



# American Council for Construction Education

825 West Bitters Road, STE 103  
San Antonio, Texas 78216  
Tel: 210.495.6161  
Fax: 210.495.6168  
E-mail: [acce@acce-hq.org](mailto:acce@acce-hq.org)

March 6, 2018

Cheryl Goodale  
Board Chair

John Schaufelberger  
Board Vice Chair

Norma Jean Andersen  
Secretary

Greg Zick  
Treasurer

Michael M. Holland  
President

Dr. Rita Hartung Cheng, President  
Northern Arizona University  
P.O. Box 4092  
Flagstaff, AZ 86001

Dear Dr. Cheng,

At its February 2018 Mid Year Meeting, the American Council for Construction Education (ACCE) Board of Trustees reviewed the application for renewal of accreditation of the Construction Management Program at Northern Arizona University. The Board had available to it the reports of its Visiting Team under the Chairmanship of Dr. Charles Berryman, and its Accreditation Committee under the Chairmanship of Dr. Khalid Siddiqi. This letter is to inform you that the Board has voted for a six-year accreditation from February 2018 through February 2024.

A renewal of accreditation visit at the end of this six-year period should be scheduled between September 1 and November 1, 2023. The self-evaluation study, in preparation for this visit, will be due in the ACCE national office no later than June 1, 2023.

The final report of the Visiting Team, as acted upon by the Board, is enclosed. This report, as do all ACCE accreditation reports, contains a delineation of perceived program Strengths, Weaknesses, Concerns, and Undeveloped Potentials. It is the hope of ACCE that the cited Weaknesses and Concerns will be addressed in coming years, while maintaining program Strengths and pursuing program potentials.

ACCE requires that you file a progress report at the end of the first year no later than November 1, 2019. Additionally, all programs are required to file a third year progress report, making your third year progress report due no later than November 1, 2021. A Progress Report form designed specifically for your program will be sent to the program in June of the corresponding year. If for any reason these dates need to be changed, we will notify you well in advance, and should it become necessary for you to ask for an extension, we request that you do the same.

The Board of Trustees looks forward to a First Year Progress Report containing documented progress toward correcting the Weaknesses and Concerns cited in the current Visiting Team Report. The Board's comments are summarized below:

*The Council approves the re-accreditation of the program at Northern Arizona University for six years with first and third year progress reports. The Council expects an action plan in the First-Year Report to address Weaknesses on assessment of individual student learning and preparation of strategic plan for the department.*



March 6, 2018  
Dr. Rita Hartung Cheng  
Northern Arizona University  
Page 2

The ACCE Board of Trustees extends congratulations on this accreditation, and asks that I express its appreciation for the many courtesies extended to our Visiting Team and for the positive way in which your faculty and staff responded throughout.

We wish you continued success with your Construction Management Program, and feel confident that your graduates, the building community, and the Nation are richer for your efforts.

Warmest regards,  
American Council for Construction Education



Dr. Cheryel Goodale, Board Chair

Cc: Dr. Dan Kain, Provost  
Dr. Paul Jagodzinski, Dean  
Dr. Paul Gremillion, Chair  
Dr. John Tingerthal, Associate Chair and Program Coordinator  
Dr. Khalid Siddiqi, Chair, ACCE Accreditation Committee



# **American Council for Construction Education**

**Northern Arizona University**  
Flagstaff, Arizona

Bachelor of Science in Construction Management  
September 09 – 12, 2017

## **Visiting Team**

Dr. Charles Berryman, Chairman  
Louisiana State University  
Baton Rouge, Louisiana

Ms. Susan Labas, Member  
Van Zelm Engineers  
Farmington, Connecticut

Dr. Robert Ries, Member  
University of Florida  
Gainesville, Florida

Cristian Gaedicke, Member-in-Training  
California State University, East Bay  
Hayward, California

Professor Paul Holley, Member-in-Training  
Auburn University  
Auburn, Alabama

Brad Gabel, Industry Observer  
Kitchell - Retired  
Phoenix, Arizona

This Visiting Team report remains the intellectual property of ACCE and is for the sole use of the institution. It is not to be provided to or discussed with third parties not officially connected to the institution except with the express written permission of ACCE or unless required by law.



# Visiting Team Report

## Section 1: INTRODUCTION

### 1.1 Requirement

#### **Size, brief history, type, and purpose of the institution.**

Northern Arizona University was known as Northern Arizona Normal School when it began operations in 1899. The name was changed to Northern Arizona Teachers College in 1925, Arizona State Teachers College in 1929, Arizona State College at Flagstaff in 1945, and Northern Arizona University in 1966.

Northern Arizona University's fall 2016 Enrollment was 30,368 including 3,862 graduate students. Since ACCE's last accreditation in 2011, the University has seen a rapid expansion of its enrollment on the Flagstaff campus. The University has a High Research with High Undergraduate profile under the Carnegie Foundation university classification system. NAU currently offers 91 Baccalaureate Degrees, 47 Undergraduate Certificates, 31 Graduate Certificates, 50 Masters Degrees and 14 Doctoral Degrees.

#### **Institution organization and location of the construction unit.**

The University is organized into six colleges. The construction unit, the Department of Civil Engineering, Construction Management, and Environmental Engineering, is located within the College of Engineering, Forestry, and Natural Sciences. It is one of ten units in the College of Engineering, Forestry and Natural Sciences.

#### **Size, number of faculty members, brief history, and purpose of the construction unit.**

In the spring of 2017 the Department had 726 undergraduate students, with CM having 203 students, Civil Engineering (CE) having 357 students and Environmental Engineering (EnE) having 166 students. CM students make up 25% of the departmental majors and the program has roughly 30% (6.35 FTE and 3 part-time faculty) of the faculty lines.

In 2004, the College of Engineering merged with the College of Natural Sciences to form a new college. It was named the College of Engineering and Natural Sciences. The College includes the following programs: Engineering, Construction Management, Computer Science and Engineering, Biology, Environmental Science, Chemistry, Geology, Mathematics, Physics and Quaternary Studies. In 2008, the College of Forestry consolidated within this larger college to form the College of Engineering, Forestry and Natural Sciences. During the 2008-2009 academic year, the University was faced with significant state budget reductions, and the departments of Civil and Environmental Engineering were combined with the Construction Management Department to form a new Educational Unit called the Department of Civil Engineering, Construction Management, and Environmental Engineering (CECMEE). A Department Chair leads it with Associate Chairs assigned to each of the programs.

The current CM Program evolved from a vocational education program in “industrial supervision” that was started in the late 1970’s. This original construction program was created in 1984 with the first construction degree awarded in 1985. In 1993, the CM Program was moved from vocational education into the College of Engineering and Technology. In 1999, the CM Program was granted department status within the College but lost this status when it was merged with Civil and Environmental Engineering in 2009 due to College budget issues. The major emphasis of the program is general contracting and construction management but sufficient electives and applied course content make our students potential recruits in specialty trade contracting and in heavy highway construction.

**Accreditation history – first accredited and reaccredited.**

The Degree Program received its initial ACCE accreditation in 2000 and was reaccredited in 2006 and 2012.

**Degree title and credit hours required.**

Bachelor of Science in Construction Management.  
The Degree Program requires 120 semester credit hours for completion.

**Other degree programs administered by the construction unit.**

Other than the CM Program, the Department administers Degree Programs in Civil Engineering and Environmental Engineering.

The CM Program offers a Minor in Construction Management and a Certificate in International Construction Management.

**Name of regional accrediting agency of the institution.**

Higher Learning Commission (HLC)

**Name and position of persons interviewed during the visit.**

Institution Administration and Staff

Dr. Rita Cheng, President, Northern Arizona University  
Dr. Daniel Kain, Vice President and Provost for Academic Affairs,  
Dr. Pauline Entin, Vice-Provost for Academic Programs  
Dr. Paul Jagodzinski, Dean, College of Engineering, Forestry, and Natural Sciences  
Dr. Diana Elder, Associate Dean for Academic Affairs, College of Engineering,  
Forestry, and Natural Sciences  
Dr. Daniel Goebel, Dean; College of Business  
Ms. Melinda Treml, Director of Curriculum and Assessment  
Ms. Melissa Mount, Director of Development, Northern Arizona University  
Foundation  
Ms. Kelley Horn, Assistant Development Officer, Northern Arizona University  
Foundation

Ms. Elizabeth Glass, Program Director, Employment Services or Career Development Center  
Ms. Naomi Bishop, Librarian  
Mr. Ruben Ricardo, Academic Advisor, College of Engineering, Forestry, and Natural Sciences  
Ms. Singne Slayton, Business Manager, College of Engineering, Forestry, and Natural Sciences  
Mr. Pete Gomersall, Information Technology Director; College of Engineering, Forestry, and Natural Sciences  
Ms. Gay Spivey, Administrative Associate, College of Engineering, Forestry, and Natural Sciences

#### Educational Unit Administration and Staff

Dr. Paul Gremillion, Chair, Department of Civil Engineering, Construction Management and Environmental Engineering  
Dr. Bridget Bero, former Chair, Department of Civil Engineering, Construction Management and Environmental Engineering  
Dr. John Tingerthal, Associate Chair, Department of Civil Engineering, Construction Management and Environmental Engineering overseeing the Construction Management Program, and Construction Management Associate Professor

#### Program Faculty and Staff

Dr. Tom Rogers, Professor, Construction Management Program  
Ms. Agnes Drogi, Professor of Practice, Construction Management Program  
Mr. Alan Francis, Associate Professor of Practice, Construction Management  
Dr. Chun-Hsing Ho, Assistant Professor, Construction Management Program  
Mr. Kaikea Kaoni, Assistant Professor of Practice, Construction Management  
Mr. Robert Bruner, Assistant Professor of Practice, Construction Management Program  
Dr. Jeffery Heiderscheidt, Lecturer, Construction Management Program

#### Industry Advisory Board Members

Ron Wilson, Design Executive, Mortenson Construction  
Bill Headley, Senior VP, Holder Construction  
Andrew Rogers, Estimator/Project Manager, Granite Construction  
Brad Gabel, Vice President, Kitchell - Retired

#### Students

Seniors – 10 in attendance  
Juniors – 2 in attendance  
Sophomores – 2 in attendance  
Freshman – 1 in attendance

## **Section 2: Governance and Administration**

### **2.1 Requirements**

#### **2.1.1 INSTITUTIONAL ORGANIZATIONAL STRUCTURE**

##### **2.1.1.1. The organizational structure of the institution provides a basis for establishing authority and responsibility, utilizing resources and achieving the degree program's mission, goals, and objectives.**

The organizational structure of the University clearly establishes the authority and responsibility of Department Chair to manage their respective Educational Unit. The Chair of the Department of Civil Engineering, Construction Management, and Environmental Engineering reports to the Dean of the College of Engineering, Forestry and Natural Sciences. The Department Chair manages research funding, scheduling and teaching assignments, faculty annual reviews, and/or tenure and promotion, academic integrity issues, shared resources, and interface with college and university administration.

The Dean of the College reports to the Provost, who reports to the President of the University. This clear organizational structure provides the basis for establishing authority and responsibility, utilizing resources, and achieving the mission, goals, and objectives of the CM Program.

##### **2.1.1.2. The degree program and its relationship to the overall organizational structure of the institution are documented, well-defined, and accessible to the public.**

The CM Program is one of three Degree Programs within the Civil Engineering, Construction Management, and Environmental Engineering Department. The Department Associate Chair for CM reports to the Department Chair. The Associate Chair for CM manages the assigned and budgeted university resources and manages outside funding with consent of the Department Chair. The current duties of the Associate Chair for CM include working with students in matriculation issues, and with outside industry partners, and managing the program curriculum, assessment, and strategic planning efforts. Additionally, the Associate Chair for CM handles fund-raising for the program and manages Program accreditation, articulation agreements and student transfer evaluations.

The Visiting Team found the degree program and its relationship to the overall organizational structure of the institution was documented, well-defined, and accessible to the public.

## **2.1.2 EDUCATIONAL UNIT AUTONOMY, STRUCTURE, AND LEADERSHIP**

### **2.1.2.1 The educational unit is a distinct and identifiable entity within the educational institution.**

The Civil Engineering, Construction Management, and Environmental Engineering Department is clearly a distinct and identify entity with Northern Arizona University.

### **2.1.2.2 The degree program or educational unit is headed by a qualified administrator who is knowledgeable in and committed to the construction discipline.**

Dr. John Tingerthal joined the faculty at Northern Arizona University in 2007 and was appointed as a Distinguished Teaching Fellow in 2015. He is a registered structural engineer with eight years in the field. He has a Bachelor of Science from the University of Minnesota-Twin City, and a Master of Science in Civil Engineering from the University of Illinois at Urbana-Champaign with an Educational Doctorate from Northern Arizona. He is currently an Associate Chair within the Department of Civil Engineering, Construction Management and Environmental Engineering and heads the CM Program. During the faculty and student interview process, it was learned that he is well qualified, knowledgeable and extremely committed to the CM Program. The Visiting Team considers his leadership a Strength of the program.

### **2.1.2.3 The organizational structure of the educational unit is designed to encourage communication, coordination, and interaction among administrative officers, faculty, and students involved with the degree program, other disciplines, and other educational institutions.**

The Department Chair and Associate Chair are granted academic teaching release time to adequately administer the program. With the Department's Associate Chair for CM closely integrated with the CM Program, the organizational structure naturally encourages communication and interaction among all stakeholders of the program, other disciplines and other educational units.

### **2.1.2.4 The educational unit and the leadership structure are well-defined and accessible to the public.**

The Department of Civil Engineering, Construction Management and Environmental Engineering clearly defines their leadership structure through a graphic organizational chart defining the college hierarchy. It is publically accessible through on their Department website.

### **2.1.3 FACULTY PARTICIPATION**

#### **2.1.3.1 Faculty members participate in the educational unit's governance and administration in accordance with the educational institution's guidelines.**

Faculty of the CM Program regularly engage in program strategic planning, curriculum development, industry outreach, fundraising and scholarly endeavors. Although the Department Chair serves at the consent of the Dean, the Dean consults with all faculty within the Department in selecting the Department Chair. In a like manner, the Department Chair seeks consent of the CM Program faculty in selection the Department Associate Chair that will oversee the CM Program. After a selection is made, the hiring recommendation is sent to the Dean for approval.

The College, Department and program engage in governance through a variety of committee, subcommittees, and task forces. Principle among them is the Department's Faculty Service Committee (FSC) for the Department's three programs. This committee provides recommendations for annual performance reviews, tenure track recommendations and post tenure reviews, as well as recommendations for faculty personal advancement. It is not uncommon for one of the CM faculty to chair the FSC.

#### **2.1.3.2 Faculty members participate in the degree program maintenance and administration in accordance with the educational institution's guidelines.**

The faculty of the CM Program are responsible for curriculum and content, as well as student learning outcomes assessment. These same faculty utilize several resources to develop measurable student learning outcomes. They attend ACCE training, work closely with their Industrial Advisory Board, and regularly visit the University's Office of Curriculum Learning Design and Academic Assessment. During the academic year 2013-2014, the Provost's Academic Leadership Council collaborated with faculty from across campus to develop a shared approach to evaluating programs in terms of strategic priority, academic quality, and financial/resource implications. Program curriculum changes now require a Departmental curriculum review and consent, followed by a College curriculum review. The University's e-Learning Center and Office of Curriculum, Learning Design and Academic Assessment support the CM faculty for curriculum development, learning and design and academic assessment. Faculty members do participate in maintaining and administering the CM Program at various levels.

## **2.1.4 CONTRIBUTION TO THE INSTITUTION**

### **2.1.4.1 The educational unit and degree program contribute to the mission of the institution.**

It is probable that the Department of Civil Engineering, Construction Management and Environmental Engineering contributed to the mission of Northern Arizona University; however, it was unclear and difficult for the Visiting Team to determine the level of contribution. There was no Strategic Plan in place at the department level at the time of the visit. This has been identified as a Weakness. In the interview, the former Department Chair, Dr. Bridget Bero, recognized the need for a departmental Strategic Plan. She stated that she began the process but left before it was completed.

## **2.2 General comments of the Visiting Team, if any, not included in the preceding discussion in this section of the report.**

The CM Program's Self-Study sometimes inadvertently interchanged ACCE definition and responsibilities of an Educational Unit and a Degree Program. There was some confusion between the two entities. After the campus visit, it was clear that the Department of Civil Engineering, Construction Management and Environmental Engineering structure and operation is an Educational Unit as defined by ACCE. From ACCE Document 103, Standard 1, Definitions:

“Educational Unit: ACCE recognizes there are units at institutions of higher learning composed of faculty and staff capable of teaching or conducting research. These units typically offer degree programs with which they are affiliated. Operations may include budgets, faculty evaluations, promotion and tenure, scholarly activities, and determination of work assignments.”

The Construction Management Degree Program is organized under this Educational Unit with two other Programs. The CM Program aligns with ACCE's definition of a Degree Program. From ACCE Document 103, Standard 1, Definitions:

“Degree Program: ACCE accredits post-secondary degree programs in construction. A degree program is an educational system with identified academic coursework, containing the body of knowledge necessary to obtain a college or university degree in that field of study. The degree program has objectives, learning outcomes, a curriculum, faculty, and facilities.”

## **Section 3: CURRICULUM**

### **3.1 Requirements**

#### **3.1.1 DEGREE PROGRAMS**

##### **3.1.1.1 The professional program offered by the construction education unit is consistent with the philosophy and the purposes of the institution.**

Northern Arizona University Mission:

*“Our academic programs, research, public service, and creative endeavors enrich lives and create opportunities in Arizona and beyond. We develop solutions to challenges and drive innovation in a supportive, inclusive, and diverse environment.”*

The Department’s CM Program and teaching philosophy is consistent with the University’s mission. Its curriculum and range of opportunities are innovative and industry relevant; its student body represents a close knit culture and is comparably diverse among construction programs. The curriculum and in particular the Construct for Practice (C4P) Program are designed to accommodate continuously changing needs in the profession, and provides perspective to both office and field processes. The overall curriculum, its practical and contemporary nature, and pervasive engaging character that connects students, faculty, and industry is considered a Strength of the program.

##### **3.1.1.2 The degree program curriculum contains at least the required minimum number of credit hours.**

The CM Program requires students to successfully complete 120 semester credit hours to obtain a degree, which is the minimum required by ACCE.

##### **3.1.1.3 The degree program curriculum relates to the needs of society and the construction profession.**

The CM Program serves the construction industry by providing well-prepared graduates. Industry representatives report that they are not only technically versed, but also practical and hard workers. The curriculum promotes connection to society and a broader audience in several ways. The University’s liberal studies requirements and required business minor for CM Program majors, the foreign language credits, as well as community service outlets are demonstrative on this front.

### **3.1.2 GENERAL EDUCATION**

#### **3.1.2.1 The curriculum meets the requirements for the Core Subject Area of Communications.**

There are 9 semester credit hours in the core subject area of communications.

The CM Program exceeds ACCE minimum requirements in this core subject area.

#### **3.1.2.2 The curriculum meets the requirements for the Core Subject Area of Mathematics.**

The Program meets ACCE requirements in the core subject area of Mathematics.

#### **3.1.2.3 The curriculum meets the requirements for the Core Subject Area of Physical Science.**

The students are required to take 8 semester credit hours in physical science.

The CM Program exceeds ACCE requirements in the core subject area of physical sciences.

### **3.1.3 BUSINESS AND MANAGEMENT**

#### **3.1.3.1 The curriculum meets the requirements for the Core Subject Area of Business and Management.**

Students are required to take seven required courses external to the CM Program. This totals 21 semester credit hour that are covering topics in business. Required courses include introduction to business law (3 CH), principles of financial accounting (3 CH), principles of managerial accounting (3 CH), introduction to economics (3 CH), concepts in finance (3 CH), concepts in management (3 CH), and concepts in marketing (3 CH). These courses are also part of the required Business Minor for CM students.

The program exceeds ACCE requirements in the core subject area of business management.

#### **3.1.3.2 The business and management topics are taught outside of the degree program and are separate and distinct from construction business and management topics.**

A total of 21 semester credit hours of business and management are taught outside of the CM Program. These courses (with

designations ACC, ECO, MGT, FIN, and MKT) are taught in the W.A. Franke College of Business.

### 3.1.4 CONSTRUCTION

**Tables 3.1 Summary of Category Credit Hour Requirements**

**Table 3.1.1 Bachelor Degree Programs**

The curriculum Core Subject Area credit hour count is as follows:

Core Subject Area	ACCE Minimum (sh*)	Degree Program	Visiting Team
<b>General Education</b>			
<b>Communications</b>	<b>6</b>	<b>7</b>	<b>7</b>
<b>Mathematics</b>	<b>3</b>	<b>4</b>	<b>4</b>
<b>Physical Science</b>	<b>6</b>	<b>8</b>	<b>8</b>
<b>Business and Management</b>	<b>12</b>	<b>21</b>	<b>21</b>
<b>Other Communications, Mathematics, Physical Science, or Business and Management</b>	<b>6</b>	<b>0</b>	<b>0</b>
<b>SUBTOTAL (External to Program)</b>	<b>33</b>	<b>40</b>	<b>40</b>
<b>Construction</b>	<b>50</b>	<b>66</b>	<b>66</b>
<b>Other</b>	<b>37</b>	<b>14</b>	<b>14</b>
<b>TOTAL CREDIT HOURS</b>	<b>120</b>	<b>120</b>	<b>120</b>

\*semester hours

#### 3.1.4.1 Summary Comments.

Other Communications, Mathematics, Physical Science, or Business and Management core subject area has zero credit hours. This is due to all of the 21 semester credit hours for the Business Minor being credited under the Business and Management core subject area. This still complies with ACCE Standards as they exceed the minimum by 9 semester credit hours in this area.

The CM Program provides a thorough and unique curriculum by combining relevant contemporary construction coursework and integrated labs, accompanied by requirements in business, liberal studies, and foreign language.

**3.1.5 STUDENT LEARNING OUTCOMES**  
**(3.1.5.1 & 3.1.5.2 not used)**

**3.1.5.3 Determination of Achievement of Student Learning Outcomes**

The CM Program's Self-Study listed each SLO with an expanded description as interpreted and assessed by the program. Prior to the visit, documentation demonstrating student achievement was electronically provided via PDF file. During the visit, the same information was provided hardcopy in notebooks organized by each program SLO. This was very helpful for the Visiting Team. Each SLO had a comprehensive process in determining student achievement; however, after a review of these documents, it was determined that the CM Program misunderstood the ACCE definition meaning of an indirect assessment and the need to assess individuals within a group project as it relates to the SLO in question.

All of the indirect assessments used by the program were from projects, exam, or quizzes. They were not intended to assess student learning through student perception, opinion, or attitude; therefore, could not be used as an indirect assessment. From ACCE Standard 1, Definitions:

“Indirect Assessment: Evidence of student learning is the perception, opinion, or attitude of students (or others).”

The CM Program utilizes a unique and very successful concept called Construct for Practice (C4P). It is a three year integrated laboratory utilizing where the students proceed from trade worker, to project designer, then to a project manager overseeing the aforementioned trades. Throughout this three year curriculum, students work in teams to complete the assigned project. Several direct measurements of the SLOs were assessed based on team performance not by individual performance. On some SLO assessments, when individual performance was measured, it was project (or course) specific, not SLO specific. In some other instances, no rubric was provided to indicate how the SLO was being assessed. While the program's determination of achievement was generated using various assessments, several SLO assessments were not in compliance with ACCE Standards. This has been identified as a Weakness.

**A. For the individual course(s), have the outcomes been incorporated in the curriculum?**

The program provided the Visiting Team with a course outcomes mapping summary that shows a direct relationship between all CM Course Learning Outcomes and ACCE Student

Learning Outcomes. In addition, each course syllabus included direct references between specific Course Learning Outcomes and corresponding ACCE Student Learning Outcomes. The information provided demonstrated that the outcomes have been adequately incorporated into the curriculum.

**B. A course syllabus was provided for each course used to support the Student Learning Outcomes. Each syllabus met the following criteria. This includes any course offered by alternative forms of delivery. (Explain any findings of lack of full compliance following the table.)**

Syllabi were provided for all the courses and were presented in a rather consistent manner. They all included, at a minimum, a description of the course, a topics outline, an identification of related SLO's with associated measures.

<b>Course Syllabus Requirements</b>	<b>Compliance Status</b>
<b>Contained a description of the Student Learning Outcomes included in the course</b>	In compliance
<b>Contained a description of the instructional methods used in the course</b>	In compliance
<b>Contained a topical outline</b>	In compliance
<b>Described the methods used to assess student learning of Course Learning Outcomes</b>	In compliance
<b>Described grade performance criteria</b>	In compliance

**Description of any findings of lack of full compliance:**

**C. Evidence was provided that Student Learning Outcomes were included in the curriculum of each course assigned responsibility for addressing topics related to the outcomes.**

Evidence was provided demonstrating the integration of Student Learning Outcomes in those courses used for Program assessment.

**D. Each Student Learning Outcome is evaluated by at least two assessment methods with at least one of the methods being a direct assessment.**

These Student Learning outcomes were evaluated by at least two assessment methods (with at least one being direct or having two or more direct assessments):

6. Analyze professional decisions based on ethical principles.
8. Analyze methods, materials, and equipment used to construct projects.
11. Apply basic surveying techniques for construction layout and control.
12. Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.
13. Understand construction risk management.
14. Understand construction accounting and cost control.
19. Understand the basic principles of structural behavior.
20. Understand the basic principles of mechanical, electrical and piping systems

The remaining Student Learning Outcomes are missing second assessment and therefore, is being cited as a Weakness. See Section 3.1.5.3 for more information.

**E. Copies of assessment tools were provided to demonstrate students' ability to meet each Student Learning Outcome.**

Copies of assessment tools were provided to the Visiting Team.

**F. The results of the assessment of student achievement of Student Learning Outcomes were included in the program's Quality Improvement Plan.**

Each Student Learning Outcome assessment includes establishment of data points for future Quality Improvement Plan along with 'next steps' and potential strategies for improvement. A table in the Self Study demonstrates collective performance. It identified which Student Learning Outcomes and their corresponding assessments needing improvement and at what magnitude.

### **3.2 Courses Delivered by Alternative Forms of Delivery**

**Courses offered via multiple forms of delivery with the same course number have consistent content and learning objectives.**

Not applicable.

**3.3 Multiple Campus Program Delivery**

- **The degree program offers courses on multiple campuses and the accreditation may cover all campus locations if the following criteria are met. (Explain any findings of lack of full compliance following the table.)**

<b>Degree Program Requirements</b>	<b>Compliance Status</b>
<b>A single institution is authorized to grant the degree.</b>	Not applicable
<b>The degree program is administered by a single qualified administrator.</b>	Not applicable
<b>Adequate faculty and staff are available to facilitate the degree program at each location.</b>	Not applicable
<b>A single curriculum is used on all campuses, and degree requirements are consistent.</b>	Not applicable
<b>Adequate faculty and staff are available to facilitate the degree program at each location.</b>	Not applicable

**Description of any findings of lack of full compliance:**

- **Summary Comments**

Not applicable.

**3.4 Dual or Second Degrees**

**Second degree programs and modified curriculum educational units accepting second or dual degree students into an ACCE accredited undergraduate degree program shall demonstrate that the modified degree path for those students fulfills the required curriculum standards.**

Not applicable.

**3.5 General comments of the Visiting Team, if any, not included in the preceding discussion in this section of the report.**

While the assessment of several Student Learning Outcomes needs modification and additional information for full compliance, the Visiting Team believes the curriculum is appropriately being delivered. They have a solid foundation. Technical adjustments to the assessment tools are all very straightforward and can be easily accomplished by the CM Program in a relatively short period.

## **Section 4: FACULTY AND STAFF**

### **4.1 Requirements**

#### **4.1.1 FACULTY QUALIFICATIONS**

**4.1.1.1 The faculty members possess appropriate academic qualifications, professional experience, and, where applicable, pursue scholarly and creative activities essential to the successful conduct of an academic degree program of construction and in compliance with regional accreditation requirements.**

The CM Program has qualified tenured, tenure-track, and Professors of Practice who are dedicated professionals and committed to the success of the students and the program. The faculty were commended several times by students and staff for their dedication and support. Faculty have appropriate combinations of education and experience in the construction industry.

**4.1.1.2 The faculty members demonstrate expertise in the areas for which they have teaching responsibilities and possess adequate backgrounds in supporting disciplines.**

Courses in the CM Program are assigned to faculty based on their qualifications and interests. The faculty have construction experience, which provides a broad understanding of all disciplines in the field.

**4.1.1.3 Evaluation of faculty member competence recognizes appropriate professional experience as being as important as formal educational background.**

The inclusion of Professors of Practice in the faculty make up demonstrates the value placed on practical experience. Faculty interviews suggest that they appreciate the program's willingness to support innovation and new ideas in the classroom, commensurate with changes, shifts, and improvements in the industry.

#### **4.1.2 FACULTY SIZE**

**4.1.2.1 The size of the faculty is commensurate with the number of courses offered, the number of students, and the other responsibilities of the faculty.**

The CM Program has a 6.5 FTE. The overall faculty size is appropriate for the number of students in the program, and is comparable to the size of the faculty in other programs within the

Department. However, the CM Program has only 1.5 FTE tenure or tenure track faculty, which is significantly less than the other two programs in the Department, and is therefore a Concern. The low number of CM tenured or tenure track faculty has the potential to become critical should there be an abrupt change in the research direction of the College or University, or if there is a need for representative administrators for CM. At the time of the visit, it was questionable if a Professor of Practice (a non-tenure track faculty) can be considered for a departmental or college level administrative position.

The industry affirmed that regional construction is booming and that they are seeking more qualified CM graduates. This provides the opportunity for the CM Program to grow their undergraduate program while working to develop a master's degree program. This could be realized if the Department, industry, and resources are strategically aligned. The Visiting Teams views the expansion of student enrollments as an Undeveloped Potential.

**4.1.2.2 The faculty size is adequate for the type of instruction used in the program and is comparable to other academic programs within the institution.**

Currently, the faculty size is adequate for their type of instruction. Interviews with students and staff indicate there are required courses offered only once per year. While this may not represent an inadequacy of the size of the faculty in general, it may impact the graduation rate for transfer students.

**4.1.3 FACULTY WORK LOAD**

**The faculty work load is distributed fairly considering teaching, advising, research, and service responsibilities of the faculty.**

Faculty workloads appear to be distributed fairly, and in accordance with the College policy. There is also a reasonable distribution of faculty duties/expectations outside of teaching, including advising, committee service, competition team coaching, etc.

**4.1.4 ADMINISTRATIVE AND TECHNICAL STAFF SUPPORT**

**The administrative and technical support is adequate and comparable to that received by degree programs of similar size and function within the institution.**

Staff support for the CM Program is centralized at the Department level. Staff interviews suggest enthusiastic, qualified, and experienced support for the program, and that their contribution and engagement with the CM Program is comparable to the other programs that they serve within the College.

CM does not have a graduate program and therefore does not have research or teaching assistants available. As noted in Section, 4.1.2.1 above, this Undeveloped Potential may be part of the assessment of the viability of program growth at the graduate level.

#### **4.1.5 EMPLOYMENT POLICIES**

##### **4.1.5.1 Faculty compensation is competitive with comparable positions within the institution.**

CM faculty compensation appears comparable to the institutional averages as reported in the Self Study, although just slightly lower than the averages (by rank) in other units within the Department and College.

##### **4.1.5.2 Faculty members are provided with rank, status, salary, and benefits commensurate with their educational backgrounds and professional experiences.**

The high percentage of non-tenure track faculty makes the CM Program somewhat unique within the Department and College, and in many ways it is difficult to collectively compare to other units whose faculty have larger research appointments. CM faculty compensation appears to be commensurate with their academic backgrounds and professional experiences.

#### **4.1.6 PROFESSIONAL DEVELOPMENT**

##### **4.1.6.1 Continuing professional opportunities are provided to faculty members.**

The range of professional development opportunities and their associated financial resources appears to be satisfactory based on the size of the faculty. Faculty members are able to identify and negotiate their planned undertakings within their annual Statement of Expectations.

##### **4.1.6.2 Faculty members are encouraged to engage in consulting work when it does not conflict with normally assigned duties.**

Based on the nature of the Professors of Practice representing a majority of the faculty, relevant work in industry is a regular (encouraged and expected) component. As long as academic commitments in their respective Statement of Expectations are met, this structure has great benefit to bring current industry conditions and trends into the classroom.

#### **4.1.7 FACULTY EVALUATIONS**

**A clearly defined program of faculty evaluation is in place and may include student, peer, and/or administrator evaluations.**

In accordance with the College's Condition of Faculty Service policy, CM faculty receive feedback through a variety of mechanisms, including annual performance evaluations measured against their Statement of Expectations, Promotion and Tenure review for those on tenure track, and a self-evaluation. While student interviews demonstrated to the Visiting Team that there are regular course/faculty evaluations, they were not provided in the Self-Study due to privacy concerns. The inclusion of these, as well as peer evaluations of teaching, is an optional consideration for faculty evaluation.

#### **4.2 General comments of the Visiting Team, if any, not included in the preceding discussion in this section of the report.**

The Visiting Team observed a dedicated, industry-relevant faculty who are committed to the professional education of the CM students. Their engagement is a major influence on what is an enviable student body culture within the Department. While the structure of faculty positions and responsibilities within the CM Program presents a Concern related to the imbalance between tenured/tenure track versus Professors of Practice, it may also be an opportunity to consider the potential for program growth and research expansion.

### **Section 5: STUDENT POLICIES**

#### **5.1 Requirements**

##### **5.1.1 Academic Policies**

**Policies pertaining to academic requirements are in writing and are developed with input from faculty, students, and other program stakeholders. The policies indicate required courses and acceptable elective courses that meet degree program requirements.**

The curriculum and sequence of courses is well documented in meeting institutional and ACCE standards, and is clearly communicated to students, faculty, and other stakeholders. Industry engagement with the program is very strong, including their voice in consideration of academic requirements.

### 5.1.2 Teaching Quality

**Faculty evaluations include assessment of the quality of teaching by full-time and part-time faculty members, and a process has been implemented for establishing metrics to evaluate and improve the quality of teaching within the degree program.**

Faculty annual review includes a structured evaluation of teaching effectiveness and student learning. Departmental policies specify expectations for teaching and quality improvement. The policies cover course development and maintenance and provide examples of teaching effectiveness.

### 5.1.3 Admissions and Enrollment

**The degree program's entrance requirements reflect standards supportive of the student's potential for success in studies and in professional practice, while reflecting institution-wide policies and the degree program's mission, goals, and objectives.**

The program's admission requirements follow institutional policies on open enrollment. The required pre-requisite courses for students are a blend of math, science, communication, and construction courses.

### 5.1.4 Recruitment and Composition

**5.1.4.1 The degree program has implemented recruitment and retention programs to achieve its aspirations regarding student composition.**

At the program level, CM has a strategic plan that has a goal to start developing a formal recruitment and retention plan beginning fall 2016. Their Quality Improvement Plan has a fall 2017 completion date. They currently engage in direct student recruiting in Arizona through mailings and attending the Arizona high school college recruiting and career fairs. They have also implemented recruited activities in the Flagstaff STEM day and the Arizona Construction career days.

**5.1.4.2 Recruitment programs are focused on individuals with high academic achievement.**

Northern Arizona University sets academic requirements that are rational and reflect a student's ability to complete college level academic work and obtain a degree. The CM Program requires successful completion of a pre-professional program before enrolling in 200 or higher level CM courses.

**5.1.4.3 Recruitment and publicity for the degree program are comparable to recruitment efforts in other programs within the institution.**

Northern Arizona University has an outreach that is specific to each individual program. The CM Program also produces related recruitment materials.

**5.1.5 ACADEMIC ADVISING AND MENTORING**

**The degree program has an organized system of academic advising, counseling, and professional guidance that is competent, continuous, and consistent.**

The university provides advising for students before they declare a major by way of the 'Gateway' Program. After their major has been declared, the Department of Civil Engineering, Construction Management, and Environmental Engineering takes over advising duties. There is one departmental advisor that advises the students within its three programs. Interviews suggest that advising for CM students is commensurate with the other programs within the Department. In addition, advising is well planned and easier to implement given the CM Program's clear curriculum progression. Software platforms such as 'Salesforce' are utilized to provide data for administrators to get feedback on student interest and ability to enter into the program. While faculty are not formally engaged in student advising, they do appear to have a strong informal role in participating on this front, contributing to the positive and familial culture of the program.

**5.1.6 COURSE SCHEDULING**

**Program courses are offered in formats and at times to ensure appropriate student access to them and timely completion of degree requirements.**

Courses have a defined schedule that seems to allow entering students to successfully complete their course of study, although the scale of the program has some required courses offered only once per year. Given that the majority of CM students do not begin the curriculum their first semester, this could have some impact in graduation rates. If courses are offered each semester, this could increase enrollments as more students could potentially transfer into the CM Program. The Visiting Team views this as an Undeveloped Potential for program growth.

**5.1.7 STUDENT PLACEMENT**

**5.1.7.1 Student placement services are available that can effectively assist students in entering the job market.**

Two CM-dedicated career fairs are offered per year, and the program offers significant support for opportunities such as

student competitions and a weekly evening professional seminar which include wide opportunities for interaction with industry.

#### **5.1.7.2 Students are well informed about and have access to placement services and employment opportunities.**

Students participate in the college career fairs, have weekly on-campus seminars by industry representatives, have access to posted hard copy job openings, and have access to several recruiting and job posting through the CM Program's website. Student interviews suggest that they are well informed about the range of opportunities.

#### **5.1.8 EXTRACURRICULAR ACTIVITIES**

**Students (including those participating through alternative delivery methods) are encouraged to participate in activities that complement their academic studies. Such activities include involvement with industry-based professional and trade organizations.**

Students are encouraged to engage in a wide range of extra-curricular activities, including professional organizations, competitions, community service projects, field trips, and fund-raisers. Students meet with the Chair and faculty at the beginning of each semester. They also attend a weekly industry seminar so they can be informed of opportunities and events. Student interviews suggest that most upper classmen in the CM Program participate in multiple extracurricular activities throughout the academic year.

#### **5.1.9 STUDENT FEEDBACK**

**There is an established plan for systematically collecting student feedback as part of the degree program Assessment Plan.**

A senior survey provides students an opportunity to formally provide feedback to the faculty. Student interviews suggest that most also contribute to course evaluations, and appreciate the opportunity to give feedback in shaping coursework for those who come behind them. Students also have the opportunity to provide feedback through the Industry Advisory Board, further connecting program stakeholders for continuous improvement.

### **5.1.10 FINANCIAL AID AND SCHOLARSHIPS**

**Students are informed of the availability of financial aid and scholarships and the criteria for award of financial aid and scholarships.**

Students are sent an email in the fall and spring semesters that includes information on scholarships. Availability and application instructions are provided. Scholarships and selection criteria are posted on the program's website.

In addition to institutionally managed/awarded scholarships and aid, the CM Program provides several endowment-funded opportunities. Many of these are made available through industry, further evidencing industry's strong support of the program.

### **5.2 General comments of the Visiting Team, if any, not included in the preceding discussion in this section of the report.**

None

## **Section 6: PHYSICAL RESOURCES**

### **6.1 Requirements**

#### **6.1.1 OFFICES, CLASSROOMS, AND LABORATORY SPACES**

**Physical facilities, such as offices, classrooms, laboratories, and associated equipment, are available and maintained to adequately support the degree program's mission, goals, and objectives; to enable students to attain required learning outcomes; and to provide faculty and staff with adequate space.**

The physical facilities are available and properly maintained. Faculty and staff have adequate space. The CM Program has exclusive laboratories for the Construct for Practice experience and a computer room for projects. The construction program teaches classes in a variety of rooms in the Engineering Building No. 69. In 2006 the engineering building was completely gutted, expanded and remodeled; the classrooms are modern and typically have long desks with separate chairs. Technology is available with overhead projectors, Wi-Fi, computer lecterns etc., with sound attenuation in some large rooms. There are classrooms that have been fitted out for distance applications.

The CM Program is given equal priority in scheduling classes for their students. The CM Program controls scheduling in its own Laboratories and special use spaces. Occasionally CM classes have been scheduled in other buildings typically on the south campus. They have used special technology classrooms in Cline Library for specific classes and presentation work.

## **6.1.2 LIBRARY RESOURCES**

### **6.1.2.1 Adequate library services are provided to enable students to attain required learning outcomes.**

The Cline Library resources at Northern Arizona University supports the University's strategic plans and goals enabling students to attain required learning outcomes. Such resources include individual and group areas to study and work on projects, a comprehensive book collection, a collection of standards and codes, access to construction research databases, and an innovation laboratory within the library.

The Northern Arizona University library is collaborating with Arizona State University Libraries and the University of Arizona Libraries to select and implement a new library services platform at the three state universities. The joint effort strengthens the state universities' negotiating power with vendors and is providing a more robust, consistent and powerful system for users and staff across the state. The new system greatly enhances the ability to search for relevant library resources. Students in the Construction Management Program also have access to a variety of research tools and resources through the central Cline Library, including e-books, e-journals, streaming media, full-text databases and more. The library provides material electronically where possible, allowing students to access it from any location at any time. Key databases for students in the CM Program include: ASCE Civil Engineering Database; GeoRef; EIS: Digests of Environmental Impact Statements (ProQuest); and the Environmental Science Collection.

Students can also access relevant journals under the Engineering listings. The library catalog provides links to recent e-books related to construction management, sustainable construction, the construction industry, construction standards, and related topics.

### **6.1.2.2 Adequate library services are provided to support the scholarly and professional activities of the faculty.**

The library has also collaborated with Construction Management faculty on a number of courses, as well as creating online resource guides for a number of classes.

Faculty developing grants, manuscripts or other projects can consult with librarians, who can then connect faculty with resources that can enrich their work while saving them time. For example, librarians assist faculty with reference management, comprehensive literature reviews and the development of data plans. In FY2016, library staff logged 110 sessions during which

they partnered with faculty in this way. The library also has an NAU Author's Room that showcases titles by faculty. The library offers a comprehensive list of research databases and practice related books for faculty.

### **6.1.3 INFORMATION SYSTEMS AND TECHNOLOGICAL EQUIPMENT**

#### **6.1.3.1 Adequate computer equipment and software are provided to enable students to attain required learning outcomes.**

The CM Program has access to shared computer equipment and has exclusive Construct for Practice classrooms and laboratories with construction specific software. These include AutoCAD, Revit, Civil #D, On-screen takeoff, Office, and Bluebeam. The CM Program owns over 35 laptops and several tablets that are used in class or for student competitions. Three areas on campus have computers that are dedicated and restricted for CM Program use:

- EGR220 – Plan Room. Small lab with 2 desktops connected to large 50” touch panel LCD’s
- EGR315 – 2 part room with approximately 20 high-end 2 screen workstations with cad quality graphics cards.10 dual screen thin clients connecting to remote desktop server cluster:
- Bldg. 47A – CM C4P Lab area is an enclosed construction area with 10 desktop workstation systems and one jobsite-style kiosk with a 42” screen.

Their computers are maintained by centralized IT personnel, and replaced on a 3 year cycle.

During the interview process, it became clear that the students heavily utilize computer equipment and construction software throughout their curriculum. By the time the students graduate, they are very advanced with the usage of construction technology. This is considered a Strength of the CM Program.

#### **6.1.3.2 Adequate computer equipment and software are provided to support the scholarly and professional activities of the faculty.**

In the college, there are fifteen classrooms that are fully outfitted with dedicated teaching computers, auxiliary connections, projectors, electronic screens, audio systems, wireless streaming capabilities, document cameras, and automated AV control systems. Faculty use a variety of cognitive teaching tools including internet access, movies, web-streaming clips in the course work. A large number of the Construction Management courses are partially delivered online as “hybrid” course work with significant content delivered by LMS.

Through a grant from the e-Learning center, the CM Program has procured two high-quality video conferencing systems which are used to bring experts into the classroom via web conference. Most of the CM faculty use tablet computers in the classrooms, projecting the screen as virtual whiteboards. At the end of the class the notes are then downloaded to the class Learning Management Systems (The LMS is Blackboard Learn).

**6.2 General comments of the Visiting Team, if any, not included in the preceding discussion in this section of the report.**

None.

## **Section 7: FINANCIAL RESOURCES**

### **7.1 Requirements**

#### **7.1.1 BUDGETED FUNDS**

**7.1.1.1 The construction education unit is accorded status comparable to other educational units of similar size and function within the institution with regard to funding.**

The CM Program has comparable status with regard to funding with other programs within the Department. However, the tenured faculty lines for the CM Program were recently reduced from two (2) to one and a half (1.5). As mentioned in Sections 4.1.2.1 and 4.2 of this report, the Visiting Team noted this as a Concern as it could be detrimental to the growth and mission of the CM Program.

The Provost controls all permanent budget book (state provided) faculty positions. Non-state budgeted faculty positions are determined at the origin of source funding, also controlled by the Provost. Salary structure is developed from an analysis of the University's peer institutions. When hiring, the University uses data from the CUPA (College and University Personnel Association) and market-based statistics to determine a salary range for each faculty rank based upon the assigned CIP (Classification of Instructional Program) code to the program or unit. Northern Arizona University's current approach is to pay a salary that is 92% of the peer institution median for tenure track positions, and 87% for non-tenure track positions. However, College norms are also used to determine these ranges.

**7.1.1.2 Sufficient funds are provided to support competitive faculty and staff salaries as well as educational materials, supplies, and equipment that are necessary for the degree program to achieve its mission, goals, and objectives and to enable students to attain the required learning outcomes.**

The average salaries of CM faculty are higher than the Northern Arizona Median Faculty Salary, but lower than the engineering faculty in the Civil and Environmental Engineering Programs. Part of the reason why the CM Program faculty salaries are lower is that the CM Program employs Professors of Practice, who earn less than tenure track faculty. It should be noted that the Professor of Practice ranks are required to demonstrate maintenance of professional skill as a practitioner service. The program receives comparable educational materials and supplies within the Department.

**7.1.1.3 Budgeted financial resources are adequate to enable the degree program to achieve its planned growth, future goals, and objectives.**

The budgeted financial resources allow the degree program to fulfill its mission. The program does not expect a significant increase in allocated resources in the next 7 years, as the University is approaching a private university funding model based on tuition dollars. A particular advantage of the CM Program is its ability to augment state funding with support from industry, donors, and alumni.

**7.1.2 Nonrecurring Funds**

**Nonrecurring funds have been identified and recorded and are used to supplement budgeted funds rather than replace budgeted funds.**

The CM Program is highly successful attracting external funds from industry and donors. Their yearly non-recurring funds have increased 65% between the 2013-2014 and 2016-2017. The program has a diverse mix of fundraising opportunities and events. These events attract funding and also provide students networking opportunities with potential employers. While the recurring funds available to the CM Program are acceptable to supplement the program's commitments to its students and retain accreditation, their ability to maintain a significant external funding structure allows them to provide an exceptional university for their students.

The program relies heavily on a program called GenNext for this extra funding, as well as three significant fund-raising events, a Winter Clay Shoot, A Fall Golf outing and a Spring Banquet [The Demolition Ball].

The GenNext sponsorships were \$87,500 for the 2016/17 academic year and the total non-recurring funds exceeded \$147,500. These totals do not include the endowed scholarships or university central funds available for a variety of student experience enhancements.

**7.2 General comments of the Visiting Team, if any, not included in the preceding discussion in this section of the report.**

The CM Program has a robust fundraising structure and a strong connection with industry and donors. Additional financial resources would be desirable to achieve an Undeveloped Potential of program growth via increased enrollment, the addition of additional class sections, and the addition of a Master of Science in Construction Management degree program.

## **Section 8: INDUSTRY, ALUMNI, AND PUBLIC RELATIONS**

### **8.1 Requirements**

#### **8.1.1 SUPPORT FROM INDUSTRY**

**8.1.1.1 The educational unit or the degree program has organized a construction industry advisory committee representative of potential employers of graduates of the degree program.**

The Construction Management Program has an Industry Advisory Board consisting of a maximum of twenty (20) Individual Member seats apportioned to represent the business sectors of the construction industry including commercial, heavy civil, residential, industrial and specialty construction. IAB membership is limited to one representative per firm or organization. Each member has full voting rights. There are Commercial, Industrial and Heavy Civil and Highway construction firms, construction trade organizations (AGC, ABC, ASA, etc.), as well as specialty trade contractors both local, national and international on the board.

**8.1.1.2 The committee meets at least once per year to advise and assist the development and enhancement of the degree program, and minutes of the meetings are recorded.**

The CM Program's Industrial Advisory Board meets formally two times a year (fall and spring semesters) as required by their bylaws. Additional industry guests are in attendance at most meetings.

### **8.1.1.3 Minutes of such meetings shall be kept on file.**

Minutes are taken of the proceedings at each Industry Advisory Board Meeting, and are kept on file as part of their permanent record. ACCE Visiting Team members reviewed meeting minutes from 2014 - 2016.

## **8.1.2 SUPPORT FOR INDUSTRY**

### **Faculty members actively participate in professional associations and organizations maintain liaison with various constituencies and to serve the construction industry.**

Faculty members from the CM Program are present at each of the scheduled Industry Advisory Board meetings. In addition, the faculty maintain strong and active relationships with industry associations and regional corporations. These relationships have brought in monetary donations as well as supplies and materials to support program initiatives.

Faculty members are regularly engaged in teaching at the Carpenters International Training Center in Las Vegas. The CM Program looks for investments of resources where a mutually beneficial outcome can be achieved. One recent collaboration was with the Lean Construction Institute. Northern Arizona University's Student Community of Practice is the first recognized Lean Construction Institute student organization. Faculty also provide seminars in collaboration with industry.

## **8.1.3 Student-Industry Relations**

### **8.1.3.1 The degree program encourages and facilitates student participation in construction-related organizations, internships, and cooperative education programs.**

The CM Program offers a robust weekly event known as "Construction Industry Seminar". This event connects students with potential employers, and also provides a means by which industry professionals can share their expertise with students. Events are structured in a manner that allows faculty, students and industry to connect with one another. Industry presenters offer a one-hour lecture on current and wide-ranging construction topics that include innovations in technology, building methods, management trends, legal considerations, and much more.

The CM Program has an optional internship program for course credit. While this is not required, a majority of students participate in summer internships. First year students are encouraged to become actively engaged in construction work.

Due to the growth in student population and research at Northern Arizona University, there has been significant construction taking

place on campus. Many of the students work part-time as interns on these projects, and also for the University's Capital Assets Department. Class field trips are regularly scheduled to campus buildings that are under construction.

**8.1.3.2 All students (on-campus or distance learning) have access to information about internships, cooperative education programs, and activities of construction-related organizations in their local area.**

The CM Program uses its website and in-class announcements to disseminate information to CM students. Students are encouraged to attend the weekly Construction Industry Seminars, join student organizations, and participate in internship programs to learn about construction related firms, careers and activities.

**8.1.4 ALUMNI RELATIONS AND FEEDBACK**

**8.1.4.1 The degree program maintains a current registry of alumni and solicits feedback from them as part of the degree program's Quality Improvement Plan.**

The University Alumni Association and Foundation maintains an alumni database. When required, the CM Program accesses this information. Currently, they also have an email list for annual or more current newsletters. In addition, they have a LinkedIn site that has over 600 connections of alumni and stakeholders.

The CM Program does solicit feedback from their alumni to improve the curriculum and meet the needs of industry.

**8.1.4.2 Alumni are engaged in such activities as membership in the construction industry advisory committee, student career advising, curriculum review and development, fund raising, and continuing education.**

Many members of the CM Program's Industry Advisory Board are alumni. The alumni typically lead the recruitment of students on campus, provide curriculum reviews and development, engage in fund raising activities, and continuing education. This is a Strength of the program. For example, in the spring semester of 2017, at a Phoenix alumni fund raising event (Top Golf) there were 65 alumni and industry supporters in attendance. In addition, there have been 20 years of alumni golf outings, and over a decade of football homecoming tailgating.

### 8.1.5 PUBLIC DISCLOSURES

The program manifests accountable behavior by providing the information listed in the following table in a manner that it is current and accessible to the general public. (Explain any findings of lack of full compliance following the table.)

<b>Public Information Requirements</b>	<b>Compliance Status</b>
<b>Objectives of the Program</b>	In compliance
<b>Program Admission Requirements</b>	In compliance
<b>Program Assessment Measures</b>	In compliance
<b>Information Obtained from Assessment Measures</b>	In compliance
<b>Actions Taken as Result of Assessment Data Collected</b>	In compliance
<b>Student Achievement</b>	In compliance
<b>Rate and Types of Employment of Graduates</b>	In compliance
<b>Data to Support Qualitative Claims made by the Program</b>	In compliance

**Description of any findings of lack of full compliance:**

### 8.1.6 GENERAL COMMENTS OF THE VISITING TEAM, IF ANY, NOT INCLUDED IN THE PRECEDING DISCUSSION IN THIS SECTION OF THE REPORT

None.

## Section 9: ACADEMIC QUALITY PLANNING PROCESS AND OUTCOME ASSESSMENT

### 9.1 Requirements

#### 9.1.1 CONTINUOUS IMPROVEMENT

The educational unit has a Quality Improvement Plan (QIP) that is used for continuous improvement of the degree program. The plan includes all of the elements listed in the following table. (Explain any findings of lack of full compliance following the table.)

Educational Unit	Compliance Status
Strategic Plan for the educational unit	Non-compliance
Assessment Plan for degree program	In compliance at Program level
Assessment Implementation Plan for degree program	In compliance at Program level

#### Description of any findings of lack of full compliance:

The Department of Civil Engineering, Construction Management, and Environmental Engineering does not have a Quality Improvement Plan (QIP); however, the CM Program does have their own QIP. The missing Departmental Strategic Plan and is a Weakness (also noted in Section 2.1.4.1).

The CM Program does have a Quality Improvement Plan that complies with ACCE Standards.

#### 9.1.2 EDUCATIONAL UNIT STRATEGIC PLAN

The Educational Unit has a Strategic Plan that is updated periodically and includes: (Explain any findings of lack of full compliance following the table.)

Educational Unit	Compliance Status
A formal documented QIP containing	Non-compliance
Systematic and sustained effort to enable the degree program to achieve its mission	Non-compliance
Assessment of available resources and external factors that may influence the degree program	Non-compliance
Input from degree program constituencies when plan is updated	Non-compliance

**Description of any findings of lack of full compliance:**

As noted in the previous section, the Department of Civil Engineering, Construction Management, and Environmental Engineering has yet to develop a Strategic Plan; therefore is not in compliance with the ACCE Standard. This non-compliance is being reported as a Weakness.

The CM Program completed and updated their Strategic Plan and is compliant with all components.

**9.1.3 DEGREE PROGRAM ASSESSMENT PLAN**

**The degree program has an Assessment Plan that is used for continuous improvement of the degree program. The plan includes all of the elements listed in the following table. (Explain any findings of lack of full compliance following the table.)**

<b>Degree Program</b>	<b>Compliance Status</b>
<b>Mission statement</b>	In compliance
<b>Degree program objectives</b>	In compliance
<b>Degree program learning outcomes</b>	In compliance
<b>Assessment tools and frequency of use</b>	Non-compliance
<b>Performance criteria</b>	In compliance
<b>Evaluation methodology</b>	In compliance

**Description of any findings of lack of full compliance:**

Degree Program Student Learning Outcomes and ACCE's Student Learning Outcomes are the same. They have a systematic means of assessment; however, some of the Program Student Learning Outcomes only have one valid assessment and therefore, is a Weakness of the program. This is further detailed in Sections 3.1.5.3 and 3.1.5.3(D).

#### 9.1.4 Assessment Plan Implementation

The degree program has an Assessment Implementation Plan that is used for continuous improvement of the degree program. The plan includes all of the elements listed in the following table. (Explain any findings of lack of full compliance following the table.)

<b>Degree Program</b>	<b>Compliance Status</b>
<b>Documentation of the results of each assessment cycle (Data collection must occur at least annually)</b>	In compliance
<b>Documentation of the analysis of the data collected in each assessment cycle (Data assessment cycle is not to exceed three years)</b>	In compliance
<b>Documentation of any program revisions made as a consequence of analysis made at end of each assessment cycle</b>	In progress

#### **Description of any findings of lack of full compliance:**

Only one assessment cycle has been completed; therefore, there has yet to be any revisions made because of analysis generated at end the previous assessment cycle.

#### **9.2 General comments of the Visiting Team, if any, not included in the preceding discussion in this section of the report.**

As noted in Section 2.2 of this report, the CM Program's Self-Study sometimes inadvertently interchanged ACCE definition and responsibilities of an Educational Unit and a Degree Program. There was some confusion between the two entities. This confusion caused the CM Program to take on some of the ACCE responsibilities required of the Department of Civil Engineering, Construction Management, and Environmental Engineering. The new President, Dr. Rita Cheng, is in the final stages of a University-wide Strategic Plan. During the interview process, several mentioned that many academic units are waiting on the completion of this plan before developing their own Strategic Plan. As it was understood by the Visiting Team, each unit and program will be expected to align themselves with the University's Strategic Plan.

## **Section 10: REVIEW OF LAST VISITING TEAM'S WEAKNESSES AND CONCERNS**

### **10.1 List last Visiting Team's noted Weaknesses and indicate the status of each Weakness at the time of the current site visit.**

No Weaknesses identified from the last visit in September 2011.

### **10.2 List last Visiting Team's noted Concerns and indicate the status of each Concern at the time of the current site visit.**

#### **10.2.1** Number of tenure-track and tenured faculty. There is a Concern that a replacement tenure-track or tenured faculty member is critically needed by the CM Program.

This Concern was initially alleviated by the hiring of a tenure-track faculty; however, after this individual was hired, 50% of his line was apportioned to the Civil Engineering Program. This Concern remains.

## **Section 11: STRENGTH, WEAKNESSES, CONCERNS, AND UNDEVELOPED POTENTIAL.**

### **11.1 List Strengths.**

**11.1.1** Program Leadership. One of the major strengths is the dedication and hard work of the Associate Chair for the Department of Civil Engineering, Construction Management and Environmental Engineering. Dr. John Tingerthal's commitment to the CM Program is widely recognized by faculty, staff, and administration.

**11.1.2** Student engagement. There is a close student engagement with industry and faculty. Along with this is a strong culture of camaraderie and hard work.

**11.1.3** Industry Support. The engagement and dedication to the success of the CM Program was impressive. Industry is involved at many levels within the program.

**11.1.4** Use of Technology. Due to the unique delivery of their C4P Program, students become extremely adept at using various computer technologies and software.

- 11.2 List Weaknesses. (Include and identify as such any Weakness(es) remaining from previous Visiting Team reports, as discussed in Section 10. Also, include and identify as such any Concerns remaining from previous Visiting Team reports that have become Weaknesses, as discussed in Section 10.)**

**Weaknesses of the program must be related to a lack of full and complete compliance with an ACCE standard or criteria as prescribed in Document 103, Standards and Criteria for Accreditation of Postsecondary Construction Education Degree Programs. Weaknesses may be based either on evidence of non-compliance with or lack of evidence of compliance with ACCE requirements. For each Weakness, specifically cite the appropriate ACCE standard or criteria that forms the basis for the Weakness.**

**For each Weakness listed, the reasons for citing a lack of full and complete compliance with the standard must be fully explained within the body of the report. Include in this Section a specific reference to the location of that explanation in the body of the report.**

**All Weaknesses listed in the report must have been discussed with the administration of the institution during the exit interview. Any Weakness not so discussed must be brought to the attention of the Program Administrator and his/her next higher administrative unit by the Visiting Team Chair prior to being included in the report.**

- 11.2.1** Determination of Achievement of Student Learning Outcomes [See Sections 3.1.5.3, 3.1.5(D) and 9.1.3]. All Student Learning Outcomes must have at least two assessments with at least one being a direct assessment (or two being direct assessments). When using group Projects as an assessment tool, it must be specific to the Student Learning Outcome to be assessed and based on individual student performance [ACCE Document 103; Section 3.3.5.3 (D) and 3.3.5.2 (E)]
- 11.2.2** Educational Unit Strategic Plan [See Sections 2.1.4.1, 9.1.1, and 9.1.2]. The Department of Civil Engineering, Construction Management and Environmental Engineering does not have a Strategic Plan [ACCE Document 103; Sections 9.1.2.1, 9.1.2.2, and 9.1.2.3 ].

- 11.3 List Concerns. (Include and identify as such any Concern(s) remaining from previous Visiting Team reports, as discussed in Section 10. Also, include and identify as such any Weaknesses remaining from previous Visiting Team reports that while corrected to some extent have now become Concerns, as discussed in Section 10.)**

**Concerns may or may not be specifically related to Document 103. A Concern relates to circumstances, situations, or issues that either have or could in the future have an adverse impact on the construction program and/or could become a Weakness if not addressed. For each Concern, specifically cite as appropriate:**

- **Its adverse impact or potential adverse impact; and/or**
- **That part of Document 103 that forms the basis for the Concern; and/or**
- **State how the Concern could become a Weakness.**

**For each Concern listed, the basis for the concern must be fully explained within the body of the report. Include in this Section a specific reference to the location of that explanation in the body of the report.**

- 11.3.1** Number of tenure-track and tenured faculty [See Sections 4.1.2.1, 4.2, and 7.1.1.1]. Originally, this Concern was alleviated during the last ACCE visit with the hiring of a tenure-track faculty for CM; however, the faculty position for all practical purposes now operates in Civil Engineering Program. Records indicate that the CM Program has 1.5 FTE tenure or tenure track faculty. Other programs within the Department of Civil Engineering, Construction Management and Environmental Engineering have a much higher tenure density. A reasonable balance is needed to ensure equity among the programs, a succession plan for CM Program leadership and to support the strategic direction of Northern Arizona University. Failure to increase the number of tenure or tenure track faculty could eventually lead up to a Weakness [ACCE Document 103, Sections 4.1.2 and 7.1.1.1].

**11.4 List Undeveloped Potentials.**

**Undeveloped Potentials are those areas that in the opinion of the Visiting Team might be explored for the potential enhancement of the program.**

- 11.4.1** Growth Potential. Depending on proper planning and resources, the CM Program could increase in size due to the nature of the discipline and to positive construction forecast for decades to come. In addition, if the program would offer courses each semester, they could easily increase enrollments through transfers and could increase graduation rates.

**11.4.2** Masters Degree Program. A post-baccalaureate construction degree program could offer increased program growth, a research activity for new hires, and graduate teaching assistants that can assist the faculty to expand their C4P Program to accommodate more undergraduate students.