

AMBULATORY SURGERY CENTER PROJECT

WEST ASHLEY, CHARLESTON, SOUTH CAROLINA

Graduate Studies Architecture + Health
Clemson University School of Architecture

ARCH 8950.2 | A+H Studio

Shahrouz Beheshti, Shicong Cao, Luke Davis, Lansing Dodd, Megan Girvan, Malone Hopkins, Laney Tuten, Wenz Tuttle, and Caroline Wyrick.



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INSTRUCTOR:

Byron Edwards

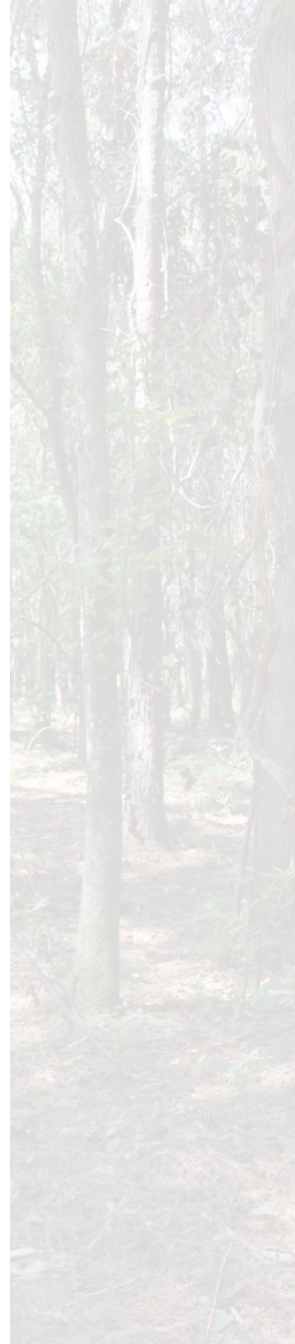
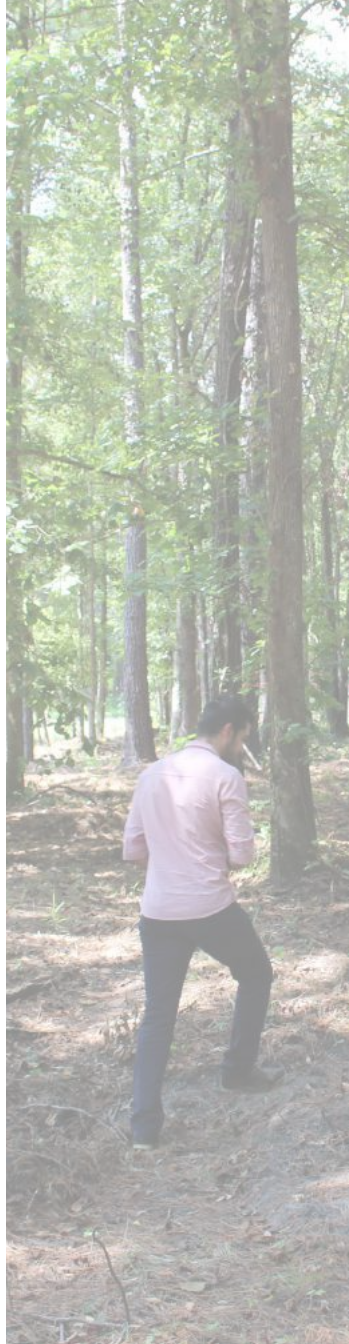
MASTER OF ARCHITECTURE + HEALTH STUDENTS:

Shahrouz Beheshti, Shicong Cao, Luke Davis, Lansing Dodd, Megan Girvan,
Malone Hopkins, Laney Tuten, Wenz Tuttle, and Caroline Wyrick.

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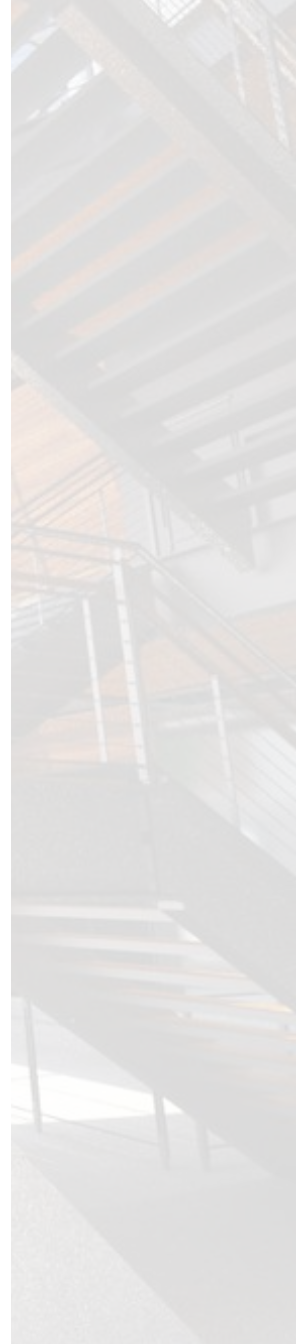
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01 PROJECT OVERVIEW

The Fall semester 2016 project in the first year student's Architecture + Health studio was for a 100,000 + square foot Ambulatory Services Campus Masterplan on the Medical University of South Carolina's (MUSC) new Ambulatory Campus in the West Ashley area of Charleston, South Carolina. The first Phase Design Project is a 40,000 square foot Orthopedic Ambulatory Surgery Center for MUSC's Musculoskeletal Institute. The Ambulatory Surgery Center is planned to include the following departments; Surgery, Imaging and a future medical office building. The Surgery center is planned to accomodate 6 ORs and 2 Procedure Rooms with the ability to expand in the future.

This project aims to address MUSC's space program needs, but also incorporate a holistic approach to healing and an innovative integration of alternative medical and non-medical healing concepts of the mind, body and spirit in terms of dealing with the internal and external influences of a truly healing environment. The project also addresses the health of the community at large in its environmental and contextual response. The student design solutions seek to address the specific environmental issues of the site including topographic, vegetation, soil, site access, and utilities and how they relate to the specific health, cultural, racial, socio-economic, and political issues in the area by paying homage to the importance of this specific site and its contextual significance in the community of West Ashley.-



02 CASE STUDIES

Case studies were identified to illustrate best practice and emerging concepts and solutions on relevant Ambulatory Surgery Center design, arrangements, room features and elements.

UCLA OUTPATIENT SURGERY & ONCOLOGY CENTER

AMBULATORY SURGERY & CARE CENTER, BRANDYWINE VALLEY

THE CHILDREN'S HOSPITAL OF PHILADELPHIA (AMBULATORY CARE CENTER)

CHKD HEALTH & SURGERY CENTER

SEATTLE CHILDREN'S BELLEVUE CLINIC

UNIVERSITY OF VIRGINIA HEALTH SYSTEM, BATTLE BUILDING

SENTARA OBICI HOSPITAL, AMBULATORY SURGERY CENTER

ORTHOPEDIC & SPORTS INSTITUTE OF THE FOX VALLEY

UCLA Outpatient Surgery and Oncology Center

Santa Monica, California



SQ FT

58,651 BGSF
Clinic Building
73,736 BGSF
Parking Garage



OWNER/AFFILIATION
UCLA Medical Center



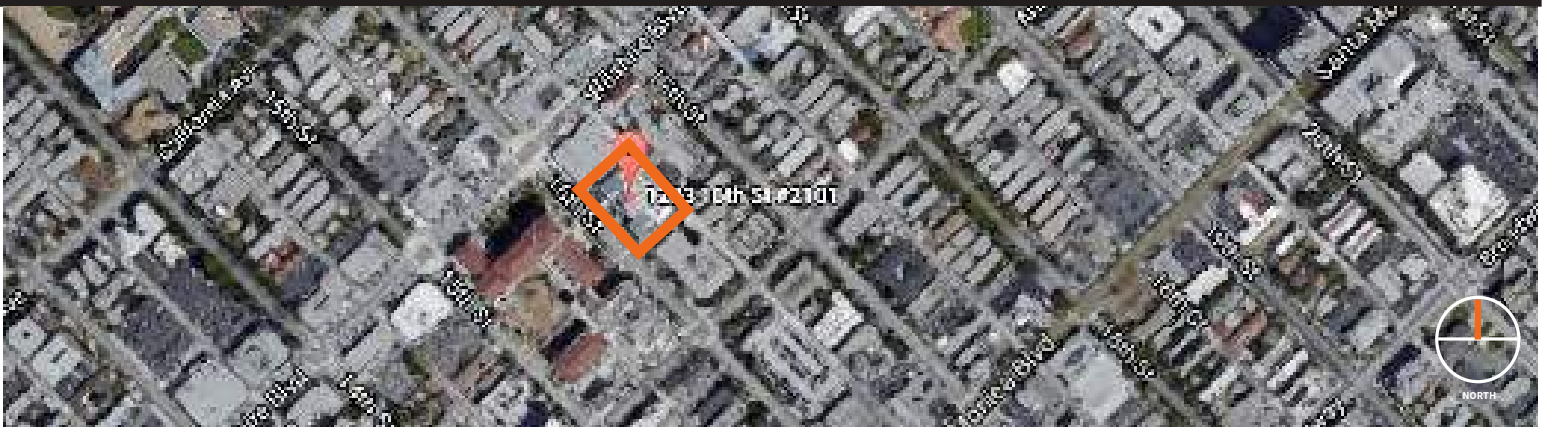
ARCHITECT(S)
Michael W. Folonis
Architects (MWFA)



**UCLA PATIENT
VISITS**
Unknown



Image Sources: <http://www.folonisarchitects.com/ucla-1/>
<http://www.archdaily.com/388708/ucla-outpatient-surgery-and-oncology-center-michael-w-folonis-architects>



ABOUT | DESIGN INTENTIONS

The **design concept asserts that a more natural and less clinical environment promotes healing in patients and alert, productive behavior in doctors, staff, and students.** Primary design considerations include the creation of a distinctive and articulated massing, the maximal inclusion of natural day lighting and ventilation throughout the building, and a strong indoor-outdoor connection. The project achieves LEED Gold Certification for New Construction and is the first Outpatient Surgery and Oncology Center in the nation to achieve this rating.



UCLA Outpatient Surgery and Oncology Center

"CREATE a more Natural and less Clinical Environment to promote Healing"

Strategies

Daylighting

Central Light-filled Lobby with full height mullion-less glass as 3-story Indoor/Outdoor connection.

Key Public and Patient areas with perimeter windows and /or skylights

Views to Nature

Shaded and unshaded exterior Garden Patios provide choice of outdoor Respite area

Interior Planting are brought deep into the builng bringing views to Nature inside as well

Use of Warm Colors

Warm-toned wood used throughout the building

Warm accent colors and warm-off white adds to warm date-lighting and variation in color as the day progresses

Natural Materials

Use concrete, steel and glass against the backdrop of warmer wood textures and plantings

Blurring the indoor/outdoor relationships with landscaping and hardscaping inside and out

[Daylighting]



Views to Nature [Lobby]



INFUSION BAY



WAITING AREA



GARAGE ELEVATOR LOBBY



PATIENT WAITING AREAS & CONSULT



3RD FLOOR BRIDGE OVER ATRIUM

Image Sources: <http://www.folonisarchitects.com/ucla-1/>
<http://www.archdaily.com/388708/ucla-outpatient-surgery-and-oncology-center-michael-w-folonis-architects>



VIEW OF ATRIUM LOBBY AND STAIRS



EXTERIOR LANDSCAPE GARDENS SHADED

PATIENT WALKING DISTANCE ANALYSIS:

- +From entrance to registration: **86 ft**
- +From registration to medical waiting: **151ft**
- +From medical waiting to exam room: **4ft - 68ft**
- +From registration to radiation waiting: **108 ft**
- +From radiation waiting to LINAC/other: **100 ft**
- +From registration to pre-op: **211 ft**

KEY:

- Circulation Path



LEVEL 2



LEVEL 1



GROUND FLOOR

FLOOR PLAN | ANALYSIS



AERIAL VIEW

CONCLUSION |

All design elements—from planning to materials—were guided by the concept that **a more natural, and less clinical, environment promotes healing in patients and supports alert, productive behavior in doctors, staff, and student.**

Taking advantage of climate and site conditions, the building features natural daylighting and ventilation. The building skin is composed of glass and smooth concrete; the materials were selected for their direct, clean presentation and functionality. Two building blocks are linked by an expansive atrium lobby, which serves as an orderly circulation core.



NORTH

<http://www.folonisarchitects.com/ucla-1/>

UCLA Outpatient Surgery and Oncology Center

Departmental Plan Key:

- Pre-Op / Post- Op
- Surgery
- OR Care + Team Support
- Support Space
- Circulation, Shafts, Stairs
- Mechanical + Electrical

Key Spaces:

- ▶ Surgery OR (402SF - 410 sf)
- ▶ Physician Workrooms (275 sf - 295 sf)
- ▶ Prep/Recovery Bays (77 sf - 79 sf)
- ▶ Offices (88 sf - 116 sf)
- ▶ Nurse Stations (95 sf - 191 sf)

Departmental Gross Square Foot Take-Offs

Pre-Op/Post-Op	4840 SF
Surgery	7860 SF
OR Care + Team Support	3047 SF
Shafts + Vertical Circulation	1326 SF
Mechanical	285 SF

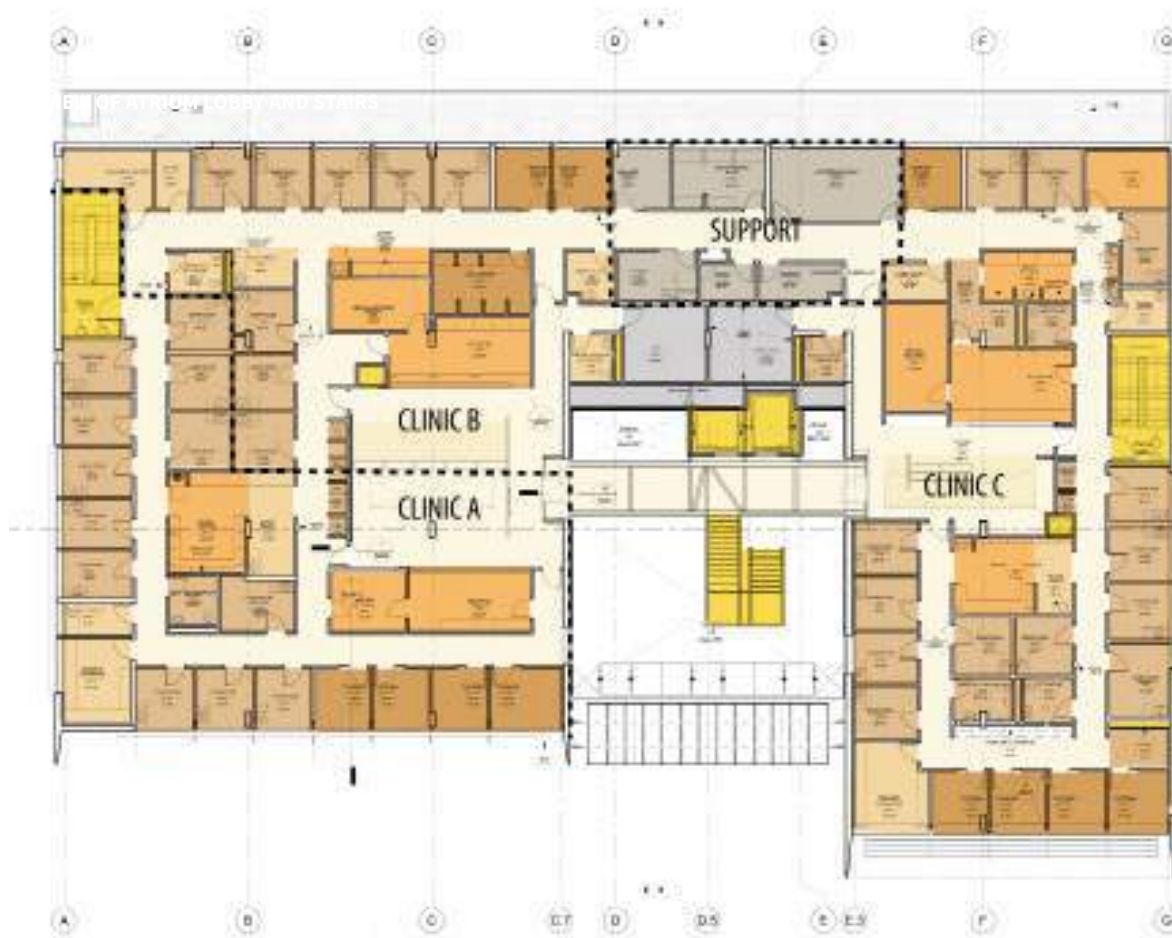
LEVEL TWO DGSF TOTAL: 17,358 SF

LEVEL TWO: ORs (8) 400 SF = 3200 SF



"Departmental Square footages based on 'Analysis of Departmental Area in Contemporary Hospitals calculation methodologies & Design Factors Report, 2014.

LEVEL THREE:



Departmental Plan Key:

- Clinic A
- Clinic B
- Clinic C
- Support Space
- Circulation, Shafts, Stairs
- Mechanical + Electrical

Key Clinical Spaces:

- ▶ Patient Exam Rooms (90 sf - 110 sf)
- ▶ Provider Offices (90 sf - 120 sf)
- ▶ Nurse Stations (112 sf - 125 sf)
- ▶ Records (178 sf - 200 sf)
- ▶ Reception (254 sf)

Departmental Gross Square Foot Take-Offs

Clinic A	4125 SF
Clinic B	3420 SF
Clinic C	5820 SF
Support Space -	732 SF
Shafts + Vertical Circulation	1335 SF
Mechanical	555 SF

LEVEL THREE DGSF TOTAL: 15,987 SF

Ambulatory Surgery and Care Center, Brandywine Valley

Glen Mills, Pennsylvania



SQ FT
44,000 SF



OWNER/AFFILIATION
The Children's
Hospital of
Philadelphia



ARCHITECT(S)
Ewing Cole



PATIENT VISITS
Unknown



Views from the Entrance of Parking Lot



PT/GYM



WAITING AREA

<http://www.targetbuilding.com/wp-content/uploads/2016/06/1.jpg>
<http://www.ewingcole.com/portfolio-items/the-childrens-hospital-of-philadelphia/#prettyPhoto>
http://www.bizjournals.com/prnewswire/press_releases/2015/10/06/DC21607



ABOUT THE FACILITY

The two-floor facility features different **specialty care that include allergy, cardiology, gastroenterology, nephrology, neurology, and orthopedics.** The center also has a rehabilitation service, gyms for physical therapy, and ambulatory surgery center. The surgery center will provide outpatient surgeries to children of all ages.



VIEW FROM THE ROAD



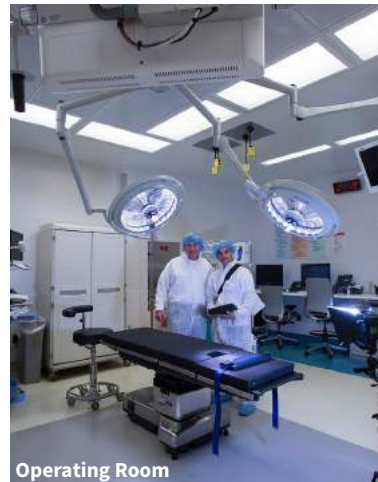
SECOND FLOOR WAITING AREA

Ambulatory Surgery and Care Center, Brandywine Valley

ANALYSIS

- ▶ Daylighting
- ▶ Views to Nature
- ▶ Use of Vibrant Colors

[Daylighting]





HALLWAY TO PRE-OP



Second Floor



FRONT ENTRANCE



PT/OT GYM

FLOOR PLAN | ANALYSIS



LEVEL 2



LEVEL 1

PATIENT WALKING DISTANCE ANALYSIS:

First Floor:

+From entrance to registration:	32 - 54 ft
+From registration to medical waiting:	22 ft
+From medical waiting to exam room:	70 - 139 ft
+From registration to X-Ray:	122 ft

Second Floor:

+From entrance to second floor registration:	115 ft
+From registration to pre-op:	64 - 108 ft
+From pre-op to OR:	87 - 110 ft
+From OR to PACU:	56 - 155 ft
+From PACU to Exit:	123 - 181 ft

FAMILY MEMBER WALKING DISTANCE ANALYSIS:

First Floor:

+From entrance to registration:	32 - 54 ft
+From waiting to financial counselor:	42 ft

Second Floor:

+From entrance to second floor registration:	115 ft
+From registration to pre-op:	64 - 108 ft

STAFF WALKING DISTANCE ANALYSIS:

First Floor:

+From registration to exam room:	124 ft
+From registration to X-Ray:	122 ft

Second Floor:

+From pre-op nurses station to OR:	129 ft
+From OR to PACU nurses station:	112 ft



Ambulatory Surgery and Care Center, Brandywine Valley

Department Plan Key:

- Admin & Support
- Radiation
- Mechanical & Electrical
- Sterile & Support Space
- Exam Rooms

Key Spaces:

- ▶ Exam Rooms (125 -144 sf)
- ▶ Office Spaces (144 sf)
- ▶ X-Ray (480 sf)

Departmental First Floor Gross Square Foot

Clinic	14330 SF
PT/Gym	1883 SF
Waiting	1244 SF

Level One:



LEVEL TWO:



Department Plan Key:

- Admin & Support
- Pre-Op & PACU
- OR
- Sterile & Support Space
- Exam Rooms

Key Spaces:

- Pre-Op (166 sf)
- PACU (166 sf)
- OR (600 sf)

Departmental Second Floor Gross Square Foot

Pre-Op & PACU	7354 SF
OR	4639 SF
Shell	5212 SF
Waiting	2361SF

The Children's Hospital of Philadelphia (Ambulatory Care Center)

King of Prussia, Pennsylvania



SQ FT
135,000 SF



OWNER/AFFILIATION
Private



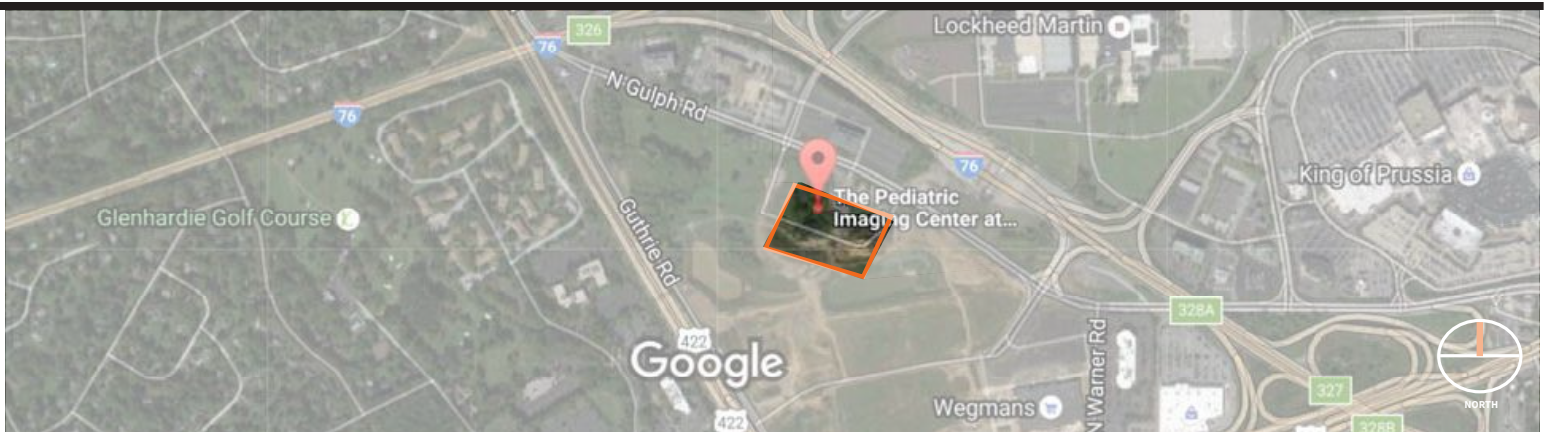
ARCHITECT(S)
EWING COLE



PATIENT VISITS
Unknown



Image Sources: <http://www.ewingcole.com/wp-content/uploads/2014/06/CHOP46.jpg>
<https://www.google.com/maps/place/The+Pediatric+Imaging+Center+at+CHOP+Specialty+Care/@40.0881332,-75.4093664,1833m/data=!3m1!1e3!4m6!3m5!1s0x89c69448f95bee8b:0xc7bd53d3735f6ec7!4b1!8m2!3d40.087247!4d-75.4077188>



ABOUT | DESIGN INTENTIONS

The facility includes ambulatory surgery, urgent care, primary care, specialty care, imaging, orthopedics, physical and occupational therapy, day hospital for cancer patients, and a sleep center. The design of the building is a **dynamic exterior of the building provides a distraction for young visitors and their families.** Primary design considerations include the creation of a

<http://www.archdaily.com/388708/ucla-outpatient-surgery-and-oncology-center-michael-w-foloni-architects>



The Children's Hospital of Pennsylvania (Ambulatory Care Center)

Department Plan Key:

- Admin & Support
- Radiation
- Mechanical & Electrical
- Sterile & Support Space
- Exam Rooms
- Circulation, Shafts, Stairs

Departmental First Floor Gross Square Foot

Admin & Support	2614 SF
Radiation	295 SF
Mechanical & Electrical	665 F
Sterile & Support Space	633 SF
Exam Rooms	7176 SF
Circulation	4050 SF

LEVEL ONE:



This is a detailed architectural floor plan of the second floor of the University of Illinois at Chicago (UIC) building. The plan is oriented with a grid system where letters A through H run vertically and numbers 1 through 8 run horizontally. The building's footprint is irregular, with a sloped roofline on the right side. The plan is color-coded to distinguish different functional areas: green for offices, orange for classrooms, purple for conference rooms, yellow for elevators, and blue for the library. The plan includes numerous room labels such as 'OFFICE', 'CONFERENCE', 'CLASS', 'ELEVATOR', 'STAIR', 'RESTROOM', 'COPY', 'PRINT', 'FAX', 'RECEPTION', 'STORAGE', 'CLOSET', 'HALL', 'LOBBY', 'RECEPTION AREA', 'STAFF', 'INFORMATION DESK', 'PLAZA AREA', 'ELEVATOR SHAFT', 'STAIR TO G/F', 'STAIR TO B1', 'STAIR TO B2', 'STAIR TO B3', 'STAIR TO B4', 'STAIR TO B5', 'STAIR TO B6', 'STAIR TO B7', 'STAIR TO B8', 'STAIR TO B9', 'STAIR TO B10', 'STAIR TO B11', 'STAIR TO B12', 'STAIR TO B13', 'STAIR TO B14', 'STAIR TO B15', 'STAIR TO B16', 'STAIR TO B17', 'STAIR TO B18', 'STAIR TO B19', 'STAIR TO B20', 'STAIR TO B21', 'STAIR TO B22', 'STAIR TO B23', 'STAIR TO B24', 'STAIR TO B25', 'STAIR TO B26', 'STAIR TO B27', 'STAIR TO B28', 'STAIR TO B29', 'STAIR TO B30', 'STAIR TO B31', 'STAIR TO B32', 'STAIR TO B33', 'STAIR TO B34', 'STAIR TO B35', 'STAIR TO B36', 'STAIR TO B37', 'STAIR TO B38', 'STAIR TO B39', 'STAIR TO B40', 'STAIR TO B41', 'STAIR TO B42', 'STAIR TO B43', 'STAIR TO B44', 'STAIR TO B45', 'STAIR TO B46', 'STAIR TO B47', 'STAIR TO B48', 'STAIR TO B49', 'STAIR TO B50', 'STAIR TO B51', 'STAIR TO B52', 'STAIR TO B53', 'STAIR TO B54', 'STAIR TO B55', 'STAIR TO B56', 'STAIR TO B57', 'STAIR TO B58', 'STAIR TO B59', 'STAIR TO B60', 'STAIR TO B61', 'STAIR TO B62', 'STAIR TO B63', 'STAIR TO B64', 'STAIR TO B65', 'STAIR TO B66', 'STAIR TO B67', 'STAIR TO B68', 'STAIR TO B69', 'STAIR TO B70', 'STAIR TO B71', 'STAIR TO B72', 'STAIR TO B73', 'STAIR TO B74', 'STAIR TO B75', 'STAIR TO B76', 'STAIR TO B77', 'STAIR TO B78', 'STAIR TO B79', 'STAIR TO B80', 'STAIR TO B81', 'STAIR TO B82', 'STAIR TO B83', 'STAIR TO B84', 'STAIR TO B85', 'STAIR TO B86', 'STAIR TO B87', 'STAIR TO B88', 'STAIR TO B89', 'STAIR TO B90', 'STAIR TO B91', 'STAIR TO B92', 'STAIR TO B93', 'STAIR TO B94', 'STAIR TO B95', 'STAIR TO B96', 'STAIR TO B97', 'STAIR TO B98', 'STAIR TO B99', 'STAIR TO B100'. A north arrow is located in the upper right corner. The plan also shows various structural elements like walls, doors, windows, and stairs.

- Admin & Support
- Pre-Op & PACU
- OR
- Sterile & Support Space
- Exam Rooms
- Circulation, Shafts, Stairs

Admin & Support	3012 SF
Pre-Op & PACU	2073SF
OR	2230 SF
Sterile & Support Space	1779 SF
Exam Rooms	156 SF
Circulation, Shafts, Stairs	3078 SF

The Children's Hospital of Pennsylvania (Ambulatory Care Center)

Department Plan Key:

	Admin & Support
	Radiation
	Mechanical & Electrical
	Sterile & Support Space
	Exam Rooms
	Circulation, Shafts, Stairs

Departmental Second Floor Gross Square Foot

Admin & Support	4224 SF
Radiation	653 SF
Mechanical & Electrical	660 SF
Sterile & Support Space	1102 SF
Exam Rooms	5502 SF
Circulation	4095 SF
Lobby/Waiting/Other	2669 SF

LEVEL THREE:



"Departmental Square footages based on 'Analysis of Departmental Area in Contemporary Hospitals calculation methodologies & Design Factors Report, 2014.



CHKD Health and Surgery Center

Virginia Beach, Virginia



SQ FT
60,000 BGSF



**OWNER/
AFFILIATION**
Children's Hospital of
the King's Daughters



ARCHITECT(S)
Paul Finch &
Associates (PF&A)
2008



**CHKD PATIENT
VISITS**
unknown



MAIN ENTRANCE



FAMILY WAITING AREA



INFORMATION DESK

Image Sources: <http://www.pfa-architect.com/health-surgery-center-at-princess-anne-chkd>



ABOUT | DESIGN INTENTIONS

The primary design concept was to create a motif for the building that would be relatable to both pediatric and young adult patients. The motif chosen for the interior spaces and the overall building form is **music**. The musical theme blends into both the medical equipment and the wayfinding of the hospital. The curves in the atrium's roof and the exterior glass canopy express the idea of the flow and wave-like quality of music and sound.

<http://www.pfa-architect.com/health-surgery-center-at-princess-anne-chkd>



STAFF ENTRANCE



ENTRANCE DETAIL

CHKD Health and Surgery Center

"be in tune with both pediatric and young adult patients"

ANALYSIS

PROS:

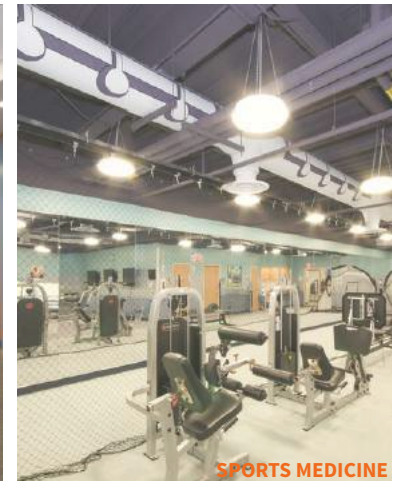
► **Wayfinding** is created with consideration to the musical theme. Abstracted forms of instruments and music notes line the flooring of hallways to guide patients to their next destination.

► **A relatable theme** is brought to life through flooring, wall art, and display pieces that makes the building feel comfortable and welcoming for both pediatric and young adult patients.

► **The use of bright colors** allows the hospital to appear pediatric friendly, but the choice of colors does not make it too childish for young adults.

► **Interactive lighting** stimulates interest that distracts patients, especially pediatric patients, from the procedure they may be worried about. It also assists with wayfinding by leading new patients to the information desk.

[Wayfinding]



[Relatable Themes]



REGISTRATION AREA



EXTERIOR CURVED GLASS CANOPY

The main area for ambulatory surgery is found on the third floor of the center. Many of the more day-to-day orthopedic and physical therapy functions of the building are located on the first floor. The ambulatory area includes spaces for pre-op, operating rooms, and post-op. There are also spaces for medical offices on this floor, which could be adapted into medical exam rooms.

<http://www.pfa-architect.com/health-surgery-center-at-princess-anne-chkd/>

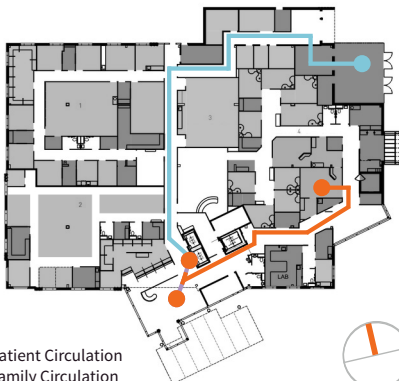
LEVEL 3



LEVEL 2



LEVEL 1



KEY:



Patient Circulation
Family Circulation
Staff Circulation



NORTH



SITE PLAN

DISTANCE ANALYSIS:

Patient:

- From entrance to registration: 50-60 ft
- From registration to pre-op: 80-90 ft
- From pre-op to OR: 41-105 ft
- From OR to post-op: 41-105 ft

- From registration to imaging: 70-75 ft
- From registration to pediatric clinics: 130-170 ft

Family:

- From entrance to registration: 50-60 ft
- From registration to pre-op: 80-90 ft
- From pre-op to registration: 80-90 ft

- From registration to pediatric clinics: 130-170 ft

Staff:

- From staff entrance to pre-op: 180-190 ft
- From pre-op to OR: 41-105 ft
- From OR to post-op: 41-105 ft
- Within clinic: 60-95 ft

CHKD Health and Surgery Center

DEPARTMENT PLAN KEY:

- Exam Room/Office
- Admin
- Staff Support/Work Area
- Imaging

- 1. Physical Therapy
- 2. Sports Medicine
- 3. Meeting Room
- 4. Pediatric Orthopedics
- 5. Radiology
- 6. Lobby

Key Spaces:

- ▶ Exam Room (115 sf - 805 sf)
- ▶ Office (65 sf)
- ▶ Imaging Room(200 sf - 250 sf)

Departmental Gross Square Foot

Physical Therapy	3575 SF
Sports Medicine	2532 SF
Pediatric Orthopedics	1560 SF
Radiology	2280 SF

LEVEL ONE:



LEVEL TWO:



DEPARTMENT PLAN KEY:

- Exam Room/Office
- Admin
- Staff Support/Work Area
- Imaging

- 1A.** Pediatric Practice A
- 1B.** Pediatric Practice B
- 1C.** Pediatric Practice C
- 2.** Child Abuse Clinic
- 3.** Open to Below

Key Spaces:

- ▶ Exam Room (65 sf - 70 sf)
- ▶ Office (75 sf)
- ▶ Imaging Room (185 sf - 200 sf)

Departmental Gross Square Foot

Pediatric Practice A	2973 SF
Pediatric Practice B	2738 SF
Pediatric Practice C	2885 SF
Child Abuse	1642 SF
Imaging	740 SF

CHKD Health and Surgery Center

DEPARTMENTAL PLAN KEY:

	Exam Room/Office
	Pre-Op
	OR
	Post-Op
	Admin
	Staff Support/Work Area

- 1. Outpatient Surgery
- 2. Specialty Clinics
- 3. Open to Below

Key Spaces:

- ▶ Surgery OR Room (350 sf - 400 sf)
- ▶ Pre-OP Room (85 sf - 90 sf)

Departmental Gross Square Foot

Pre-Op	1120 SF
OR	2522 SF
Post-Op	1570 SF
Specialty Clinics	1665 SF

LEVEL THREE: ORs (4) x 400 = 1600 SF



CONCLUSION:



CONCEPT: Music as Aesthetic Theme



All aspects of the hospital contributed to the design theme of music and sound. From ductwork, flooring, and furniture to roofing, canopies, and lighting schemes, the theme plays both into small details and the overall structure to make the building more **relatable and fun for its patients.**

The use of bright colors allows the building to be pediatric-friendly, while not looking childish to the young adult patients. **Wayfinding is successfully created through the use of musically themed aspects** such as flooring and wall features.

The center's goals for creating an inviting space for their young patients seem to be met aesthetically and functionally.

SEATTLE CHILDREN'S BELLEVUE CLINIC

Seattle, Washington



SQF
80,000



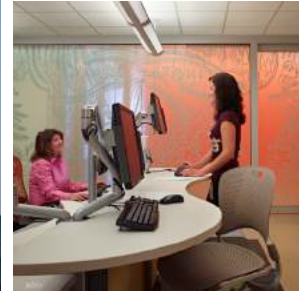
OWNER/AFFILIATION
Seattle Children's
Hospital



ARCHITECT(S)
NBBJ



TYPE OF FACILITY
Pediatric Surgery Center &
Ambulatory Care Clinic



<http://www.nbbj.com/work/seattle-childrens-hospital-bellevue-clinic-and-surgery-center/>



Bellevue, Washington

About this Clinic from the NBBJ website:

The architect focused on the use of Continuous Performance Improvement (CPI) and Integrated Project Delivery (IPD) to increase the efficiency of building the spaces. The focus on these processes allowed the architects to decrease building time, square footage and project cost to meet their goal of high quality care as cost effective care. The architects also spent a good deal of time studying the experience of bringing a child in for surgery. The design and layout of spaces is meant to allow parents to remain with their children for as long as possible and use daylight and calming views to dampen as much of the stress of the experience as possible.

CHARACTERISTICS

- four operating rooms with clean cores
- + regular and modular pod layout within the clinic
- + clear separation between front of house and back of house areas
- + design aesthetic that is playful yet appropriate to all ages within the pediatric patient spectrum
- + efficiency of layout and flow of patients, staff and materials that cut down on cost and

construction time

- + use of a linear layout of induction rooms, ORs and post-op spaces increase parent-child time
- + transitional indoor-outdoor spaces
- + adaptable staff work stations
- staff work areas deep in the floor plate have little access to natural daylight

- pre-op
- medical pod
- post-op
- admin
- staff support/work area
- or
- imaging



SECOND FLOOR



FIRST FLOOR



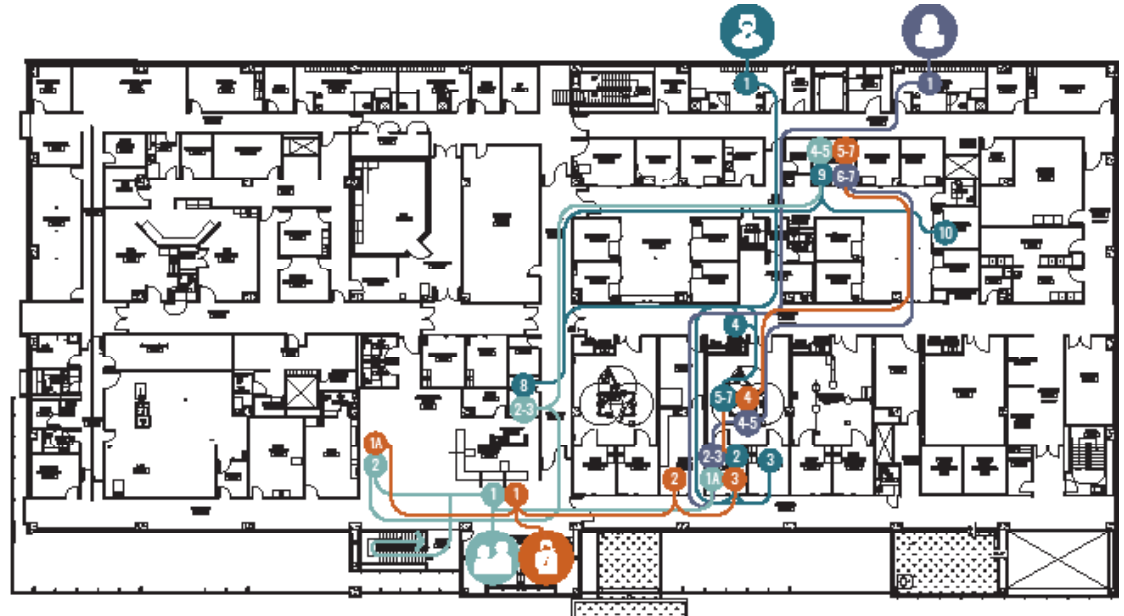
Diagram Adapted From NBBJ
by Jessica Welch

Seattle Children's Bellevue Clinic

FLOWS & TYPES

- Patient
- Family
- Surgeon
- Anesthesiologist

 Diagram Adapted From NBBJ
by Rachel Matthews
NORTH



PATIENT

1. Admission
 - a. Waiting
2. Height & Weight
3. Pre-Op Assessment / Induction
4. Surgery
5. Emergence
6. Post Anesthesia Recovery
7. Discharge



FAMILY

1. Admission
 - a. Pre-Op Assessment
2. Waiting
3. Report from Surgeon
4. Post Anesthesia Recovery
5. Discharge



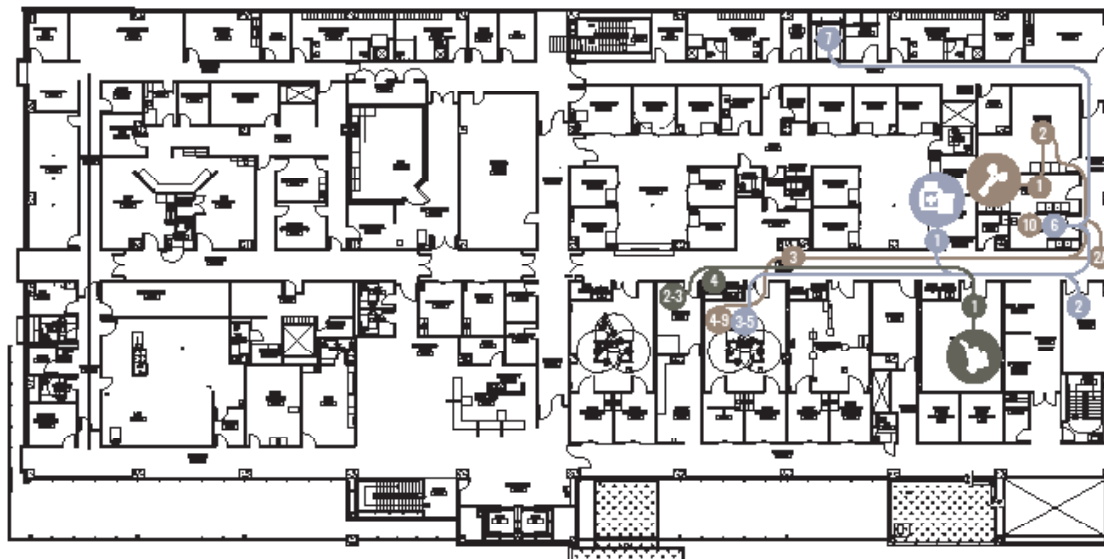
SURGEON

1. Change Clothes
2. Pre-Op Assessment
3. Check other patients
4. Scrub
5. Time-Out
6. Surgery
7. Dictating
8. Report to Family
9. Post Anesthesia
10. Check other patients



ANESTHESIOLOGIST

1. Change Clothes
2. Pre-Op Assessment
3. Anesthesia Induction
4. Time-Out
5. Monitoring during surgery
6. Anesthesia Emergence
7. Post Anesthesia hand-off



- Supplies/Medications/Disposables
- Sterile Instruments/Materials
- Movable Furniture or Equipment



NORTH

*Diagram Adapted From NBBJ
by Rachel Matthews*



SUPPLIES / MEDICATION / DISPOSABLES

1. Storage/Pharmacy
2. Storage & Inventory
3. Staging for Surgery
4. Surgery
5. Waste
6. Temporary Waste Storage
7. Central Waste Storage (Exit building)



STERILE INSTRUMENTS / MATERIALS

1. Sterile Processing
2. Clean Staging
 - a. Morning Staging
3. Storage and Distribution
4. Disassembly
5. Unpackaging & Inventory
6. Assembly
7. Surgery
8. Reassembly/Inventory/Cleaning
9. Cart Reassembly
10. Soiled Staging



MOVABLE EQUIPMENT

1. Central Storage
2. Department Storage
3. Cleaning
4. Staging for Surgery

University of Virginia Health System Battle Building

Charlottesville, Virginia



SQ FT
200,000 BGSF
Clinic Building



OWNER/AFFILIATION
University of
Virginia Health
System



ARCHITECT(S)
Stanley Beaman
& Sears, Odell
Associates



**UVA PATIENT
VISITS**
Approximately
100,000 Outpatient
Visits Per Year (2011)

BUILDING EXTERIOR



PEDIATRIC EXAM ROOM



Image Sources: <http://stanleybeamansears.com/project/university-of-virginia/>
<https://news.virginia.edu/content/officials-break-ground-battle-building-uvas-childrens-hospital>



ABOUT | DESIGN INTENTIONS

Envisioned as a **“collection of interdisciplinary, multifunctional ‘neighborhoods’ for care”**, the University of Virginia Health System Battle Building houses the UVa Surgery Center, which contains 12 ORs for adult and pediatric procedures, as well as all Pediatric Outpatient Clinics of the UVa Health System. The second building designated with LEED Gold certification on the UVa Health System campus, the Battle building was designed with extensive sustainable elements. Seven floors and 200,000 square feet house dozens of pediatric specialties, ranging from primary to specialized care in cancer, heart disorders and many other pediatric illnesses.



MAIN LOBBY



REGISTRATION

Image Sources: <http://stanleybeamansears.com/project/university-of-virginia/>
<https://childrens.uvahealth.com/patient-info/battle-building-at-uva-childrens-hospital>

University of Virginia Health System Battle Building

ANALYSIS

PROS

- ▶ Use of **bright, cheerful colors** for the engagement of pediatric patients
- ▶ Integration into the **campus and urban context** engages with the campus and community as a whole
- ▶ Curtain walls allow for abundant **natural light** in exam rooms, waiting areas and lobbies
- ▶ An **outdoor terrace** on the 3rd floor allows patients and family the opportunity to experience the calming effects of nature without traveling to the first floor
- ▶ **Circulation of patient is clearly delineated** and based on whether the patient is pediatric or adult
- ▶ **Warm colors and wood tones** create an inviting environment for patients
- ▶ **Flexibility** as Pediatric pre-op bays can also be used for post-op purposes

CONS

- ▶ Registration is located on 2nd floor; patients and families must take elevator to access registration
- ▶ Central Sterile located on separate level from operating room floor; no sterile core on operating room level
- ▶ Operating Rooms, Pre-op, Post-Op and PACU are located on ground level and have limited access to daylight

[COLOR AND DAYLIGHT]



PEDIATRIC EXAM ROOMS



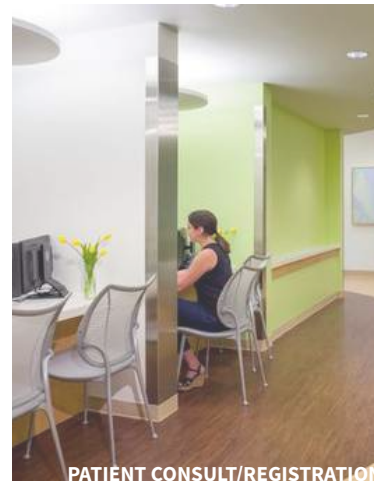
CHILDREN'S SPACE



NURSE STATION IN PEDIATRICS



ELEVATOR LOBBY



PATIENT CONSULT/REGISTRATION



PEDIATRIC WAITING

Image Sources: <http://stanleybeamsears.com/project/university-of-virginia/>



OR CORRIDOR



PACU UNIT

DISTANCE BETWEEN SPACES:

Patient Flow Pattern

- +From 1st floor entrance to 2nd floor registration: 185' - 7"
- +Registration to medical waiting (10'-0" min to 48'-9" max)
- +2nd floor Waiting to ground floor pre-op: (67'-11" min to 189' max)
- +Post-op to exit : (181'-0" min to 212'-0" max)

Family Flow Pattern

- +From entrance to registration: 185'-7"
- + From registration to waiting (10'-0" min to 48'-9" max)
- +From waiting to pre-op (67'-11" min to 189' max)
- +From waiting to post-op (Pediatric only): (131'-8" min to 219'-4" max)

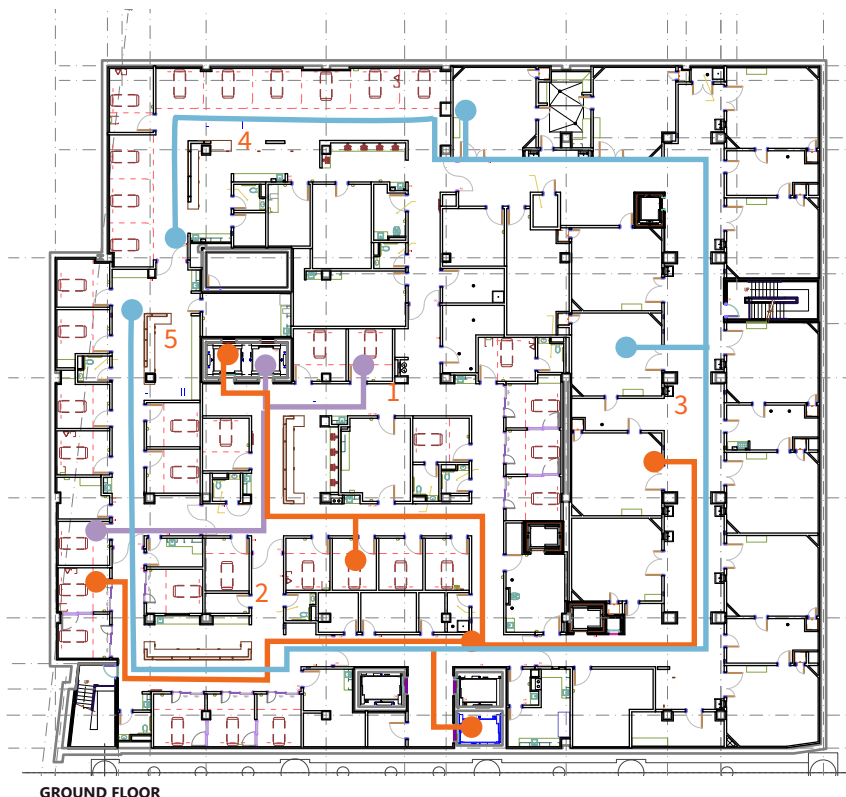
Staff Flow Pattern

- Pre-op to OR: (107'-9" min - 263' - 2" max)
- OR to post-op: (30'-0" min - 413'-0" max)

1. PRE-OP
2. PEDS PRE-OP/POST
3. SURGERY
4. PACU - STAGE I
5. PACU - STAGE II

CONCLUSION |

The Battle Building embodies a patient-centered model of allowing the patient to access multiple caregivers in one location on the medical campus. The outpatient surgery center contains dedicated pediatric spaces, which allows the Children's Hospital to streamline the surgery process for the families of complex medical cases. With its focus upon creating an interactive environment for children through the theme of **storytelling, bright and cheerful setting as well as ample opportunities for calming effects through daylighting and views of nature**, patients can be treated in a therapeutic environment.



GROUND FLOOR

University of Virginia Health System Battle Building

FLOOR PLAN | ANALYSIS

Department Plan Key:

- Pre-Op
- Post-Op
- Surgery
- OR Care + Team Support
- Support Space
- Mechanical + Electrical

Key Spaces:

- ▶ Surgery ORs (431 sf to 457 sf)
- ▶ Anesthesia Workroom (309 sf to 404 sf)
- ▶ Prep/Recovery Bays (121 sf to 143 sf)
- ▶ Nurse Stations (Approx. 500 sf)
- ▶ Sterile Storage (340 sf)

Departmental Gross Square Foot Take-Offs

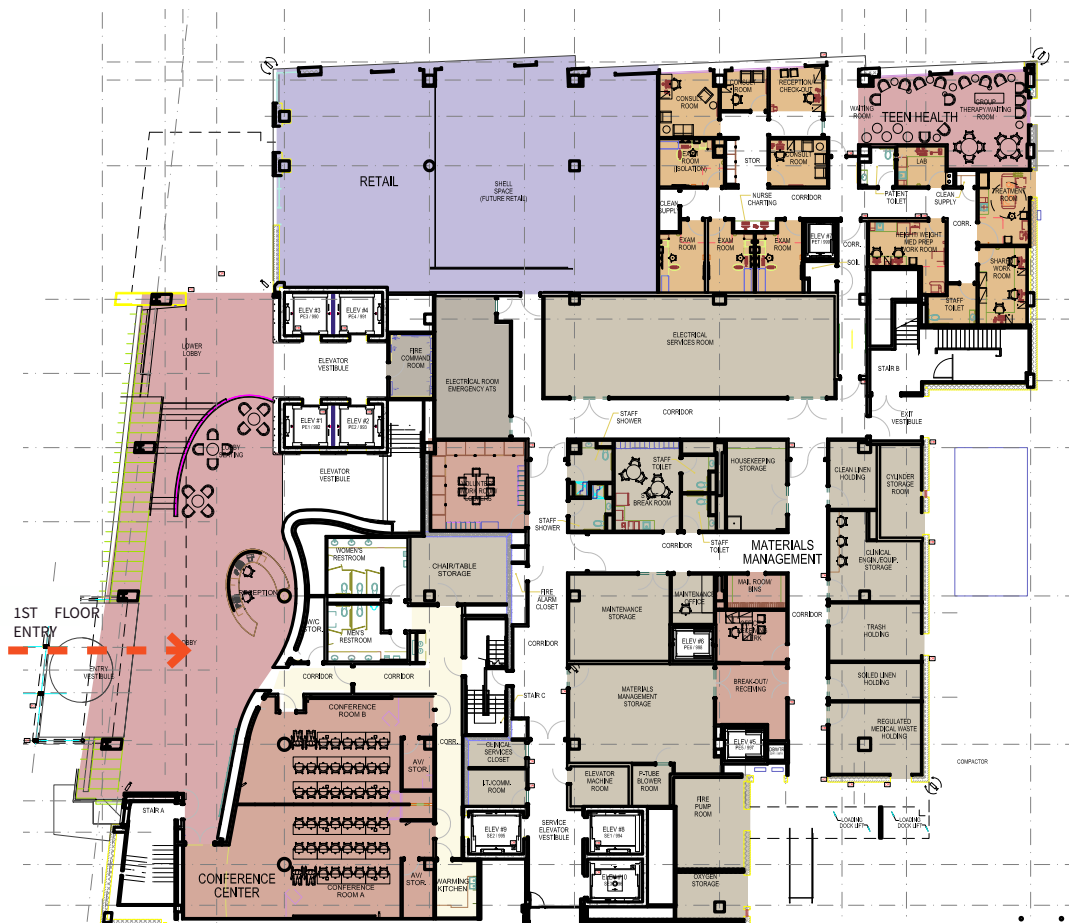
Pre-Op/Post-Op	16,949 Sf
Surgery	12,929 Sf
OR Care + Team Support	2,309 Sf
Shafts + Vertical Circulation	1,755 Sf

GROUND LEVEL: ORs (12) x 450 = 5,400 SF



"Departmental Square footages based on 'Analysis of Departmental Area in Contemporary Hospitals calculation methodologies & Design Factors Report, 2014"

LEVEL ONE:



Department Plan Key:

	Retail
	Clinic and Lab
	Admissions, Administration & Support
	Waiting/Reception
	Materials Management
	Mechanical + Electrical

Key Spaces:

- ▶ Teen Health (3,401 sf)
- ▶ Lobby/Waiting (4,407 sf)
- ▶ Supply Rooms (General) (625 sf)
- ▶ Retail (3,439 sf)
- ▶ Exam Rooms (140 sf)

Departmental Gross Square Foot Take-Offs

Retail	3,442 SF
Lobby/Waiting	4,463 SF
Conference Center	1,721 SF
Materials Management	5,982 SF
Teen Health/Clinics	3,401 SF
Shafts/Vertical Circulation	1,527 SF
Electrical	1,653 SF
Volunteer Room	350 SF

University of Virginia Health System Battle Building

Departmental Plan Key:

- Waiting/Reception
- Surgery Support
- Administrative
- Central Sterile/Processing
- Mechanical + Electrical

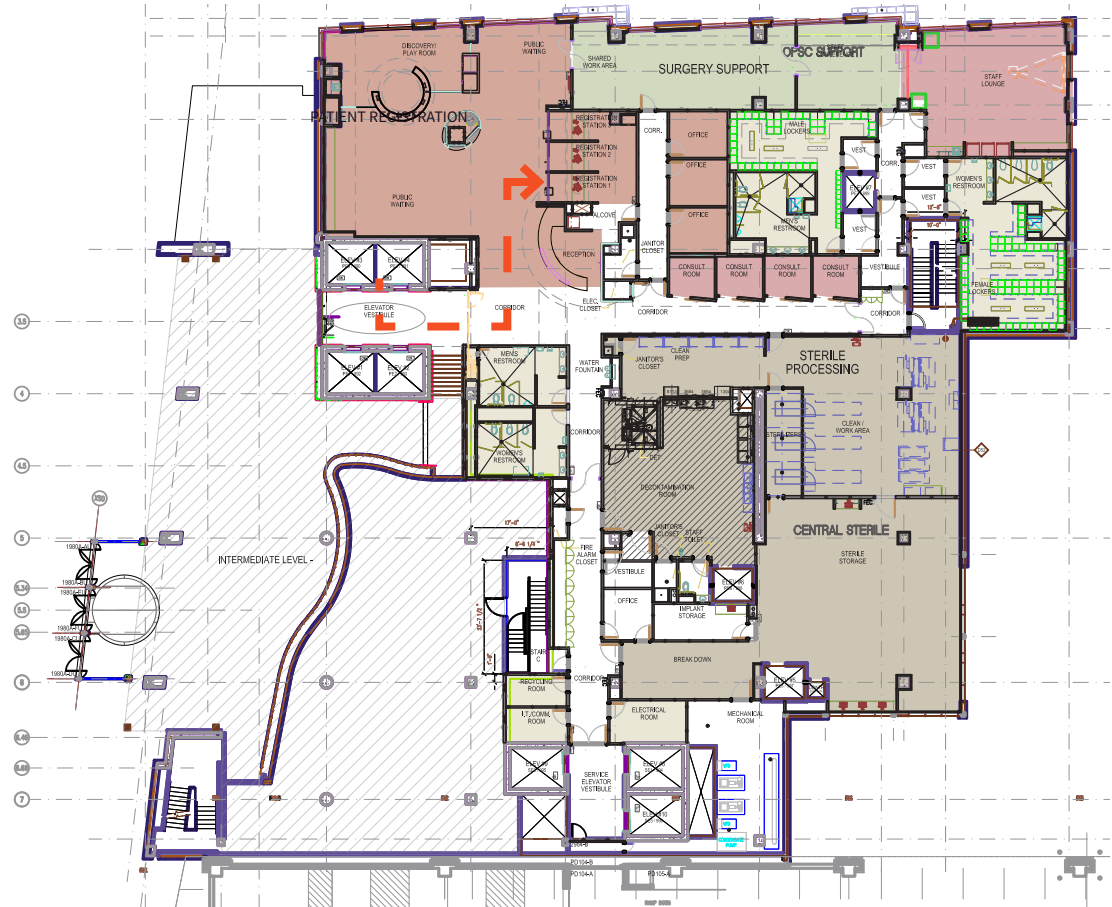
Key Spaces:

- ▶ Central Sterile (2,010 sf)
- ▶ Surgery Support (768 sf)
- ▶ Sterile Processing (1,515 sf)
- ▶ Waiting (1,968 sf)
- ▶ Registration (407 sf)

Departmental Gross Square Foot Take-Offs

Central Sterile and Processing	4,370 SF
Registration/Administration	1,120 SF
Surgery Support	768 SF
Waiting + Playroom	2,223 SF
Staff Area	2,310 SF
Shafts + Vertical Circulation	1,755 SF
Mechanical	491 SF
Electrical	143 SF

LEVEL TWO:



"Departmental Square footages based on 'Analysis of Departmental Area in Contemporary Hospitals calculation methodologies & Design Factors Report, 2014.

LEVEL THREE:



PATIENT DISCHARGE TO PARKING DECK

Department Plan Key:

- Clinic and Lab
- Admissions, Administration & Support
- Waiting/Reception
- Procedure Rooms
- Mechanical + Electrical

Key Spaces:

- ▶ Procedure/Ultrasound (220 sf)
- ▶ Lobby/Waiting (2,887 sf)
- ▶ Clean Storage (100 sf)
- ▶ Staff Lounge (156 sf)
- ▶ Exam Rooms (140 sf)

Patient Circulation

Patients enter from the first floor, register on the second floor, then are discharged after treatment to the 3rd floor parking deck.

Sentara Obici Hospital - Ambulatory Surgery Center

Suffolk, Virginia



SQ FT
22,900 BGSF



OWNER/AFFILIATION
Sentara Obici
Hospital



ARCHITECT(S)
PF & A architects
Norfolk, VA



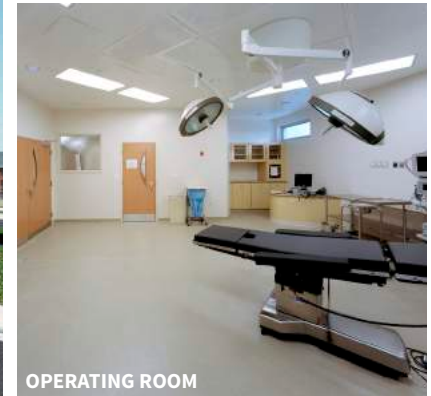
PATIENT VISITS
8841 since opening



MAIN ENTRANCE, DROP-OFF

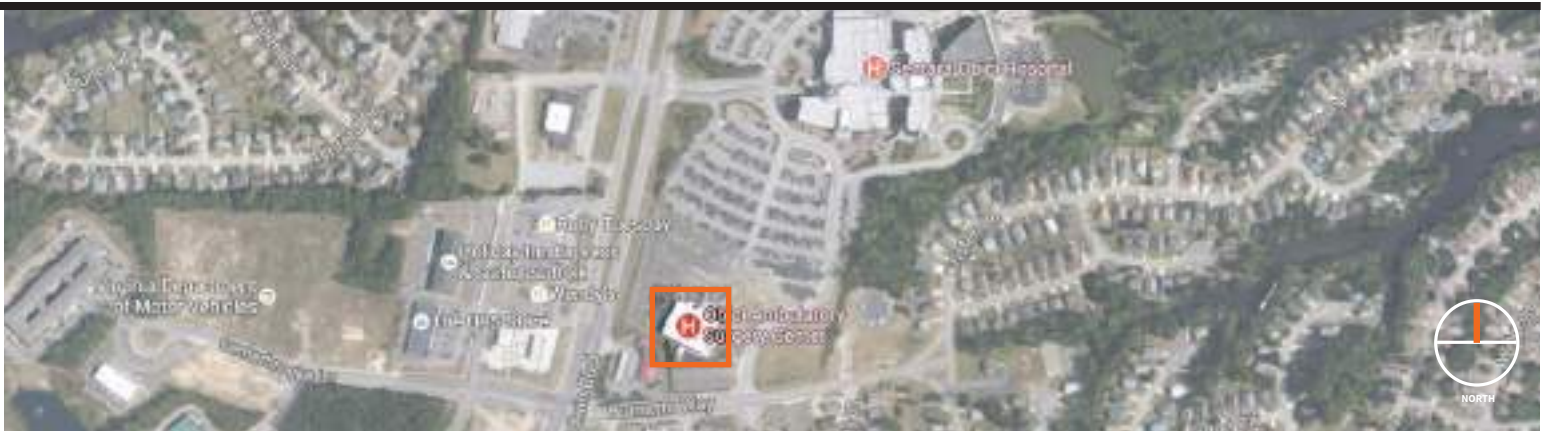


CLEAN CORE CONTROL STATION



OPERATING ROOM

Image Sources: <http://www.pfa-architect.com/ambulatory-surgery-center-sentara-obici-hospital/>
Data source: <http://health.usnews.com/best-hospitals/area/va/sentara-obici-hospital-6341153>



ABOUT | DESIGN INTENTIONS

This facility is an ambulatory surgery center that stands alone from the larger Sentara Obici Hospital campus. As such, its exterior had to respond to the hospital on one side as well as the medical office building on the other side. Patient flow and efficiency were predominant design drivers. **A unique aspect of the facility is the extensive amount of green design features** including solar tubes in non-sterile corridors that allow lights to be turned off on sunny days. The overall structure strives to reduce environmental loads on the building while also creating a positive and healing daylit environment.



MAIN ENTRANCE DRIVE



PRIVATE PATIENT PICK-UP

Image Sources: <http://www.pfa-architect.com/ambulatory-surgery-center-sentara-obici-hospital/>

Sentara Obici Hospital - Ambulatory Surgery Center

"Reduce environmental loads on the building while also creating a positive and healing daylit environment."

PRO

- ▶ **Solar tubes** in non-sterile corridors allow staff access to daylight and allow lights to be turned off
- ▶ **Solar baffles**, tinted windows and a white roof allow for heat mitigation and more energy
- ▶ Monumental covered **drop-off** allows for easy patient access during all weather conditions
- ▶ Separation between patient areas and restricted OR areas is enforced by a **buffer of staff** buffer of staff and administration spaces



CON

- ▶ Staff work areas deep in the floorplate have little access to natural daylight
- ▶ Irregular layout of post-op and pre-op spaces



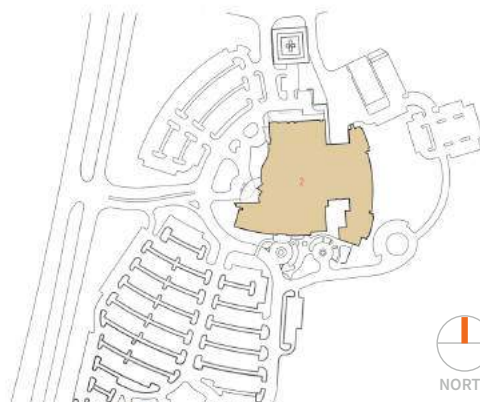
Image Sources: <http://www.pfa-architect.com/ambulatory-surgery-center-sentara-obici-hospital/>



CANOPY



MAIN ENTRANCE



SITE PLAN:

1 Ambulatory surgery center

2 Existing Sentara OBICI Hospital



NORTH



NORTH

KEY SPACES:

- ▶ OR (578 sf x 2)
- ▶ Future OR (535 sf x 2)
- ▶ Procedure room (391 sf x 2)
- ▶ Pre-Op (87 sf x 6, 110 sf x 2)
- ▶ PACU (106 sf x 4, 129 sf x 4)
- ▶ Post-Op (89 sf x 8)

- ▶ Pre-Op/Post-Op (6790 sf)
- ▶ Surgery suite/staff support (8170 sf)

Sources: <http://www.pfa-architect.com/ambulatory-surgery-center-sentara-obici-hospital/>

Sentara Obici Hospital - Ambulatory Surgery Center

KEY

1. Patient Drop-off
2. Reception/Waiting
3. Post-Op
4. Nurses Station
5. Pre-Op
6. Doctor's Lounge
7. Service/Delivery
8. Sterile/Soiled
9. Operating Room
10. Future Operating Room
11. Procedure rooms
12. Patient Pick-up

DISTANCE ANALYSIS:

PATIENT: —●—●—

From entrance to registration: **25 ft**
From registration to medical waiting: **15ft**
From waiting to Pre-Op: **78 - 117 ft**
From Post-Op to entrance : **74 - 122 ft**

FAMILY: —●—●—

From entrance to registration: **25 ft**
From registration to medical waiting: **15ft**
From waiting to Pre-Op: **78 - 117 ft**

STAFF: —●—●—

From Pre-Op to OR: **86 - 145 ft**
From OR to Post-Op: **155 - 205 ft**
From PACU to Post-Op: **51 - 132 ft**

FLOOR PLAN: ORs (2) x 578 = 1156 SF



FLOOR PLAN ANALYSIS



KEY:

- Pre-op
- Post-op
- Staff support/work area
- Procedure rooms
- OR
- Administration
- Reception/waiting

SERVICE

- ▶ orthopedic
- ▶ gynecologic
- ▶ general
- ▶ ophthalmologic
- ▶ plastic
- ▶ podiatry and pain management
- ▶ surgeries procedures



NORTH

Orthopedic and Sports Medicine Institute of the Fox Valley

Appleton, Wisconsin



SQ FT
50,000 BGSF



OWNER/AFFILIATION
Private



ARCHITECT(S)
FLAD Architects



PATIENT VISITS
11,000 per year



ENTRANCE



Lobby



Cafe

Image Sources: http://www.flad.com/projects/detail.php?project=fox_valley_ortho



ABOUT | DESIGN INTENTIONS

About this clinic from the FLAD Architects Website.

Three specialized physician groups banded together **not only to treat orthopedic injuries, but to provide an environment focused on positive patient outcomes.**

The physicians' vision of a new, 50,000-square-foot ambulatory surgery clinic and office building was realized, housing outpatient clinic space, general radiographic rooms, four operating rooms, an MRI diagnostic imaging suite, and space for rehabilitation and orthotics services.

Emphasizing the Orthopedic & Sports Institute's **connection to the community, the building also reflects the area's history.** Flad's design connects the architectural expression of the clinic to the historic roots of the Fox River Valley paper mills, through warm natural interior materials, soaring glass walls, exposed wood, and steel structural elements.

http://www.flad.com/projects/detail.php?project=fox_valley_ortho

FACILITY PLAN | Orthopedic and Sports Medicine Institute of the Fox Valley



<http://www.osifv.com/facility/main-campus>

Orthopedic and Sports Medicine Institute of the Fox Valley

“The design goal for the building was to enhance the patient experience through the use of warm, natural materials. The interior materials, such as wood and stone, enhance the public spaces. Color, floor patterns, and signage are used to support way-finding throughout the building.”

-Alana Schrader
Interior Designer at FLAD

ANALYSIS

4 **Operating Rooms with substerile rooms**, built on a 23-hour extended care model

PROS

- + **Landmark lobby** to promote easy wayfinding and access to daylight
- + Use of shared lobby and registration for clinics to create a more efficient floorplan
- + Large covered patient drop-off area
- + Building design and materials are drawn from local history and context
- + Location of ORs along exterior wall allow for possibility of **daylighting and future expansion**
- + Clear separation of functional zones

CONS

- Staff work areas are deep in the floor plate and have limited access to natural daylight



WAITING AREA



DAYLIGHTING IN RECOVERY BAYS



GROUND FLOOR PLAN | ORTHOPEDIC AND SPORTS INSTITUTE OF THE FOX VALLEY

The design goal for the building was to enhance the patient experience by creating a comforting environment that is focused on providing excellent patient care and positive patient outcomes.

A main entry hall was developed with a concierge-style greeter and for easy, visible access to all three physicians' practices.

The entry sequence acts as an icon for the building with a two-story lobby featuring soaring glass walls opposite one another, bringing in an abundance of daylight.



Efficiencies were built into the floor plan by designing clinic areas that share a central waiting room, provide a central imaging department usable by all groups, as well as shared administrative offices and medical records.

1. VESTIBULE
2. LOBBY/ RECEPTION
3. RESOURCE CENTER
4. CONFERENCE ROOM
5. ORTHOTICS
6. PHYSICAL THERAPY
7. BUSINESS OFFICES
8. SERVICE
9. IMAGING
10. SURGERY CENTER
11. BUSINESS OFFICES
12. PRE-OP
13. OR
14. RECOVERY
15. LOCKERS

DESIGN INSPIRATION

When starting the design process, the team examined the architectural history of the area, with a focus on turn of the century paper mills dating as far back as 1883. Working with the paper mills' architectural details and material palette, we were able to find common ground on the design of the new medical facility that appealed to everyone in the physician groups.

The resulting design expresses the historic roots of the manufacturing industry in this region. The connection to the Fox Valley paper mills was accomplished through the use of familiar building forms and materials in concert with exposed wood and steel structural elements. The main entry, a focal point of the building, features a pitched metal roof that is reflective of one of the neighboring paper mills.

The final architectural style works well with the site and surrounding region and reflects the practices' unique connection to the community.

http://www.flad.com/projects/detail.php?project=fox_valley_ortho

Orthopedic and Sports Medicine Institute of the Fox Valley

GROUND FLOOR PLAN | KEY SPACE & DISTANCE ANALYSIS

KEY:

1. Patient Drop-off
2. Reception/Waiting
3. Pre-Op
4. Nurses Station
5. Operating Room
6. Sterile/ Soiled
7. Post-Op
8. Patient Pick-up
9. Service Delivery

DISTANCE ANALYSIS:

PATIENT: ●—●

From entrance to registration:	25 ft
From registration to waiting room:	7 ft
From Waiting Room to Pre-op	40 - 60 ft
From Post-op to pick-up	10 - 35 ft

FAMILY: ●—●

From entrance to registration:	25 ft
From registration to waiting room:	7 ft
From Waiting Room to Pre-Op:	40 - 60 ft

STAFF: ●—●

From Pre-Op to OR	40 - 80 ft
From From OR to Post-Op	60 - 120 ft



ASPECTS OF THE SURGERY CENTER:

- Private prep rooms for patients and their families
- Separate space for insurance or financial consultation
- Custom-made pants and shirts for comfort and dignity
 - Warming blankets for patient comfort
- **Dedicated exit with carport**, separate from main entrance for convenience and privacy

<http://osifv.com/facility/main-campus>

GROUND FLOOR PLAN | ORs (4) x (615 - 650 sf) = 2,535 sf



KEY:

- Pre-op
- Post-op
- Staff support/work area
- OR
- Administration
- Reception/waiting
- Imaging

PROJECT SUMMARY:

Total building area (sq. ft.): 50,000 BGSF
 Construction cost/sq. ft.: \$204
 Total construction cost (excluding land): \$10,200,000

ARCHITECT:

FLAD & Associates

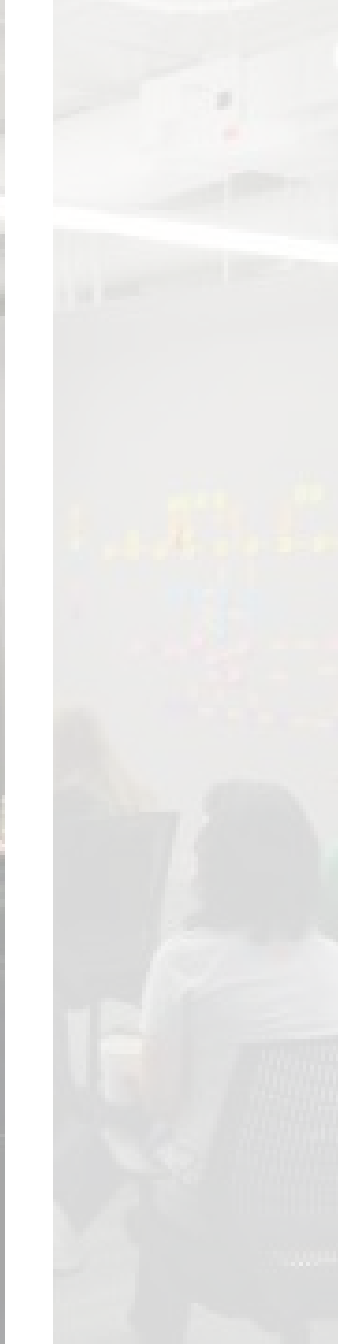
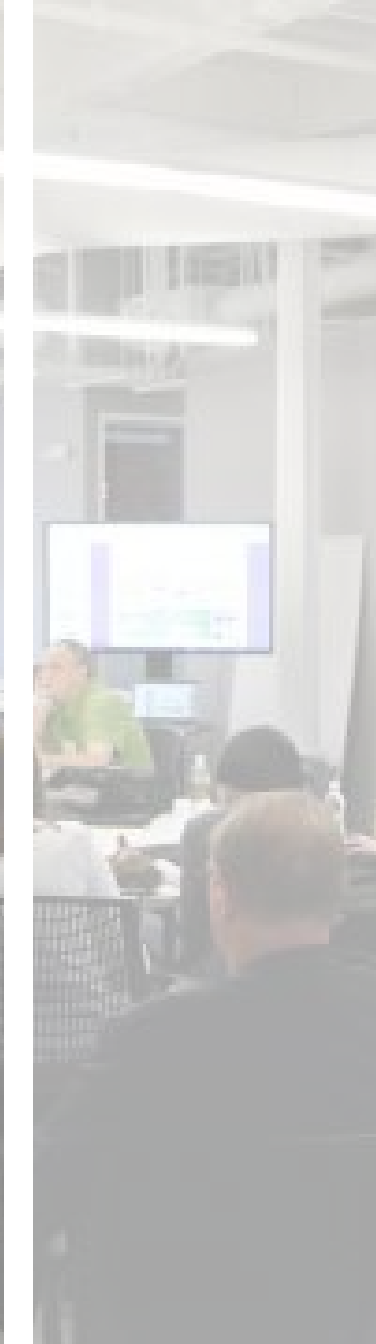
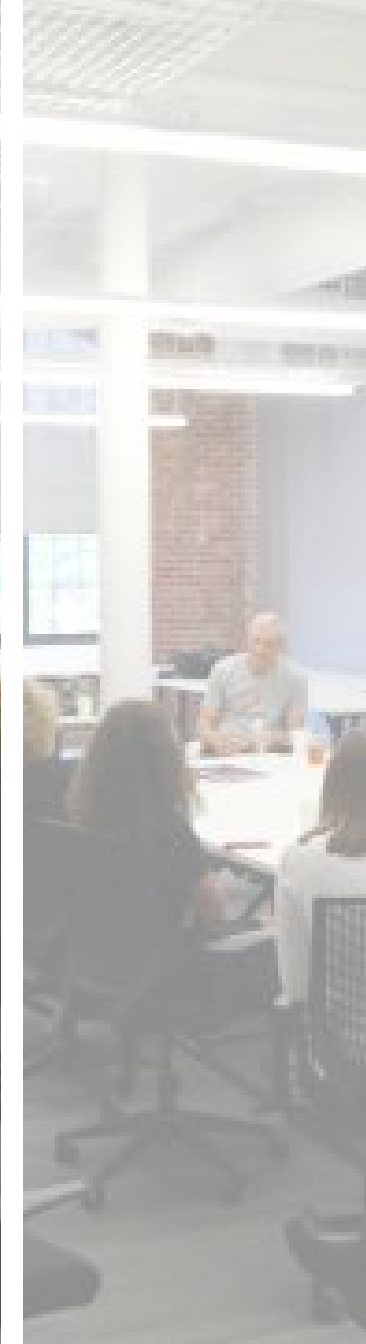
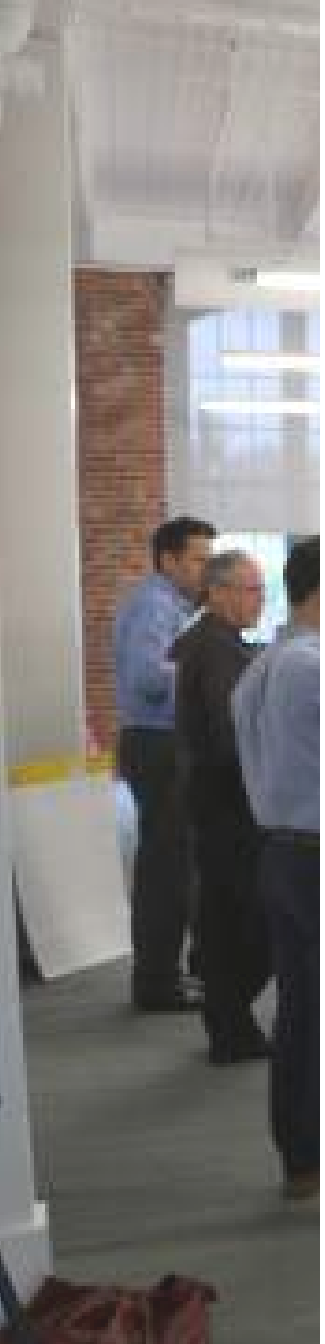
Design Team: Fred Peterson, AIA, ACHA, Principal/
 Project Manager; Tom Grove, AIA, ACHA, Principal/
 Medical Planner; Jeffrey C. Raasch, Design Principal;
 Mark Dingle, Project Designer; Alana Schrader, Sr.
 Interior Designer

KEY SPACES | SURGERY CENTER:

OR x 4 (615 sf - 650 sf)

Pre-Op x 6 (90sf)

Post-Op x 11 (70 sf x 6, 90 sf x 2)



03 LITERATURE REVIEW

Type information here about the literature review process

ORTHOPEDIC AMBULATORY PROCEDURES
OPERATING SUITE LAYOUTS
PATIENT JOURNEY SCENARIOS

ORTHOPEDIC AMBULATORY PROCEDURES



CARPAL TUNNEL RELEASE

Description:

Carpal tunnel syndrome happens when the tunnel the tissues surrounding the flexor tendons swell, or becomes narrowed which puts pressure on the median nerve. The pressure can cause pain, numbness, tingling, and weakness in the hand.

Carpal tunnel syndrome can occur when:

- When you grow older
- Heredity
- Repetitive hand use
- Pregnancy
- Diabetes, arthritis, and thyroid gland imbalance

Examination:

During the physical examination, the doctor will examine the patients hand and wrist and perform several different test. The test will include a test for numbness or tingling in the patients fingers, sensitivity by lightly touching the hand, and weakness in muscles around the base of the thumb.

Tests:

Tests used in diagnosing Carpal Tunnel are:

- Electrophysiological tests
- Electromyogram (EMG)
- Ultrasound
- X-rays
- Magnetic Resonance Imaging (MRI) scans

Treatments:

Surgical Treatment: There are two surgical procedures for carpal tunnel, but both are used to help relieve pressure on the median nerve. The patient can be put under local anesthesia, which numbs the hand and arm, or they can be put under general anesthesia, which puts them to sleep.

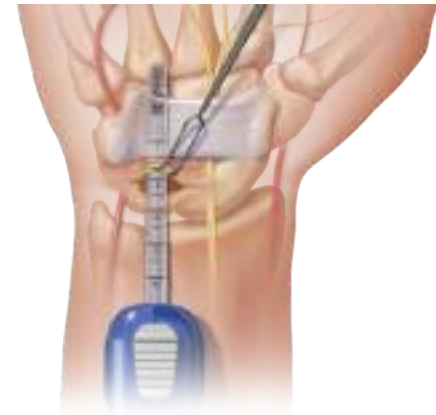
Open Carpal Tunnel Release:

The doctor makes a small incision in the palm of the hand and views inside to divide the transverse carpal ligament to increase the size of the tunnel and decrease the pressure on the median nerve.

Endoscopic Carpal Tunnel Release: The doctor makes one or two small incisions and uses a miniature camera to see inside, while using a small knife to divide the transverse carpal ligament.

Recovery:

Immediately following the surgery the patient will need to elevate the hand, palm will be sore for several weeks. Doctor will talk to patient about when they can return to work. Usually within 2 to 3 months the median nerve will be stronger than before surgery.



ROTATOR CUFF REPAIR SURGERY



Description:

The rotator cuff is a group of four tendons that help move the shoulder, but when the rotator cuff tears it is common to have shoulder pain and disability. The rotator cuff tendons can tears from falling or heavy lifting and also can by aging. Over time the rotator cuff unattended can lead to greater pain and disability.

Examination:

Patient should be cleared by primary doctor before having the procedure.

Tests:

Rotator Cuff Repair can require the following tests:

- Blood test
- X-rays
- EKGs

Treatments:

Open Repair: The traditional open surgical incision is required if the tear is large or complex. This procedure is the most invasive but can be used for the surgeon to detach the shoulder muscle to see and gain better access to the torn tendon.

All-Arthroscopic Repair: During the arthroscopic repair the surgeon will insert a small camera into the shoulder joint and make small incisions. Arthroscopic repairs are usually outpatient because it is the least invasive method.

Mini-Open Repair: The mini-open repair is the newest of the technology and only requires a incision 3 to 5 cm long. The technique uses arthroscopy to assess and treat the damage, while avoiding detaching the deltoid muscle. When they finish the arthroscopic portion they repair the rotator cuff through a mini-open incision. While repairing the tendon, the doctor views the process directly rather than on a screen.

Recovery:

The patient will experience some pain after the surgery but that can be monitored by the doctors and nurses. Rehabilitation is very important after surgery. The patient will go through a three part process, immobilization, passive exercise, and active exercise. Usually the patient can return to work within 2 to 3 weeks.

THUMB ARTHROPLASTY

Description:

The procedure is needed when patients have advanced basilar thumb arthritis. The procedure helps to take pain away from the thumb and also improve the function. Most patients have problems with pinching or grasping because it causes a lot of pain to the thumb.

Examination:

Patient should be cleared by primary doctor before having the procedure.

Tests:

Thumb Arthroplasty can require the following tests:

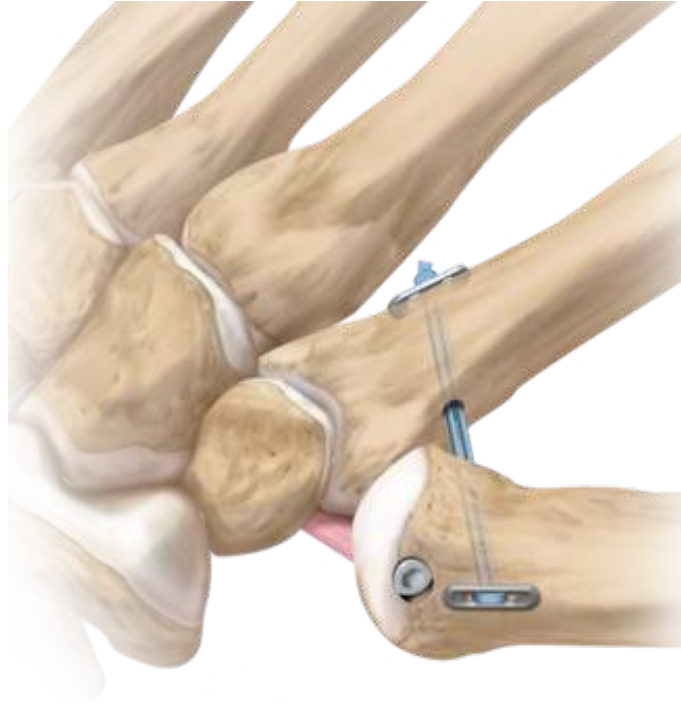
- Blood test
- X-rays
- EKG

Treatments:

The procedure requires the patient to have general anesthesia and also a axillary block. The surgeon will make a incision along the thumb and they will remove the joint and replace the tendon with a graft. The surgeon will take the tendon by making one or two incisions in the forearm. One or two pins will be used to stabilize the thumb and will be removed in 4 weeks after the procedure.

Recovery:

The patient will be released having to wear a splint, and this should not be removed. Hand should stay elevated as much as possible during the first week. The patient will need to go back and see the doctor 10 - 14 days after the procedure. Hand therapy will be needed so the patient can regain movement; strengthening normally takes 2 months to come back.



KNEE ARTHROSCOPY / MENISCECTOMY



Description:

Arthroscopy is a common surgical procedure that the joint is viewed with a small camera. The Arthroscopy is done through small incisions and they use a small camera to help see how to repair the damaged tissue in the know.

Examination:

Patients will need to have a complete physical exam before surgery.

Tests:

Tests that could be done before the procedure are:
Electrocardiogram (EKG)
Blood Count Test

Treatments:

Most patients will be put under general anesthetic. Three small incisions are made for special instruments, like a fiber-optic camera, to be placed into your knee. Arthroscopic instruments are used to remove torn parts of the meniscus and/or damaged cartilage on the bone surfaces. The surgery is usually about 30 minutes, but could last longer depending on the scope of the procedure. In most cases, incisions can be closed with Sterile-strips instead of stitches.

Recovery:

Right after surgery if pain is at a minimal then crutches or walkers are not required. The surgery has a very high success rate and most cases the recovery will be smooth and quick. Patients resume all activities within 4 to 6 weeks.

TRIGGER FINGER RELEASE

Description:

The procedure is to alleviate triggering or locking of the finger. The tendon becomes swollen and catches as it goes under the pulley or sheath.

Examination:

Patient should be cleared by primary doctor before having the procedure.

Tests:

Trigger finger release can require the following tests:

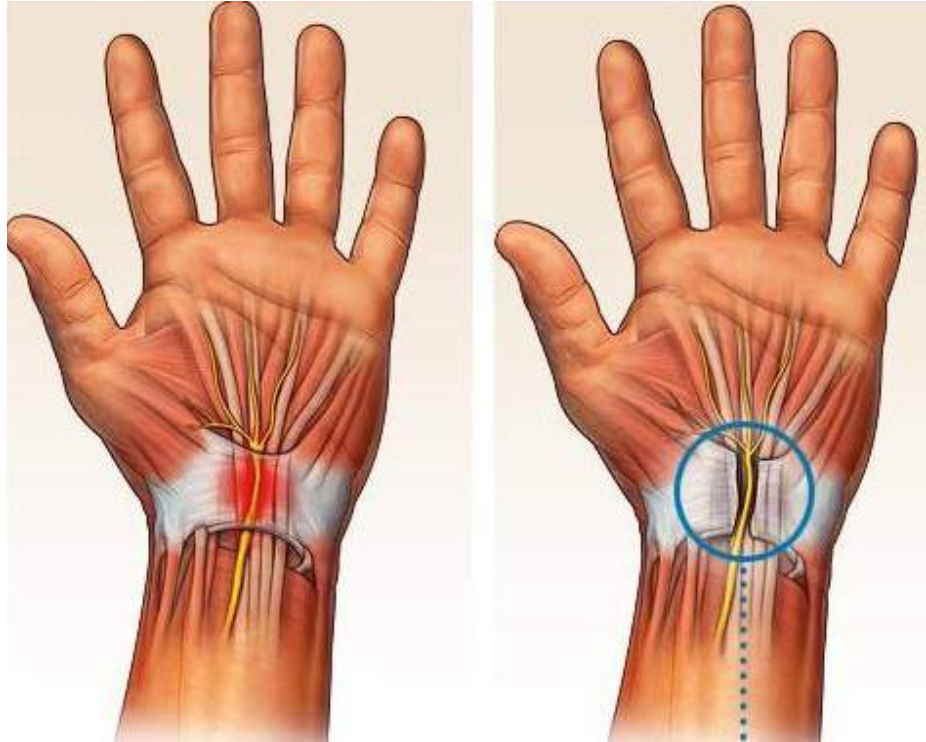
- Blood test
- X-rays
- EKG

Treatments:

The surgeon will make a small incision in the palm of the hand and release the sheath tendon. Once it is released the tendon is then manipulated to ensure no further locking or catching. The patient will not need any general anesthetic but usually just some sedation and local anesthetic into the palm of the hand.

Recovery:

After surgery the patient will be released home with a soft dressing; the dressing can be removed within 2 to 3 days. Hand Therapist will provide a set of exercises that the patient can do on their own. The time the patient can return to work depends on each individual's case. After 6 weeks the patient can return to all normal activity.



WRIST FRACTURE REDUCTION & FIXATION



Description:

Fractures to the wrist usually are injuries at the end of the radius bone or the ulna. Different fractures will be treated differently; some using casting only; while others fractures require surgery.

A few types of wrist fractures are:

- Intra-articular fracture
- Extra-articular fracture
- Open fracture
- Comminuted fracture

Examination:

Patient should be cleared by primary doctor before having the procedure.

Tests:

A wrist fracture reduction can require the following tests:

- Blood test
- X-rays
- EKG

Treatments:

The type of surgery depends on the fracture pattern and the surgeon's preference. Some cases will not require incisions while other will need them. Typically the surgeon will make a small incision to access the broken bone to realign using cast, metal pins, and plate and screw.

- Open fractures need to be treated within 8 hours of the injury. If the surgeon does a internal fixation with plates or screws, the patient might need another procedure several days later.

Recovery:

After surgery, the patient will go home in a splint that is from their hand up to just above their elbow. The patient will remain in the cast for 4 to 6 weeks, but will be able to return to work 2 to 3 weeks after surgery. At 6 weeks the patient should be fully recovered.

ARTHROSCOPIC SURGERY - ANKLE, ELBOW, SHOULDER

Description:

Arthroscopic is using a small camera and surgical tools to examine and repair a torn muscle. By using the arthroscopic technique, the surgeon is able to make a smaller incision which allows the patient to heal quicker.

Examination:

Patient should be cleared by primary doctor before having the procedure.

Tests:

Trigger finger release can require the following tests:

- Blood test
- X-rays
- EKG



Treatments:

Ankle: The patient will receive general anesthesia and the surgeon will insert an arthroscope into the ankle through a incision and they will inspect all the tissue and make repairs.

Elbow: The patient will receive general anesthesia, and the surgeon will start by filling the elbow joint with fluid. The surgeon will make several small incisions and use the arthroscope to identify the problem by shaving, cutting, grasping, suture passing and knot tying.

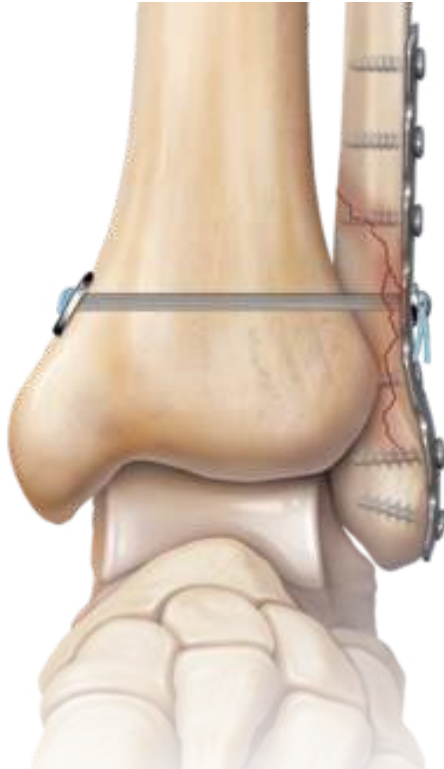
Shoulder: Patient might be placed in beach chair position or lateral decubitus position. The surgeon will inject a fluid into the shoulder and make a small puncture in the shoulder to use the arthroscope. After the problem is identified, the surgeon will repair it by shaving, cutting, grasping, suture passing, and knot tying.

Recovery:

Patients will be able to go home the same day after they recover from anesthesia. Most patients can go home after 1 to 2 hours after the procedure. Since the incisions are so small they can just use soft dressing to cover it up. Rehabilitation is a virtual role into getting back to normal activities.



HAND, TOE & ANKLE FRACTURES



Description:

Fractures are when a bone breaks and can result from a fall, crush injury, or direct contact in sports.

Examination:

A doctor will examine the patient to check the condition of the fractures by doing small tests and identify what the best course of action is.

Tests:

A fracture can require the following tests:

- X-rays
- MRI scan
- CT scan

Treatments:

Surgeon makes a incision to access the broken bone directly to improve alignment. Depending on what kind of fracture it is holding the bone in place can be done by a cast, metal pins, plates and screws, and an external fixator.

Recovery:

If patients has a cast on, it takes about 6 weeks to recover. Most patients need rehabilitation after healing from their fracture.

ACL RECONSTRUCTION

Description/Cause:

Almost half of all injuries to the ACL occur with other injuries to the knee, such as articular cartilage, meniscus, or others. Partial tears to the ACL are rare; most ACL injuries are complete to near complete tears.

The Anterior Cruciate Ligament can be injured in the following ways:

- Changing direction suddenly
- Stopping Rapidly
- Slowing down when running
- Landing a jump wrong
- Direct contact or collision, such as in a sport

Examination:

During a physical examination, the doctor will check the structures of the injured knee, and compare to the non-injured knee. Most injuries can be diagnosed with a physical examination.

Test:

Tests used in diagnosing ACL Injuries:

- X-Rays
- Magnetic Resonance Imaging (MRI)

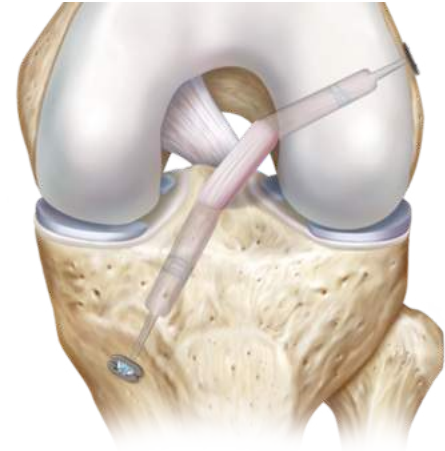
Treatment:

Nonsurgical Treatment: A torn ACL will not heal without surgery, however bracing or physical therapy can be effective for patients that are older or has a very low activity level.

Surgical Treatment: For surgical treatment the doctor will replace the torn ligament with a tissue graft. If the patient is a athlete, it will take about six months until they can return to their sports. The surgery to rebuild an ACL is done with an arthroscope using small incisions, which is less invasive. Since the surgery is less invasive, it is less painful, less time in the hospital, and has a quicker recovery time.

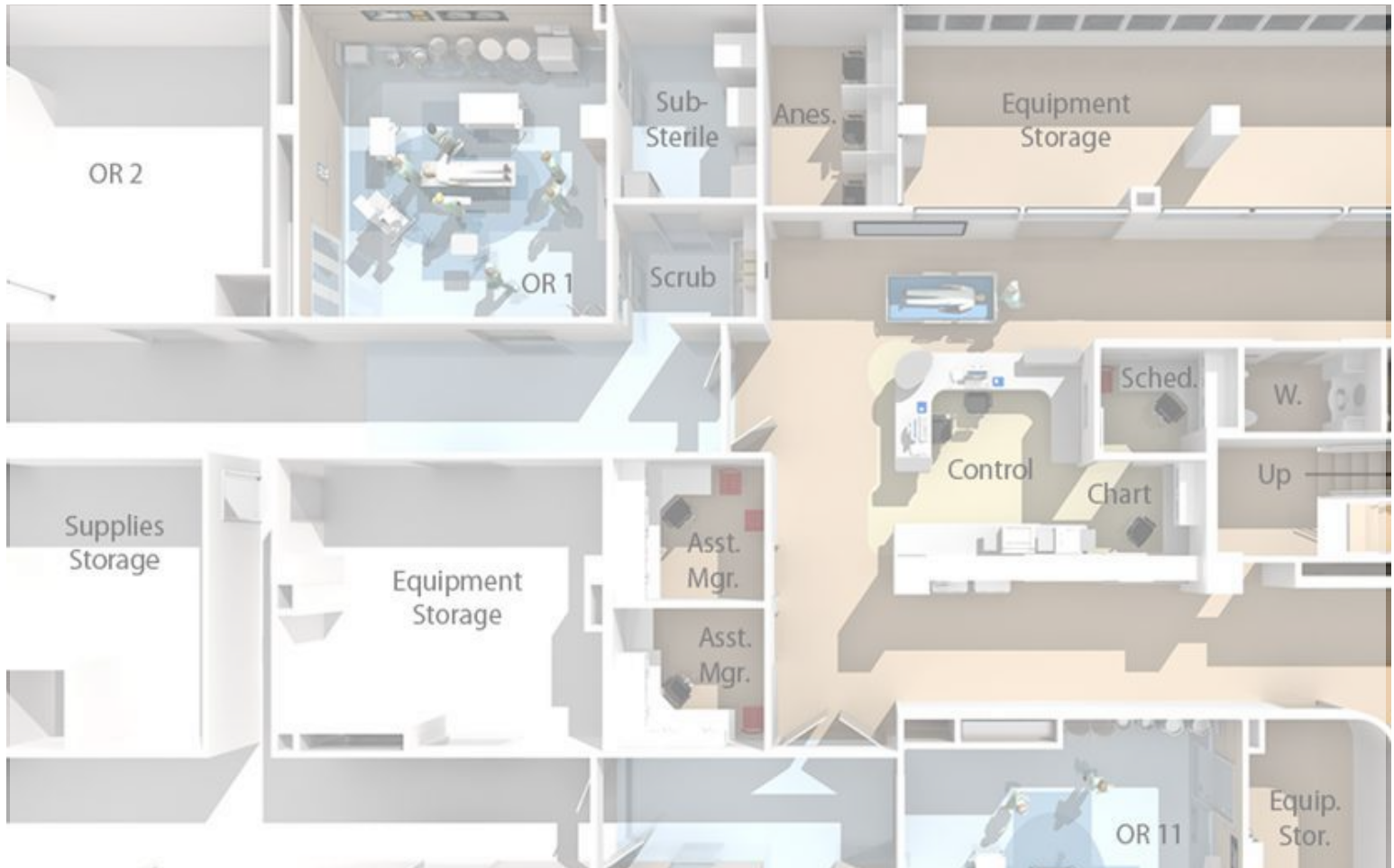
Recovery:

Whether people are treated with a nonsurgical or surgical treatment, rehabilitation will play a vital role in getting back to normal daily activities. **The rehabilitation will help regain strength and motion in the knee.**

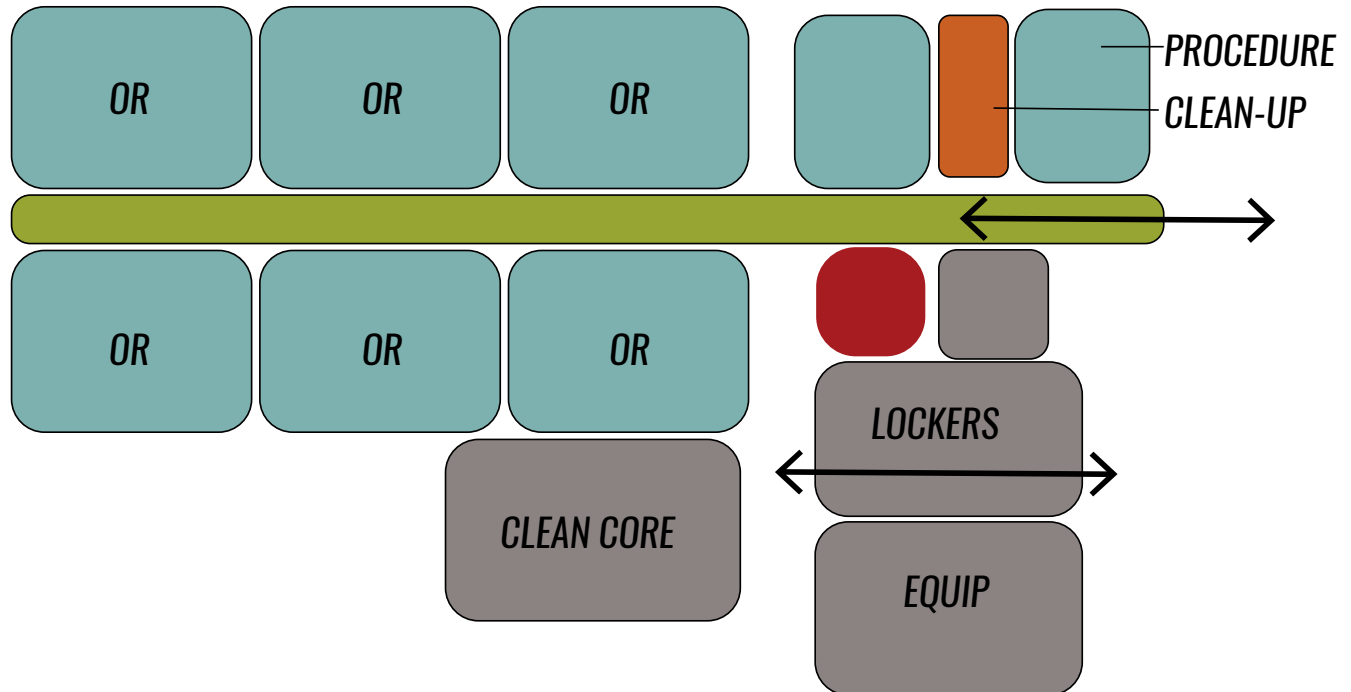




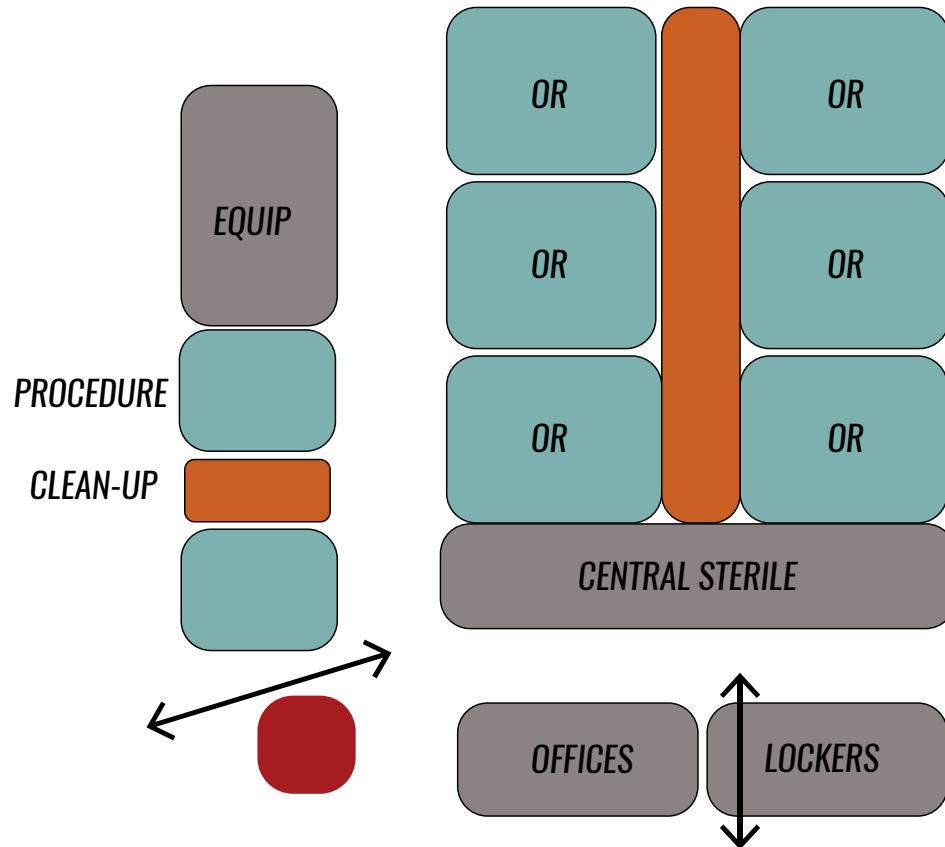
SURGICAL SUITE LAYOUTS



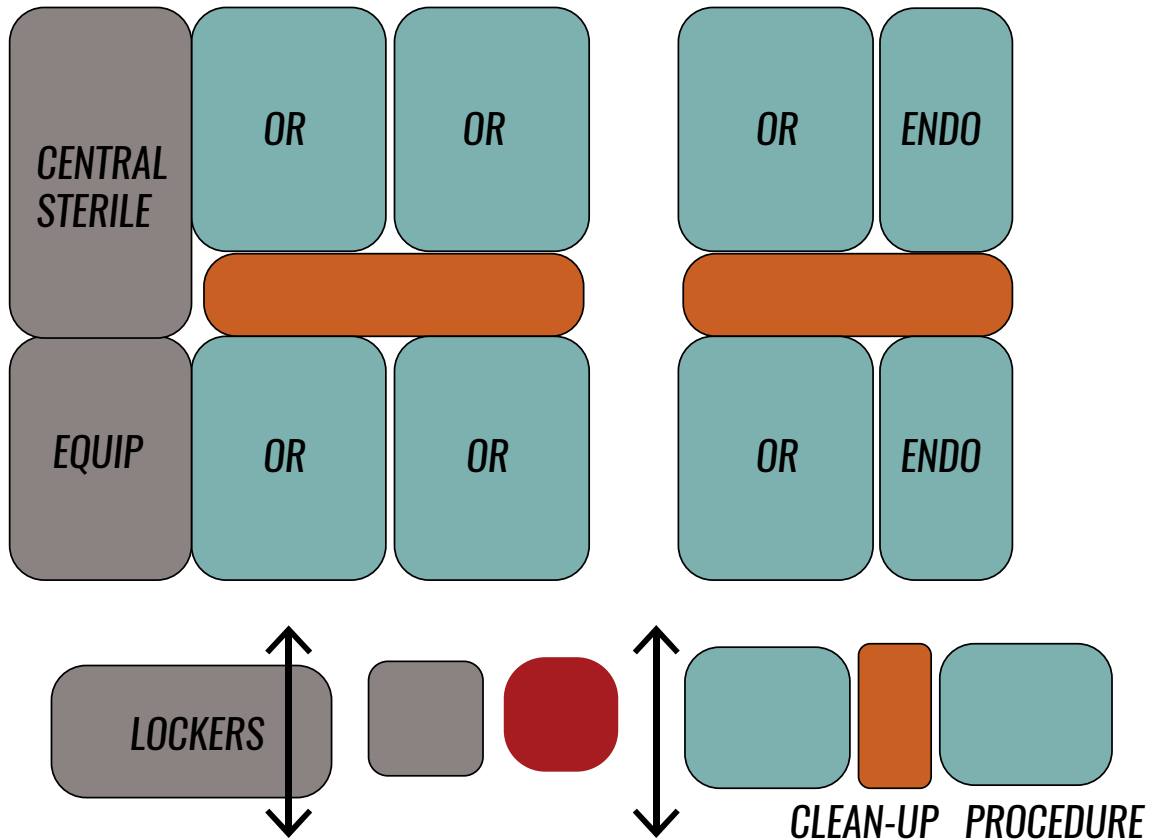
SINGLE CORE LAYOUT



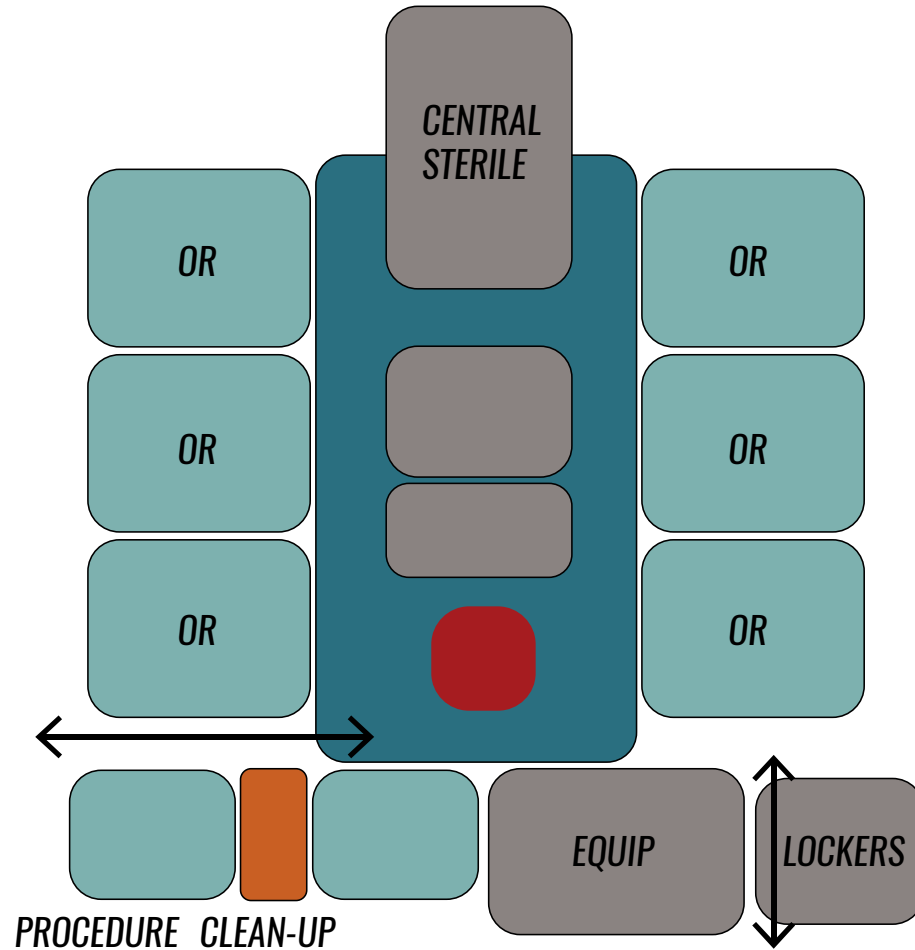
CLEAN CORE LAYOUT



SPLIT CLEAN CORE LAYOUT



WORK CORE LAYOUT



PATIENT JOURNEY SCENARIOS



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PATIENT JOURNEY SCENARIOS

Stages of Surgery

ARRIVAL PRE-OP SURGERY POST-OP DISCHARGE FOLLOW UP

ADOLESCENT/ YOUNG ADULT WITH PARENT



Phoebe, 22

Phoebe is a senior in college. She has been so excited about going on one of her last retreats with one of her campus organizations. She is particularly excited for the annual football game they play on Saturday. Phoebe heads outside Friday night for the traditional pre-game tackle practice. Unfortunately, it is the one icy night of the year. She runs up for the tackle, but then due to the slippery ground, disaster strikes. Her knee gets twisted while she falls to the side, and she tears her anterior cruciate ligament. Since the ligament has completely torn, she will have to have surgery to repair it. The surgery does not require an inpatient stay, so Phoebe decides to have the surgery at an ambulatory orthopedic surgery center.

ADULT PATIENT WITH SPOUSE



Jonathan, 39

Jonathan is a loving husband to MacKenzie for 10 years, devoted father of 2 young children, Mason and Emily, and an athlete with a passion for running, golfing and especially tennis, a sport he played professionally throughout his career and received numerous accolades before retiring 4 years ago. He now coaches tennis at a university. Due to the pressure put upon his knees during his tennis career and genetics, Jonathan needs a replacement of his left knee (total knee arthroplasty) at an ambulatory orthopedic surgery center to give him the opportunity to keep playing the sports he loves.

ARRIVAL

 TRAVEL Phoebe's mom Lee Ann picks her up after her morning classes at her college. Thankfully her college is in the city, so they won't have to travel far. Phoebe is using crutches for her injury , so she is thankful to have her mom drive. Phoebe's dad is on a business trip, but they have gotten to talk on the phone before Phoebe has her surgery.	 PARKING Lee Ann drives Phoebe to the patient drop off area. They have a hard time finding the drop off area because the parking's signage is vague and the architectural features are not helpful in showing them where to go. Phoebe gets out with her crutches at the drop-off and waits for her mom to park. She is comfortable standing there and would rather wait for her mom to be with her when she enters.	 ENTRY Lee Ann meets Phoebe and they walk in together. It takes Phoebe a lot of work to walk on the crutches , so she is tired even from short distances like these.	 REGISTRATION Phoebe pre-registered for the surgery a week ago, so she only needs to check-in and verify her information. Phoebe is still on her parents' insurance, so she lets Lee Ann handle the payment information while she takes a break in a waiting area .	 WAITING Lee Ann joins Phoebe in the waiting area. The ambience of the space is nice, so they are distracted from most pre-surgery worries for the moment by talking about the room's decorations, but Lee Ann also wants to make sure Phoebe is prepared for the surgery. Lee Ann reminds Phoebe that she needs to make sure the anesthesiologist knows her medication allergies. Phoebe has had minor surgeries before, so she reassures Lee Ann that she will be fine. She is secretly thankful Lee Ann will be able to meet her in pre-op.
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PRE-OP

 PATIENT TRANSITION Phoebe's nurse escorts her back for pre-op. Lee Ann comes also. Phoebe still has a slow walk due to her crutches, but she makes it to her pre-op space and sits on the bed. Lee Ann also has a space to sit in a chair .	 CHANGING Phoebe changes into her hospital gown. She doesn't mind that her mom stays with her, because there is enough space for both of them . She is thankful for the privacy from the other pre-op occupants though. Since her injury is in her knee, she has been wearing clothes that are easy to put on and off without bending it, so this time is not too hard for her. She gives a bag of her clothes to Lee Ann to keep during the surgery.
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Jonathan's wife, MacKenzie, drives him to the orthopedic surgery center. Jonathan is nervous , but glad to have his wife there with him today. MacKenzie's mother offered to babysit Emily and Mason today while their dad undergoes his knee replacement.	MacKenzie and Jonathan arrive at the surgery center and park their car in the parking lot, close to the building entrance .	Jonathan's knee is in a brace, but he is still semi-mobile. Jonathan walks together with MacKenzie to the front entrance; they appreciate the landscaping and trees within the parking lot and entry area, which is calming during these tense moments .	Jonathan and MacKenzie arrive at the center's registration desk, where Jonathan checks in for his surgery . This process goes quickly, as Jonathan pre-registered online before his arrival.	Jonathan and MacKenzie walk to the nearby waiting area, and Jonathan's nervousness increases. While he waits, he wonders "was this a good idea?" and "will something go wrong?", but he looks around the space and the carefully designed furniture, color palette, materials and views of the landscape through the windows helps relax him as he waits to be called in to prepare for surgery. He also notices the pleasant views of the landscaping outside through the windows .	A nurse escorts Jonathan and MacKenzie into the pre-op area to prepare for Jonathan's surgery.	Jonathan is directed to his pre-op bay, where he changes into a gown. There is just enough space for MacKenzie to stay with him in the pre-op bay . His knee is sore, but is able to change without any issues. He places his belongings into a locker provided to patients for safe keeping .
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PRE-OP	SURGERY			POST-OP	DISCHARGE	FOLLOW UP			
									
IV	CONSULTATION	PATIENT TRANSPORT	INDUCTION	SURGERY	EMERGENCE	FAMILY ARRIVAL	DISCHARGE	TRAVEL	REHAB/ FOLLOW UP
Phoebe waits in her bed after changing. The nurse comes in to check Phoebe's charts and start her IV. Phoebe does not like getting an IV, but thankfully they have brought her a heated blanket from outside her pre-op bay, so she is content. The IV liquid burns a little, but she is so comfortable with her blanket she barely notices. She is also thankful the lighting in the bay is not harsh, which helps her relax a little more. Lee Ann feels sometimes feels like she is in the way of the nurse, but it is important to her to be with Phoebe.	The anesthesiologist and surgeon comes to see them and do a last minute check on Phoebe's information. It's getting crowded! Phoebe asks if he has gotten the long list of medicines she is allergic to so she doesn't receive the wrong anesthesia. He is so kind and reassures her she will be getting the right type of anesthesia. Phoebe and Lee Ann are relieved. Lee Ann must go back to the waiting area, so she and Phoebe hug. Lee Ann says she'll be praying and will be updating the family.	Phoebe is wheeled down the hall to the OR. Her wonderful heated blanket continues to help her relax, but she is still a little worried about induction. She is wheeled into the OR, and immediately notices all the equipment surrounding her like the large C-arm. This seems a little strange, but the window with views of the surrounding trees makes her feel more calm than the blank walls of the previous OR's she's been in.	The anesthesia team says a few words to Phoebe about what induction will feel like, and Phoebe is appreciative they have dimmed the lights for induction, because the lights above her were very bright. Then they start induction through a mask they give Phoebe.	Phoebe's knee is worked on and she has a successful surgery. The laparoscopic process made the surgery relatively quick, but it also means there is more equipment that will take up OR space.	Phoebe's emergence begins in the OR, but she is not aware of it yet. She is moved to the post-op area where she continues to emerge.	Lee Ann is brought back to the post-op area while Phoebe is in the final stages of emergence. It takes Phoebe a little longer than others to fully wake up, so Lee Ann patiently waits and updates the family via text on Phoebe's status. Phoebe slowly becomes aware of where she is, and the nurse goes out of Phoebe's bay and comes back with something to drink and a small snack, so she feels better.	Phoebe's nurse reviews her post-surgery instructions both to Phoebe and Lee Ann and explains how to stay on top of the pain. Lee Ann will be helping Phoebe at their home as Phoebe recovers. The nurse calls for a wheelchair, and Lee Ann leaves to get the car and bring it back to the drop-off area. Phoebe is wheeled to the car by a nurse and happily gets in after saying goodbye to her nice nurse.	Lee Ann drives by the pharmacy for Phoebe's pain medicine, and then drives Phoebe home. Phoebe will be taking a few days to recover at home before going back to school. Phoebe sleeps the whole way home. Her dad calls to check on her. Her little brother is at home with her during her recovery. He is so excited to see her that he sometimes forgets she needs to rest. He also forgets that he shouldn't touch her newly sewn up knee. She has two cats at home, but they mainly stay away from her knee.	Phoebe goes to physical therapy for her knee at the surgery center twice a week for the next 7 weeks. Her college roommates and Lee Ann alternate in driving her until it is healed enough to drive herself.
After vitals, receiving an identification bracelet and other preliminary tasks, Jonathan is placed in the pre-op bay, and the nurse inserts the IV into his arm, which will deliver his medications and any other needed fluids. The pre-op bay's lighting is somewhat harsh, and leaves Jonathan uneasy during the IV process. McKenzie senses his nervousness and holds his hand, which helps restore some of his confidence.	The Anesthesiologist comes to see Jonathan before transporting him to surgery. She answers any questions he may have before he begins the surgery process, and goes over the advantages and disadvantages of different types of anesthesia. Jonathan is a cautious man and concerned about the risks, but his anesthesiologist's professionalism and expertise calms him. Jonathan and McKenzie hug each other before she leaves the pre-op bay.	Jonathan is transported via his patient bed into the Operating Room; he is then transferred to the surgical bed by the transport staff, and he nervously shimmies himself into place on the bed.	Within the Operating Room, Jonathan is then induced for surgery; he is anxious throughout the induction process.	Jonathan undergoes total knee replacement surgery. The surgeon utilizes robotic surgical equipment during the surgery, and the surgery does not present any complications.	Jonathan begins to undergo the emergence process while in the Operating Room. The transport staff must navigate past two corner turns within the corridors to take him to the post-op area to continue emergence and for recovery. He is still groggy coming out of anesthesia, but is back to normal in a few hours.	McKenzie is informed that Jonathan's surgery was successful; relieved, she is able to travel to the post-op area in order to see him after his surgery. Jonathan recovers from his surgery with his wife at his side after a long day, and appreciates the privacy the post-op bay provides. As he recovers, he enjoys the daylight coming in through the windows above his patient bed.	Jonathan receives discharge instructions, which includes wound care and instructions on preventing blood clots. He is told that during his recovery process, he needs to return to the clinic to complete a series of physical therapy exercises. McKenzie picks up the car from the parking lot, and Jonathan is transported by a volunteer via wheelchair to the pick-up area of the Ambulatory Surgery Center.	McKenzie and Jonathan travel back home in their car; it will be a few weeks before Jonathan will be able to drive himself. After arriving home, Emily and Mason reunite with their parents, excited to see that their dad is doing well.	To continue his rehabilitation process, Jonathan comes back to the clinic and is shown how to perform the needed exercises for his recovery, including quad sets and leg raises. He completes a series of rehabilitation treatments, and meets the goal of bending his leg to a 90-degree angle by the one-week point. Jonathan looks forward to being back on the tennis court with his students.

PATIENT JOURNEY SCENARIOS

Stages of Surgery

ARRIVAL PRE-OP SURGERY POST-OP DISCHARGE FOLLOW UP

ELDERLY PATIENT WITH DAUGHTER ADVOCATE



James, 79

James has been living alone since his wife died 6 years ago. He has 3 children, Lisa, George and Maria. Lisa and George are living at another city. Maria, his youngest daughter, lives nearby, and comes to see him every weekend. Last week when James was trying to water his plants, he fell down on the slippery floor. When he stood up, he felt his hip was painful. It was not severe so he didn't pain much attention to it. The hip showed signs of bruising the next day. The pain still existed and became more severe. Maria brought him to the doctor and after tests, the doctor found out that James had a fracture on his hip joint. James needs an surgery to determine the severity of the fracture.



TRAVEL

Maria asks for a leave from work on Tuesday and brings James to the ambulatory surgery center, where they have an appointment at 10:00 am. Maria picks James up from his home. James' hip is painful but he doesn't have a wheelchair at home. Maria supports James by arm and brings him onto the car. They drive for 20 minutes and arrive at the surgery center at 9:45 am.



PARKING

Maria arrives at the drop-off area and a valet takes their car to the parking lot. A wheelchair is brought out to James by a nurse.



ENTRY

The nurse pushes the wheelchair to registration. The door opens automatically.



REGISTRATION

Since James has already registered by phone, he only needs to check in. There is an iPad with registration program on the desk. Maria does the registration for James on the iPad within several minutes.



WAITING

Then they go to the waiting area, which is about 10 feet away. Maria pushes the wheelchair to a table near the storefront window. She stops the wheelchair and takes a seat across the table. James says the landscape outside is calming. They sit there and talk for a little while. James feels thirsty. James is not supposed to eat or drink from the midnight before. Maria is grateful that there is no coffee machine around the waiting area. At 10:05 am, a nurse calls James to go to the pre-op area.



PATIENT TRANSITION

The nurse pushes the wheelchair to the pre-op area, which is not far away. After two turns, they arrive at a private compartment.



CHANGING

James changes into gown with the help of the nurse. Maria steps out. After changing, Maria steps in and takes James' phone, purse and watch with her and the nurse puts James' clothes into a bag and puts it in a shelf under the bed.

ELDERLY PATIENT WITH SPOUSE



Bill, 74

Bill has been married to Jenny for 50 years, with 4 grown children, Will, Jack, Matt and Rachel. Bill played basketball in high school, college, and some until the past couple of years. Over the past couple of years Bill with age has started having problems with numbness and pain through his forearm to his shoulder. After going to many appointments and doing tests, doctors have realized that Bill has Carpal Tunnel Syndrome, which can occur by repetitive hand and wrist motions. Due to the numbness and pain in his hand, which keeps getting worse with age. Bill needs carpal tunnel release at an orthopedic surgery center to be able to use his hand pain free.

Bill's wife, Jenny, drives him to the orthopedic surgery center. Bill's hand is in pain so he doesn't drive much anymore, which bothers him, because he has always been the dominant partner and now he feels dependent on his wife. All of their kids have already called to tell Bill they love him, but won't be able to come to the surgery today because they are working.

Bill and Jenny drive to the drop off area where they let a valet take their car to park it. Jenny had a knee replacement 2 months ago and still is regaining strength so a wheelchair is brought out to the car for her.

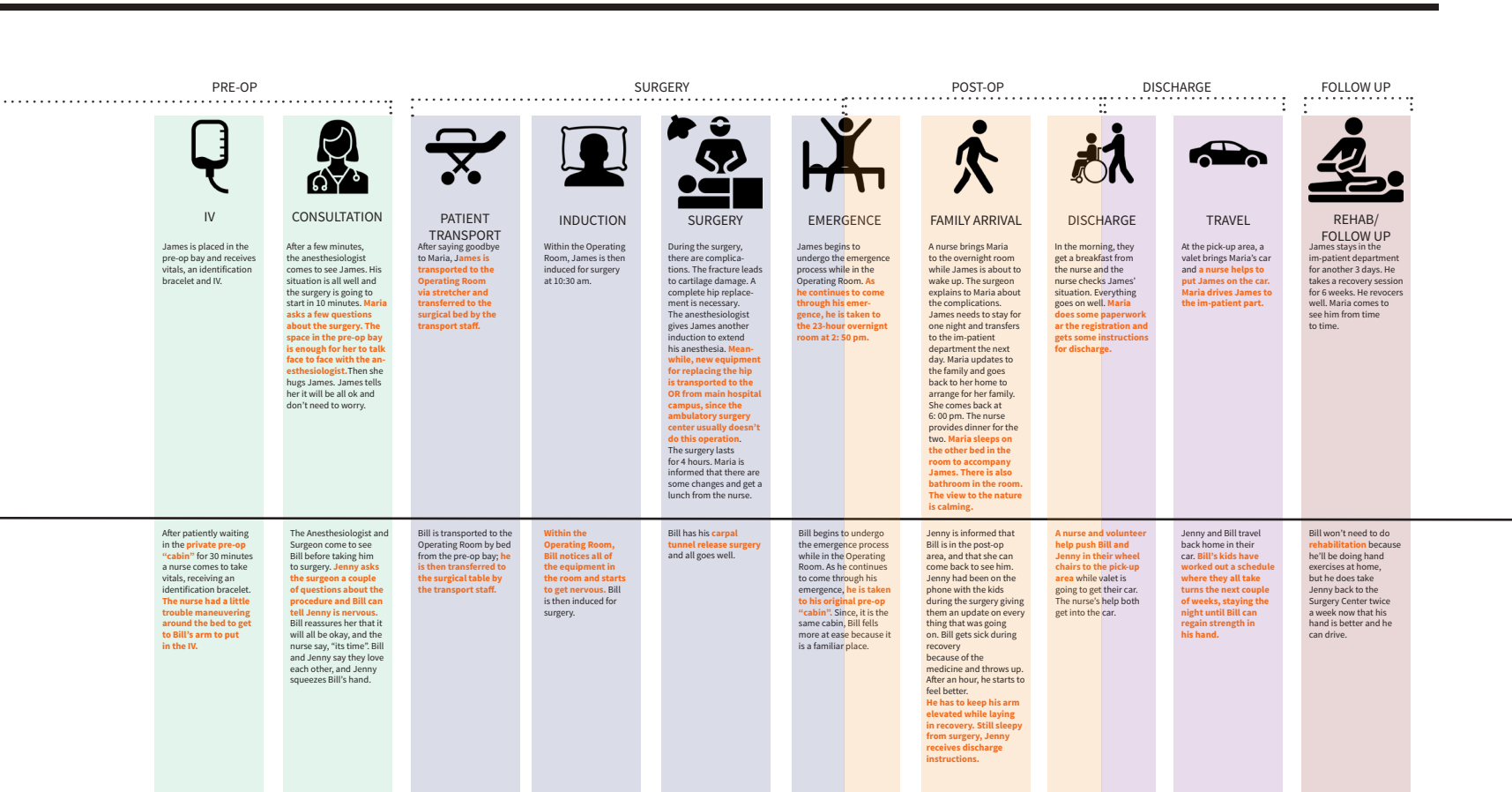
Bill tries to push the wheelchair with Jenny in it to registration, but his hand his in too much pain so Jenny wheels her self in.

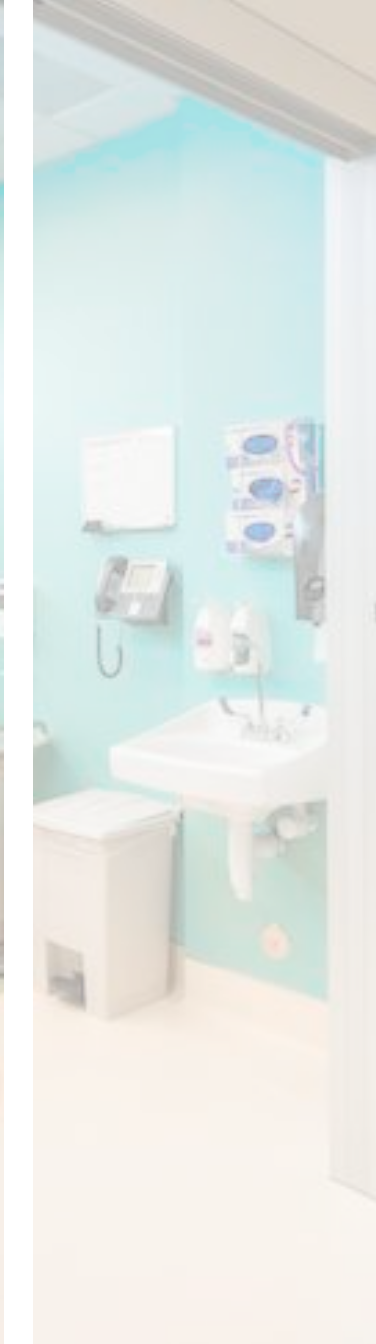
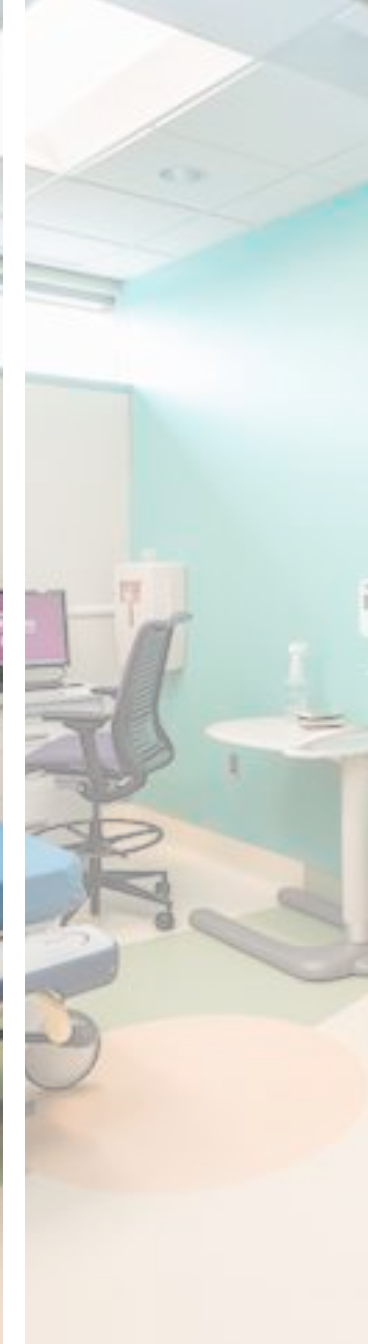
Bill preregistered with his doctors office, so he only had to check in with the nurse at the desk.

Bill and Jenny go to crowded waiting area, and Bill tells Jenny he loves her. While they are waiting, he wonders "what will Jenny do while I'm in surgery", "will she be okay", "I hate to leave her all alone." Jenny looks at him as if she knows what he is thinking and says, "it's going to be fine", and smiles.

A nurse calls Bill into the Pre-Op "Cabin", and both him and Jenny get up to go. They follow the nurse back but it is a little difficult getting around with his hand in pain and Jenny in the wheelchair, the nurse helps the best she can.

When they got to their pre-op "cabin", they shut the sliding door which helped to make the space more private, and Bill struggles to change into a gown. Since it was "cabin", he was able to keep his belongings in the room.





04 CODE REVIEW

Applicable code review that identifies design requirements and criteria are from the following sources

The Facility Guidelines Institute (FGI)

International Building Code (IBC)

Americans with Disabilities Act (ADA)

OR, PROCEDURE ROOM & PATIENT BAY REQUIREMENTS

STAFF SUPPORT & STORAGE AREAS

RESTROOMS & ELEVATORS

STAIRS & PARKING

CODE REVIEW

FGI Guidelines- Specific Requirements for Outpatient Surgical Facilities

3.7-3.2.3 Space Requirements

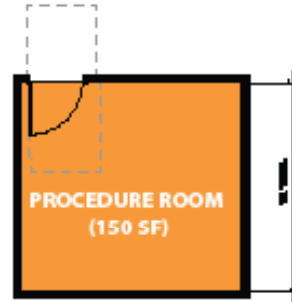
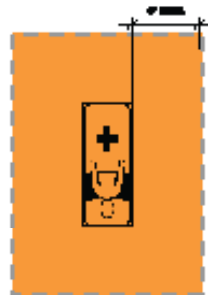
Procedure rooms shall have a minimum clear floor area of 150 square feet with a minimum clear dimension of 12 feet.

Procedure rooms shall have a minimum clearance of 4 feet on each side and at the head and foot of the procedure table.

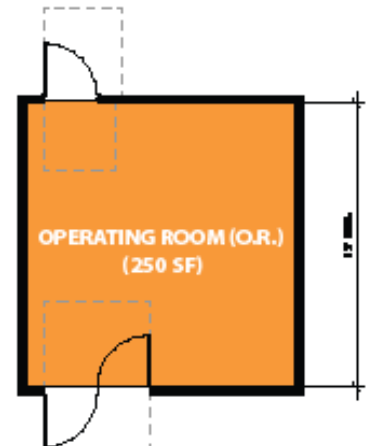
Each operating room shall have a minimum clear floor area of 250 square feet with a minimum clear dimension of 15 feet.

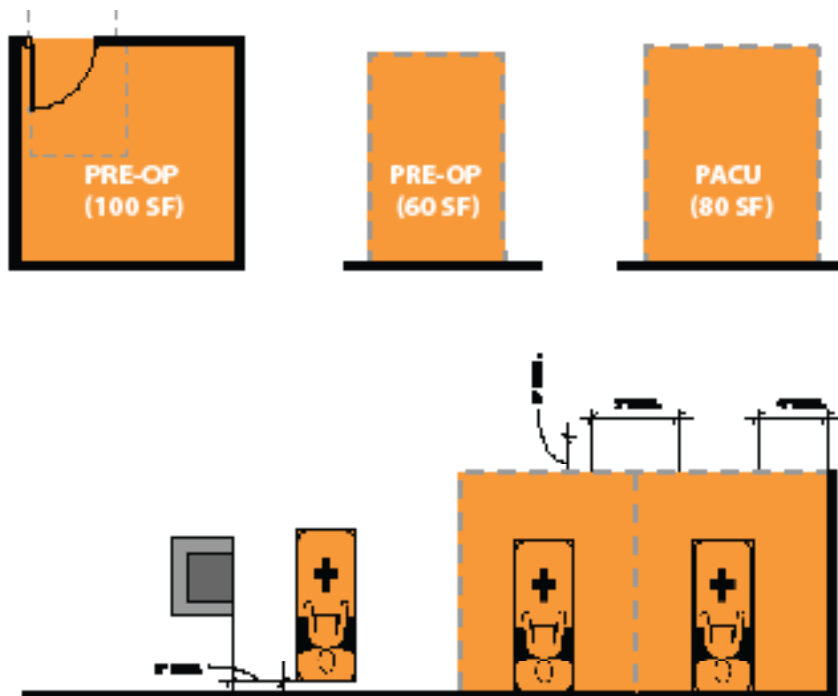
3.7-3.6 Support Areas for Surgical Suite

Soiled and clean workrooms shall be separated. The soiled workroom shall be directly accessible to the semi-restricted area of the surgical suite, and shall not have direct connection with operating rooms or other sterile activity rooms.



3.7-3.2.3 Space Requirements





3.7-3.4.2 Preoperative Patient Care Area

3.7-3.4 Pre- and Postoperative Patient Care Areas

Patient care stations shall be provided to accommodate stretcher patients as well as seating space for patients and for visitors.

3.7-3.4.2 Preoperative Patient Care Area

Where bays are used, a minimum clear floor area of 60 square feet shall be provided for each patient in a lounge chair or stretcher.

Where single-patient rooms are used, a minimum clear floor area of 100 square feet shall be provided.

At least one door to the recovery room shall provide access directly from the semi-restricted area of the surgical suite without crossing a public corridor.

A minimum clear floor area of 80 square feet shall be provided for each patient bay.

CODE REVIEW

FGI Guidelines- Specific Requirements for Outpatient Surgical Facilities

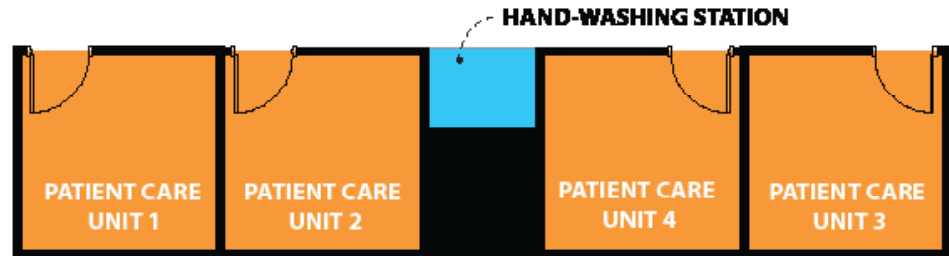
3.1-3.6.5.3 Additional requirements for hand-washing stations that serve multiple patient care stations

(1) At least one hand-washing station shall be provided for every four patient care stations or few and for each major fraction thereof.

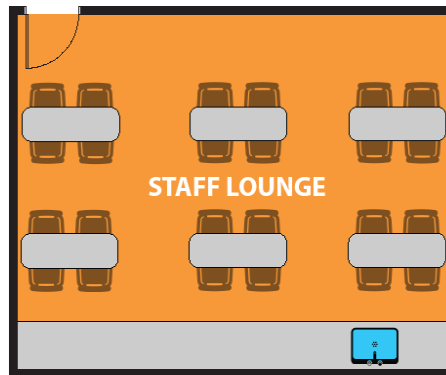
(2) Based on the arrangement of the patient care station, hand-washing station shall be evenly distributed and provide uniform distance from the two patient care stations farthest from a hand-washing station.

3.1-6.4.1 Staff Lounge

When a staff lounge is provided, it shall include a hand-washing station.



3.1-3.6.5.3 Additional requirements for hand-washing stations that serve multiple patient care stations

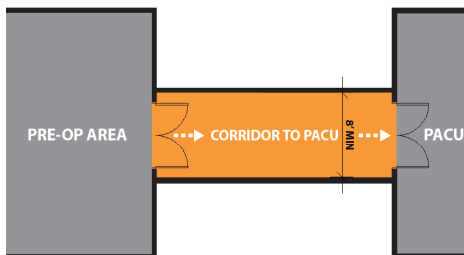


3.1-6.4.1 Staff Lounge

STRETCHER & WHEEL CHAIR ALCOVE



ABOVE: 3.1-3.6.5.3



3.7-7.2.2 Design and Construction Requirements - Architectural Details

3.7-3.6.11.2 Surgical Equipment and Supply Storage.

Storage shall be provided for equipment and supplies used in the surgical suite.

(1) Area, the combined area of equipment and clean clinical supply storage room(s) shall have a minimum floor area of 50 sq.ft. for each operating room(s) up to two and an additional 25 sq. ft. per additional operating room.

3.7 -3.6.11.3 Storage Space for Stretchers and Wheelchairs

(1) A stretcher storage area for at least one stretcher shall be provided.

(2) Wheelchair storage space shall be immediately accessible to areas of high use.

3.7-3.6.11.4 Emergency Equipment Storage

(1) At a minimum, emergency equipment storage shall be provided in both the surgical suite and recovery areas.

3.7-7.2.2 Design and Construction Requirements - Architectural Details

(1) Public corridors shall have a minimum width of 5 feet.

(2) Where patients are transported on stretchers, at least one corridor that connects the surgical suite and the PACU to an exit shall have a minimum width of 6 feet.

(3) The corridor connecting the surgical suite and the PACU shall have a minimum width of 8 feet.

(4) Staff only corridors shall be permitted to be a minimum of 3 feet and 8 inches.

CODE REVIEW

3.1-3.8.2 Toilet Room(s) for Patient Use (FGI)

These shall be provided separate from public use toilet room(s) and located to permit access from patient care areas without passing through publicly accessible area.

3.1-3.9.8.2 Toilet Rooms (FGI)

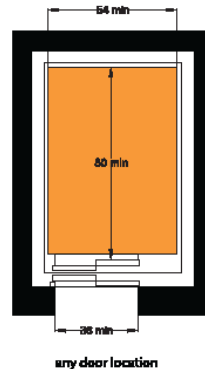
Toilet rooms with hand-washing stations shall be directly accessible to procedure rooms(s) if procedures provided at the facility require patient access to toilets.

3.1-6.2.4.1 Public Toilets (FGI)

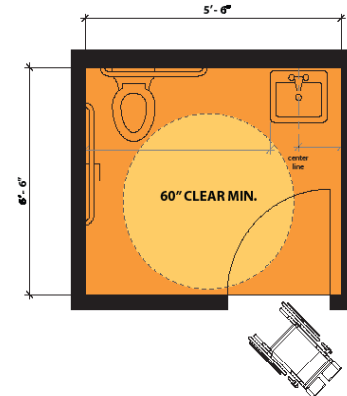
Toilet room(s) for public use shall be readily accessible for the waiting area without passing through patient care or staff work areas or suites.

3.1-8.7.2.3 Elevator Dimintions (FGI)

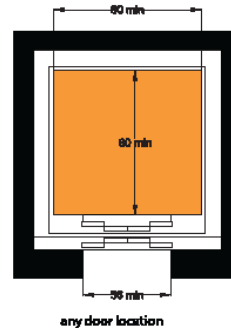
Where outpatients are expected to be transported between different levels on stretchers, such as in facilities with operating rooms and recovery room on different floors, elevator cars shall have a minimum inside floor dimension of 5ft. 8 in. x 7ft. 9in.



3.1-8.7.2.3 Elevator Dimintions

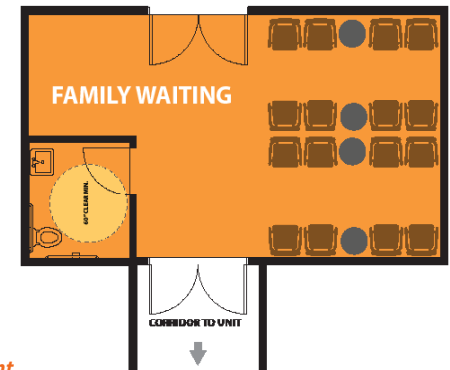


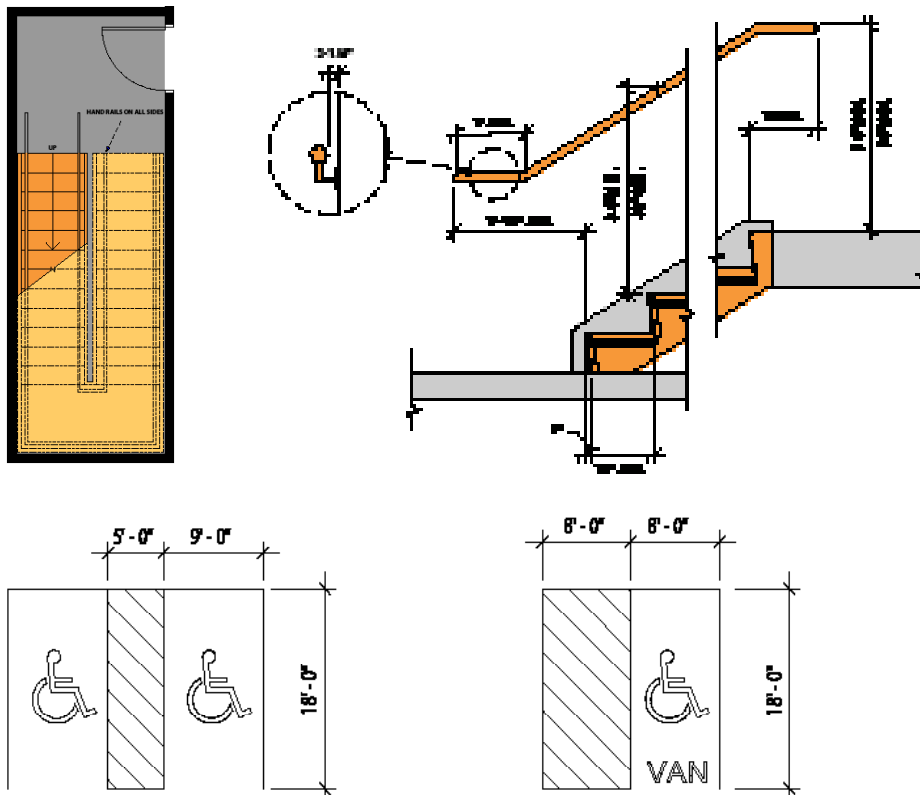
3.1-3.8.2 Toilet Room(s) for Patient Use.



ABOVE: 3.1-8.7.2.3 Elevator Dimintions

RIGHT: 3.1-3.8.2 Toilet Room(s) for Patient Use





4.9 Stairs

Stair treads shall be no less than 11 in wide... Open risers are not permitted. Handrails that are not continuous must have a... minimum 12 inch horizontal extension is at each top riser. A minimum 12 inch horizontal extension plus the width of one tread is required at each bottom riser.

3.7-1.3 Parking (FGI)

Four parking spaces shall be provided for each room routinely used for surgical procedures plus one space for each staff member.

208.2.1

10% of patient and visitor parking spaces provided to serve outpatient hospital facilities shall be accessible.

CODE REVIEW

IBC Guidelines

404.6 Enclosure of atriums

Atrium spaces shall be separated from adjacent spaces by a 1-hour fire barrier constructed in accordance with Section 707 or 711.

404.9.3 Exit access travel distance at other than the level of exit discharge

Where the path of egress travel is not at the level of exit discharge from the atrium that portion of the total permitted exit access travel distance that occurs within the atrium shall not be greater than 200 feet.

1005 Means of Egress Sizing

1005.3.1

The capacity, in inches, of means of egress stairways shall be calculated by multiplying the occupant load served by such stairways by a means of egress capacity factor of .3 inch

per occupant. Where stairways serve more than one story, only the occupant load of each story considered individually shall be used in calculating the required capacity of the stairways serving that story.

1005.3.2

The capacity, in inches, of means of egress components other than stairways shall be calculated by multiplying the occupant load served by such component by a means of egress capacity factor of .2 inch per occupant.

1005.3.4

The minimum width or required capacity of means of egress required from any story of a building shall not be reduced along the path of egress travel until arrival at the public way.

1006 Number of Exits and Exit Access Doorways

Two exits or exit access doorways from any space shall be provided where the design occupant load or the common path of egress travel distance exceeds the maximum occupant load of 49 in Type B buildings. Where two exits are required from any portion of the exit access, they shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between them.

1016 Exit Access

Egress from a room or space shall not pass through adjoining or intervening rooms or areas except where such adjoining rooms or areas and the area

served are accessory to one or the other and provide a discernible path of egress travel to an exit.

1017 Exit Travel Distance

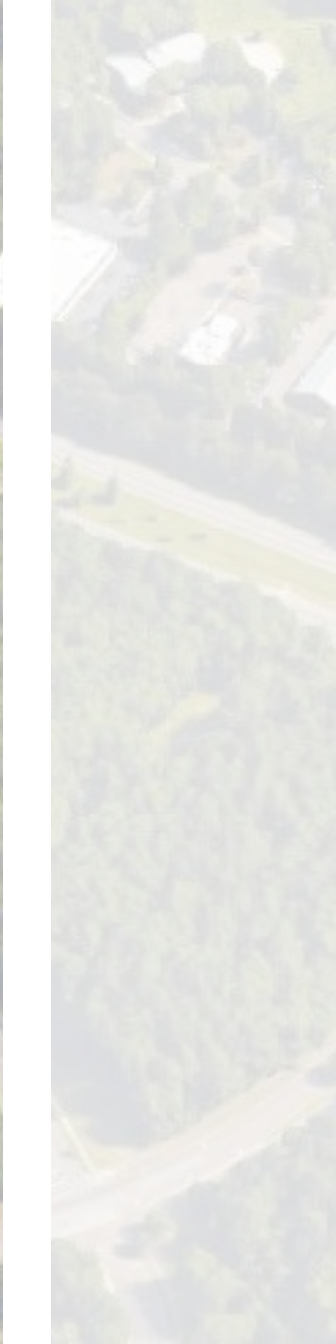
For Type B construction, the limit for exit travel distance without a sprinkler system is 200 feet, and 300 feet with a sprinkler system.

1020 Corridors

Where more than one exit is required, the exit access shall be arranged such that there are no dead ends in corridors more than 20 feet in length.

707.3.10 Fire Resistance Rating

Fire barriers shall be 2 hour walls.

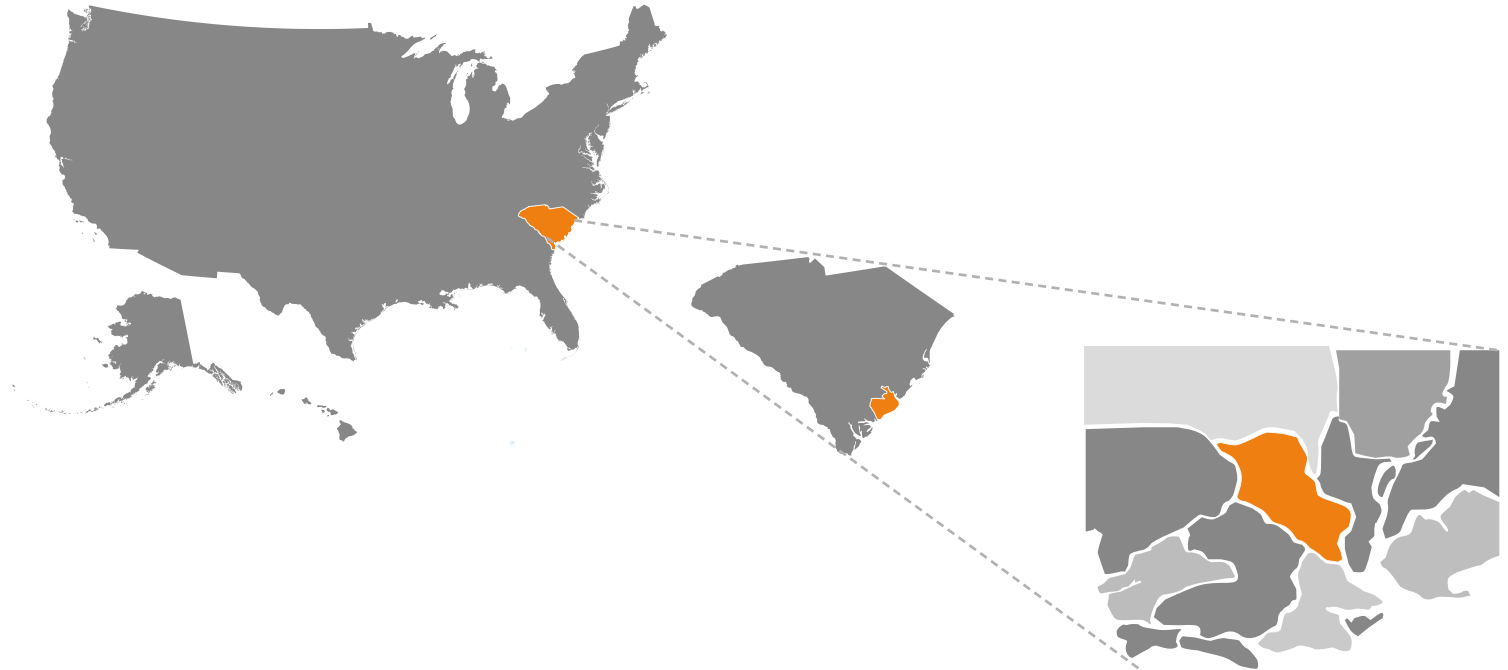


05 PROJECT SITE INFORMATION

Site information text here

PROJECT LOCATION
COMMUNITY & DEMOGRAPHICS
GEOGRAPHY & CLIMATE
RELEVANT ZONING ANALYSIS
OPPORTUNITIES & CONSTRAINTS

PROJECT LOCATION



South Carolina, USA

Charleston County

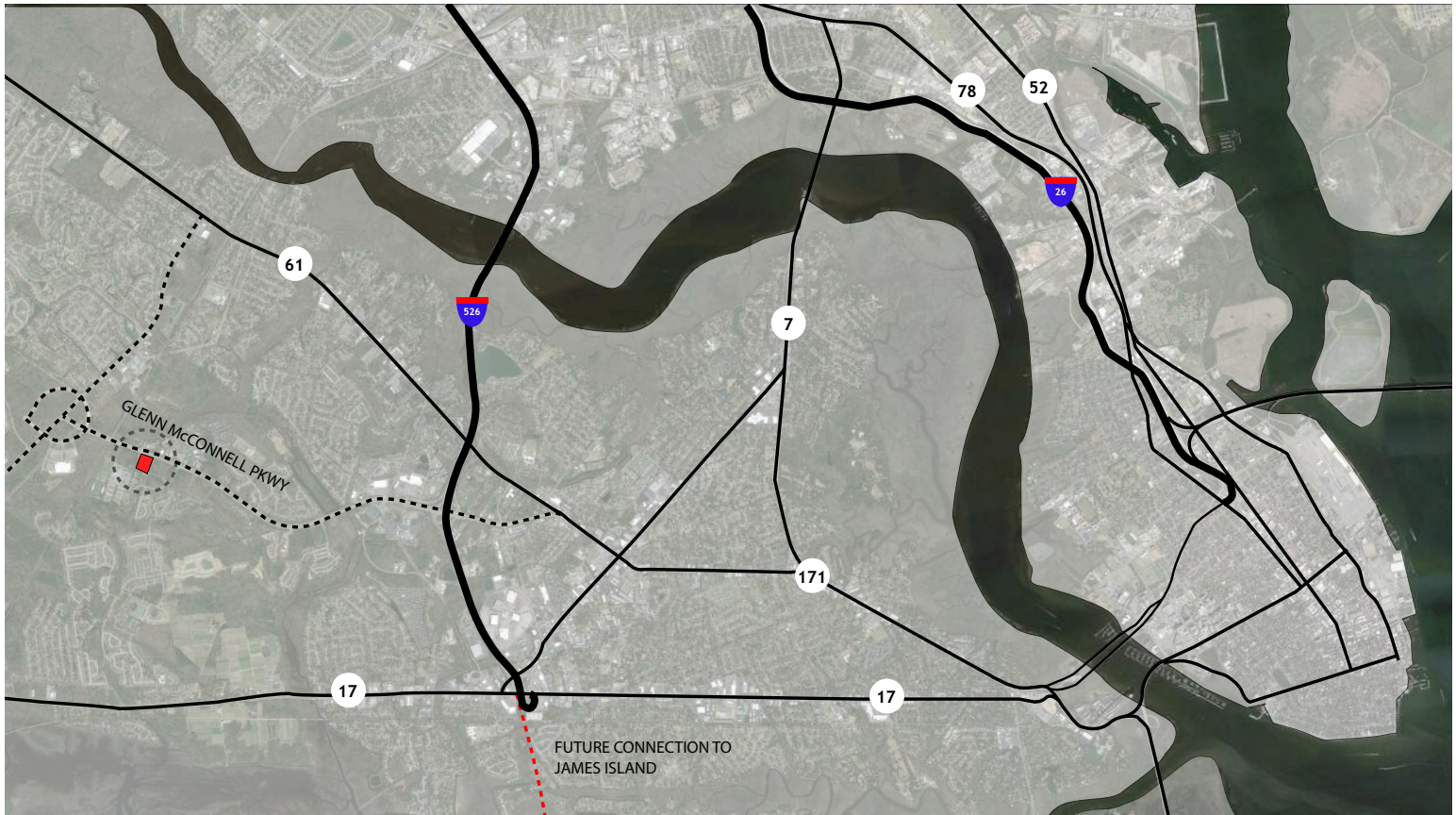
West Ashley

MAJOR ROADWAYS

VEHICULAR TRANSPORTATION

Our site in West Ashley is adjacent to major roads which connect to the main peninsula of Charleston, SC, its metropolitan area, and other cities, allowing for opportunities to welcome guests from the local community and beyond.

- Primary Roads
- Secondary Roads
- Tertiary Roads

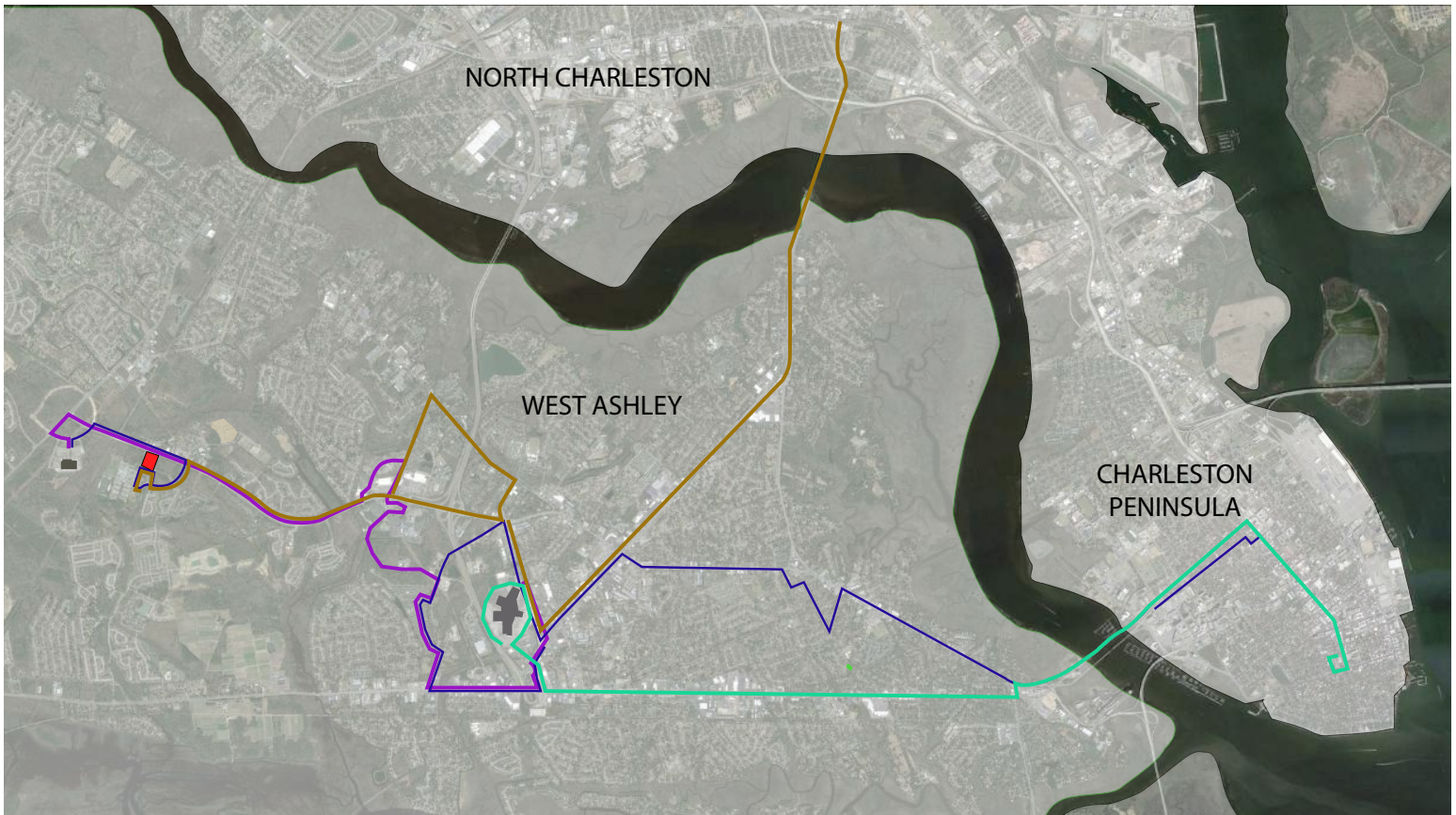


PUBLIC TRANSPORTATION

BUS ROUTES

The site connects to local CARTA bus routes which extend throughout West Ashley's residential and commercial areas. The routes extend further into the Charleston metropolitan area, including North Charleston and the Charleston peninsula.

- Route 32
Northbridge
- Route 33
St. Andrews/Ashley River Rd.
- Route 2
East/West Express
- Route 301
Glenn McConnell Circulator



COMMUNITY FEATURES

SERVICES IN WEST ASHLEY

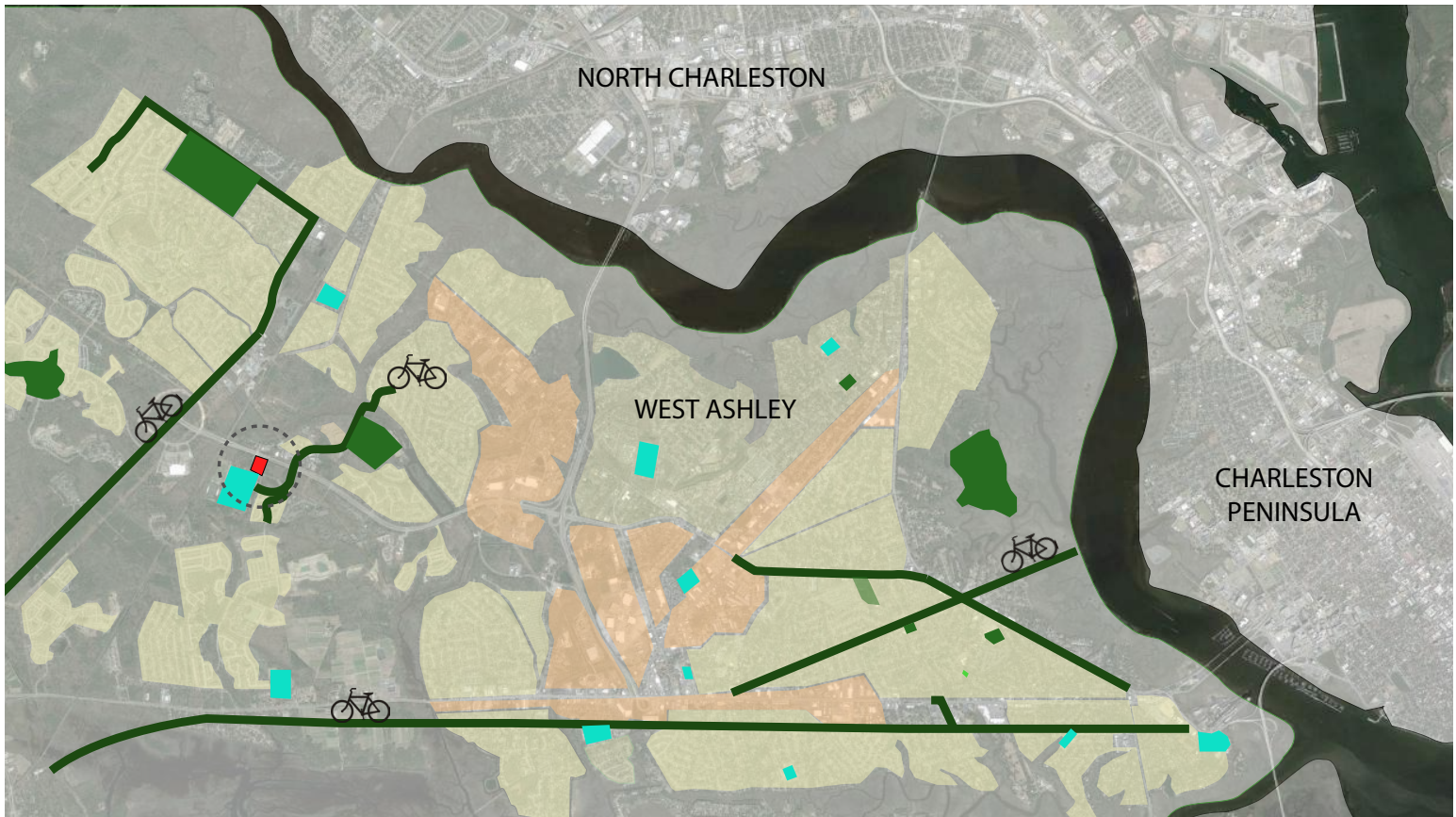
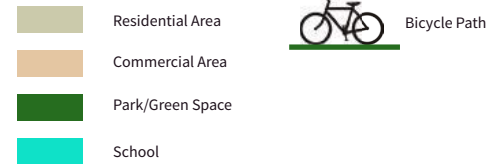
Within the context of West Ashley, the site interacts with a number of community assets such as the West Ashley Park. A number of gathering spaces and community centers are located in the West Ashley area, as well as community gardens and trails which propel residents toward better health.



BICYCLE PATHS

BICYCLE PATH INTEGRATION

West Ashley has expanded its bicycle path system, creating a link to our site between West Ashley park and West Ashley High School. Other bike paths include a path on Bee's Ferry Road and the West Ashley Greenway below highway 17.

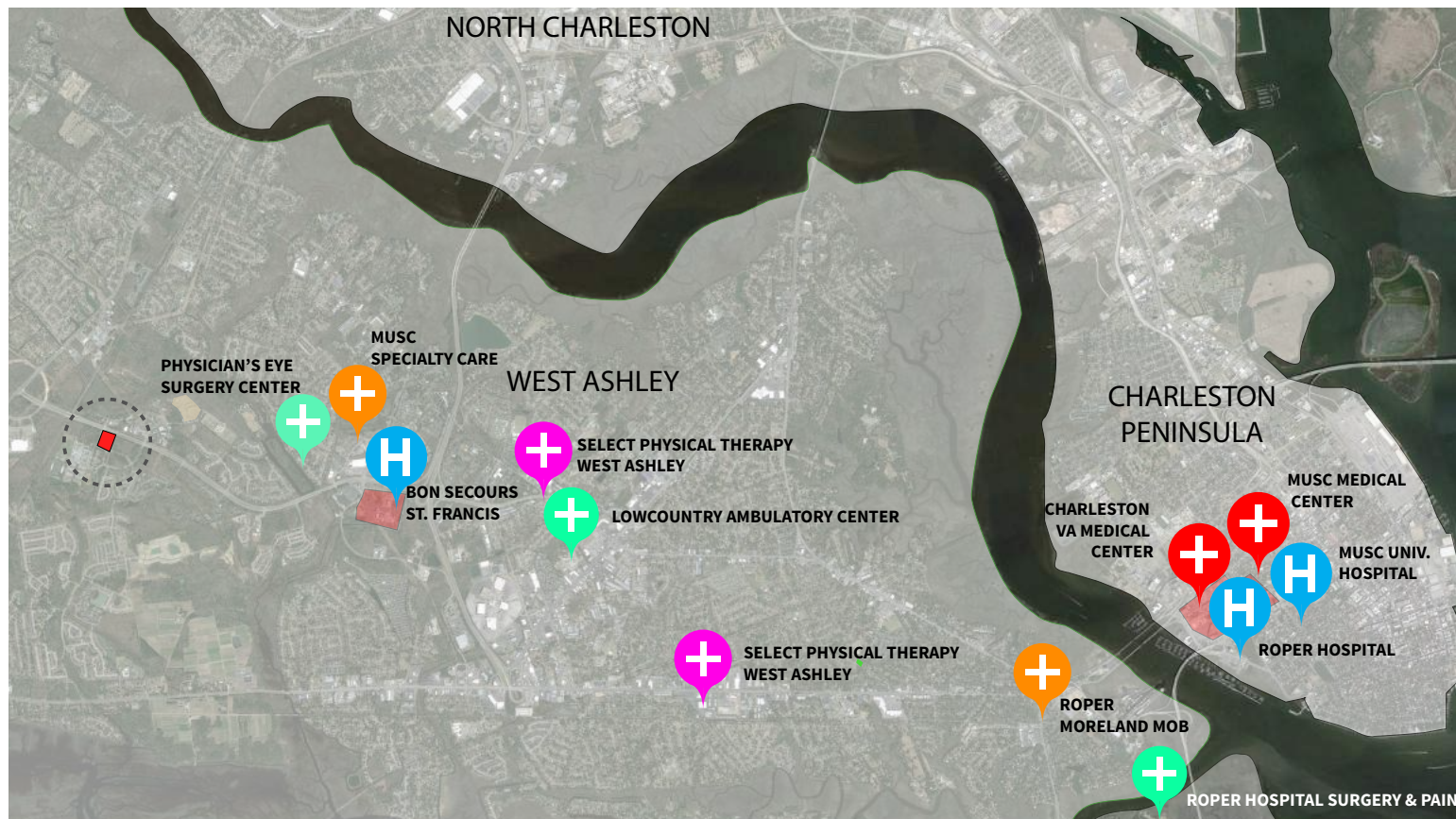
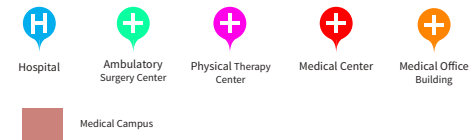


<http://gis.charleston-sc.gov/interactive/bike/>

COMPETITORS

COMPETING MEDICAL FACILITIES

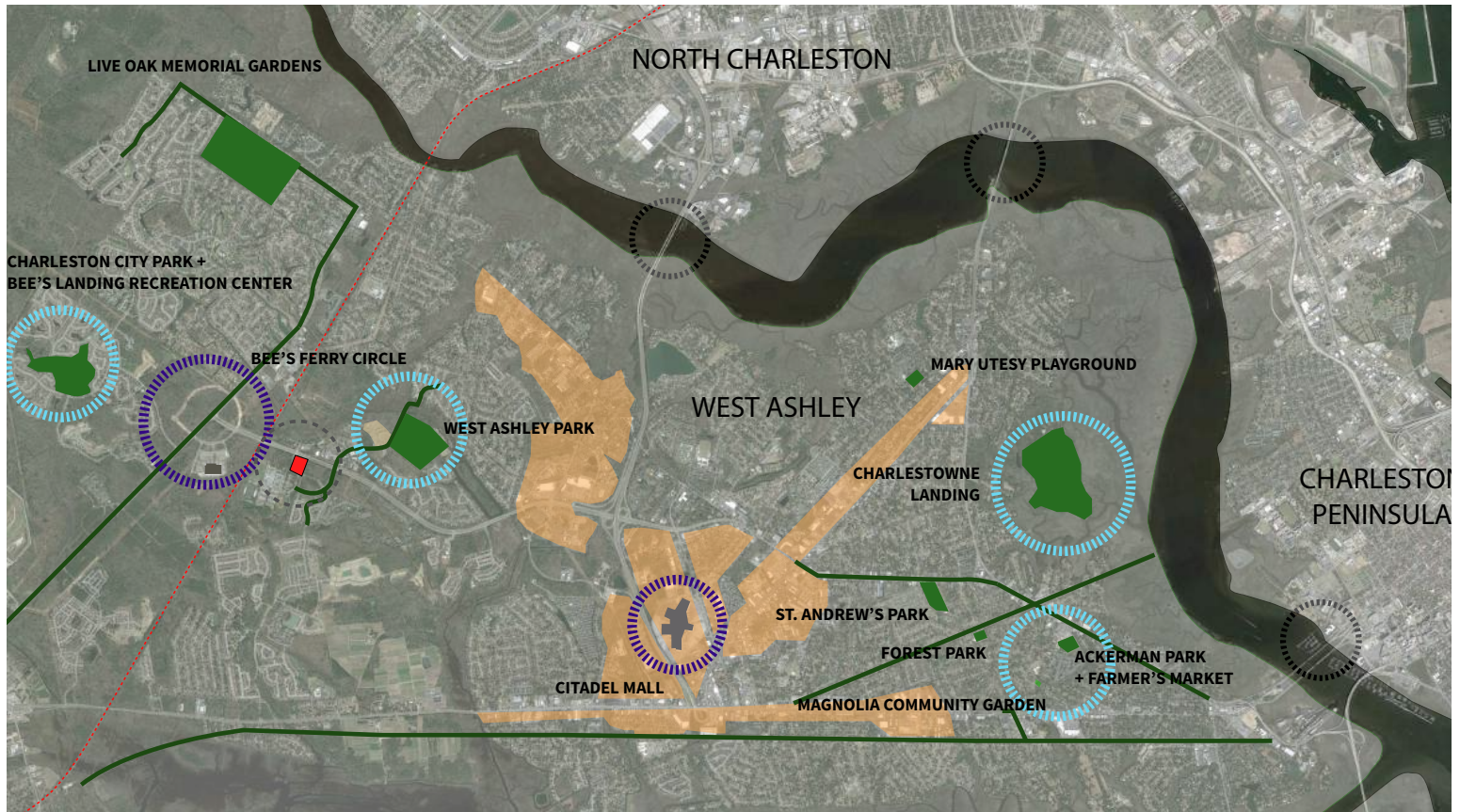
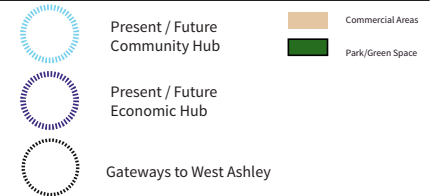
The closest medical center to the West Ashley site is Bon Secours St. Francis Hospital, which performs orthopedic surgery and inpatient rehabilitation. In West Ashley, the Lowcountry Ambulatory Center performs outpatient ambulatory surgery procedures, and the Roper St. Francis System performs outpatient surgical procedures at The James Island Ambulatory Surgery & Pain Management Center and Roper Hospital - Berkeley.



PRESENT AND FUTURE HUBS

CENTERS OF ECONOMY AND COMMUNITY IN WEST ASHLEY

The city of West Ashley has implemented a series of recreational hubs, such as the Bee's Landing recreation center and and emerging hubs, such as the West Ashley park, which is connected to a bike route and recently implemented a farmer's market. Existing commercial hubs include the Citadel Mall, and future development is slated for the circle at Bee's Ferry road, which is planned to become a mini-downtown for West Ashley.

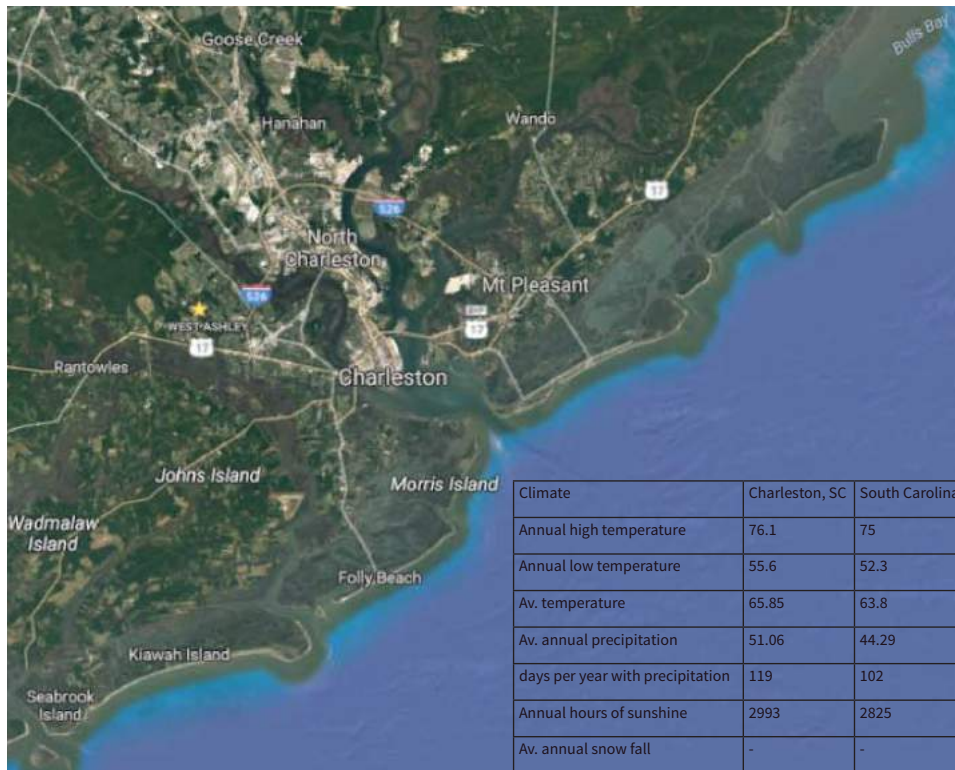


GEOGRAPHIC AND CLIMATOLOGICAL INFORMATION



http://www.nws.noaa.gov/com/weatherreadynation/img/art_imgs/140904_hurr.hugo.jpg

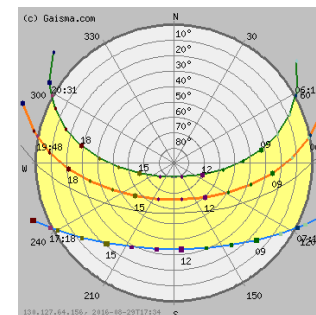
GENERAL CLIMATE INFORMATION



<https://weatherspark.com/averages/30670/Charleston-South-Carolina-United-States>

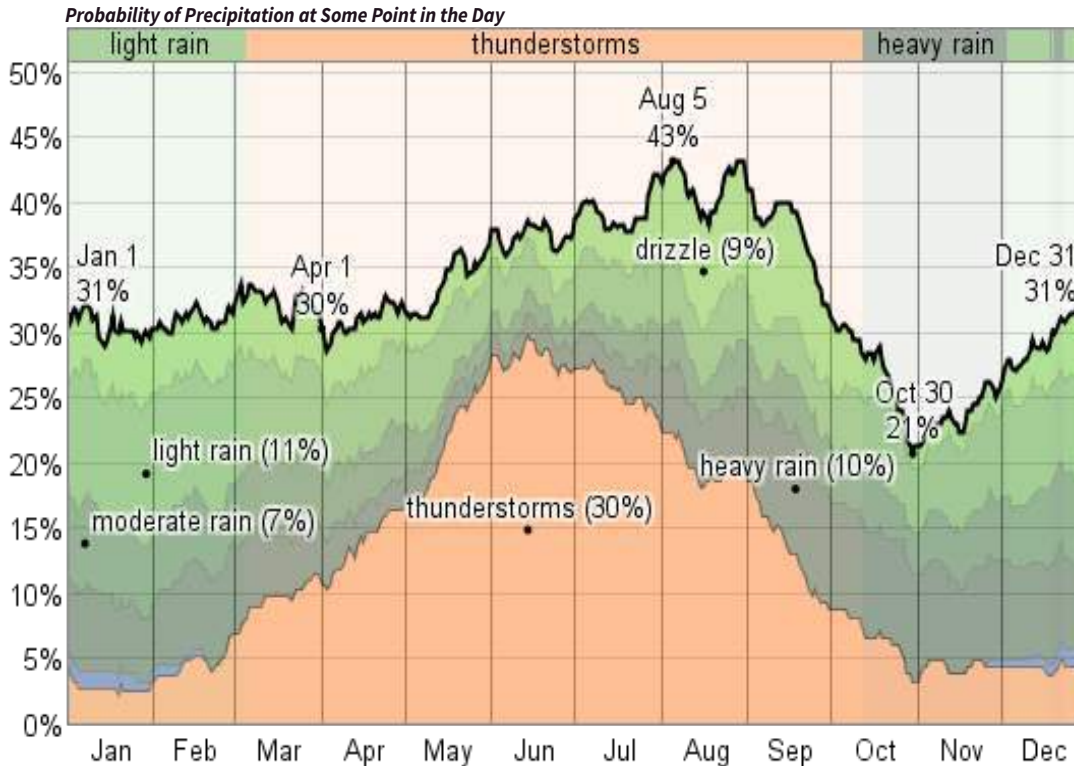
<http://www.usclimatedata.com/climate/charleston-afb/south-carolina/united-states/ussc0052>

Charleston, South Carolina has a **warm humid temperate climate with hot summers and no dry season**. The area within 25 miles of this station is covered by oceans and seas (45%), forests (35%), croplands (12%), lakes and rivers (3%), and built-up areas (3%).



<http://www.gaisma.com/en/location/charleston-south-carolina.html>

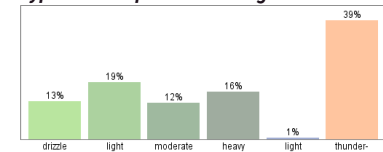
YEAR-ROUND PRECIPITATION



The probability that precipitation will be observed at this location varies throughout the year. Precipitation is most likely around August 5, occurring in 43% of days. Precipitation is least likely around October 30, occurring in 21% of days.

Over the entire year, the most common forms of precipitation are **thunderstorms**, light rain, heavy rain, drizzle, and moderate rain.

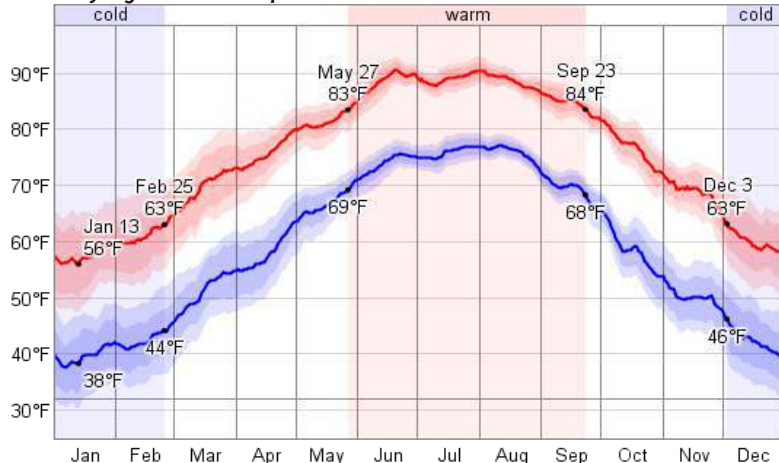
Types of Precipitation Throughout the Year



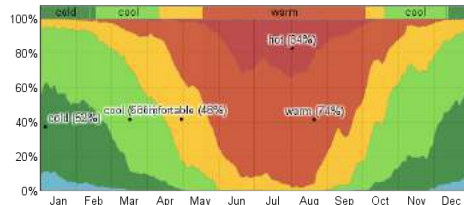
<https://weatherspark.com/averages/30670/Charleston-South-Carolina-United-States>

AVERAGE TEMPERATURES

Daily High and Low Temperature



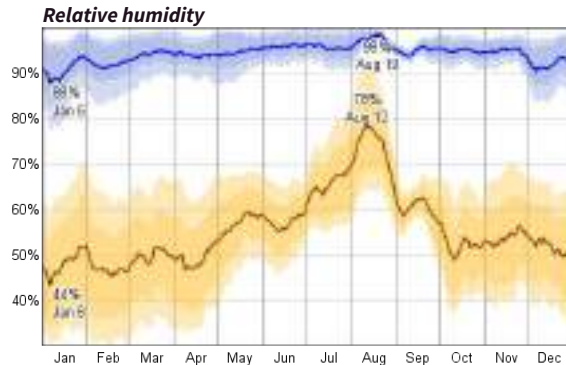
Fraction of Time Spent in Various Temperature



Over the course of a year, the temperature typically varies from **38°F to 91°F** and is rarely below 30°F or above 93°F. The most comfortable seasons are **April, May and October**.

The average fraction of time spent in various temperature bands: frigid (below 15°F), freezing (15°F to 32°F), cold (32°F to 50°F), cool (50°F to 65°F), comfortable (65°F to 75°F), warm (75°F to 85°F), hot (85°F to 100°F) and sweltering (above 100°F).

RELATIVE HUMIDITY



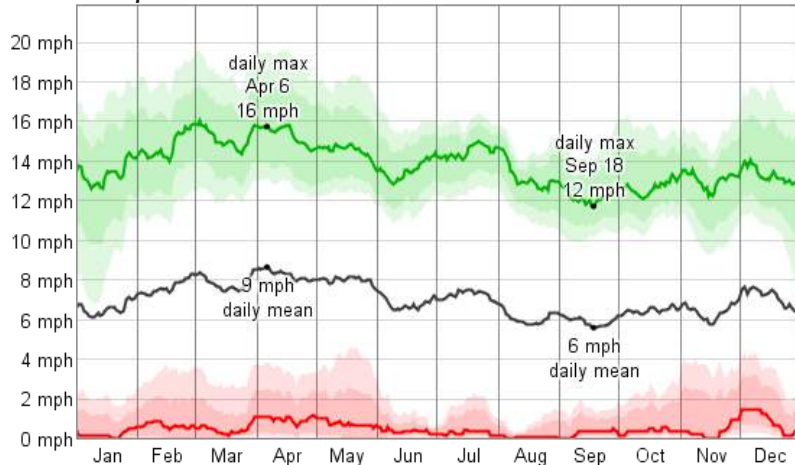
The relative humidity typically ranges from **44% (comfortable) to 98% (very humid)** over the course of the year, rarely dropping below 30% (comfortable) and reaching as high as 100% (very humid).

Over the course of a year, the dew point typically varies from **28°F (dry) to 82°F (very oppressive)** and is rarely below 17°F (dry) or above 87°F (very oppressive).

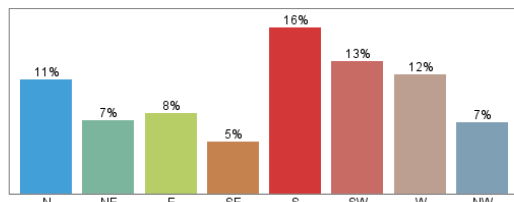
<https://weatherspark.com/averages/30670/Charleston-South-Carolina-United-States>

PREDOMINANT WIND

Wind speed



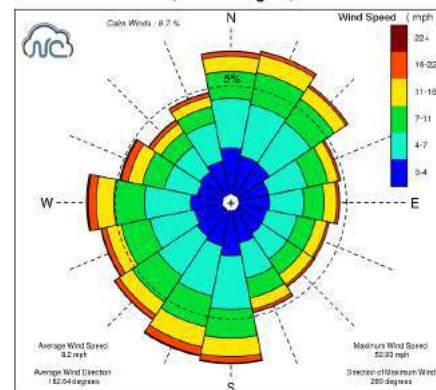
Wind Directions Over the Entire Year



<https://weatherspark.com/averages/30670/Charleston-South-Carolina-United-States>

Over the course of the year typical wind speeds vary from **0 mph to 16 mph (calm to moderate breeze)**, rarely exceeding 20 mph (fresh breeze). The wind velocity throughout the year is almost constant. The wind is most often out of the **south** (16% of the time), south west (13% of the time), west (12% of the time), and north (11% of the time).

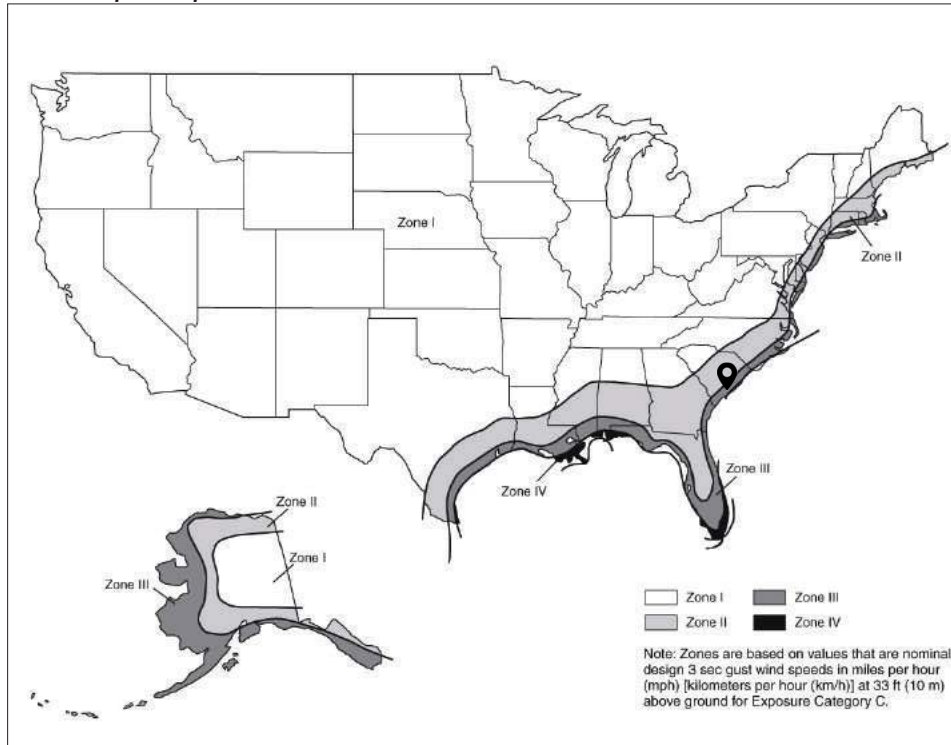
**Wind Rose for Charleston Airport (KCHS)
Jan. 1, 1945 to Aug. 31, 2016**



<http://climate.ncsu.edu/windrose.php>

HURRICANE RISK

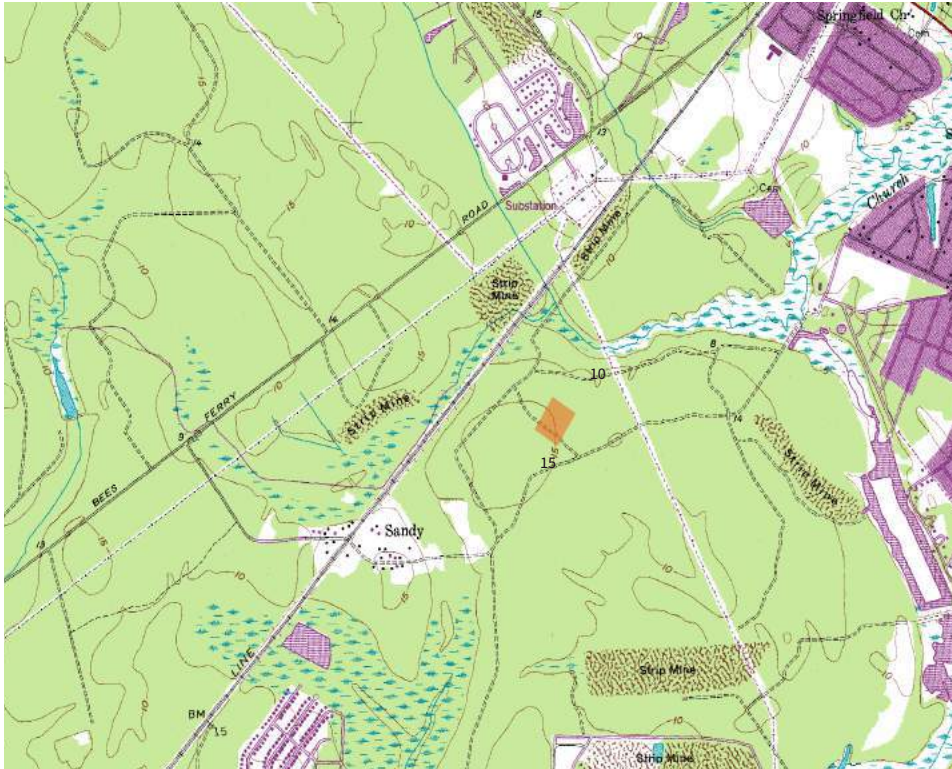
NFPA wind speed map



Charleston belongs to Zone 3, which means areas between **the 110-mph and the 130-mph isotachs**.

https://www.fema.gov/media-library-data/20130726-1501-20490-5921/fema_p85_apndx_g.pdf

TOPOGRAPHY



<https://www.topoquest.com/>

Storm Surge Inundation for Hurricanes of Different Categories



Category 1



Category 2

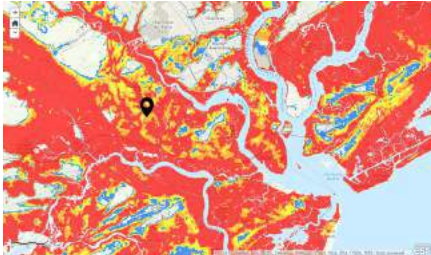
The site is relatively flat but with minimum threat from hurricanes of category 2 or under.

<http://noaa.maps.arcgis.com/apps/Storytelling-TextLegend/index.html?appid=b1a20ab5eec-149058bafc059635a82ee>

FEMA: SITE NOT IN A FLOOD PLANE



Category 3



Category 4

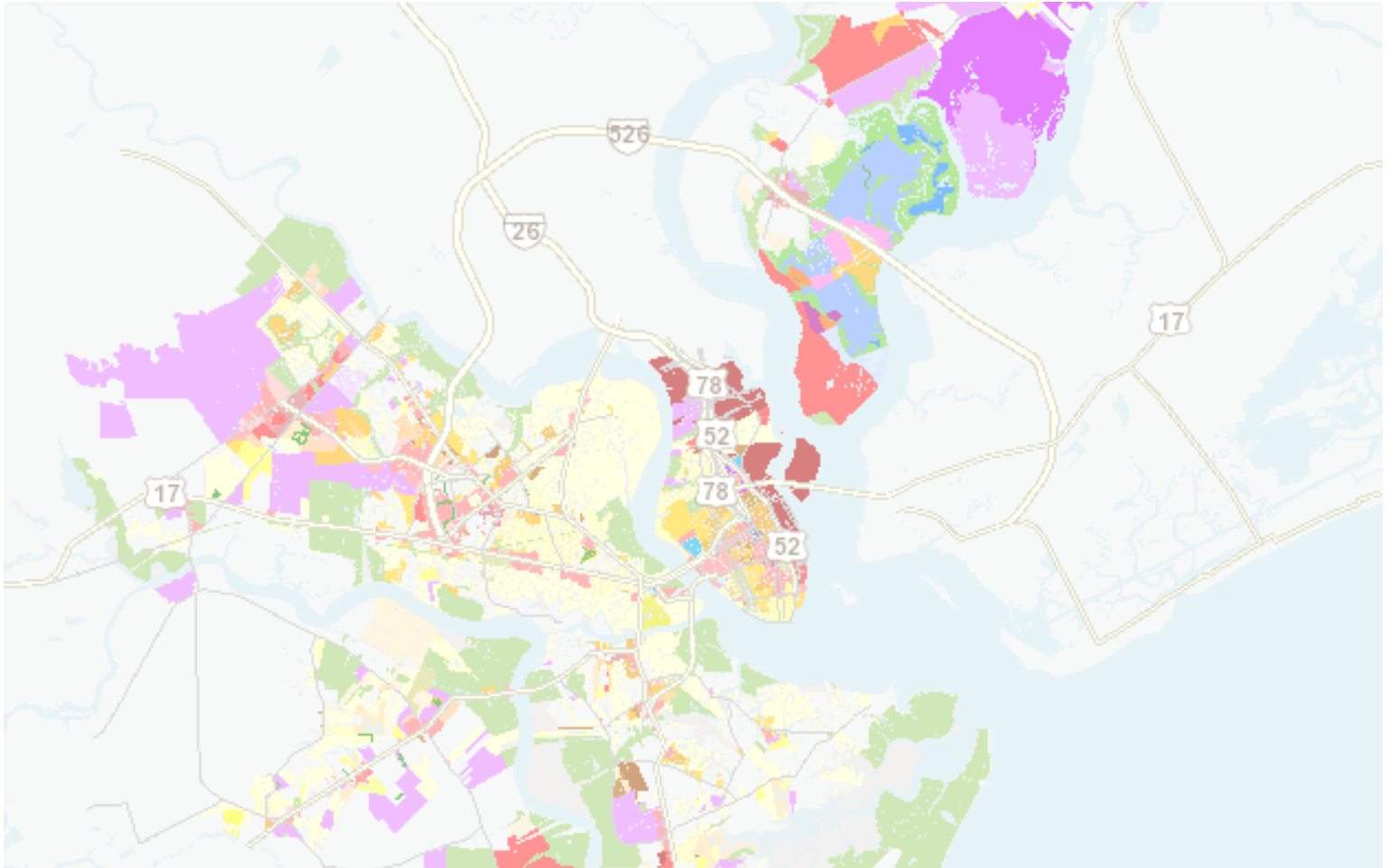
Inundation depth

- Up to 3 feet above ground
- Greater than 3 feet above ground
- Greater than 6 feet above ground
- Greater than 9 feet above ground
- Levee Areas - Consult Local Official For Flood Risk



The site locates on the area that determined to be outside 0.2% annual chance floodplain. <https://msc.fema.gov/portal>

RELEVANT ZONING ANALYSIS



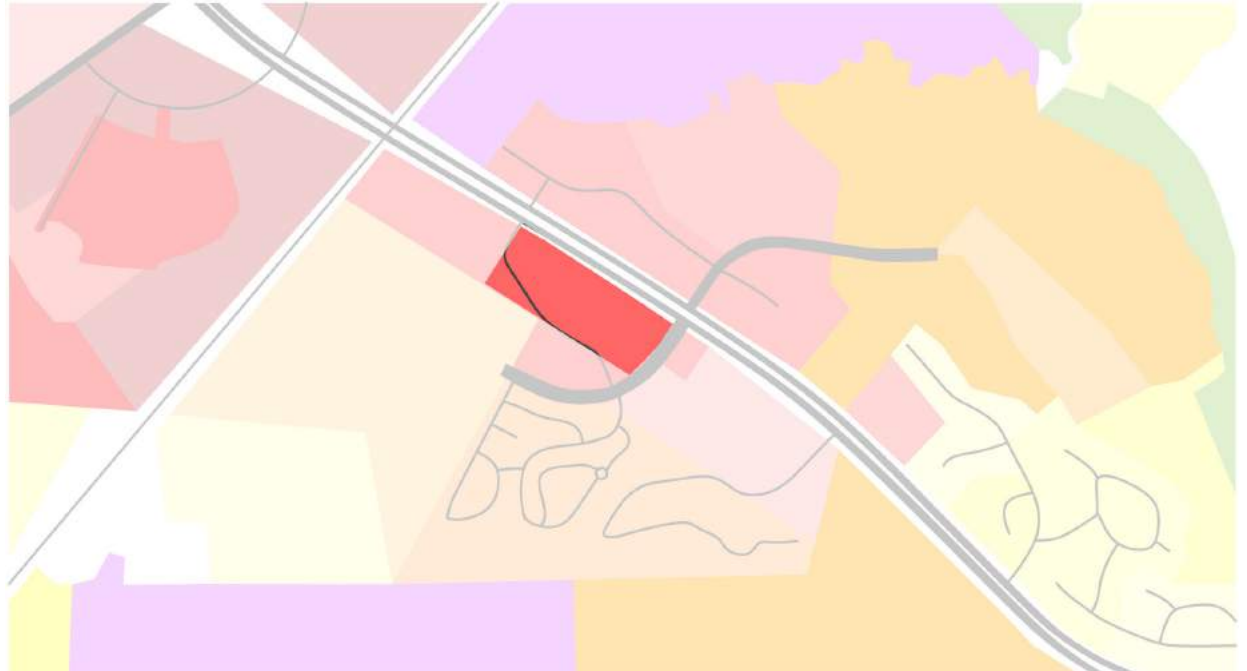
<http://gis.charleston-sc.gov/arcgis/rest/services/External/zoning/MapServer/>

PROJECT SITE ZONING DISTRICT

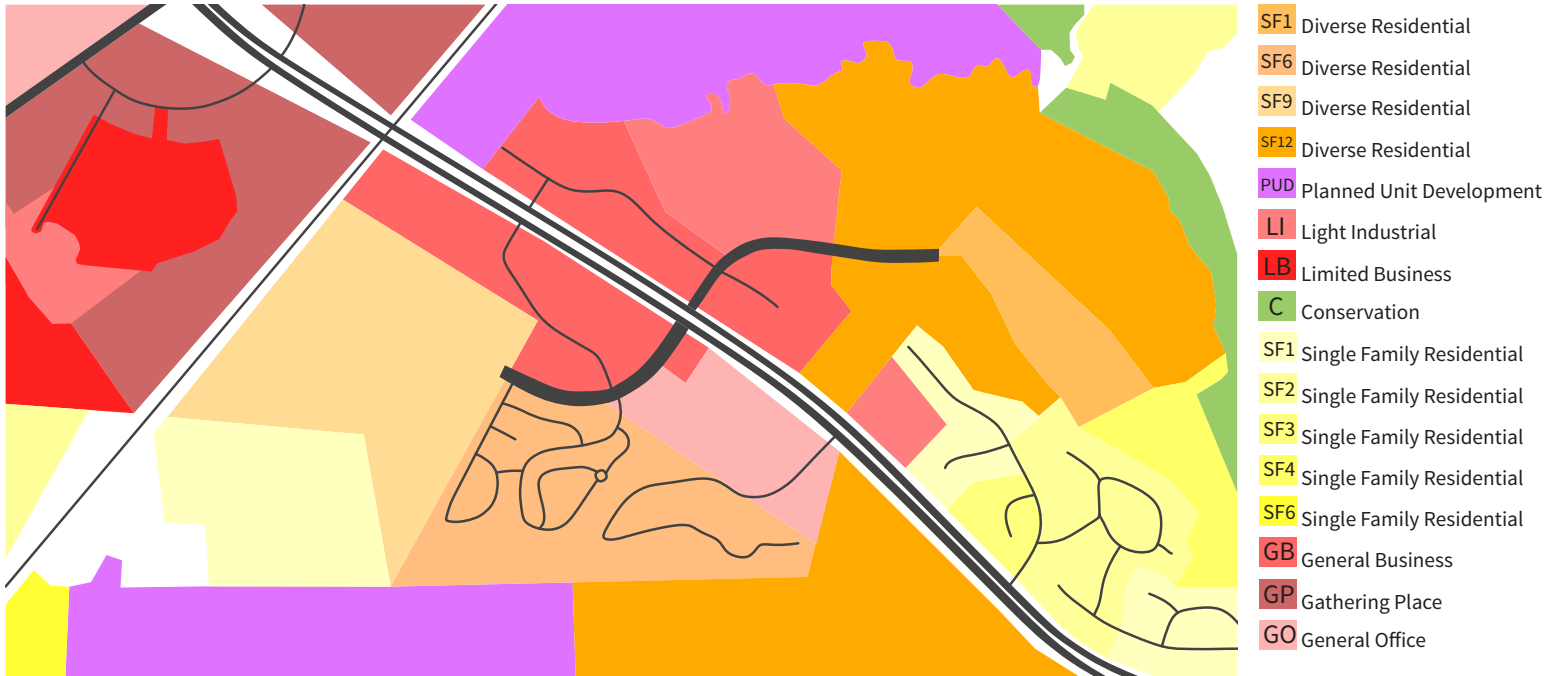
GB

SITE'S DISTRICT:
GENERAL BUSINESS

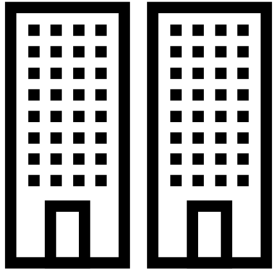
The GB district is intended to provide for a **broad range of commercial uses** and activities. It is the most intensive commercial zoning district.



SURROUNDING ZONING DISTRICTS



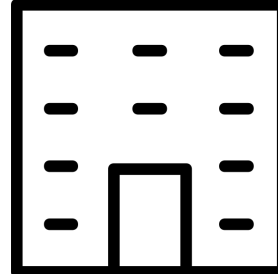
DESIGN REVIEW STANDARDS



The shape, configuration, design, color, and types of material of proposed buildings, and/or alterations and additions to existing buildings, must **establish an identifiable character for the development and not detract from neighboring properties.**



Excessive ornamentation shall be avoided to prevent visual clutter.



Long, monotonous facade designs including, but not limited to those characterized by unrelieved repetition of shape or form or by unbroken extension of line shall be avoided.

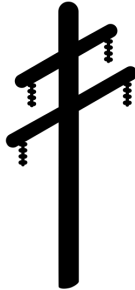


The **use of loud, garish colors must be avoided** except when the use of colors so characterized is essential for creating a successful design which complies with all other standards.

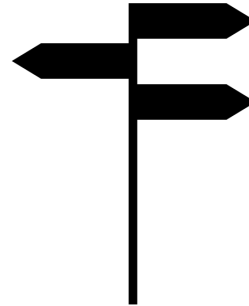
DESIGN REVIEW STANDARDS



Pedestrian and vehicular traffic should be separated. The arrangement of parking areas should be safe and convenient and, in so far as practicable, should not detract from the design of proposed buildings and structures and the neighboring properties.

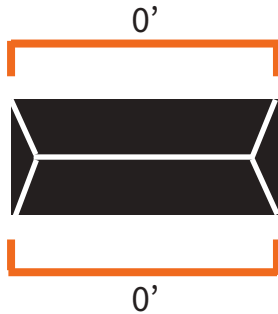


Utility lines should be contained underground when possible.



Exterior signs should not detract from the design of proposed or existing buildings and structures and the surrounding properties

STRUCTURE SETBACKS AND HEIGHTS



There are **no required front or rear setbacks** for GB non-residential zones.

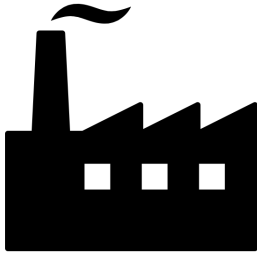


There are **no required side setbacks** for GB non-residential zones.



The **height limit** for structures in the district is **55 feet**.

STRUCTURE SETBACKS AND HEIGHT EXEMPTIONS



Chimneys, stacks, elevator bulkheads, elevator penthouses, stair towers, gas or water towers, cooling towers, stage towers or scenery lofts, and other necessary **mechanical appurtenances, may be extended above the height limit of the district;** provided that any such structure shall be set back from the vertical plane of the permitted building setback line one foot horizontally for each two feet of extra height.

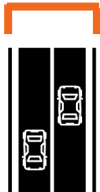


In the GB district, **hospital heights may be increased to eighty feet, but not exceed six stories;** provided that the width of each side yard and rear yard is at least 25 feet.



The Commercial Corridor Design Review Board is authorized to permit architectural features such as parapets, cupolas, roof structures, and other similar features, on hospitals, to exceed the eighty foot height limitation but not exceed a total building height of 95 feet.

DRIVEWAY DIMENSIONS

				
	30'	15'	15°	20'
	40'	20'	20°	30'
	60'	30'	30°	70'

The speed of the adjacent right-of-way determines the dimensions needed for a building's driveway.

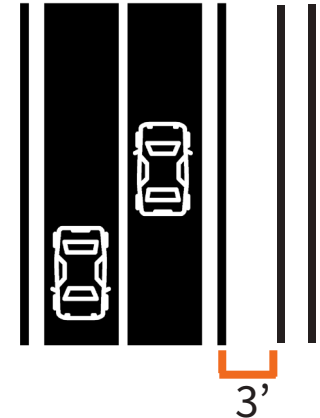
DRIVEWAYS AND SIDEWALKS



If the adjacent right-of-way is less than or equal to 130' in length, only **one driveway** can be placed.



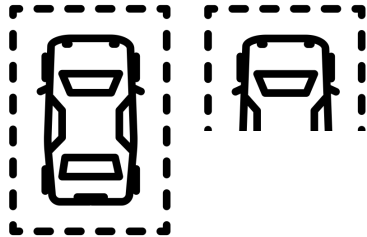
If the adjacent right-of-way is greater than 130' in length, **two driveways** can be placed.



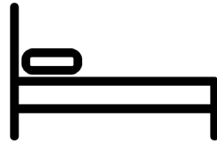
Sidewalks should be provided in the public right-of-way, and extend across the length of the right-of-way adjacent to the development. Sidewalks may abut the curb. **Where there is no curb, sidewalks should be offset at least 3 feet from the edge of the pavement.**

The length of the adjacent right-of-way determines the amount of driveways needed.

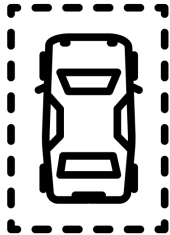
PARKING REQUIREMENTS



per



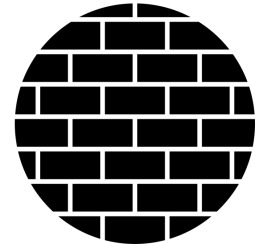
+



per



All **surface parking lots** should be paved with a **durable, hard surfaced material** which is appropriate for the intended land use. All handicapped parking spaces, and the paths connecting spaces to buildings, should be hard-surfaced regardless of the land use.

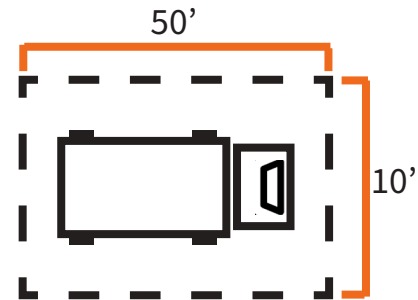
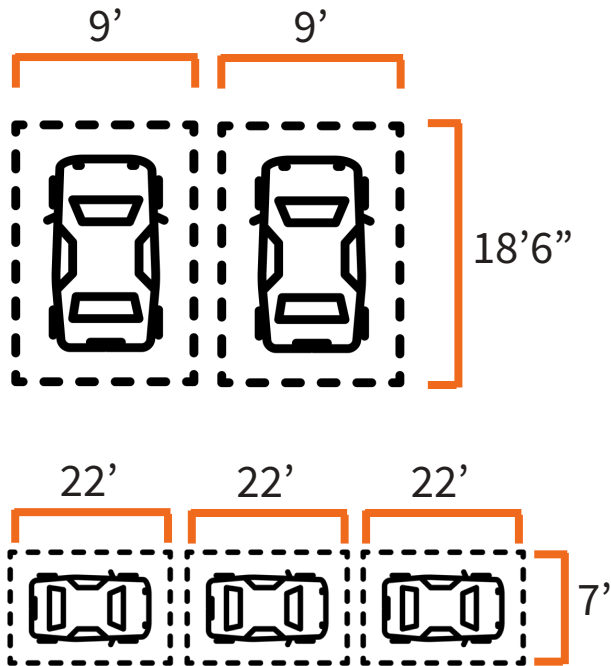


Lighting used to illuminate any parking area shall be shielded or otherwise designed to direct light away from adjacent residential districts.



Off street-parking spaces needed per capita.

PARKING AND SERVICE REQUIREMENTS



Structures should provide space as indicated herein for the **loading and unloading of vehicles: one space 10 by 50 feet for each 10,000 square feet of floor area** or fraction thereof.

Dimensions required for perpendicular and parallel parking spaces.

RECOMMENDED LANDSCAPING



Yellow Poplar



Pecan



Red Maple



Southern Red Oak



Forsythia



Savannah Holly



Pampas Grass

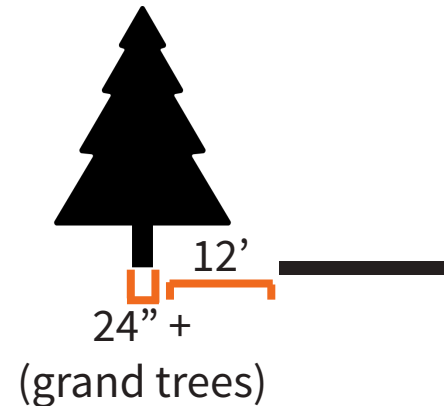
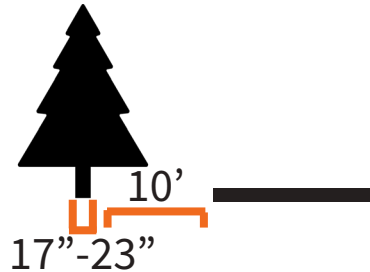
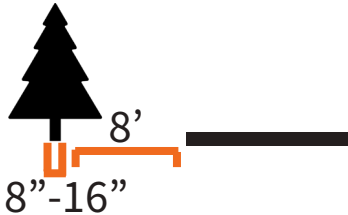


Fragrant Tea Olive

TREE PROTECTION REQUIREMENTS



The removal, relocation, **destruction or abuse in any manner of any grand tree** (24" in trunk diameter or greater, excluding pine trees and sweetgum trees) **is not allowed.**



A **minimum setback** will be maintained **between impervious surfaces and the bases of all protected and grand trees.** This setback depends on the diameter of the tree trunk.

LANDSCAPING FOR PARKING AND SERVICE AREAS



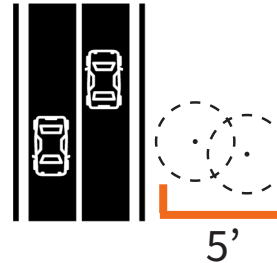
All new surface **parking lots, vehicular use areas, and refuse collection areas** will require the **installation of landscaping, screen walls or fences.**



Surface parking lots, service areas or other **vehicular use areas** should include **landscaping** where such areas **abut a public right-of-way** or neighboring parcel.



Each parking row should terminate with landscape islands and no more than twelve parking spaces shall be permitted in a continuous row without being interrupted by a landscape island.



A **landscaping area at least 5 feet in depth** should be located **adjacent to the abutting right-of-way** or neighboring parcel.



The landscaping area should be planted with **one recommended tree for each 25 linear feet of landscaping** area and an evergreen hedge or other **durable landscape material of at least 3 feet in height** to provide a continuous landscape element.

City of Charleston Zoning Website:

<https://www.municode.com/library/sc/charleston/codes/zoning>

Images:

Drew Ellis from the Noun Project
Delwar Hossain from the Noun Project
Icon Fair from the Noun Project
Magicon from the Noun Project
David from the Noun Project
Klara Zalokar from the Noun Project
Thomas Helbig from the Noun Project
Paulo Sa Ferreira from the Noun Project
Creative Still from the Noun Project
Edward Boatman from the Noun Project
Nick Bluth from the Noun Project
Nikita Kozin from the Noun Project
Drusilla from the Noun Project
Denis Sazhin from the Noun Project
Stefan Eckstein from the Noun Project
Misirlou from the Noun Project

SITE OPPORTUNITIES AND CONSTRAINTS



EXISTING ROADS

Opportunities

Access from Murray Blvd.

Potential driveway connection to West Ashley High School

Possible second traffic light at Glenn McConnell Pkwy and Murray Blvd.

Constraints

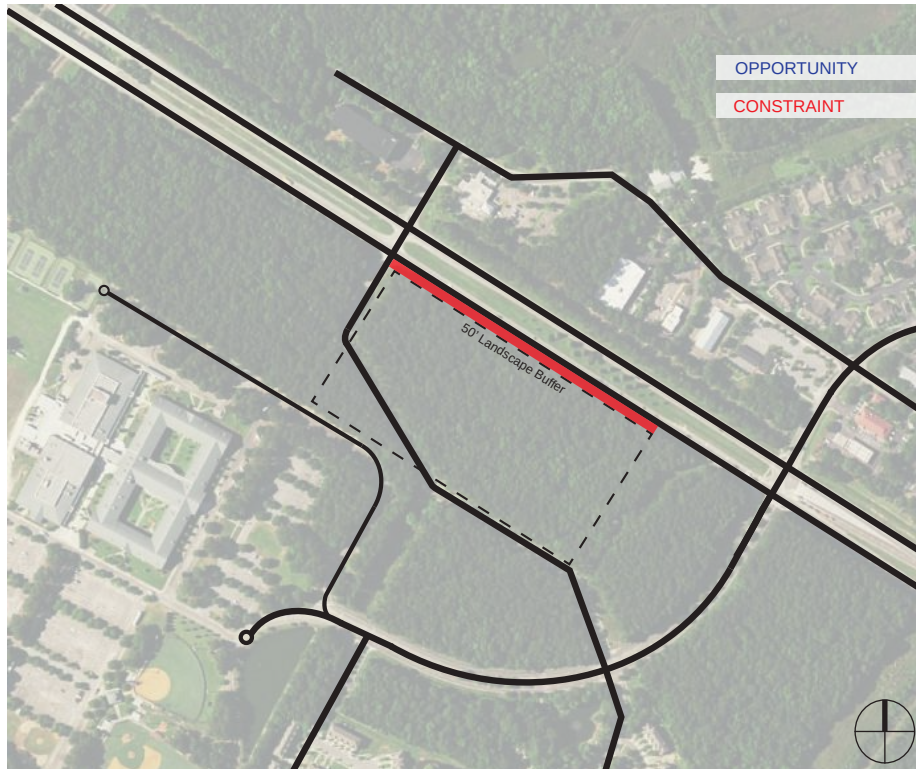
No direct access from Glenn McConnell Pkwy.

Murray Blvd. dividing one corner of the site.

No traffic light from Murray Blvd. onto Glenn McConnell Pkwy for left turns.



EASEMENT/BUFFER



Opportunities

No easements/buffers on three sides of the property provides unrestricted positioning on the site

Constraints

50 foot landscape buffer along the property line touching Glenn McConnell Parkway

More difficult to advertise the building if it is setback from the highway

PREDOMINANT WIND

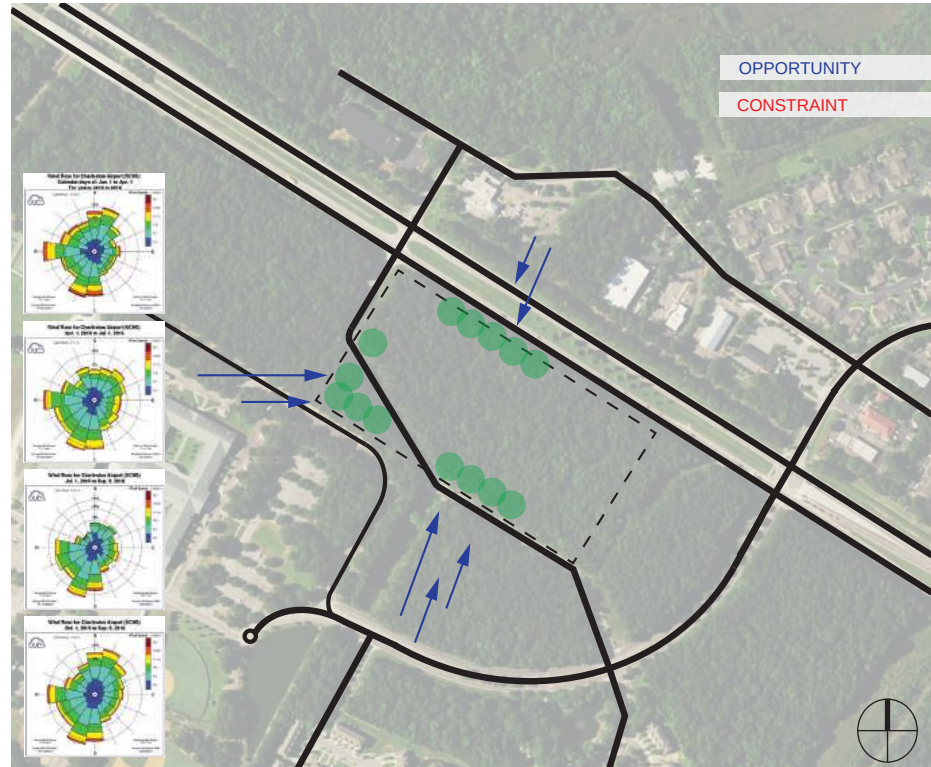
Opportunities

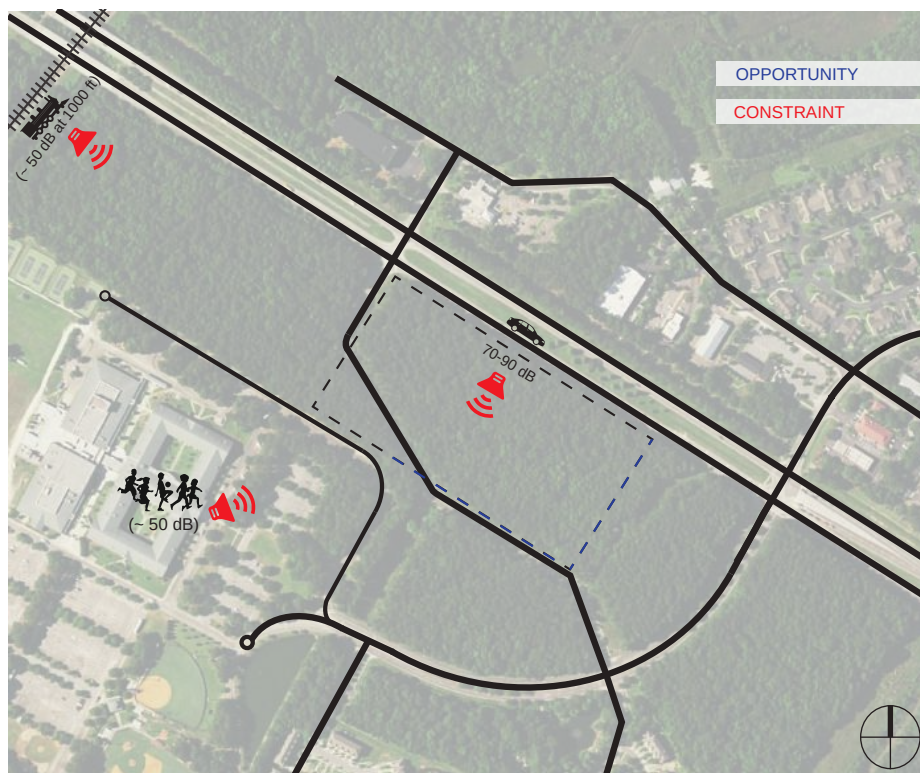
Incorporate understanding of wind analysis into facility and landscape design of the site plan

Taking advantage of thermal cooling and windbreaks to create a microclimate

Constraints

Hurricane season and winter months create more intense wind conditions





Opportunities

Position building away from or shielding the sources of noise for quiet spaces

Use of trees, vegetation, and/or facility to act as a sound barrier

Constraints

Four-lane highway adjacent to site is the loudest source of noise.

School and railroad will be other sources of noise intermittently throughout the day

Source:

<https://www.chem.purdue.edu/chemsafety/Training/PPETrain/dblevels.htm>

VIEWS FROM THE SITE

Opportunities

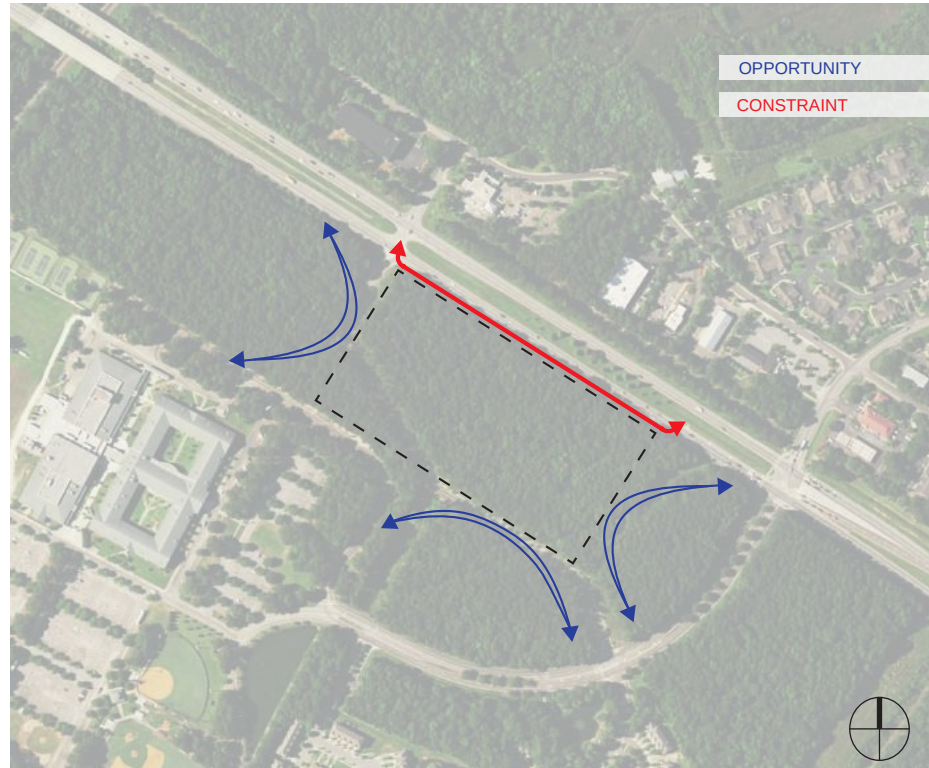
Current views to wooded lots on three sides of the property

Designing the building as a visual “billboard” to be easily located from the highly trafficked highway

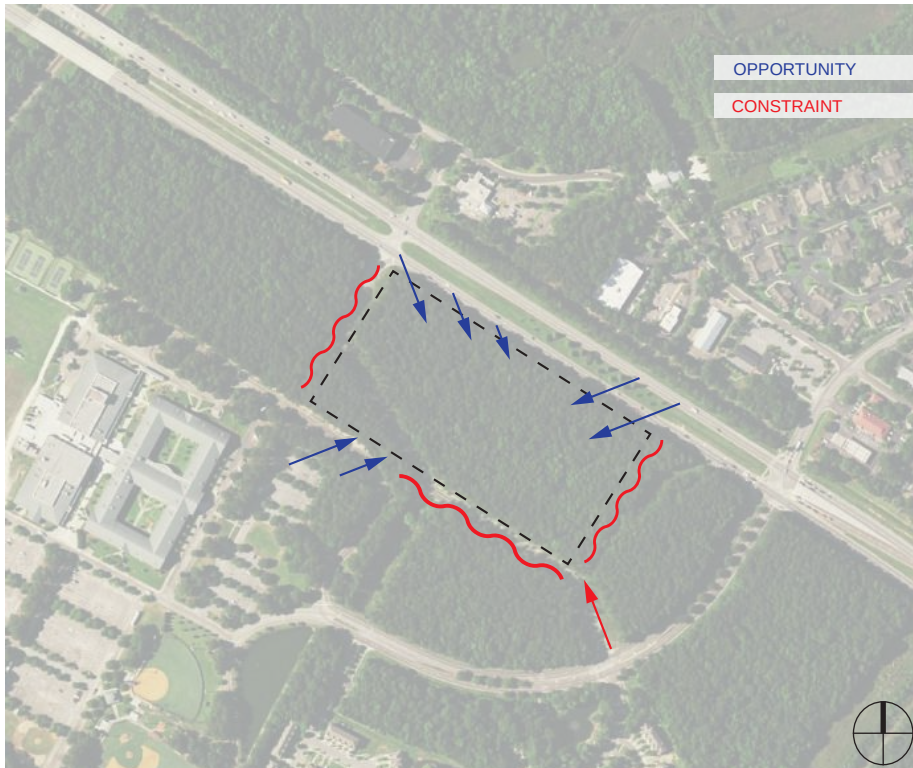
Constraints

View to the Northeast from the property looks toward a 4 lane divided highway

Unknown future views of adjacent properties (currently wooded and developable)



VIEWS TO THE SITE



Opportunities

Good visibility from Glenn McConnell Pkwy as a means of visual marketing and awareness for the community

Constraints

Three sides of site and access from West Wildcat Blvd difficult to see due to large wooded lots adjacent to site

SOLAR ORIENTATION

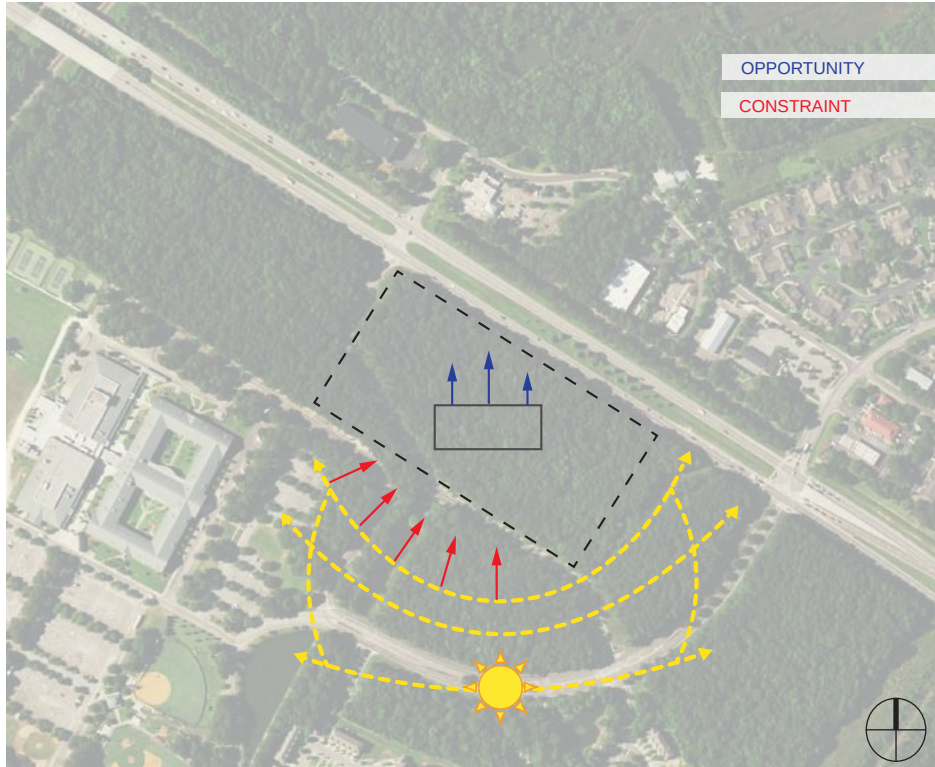
Opportunities

Orienting facility with attention to the North and East sides of property for less heat gain throughout the summer months

Trees and facility designed in a way to provide shading

Constraints

More intense light and heat from South and West of site



FUTURE WEST ASHLEY CIRCLE PLAN

Neighboring Development

Opportunities

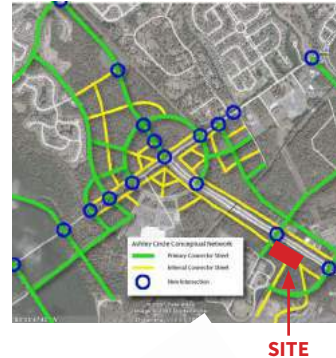
More walkable and bikeable community with residential and shopping opportunities.

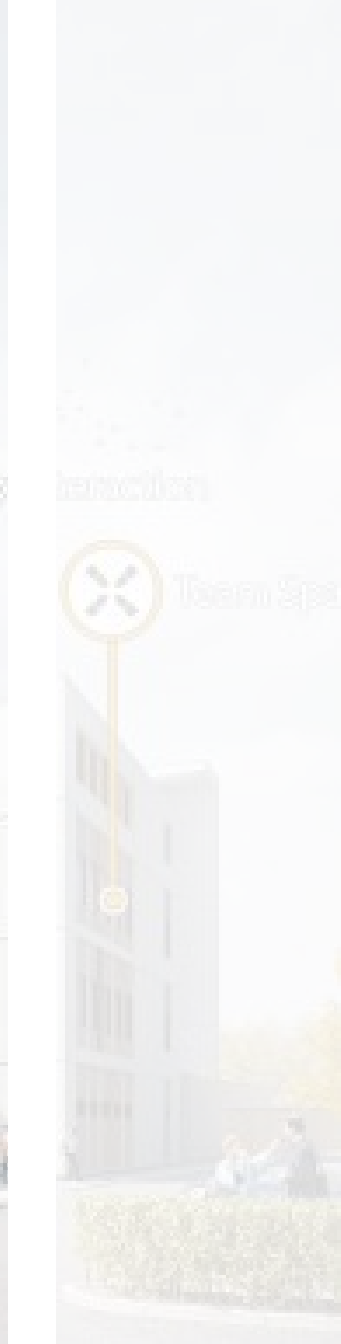
Potential to be a landmark in relation to the West Ashley Circle development plan

Constraints

More congested roadways

More dense population moving into this area of Charleston





06 DESIGN GUIDELINES

The following section was developed during a design charrette at the Learning Lab Workshop at the Clemson Design Center in Chareston, South Carolina. These design guidelines serve as a means of informing the design process.

AMBULATORY SURGERY CENTER FLOW DIAGRAM

ENTRY SEQUENCE

WAITING EXPERIENCE

TEAM SPACES

FAMILY INTERACTION

FLEXIBILITY

AMENITIES

DAYLIGHTING

ADDITIONAL CONSIDERATIONS



PATIENT

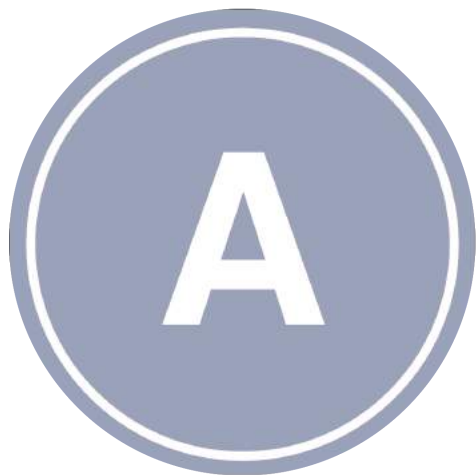


FAMILY



SURGEON

Throughout the surgical process, many players move around and interact with one another in the facility. Understanding these players and their essential flows is critical to facility planning and design. There are a range of potential and essential activities that play a role in the efficient flow of one of these players through the ambulatory surgery center.



ANESTHESIOLOGIST



NURSE



STAFF

The six icons above are depicted on the title page of each guideline. These are included to represent which players are involved in the consideration of that topic. Knowing which players are involved in each of the seven identified guidelines is a helpful reference and reminder for whom the guideline is targeted.

Ambulatory Surgery Center Flow Diagram

[how] was the a flow diagram created?

During the RIPCHD.OR Workshop (Realizing Improved Patient Care Through Human - Centered Design in the Operating Room) in Charleston, SC, the 1st year studio engaged with a number of experts in the ambulatory surgery including but not limited to, anesthesiologists, surgeons, nurses, architects and civil engineers, to understand the circulation and flow of patients, family and staff.

To determine the best case practice for each group, the group divided into a indepth understanding of the tasks each person performs on a daily bases starting with their journey into the facility and finishing with the end of the day routines.



valet gets vehicle

reception registration (scheduling)



drop off patient

assist with registration

park car or optional valet



home

pre procedure process/ physician's office package

report to ASC

check-in digitally phone waiting area

pre-surgery lab/imaging (days before)

register at kiosk or staff desk



staff parking

staff entry



review chart (day before)

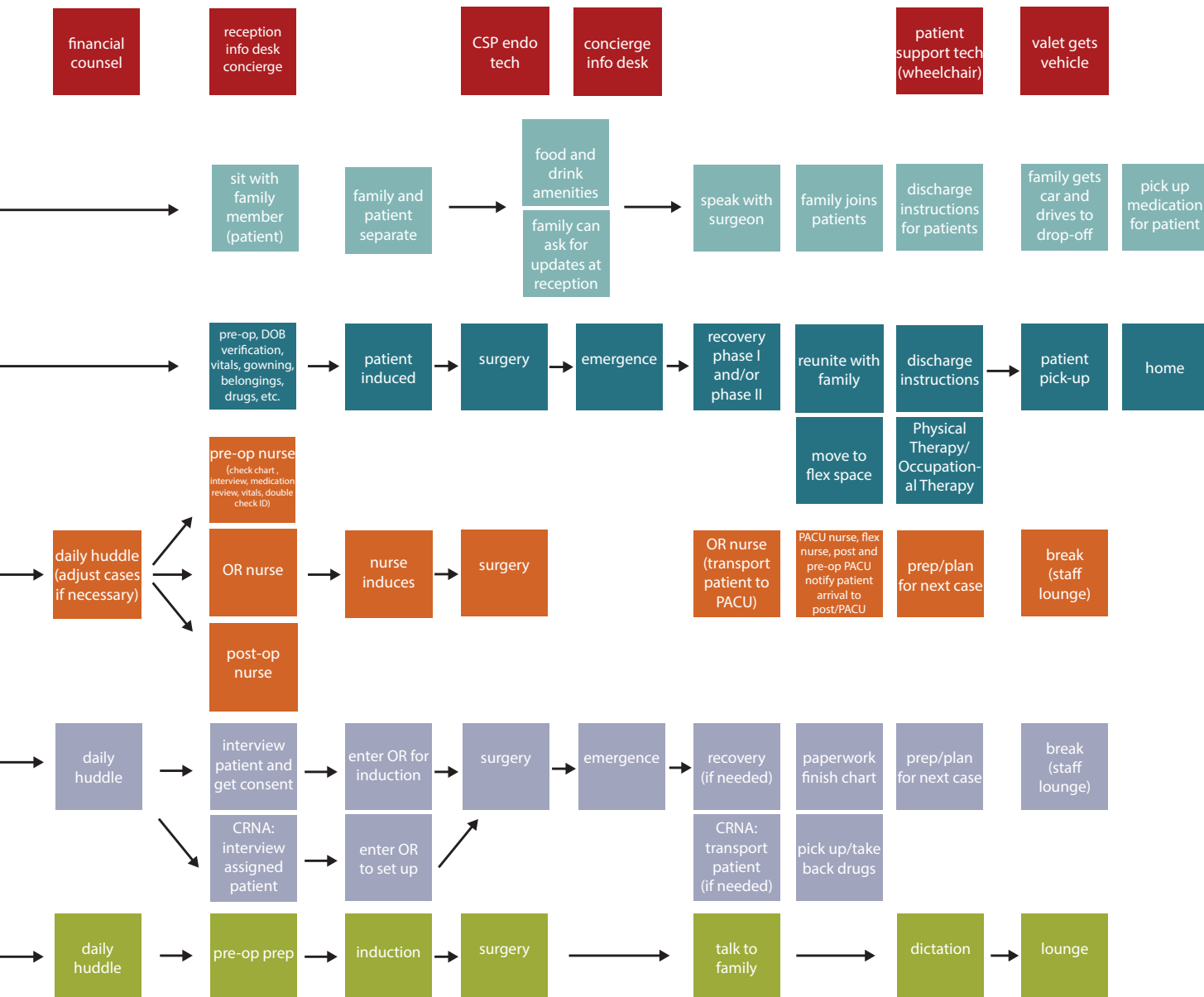
staff parking

staff entry



staff parking

staff entry



ENTRY SEQUENCE



[what] is a entry sequence?

A entry sequence is divided into the following progression:

Exterior wayfinding, patient drop-off & pick up, entry from parking and the lobby space experience.

Exterior Wayfinding: Architectural wayfinding. Identifiable landmark that can be seen from a distance. Recognizable brand. Directional signage to parking or patient drop off.

Patient Drop-off & Pick up: A traffic circle that is potentially under awning or shading. Designated area for temporary parking. Pick-up and drop-off area can be separate.

Entry From Parking (Patient and Staff): bridge, underground passage, covered sidewalk.

Lobby Experience: first impression that should evoke positive reactions, monumental (defined) spaces, interior wayfinding.

Sources:

<http://www.pfa-architect.com/ambulatory-surgery-center-sentara-obici-hospital/>

<http://idea.ap.buffalo.edu/udny/section4-1c.htm>

http://www.ojdesign.com.au/uploads/2/3/9/8/23984508/8155503_orig.jpg

<http://kidcrave.com/wp-content/uploads/2012/08/ch.jpg>

<http://www.healthcaredesignmagazine.com/blogs/jkovacs/clinic-design-entry-sequence>



[why] is it important?

The entry sequence make the first and important impression to patients and their family upon arrival to the facility. It can inspire trust and confidence or deter the patient's assurance on the equality of care they will receive. For most healthcare facilities, including ambulatory surgery center, it is important to have more than one point of access for both patients and staff. In addition, a well designed entry sequence should be "straightforward and stress free". The access point should be intuitively understood as the main point of entry. The goal is to navigate patient, family and staff to the designated healthcare facility for a specific service with ease.

When designers compose a scheme for the an entry sequence, the following features should be considered:

- Visual Prominence
- Landscaping
- Lighting
- Signage
- Parking

Source: Information is paraphrased from Healthcare Design Magazine article by Christine Guzzo Vickery

[what] is the purpose of:

Exterior wayfinding:

Identify the building to be memorable in its context. Even reinforce the intuitive recognition of the structure through signage/branding prior to arrival. This can be achieved through architectural gestures and creative graphic.

Patient Drop-off & Pick up:

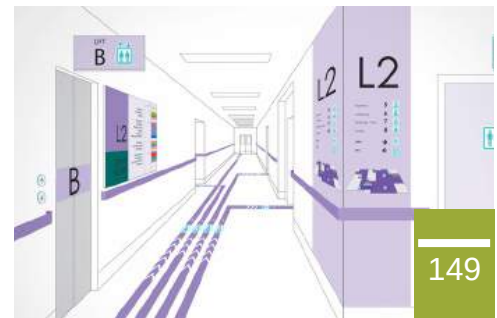
Easily accessible areas for patient families. The area should include directional information to valet, parking and handicap assistance if applicable. In addition, the area is designed for patient and family convenience and health during bad weather conditions.

Entry to ASC from Parking (Patient and Staff):

Can be achieved in a number of ways including an attached garage, bridges, underground passage and covered sidewalk from parking lots.

Lobby Experience:

Sometimes defined as a monumental space that is significantly more impressive in scale and architectural gesture than the rest of the facility. It can invoke feelings of safety and successful design of this space can alleviate a patient's and family's level stress to some extent. This also includes interior wayfinding circulation direction and allows people to determine their location, setting and destination.



WAITING EXPERIENCE



[what] is the waiting experienced?

The waiting experience is defined as:

- The length of time and location of the patient and family from the moment the patient enters the facility to the moment the medical assistant/nurse begins the clinical visit.
- The length of time and location of the family from the moment of departure from the patient to the moment they reunite with the patient.

The patient experience goes beyond the clinical spaces and includes what happens in the waiting and transition spaces. Designing an effective waiting experience that creates **smooth transitions can replace emotional anxiety and physical pain with a more enjoyable and useful atmosphere.** Whether the waiting experience is its own physical space or a process that happens virtually or in conjunction with other activities, creating an effective patient flow as well as satisfaction is paramount. The waiting experience should ultimately be a meaningful experience for the patient that “prepares them for the next step along their journey.”

[why] is it important?

According to Hospitals and Health Networks Magazine, patients are behaving more like consumers who shop around for the best services. Two important components to those services are how long a patient waits and the characteristics of the spaces where the waiting takes place. A study found that there was a **95% satisfaction rate among patients who waited less than 5 minutes, but when waiting exceeded 30 minutes satisfaction dropped to 80%**. In everyone's eyes - patient's, family, clinician's, owner's - waiting time is wasted time. Virginia Mason physician, Robert Mecklenberg explained that he had not previously realized that "the waits and delays and these rooms with the internet access and the fish tanks and the coffee machines [...] were all unnecessary costs which are ultimately paid by the patient." It is evident that the patient, who has become the consumer, drives the changes. These demands include making waiting time an enjoyable and productive (or in some cases non-existent) experience.

[how] is it achieved?

Physical Room:

Seating density and organization

- additional physical space results in additional emotion space
- the use of less chairs but more space per chair
- patients want separation from strangers but proximity to family members
- create zones and clusters that resemble homelike condition rather than long rows of chairs

Balancing sight lines

- people want views to nature and views to the information source
- design sideways seating that creates peripheral views to windows and information

Eliminating the Waiting Room:

Activity areas

- create pods dispersed throughout the facility programmed for various activities

Provide a receptionist

- upon arrival patients should be greeted by staff member who directs them to their exam room

Kiosks

- patient can register and perhaps conduct some pre-surgery activities at self-serve kiosk stations



[who] has achieved it?

Seattle Children's Bellevue Clinic

Architect:

NBBJ

SQ FT:

80,000

"Surgery is as stressful for the parent as it is for the child, so special attention was taken to alleviate anxiety."
-NBBJ

Seattle Children's Bellevue Clinic utilized Continuous Process Improvement to **eliminate the waiting room**. The architect explained that "CPI takes a holistic look at the 'flows of healthcare' with the goal of the safest, most efficient and family-friendly experience. By evaluating these flows early in the process, the design team selected smarter solutions and integrated them faster and cheaper than a traditional hospital project of this kind." They also used computer simulation to create a lobby just the right size that reflected their leaner process. The smaller, more cost efficient lobby, eliminates unnecessary waiting and allows for more face time with clinicians.



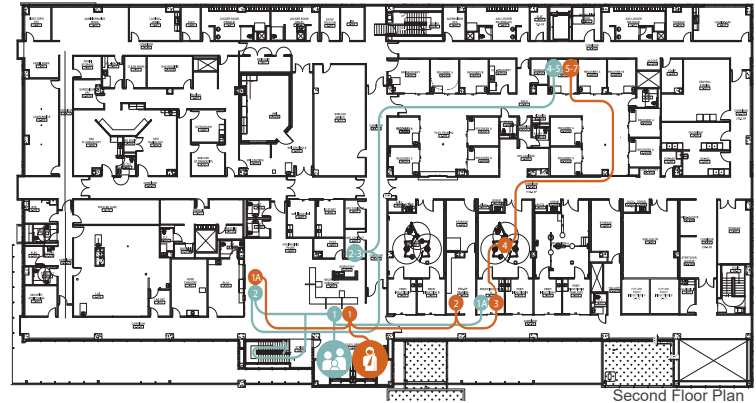
Patient

1. Admission
 - a. Waiting
2. Exam
3. Induction
4. Surgery
5. Emergence
6. PACU
7. Discharge



Family

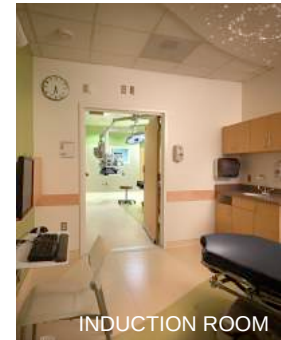
1. Admission
 - a. Pre-Op Assessment
2. Waiting
3. Report from surgeon
4. PACU
5. Discharge



PATIENT LOBBY



REGISTRATION



INDUCTION ROOM



[who] has achieved it?

Virginia Mason Kirkland Clinic

Architect:
CollinsWoerman
SQ FT:
19,400

"I just spent less time in the waiting room, and felt I had more time with my doctor and nurse to talk about my concerns." -Philip (a patient at Virginia Mason Kirkland Clinic)

Virginia Mason Kirkland Clinic has utilized LEAN management principles to not just transfer the wait to your exam room, but to almost eliminate it. Studies have shown that the patient waits an average of five seconds before the exam begins. Virginia Mason Kirkland has also noticed other benefits such as better infection control. The clinic has been able to accomplish this with an effective on-stage/off-stage corridor typology and by using a sophisticated tracking device for patients. With the new system, Kirkland clinic maintains 42 exam rooms, 20 physicians, and 400-500 patients per day.



Sources: http://www.versustech.com/pdf/SS%20100830%20VM%20Kirkland%20FINAL_1up.pdf
<http://www.collinswoerman.com/virginia-mason-kirkland-clinic>

TEAM SPACES

[what] is a team space?

Areas that range in size as needed to foster a collaborative atmosphere and encourage an environment for staff, nurses, anesthesiologists, and surgeons to work effectively by increasing communication opportunities.

"The layout and design of workplaces have long been used to provide support for heads-down work, in addition to communication and teamwork. Private offices are generally perceived to allow quiet work, private meetings and, often, confer higher status; shared spaces are intended to encourage teamwork and communication and facilitate supervision by management. In healthcare, physicians and other providers have traditionally been provided private offices. However, a number of healthcare organizations see private offices for providers as reinforcing patterns of hierarchy, disconnected roles and limiting collaboration. In response, many organizations are creating shared team rooms to encourage team-based care."

Sources:

Designing Team Rooms For Collaboration in the Outpatient Clinics (2015 AAH Report by Jennifer Dubose, Lisa Lim, and Ross Westlake)

Image Sources:

<http://perkinswill.com/news/next-space-office-future-workers-today>



[why] are they important:

“US health systems are moving away from episodic care delivered in silos to coordinated, team-based care with a goal to improve the experience for individual patients and improve population health overall.”

[what] occurs:

the staff huddle:

planning time to establish situational awareness, reinforce plans for the specific case and assess any need to adjust the plan for the schedule.

coordinate care:

“the deliberate organization of patient care activities between two or more participants involved in a patient’s care to facilitate the appropriate delivery of health care services.”

[how] are team spaces achieved:

Provide a variety of movable furniture options in the designated team spaces.

Provide a change in materials to visually identify the collaborative areas.

Provide moveable walls to transform the space throughout the day, as needed.

[where] are team spaces:

- Nurses Stations (traditional location)
- Alcoves
- Flex Spaces
- Conference Rooms
- Hoteling Offices

[where] are examples:

- Mercy Care Downtown - Atlanta, GA
- Whitman-Walker Health - Washington, DC
- Piedmont Newnan Hospital - Newnan, GA
- Rush Medical Center - Chicago, IL

Sources:

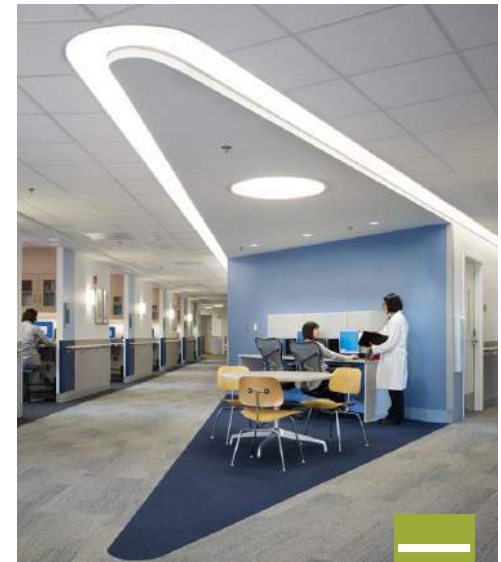
Designing Team Rooms For Collaboration in the Outpatient Clinics (2015 AAH Report by Jennifer Dubose, Lisa Lim, and Ross Westlake)

Image Sources:

<http://perkinswill.com/news/next-space-office-future-workers-today>

<http://www.contractdesign.com/practice/health-care/Healthcare-experts-at-Perkins-Will-report-on-rethinking-workplace-in-healthcare-30451.shtml>

<http://www.healthcaredesignmagazine.com/article/crafting-new-icon>



FAMILY INTERACTION

[what] is family interaction?

Family interaction is when a patient, family, and medical staff can interact or talk whether that is in a public or private setting. In some cases it might just be the staff and family interacting if the patient is recovering right after surgery. This space can be a physical space or a way to communicate through technology.

Families can be left for hours at a time not knowing what is going on or what stage the patient is in, whether it is surgery or recovery. If the family has sufficient interaction with the patient and process before, during, and after surgery, then they will feel more comfortable and have a better experience at the surgery center.

Source:

<https://healthcaredesigned.wordpress.com/tag/medical-clinic-design/>



[why] is family interaction important :

“Patients really like when the family feels part of the process and it makes the Ambulatory Surgery Center experience better. When the family members come into the room they get a very in-depth discharge education before surgery, which we repeat afterwards as well.”

“When the patient leaves for surgery, a nurse always walks family members back to the waiting room and makes sure they know where to get coffee or breakfast while they wait.”

-Karen Reiter, Administrator at DISC Sports & Spine Center in Marina del Rey, CA

[what] technology can be used:

Electronic Access to Surgical Events (EASE) is a texting platform for patients and families.

Monitor screens tracking the patient and informing family members about the stage in surgery

Versus Information System streamlining patient flow with location and event-related data.

[how] to address these considerations:

- Pre-Op/Induction rooms* should provide spaces where family members can be with the patient before surgery.

- Private spaces* should be provided where families can get an update about the patient; such as consult rooms.

- PACU rooms* should be provided where family members can come be with patients. Most family members and patients will want to be with each other during this time.

Sources:

<http://discmdgroup.com/5-asc-leaders-on-how-they-improve-the-patient-experience/>

Images Sources

www.boulderassociates.com/project/sutter-santa-rosa-ambulatory-surgery-center-relocation/

www.hfmmagazine.com/articles/2411-new-ambulatory-surgical-center-believes-there-is-no-place-like-home-for-recovery

www.sjbarrett.com/portfolio



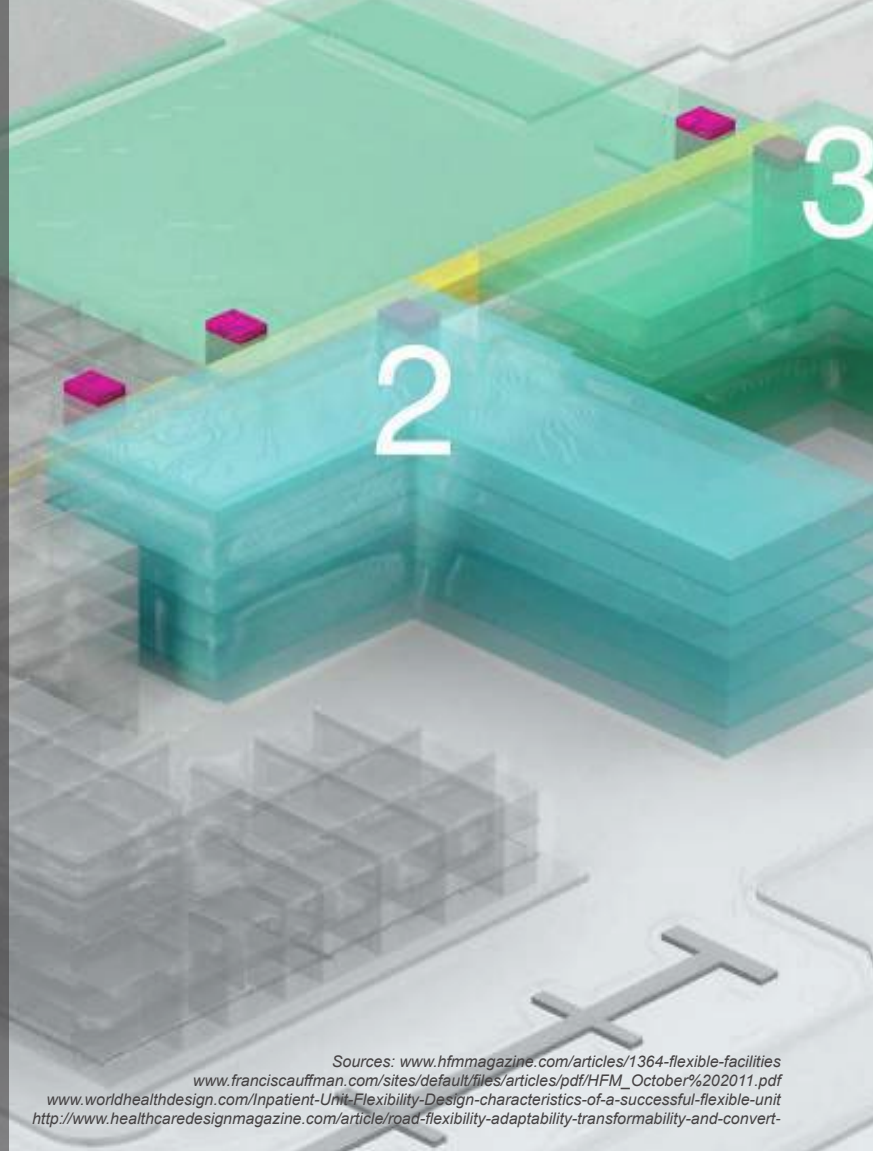
FLEXIBILITY

[what] is flexibility?

Flexibility is defined as the “ability to convert the environment to new uses, with a simple and/or inexpensive alteration to the physical environment.” Flexibility also requires the ability to adapt an environment to a new use without making any changes to the physical structure..

[why] is it important?

Healthcare facilities are highly complex and function-specific structures that must respond to multiple conflicting demands over their lifetimes. At the same time, the nation's health care systems have a high level of future unpredictability. Hospital buildings, therefore, face an indeterminate future in which they must function with a high degree of accuracy yet remain viable for a period of time even as technology changes. According to Healthcare Design Magazine, “Healthcare facilities face more challenges in providing a flexible built environment than other types of architecture. Healthcare institutions no longer can afford for individual spaces to have one particular function throughout the lifespan of a facility; they must be flexible to respond to a variety of potential changes.”



Sources: www.hfrmmagazine.com/articles/1364-flexible-facilities
www.franciscauffman.com/sites/default/files/articles/pdf/HFM_October%202011.pdf
www.worldhealthdesign.com/Inpatient-Unit-Flexibility-Design-characteristics-of-a-successful-flexible-unit
<http://www.healthcaredesignmagazine.com/article/road-flexibility-adaptability-transformability-and-convert>

[how] is it achieved?

Armatures

- design permanent major corridors that allow for growth and change around those axes

Multi-use Spaces

- plan space and building configurations that allow for a variety of functions throughout each day and over time

Modular Planning

- organize multi-use spaces in clinics and other areas with repetitive design

Soft Spaces

- design soft space that are easily relocatable adjacent to complex and high tech spaces to allow for easy expansion

Interstitial Space

- utilizes interstitial space above high-tech spaces such as operating rooms in order to easily access utilities and to renovate other areas of the building without shutting down key operations

Modular Utility Systems

- modular utility systems can be used for selective shut down of medical and electrical systems when not in use or when under repair

[who] has achieved it?

Banner Estrella Hospital

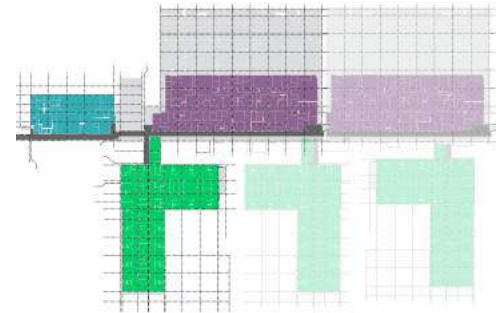
NBBJ Architects
450,000 SQ FT

“Banner Estrella is designed to adapt to unknown futures, such as the inevitable shifts in patient care, business plans and emerging technologies. NBBJ created a modular design of temporary zones organized around a permanent infrastructure/circulation spine. The building was planned backwards, starting with the final planned expansion [...] then backtracked to the first phase of construction by simply subtracting elements.” - NBBJ

Steven and Alexandria Cohen Children’s Medical Center

Francis Cauffman
8,433 SQ FT

A temporary Pediatric Intensive Care Unit was design to be converted to a Bone Marrow Transplant Unit 20 months later with minimal renovations. The flexibility was built in so that only one wall near the nurse’s station would be removed to convert the entire department from a PICU to a BMT. The patient rooms were already programmed to be interchangeable with no construction necessary.



Banner Estrella Hospital



Steven and Alexandria Cohen
Children’s Medical Center



Stanford Hospital and Clinics
Infusion Therapy and Ambulatory Treatment Center

AMENITIES



[what] constitutes as an amenity?

Amenities are additional programmed spaces and services available both to the family during waiting and patients during longer recoveries.

Even though amenities have always been part of the healthcare equation, today's market and the consumer's ability to select their own care provider has increased their importance. Considered a **valuable part of patient centered care experience**, these conveniences serve as a way to attract new and retain existing patients. The idea that **quality amenities equals quality care in the facility** is a concept that has been accepted and expected when consumers select their preferred provider.

"...improved amenities have a greater effect on hospital volume. So a hospital seeking to strengthen its financial position might view investment in amenities as a sound strategy." - Dana P. Goldman, Ph.D., Mary Vaiana, Ph.D., and John A. Romley, Ph.D.

Sources:

<http://www.nejm.org/doi/full/10.1056/NEJMp1009501#t=article>
<http://perkinswill.com/work/the-johns-hopkins-hospital.html>
<http://pagethink.com/v/project-detail/Children-s-Medical-Center-Legacy/59/>
<http://pagethink.com/v/project-detail/Driscoll-Children-s-Specialty-Clinics/5g/>
<http://pagethink.com/v/project-detail/Texas-Children-s-Hospital-West-Campus/3t/>
<http://www.hok.com/design/type/healthcare/stanford-childrens-health-specialty-services-center/>



[why] is it important?

Patient families can be waiting anywhere from 15 minutes to nearly 24 hours. This time can be stressful, and this is before the become the main caregivers upon the patient's' discharge. Programming these spaces can create positive distractions that improve the family experience.

[how] to address these considerations.

Areas with food and drink should be provided and have a cafe environment, preferably with access to the outdoors.

Positive distractions can be as simple as provision of TV screens. These should be placed on display walls with small clusters of seating. A separate screen with greater visibility may display the EPIC system. Other amenities may include: ambulation spaces (encouraging movement of visitors), business centers, areas for children, etc.

“Ambulation zones within the recovery area allow space for patients to get out of bed as soon as possible post-surgery and to walk with their caregivers in a secure and private area. Amenities in this area can include small lounge spaces, availability of refreshments, entertainment areas, quiet resting spaces and conveniently accessible dressing and toilet facilities.” (Brand, 2013)





DAYLIGHTING

[what] is daylighting?

Daylighting is the allowance, through architectural elements, of **natural sunlight** into patient, staff and family areas within the built environment of the ambulatory surgery facility. Through the use of windows, doors, and openings **direct or diffused sunlight can provide interior lighting**. Daylighting is often used when visual comfort or reduced energy consumption is desired. According to an article by Informe-Design, designers should attempt to get “as much daylight as possible deep into a building while controlling the brightness of surfaces within the users’ field of vision.

Sources: stanleybeamansears.com/how-important-is-natural-daylight-to-the-recovery-of-hospital-patients/
www.architecturalrecord.com/articles/7470-ucla-outpatient-surgery-and-medical-building?v=preview

[why] is it important?

By 1863, Florence Nightingale was already writing about the benefits of daylight for patients. She said that “the axis of the ward should be as nearly as possible north and south; the windows on both sides, so that the sun shall shine in (from the time he rises till the time he sets)...” Even then, Nightingale recognized the positive influence daylight can have on a patient's mind and body. Now, the topic of daylight has returned to the forefront of hospital design. In addition to energy savings benefits, studies have shown that daylighting provides both mental and physical health benefits. According to the U.S. Department of Energy, exposure to natural lighting in health-care facilities has been shown to provide a **“12 percent increase in patient recovery time, lower absenteeism among staff, as well as increased productivity, job satisfaction, and psychological well-being.”** In addition, a University of Pittsburgh study showed that patients with access to sunlight required 20% less pain medication, leading to lower medical costs.

[how] is it achieved?

Create ways for daylight to reach interior core of facility

- use light wells to bring daylighting vertically down to the interior core
- design interior courtyards to incorporate windows into the center of the floor plate

Provide windows in operating rooms

- daylighting has been shown to provide beneficial outcomes for tasks involving fine color discrimination

Orient rooms and windows in the North-South direction

- avoid unwanted glare and warmth discomfort by orienting rooms to receive indirect sunlight

Use shading devices

- provide exterior and interior shading devices to redirect and diffuse daylighting and eliminate glare at various times of day

Provide windows in staff break areas

- giving staff views to the exterior and natural light gives a sense of orientation and connection to the exterior environment

Utilize clerestory windows in patient recovery areas

- Protect patient privacy while integrating daylight into patient recovery areas to promote faster healing

Develop visual indoor/outdoor connections

- provide calming views of nature and the exterior environment



UCLA OUTPATIENT SURGERY
AND ONCOLOGY CENTER



LEGACY EMERGENCY ROOM



COMMUNITY HOSPITAL
BRANDENBURG

[who] has achieved it?

Palomar Medical Center

Architect:
CO Architects
SQ FT:
740,000

"There is evidence that daylight, views, and access to the outdoors all contribute to human well-being and improved health."

- Frances Moore

CO Architects took advantage of the context and arranged the various functions of the hospital according to optimal climate, daylight, and view exposures. The use of garden terraces as well as interior courtyards maximize both the physical and visual access to nature and daylight whether you are in the lobby, a patient room, or even in the operating room. Frances Moore, senior associate at CO Architects believes that "because of the built environment at the 11-story Palomar West, there will be better medical outcomes. Staff will be less stressed and deliver better care; patients in the 360 beds will heal faster."



Sources: <http://www.aia.org/practicing/groups/kc/AIAB099702>
<http://coarchitects.com/project/palomar-medical-center/>

<http://www.healthcaredesignmagazine.com/article/new-approach-sustainable-design-palomar-medical-center-west>

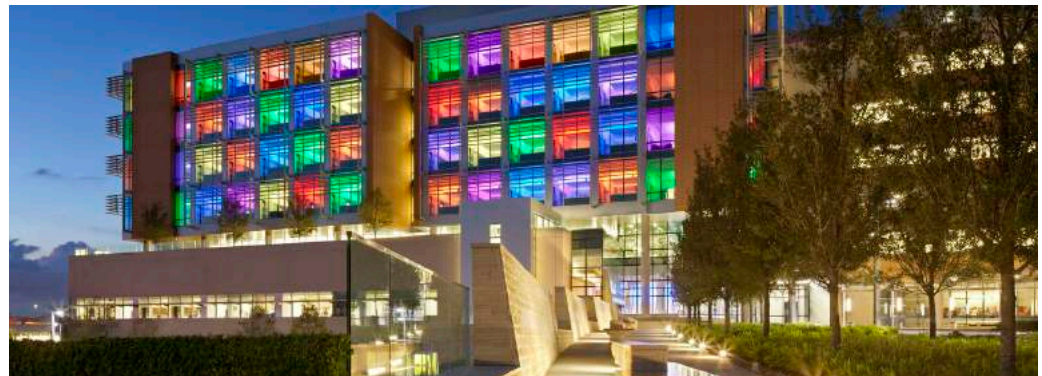
[who] has achieved it?

Newmours Children's Hospital

Architect:
Stanley Beaman & Sears
SQ FT:
630,000

"Nemours' interior spaces actually strategically harvest daylight and the floor to ceiling windows provide patients with garden views."

The design of the hospital allows the interior to be flooded with light through large curtain walls, and promotes a strong visual and physical connection to the exterior environment. The sun and humidity are a major concern in Florida's subtropical environment but according to the architect, "extensive solar studies resulted in shaded outdoor spaces, and also helped determine the design and placement of sun screens - blocking direct sunlight, while admitting abundant natural light to the interiors. The idea is to stimulate patients' senses and create a holistic healing environment which the hospital achieves through access to daylight and outdoor spaces.



Sources: <http://www.archdaily.com/439396/nemours-children-s-hospital-stanley-beaman-and-sears>
<http://stanleybeamansears.com/how-important-is-natural-daylight-to-the-recovery-of-hospital-patients/>
<http://www.healthcaredesignmagazine.com/article/model-update-nemours-childrens-hospital>

ADDITIONAL DESIGN CONSIDERATIONS

No Waiting as an Overall Goal

Traditional Approach vs. Flexible Approach

Enable Cultural Shifts

2:1 Patient to Staff Ratio

Keep Family Informed Throughout Surgery

Consider Digital Assessments

Shared Lounge for all Staff

Charting Areas (Mobile vs Fixed)

Central Scheduling Off-Site

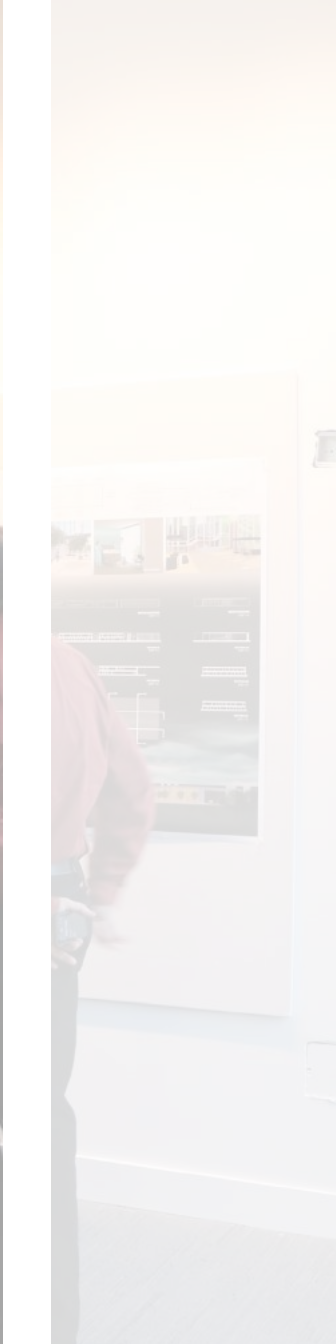
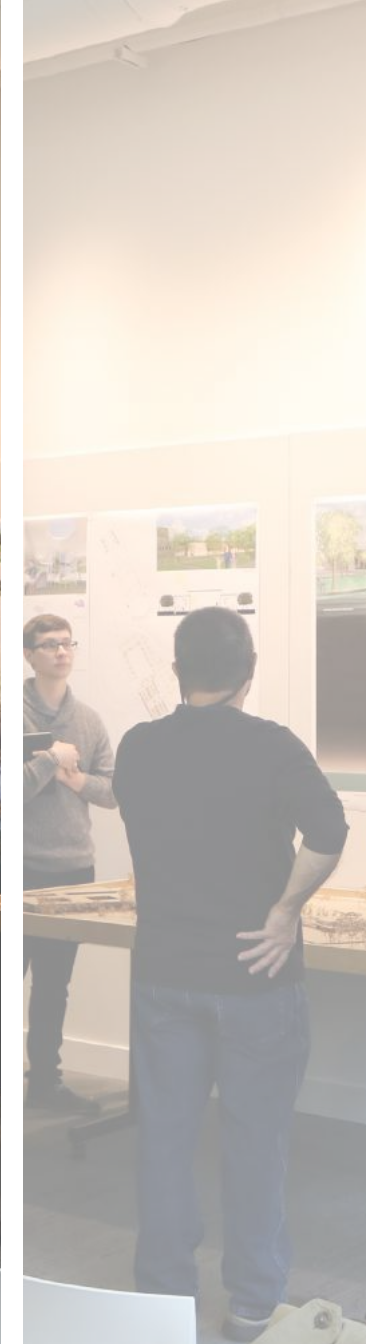
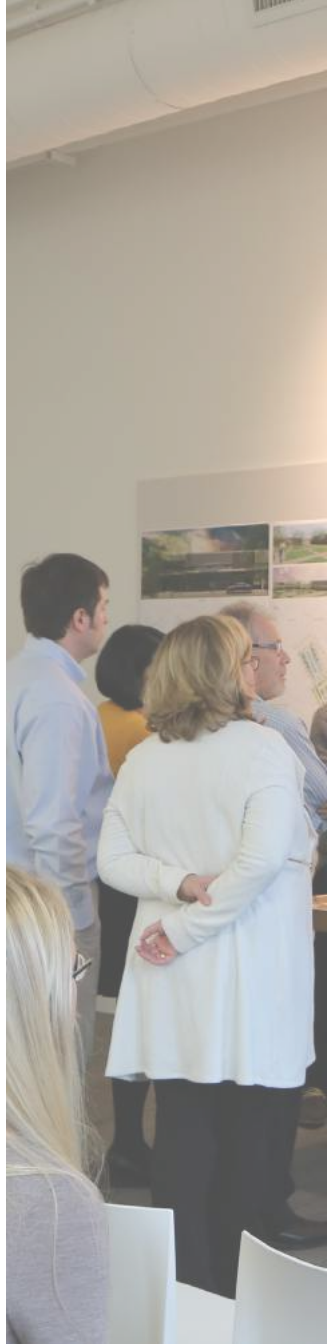
Pre-Cleaning Instruments

Flex Room for 23-Hour Stay

Standardized OR Rooms for Easy Transitions

Image Source: Aarhus Arkitekterne.

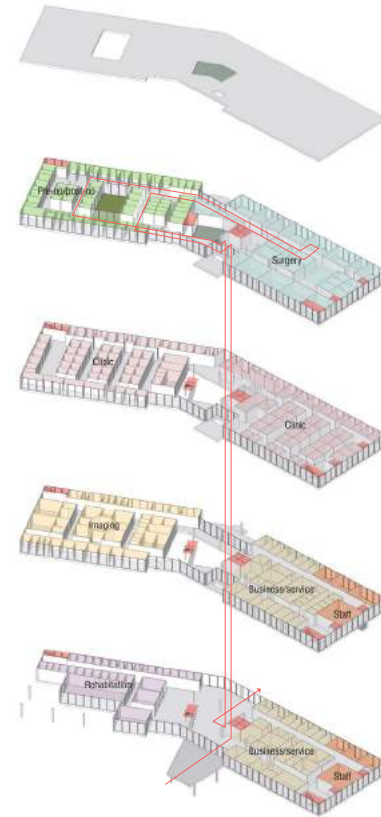
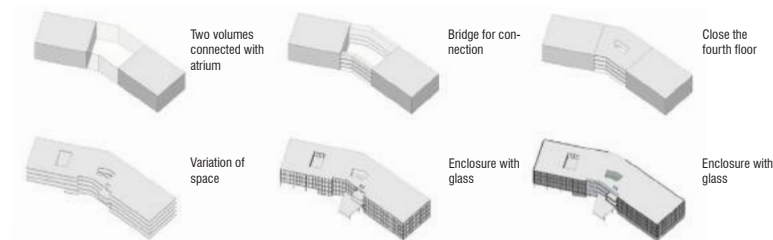
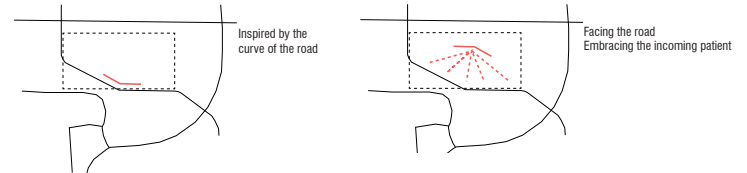
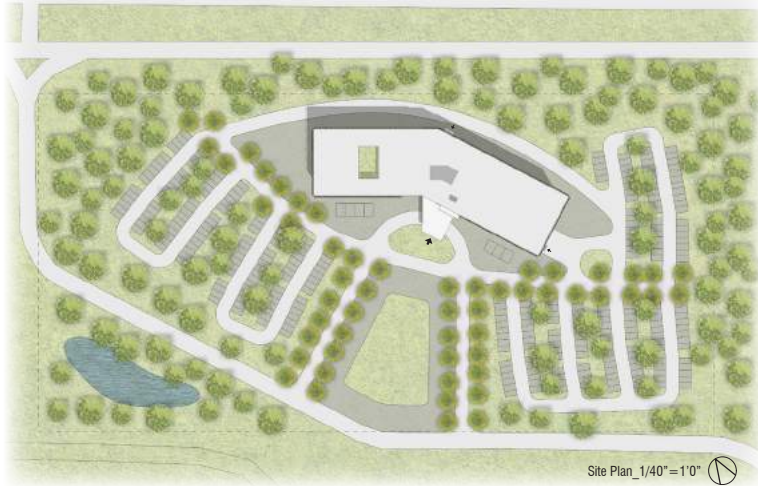




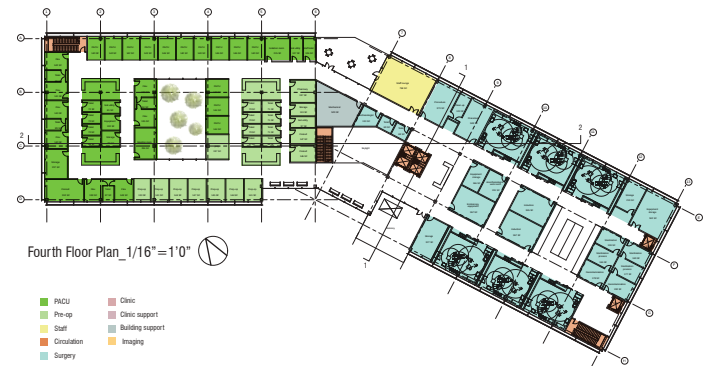
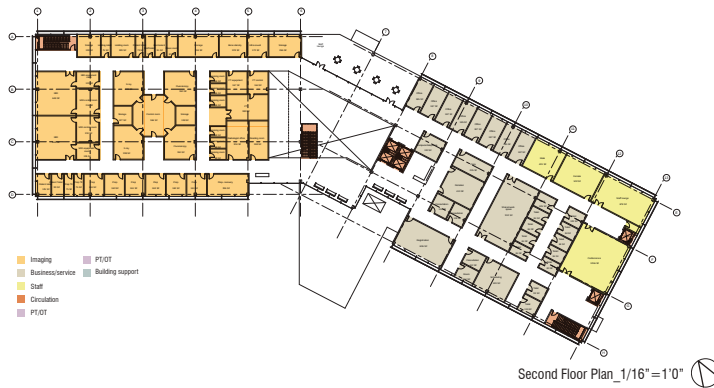
07 STUDENT DESIGN SOLUTIONS

First year students in the Architecture + Health Studio presented their final designs at a review at the Clemson Design Center in Charleston on December 5, 2016. Faculty, healthcare professionals, architects and fellow students took part in the final critique for the culmination of the ambulatory surgery center project proposal for the Medical University of South Carolina's Musculoskeletal Institute in West Ashley. The following pages represent the student work presented at the Fall 2016 final review.

EMBRACING NATURE



Stacking and patient journey





South facade



North facade



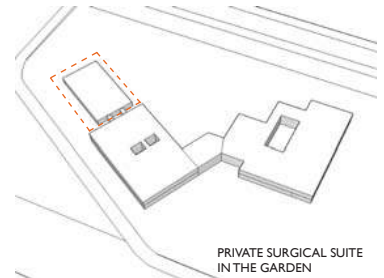
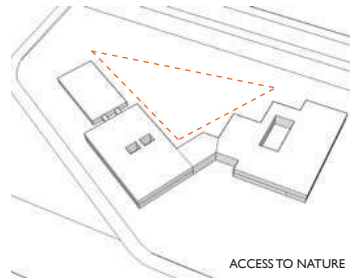
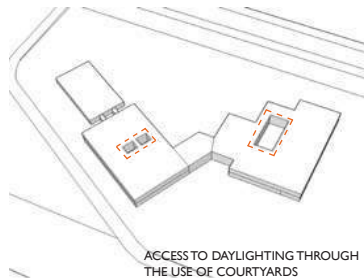
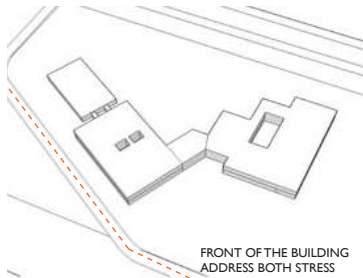
Section 2-2



SURGERY IN THE GARDEN



GOALS







PRE-OP & POST-OP



SURGICAL SUITE



IMAGING



ORTHO CLINICS



SPECIALTY CLINICS



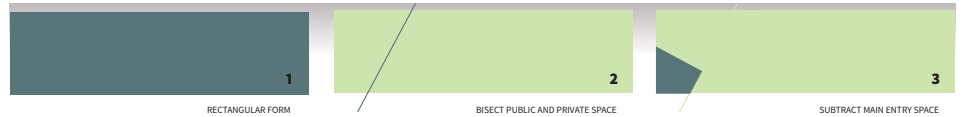
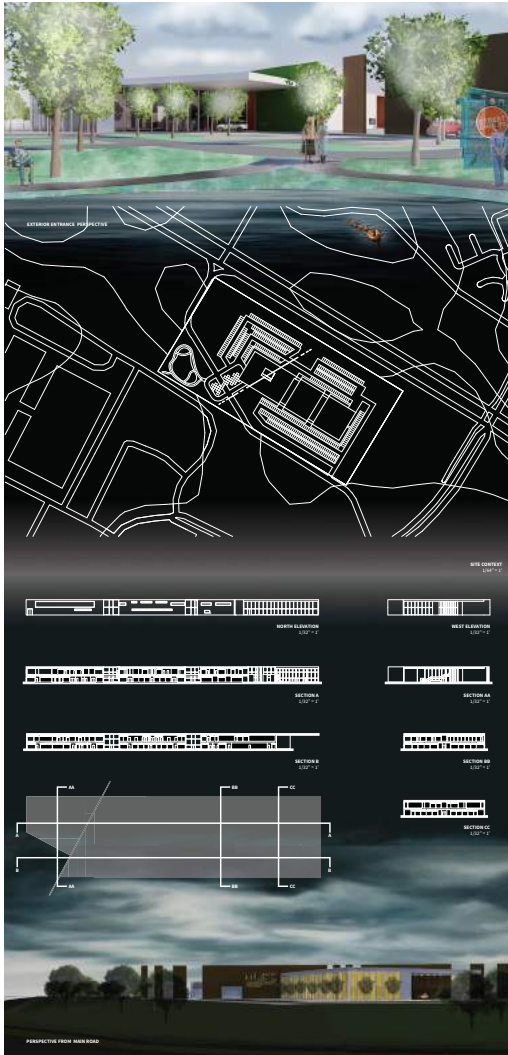
FIRST FLOOR STRUCTURAL PLAN



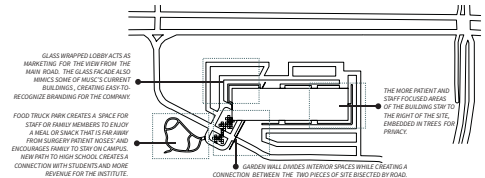
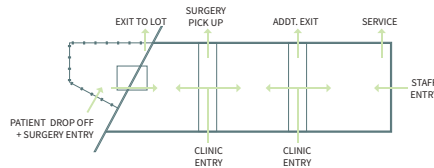
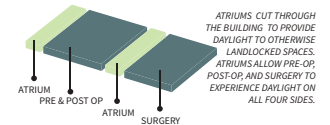
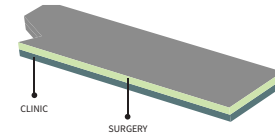
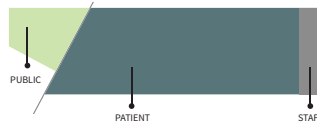
FIRST FLOOR PLAN: 1/32" = 1'



GARDEN WALL PAVILION



EVOLUTION OF BUILDING FORM

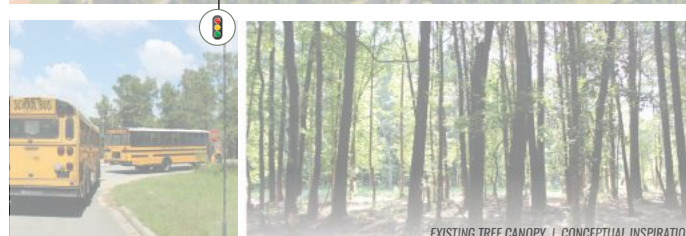
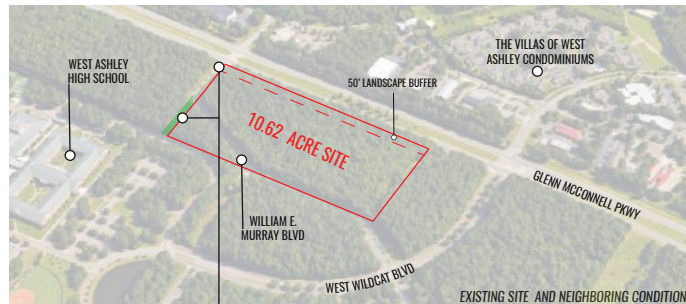




SURGICAL CANOPY



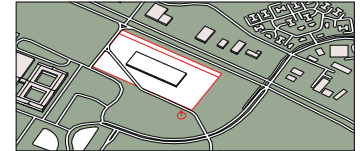
OFFERING SHELTER IN A TIME OF NEED IS A GESTURE THAT REPRESENTS THE HIGHEST FORM OF RESPECT, KINDNESS, AND CARE. TRADITIONALLY, ACROSS THE SOUTHEASTERN U.S., A PLACE TO OFFER NEIGHBORS A WELCOMING INVITATION IS THE FRONT PORCH, AND SURGICAL CANOPY IS THE COMFORTABLE PORCH FOR ALL NEIGHBORS IN THE WEST ASHLEY, CHARLESTON COMMUNITY. AN ENTRY SHELTER IS BOTH THE THRESHOLD AND CONNECTION BETWEEN FOUR BUILDINGS OF AN AMBULATORY SERVICES CAMPUS MASTERPLAN FOR THE MEDICAL UNIVERSITY OF SOUTH CAROLINA (MUSC). THE DESIGN PROJECT INCLUDES A 40,000 sf ORTHOPEDIC AMBULATORY SURGERY CENTER (ASC) FOR MUSC's MUSCULOSKELETAL INSTITUTE AS WELL AS AN IMAGING CENTER, ORTHOPEDIC CLINIC AND SPECIALTY CLINIC. THE ASC IS PLANNED TO INCLUDE 6 OPERATING ROOMS, 2 PROCEDURE ROOMS AND A TOTAL OF 29 PRE-OP, POST-OP, AND FLEX ROOM BAYS.



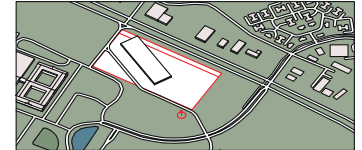
OPERATIVE VERB DIAGRAMS

AMBULATORY SURGERY CENTER
IMAGING CENTER
MEDICAL OFFICE BUILDINGS

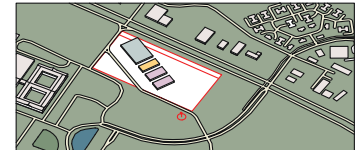
1. MASS



2. ROTATE



3. DIVIDE



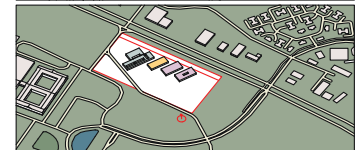
4. SHIFT



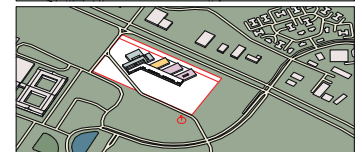
5. SUBTRACT



6. EXTRUDE



7. SHELTER



SITE PLAN

SCALE: 1/32" = 1' - 0"

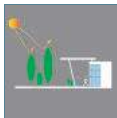


EXTERIOR FORMAL DESIGN DRIVERS

"PLUG AND PLAY" OPPORTUNITY
ESTABLISHING A BUILDING TYPOLOGY
FOR PHASED FUTURE CONSTRUCTION



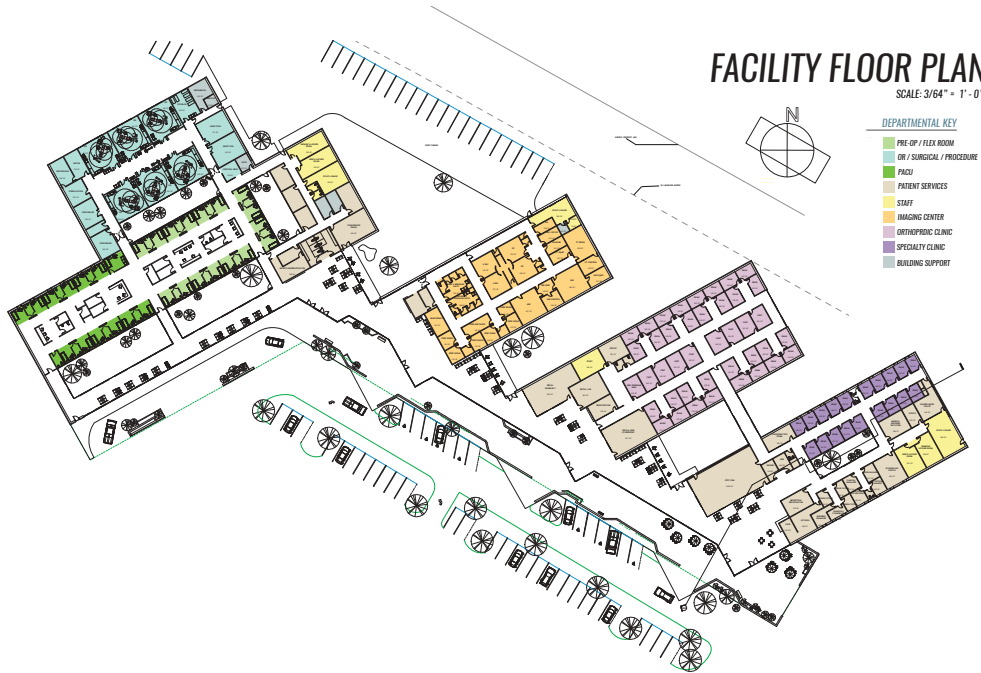
MICROCLIMATE ENTRY
CREATING A SHADED AND COMFORTABLE ENTRY
THRESHOLD USED AS A GARDEN WALKWAY



FACILITY PERSPECTIVE VIEW



GARDEN WALKWAY AT SPECIALTY CLINIC ENTRANCE



INTERIOR SCHEMATIC DESIGN DRIVERS



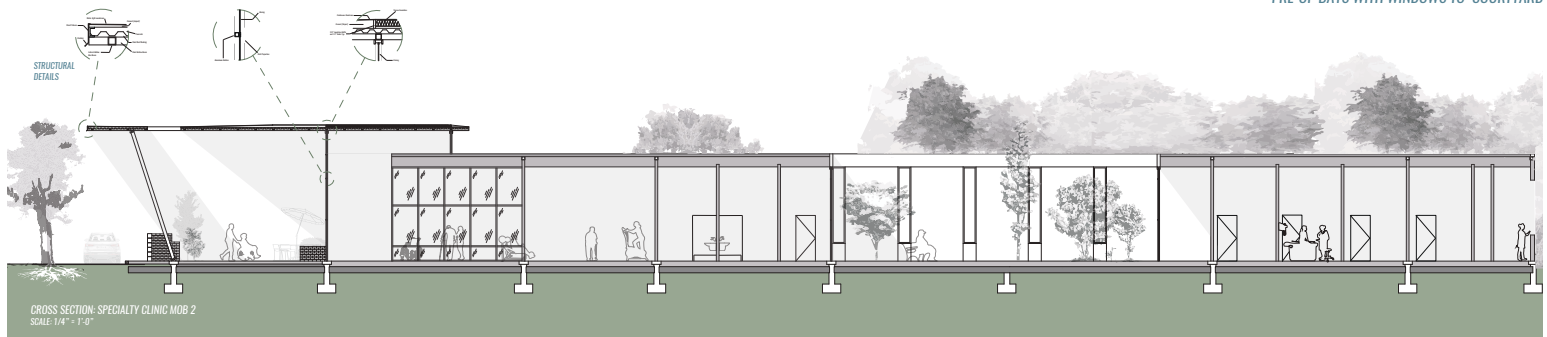
DAYLIGHT IN EVERY OR
ALLOWING NATURAL LIGHT TO ENTER ALL SIX OPERATING ROOMS FOR PATIENTS AND STAFF



A WINDOW IN EVERY BAY
PROVIDING PATIENTS AND CARE MEMBERS A VIEW FROM ALL PRE-OP, FLEX ROOM AND RECOVERY BAYS



PRE-OP BAYS WITH WINDOWS TO COURTYARD



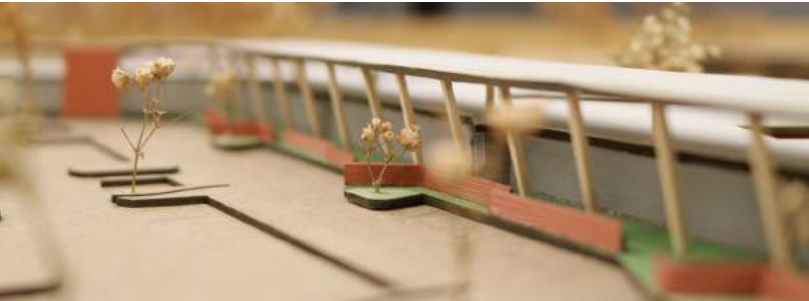
AMBULATORY SURGERY CENTER

KEY SPACES

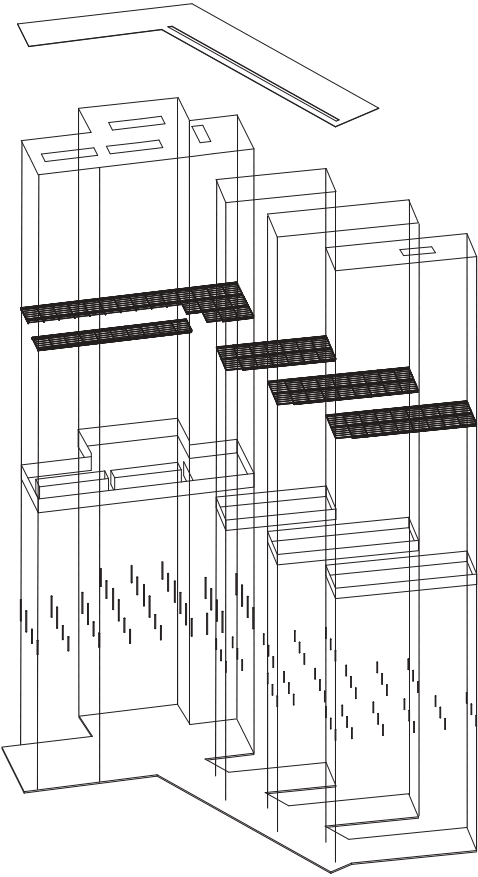
OR x 6 (613 sf - 641 sf)
 Pre-Op x 8 (116 sf)
 23-hr Flex Room x 8 (116 sf)
 PACU x 13 (116 sf)
 Induction Room x 2 (417sf - 423sf)
 Procedure Room x 2 (293 sf)

FLOW AND DISTANCE ANALYSIS

- PATIENT:**
 - Entrance to registration: 45 ft
 - Registration to waiting area: 15 ft
 - Waiting area to pre-op: 60 - 100 ft
 - Post-op to pick-up: 50 - 120 ft
- FAMILY:**
 - Entrance to registration: 45 ft
 - Registration to waiting area: 15 ft
 - Waiting area to post-op: 60 - 120 ft
- STAFF:**
 - Pre-op to OR: 60 - 120 ft
 - OR to post-op: 60 - 160 ft



ASSEMBLY SYSTEM DIAGRAM



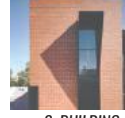
6. GARDEN WALK CANOPY ROOFING



5. METAL ROOF DECKING



4. STEEL TRUSSES AND BEAMS



3. BUILDING ENVELOPE



2. STEEL HOLLOW TUBE COLUMNS

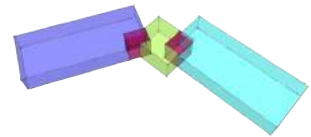
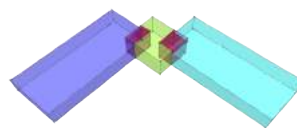
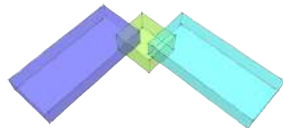
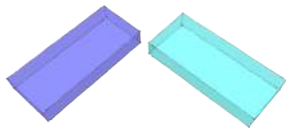


1. CONCRETE SLAB

ARCHITECTURAL JOINT



The Joint





The two different programmatic elements, the Orthopedic Ambulatory Surgery Center and the Medical Office Building are connected through a “joint”. This joint functions as an atrium that becomes a welcoming lobby filled with daylight for patients, staff, and visitors. The MOB and ASC are framed by a thick roof and wall system that encompasses a long span of glazing. These boxes penetrate into the atrium forming the waiting spaces within the lobby.

The large atrium also addresses the main intersection. Situating the building to address the corner maximizes frontage and marketing exposure for MUSC.

Louvers are utilized on the long spans of glazing to provide sun protection as well as privacy. The louvers vary depending on the level of privacy needed on the interior, creating a change in the facade. Throughout the facility, the patient and staff experience is enhanced through the use of daylight.



Second Floor Waiting Area



Surgical Suite Circulation



First Floor Plan

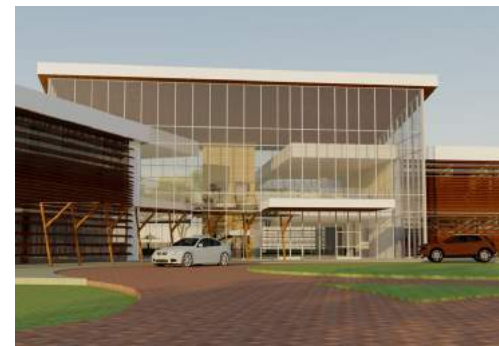
- | | |
|--|---|
|  specialty clinic |  business/ patient services |
|  ortho clinic |  imaging |





Second Floor Plan

- | | |
|---|--|
| PACU | Surgery / Procedure |
| prep | Staff |



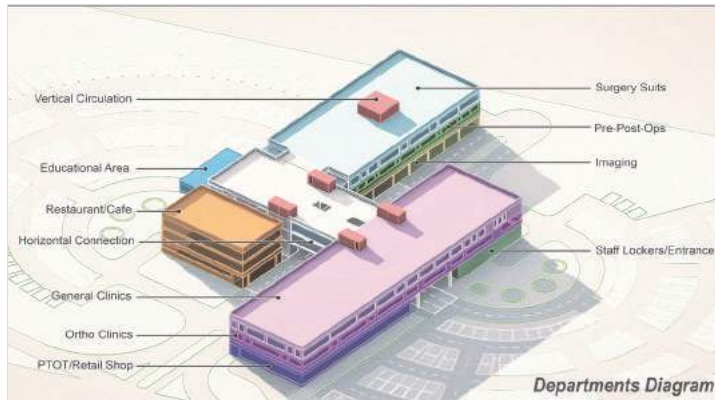
Entry Plaza and Drop-off



THE BRIDGE



In this project, objective was a comprehensive design for MUSC Musculoskeletal and Medical Office building including Surgery Suites, Pre/Post-Ops, Imaging, Orthopedics and General Examination rooms, PT/OT Gym, Retail Shops and Restaurant/Cafe. Project is located in West Ashley in Charleston.



Project consists of two main departments. Ambulatory Surgery Center and Medical office Building. A bridge between two buildings plays a connecting role and provide more access to different departments and restaurant/cafe.



Two volumes are located as different departments and connected by a transparent bridge which acts as the main lobby for registration and reception plus connection between departments.



First Floor

ASC: Main Imaging
 MOB: Staff Locker/Entrance, PT/OT, Retail Shops
 Community Building: Restaurant Counter/Order



Second Floor

ASC: Pre-Op/Post-Op/Flex Rooms, Educational Department
 MOB: Orthopedic Examination Rooms
 Community Building: Restaurant
 Bridge: Main Lobby plus Registration/Reception, Staff Lounge



Third Floor

ASC: Surgery Suits, Surgery Staff Lockers
 MOB: General Examination Rooms, MOB Imaging
 Community Building: Cafe
 Bridge: Staff Lounge, Patient Family Waiting Area

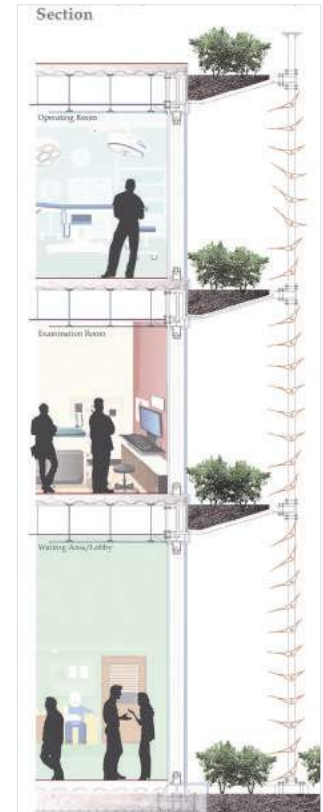


Lobby and Registration/Reception

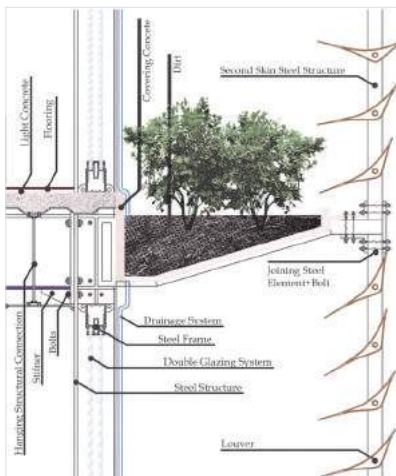


South-East Elevation

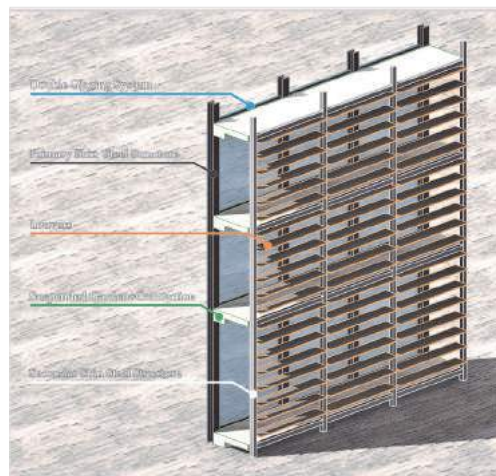
Parametric Modular Louvers are design to let more light into MOB departments specially public spaces and Examination rooms. On the other side Louvers allow very less light on Imaging departments and very limited amount of natural light into surgery suits and Pre-ops/Post-ops. Buildings are covered by a series of Parametric Modular Louvers in order to enable building provide best natural condition for each space based on its lighting needs.



A series of gardens fill the 4 feet space between louvers and building transparent facade.



Gardens Structure detail for connection to louvers modular structure and building slab.



General formation and connection of facade elements.



Detail physical detail model shows and tests practicality of details designed for green double skin facade.

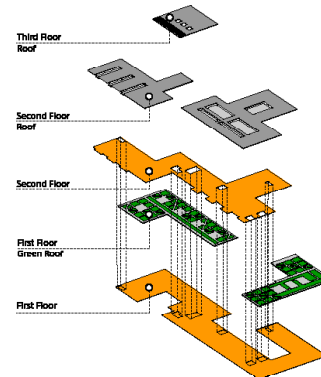
AMBULATORY PAVILION



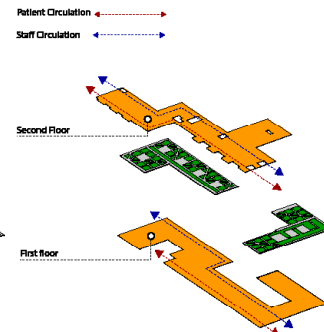
The semester long Ambulatory Service and Medical Office Building project is based off of project needs for the Medical University of South Carolina's (MUSC's) Musculoskeletal Institute and their future Orthopedic Ambulatory Surgery Center. Approximately 40,000sf is allotted to the surgery center and another 40,000sf is given to the MOB. In addition, the 80,000 sf project also includes spaces for the imaging department, medical offices, staff amenity spaces and a cafe. The design takes in consideration the future expansion if the operating room and clinics. The operating room will eventually expand from 2 O.R.s to 6 O.R.s. The O.R.s will have windows to bring in natural light.

The use of daylight was crucial to the design of this building. This outpatient facility is focused on providing quality patient-center care while given healthcare staff a functional and health work environment. The building uses the cabin-concept for pre-op and post-op area, an European work core for the O.R.s. and the pod concept for the clinics.

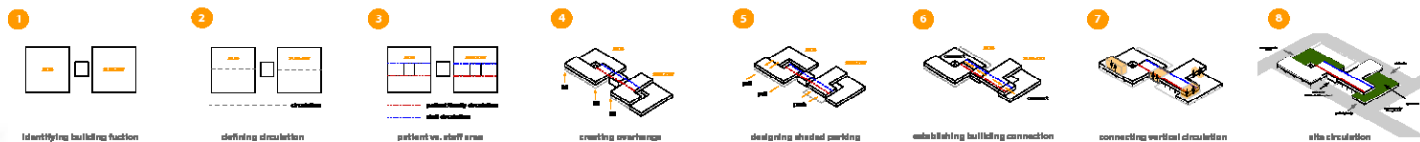
Vertical Circulation



Patient & Staff Circulation



LEFT: 2nd Level Lobby



The goal of the project is to address MUSC's space program needs while using a holistic approach to understanding what a healing environment should be. To do this, the program addresses the integration of medical innovations and deal with the internal and external influences that define a healing environment. The project also has an larger impact on the community as a whole and should address issues of topography, vegetation while paying homage to the importance of this specific site and its contextual significance in West Ashley area of Charleston, S.C.



Ground Level



2nd Level



ABOVE: Operating Room with view | BELOW: 2nd



MUSCULOSKELETAL INSTITUTE



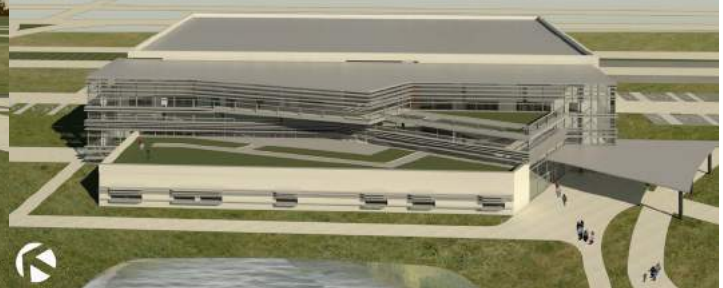
LEVEL 03



LEVEL 02



LEVEL 01



SUPPORT THE NEEDS OF
PATIENTS, FAMILY, AND
STAFF ALIKE



PROVIDE DIFFUSE LIGHT TO
WORK AREAS, AND RAYS OF
LIGHT IN PUBLIC SPACES



ENCOURAGE PATIENT
MOVEMENT, MINIMIZE
BUILDING FOOTPRINT



CONNECTING SPINE

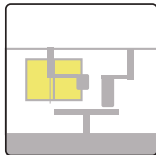
DESIGN GOALS



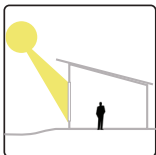
LANDMARK COURTYARDS



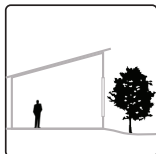
PARKING IN THE PARK



WINDOWS IN ORs AND
RECOVERY AREAS



EMPHASIS ON DAYLIGHTING



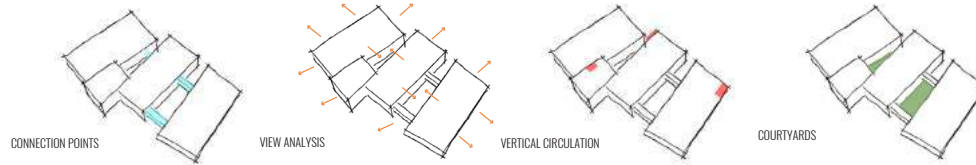
CONNECTION TO NATURE



FRONT ENTRANCE + DROP OFF

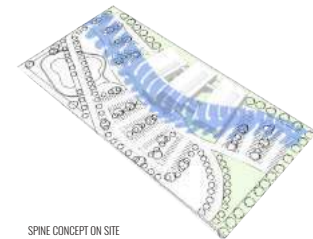
This design for the Medical University of South Carolina Orthopedic Musculoskeletal Institute and Ambulatory Surgery Center in West Ashley, SC was inspired by the structural form of the human spine, echoing the geometry of the vertebrae and disks within the building's plan and section. Welcoming patients and family, the center creates a home-like feel with its warm tones on the exterior wood rainscreen and fiber cement paneling. The design allows for ample daylighting with the use of glazing throughout. To emphasize access to nature, two courtyards define the circulation of the building and enables an indoor/outdoor connection to views throughout the surgery center.

BUILDING FORM

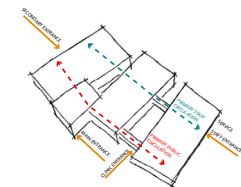


CORRIDORS WITH DAYLIGHT

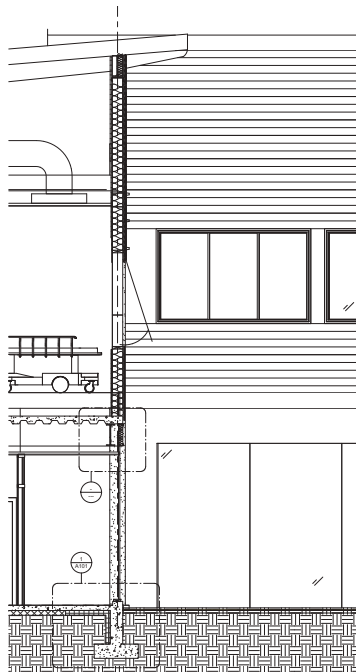
LOBBY



SPINE CONCEPT ON SITE



CIRCULATION - 1ST FLOOR



WALL SECTION

- SURGERY
- STAFF
- SUPPORT
- PRE-POST OP
- IMAGING
- VERTICAL CIRCULATION
- SPECIALTY CLINIC
- ORTHOPEDIC CLINIC



1ST FLOOR PLAN ON SITE



POST AND PRE-OP UNIT



LONGITUDINAL SECTION

CROSS SECTION THROUGH OR DEPARTMENT



2ND FLOOR PLAN



SITE PLAN



2ND FLOOR BALCONY



PATIENT AND STAFF FLOWS 2ND FLOOR



FRONT ELEVATION

