

Appendix A

The University of North Carolina Notification of Intent to Plan a New Baccalaureate, Master's, or C.A.S. Program

THE PURPOSE OF ACADEMIC PROGRAM PLANNING: Planning a new academic degree program provides an opportunity for an institution to make the case for need and demand and for its ability to offer a quality program. This notification and the planning activity to follow do not guarantee that authorization to establish will be granted.

Date February 15, 2008

Constituent Institution: The University of North Carolina at Charlotte

CIP Discipline Specialty Title: Construction Management

CIP Discipline Specialty Number: 52.2001 Level: B M C.A.S.

Exact Title of the Proposed Program Master of Science in Construction & Facilities Management

Exact Degree Abbreviation (e.g. B.S., B.A., M.A., M.S., C.A.S.): M.S.C.F.M.

Does the proposed program constitute a substantive change as defined by SACS? Yes No

a) Is it at a more advanced level than those previously authorized? Yes No

b) Is the proposed program in a new discipline division? Yes No

Approximate date for submitting the Request to Establish proposal (must be within one year of date of submission of notification of intent to plan): May 2008

Proposed date to establish degree: month August year 2009 (Date can be no sooner than six months after the date of notification of intent to plan and must allow at least three months for review of the request to establish, once submitted.)

1. Describe the proposed new degree program. The description should include:

a) a brief description of the program and a statement of educational objectives

Construction Management is a program that prepares individuals to manage, coordinate, and supervise the construction process from concept development through project completion on timely and economic bases. Such programs include instruction in commercial, residential, mechanical, highway/heavy civil, electrical, environmental, industrial, and specialty construction; **facilities management**; project planning; budgeting and cost control; logistics and materials management; personnel management and labor relations; site safety; construction contracting; construction processes and techniques; organization and scheduling; and applicable codes and regulations [U.S. Dept. of Education's NCES CIP-2000].

Facility management is a profession that encompasses multiple disciplines to ensure functionality of the built environment by integrating people, place, process and technology. The body of knowledge required for facility management degree programs include facility function (professional practice), human and environmental factors, planning and project management, finance, operation and maintenance, real estate, written and oral communication, information technology, quality management and assessment procedures (research and analytical methods), and integrative and problem solving skills [IFMA Standards for Recognized Programs]. **Construction management** was listed as a job responsibility by 71% of facility managers in an industry-wide survey [IFMA.org, Facilities Industry Survey, 2004]. As can be seen, there is a considerable overlap between the construction management and facility management professions.

More corporations, industries, and owners are demanding more full-service, turn-key procurement of their physical infrastructure and associated operations and maintenance. As a result more construction industry professionals are being asked to manage and deliver design, construction, and facility operations and maintenance services. In order to keep abreast of the ever increasing and expanding knowledge of materials, methods, and technology in this broad field requires advance training and education beyond the baccalaureate degree level.

To fill this need, the Department of Engineering Technology proposes the creation of a Master of Science in Construction and Facilities Management (MSCFM) degree program. The MSCFM degree program will build off the body of knowledge required by the American Council for Construction Education (ACCE) for the existing construction management undergraduate degree program and will incorporate areas of knowledge required by the International Facility Management Association (IFMA). It is anticipated that the program will consist of an 18-credit hour common core, a 6-credit hour elective core in either construction management or facility management, and a capstone experience including either 3-credit hours of major electives plus a 3-credit hour integrated capstone project or 6-credit hours dedicated to graduate research thesis. A draft of the 30-credit hour degree program is outlined below:

Common Core Courses (18-credit hours)

| | | |
|-----------|--|----------------|
| CMET 5130 | Building Information Modeling | 3 credit hours |
| CMET 5135 | Advanced Project Planning & Management | 3 credit hours |
| CMET 5240 | Safety & Risk Management | 3 credit hours |
| FMET 5130 | Research and Analytical Methods | 3 credit hours |
| FMET 5135 | Building Energy Management | 3 credit hours |
| FMET 5240 | Maintenance of Constructed Facilities | 3 credit hours |

Students select one of the following elective cores:

Construction Management Elective Core (6-credit hours)

| | | |
|-----------|--------------------------------------|----------------|
| CMET 6145 | Alternative Project Delivery Methods | 3 credit hours |
| CMET 6250 | Quality Assurance in Construction | 3 credit hours |

Facilities Management Elective Core (6-credit hours)

| | | |
|-----------|--|----------------|
| FMET 6145 | Facilities Management Financial Analysis | 3 credit hours |
| FMET 6250 | Real Estate & Property Management | 3 credit hours |

Students select one of the following capstone experiences:

Integrated Capstone Project Sequence (6-credit hours)

| | | |
|----------------|-----------------------------|----------------|
| Major Elective | | 3 credit hours |
| CMET 6800 | | |
| or FMET 6800 | Integrated Capstone Project | 3 credit hours |

Master's Thesis and Research Sequence (6-credit hours)

| | | |
|--------------|----------------------------|----------------|
| CMET 6900 | | |
| or FMET 6900 | Master's Thesis & Research | 6 credit hours |

Major electives courses will be created based on faculty research interest and industry feedback. In addition, appropriate existing graduate level courses will be identified from other programs within the University, such as the Engineering Management program or others.

b) the relationship of the proposed new program to the institutional mission and how the program fits into the institution's strategic plan

The proposed graduate program meshes nicely with the institutional mission and strategic plan. It fits the University themes of Applied Sciences and Technologies and Urban and Regional Development. As the first graduate level program to be located within the Department of Engineering Technology, the program will allow the ET Department and its faculty to become active participants in the institutional goal of raising the University's graduate research and scholarly profile.

The Department mission statement indicates that our programs exist to serve business and industry in this region by supplying highly competent construction management and engineering technology graduates (technologists). With the increasing urbanization and associated transportation and infrastructure challenges, the resultant exploding demand for construction professionals and the associated demand for facility managers across the nation and particularly in North Carolina and the Charlotte region become ever more acute. This proposed program is positioned in support of the Department, College and University missions to provide intellectual capital and to educate North Carolina citizens to meet the challenges of the region and state.

The proposal contributes to Goal 4 of the Department's strategic plan which is the planned development of a School of Technology with graduate level programs. Additionally, Goal 3 of the Department's strategic plan is to add new and/or expand existing programs in specific niche areas. Among the alternatives considered as part of this effort, the M.S. in Construction and Facilities Management is the Department's first priority for its initial graduate level program.

c) the relationship of the proposed new program to other existing programs at the institution

The proposed program would be located in the Department of Engineering Technology and would primarily serve students graduating from the Department's existing B.S. in Construction Management program and a future B.S. in Facilities Management program. With some deficiency remediation, the graduate program could also accommodate students graduating from the Department's civil, mechanical, electrical, and fire safety engineering technology programs, as well as other College of Engineering baccalaureate programs. It is also anticipated that working construction and facility management professionals from local and regional industries seeking to maintain or upgrade their job skills will also avail themselves of the program.

The majority of the program would be delivered by faculty from the Construction Management and Civil Engineering Technology program. However, due to the broad, interdisciplinary nature of the topics required for the program, some required courses would also be delivered by faculty from the Department's mechanical, electrical, and fire safety engineering technology programs. As such, the program has the potential to produce graduate level research and external funding opportunities for all of the Department's academic programs.

d) special features or conditions that make the institution a desirable, unique, or appropriate place to initiate such a degree program.

UNC Charlotte sits in a unique place from geographic, demographic, and business perspectives for a construction and facilities management program. The institution provides educational opportunities to residents of the largest metropolitan area in North Carolina. Charlotte is home to one of the most robust construction climates in North America. The attraction of the area is apparent in the numbers.

In 2006, Charlotte awarded 24,250 building permits representing over \$4 billion of new construction and the industry has shown continued growth over the last ten years as shown in Table 1 [Charlotte Chamber of Commerce].

Table 1: Charlotte-Mecklenburg 10-Year Construction Summary 1997 - 2006

| Year | Permits | Value Residential (millions) | Value Non-Residential (millions) | Value Total (millions) |
|---------------|----------------|-------------------------------------|---|-------------------------------|
| 2006 | 24,250 | \$2,709.5 | \$1,560.9 | \$4,270.4 |
| 2005 | 22,037 | 2,063.2 | 1,297.6 | 3,360.7 |
| 2004 | 19,243 | 1,730.8 | 1,326.0 | 3,056.8 |
| 2003 | 18,984 | 1,600.8 | 905.7 | 2,506.5 |
| 2002 | 19,770 | 1,564.1 | 814.4 | 2,378.5 |
| 2001 | 19,174 | 1,640.2 | 1,117.5 | 2,757.7 |
| 2000 | 18,937 | 1,641.0 | 1,670.6 | 3,311.6 |
| 1999 | 19,323 | 1,313.7 | 1,044.2 | 2,357.9 |
| 1998 | 17,845 | 1,362.5 | 1,005.3 | 2,367.8 |
| 1997 | 15,635 | 1,036.1 | 836.2 | 1,872.3 |
| Totals | 195,198 | \$16,661.9 | \$11,578.4 | \$28,240.2 |

The growth of Charlotte is a magnet for construction companies. Low costs, high construction activity levels, and convenient access to both materials and skilled labor provide the reasons that over 4,700 construction firms employ 48,273 qualified workers in the metro area. These companies come in a wide variety of sizes, from a number of small, more personal operations to at least 65 firms each employing more than 100 people [Charlotte Chamber of Commerce].

In addition to its large construction industry, Mecklenburg County and the surrounding metropolitan area are home to nine of the Fortune 500 companies, as listed in Table 2. This ranks Charlotte 6th nationally in number of Fortune 500 companies headquartered within the county. These headquarters represent more than \$267.3 billion in revenue for 2006. More importantly, 328 of the Fortune 500 companies have made a commitment to the city by placing one or more of their facilities within the county [**Charlotte Chamber of Commerce**].

Table 2: Charlotte Area's Fortune 500 Headquarters

| Name | Revenue | Rank |
|---|----------------|-------------|
| Bank of America (Banking) | \$117 billion | 9 |
| Lowe's (Retail) | \$47 billion | 45 |
| Wachovia, Corp. (Banking) | \$46.8 billion | 46 |
| Duke Energy (Utilities) | \$16 billion | 143 |
| Nucor (Metals) | \$14.8 billion | 161 |
| Sonic Automotive (Automotive Retailing) | \$8.7 billion | 238 |
| Family Dollar (Retail) | \$6.4 billion | 359 |
| Goodrich Corp. (Aerospace and Defense) | \$5.9 billion | 390 |
| SPX (Electronics) | \$4.7 billion | 471 |

These 328 Fortune 500 companies represent a diverse range of industries such as energy, commercial banking, automotive retailing, steel fabrication, electronics, aerospace and defense, general

merchandisers, and specialty retailers. Each of these companies maintains and operates numerous facilities that require experienced and trained facility management professionals. In addition, there are numerous smaller companies and industries within the region that also require facility management services.

This robust economic climate for construction and business services in the Charlotte region make UNC Charlotte an ideal fit for a Masters in Science of Construction and Facilities Management degree program. In addition, UNC Charlotte would be only one of a few select institutions in the entire country with a facility management related graduate degree program. Institutions with IFMA acknowledged graduate programs include Arizona State University, Cornell University, Georgia Institute of Technology, and the University of Florida.

UNC Charlotte's Department of Engineering Technology has provided quality technical education for over 30 years. Our programs have met rigorous standards for specialized accreditation, and we have a long history of working with the Charlotte area construction industry to supply graduates for the greater Charlotte region and throughout North Carolina. This proposed program will only enhance the Department's outreach and integration with the community, enlarge its scholarly research capacity, and produce much needed graduates for the Charlotte construction and business community.

2. List all other public and private institutions of higher education in North Carolina currently operating programs similar to the proposed new degree program.

The proposed program at UNC Charlotte is unique in that the curriculum is an integrated construction and facility management program. No program in the UNC system currently provides this curriculum. Hence, graduates will be prepared to deal with management of construction activities as well as post-construction operation of facilities.

Traditional construction management programs are offered at ECU and WCU as follows:
East Carolina University – Masters of Construction Management
Western Carolina University – Masters of Construction Management

Currently, there are no institutions of higher education in North Carolina offering graduate degree programs in Facilities Management. In fact, there are only three programs nationally offering graduate programs in facility management which are acknowledged by IFMA: Cornell University, Georgia Institute of Technology, and Pratt Institute. Other institutions with graduate concentrations or tracks related to facilities management include Arizona State University and the University of Florida.

3. Estimate the number of students that would be enrolled in the program during the first year of operation: Full-Time 8 Part-Time 8

These estimates are considered conservative and are based on enrollment experiences in similar Masters of Construction Management programs at Eastern Carolina University and Western Carolina University. Both these degree programs are new programs launched within the last several years and are still developing their enrollments. Neither of these programs is located in a metropolitan area of 1.5 million people as is the proposed UNC Charlotte program. Internally, there is an interest among the current student body of UNC Charlotte and the College of Engineering for such a program.

4. If there are plans to offer the program away from campus during the first year of operation:

- a) briefly describe these plans, including potential sites and possible method(s) of delivering instruction.

It is expected that this program will be concurrently delivered to on-campus students and to off-campus students via distance education. Place bound students and working adults will be able to complete the degree primarily via the Internet. Distance education students will be required to complete a non-thesis option in the program.

- b) indicate any similar programs being offered off-campus in North Carolina by other institutions (public or private)

No program in construction and facility management is being offered in North Carolina.

- c) estimate the number of students that would be enrolled in the program during the first year of operation: *Full-Time* 6 *Part-Time* 10

Note: These distance education enrollment projections are in addition to the on-campus enrollment projections listed in item #3 above.

5. List the names, titles, e-mail addresses and telephone numbers of the person(s) responsible for planning the proposed program.

Anthony L. Brizendine, Chair & Professor
Engineering Technology & Construction Mgmt
Telephone: 704-687-6154
Email: albrizen@uncc.edu

G. Bruce Gehrig, Assistant Professor
Construction Management & Civil ET Program
Department of Engineering Technology
Telephone: 704-687-6165
Email: gbgehrig@uncc.edu

This intent to plan a new program has been reviewed and approved by the appropriate campus committees and authorities.

Chancellor _____