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Proposed Design Team and Organization

TEAM

BBH Design has extensive experience in recent projects of similar scope and scale to the proposed Clemmons Medical Center Phase II Addition. The strength of our team is our comprehensive understanding of surgery centers and emergency departments, our strong local presence, implementation of research-informed design, and established relationships with key members of Novant Health.

BBH Design is an innovative leader in the planning and design of high performance healing environments. As a trusted partner, we have accomplished the following milestones related to your project:

- Novant Haymarket POE- immediate translation of post occupancy evaluation (POE) research.
- WakeMed North Hospital ESM – a 61-bed LEED for Healthcare Silver hospital featuring energy savings measures (ESM) that is projected to save $237,132 each year.
- LEAN Design for Freestanding ED - efficient design for a logistically challenging site and saved $ 1,000,000 in capital costs. A 2014 recipient of an Eagle Award from ABC of the Carolinas and a National First Place Eagle Award from ABC for Excellence in Construction Award.

BBH Design integrates rigorous research into every healthcare project using simulation, GIS-based analysis, space syntax assessment, post-occupancy evaluation, survey research, behavior observation, and mock-ups to assure return on investments.

BBH Design creates collaborative project environments through our Process Design methodology that encourages communication, empowers ownership and holds stakeholders accountable. In addition to Process Design, Scott Garand spearheads our LEAN initiatives and Kaizen events for operational efficiencies. Scott has recently facilitated three (5) day Lean Kaizen Events including a freestanding Women's Hospital and two Inpatient Emergency Departments.

BBH Design utilizes BIM technology including electronic specs and integrated room data sheets to deliver over 1,000,000 SF of healthcare space leading to an industry reputation of well-coordinated documents that mitigate costly revisions during construction.
Proposed Design Team and Organization

STIMMEL
Stimmel is a full service Landscape Architecture, Land Planning & Civil Engineering firm with more than 28 years of experience in more than 150 communities in the southeast. With our expert professional staff of 30, including Licensed Landscape Architects & Civil Engineers, LEED Accredited Professionals & former governmental regulatory officials, we help a broad range of clients determine what to build & where to build it. While our approach is grounded by practical experience, our objective is to create vibrant work integrated with the surrounding environment.

Stimmel has extensive healthcare site design experience ranging from neighborhood scale family practice facilities to completely new hospitals. Generally these projects include medical office buildings, regional dialysis centers, hospital expansions, cancer centers, healthcare amenities such as healing gardens and courtyards, central energy plants, material management, etc. As a result, we've developed work that is compelling, financially viable, and environmentally appropriate.

As the site work engineer of record for the Village Point infrastructure, Clemmons Medical Center Phase 1 and Novant Health Medical Office Building that recently completed construction in 2014, we are extremely familiar and educated with the site and its components.

Along with our extensive experience with Novant and the Clemmons Medical Site, we've worked on over 50 Medical Office Buildings, including 15+ for Novant Health. Recently completed healthcare projects include the Wesley Long Community Hospital Regional Cancer Center and Emergency Department Expansion, Moses H. Cone Memorial Hospital Central Energy Plant and new North 96 Bed Tower, the new Novant Hospital in Kernersville, and the new Wake Forest Baptist Health Hospital in Davie County.

MULKEY
Throughout our history, we have been fortunate to work with an impressive list of clients from both the public and private sectors, many in the healthcare industry. Some of our healthcare clients include the Veterans Administration, North Carolina Department of Health and Human Services, Carolinas Medical Center, UNC Healthcare, Duke University Medical Center, WakeMed Health & Hospitals, Rex Healthcare, and Harnett Health System. Mulkey takes great pride in the confidence our clients have shown in our firm, and we are pleased to be associated with such prominent projects as WakeMed North Campus, Fayetteville Veterans Administration Health Center, UNC Chapel Hill Biomedical Research Imaging Center, Duke University Medical Center School of Nursing, Harnett Health Hospital, NC Department of Health & Human Services Butner Psychiatric Hospital, and the award-winning WakeMed Apex Healthplex. We have also successfully completed a wealth of projects with architects throughout the southeast.

SYSKA HENNESSY GROUP
At Syska Hennessy Group, we create exceptional environments. With nearly 500 employees in 16 offices nationwide as well as internationally, we do this by focusing our high performance engineering, consulting and commissioning services on our clients’ business practices and challenges, creating projects that position them for success.

Drawing on 87 years of engineering experience, we have helped to shape the skyline in cities around the world. Creating building systems in some of the most iconic and technically-advanced buildings has taught us to balance a truly global perspective on best practices with a very clear focus on our clients and their specific needs.
Proposed Design Team and Organization continued

Organizational Chart

Provide an organization chart of the proposed project team who will be assigned; be directly involved, and responsible throughout the duration of the project.

Provide resumes for each member of the proposed design team. Please see the following pages for the team resumes which include: BBH Design, Syska Hennessy Group, Mulkey, and Stimmel Associates.
Richard Beale has over 35 years of architectural experience in a wide variety of project sizes and types in both new construction and renovations. Rich has served in a variety of roles on hospitals, medical clinics and institutional facilities, ranging in construction cost from under a million up to 500 million dollars. Rich is a certified healthcare architect through the American College of Healthcare Architects.

**Education**
- Master of Architecture
  - Washington University
- Bachelor of Science in Architecture
  - Clemson University

**Selected Experience**
- UPMC East - LEED Silver
  - New 156-Bed Hospital
  - 460-Space Parking Garage
- Rex Healthcare / UNC Health Care
  - Facility Master Plan
  - Surgical Facilities Expansion
  - Observation and Administration Renovation
  - C-Section Rooms
- WakeMed Raleigh Campus
  - Patient Tower
  - 4th Floor NICU Renovations
  - 12-Bed Adult Observation Unit Renovation
  - 14-Bed Emergency Department (ED) Holding Area
  - 4th Floor Neonatal Intensive Care Unit (NICU) Renovation
  - Pediatric Intensive Care Unit (PICU)
- WakeMed North Hospital
  - 61-Bed Women's Hospital

With more than 20 years in healthcare design, Scott has spent 100 percent of his career focused on strategic master healthcare facility planning and implementation. The foundation of his career includes a Master of Healthcare Architecture from Clemson University that included a focus on European healthcare system design. He has served as the Principal and Client Manager for approximately $300 million of projects to the industry. Recently, Scott has focused on Lean processes and Kaizen Events in order to help maximize hospital's operations and efficiencies in an effort to help expedite a project's speed to market.

**Education**
- Master of Architecture, Healthcare Studio
  - Clemson University
- Bachelor of Science, Design
  - Clemson University

**Selected Experience**
- Confidential Client
  - Greensboro, North Carolina
  - Certificate of Need, Women's and Children's Hospital
- Nash Memorial Hospital*
  - Free standing Women's Center Renovations
- Catawba Valley Medical Center*
  - Strategic Master Facility Plan
  - Women's Center Additions and Renovations
  - Surgery Center Additions and Renovations
  - Pediatric Unit Renovations
  - Lobby Additions and Renovations
  - Greystone Medical Office Building Renovations
- CMC-NorthEast*
  - Inpatient Rehabilitation Hospital
  - Strategic Master Facility Plan
  - Hayes Family Center – Women's Center Renovations
  - Jeff Gordon Children's Hospital
  - Surgery Center Additions and Renovations
  - Surgery Center Post Surgical Care Unit
  - Additions and Renovations
  - Batte Cancer Center and Ambulatory Center
  - Sanger Heart Clinic
  - Dietary Renovations
  - Pharmacy Renovations
  - Linear Accelerator Equipment Replacement
  - Electrophysiology Equipment Replacement
  - Cath Lab Renovations
  - Energy Plan Additions and Renovations
  - Employee Parking Deck
  - Visitor Parking Deck
ELIZABETH KOLEPP-MAYER, AIA, LEED AP BD+C
Senior Associate
Project Manager/Project Designer
BBH Design

Elizabeth has a diverse background in healthcare and higher education facilities. Her experience includes all phases of project development. Elizabeth’s recent experience includes being the Project Manager and Designer for an Ambulatory Surgery Center prototype, in which multiple design drivers such as corporate goals, end-user feedback and research findings were used to create a system-specific solution. She is sensitive to the important balance of finding efficiencies in system-wide standardization, yet continuing to improve patient care through cutting edge technology and innovative, flexible built environments.

Education
Bachelor of Architecture
Bachelor of Environmental Design in Architecture
North Carolina State University

Selected Experience
Novant Health
• Haymarket Medical Center POE
• Mint Hill Medical Center Pre-design

WakeMed Raleigh Campus
• Patient Tower
• Pharmacy Renovation

Rex Healthcare/UNC Health Care
• The North Carolina Cancer Hospital at REX
• The North Carolina Heart and Vascular Hospital at REX

WakeMed Knightdale Healthplex
WakeMed North Healthplex Cysto
Medical University of South Carolina
• Pediatric Clinic Offices
• Physical Therapy/Occupational Therapy Suite
• Pharmacy Clean Room

University of North Carolina Hospitals
• Peripheral Vascular Lab Renovation

ESPERANZA HARPER, EDAC, LEED GA
Healthcare Planner
BBH Design

Esperanza is an experienced healthcare planner with a passion for designing healing environments. She has worked on a variety of projects from hospital master planning and mobile clinics to ambulatory surgery centers and full hospital renovation and expansion projects. She is able to effectively coordinate with clients to meet and exceed their needs and goals. Esperanza keeps abreast of healthcare design trends and evidenced-based research to guide her efforts in planning. Her knowledge of the healthcare field aids her in planning effective and innovative strategies for facilities.

Education
Master of Architecture
University of Michigan

Bachelor of Arts in Art History; Minor in Architectural Engineering
Tufts University

Selected Experience
UNC Hospitals
• Perioperative Building

Rex Healthcare/UNC Health Care
• The North Carolina Heart and Vascular
• Hospital at REX

UPMC East
• New 156-Bed Hospital
• Physical Therapy Rehab Unit
• Wiser Room

WakeMed North Hospital
• WakeMed Raleigh Campus
• Patient Tower
• Women Services Study
• OR Study

Crittenton Hospital
• Expansion and Renovations
• Master Facilities Plan

CHD Meridian
• Wellness Center
Michael is Mulkey’s building structures group manager. He has over 16 years of progressively responsible experience in engineering design, structural project management, construction management, and client relationship development in the building industry. He combines excellent technical, analytical, problem solving, and engineering qualifications with practical construction detailing. Michael has provided structural engineering services for a vast array of healthcare projects.

**Education**
B.S., Architectural Engineering – Structures and Construction Management, The Penn State University

**Selected Experience**

- **WakeMed Raleigh Campus**
  Patient Tower

- **Harnett Health System**
  Central Campus Hospital Facility

- **Spring Valley Hospital**
  Bed Tower
  Surgery Center
  Administration Building

- **Randolph Hospital**
  Cancer Center and Outpatient Center Addition

- **North West Texas Heart Hospital**
  Heart Hospital Addition

- **Fort Duncan Hospital**
  Bed Tower
  Administration Building

- **Desert Springs Hospital**
  Bed Tower Addition

- **Del E. Webb Women’s Center and Bed Tower Addition**

- **WakeMed North Emergency Department**

- **Fayetteville VA Healthcare Center**

- **George Washington University**
  Replacement Hospital

- **Palmdate Medical Center**
  Bed Tower
  Surgery Center
  Administration Building

- **Inland Valley Medical Center**
  CCU Addition
  Bed Addition

- **CMC**
  Union Medical Office Building
  Harrisburg Pavilion
  Kannapolis Pavilion
Capacity to Complete the Project

Describe your firm's current and projected volume of work as it relates to this project and the proposed team's ability to provide high quality professional service within the project schedule.

Maintaining a high level of service is a key factor in our practice. In order to maintain that level of excellence, BBH Design only accepts work that we can complete according to client goals and expectations. With 16 registered architects and 15 LEED accredited staff members, we have highly skilled professional staff available to dedicate to the Clemmons Medical Center Phase II Addition, and we welcome the opportunity to service the needs of Novant Health in this important endeavor.

RECOMMENDED TEAM MEMBERS

<table>
<thead>
<tr>
<th>CLIENT</th>
<th>ROLE</th>
<th>PHASE</th>
<th>WEEKLY HOURS</th>
<th>DURATION</th>
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<tbody>
<tr>
<td><strong>Rich Beale, ACHA - BBH Design Partner-in-Charge</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Novant Health ASC</td>
<td>Partner in Charge</td>
<td>PD</td>
<td>4</td>
<td>5 Months</td>
</tr>
<tr>
<td>WakeMed North Hospital</td>
<td>Partner in Charge</td>
<td>CA</td>
<td>2</td>
<td>1 Month</td>
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<tr>
<td>NHCMC - Phase II Addition</td>
<td>Partner in Charge</td>
<td></td>
<td>2</td>
<td>24 Months</td>
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<tr>
<td><strong>Scott Garand, AIA - BBH Design Principal in Charge</strong></td>
<td></td>
<td></td>
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<tr>
<td>Cone Health</td>
<td>PIC</td>
<td>PD</td>
<td>18</td>
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<td>New Hanover ED Addition</td>
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<td>CD</td>
<td>2</td>
<td>2 Months</td>
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<tr>
<td>NHCMC - Phase II</td>
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<tr>
<td><strong>Elizabeth Kolepp-Mayer, AIA, LEED AP BD+C - BBH Design Project Manager/Designer</strong></td>
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<td></td>
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<td>Novant ASC</td>
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<td>PD</td>
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<td>5 Months</td>
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<td>PD</td>
<td>DD</td>
<td>20</td>
<td>9 Months</td>
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<td>NHCMC - Phase II</td>
<td>PM/PD</td>
<td></td>
<td>10</td>
<td>24 Months</td>
</tr>
<tr>
<td><strong>Jason Kolano, AIA - BBH Design Project Architect/Construction Administrator</strong></td>
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<td></td>
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<tr>
<td>Cone Health</td>
<td>PM</td>
<td>PD</td>
<td>12</td>
<td>5 Months</td>
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<td>PM/PA</td>
<td>CD</td>
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<td>PA/CA</td>
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<td><strong>Esperanza Harper, EDAC - BBH Design Planner</strong></td>
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<td>20</td>
<td>2 Months</td>
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</tbody>
</table>
Project Experience

Describe not less than three (3) and no more than five (5) recent projects in your firm’s design portfolio in the past three years that most closely match the size, scale, and complexity of Novant Health’s project.

<table>
<thead>
<tr>
<th>Project</th>
<th>Size</th>
<th>Design Cost</th>
<th>Construction Cost</th>
<th>Total Project Cost</th>
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</thead>
<tbody>
<tr>
<td>UPMC Lemieux Sports Complex / MOB</td>
<td>185,000 sf</td>
<td>Confidential</td>
<td>Confidential</td>
<td>N/A</td>
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<tr>
<td>WakeMed North Campus</td>
<td>MOB, MOB/Deck, Hospital Phases 1-4</td>
<td>$5,000,000</td>
<td>Phases 1-4</td>
<td>$53,000,000</td>
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<tr>
<td>UPMC East</td>
<td>300,000 sf (Hospital) 11,603 sf (Parking Garage)</td>
<td>Confidential</td>
<td>Confidential</td>
<td>250,000,000</td>
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<tr>
<td>Carolinas HealthCare System SouthPark Freestanding Emergency Department</td>
<td>29,500 sf Emergency Dept 93,440 sf Overall</td>
<td>$1,038,000</td>
<td>$18,000,000</td>
<td>$28,000,000</td>
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<tr>
<td>New Hanover Regional Medical Center Campus Development</td>
<td>28,000 sf Emergency Dept 26 acre Master Plan</td>
<td>$960,000</td>
<td>$11,200,000</td>
<td>$15,000,000</td>
</tr>
</tbody>
</table>
A Pittsburgh professional hockey team and UPMC are teaming to build a “first-of-its-kind” sports performance medical office building and practice rink, with the goal of making it the top spot in the country for hockey-related training, injury treatment and prevention.

The center will be geared primarily toward hockey players, but open to other athletes from the western Pennsylvania region as well. There will be programs to help players improve specific hockey-playing techniques.

The sports medicine side will help with the prevention and treatment of hockey-related injuries. The complex will offer expert care in orthopaedics, concussion management, physical and occupational therapy, imaging and sports-performance training. This will be the first facility in the United States dedicated primarily to hockey and the rehabilitation of hockey related injuries.

**Design Timeline:**
- Schematic Design: 5 months
- Design Development: 3 months
- Construction Documents: 6 months
- Anticipated opening: August 2015

**REFERENCES**

Mr. Joseph T. Badalich, Senior Project Manager
412 372-1742
UPMC Lemieux Sports Complex continued
Cranberry, Pennsylvania

Level 1

Level 2
The WakeMed North Campus design creates a health campus that links the built environment with WakeMed’s core values of image and accessibility.

Phase 1: The WakeMed North Healthplex is a 105,000-square-foot facility containing medical offices, rehabilitation, radiology, and an ambulatory surgery center.

Phase 2: A 20,000-square-foot Emergency Department and a 10,000-square-foot Radiology Department are the first stand-alone emergency department in North Carolina.

Phase 3: The 80,000-square-foot Physicians Office Pavilion was envisioned as an extension of the Original development for WakeMed.

Phase 4: 61-bed Acute Care Hospital focusing on women’s health with the following services: LDR (Labor-Delivery-Recovery), C-section, Level II Nursery, Emergency (existing), Surgery (existing), Dietary, Lab, Pharmacy, Pre-Admission Testing and Imaging (partially existing). The project includes a main entry, phased renovations of 42,700 SF, horizontal and vertical additions of 131,600 SF, and a central energy plant. The project has submitted for LEED for Healthcare Silver and projects a $237,132/year savings in energy each year.

REFERENCES

Mr. Tom Cavender, PE, VP of Construction and Design, 919 350-8098
Ms. Carolyn D. Knaup, RN, MHA, VP of Ambulatory Services, 919 350-8000
Project Experience continued

WakeMed North Hospital continued
Women’s Health Floor Plans (Phase 4)
Specialized and Appropriate Expertise

Provide examples of measurement tools your firm brings to the project, to measure operational success of the design, such as improvements in patient safety, improvement in HCAHPS scores, and operational efficiencies.

RIGHT SIZING INPATIENT ROOMS
UPMC EAST HOSPITAL

INTRODUCTION

The patient room is one of the largest investments a hospital will make, with the design decision multiplied dozens, even hundreds of times. The challenge that the BBH Design team faced at UPMC East was to balance performance and cost, assuming that at some point there are diminishing returns on how much performance is enhanced by an increase in size and cost.

BIGGER ≠ BETTER

The new equation needs to be economically viable and offer value over the long term, suggesting bigger does not always mean better.

OBJECTIVES

The first challenge for a patient room prototype was to find the right size and layout that would be patient and family centered while delivering capital and operational savings. The average patient room size in the U.S. has seen a steady increase of 33% since 2002. But has this translated into improved patient safety and satisfaction outcomes?

METHODS

• Facility Benchmarking: Compared patient room square footage across the UPMC system and non-UPMC facilities
• Mock-Up Experiments: A series of progressive mock-ups allowed the team, project executives, and caregivers to test performance against pre-defined patient/family centered criteria
• Cost Analysis: Evaluated capital, operational, maintenance, and energy savings achieved by right-sizing all of the 156 patient rooms in the facility
• Space Syntax Analysis: Mathematically calculated effects of the right-sizing on safety, communication, collaboration, and work flow efficiency
• Retrospective Research: Compared patient safety, and HCAHPS satisfaction

UPMC East was committed to a more space-efficient option knowing that wasted square footage was a luxury they could no longer afford. The design team ultimately zeroed in on a 220 sf patient room, which represents an 80 sf savings per room.
IMPLICATIONS

SAVINGS

As a direct result of the right-sizing of the patient room research, it is estimated that UPMC East will save $4.9 million in capital costs as well as $8.7 million in operational costs over the next 50 years. Right-sizing also will yield an estimated $1 million dollars in energy savings the next 10 years of operation, which equates to $5 million over the building’s overall life.

DESIGN + LAYOUT

Space syntax analysis was performed on several UPMC facility floor plans, including UPMC East in order to evaluate right sized units and their potential impact on patient centered care. The analysis indicated that visibility into patient rooms was considerably higher at UPMC East and that its corridor system was easier to both understand and navigate. Higher corridor-to-patient visibility may have contributed to higher patient satisfaction. Specifically, caregivers may be more responsive to patients’ needs because it is easier to see a greater number of patients from UPMC East corridors.

PATIENT SAFETY + SATISFACTION

Using archival data from UPMC hospitals, the team discovered that the 220 sf rooms at UPMC East didn’t register as a negative in HCAHPS scores. Compared to peers across the UPMC system, patients at UPMC East reported significantly greater satisfaction with responsiveness to their needs, better communication with nurses and a greater likelihood of recommending the hospital. From a quality and safety standpoint, patients at UPMC East had significantly fewer falls and readmissions.

4.92% HOSPITAL RATING OF 9-10
3.82% DEFINITELY RECOMMEND HOSPITAL
8.23% AVERAGE LENGTH OF STAY