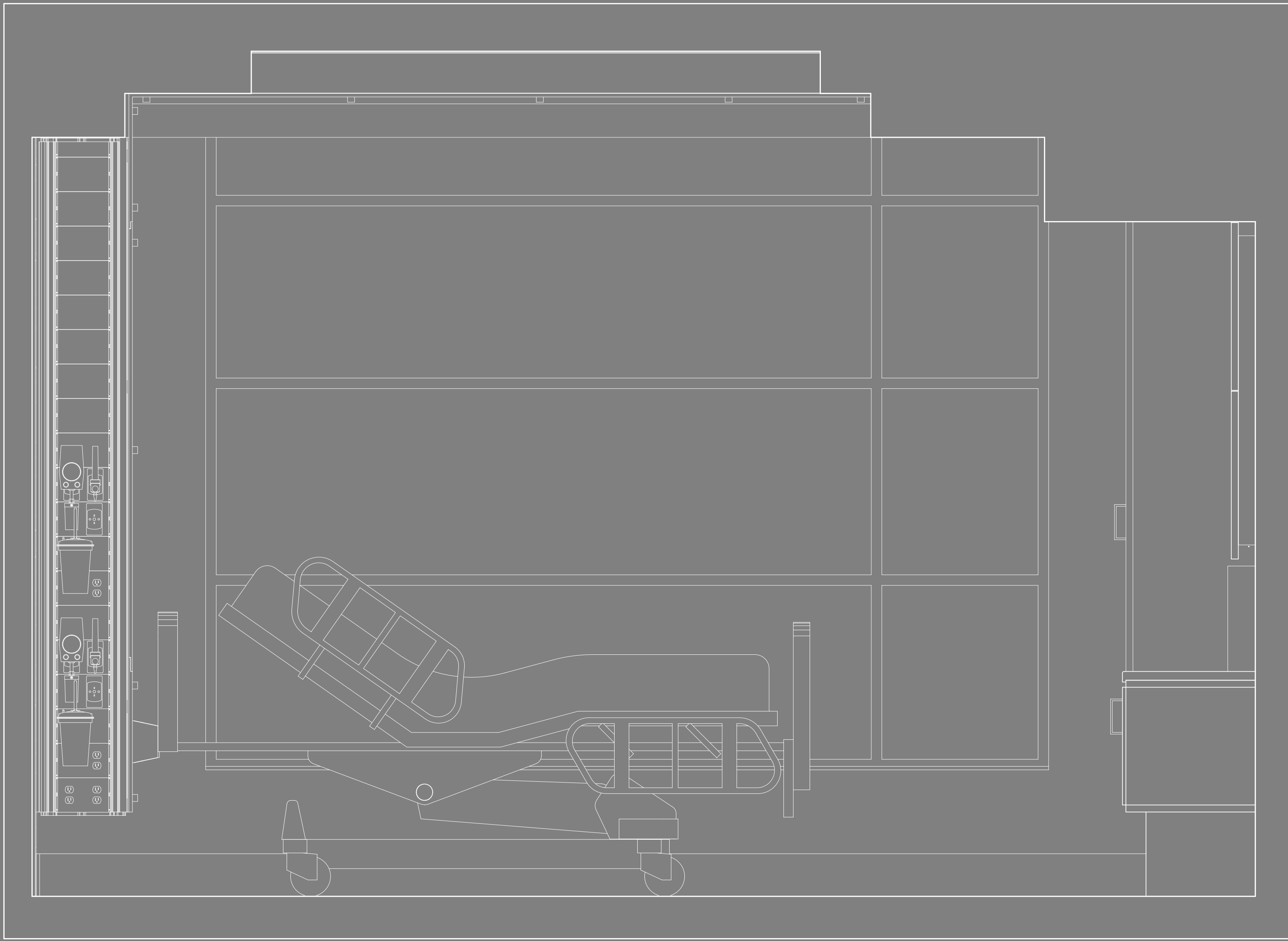
interactive digital interface for patient, staff, and family alike

FOOTWALL DESIGN



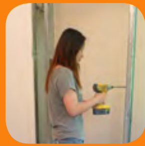
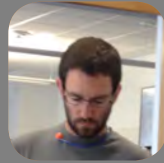
night lighting includes; examination, task, and mood lighting solutions

COMPREHENSIVE DESIGN



Patient Room Prototype v2012 | 2.0 Design Goals & Concepts

FABRICATION










final design concept: footwall

final design mock-up: footwall

final design mock-up: headwall & footwall-bench bed up

final design mock-up: footwall-bench bed down

final design mock-up: footwall-bench bed up & down

night lighting includes; examination, task and m nting final design mock-up: footwall freatures

hand-washing station provides indirect illumination

Patient Room Prototype v2012 | 3.0 Fabrication final design concept: headwall-night time settings

final design concept & mock-up: interchangable side panels

AKNOWLEDGEMENTS

Interdisciplinary Project Team:

The core project team included faculty and students at Clemson University and Carleton University.

Clemson University Graduate Program in Architecture + Health

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Steve Palmer, Director Marketing, Trumpf Medical Systems.

Jeff Saunders, Project Engineer

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Julie Elliot, IIDA, Compass Technical Sales Specialist, Herman Miller Healthcare

3Form

Chris Hawkins, Technical Sales Representative
Katie Dill, SC Sales Representative

Solid Surfaces

Leyton Watts,
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Melinda Brown, RN Supervisor

Valerie Douglas, RN Nurse Manager

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Jill Dugaw, Guest Services Manager

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Ross Nicholson, Architectural Lighting, Carleton University

Byron Edwards AIA, ACHA, VP and Director of Healthcare and Technology Group, LS3P Architects

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