

ELEMENT 19

COMMUNITY / UNIVERSITY HOSPITALBoca Raton Community Hospital – Community Affiliated Teaching Hospital @ FAUElement 1 and Element 2INTRODUCTION / MISSION and PROGRAM

FAU has entered into an agreement with University of Miami Miller School of Medicine (UMMSM) and the Boca Raton Community Hospital (BRCH) to develop a regional campus for the purposes of medical education of students and residents (and potentially other health professionals). BRCH seeks to relocate onto the FAU campus and build a new community/university hospital. This will enable the regional medical campus to have access to a state of the art teaching hospital to achieve the objectives of responding to the physician shortage in the state, develop a new curricular experience emphasizing chronic and comprehensive care as well as interdisciplinary education. It will also provide FAU with additional conference and teaching space for the medical education program and provide FAU biomedical scientists to become more competitive for extramural research funding. Other FAU components will also have opportunity to participate in educational and research activities with the hospital as an integral component of the campus.

Element 4 – Future Land Use

The purpose of this element is to describe the existing and future land use pattern to be developed on the University and to address how this land use pattern will be coordinated with that planned by the host community.

The following Site Development Plan, furnished by BRCH, illustrates the phased development pattern for the Community / University Hospital through the master plan horizon of 2016. See the accompanying Phasing Summary Drawing.

| Element | Beds/Spaces | Gross Square Feet | Year Construction Begins | Year Construction Complete |
|---|-------------|-------------------|--------------------------------------|----------------------------|
| Phase One Development - (2007 - 2011) | | | | |
| Hospital Phase I | 530-Beds | 1,250,000 | 2007 | 2011 |
| Medical Office Building I | | 150,000 | 2008 | 2009 |
| Parking Structure I | 1600-Spaces | | 2009 | 2010 |
| Total Area Phase I | | 1,400,000 | | |
| Floor Area Ratio - Phase I | | 0.85 | Developed Square Feet | 1,400,000 |
| Phase Two Development (2012 - 2013) | | | | |
| Hospital Phase II | 82-Beds | 200,000 | 2012 | 2013 |
| Medical Office Building II | | 150,000 | 2012 | 2013 |
| Parking Structure II | 3000-Spaces | | 2012 | 2013 |
| Sub-Total Area Phase II | | 350,000 | | |
| Floor Area Ratio - Phases I & II | | 1.06 | Developed Square Feet | 1,750,000 |
| Phase Three Development (2014 - 2016) | | | | |
| Special Services Hospital | 100-Beds | 250,000 | 2014 | 2016 |
| Medical Office Building III | | 150,000 | 2015 | 2016 |
| Sub-Total Area Phase III | | 400,000 | | |
| Floor Area Ratio - Phases I, II, & III | | 1.30 | Developed Square Feet | 2,150,000 |
| Floor Area Ratio - Total Development | | 1.40 | Total Developable Square Feet | 2,317,392 |

NOTES:

1. Calculations based on a 38-acre site (38-acres x 43,560sf = 1,655,280 sf).
2. Parking Structure areas are not included in the overall Floor Area Ratio Calculations.

Community Affiliated Teaching Hospital Site Development Plan

| Element | Beds/Spaces | Gross Square Feet | Year Construction Begins | Year Construction Complete |
|--|-------------------------|-------------------|--------------------------------|----------------------------|
| Phase One Development - (2007 - 2011) | | | | |
| Hospital Phase I | 530-Beds | 1,250,000 | 2007 | 2011 |
| Medical Office Building I | | 150,000 | 2008 | 2009 |
| Garage I | 1600-Spaces | | 2009 | 2010 |
| Phase Two Development (2012 - 2013) | | | | |
| Hospital Phase II | 82-Beds | 200,000 | 2012 | 2013 |
| Medical Office Building II | | 150,000 | 2012 | 2013 |
| Garage II | 3000-Spaces | | 2012 | 2013 |
| Phase Three Development | | | | |
| Special Services Hospital | 100-Beds | 250,000 | 2014 | 2016 |
| Medical Office Building III | | 150,000 | 2015 | 2016 |
| Totals | | 2,150,000 | | |
| | Floor Area Ratio | 1.4 | Developable Square Feet | 2,317,392 |

Element 5 – Academic Facilities

The purpose of the element is to ensure provision of academic facilities to meet University needs during the planning period.

Academic Hospital vs. Community Hospital (Provided by HKS)

Hospital square footage has steadily increased over the years. Ten years ago, the average size of a Hospital ranged from 1,600 – 1,800 building gross square feet (BGSF) / bed as noted by the sources identified below.

- According to *Healthcare Space Planning Newsletter* (June 1996), “national publications reported that the average space per bed was about 1,200 square feet” in mid 1992.
- Chi Systems (1991) reported that the Current Hospitals ranged in size from 1,400 – 1,600 SF/Bed and that Future Hospitals would range in size from 1,800 – 2,000 SF / Bed.

Due to new technology, patient and family–focused care initiatives, and code requirements, the BGSF / bed has steadily increased over the past ten years. According to TriBrook Healthcare Consultants (2004), “Hospital square feet per bed has increased from approximately 1,000 – 1,200 square feet in the early 1980s to about 2,200 to 2,400 square feet for hospitals being planned today.”

HKS has developed a database that is based on 12 Greenfield Hospital projects constructed between 1997 and 2005. The average BGSF / bed for Greenfield Hospitals is 2,163 BGSF/ bed. The majority of the Greenfield Hospital projects were community hospitals ranging in size from 100 – 300 beds. The BGSF / bed for academic hospitals is greater as depicted in the two examples of recent academic hospital building projects listed below:

- UCLA Ronald Reagan Medical Center (+525 beds):
 - 1,200,000 BGSF (without clinics)
 - 2,285 BGSF/Bed
 - 1,670,000 BGSF (with clinics that were built 10 years ago)
 - 3,180 BGSF/Bed
- Los Angeles County / University of Southern California Medical Center (600 beds):
 - 1,500,000 BGSF (with clinics)
 - 2,500 BGSF/Bed
 - Approved Budget: \$820,558,000 or \$1,367,597/Bed

In the June 30, 1988, *AHA Monitrends Report*, a square footage comparison was provided between non-teaching and teaching hospitals with 400 or more beds by region. Although the information is 17-years-old, it is interesting to note that the SF / bed for teaching hospitals was greater than non-teaching hospitals.

| <u>Division¹</u> | <u>Non-Teaching</u> | <u>Teaching</u> | <u>Percent Increase</u> |
|-----------------------------|---------------------|----------------------|-------------------------|
| <u>1</u> | <u>NAV</u> | <u>1,775</u> | |
| <u>2</u> | <u>974</u> | <u>1,482</u> | <u>52%</u> |
| <u>3</u> | <u>1,352</u> | <u>1,522</u> | <u>13%</u> |
| <u>4</u> | <u>1,254</u> | <u>1,631</u> | <u>30%</u> |
| <u>5</u> | <u>1,413</u> | <u>1,660</u> | <u>17%</u> |
| <u>6</u> | <u>1,399</u> | <u>Included in 7</u> | |
| <u>7</u> | <u>1,378</u> | <u>1,538</u> | <u>18%²</u> |
| <u>8</u> | <u>1,133</u> | <u>Included in 7</u> | |
| | | | |
| <u>Overall Average</u> | <u>1,272</u> | <u>1,601</u> | <u>26%</u> |

Notes:

1. Divisions listed above represent the following areas:

| <u>Division</u> | <u>Area / Region</u> |
|-----------------|--|
| <u>1</u> | <u>Upper New England</u> |
| <u>2</u> | <u>New York and Pennsylvania</u> |
| <u>3</u> | <u>Atlantic seaboard (includes Florida and Georgia)</u> |
| <u>4</u> | <u>Illinois, Indiana, Michigan, Ohio</u> |
| <u>5</u> | <u>Kentucky, Mississippi, Tennessee</u> |
| <u>6</u> | <u>Iowa, Missouri, Nebraska, North Dakota, South Dakota</u> |
| <u>7</u> | <u>Arkansas, Oklahoma, Texas</u> |
| <u>8</u> | <u>Rocky Mountain (includes Arizona, Colorado, New Mexico)</u> |
| <u>9</u> | <u>West Coast (Washington to California)</u> |

2. Percent represents the average of Divisions 6, 7, and 8.

Factors that contribute to the increase in BGSF / bed for academic hospitals, and specifically to Boca Raton Community Hospital, include:

- An Academic Hospital serves as the tertiary / quaternary facility for the region. As a result, an Academic Hospital will attract a greater number of inpatients and outpatients than would a Community Hospital.

In 2005, KaufmanHall was contracted by the Hospital to determine volume projections and future bed need for a strategic community hospital (SCH) and for a community affiliated

teaching hospital (CATH). As noted in the table below, bed need for the academic hospital option is greater than the community hospital option:

| <u>FY 2011</u> | | | | | |
|------------------------|-------------------|--------------------------|---------------------|-------------------------|---------------------|
| <u>Hospital</u> | <u>ICU</u> | <u>Med / Surg</u> | <u>Other</u> | <u>Telemetry</u> | <u>Total</u> |
| <u>CATH</u> | <u>43</u> | <u>257</u> | <u>66</u> | <u>159</u> | <u>525</u> |
| <u>SCH</u> | <u>39</u> | <u>233</u> | <u>60</u> | <u>143</u> | <u>475</u> |
| <u>Baseline</u> | <u>37</u> | <u>220</u> | <u>57</u> | <u>136</u> | <u>450</u> |
| | | | | | |
| <u>FY 2015</u> | | | | | |
| <u>Hospital</u> | <u>ICU</u> | <u>Med / Surg</u> | <u>Other</u> | <u>Telemetry</u> | <u>Total</u> |
| <u>CATH</u> | <u>52</u> | <u>306</u> | <u>78</u> | <u>189</u> | <u>625</u> |
| <u>SCH</u> | <u>46</u> | <u>269</u> | <u>69</u> | <u>166</u> | <u>550</u> |
| <u>Baseline</u> | <u>39</u> | <u>233</u> | <u>60</u> | <u>143</u> | <u>475</u> |

Similar to the bed need projections identified above, additional procedure rooms would be needed for diagnostic and treatment departments in the CATH facility option versus the SCH option. Additional square footage will be needed to support the increase in beds and procedure rooms associated with the CATH option.

- Academic Hospitals provide research services, both clinical and wet lab, which requires square footage that would not typically be found in a Community Hospital.
 - According to the 2003 Symposium on Healthcare Design (September 2003), the average net square feet (NSF) of wet lab space per principal investigator is 1,240 – 1,750 SF. Currently, there is no wet lab space planned within the space program of the new facility.
 - Currently, the Hospital’s Research Department is located off-site. In the future, the department director for Research projects that each specialty with a residency / medical student program will have its own clinical research program. Based on preliminary staffing estimates, Research will initially require 2,500 DGSF on the new medical campus.
- Medical Laboratory Planning and Design (1989) compared SF differences for a Laboratory located in a non-teaching hospital versus a university hospital. Comparisons were developed based on three distinct categories: FTE’s, procedures and inpatient beds.

Net Square Feet (Square Meter) Per FTE:

| <u>Most Hospitals</u> | <u>University Hospitals</u> |
|-----------------------|-----------------------------|
| 150 (13.8) | 180 (16.6) |

Net Square Feet (Square Meter) Per Procedure Performed:

| <u>Small Hospitals</u> | <u>Mid-Size</u> | <u>University Hospitals</u> |
|------------------------|-----------------|-----------------------------|
| 47 (4.3) | 52 (4.8) | > 57 (5.2) |

Net Square Feet (Square Meter) Per Bed:

| <u>Small Hospitals</u> | <u>Large</u> | <u>University Hospitals</u> |
|------------------------|-----------------|-----------------------------|
| 25-27 (2.3-2.5) | 30-37 (2.8-3.4) | > 40 (> 37) |

- Dedicated space for residents and medical students is required in an Academic Hospital. The dedicated space includes on-call rooms, lockers rooms, lounges, and resident chief offices. Based on draft room-by-room space programs developed for the Boca Raton Community Hospital replacement facility, examples of additional support space required for residents and medical students include:

On-call Rooms: Up to 27 on-call rooms have initially been identified by Medical Education for residents and medical students. Each on-call room with adjoining toilet / shower room will require 150 NSF. Based on 27 rooms, 4,050 NSF / 5,265 DGSF will be needed. A listing of the on-call rooms requested by Medical Education for each service is as follows:

- Medical / Surgical Nursing Units: 16 on-call rooms
 - Two on-call rooms per nursing unit floor are requested by Medical Education to support residents and medical students. For initial planning purposes, eight floors of two 30-bed medical surgical nursing units will be needed by 2015. This equates to 16 on-call rooms for residents and medical students serving the medical / surgical inpatient nursing units.
- Critical Care Nursing Units: A minimum of 4 on-call rooms
- Emergency Department: 2 on-call rooms
- Surgery Department: 2 on-call rooms
- OB Services: 3 on-call rooms (2 rooms for residents + 1 room for medical students)

Medical Education: Medical Education office has been requested for the new replacement facility that would house six Chiefs of Service, a Director and two Administrative Assistants. Approximately 2,100 DGSF is needed for this service, which is directly related to the residency program.

Medical Library: In most new community hospitals, a virtual medical library is typically implemented, requiring no square footage. In academic hospitals, dedicated medical library

space is provided where residents and medical students can conduct research, have a quiet area to study, seek assistance from a certified medical librarian for various searches, etc. Approximately 1,400 DGsf has been programmed for a Medical Library in the new replacement facility.

Residents' and Medical Students' Lounge and Locker Rooms: Approximately 2,000 DGsf will be needed for lockers and lounge areas for 100 – 120 residents and 130 medical students.

- Support space (i.e., team rooms, conference / classrooms, on-call rooms) is needed on the inpatient nursing units and in the diagnostic and treatment departments for residents and medical students.
 - On the inpatient nursing units, additional SF has been allocated for conference rooms to support the needs of the medical students and residents. In addition to the provision of two team rooms (one for physicians and one for nursing staff) and one conference / report room, two conference rooms (each room seats 15 – 20) will be located between two 30-bed nursing units. These conference rooms will be used for medical rounds, inservices and for teaching purposes. Approximately 880 NSF has been allocated for the two conference rooms on each floor. If the new replacement facility has nine to 10 inpatient nursing unit floors (includes floors for Medical/Surgical Nursing Units, Critical Care Units and OB Services), nearly 9,000 NSF (880 NSF x 10 floors) would be needed just for conference space associated with the academic teaching programs. Additional conference room space will also be provided in the major diagnostic and treatment departments, such as the Emergency Department, Interventional Suite, Radiology and Surgery.
- Most Academic Hospitals include a large conference center that provides several large-sized classrooms and an auditorium (optional) to accommodate the educational needs of residents and medical students.
- Some Academic Hospitals will provide faculty office space within the facility. For initial planning purposes, no faculty offices have been programmed in the new replacement facility. If they are to be provided, this will increase the square footage needs for the new replacement facility.
- Clinic space may be provided where faculty can see their private patients, in addition to clinic patients seen by residents and medical students.
- Academic Hospitals will provide new and more advanced technology than a Community Hospital, even if utilization of that particular technology is low. For example, a PET/CT Scanner or a Gamma Knife would be provided by an Academic Hospital instead of by a Community Hospital. These technologies and their support space will add square footage to the total hospital SF, thereby, increasing the BGsf / Bed.

Academic Medical Center Cost Differential

Pure Academic Space

| | Design Gross Square Feet | Mech/Elec | Gross Up Factors | | Central Plant | Building Gross Square Feet |
|---|-----------------------------|-----------|------------------|-----------------|------------------|-------------------------------|
| | | | Circulation | Ext Walls | | |
| On Call Rooms | 6,120 | 8% | 12% | 3% | 4% | 7,930 |
| Student Lockers | 3,060 | 8% | 12% | 3% | 4% | 3,965 |
| Student Lounge | 3,060 | 8% | 12% | 3% | 4% | 3,965 |
| Visiting Faculty Lounge | 3,060 | 8% | 12% | 3% | 4% | 3,965 |
| Patient Rooms (25 Square Feet Per Room) | 13,275 | 8% | 12% | 3% | 4% | 17,201 |
| Unit Conference Rooms | 12,320 | 8% | 12% | 3% | 4% | 15,963 |
| Clinical Laboratory (Additional Square Feet) | 1,836 | 8% | 12% | 3% | 4% | 2,379 |
| Medical Education Office | 2,100 | 8% | 12% | 3% | 4% | 2,721 |
| Medical Library | 1,400 | 8% | 12% | 3% | 4% | 1,814 |
| Total Square Feet | | | | | | 59,903 |
| Average Construction Cost | \$ 242.00 | | | | | \$ 14,496,427.76 |
| Information Systems Infrastructure | \$ 25.00 | | | | | \$ 1,497,564.85 |
| Fixtures, Furnishings & Equipment | \$ 11.00 | | | | | \$ 658,928.53 |
| Direct Building Costs | | | | | | \$ 16,652,921.14 |
| | Construction | | IT / Comm | FF&E | | |
| 2006 Escalation | 15% | | 3.5% | 3% | | \$ 18,899,567.94 |
| 2007 Escalation | 10% | | 3.5% | 3% | | \$ 20,641,267.31 |
| 2008 Escalation | 10% | | 3.5% | 3% | | \$ 22,552,185.15 |
| Total Direct Building Costs with Escalation | | | | | | \$ 22,552,185.15 |
| Design Fees | 8% | | | | | \$ 1,332,233.69 |
| Administrative Costs | 5% | | | | | \$ 1,127,609.26 |
| Contingencies | 10% | | | | | \$ 2,255,218.51 |
| Total Project Cost for Pure Academic Differences | | | | | | \$ 27,267,246.61 |

Volume Related Differences Between SCH and CATH Models

| | Design Gross Square Feet | Mech/Elec | Gross Up Factors | | Central Plant | Building Gross Square Feet |
|--|-----------------------------|------------------|------------------|-----------------|------------------|-------------------------------|
| | | | Circulation | Ext Walls | | |
| Number of Patient Rooms (SCH 460 CATH 531) | 44,375 | 8% | 12% | 3% | 4% | 57,498 |
| Clinical Nutrition Area | 710 | 8% | 12% | 3% | 4% | 920 |
| Emergency Department | 1,450 | 8% | 12% | 3% | 4% | 1,879 |
| Interventional Angiography | 3,200 | 8% | 12% | 3% | 4% | 4,146 |
| Interventional Suite Prep / Recovery | 1,350 | 8% | 12% | 3% | 4% | 1,749 |
| Clinical Laboratory | 2,840 | 8% | 12% | 3% | 4% | 3,680 |
| Anatomical Laboratory | 426 | 8% | 12% | 3% | 4% | 552 |
| Medical Imaging | 9,000 | 8% | 12% | 3% | 4% | 11,662 |
| Rehabilitation Services | 500 | 8% | 12% | 3% | 4% | 648 |
| Biomedical Engineering | 355 | 8% | 12% | 3% | 4% | 460 |
| Central Sterile Processing | 400 | 8% | 12% | 3% | 4% | 518 |
| Environmental Services | 923 | 8% | 12% | 3% | 4% | 1,196 |
| Food Services | 4,260 | 8% | 12% | 3% | 4% | 5,520 |
| General Staff Facilities | 532 | 8% | 12% | 3% | 4% | 689 |
| Mail Room | 71 | 8% | 12% | 3% | 4% | 92 |
| Laundry & Linen | 216 | 8% | 12% | 3% | 4% | 280 |
| Maintenance / Engineering | 1,065 | 8% | 12% | 3% | 4% | 1,380 |
| Materials Distribution | 2,272 | 8% | 12% | 3% | 4% | 2,944 |
| Radiation Safety | 71 | 8% | 12% | 3% | 4% | 92 |
| | | | | | | 95,904 |
| Average Construction Cost | \$ 242.00 | | | | | \$ 23,208,833.84 |
| Information Systems Infrastructure | \$ 25.00 | | | | | \$ 2,397,606.80 |
| Medical Equipment | 18% | | | | | \$ 4,177,590.09 |
| Fixtures, Furnishings & Equipment | \$ 11.00 | | | | | \$ 1,054,946.99 |
| Direct Building Costs | | | | | | \$ 30,838,977.72 |
| | Construction | Med Equip | IT / Comm | FF&E | | |
| 2006 Escalation | 15% | 3% | 3.5% | 3% | | \$ 34,561,195.15 |
| 2007 Escalation | 10% | 3% | 3.5% | 3% | | \$ 37,478,749.74 |
| 2008 Escalation | 10% | 3% | 3.5% | 3% | | \$ 40,671,096.35 |
| Total Direct Building Costs with Escalation | | | | | | \$ 40,671,096.35 |
| Design Fees | 8% | | | | | \$ 2,467,118.22 |
| Administrative Costs | 5% | | | | | \$ 2,033,554.82 |
| Contingencies | 10% | | | | | \$ 4,067,109.64 |
| Total Project Cost for Volume Differences | | | | | | \$ 49,238,879.02 |

Academic Medical Center Cost Differential

Pure Academic Space

| | Design Gross Square Feet | Mech/Elec | Gross Up Factors | | | Building Gross Square Feet |
|---|-----------------------------|-----------|------------------|-----------------|---------------|-------------------------------|
| | | | Circulation | Ext Wall | Central Plant | |
| On Call Rooms | 6,120 | 8% | 12% | 3% | 4% | 7,930 |
| Student Lockers | 3,060 | 8% | 12% | 3% | 4% | 3,965 |
| Student Lounge | 3,060 | 8% | 12% | 3% | 4% | 3,965 |
| Visiting Faculty Lounge | 3,060 | 8% | 12% | 3% | 4% | 3,965 |
| Patient Rooms (25 Square Feet Per Room) | 13,275 | 8% | 12% | 3% | 4% | 17,201 |
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| Total Square Feet | | | | | | 59,903 |
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| Information Systems Infrastructure | \$ 25.00 | | | | | \$ 1,497,564.85 |
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| Direct Building Costs | | | | | | \$ 16,652,921.15 |
| | Construction | | IT / Comm | FF&E | | |
| 2006 Escalation | 15.00% | | 3.50% | 3.00% | | \$ 18,899,567.94 |
| 2007 Escalation | 10.00% | | 3.50% | 3.00% | | \$ 20,641,267.31 |
| 2008 Escalation | 10.00% | | 3.50% | 3.00% | | \$ 22,552,185.15 |
| Total Direct Building Costs with Escalation | | | | | | \$ 22,552,185.15 |
| Design Fees | 8.00% | | | | | \$ 1,332,233.69 |
| Administrative Costs | 5.00% | | | | | \$ 1,127,609.26 |
| Contingencies | 10.00% | | | | | \$ 2,255,218.51 |
| Total Project Cost for Pure Academic Differences | | | | | | \$ 27,267,246.61 |

Volume Related Differences Between SCH and CATH Models

| | 44,376 | 8% | 12% | 3% | 4% | 57,498 |
|--|---------------------|------------------|------------------|-----------------|----|-------------------------|
| Number of Patient Rooms (SCH 460 CATH 531) | | | | | | |
| Clinical Nutrition Area | 710 | 8% | 12% | 3% | 4% | 920 |
| Emergency Department | 1,450 | 8% | 12% | 3% | 4% | 1,879 |
| Interventional Angiography | 3,200 | 8% | 12% | 3% | 4% | 4,146 |
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| Clinical Laboratory | 2,840 | 8% | 12% | 3% | 4% | 3,680 |
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| Medical Imaging | 9,000 | 8% | 12% | 3% | 4% | 11,662 |
| Rehabilitation Services | 500 | 8% | 12% | 3% | 4% | 648 |
| Biomedical Engineering | 355 | 8% | 12% | 3% | 4% | 460 |
| Central Sterile Processing | 400 | 8% | 12% | 3% | 4% | 518 |
| Environmental Services | 923 | 8% | 12% | 3% | 4% | 1,196 |
| Food Services | 4,260 | 8% | 12% | 3% | 4% | 5,520 |
| General Staff Facilities | 532 | 8% | 12% | 3% | 4% | 689 |
| Mail Room | 71 | 8% | 12% | 3% | 4% | 92 |
| Laundry & Linen | 216 | 8% | 12% | 3% | 4% | 280 |
| Maintenance / Engineering | 1,065 | 8% | 12% | 3% | 4% | 1,380 |
| Materials Distribution | 2,272 | 8% | 12% | 3% | 4% | 2,944 |
| Radiation Safety | 71 | 8% | 12% | 3% | 4% | 92 |
| | | | | | | 95,904 |
| Average Construction Cost | \$ 242.00 | | | | | \$ 23,208,833.84 |
| Information Systems Infrastructure | \$ 25.00 | | | | | \$ 2,397,606.80 |
| Medical Equipment | 18% | | | | | \$ 4,177,590.09 |
| Fixtures, Furnishings & Equipment | \$ 11.00 | | | | | \$ 1,054,946.99 |
| Direct Building Costs | | | | | | \$ 30,838,977.72 |
| | Construction | Med Equip | IT / Comm | FF&E | | |
| 2006 Escalation | 15.00% | 3.00% | 3.50% | 3.00% | | \$ 34,561,195.15 |
| 2007 Escalation | 10.00% | 3.00% | 3.50% | 3.00% | | \$ 37,478,749.74 |
| 2008 Escalation | 10.00% | 3.00% | 3.50% | 3.00% | | \$ 40,671,096.35 |
| Total Direct Building Costs with Escalation | | | | | | \$ 40,671,096.35 |
| Design Fees | 8.00% | | | | | \$ 2,467,118.22 |
| Administrative Costs | 5.00% | | | | | \$ 2,033,554.82 |
| Contingencies | 10.00% | | | | | \$ 4,067,109.64 |
| Total Project Cost for Volume Differences | | | | | | \$ 49,238,879.02 |

Element 6 – Support Facilities

The purpose of this element is to ensure the provision of support facilities to meet University needs during the planning period. Support facilities for the Community / University Hospital are integral to the development plan as shown in Element 3 and 4 in the previous Urban Design and Future Land use sections.

Element 7 – Housing

Not Applicable – See FAU Element 7

Element 8 – Recreation and Open space

Not Applicable – See FAU Element 8

Element 9 – General Infrastructure

The purpose of this element is to ensure adequate provision of public facilities and services required to meet the future needs of the University and the Teaching Hospital. The following information is presented by Caulfield & Wheeler, Inc. See accompanying Figure 1- Conceptual Stormwater Plan; Figure 2 – Conceptual Water Distribution Plan; and Figure 3 – Conceptual Sanitary Sewer Plan.

Stormwater Management System:

The proposed project is within the existing FAU stormwater management system, which is under the jurisdiction of the Lake Worth Drainage District, and the South Florida Water Management District. Modifications of the existing permits will be required for the BRCH-FAU project. The proposed project will provide a system of inlets and culverts, including exfiltration systems, which will direct the runoff to proposed dry retention systems, which will have a legal positive outfalls to the LWDD L-46, and El Rio canals adjacent to FAU. The project will meet the required minimum threshold standards of the 3 year, 1 day storm event for the roadway elevations; and the 100 year, 3 day storm event for the minimum finish floor elevations.

The proposed elevations will be as follows:

| | |
|---|--------------------------------------|
| <u>3 year, 1 day storm elevation - El. 7.57'</u> | <u>Min. Road El. = 11.20'</u> |
| <u>100 year, 3 day storm elevation – El. 12.76'</u> | <u>Min. Finish Floor El. = 13.50</u> |
| | <u>Water Control El. = 5.50'</u> |

Wastewater Collection System:

The proposed project will be a portion of the existing FAU sanitary sewer system, which is supplied and treated by the City of Boca Raton system. Service for the proposed site will be provided by proposed 8” and 10” gravity sewer collection lines which will be extended through the site, and will be routed to a proposed wastewater pump station on the BRCH site. The pump station will pump via an 8” force main to an existing City of Boca Raton 24” force main on the east side of the property adjacent to the El Rio Canal.

The estimated wastewater flows for the BRCH site will be as follows:

| | | |
|--|---|-------------------------|
| Phase 1 – 530 bed Hospital | - | 113,950 gal./day |
| 150,000 sf Medical Office Bldg. | - | 16,520 gal./day |
| Phase 1 Sub-total | | 130,470 gal./day |
| Phase 2 – 82 bed Hospital Addition | - | 17,630 gal./day |
| 150,000 sf Medical Office Bldg. | - | 16,520 gal./day |
| Phase 2 Sub-total | | 34,150 gal./day |
| Phase 3 – 100 bed Hospital Addition | - | 21,500 gal./day |
| 150,000 sf Medical Office Bldg. | - | 16,520 gal./day |
| Phase 3 Sub-total | | 38,020 gal./day |
| Total Estimated Wastewater Flow - | | 202,640 gal./day |

Potable Water Distribution System:

The proposed project will be served by the existing FAU potable water distribution system, which is supplied by the City of Boca Raton system. Service will be provided by the existing 12” water mains on Indian River Road and FAU Blvd. which will be extended and looped through the site; and an additional 12” water main connection and 8” water meter is being proposed to the existing 30” City water main at Glades Road, for additional capacity.

The estimated potable water usage will be as follows:

| | | |
|-------------------------------------|---|------------------|
| Phase 1 – 530 bed Hospital | - | 136,740 gal./day |
| 150,000 sf Medical Office Bldg. | - | 19,824 gal./day |
| Phase 1 Sub-total | | 156,564 gal./day |
| Phase 2 – 82 bed Hospital Addition | - | 21,156 gal./day |
| 150,000 sf Medical Office Bldg. | - | 19,824 gal./day |
| Phase 2 Sub-total | | 40,980 gal./day |
| Phase 3 – 100 bed Hospital Addition | - | 25,800 gal./day |
| 150,000 sf Medical Office Bldg. | - | 19,824 gal./day |
| Phase 3 Sub-total | | 45,624 gal./day |

Total Estimated Potable Water Flows - 243,168 gal./day

Reclaim Water System:

The proposed project will be served by the existing FAU reclaimed water system, which is supplied by the City of Boca Raton system. Service will be provided by the existing 4” water mains on Indian River Road and FAU Blvd. which will be extended and looped through the site. Additional connections may be required in the future. Estimated flows are based on 1” of irrigation/week over the estimated green area of the BRCH site.

The estimated reclaimed water usage - 46,082 gal./day

Element 10—Utilities

The purpose of this element is to ensure adequate provision of utility services required to meet the future needs of the University and the Teaching Hospital.

Please see accompanying Figure 1E - Conceptual Electrical High Voltage Plan; and Figure 1G – Conceptual Natural Gas Plan.

In addition, please see the following preliminary documents which are included at the end of this section:

BRCH Hazardous Materials and Waste Management Plan

BRCH Fire Prevention Management Plan

BRCH Medical Equipment Management Plan

BRCH Safety Management Plan

BRCH Utility Management Plan

BRCH Comprehensive Emergency Management Plan

Element 11 – Transportation

The purpose of this element is to plan for future motorized and non-motorized traffic circulation systems to ensure provision of adequate transit, circulation and parking facilities to meet future University needs; to ensure the provision of adequate pedestrian and non-vehicular circulation facilities to meet the future needs of the University; and to coordinate the location of these facilities planned in the host community in the context area.

The following tables have been developed as preliminary information. Traffic studies for a 10 year parking analysis of traffic on local host roads are being conducted concurrently and will be incorporated into the appendix of this volume.

| BRCH - Community Affiliated Teaching Hospital | | | | | | | | |
|---|----------------|---------------|--------------|--------------|------------|--------------|------------|--------------|
| TRIP GENERATION - BUILDOUT | | | | | | | | |
| LAND USE | INTENSITY | DAILY | AM PEAK HOUR | | | PM PEAK HOUR | | |
| | | | Total | In | Out | Total | In | Out |
| Proposed Site Traffic | | | | | | | | |
| Medical Office Building | 450,000 s.f. | 16,259 | 1,116 | 882 | 234 | 1,276 | 345 | 931 |
| Hospital | 1,700,000 s.f. | 28,526 | 2,040 | 1,367 | 673 | 2,006 | 662 | 1,344 |
| <i>Subtotal</i> | | 44,785 | 3,156 | 2,249 | 907 | 3,282 | 1,007 | 2,275 |
| Internal Capture | | | | | | | | |
| Between Hosp and Med Office | 10% | 3,252 | 223 | 112 | 111 | 255 | 128 | 127 |
| Pass-By Capture | | | | | | | | |
| Medical Office Building | 5% | 732 | 50 | 41 | 9 | 57 | 14 | 43 |
| Hospital | 5% | 1,345 | 96 | 66 | 30 | 94 | 30 | 64 |
| <i>Subtotal</i> | | 2,077 | 146 | 107 | 39 | 151 | 44 | 107 |
| Proposed Driveway Volumes | | 41,533 | 2,933 | 2,137 | 796 | 3,027 | 879 | 2,148 |
| <i>Net Proposed Trips</i> | | <i>39,456</i> | <i>2,787</i> | <i>2,030</i> | <i>757</i> | <i>2,876</i> | <i>835</i> | <i>2,041</i> |

| | | |
|-----------------------------|-----------|---|
| Daily Traffic | | |
| Medical Office Building | [PBC] | = T = 36.13 trips / 1,000 sq. ft. |
| Hospital | [PBC] | = T = 16.78 trips / 1,000 sq. ft. |
| AM Peak Hour Traffic | | |
| Medical Office Building | [ITE 720] | = T = 2.48 trips / 1,000 sq. ft. (79% in / 21% out) |
| Hospital | [ITE 610] | = T = 1.20 trips / 1,000 sq. ft. (67% in / 33% out) |
| PM Peak Hour Traffic | | |
| Medical Office Building | [ITE 720] | = Ln(T) = 0.93Ln(X) + 1.47 (27% in / 73% out) |
| Hospital | [ITE 610] | = T = 1.18 trips / 1,000 sq. ft. (33% in / 67% out) |

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Boca Raton Community Hospital CATH @ FAU
Boca Raton, Florida

HKS Architects, Inc.
16-Feb-2006
HKS Project No. 9695.355

PARKING EVALUATION OF MASTER PLAN OPTIONS

| Facility | Bldg. Area | Square Footage | Parking Required | Parking Need | Actual Parking Provided |
|--|---|---|--|----------------------------------|-------------------------|
| PHASE ONE | | | | | |
| BRCH CATH @ FAU 1,250,000 gsf HOSPITAL + 150,000 gsf MOB 530 Total Beds | Inpatient Emergency Day Care MOB Staff Physician | 1,250,000 0 150,000 2.50 FTE / Bed 1.25 FTE / Bed | 1/2 Beds 1/175 SF 1/Staff 1/Physician | 265 857 1,325 663 | |
| Totals | | 1,400,000 | | 3,110 Spaces | 3,040 Spaces |
| Bicycle Parking | | | 5% of Cars | 156 Spaces | 156 Spaces |
| Note: Additional Parking needed for Phase One (70 Spaces) can be accommodated in areas designated as Future Phase Development. | | | | | 1 Car / 450 sf |
| PHASE TWO | | | | | |
| BRCH CATH @ FAU 1,450,000 gsf HOSPITAL + 300,000 gsf MOB 612 Total Beds | Inpatient Emergency Day Care MOB Staff Physician | 1,450,000 0 300,000 2.50 FTE / Bed 1.25 FTE / Bed | 1/2 Beds 1/175 SF 1/Staff 1/Physician | 306 1,714 1,530 765 | |
| Totals | | 1,750,000 | | 4,315 Spaces | 5,615 Spaces |
| Bicycle Parking | | | 5% of Cars | 216 Spaces | 216 Spaces |
| | | | | | 1 Car / 406 sf |
| PHASE THREE | | | | | |
| BRCH CATH @ FAU 1,700,000 gsf HOSPITAL + 450,000 gsf MOB 712 Total Beds | Inpatient Emergency Day Care MOB Staff Physician | 1,700,000 0 450,000 2.50 FTE / Bed 1.25 FTE / Bed | 1/2 Beds 1/175 SF 1/Staff 1/Physician | 356 2,571 1,780 890 | |
| Totals | | 2,150,000 | | 5,597 Spaces | 5,615 Spaces |
| Bicycle Parking | | | 5% of Cars | 280 Spaces | 280 Spaces |
| | | | | | 1 Car / 384 sf |

2.5 staff/bed from Current Hospital Ratios of Staff/Bed
1.25 physicians/bed from Current Hospital Ratios of Physicians/Bed

Element 12 – Intergovernmental Agency Coordination:

The purpose of this element is to identify and resolve incompatible goals, objectives, policies and development proposed in campus master plans and to determine and respond to the need for coordination with adjacent local governments, and regional and state agencies.

Intergovernmental coordination shall be utilized to the extent required to carry out the provisions of this Guideline.

BRCH is to provide intergovernmental notice and review requirements for hospitals/teaching hospitals.

- Agency for Health Care Administration (AHCA)
- Planning Advisory Board
- Florida Power & Light Company
- City of Boca Raton Utilities Services
- City of Boca Raton Fire Rescue Services
- City of Boca Raton Police Services
- City of Boca Raton Development Services and Municipal Services
- Palm Beach County Traffic Division
- City of Boca Raton Development Services Environmental Division
- City of Boca Raton Recreational Services
- Coastal Management Consistency Checklist
- Conservation Consistency Checklist
- Community Appearance Board
- Bell South Telecommunications Inc.
- City of Boca Raton Public Works Review Staff
- Federal Aviation Administration
- Planning and Zoning Board
- ComCast/Adelphia
- FEMA
- South Florida Water Management District
- Lake Worth Drainage District
- Florida Department of Environmental Protection
- Florida Public Utilities

Element 13 – Conservation

The purpose of this element is to ensure the conservation, protection and wise use of all natural ecosystems and natural resources on the University campus and in the context area. BRCH is to provide plan for mitigation of protected species or species of concern. The following information is presented by Caulfield & Wheeler, Inc.

Mitigation of existing burrowing owls will be done in concert with State requirements, and laws, to a site provided by Florida Atlantic University within the campus limits. The colony of owls will be moved as a group, to create as little disruption as possible. The procedure will be co-ordinated with the consultant retained by Florida Atlantic University, with consultants retained by Boca Raton Community Hospital. This moving operation will occur prior to construction.

Burrowing Owls at
The CATH site at F.A.U.

The burrowing owl nesting activities are a unique asset of the University that must be considered during the first planning cycles for the proposed hospital construction. The Florida burrowing owl has a listed status of “species of special concern,” and certain steps must be followed where destruction of their habitats will stress or destroy the owls at the proposed building sites.

Timing is the primary consideration. We will start immediately to document the existing habitats with surveys confirming occupied areas, and begin to minimize impacts to the burrowing owls, and their foraging habitats. Plans for mitigation must be filed to set timing of mitigation to sites on the campus. The nesting season for the owls is February through September, as defined in state and federal regulations designed to protect and sustain the owl species in Florida. The first steps for the mitigation process will be education for the planning staff members in the owl habitat, and what we can, and can not do in any proximity to the owl habitat. Preservation is a part of the planning and building schedule, and it will severely impact our timing and costs. In a synopsis of operations and steps involved in the immediate steps for the burrowing owl mitigation, we will do the following:

In league with our environmental consultants paperwork filing with Fish & Wildlife officials will be done in coordination with the existing habitat survey and assessment. During this time any gopher tortoise habitats will be cataloged, and steps will be taken for the special mitigation of that species at the same time. A definition of impacts statement will be issued regarding any disturbing of ground, or activities within 175 ft. of the occupied burrows. This will be part of the educational process for the planning and building staff for the project. A series of general considerations will be issued for the calculated needs and mitigations, and record-keeping activities will be on-going. Methods of avoidance of the occupied burrows will be established, tailored to the conditions on the campus. Planning and site coordination will accompany plans for the on-campus relocation of the species. Timing schedules and the construction of alternate natural, or artificial, burrows will follow on a timely basis, after the nesting seasons. Buffer zones will be created in the new areas, and a series of monitoring activities established to confirm adaptation in the new conservation areas.

This is a simplistic description of the processes that are required to ensure conformity with laws, and the humane mitigation of a species that is unique. We will allow habitation to continue, and construction planning to be on schedule.

Element 14 – Capital Improvement Element

The purpose of this element is to evaluate the need for public facilities as identified in other campus master plan elements; to estimate the cost of improvements for which the University has fiscal responsibility; to analyze the fiscal capability of the University to finance and construct improvements; to adopt financial policies to guide the funding of improvements; and to schedule the funding and construction of improvements in a manner necessary to ensure that capital improvements are provided when required based on needs identified in the other campus master plan elements.

Please see the Community Affiliated Teaching Hospital Development plan presented in Future Land Use Element 4.

Element 15 – Architectural Design Guidelines:

The purpose of this element is to establish guidelines to assist in achieving a high level of quality in architectural design throughout the State University System.

HISTORICAL PERSPECTIVE (provided by HKS)

Boca Raton Community Hospital (BRCH) is a not-for-profit hospital that is currently the largest hospital in southern Palm Beach County, occupying 30.8 acres on its main campus and 11.2 acres on the outpatient campus directly across the street. The hospital, known as the “Miracle on Meadows Road,” is a 600,000-square-foot facility that includes 394 inpatient beds and centers for outpatient surgery, oncology, women’s services, and diagnostic imaging.

Recognizing the need to continue as a leader in providing progressive healthcare and to better serve the community of Boca Raton and its surrounding areas, BRCH is embarking on an organizational restructuring and a new facility plan that will replace an aging and near obsolete facility, dating back to 1965. “The master plan that is developed will assist BRCH in directing the future of medical services to be provided to the residents of the Boca Raton Community,” said Dan Noble, principal designer, HKS, Inc.

The newly defined organization will span two campuses, both north and south of Glades Road. The southern campus, consisting of 15.2 acres, will be the outpatient campus offering medical office space, outpatient imaging services, cancer care, and the women’s breast center. This campus has its origin with the Oaks Plaza development dating back to the late 1980’s, with the catalyst for all future development being the 100,000 square foot, Eugene M. Lynn Regional Cancer Center designed by HKS Architects, Inc. The northern campus, consisting of 38 acres located at Florida Atlantic University, will provide inpatient care services and teaching facilities. This Community Affiliated Teaching Hospital will create a world class facility that supports 21st century healthcare delivered in a human-centered, healing environment.

The facility will be designed in conjunction with Florida Atlantic University (FAU) and the University of Miami (UM) to provide care to the Boca Raton Community and surrounding areas as well as satisfy the teaching needs for the newly established medical school at FAU. The new hospital will ultimately contain 712 private patient rooms organizing the 38 acre campus into clear, distinct zones for the public, outpatients, inpatients, and service/staff along with next generation expansion corridors. The replacement campus will house centers of excellence for comprehensive cardiac services, ortho/neuro/rehab/musculoskeletal services, and women’s services.

The campus will be developed in three main phases including the Phase One development consisting of 530-beds and 1,250,000 sf with 150,000 sf of Medical Office space and a 1,600 car Parking Structure. Phase Two includes an additional 82 Bed expansion consisting of 200,000 sf of Hospital area and 150,000 sf of Medical Office Space and a 3,000 car Parking Structure .

Phase Three will complete the development of the 38 acre parcel of land with an additional 100 bed expansion with 250,000 sf of Hospital Area and a 150,000 sf Medical Office Building.

Trends in Healthcare Today

- **Shift from inpatient care of services to outpatient care**
 - Convenient access and patient flow
 - Efficient utilization of facility's resources

- **Results in higher acuity of inpatients admitted into hospital, higher level of technology**
 - Universal rooms
 - Nurse work alcoves

- **Patient Focus Care**
 - All private rooms
 - Include family in patient care – allow for space
 - Technology to bedside – allow for space
 - Less movement of patient
 - Staff closer to patient
 - More efficient operating organization

- **Healing Environments / Consumer Friendly**
 - Way Finding – straightforward distinct circulation patterns
 - Natural Light – penetrate building – define spaces
 - Spaces of Respite: waiting areas-resource areas-indoor/outdoor gardens- consultation
 - Integration with Site – healing gardens
 - Color, texture, scale, choices, amenities

- **Flexibility – the ability to grow and change over time**
 - Warehouse of Space
 - Outboard Toilets
 - Swing Unit – Transitional Capability
 - Growth avenues identified
 - Increased floor to floor heights

- **Patient Safety**
 - Use Failure Modes and Effects Analysis (FMEA) at every design stage.
 - Engage a wide representation of stakeholders in the Design Process.
 - Create an organizational leadership structure to support the Design Process.
 - Design around major organizational processes. Begin Mock-ups and equipment planning on Day 1.

- Consider the human factors and environmental effects on staff as well as patients and families.
- Design around vulnerable patient populations.
- Design for flexibility, scalability, and accessibility to adapt to changes in technology and work processes.
- Design for maximum standardization.
- Provide accessible information systems at the point of service.
- Address known hazards in the physical environment.

Overall Conceptual Design Organizers

- **Functional**
 - Ensure that the facility's parts function as a whole. Above all the facility must work.
- **Progressive**
 - Reinforce the notion of BRCH as a leader in the delivery of quality healthcare. Recognize that this is a complex high tech facility and people are entrusting their lives in your care. Create a feeling of competence.
- **Non-Institutional**
 - Avoid the rigidity and coldness associated with institutional architecture. Create a non-threatening comfortable healing environment of human scale proportions
- **Distinctive**
 - Create a distinctive image to establish an appropriate identity within the community. Define a sense of place.
- **Site Responsive**
 - Recognize the site and local character
 - Topography – dual access; split service access from public access
 - Coastal Character

Building Expression / Conceptual Imagery

- **Building Organization**
 - Bed Units
 - Diagnostic & Treatment Facilities
 - Service Areas
 - Outpatient Components

- **Form**
 - Consider growth avenues
 - Vehicular & pedestrian circulation patterns
 - Relationship to college
 - Redefine the monolithic box
 - Maximize pleasant views
 - Welcoming entry / sense of arrival
 - Recognizable symbol

- **Expression**
 - Consider the aesthetic image to convey to the community
 - Organic setting on the site – Integrate with the natural landscape
 - Palm Trees : Structural expression
 - Water : Rich symbolic tie to healing – first instinct after injury is a move towards water
 - Clean wounds – replenish the body – soothing effect
 - Grapevines: Arbor – Structure to hold plant life, grapevines.
 - Material blend: stone/glass/metal: blending dynamic leading edge thinking (form) with comfortable and familiar materials. – Be progressive but not intimidating.

- **Conceptual Statement**
 - A modern facility that respects and recalls comfortable architectural human scaled elements while recognizing the facilities leadership role as a progressive place of healing.

Design Elements

- **Expressive Structures**
 - Natural organic expression – trees.

- **Natural Light**
 - Use as a wayfinding tool.
 - Enhance detailing.
 - Define spaces.

- **Integration**
 - Integrate the traditional aesthetic with the progressive.
 - Convey a sense of balance between human comfort and technical competence.

- **Detailing**
 - To break the larger facility down into smaller, less intimidating and more manageable components.

- Create that sense of Human Scale and a sense of place.

- **Overall Imagery**

- A modern facility that respects and recalls comfortable architectural human scaled elements while recognizing the facilities leadership role as a progressive place of healing today.

- **Cohesive Campus**

- Create a cohesive campus image that appears complete today but is capable of accepting future growth and modification.

Goal 1

~~To ensure the conservation, protection, and wise use of all natural ecosystems and natural resources on the University campus and in the context area.~~

Element 16 – Landscape Element (provided by Caulfield & Wheeler, Inc.)

The purpose of this element is to establish guidelines to assist the University in establishing and maintaining a high level of quality in the design of landscape treatments on the University campus.

Landscaping of the new community affiliated teaching hospital will be in keeping with the theme and measure expressed on Florida Atlantic University Campus at present. The landscape material used will compliment the feature of the new structures, parking fields, and roadways that will be constructed, and continue the sub-tropical mode and décor on the existing campus facilities.

Element 17 – Facilities Maintenance

The purpose of this element is to assess the existing conditions and required improvements of all existing buildings on the University Campus.

The following preliminary documents are included at the end of this section:

BRCH Hazardous Materials and Waste Management Plan

BRCH Fire Prevention Management Plan

BRCH Medical Equipment Management Plan

BRCH Safety Management Plan

BRCH Utility Management Plan

BRCH Comprehensive Emergency Management Plan

Element 18 – Coastal Management (provided by HKS)

The purpose of this element is to provide for the protection of resident and property in those campuses or portions of campuses within the coastal area of the host community, and to limit expenditures, and where appropriate, restrict development, in those areas subject to destruction by natural disaster within the coastal high hazard area.

Boca Raton Community Hospital’s – Community Affiliated Teaching Hospital (BRCH – CATH) will be built to a minimum of a Category 3 hurricane standard per the Florida Building Code and the Agency for Health Care Administration. Some portions of the building may be required by the Hospital and the University to be designed to a more stringent hurricane standard as a shelter or safe haven for patients, families and staff. This would ultimately provide immediate medical services in light of potential catastrophic events.