

## **Civil Engineering Department Response to the Academic Program Review**

**October 8, 2009**

### **Introduction**

This document is the Civil Engineering Department (“the Department”) response to the Review Team Report. The Review Team Report provides an evaluation of the Department, and makes suggestions for moving the Department forward. The Review Team was largely complimentary of the Department, indicating that the Department was well functioning and productive, and on an upward trajectory. At the same time, the Review Team recognizes the challenges of balancing a program that provides a strong undergraduate education that sufficiently covers all of the sub-disciplines of civil engineering and construction, while taking advantage of the opportunities in graduate education and research. With investment in strategic areas, they indicate the Department is well positioned to grow and increase our national prominence and impact. Our response to specific suggestions and observations of the Review Team Report is given below.

### **Preface to response**

The Department of Civil Engineering (“the Department”) includes both civil engineering and construction programs. Civil engineering is traditionally divided into specialty areas or sub-disciplines: structures, environmental, transportation, water resources, construction and geotechnical. The Department is largely organized along these sub-disciplines, especially the graduate curriculum, and is the only department in New Mexico to include the full range of civil engineering specialty areas. In addition, both undergraduate and graduate construction management degrees are offered by the Department. One challenge of the Department is how to adequately cover all of these areas at both the undergraduate and graduate level with limited resources (primarily faculty).

## **Response to specific Review Team recommendations and comments**

The review team produced a report which contained a number of observations and recommendations. Our response to these recommendations is given below:

### Recommendation 1 - It is reasonable to maintain graduate programs in all areas

The reviewers indicate that it is their opinion that that it is reasonable to maintain graduate programs in all areas of civil engineering and construction offered by the Department. Their rationale is, in part, that each sub-discipline is critical to the State of New Mexico and no other university in the state offers the fully-integrated CE curriculum that UNM does. At the same time, they noted that the department is medium to small sized among state university civil engineering departments and acknowledge that the department is facing a dilemma with respect to faculty in covering all of the areas. They further note that our teaching load is already high compared to peer institutions.

The Department is committed to continuing to offer graduate programs in all areas, and concurs with this recommendation from the Review Team. However, the Department believes that the review team did not adequately consider the lack of resources within the Department in terms of its ability to continue to offer multiple graduate (and undergraduate) programs in construction engineering and management.

With only 3 full-time faculty members, there are not sufficient faculty to cover the breadth of the construction degree programs in the Department. This lack of faculty was cited as a “weakness” during the last accreditation visit by the American Council for Construction Education, who accredits the construction management program. For many years, various strategies have been used to stretch the Department resources so that the construction-related degrees could be covered. The result has been that:

- Three core courses in the Construction Management undergraduate curriculum are offered only at the local community college (CNM).
- Six of the UNM-taught construction courses are taught by adjunct faculty members.
- Construction Management undergraduate students have been directed into engineering courses, negatively impacting quality for all students.

To ensure sustainability of the accredited construction programs, at least one additional faculty position is needed. The Department conducted a search for an instructor position in 2007 to bring some the CNM courses to UNM. Funding for the position was to be from a combination of an Associated General Contractors (AGC) endowment and overhead return to the department. The position was not filled; feedback from candidates indicated that the proposed salary was too low and the position was not attractive because it was not permanent. The financial status of the Department for the foreseeable future precludes funding an instructor position with the same resources.

Recommendation 2 - Department should establish its outlook and direction

We understand this recommendation to mean that the Department should be prepared to make choices and decisions with respect to resource allocation, which if any areas to emphasize, etc. The Department has undertaken meaningful strategic planning in 2001 and 2005 that has aided in decision making (e.g., hiring and promotion decisions). We are conducting another strategic planning effort this year, consistent with the recommendation and the observation by the review team that this appears to be a time of transition.

Recommendation 3 – The Department should devote resources to transportation.

The review team suggested that the transportation area is “weak” and the department should allocate resources (specifically replacement positions) to this area. The department does not accept that department is weak in the area of transportation area; we believe the review team did not appreciate that there is substantial transportation-related research being conducted by faculty and students who might not be categorized as “transportation” in the traditional sense. For example, research expenditures on transportation-related projects directed by “non-transportation” faculty in the Department totaled over \$450k in calendar year 2008. This situation highlights the increasingly blurred lines between the traditional sub-disciplines in civil engineering.

While not accepting the review team’s assessment of the transportation area, the department does agree with the review team that transportation is an area of opportunity and potential growth (p.4). In particular, the review team recommended replacement positions be allocated to transportation. The Department considers “replacement” positions on a case-by-case basis, requiring the search for a replacement position to be consistent with the strategic plan and confirmed by a faculty vote. Barring

new positions, until there is a position vacated, the Department cannot commit to what area we would seek to fill.

It is important to note that the Department houses the Alliance for Transportation Research Institute (ATRI), which has in previous years had substantial research funding (\$1.2 M in FY08, mostly sub-contracts). We will be increasingly looking for opportunities to include more funding for graduate students and faculty in ATRI proposals and projects.

#### Recommendation 4 - Rename department as Civil, Construction and Environmental

The faculty voted on this name change in May 2009 (prior to the review team report being available). The vote was a tie, and thus the proposed department name change did not pass. An evaluation of the name and the organization of the department is a strategic planning goal for this year.

#### Recommendation 5 - Promote areas of existing or emerging strengths

The review team suggested that the Department maintain the graduate program in all sub-disciplines (recommendation 1), but identify areas of excellence in which we can excel. The review team's perspective is that for a small-to-medium department to have a national reputation there needs to be a critical mass of faculty and resources in a particular area. At the same time, the review team noted that they hoped that in pursuing certain areas that this did "not involve redirecting resources in such a way that other core areas are compromised".

The Department concurs with the Review Team that a critical mass of faculty could lead to national prominence in an emphasis area. Our recent experience confirms that there are opportunities for growth in research and educational programs in civil engineering: the Department's recent hires have been extremely successful in terms of graduate student and research productivity as noted by the review team. The last 3 hires were responsible for over \$900k of research expenditures in 2008 and were supporting 34 graduate students.

The Review Team noted that there are two areas that seem to be in the best position to achieve increased prominence in the department: structures/materials and environmental/water. These areas, along with transportation and construction areas, comprise the core elements of the built infrastructure. The Department has increasingly turned toward research and education efforts that are explicitly related to **sustainable infrastructure**; our last hire was in the area of sustainable water

resources, and we continue to add content to courses related to sustainability including courses that contain that topic as the principal focus.

If additional faculty positions are made available in the areas of sustainability and infrastructure, our recent track record suggests the resulting productivity would increase the prominence and impact of the Department on a national level. To achieve a critical mass as suggested by the review team would require at least two additional faculty.

Beyond new faculty as a means to increase graduate education and research, the Department has pursued inter-disciplinary collaborations. This includes research collaboration with units inside and outside the School of Engineering, as well as participation in multi-disciplinary educational programs such as the Master's of Water Resources program and cross-listing courses with other departments (e.g., Earth and Planetary Sciences).

## **Conclusions**

The Department largely agrees with the recommendations and observations in the Review Team Report.

The Department needs at a minimum an instructor to provide our construction programs sufficient faculty to cover the curriculum and address accreditation issues.

The Department is actively directing research and education efforts toward topics related to ***sustainable infrastructure***, which can be grouped into the construction/transportation, water/environment, and structures/materials areas. These are growth areas that are critical to our future security and standard of living, and are well aligned with the University's mission. Achieving a critical mass in sustainable infrastructure would require two additional faculty.

The department is initiating a strategic planning effort to reconsider our strategic plans from 2001 and 2005 and refocus our research and educational missions. We believe our planning efforts, coupled with additional resources such as those mentioned above, will continue to strengthen what is already a strong department.