NORTHLAND PIONEER COLLEGE
CONSTRUCTION TECHNOLOGY PROGRAM REVIEW
November 29, 2006

I. Introduction

A. Methods

The following document presents a comprehensive review of the Construction Technology (BOC) program at Northland Pioneer College (NPC) as of Fall 2006. Because NPC programs are reviewed on a five-year cycle, data was collected back to the 2001-2002 academic year. The only previous program review found was authored in June 1998 (please see Part C, Page 4). John H. Darst, Construction Technology Chair conducted research for this review, with assistance from Betsyann Wilson, an independent consultant. The document was co-authored by Darst and Wilson.

This section provides the reader with background information for understanding the development and evolution of the program. Part II examines all aspects of the current program with regard to instruction, student services, noteworthy developments and external alliances and support, and that have advanced and improved the BOC program in the past five years. Parts I-II were developed using information gathered from the Division of Workforce Development, the Office of Records and Registration, the BOC Program, and the Division of Student Services. To develop Part III, members of the BOC Advisory Board were asked to report on current trends that have ramifications for the BOC program. They were also asked to add any additional salient information that would serve to examine and review the effectiveness of the NPC BOC program, as well as provide direction for its future. Part IV provides a summary of the program review document. Parts I-IV were presented to the BOC Program Review Committee on October 10, 2006 and the committee was asked to discuss issues that arose during the research and review process and provide final recommendations, which were then added to the Appendix. At a November 21, 2006 meeting of the BOC Advisory Board, members supplied information and direction discussed in Part V, Committee Recommendations on pp. 21-22.

B. A Brief History of Construction Technology at Northland Pioneer College

For clarification, the Construction Technology program at Northland is often referred to as the "BOC" program, because of the course prefix, BOC, that is used in the NPC catalog. The origin of the BOC prefix dates back to the 1983-85 catalog when Construction Technology was referred to as "Building Occupations and Construction". The name of the program was changed to Construction Technology in the 1991-93 catalog, but the BOC prefix, and subsequently the moniker stayed on to simplify record keeping and database management. The terms Construction Technology and BOC are utilized interchangeably and synonymously throughout this document.

In the very first NPC catalog – 1974-75 – courses were offered in "Building Construction" under the Division of Vocational, Technical and Public Service. In 1976, a Building Construction program was offered with a Mr. John C. Bickerton listed as "Program Contact". In 1977 the designated Program Contact was Mr. Ray Andrews, and in the 1981-83 catalog, Mr. Detmer Greathouse was named as "Program Coordinator". In the 1983-85 through 1987-89 catalogs, there were programs for the AAS and CAS in "Building Occupations/Construction" or "Building Occupations/Maintenance". Jim Richmond was listed as the Program Chairperson, with Mr. Richard Findlay identified as full-time faculty at the Winslow Campus.

In the 1989-91 catalog, the program appeared to have evolved in breadth and scope. It was now the "Building Trades" program offering the AAS and CAS in five *Areas of Emphasis*: Carpentry, Master Electrician, Drafting, Maintenance and Supervisor. The catalog description stated that "The fullest range of coursework is offered at the Lakeside/Pinetop Vocational Skill Center and Winslow's Building Trades Shops, but offerings of popular courses are available district-wide." The 1991-93 catalog described the "Construction Technology" program offering the AAS and CAS, along with "Special Certificates" recognizing completion of a core of classes in Architectural Drafting, AutoCad Specialist, Building Maintenance, Cabinetmaking, Carpentry, HVAC (Heating, Ventilation and Air Conditioning), Masonry, Plumbing, Supervision, Technical Drafting, and Wiring Technician. These Special Program Certificates were the precursors of the current Certificates of Proficiency. Program locations were still given as the Lakeside Pinetop Vocational Skills Center and "Winslow's Construction Technology Shops", and Jim Richmond was still listed as the Program Chairperson.

In the 1993-95 catalog, Jim Richmond was listed as the Director of the Division of Technology, which housed the Construction Technology program. The AAS was offered with four Areas of Emphasis: Construction Technology, Carpentry, Electrician, and Drafting Technician. The Certificate of Applied Science was offered in Architectural Drafting, AutoCad Specialist, Building Maintenance, Cabinetmaking, Carpentry, Supervision, and Wiring Electrician. Special Program Certificates were also available in these areas.

While the 1995-97 catalog description was virtually the same as 1993-95, the following edition, 1997-99 saw the first "Certificates of Proficiency" and listed Jim Richmond as Faculty in Construction. (He retired from the college in 1999.) The Construction Technology program was still housed in the Division of Technology, but the Director position was listed as "vacant". 1999-2001 saw another name change to the "Division of Business and Technology, but there was no Dean or Director. The years 2001-2003 saw the short-term coming and going of three different deans, and it was not until 2003 that Charles Kermes became the Dean of Business and Technology, a position he held until his retirement in July 2005. Tom Nagle served as interim dean of the division, from August 2005 until May 2006 while maintaining teaching responsibilities in the area of Business. As of July 2006, Dr. Michael Spangler became the Dean of the Division of Vocational and Technical Education. In August 2006, BOC was moved to the Division of Workforce Development under Dean Peggy Belknap. Workforce Development

emphasizes the delivery of courses that are immediately responsive to the needs of the workforce in various industries throughout the college service area.

In 2002 the college hired Mr. John Darst as Program Chairman of Construction Technology. Mr. Darst owns his own plumbing business and has over thirty years of experience in residential and commercial construction. He agreed to pursue an associates degree as a condition of his being hired and has obtained said degree. While the hiring of Mr. Darst to chair the Construction Technology program, which was without a chairperson or director from 1999-2002, was intended to re-organize the program and move it forward, consequences arose that delayed his ability to focus fully and immediately on his duties in that regard.

In late 2000 the NPC was approached by the CEOs of several power plants that operate within the college service area to provide high-quality education and training to prepare employees to replace a workforce that was aging out at a critical rate. The Division of Business and Industry Training (now Workforce Development) worked throughout the following year with representatives from all power plants to develop curriculum and instructional methods that would meet industry needs. Empowered by a revised Industrial Technology (ITP) curriculum that was driven by innovative online instructional technology, the college had to respond quickly with courses and faculty. Mr. Darst was asked to serve as an instructor for the power plant project. He taught Power Plant Fundamentals in Fall of 2002 and Spring of 2003 for both regular NPC students and Northern Arizona Vocational Institute of Technology (NAVIT) students (see page 10).

In addition to serving as interim ITP instructor, Darst's expertise as a musician enabled him to teach as a substitute faculty in the Music Department in Fall 2003 when a crisis arose with the incumbent Music Director. In Spring 2003, Darst was able to focus entirely on Construction Technology, then in Fall 2004 when the program coordinator for Power Plant Technology abruptly left his position Darst stepped in again to teach ITP courses. By Spring 2005, Darst once again assumed teaching and coordination of BOC as his sole responsibilities, and maintains that capacity as of this writing.

C. Summary of Previous Program Review

The only previous program review Darst and Wilson were able to locate is a spiral-bound document entitled, "Construction Technology & Drafting Technology Instructional Program Review", dated June 5, 1998. In handwriting on the cover of the document are the words, "DRAFT for Review and Comment Only", accompanied by the initials JGR, presumably James G. Richmond, then BOC Department Chair and author of the document. It is not known whether a final draft was ever written.

In his introductory remarks, Mr. Richmond indicates that Construction Technology and Drafting Technology have been reviewed as a single program, because "[their] relationship is so close that is impossible to review one in the absence of the other." He goes on to note, in an inarguably heated tone, "Unfortunately, except for data regarding completors, almost all of the data that NPC is able to provide for Program Review is ***unusable*** (sic). The financial data allocated institutional wide costs by FTSE which was

off by over 400% for these two programs." Richmond points out that most BOC and DRF courses take place at off-campus locations "...in other institution's facilities, using their capital costs." He also maintains that the FTSE reports provided to him for use in preparing the review were off by over 400%. Richmond notes that the figures he was given were 45th day numbers, rather than the data provided in the annualized FTSE report to the state, "thus penalizing programs, which operate outside the conventional semester." Other than this inference to use of the 45th day numbers, rather than annualized FTSE, it is unclear why NPC institutional research reports FTSE of 18.75 and Richmond reports FTSE of 83.30 for BOC.

The tone of the document, manifest through use of various descriptive language and asides, is one of frustration. Clearly, Mr. Richmond felt that the college was not in support of the BOC & DRF programs for the following reasons:

1. In spite of high enrollment in both programs, the college would not establish committed program facilities for BOC or DRF, relying instead upon the aforementioned "other institution's facilities" (high school vocational laboratories, tribal vocational education centers, contractors' building projects).
2. As of the writing of the draft document, Richmond had found no indication that the college intended to fund the position of BOC Department Chair for the 1998-99 academic year. (Richmond had at that time opted for the NPC Early Retirement program, and research shows that the chair position indeed went vacant until John Darst was hired in 2002.)
3. In Mr. Richmond's opinion, NPC Instructional Support Service/Information Services had been unable to develop adequate data collection and analysis instruments and procedures, so it was impossible to generate clear indicators of student success, program cost per FTSE, institutional effectiveness, etc.

It should be noted, especially with regard to item 3, that Richmond had included throughout the document numerous charts and tables, which depicted fiscal information and enrollment data. The Instructional Support Services Office had prepared these charts. A large, handwritten "X" was drawn across most of them, with handwritten comments in the margins (from Richmond?) that ranged from "incorrect", to "big lies".

In spite of the obvious frustration of Mr. Richmond in preparing the review, there were several aspects of the 98-99 program worth noting:

1. Three Program Objectives for Construction Trades were identified: 1.) Program Completors in Construction Technology will be successfully employed in their chosen field of specialization or will continue their education and training. 2.) Construction Technology students will be technically proficient in their completed area of specialization. 3.) Employers of Construction Technology completors will be satisfied with the education and training received by their employees.
2. An Outcome Assessment for each objective was given, but it is unclear what data, if any was gathered, with Richmond once again expressing frustration that the college was unwilling or unable to assist with follow-up on program completors.
3. Strategic goals for the accomplishment of each program objective were provided, along with anecdotal reports of progress.

In summary, the 1998 BOC Program Review draft document provided a sketch of BOC/DRF eight years ago. While the allegations that NPC did not support the program with regard to provision of facilities, equipment, and institutional support may have been completely valid, the obvious bias of the author made it impossible to ascertain the NPC viewpoint. Of value for this review are the use of program objectives, outcome measures and strategic goals, which should probably be updated to reflect current industry trends and incorporated into a new strategic plan to guide the BOC program and assist Mr. Darst in articulating needs.

II. The Current Status of the Construction Technology Program

The Construction Technology program currently employs 2 full-time faculty (John Darst and Danny Sorenson who coordinates a program for the White Mountain Apache Tribe – see Pages 8-9) and 6 associate faculty. Courses are offered to the general public in Room M-7 at the White Mountain Campus in Show Low and during the evening at the Whiteriver Center and at four area high schools: Joseph City, Snowflake, Show Low and Blue Ridge. (The associate faculty who teach evening classes at the high schools also serve as instructors for the Dual Enrollment program – see Page 9). Several special programs are operated under the auspices of BOC and generate much of the enrollment for the program. (See Pages 8-10).

A. Noteworthy Developments from 2001-2006

1. Chair position filled in 2002 after three-year vacancy

Mr. Darst currently carries a teaching load of nine credits per semester. He teaches the following courses: Plumbing, Electrical, HVAC, Contractor License and Law, Blueprint Reading, Construction Safety, and Estimating in a 20'x 20' classroom in a modular building at the White Mountain Campus in Show Low. As a master tradesman, his connections in the local construction community afford him the ability to take every one of his students onto actual job sites to experience and demonstrate firsthand the skills they are learning in the classroom. This is important, because this program review has revealed significant shortcomings with the hands-on lab facilities at the college. (See Equipment – Part M, page 14.) Not only does Darst know and use his contacts in the local industry, he also hires his own students to work on weekend and after-hours jobs and pays them out of his own pocket. In (month, year) Darst worked with the *White Mountain Independent* newspaper to secure a front-page article about the BOC program, complete with photos of an NPC student working on a construction site.

2. Evidence of Need for Program Growth and Expansion

In early June 2006, Mr. Jim Showalter, a representative of the Show Low Bluff Group, a developer who is in the process of building a new subdivision in east Show Low, approached the college for assistance in developing a cadre of skilled craftsmen for the building trades industry. Mr. Showalter expressed frustration that the local need for skilled workers was unmet while NPC did not have the capacity in facilities or equipment to offer a comprehensive building trades program. So needy is Mr. Showalter, that he offered to construct a building trades laboratory facility in exchange for expanded course offerings to prepare a strong local building trades workforce. Mr. Showalter feels he will

be building homes in the area for the next fifteen years, and says he speaks for all area contractors in his inability to identify and hire adequate numbers of skilled craftsmen to keep up with industry demand.

In November 2006, NPC President Ralph Orr presented a proposal to Show Low Bluff outlining a five-year partnership designed to expand the BOC program. (See page 18.) The proposed expansion will provide capacity to allow BOC to produce 40 program completors per year by 2012 to meet the needs of the building trades industry for qualified tradespeople.

3. Adoption of NCCER Curriculum

In 2003, Darst began the process of adopting a new curriculum for BOC areas of emphasis. The National Center for Construction Education and Research (NCCER) was formed in 1995 as a non-profit foundation to help address the critical workforce shortage facing the construction industry and to develop industry-driven standardized craft training programs with portable credentials. In addition to developing curriculum for all construction-related disciplines, NCCER maintains a national registry of companies that recognize this curriculum and its attendant certification. Therefore, a student at NPC who completes a BOC program using NCCER curriculum will receive a certificate that is recognized by NCCER-member companies nationwide, conceivably enhancing his or her employability with NCCER-member companies. To date, Darst has rewritten course outlines and 3035s to reflect adoption of NCCER curriculum for the following disciplines: Plumbing, Electrical Technology, and Heating, Ventilation and Air Conditioning (HVAC). The NPC curriculum committee has approved the new course outlines and 3035s for all three areas. Darst is currently working on converting Framing curriculum to NCCER standards. It must be noted that NCCER credentials are recognized only by NCCER-member employers.

4. Online and ITV Course Formats

To improve accessibility for students and stimulate enrollment, Mr. Darst (Fall of 2005) developed BOC 130, Contractor License and Law, for online delivery. The online course is pending review by the NPC Internet Guidance committee. Once approved it will allow incumbent workers the opportunity for anytime, anyplace learning. Mr. Darst has also taught Contractor License and Law over the college's Interactive Television (ITV) network to facilitate accessibility across the NPC service area.

5. BOC Moves to New Division

As aforementioned, the recent construction boom in the White Mountain area has left area contractors struggling to find skilled workers in the construction trades. In Spring 2006, the college moved the Construction Technology program from the Division of Vocational and Technical Education to the Division of Workforce Development. This is significant, because under the mentorship of Dean Peggy Belknap, Mr. Darst will have both the guidance and the autonomy to develop short-term, open-entry/open-exit courses expediently in response to the immediate needs of the building trades industry. This will enable him to capitalize on his strengths as a master tradesman with an intimate working

knowledge of the building trades industry to take the program in new directions that will result in increased enrollment and further growth.

6. Identification of Advisory Board

Following the retirement of former BOC Chair James Richmond, the BOC Advisory Committee was allowed to lapse. In Summer 2006, at the behest of Dean Belknap, Mr. Darst assembled a new advisory committee consisting of representatives from education and business and industry. Their input will serve to guide future developments in the Construction Technology program. They will be called upon to articulate needs in the industry and assist Darst in identifying the most effective means of meeting those needs. Means may include, but are not limited to new course offerings, modified course scheduling, improvement of existing facilities and equipment, revision of current degree and certificate programs, etc. They will utilize this program review as one of a variety of tools to assist them in making recommendations for ongoing program improvement and refinement. The committee met for the first time in October 2006. A list of members and their affiliations may be found in Part N on Page 15.

7. Possible Acquisition of Classroom/Laboratory Facility

In early June 2006, John Darst was directed by Jeanne Swarthout, Vice President for Instruction, to explore the possibility of leasing a facility to use as a BOC classroom/laboratory. Mr. Darst approached acquisition of a facility from several angles. In soliciting bids from Show Low area contractors and canvassing the local real estate market, he determined it would be more cost effective for the college to purchase an existing building. His real estate search turned up a 4,200 square foot building located on Thornton Avenue in Show Low. It was partitioned off into halves, and rent was set at $1,600.00 per month, per half. Darst felt half of the building would be ideal for a BOC lab, so he invited Dean Peggy Belknap, Vice President Swarthout, Blaine Hatch, NPC Vice President for Administrative Services, and David Huish, NPC Director of Facilities to visit the site with him. All expressed approval for the facility, and Dean Belknap suggested that Darst find out if the entire building was for sale. It is, for an asking price of $420,000.00. Purchase of the building was included in the aforementioned proposal presented to Show Low Bluff. If the developer agrees to purchase the building for the college, it would provide the BOC program with adequate space to develop a comprehensive Construction Technology teaching facility. It could then unreservedly offer and market a complete menu of courses to NPC students to meet the needs of the building trades industry.

B. Requirements for certificates and degrees, including prerequisites

1. Prerequisites

Placement testing is required for students who wish to enroll in academic courses. Therefore, any student attempting the Associate of Applied Science (AAS) degree or Certificate of Applied Science (CAS) in Construction Technology would be required to show appropriate scores in writing skills, reading skills and math skills

on the ASSET, the COMPASS or the ACT prior to enrolling in the required general education classes. Minimum scores are as follows:

Subject	ASSET	COMPASS	ACT
Reading Skills	42	82	18
Writing Skills	42	71	18
Math Skills	42	46	18

For each skill area, a Decision Zone exists. This is a score that falls below the minimum allowed, but permits the student to enroll in the course if he or she signs a waiver acknowledging the placement score and agreeing not to request a refund of tuition if he or she fails the course. Complete information about the college's placement policies and procedures can be found in the NPC Placement Handbook available through the Division of Student Services.

2. Associate of Applied Science

To complete the Associate of Applied Science degree in Construction Technology, a student must complete 16 credits of general education. This includes 6 credits from Communications: ENL 101 (College Composition I – 3 credits) and ENL 102 (College Composition II – 3 credits) *or* ENL 109 (Technical Writing – 3 credits) *or* SPT 120 (Public Speaking – 3 credits). Three credits of Mathematics: MAT 101 (Basic Technical Math – 3 credits) or MAT 152 (Advanced Algebra – 3 credits) are accepted for the AAS in Construction Technology. An additional 7 credits must be selected from at least *two* disciplines on the AAS Discipline Studies list: Physical and Biological Sciences, Arts and Humanities, and Social and Behavioral Sciences. The candidate for the AAS in Construction Tech must also select 28-31 credits in an area of specialization: Construction Technology, Carpentry, Drafting Technician, or Wiring Electrician. Finally, 17-20 credits from the Required Electives list round out the 64 credits needed for the AAS. While the area of specialization allows the student to emphasize a particular trade, the elective requirement ensures that he or she gets a well-rounded exposure to all areas of Construction Technology.

3. Certificate of Applied Science

To earn a Certificate of Applied Science in Construction Technology, a student must complete ENL 101 and either MAT 101 or MAT 152, as well as 15-18 core requirements listed under an area of specialization for Certificates of Proficiency. These are Architectural Drafting (17 credits), AutoCAD Specialist (17 credits), Building Maintenance (15 credits), Cabinetmaking (17 credits), Carpentry (17 credits), Supervision (18 credits), and Wiring Electrician (17 credits).

4. Certificate of Proficiency

Certificates of Proficiency are awarded for completion of the core set of classes only (no general education requirements) in the following areas: Architectural

Drafting (17 credits), AutoCAD Specialist (17 credits), Building Maintenance (15 credits), Cabinetmaking (17 credits), Carpentry (17 credits), Supervision (18 credits), and Wiring Electrician (17 credits).

C. Course offerings and Special Programs

Pages X-X in the appendices list and describe the NPC course offerings for Construction Technology. Special programs are noteworthy, because they generate a large percentage of total FTSE for the BOC program (see chart on Page X). In the absence of on-campus teaching facilities for the Construction Trades program, they provide a means for giving students the practical, hands-on experience required for mastery in vocational disciplines. They are not open to regular NPC BOC students, but rather are limited to special populations as described:

1. White Mountain Apache Tribe Workforce Investment Act Building Trades Program

While enrollment in this program is limited to those students who qualify through and are referred by the White Mountain Apache Tribe Workforce Investment program, it merits recognition in this program review, as it has long been associated with the NPC BOC program. In 1994, the White Mountain Apache Tribe Housing Improvement Program (HIP) partnered with Northland Pioneer College and the tribal Workforce Investment Act (WIA) system. They created a three-semester program to allow qualified students to develop skills for employability *and* build, repair and maintain tribal housing while earning two Certificates of Proficiency: one in Carpentry and one in Building Maintenance. The program is open only to students referred through the WIA, and only 18 are accepted into each class. The coordinator and teacher of the program is Mr. Danny Sorenson, NPC BOC Associate Faculty. Mr. Sorenson's students take 17 credits per semester, spending two days per week in the classroom and three days per week on actual HIP building sites where they apply the lessons they have learned. Mr. Sorenson always has a waiting list of students for the program. Using WIA funds, the White Mountain Apache Tribe pays for all elements of the program (student tuition, course fees and supplies, including tools) except for Mr. Sorenson's salary, which is provided by NPC. The college also provides the curriculum and accreditation and serves as fiscal agent for the project. While the dropout rate for the program can be high, Mr. Sorenson maintains that there are always 7-10 "good" completors who gain employment upon receiving their Certificates of Proficiency. In fact, a former student of the program now runs the tribal HIP program. This program has averaged 13.28 FTSE per year since 2001, accounting for 12.55% of total annualized FTSE for BOC.

2. Arizona Department of Corrections

Through an agreement with the Arizona Department of Corrections, NPC offers Construction Technology classes to inmates at the Winslow Prison

and the Apache Unit Prison near St. Johns. Until Spring 2006, a full-time coordinator, supervised by the Dean of Business and Technology, oversaw the program, which includes three full-time faculty. (The Program Coordinator position has been open since Spring 2006.) Courses are open to prison inmates only, and are not published in the regular course schedule. Tuition and fees are covered by a state-run funding source for the purpose of advancing the vocational proficiency of inmates prior to their release back into society. The Department of Corrections program is important in that it generated nearly half (45.11%) of all annualized FTSE for the BOC program from Fall 2001 through Spring 2006.

3. Dual Enrollment

Dual Enrollment is a program that allows high school students to receive credit for certain classes toward both college programs and high school graduation. Dual Enrollment agreements exist between NPC and 20 high schools in its service area, and cover a variety of both academic and vocational courses. Six high schools offer dual enrollment credit for BOC courses. They include Blue Ridge High School, Snowflake High School, Show Low High School, and Round Valley High School, Joseph City High School and Winslow High School. High school teachers are required to maintain certification as NPC Associate Faculty, and to use the college's approved course outlines and materials. Depending upon the nature of their school's dual enrollment agreement with NPC (there are three options), students pay full tuition, reduced tuition, or no tuition for taking courses for dual enrollment credit. Dual Enrollment has averaged 28.16 annualized BOC FTSE from Fall 2001 through Spring 2006, or 26.61% of all BOC FTSE.

4. Northern Arizona Vocational Institute of Technology

The Northern Arizona Vocational Institute of Technology (NAVIT) is a Joint Technological Education District (JTED) formed in 1999 to assist high school juniors and seniors in completing community college technical education classes. NAVIT serves 11 school districts in Navajo, Apache and Gila Counties. Students enrolled in NAVIT can get a jump-start on the Associate of Applied Science degree by taking community college classes beginning in the junior year of high school. NAVIT assists these students with tuition, books and fees, and NAVIT students take classes at the community college from community college instructors for part of their high school day. BOC offerings in conjunction with NAVIT have been very limited, producing only 0.80 FTSE in the 2002-2003 academic year.

D. Occupations and transfer programs for which the program prepares students

Students in Construction Technology can prepare for entry-level occupations in the building trades. These include carpenters, electricians, drafting technicians, plumbers, roofers, painters, brick masons, concrete masons and finishers, drywall installers, and HVAC (heating and air conditioning) technicians. In addition to these skilled trades, students can take classes that prepare them to become construction and building inspectors. BOC 130, Contractor License and Law, allows students to learn firsthand what being a contractor entails. People associated with contracting such as insurance and bonding, and basic accounting help prepare students to take the exam for certification as a licensed contractor, as described fully in Part E below. Certificates of Proficiency recognizing concentrated study in specific trades are available for Architectural Drafting, AutoCAD Specialist, Building Maintenance, Cabinetmaking, Carpentry, Supervision, and Wiring Electrician.

It should be noted that completion of a certificate or degree program in Construction Technology, in the absence of any additional practical experience, prepares the student for *entry-level* employment in the aforementioned fields. Contractors seeking to hire tradespeople want employees to have on-the-job experience, rather than a college degree or certificate. While NCCER certification is recognized by some unions with partial credit toward satisfying requirements for journeyman status, in the State of Arizona, only labor unions issue journeyman cards or certificates. California is the only state in the union that allows individuals to test for journeyman certification in a trade without the endorsement of a labor union.

While James Richmond referred briefly in his 1998 program review draft to an articulation agreement with NAU, NPC advising staff indicate that Northland Pioneer College BOC students cannot currently transfer credits into state university construction programs.

E. Licensure/regulatory or national industry skill standards that affect the program

This section addresses the role of licensure and regulation as it pertains to construction trades occupations in the State of Arizona, the role of certification through NCCER and licensure requirements for the Arizona Registrar of Contractors.

For anything other than entry-level employment in the construction trades, a prospective employee *must* be able to show experience. Often this is evidenced by participation in an apprenticeship program or possession of a union journeyman card. As aforementioned, NPC BOC courses in Plumbing, Electrical Technician and HVAC were revised to utilize curriculum developed by NCCER. This was done because some employers in Arizona and other states recognize NCCER certification as a valid credential for employment. In Arizona and some other states, a student taking NCCER Level 1-Level 4 classes can receive up to two years of credit toward their apprenticeship with various labor unions.

An individual in the State of Arizona seeking a contractor's license must show experience as a journeyman, foreman, supervising employee or contractor, but there are

no educational requirements. BOC 130, Contractor License and Law, provides test preparation, as all qualifying candidates for licensure must pass a business management examination. The business management test contains questions on state and federal laws and questions on the management of construction projects and business and financial management. In addition to the business management exam, the candidate must, if required, pass a second test covering the specific trade for which he or she is applying.[1]

F. Student organizations/leadership development organizations available for students

Northland Pioneer College currently sanctions no student organization or leadership development organizations for students in the Construction Technology program.

G. Enrollment

Charts on pages X-X of the appendices show enrollment patterns for Construction Technology/BOC from Fall 2001 through Spring 2006. These charts can be summarized as follows:

1. **Regular Students:** Enrollment in NPC BOC classes that are scheduled during the spring and fall semesters as part of the regular calendar accounts for about 15.7% of all BOC FTSE. Annualized FTSE for these classes averaged 16.61 from Fall 2001 through Spring 2006, with the highest total FTSE coming in Spring 2003 (29.79) and the lowest in Spring 2006 (10.66). With the acquisition of a BOC skills lab and the development of new courses and revision of existing courses in response to industry needs, these numbers should increase significantly.
2. **Department of Corrections:** BOC classes taught through the Arizona Department of Corrections (see Page 9) account for the largest percentage of all enrollment in the BOC program. From 2001-2006, FTSE averaged 47.73, or 45.11% of total FTSE for the period. The peak semester fell in Fall 2004, with 58.05 FTSE reported, while Spring 2005 marked the period of lowest enrollment with 28.05 FTSE.
3. **Dual Enrollment:** Dual enrollment accounted for 26.61% of all BOC enrollment from 2001-2006. It averaged 28.16 FTSE per semester during that period, with Spring 2005 having the highest total FTSE (40.02) and Fall 2005 having the lowest (18.9).
4. **White Mountain Apache Tribe WIA/HIP program:** This program, described on Page 8, accounts for the lowest percentage (12.55% or 13.28 FTSE per semester) of all BOC enrollment, but its numbers have been steady since 1994, and it is partially funded by the White Mountain Apache Tribe Workforce Investment Act.
5. **NAVIT:** Enrollment through the Northern Arizona Vocational Institute of Technology has not resulted in significant FTSE for the BOC program. The Fall 2002-Spring 2003 academic year revealed 0.80 FTSE attributed to NAVIT students. This is probably due to the fact that NPC does not have the

[1] Registrar of Contractors License Examinations Requirements: http://www.rc.state.az.us/1 Exam.html.

capacity or equipment to support extensive enrollment in regular BOC classes at this time.

H. Number of students completing program

While NPC's Institutional Research department keeps data on the number of BOC students receiving degrees and certificates each year (see chart Page X of the Appendices), there does not appear to be a means of tracking them after they leave the college. It is worth noting that Mr. Darst has kept up with his program completors on a personal level, so some information is available on how and where they are employed. Concerning two AAS recipients, one is employed with Nielsen Construction, a general contracting company. He is a journeyman tradesman with a specialty in framing and he runs a crew for Navajo County. He currently makes about $18.00 per hour.

Other students were not degree-seeking, but took courses for personal enrichment:

1. Student in Contractor License and Law – Now Licensed General Contractor and owner of Young Guns Construction;
2. Husband and wife took plumbing and electrical classes to improve skills. Since then, both have become Licensed General Contractors and members of the Show Low Chamber of Commerce; they are also members of the BOC Advisory Board;
3. Student took plumbing classes to advance his skill level. Now has full-time plumbing job, and is advancing quickly. Employer Gregory Aadland reports he is an excellent employee;
4. Plumbing I & II student also took framing classes to advance his skill level. He was employed as a Plumber's Helper for John Darst Construction, where he worked eves and weekends on custom homes. He is also currently building his own home.

Several students are currently employed as they pursue a BOC degree through classes with Mr. Darst:

1. Works for Lumbermens Hardware and his degree will result in job advancement with the company;
2. Currently maintenance supervisor for Navapache Regional Medical Center, and his degree will promote him within the hospital;
3. Working for an architectural design company in Overgaard and pursuing his AAS with a specialty in Drafting to advance in his career.

I. Salary ranges in occupational field

As with most vocational programs, wages are paid on an hourly basis, and depend almost entirely upon experience. Entry-level workers such as laborers and helpers for the various trades possess limited skills and earn lower wages. Apprentices are in the process of developing their skills, and their wage level reflects their degree of knowledge and experience. Journeymen are at the apex of the pay scale for tradespeople, and can earn more than those who own their own construction or contracting business, depending

upon where they are employed. For a comparative picture of salary ranges, locally, for the Phoenix metro area, statewide and nationwide please see the charts on Pages X-X of the Appendices.

J. Program cost per FTSE

Given that the NPC BOC program encompasses a variety of areas, including the White Mountain Apache Tribe Housing Improvement Program, the Department of Corrections, Dual Enrollment, and regular college enrollment, it is almost impossible to ascertain with any accuracy a cost per FTSE. While data exists for enrollment in each of these areas, budgetary information is unclear and appears to come from multiple sources, including sources from outside the college (Tribal Workforce Investment Act funds; high school budgets, Arizona Department of Corrections). To simply apply the 2005-2006 budget figure to the total FTSE for that year would not provide a valid figure.

K. Integration of Academic and Vocational Education

While Construction Technology falls under Vocational Education, all students completing the Associate of Applied Science degree in Construction Technology are required to complete sixteen credits of general education courses. Six credits come from the Language Arts area: ENL 101 – College Composition I; and ENL 102 – College Composition II *or* ENL 109 – Technical Writing *or* SPT 120 – Public Speaking. Three credits of Mathematics are required: MAT 101 – Basic Technical Math or MAT 152 – Advanced Algebra. The remaining seven credits that summate the sixteen-credit general education requirement are derived from the AAS Discipline Studies list, which includes courses in Physical and Biological Sciences, Arts and Humanities, and Social and Behavioral Sciences. The seven credits required must come from at least two separate discipline areas, ensuring a well-rounded complement of general education studies.

All students completing a Certificate of Applied Science in Construction Technology are required to take six general education credits, which include three credits of mathematics (MAT 101 or MAT 152) and ENL 101 – College Composition I.

L. Special Populations

Services to special populations are the responsibility of the Coordinator of Disability Resources and Access (DRA), under the Division of Student Services. The DRA Coordinator ensures equitable access for any NPC student who self-identifies as having a disability by providing classroom accommodations and various support services under the guidelines of the Americans with Disabilities Act (ADA). These include, but are not limited to the following: assisting with registration; coordinating services with other local, state, and federal agencies and programs; and assisting the Vice President for Administrative Services with monitoring of facilities to make sure they meet ADA access guidelines. In addition, the DRA Coordinator provides training to faculty and staff on issues related to the ADA and oversees ADA issues that may arise with regard to staff and faculty.

M. Equipment

1. **Items on hand in Fall 2002 when current chairman John Darst began (Located in WMC classroom M7)**
   a. Table saw
   b. Radial arm saw
   c. Small tool box with various hand tools: pliers, screwdrivers, etc.)
   d. Set of hand pipe threaders: ½ inch through 1 ½ inch
   e. Box of used electrical outlet boxes and a few electrical switches

2. **Items that were added as of August 2006 (Located in M7)**
   a. Skill Saw
   b. Sidewinder Skill Saw
   c. Electric pipe threader
   d. Two (2) eight-foot ladders
   e. One (1) set of training videos for HVAC (heating, ventilation and air conditioning)
   f. Training props for HVAC: Four (4) AC and heating units – one (1) functioning and three (3) for parts only

3. **Personal tools that Mr. Darst uses to teach classes:**
   a. ½ inch drive angle drills
   b. Sawzalls
   c. ½ inch drive standard drill
   d. Welding torch
   e. Various valves, plumbing fittings and supplies left over from previous projects and from Mr. Darst's construction jobs

N. Business-Industry Partnerships

1. **Construction Technology Advisory Board**
   To facilitate dialogue with industry, and respond efficiently and effectively to industry needs, Darst has assembled an advisory committee consisting of the following individuals:
   - Anna Marie Rae, General Contractor – AMR Custom Builders - and graduate of the NPC BOC program;
   - Thomas Montoya, Building Maintenance Supervisor – Navapache Regional Medical Center – and graduate of NPC BOC program;
   - Ramon and Robin Mercer, Electrical Contractors;
   - James Showalter, General Manager of Construction, Show Low Bluffs Subdivision
   - Leslie Collins, NPC student advisor;
   - Tom McRichie, General Contractor in HVAC and NPC BOC Associate Faculty

- Danny Sorenson, NPC BOC Faculty (White Mountain Apache Tribe Workforce Investment Act Building Trades Program in Whiteriver);
- Barbara Bruce, Director of the Show Low Chamber of Commerce, who has a finger on the pulse of area growth and development.

O. Facilities and Services that Support the Program

As previously mentioned, Mr. Darst takes all students in his BOC classes onto active building sites to practice the hands-on applications they are learning in the classroom. Due to limitations with space and equipment, these building sites serve as the only practical BOC lab facilities currently available.

P. Articulation and Collaboration

1. Dual Enrollment

Many area high schools offer dual enrollment classes to their students through an agreement with NPC. Dual enrollment classes allow students to earn college credits for certain classes offered at the high school before they graduate from high school. Students get a head start on college through dual enrollment. Occupational classes are accepted for credit at all state community colleges. Academic courses are accepted for credit by all state community colleges as well as state universities. Many BOC courses are offered for dual enrollment at high schools throughout the NPC service area.

2. NAVIT

The Northern Arizona Vocational Institute of Technology (NAVIT) is a Joint Technological Education District (JTED) formed in 1999 to assist high school juniors and seniors in completing community college technical education classes. NAVIT serves 11 school districts in Navajo, Apache and Gila Counties. Students enrolled in NAVIT can get a jump-start on the Associate of Applied Science degree by taking community college classes beginning in the junior year of high school. NAVIT assists these students with tuition, books and fees, and NAVIT students take classes at the community college from community college instructors for part of their high school day. While the potential for develoment of a NAVIT BOC program may exist, there are currently no offerings available.

3. Articulation with State Universities

While a Bachelor of Science in Construction Management is available from Northern Arizona University and Arizona State University – it is an extended major tied to an engineering degree –, there are no current articulation agreements allowing students to transfer BOC credits from NPC to NAU. Arizona State University also offers a Bachelor of Science degree in Construction Management and a Bachelor of Applied Science in Construction Technology is available from

Arizona State Polytechnical Institute (ASU East), but again, no articulation agreements exist allowing for credit transfer from NPC's BOC program. Only general education credits will transfer in accordance with some degree programs.

Q. Marketing Plan

According to the Office of Marketing and Public Relations, there has never been a formal marketing plan for BOC. Course offerings appear in the college catalog and course schedules, and on the NPC web site. In years past, there have been occasional news releases about happenings in the program, but there is no official brochure or other printed material produced by Marketing and Public Relations. The Division of Workforce Development does produce flyers to advertise their special course offerings; these flyers are sent to the various campuses and centers. High school students may learn about BOC classes through their involvement with Dual Enrollment.

III. The Future of the Construction Technology Industry and NPC Program: Trends

At a November 21 meeting at the White Mountain Campus in Show Low, three members of the NPC BOC Advisory Committee, all general contractors or employers, provided their perspective on trends in the local and regional construction industry. All reported that it is extremely difficult to find qualified employees in the White Mountain area. While all were willing to hire employees with minimal skills and train them, even entry-level workers are hard to find. Strategies such as advertising in the Phoenix area for help were largely fruitless for two reasons.
1) There are currently many opportunities in the Phoenix area for construction tradespeople, because of the boom in new construction taking place there;
2) White Mountain area employers cannot compete with the wages the Phoenix area contractors are willing to pay to satisfy their need for crews.
Most White Mountain area employers find candidates for employment by word-of-mouth, and even when they are able to hire help, the turnover rate is high. Highly skilled employees advance to better-paying jobs, often leaving the area, and many entry-level employees do not exhibit the commitment or work ethic to stay in a position and advance. In fact, according to the advisory committee, the lack of "soft skills": work ethic, timeliness, attention to quality of work, and commitment are sorely lacking in entry-level employees.

Although NPC has offered Construction Technology courses since its inception in 1972, the local economy has not historically supported strong interest or enrollment in the program. Now demographic trends are shifting, the population of the western U.S. is expanding at a record rate, and growth in Navajo County is projected to exceed 13% over the next five years[2]. While area building contractors and other employers in Construction Technology cannot find sufficient numbers of employees at any skill level, growth in the White Mountain area is producing a demand for tradespeople in all areas of the building trades. So great is the demand that the aforementioned Show Low Bluff Group, approached the college to assist them in preparing employees for all aspects of new home construction. Show Low Bluff expects to be building homes in the White Mountain area for the next 10-15 years, and they have offered to support the

[2] www.workforce.az.gov/admin/uploadedPublications/1988_2006NavajoProjections.xls

expansion of the NPC BOC program in order that it can reach sufficient capacity to meet the needs of the developer. This offer of a partnership from Show Low Bluff comes at a critical time when it appears that a comprehensive program to prepare skilled trades persons *must* be implemented at NPC.

In early October, NPC President Ralph Orr called a meeting of the following individuals: Dr. Jeanne Swarthout, Vice President for Learning; Peggy Belknap, Dean of Workforce Development; John Darst, BOC Program Chair; David Huish, Director of Facilities; Dr. Michael Spangler, Dean of Business and Technology; and Betsyann Wilson, an independent consultant. The group was asked to identify key elements of a five-year plan for expanding the BOC program through partnership between the college and Show Low Bluff. These elements, including a budget, would be detailed in a proposal, prepared by Wilson, and presented to representatives of Show Low Bluff by President Orr.

Orr presented the proposal in late November, and at this writing the group was taking it to its full partnership for consideration. If the proposal is accepted, it is certain the BOC program will have the capacity to expand to meet the education and training needs identified, not only by Show Low Bluff, but also by the NPC BOC Advisory Committee.

IV. Summary of Program Review Findings

From Spring 1999 until 2002, the NPC Construction Technology program had no leadership and no direction. This was due to the fact that the chair position was vacant, while the position of Dean of Business and Technology was filled and vacated thrice in the three-year period. While the 2002 chair, John Darst has extensive industry experience, he was first directed to teach ITP (Power Plant Technology) classes for 2002-2003, then to teach Music classes in Fall 2003, then to fill in for ITP again in Spring 2004. Moreover, the BOC classroom and equipment list are inarguably insufficient to support anything more than limited enrollment, and certainly do not facilitate program promotion and growth.

Still, the time for program advancement is ripe. As aforementioned, *Show Low Bluff Development Group has approached the college to articulate its need for qualified workers.* It appears the college is responding by pursuing the partnership, but much remains to be done. If it is to be successful in meeting industry needs and enrolling more students, the BOC program must adhere to an overall goal, along with attendant objectives, outcome measures and strategies, such as those provided in the Show Low Bluff proposal's five-year plan. If it does not follow the comprehensive plan, BOC is embarking upon a journey without a map.

BOC has *many* strengths upon which to build. While he has no *administrative* academic background, Program Chairman John Darst has obtained his associate's degree and more importantly has over thirty years of experience in the industry, appropriate credentials for the head of a vocational program. Moreover, he has and uses his many industry contacts to advance the success of his students. His willingness to utilize his own resources, tools and money to give students hands-on learning opportunities and experience is exemplary and distinctive of a true *teacher.* A new BOC Advisory Committee consisting of representatives from the local industry is in place and has already demonstrated its commitment to provide the program direction. Most importantly, an adequate classroom/laboratory facility is in progress through the partnership with

Show Low Bluff. Beneficial from an academic standpoint, Construction Technology has been placed in Workforce Development, a division that will enable it to serve in the fitting capacity of advancing the labor force to promote economic health. Under Workforce Development, Darst will have the autonomy to create classes and programs in response to the needs of employers under the guidance and mentorship of a dean whose mission is service to industry.

If the Construction Technology program is to live up to its potential, several factors must be addressed:

1. The program must have specific, industry-driven, time-oriented guiding goals, objectives, strategies and outcome measures.
2. An adequate and comprehensively-equipped facility *must* be obtained soon;
3. Adequate numbers of faculty must be employed to support enrollment;
4. There must be a marketing plan, complete with specific and time-oriented objectives, strategies and outcome measures to advance the program to all potential enrollees;
5. Points for Discussion (see below) should be addressed by the Advisory Committee to clarify program objectives and strategies.

Given the explosive growth, not only in Navajo and Apache Counties but across the State of Arizona, Construction Technology is an exciting and lucrative field with great potential, not only from a standpoint of workforce development, but of overall economic health. With institutional support behind it, the Northland Pioneer College Construction Technology program can only move onward and upward for the betterment of the communities, employers, and most importantly the *students* who are served by it.

A. Points for Discussion by BOC Advisory Committee

1. Are current NPC facilities adequate for teaching BOC courses? If not, what must be done to rectify the situation?

At its first meeting in October 2006, the BOC Advisory Committee vehemently agreed that facilities for teaching BOC were not only inadequate for teaching current BOC courses, but also inadequate for any kind of program expansion. After that meeting, NPC entered into negotiations with the Show Low Bluff Development Group to expand the BOC program through a partnership, which would include not only a larger and better-equipped facility, but also equipment and teaching supplies to assist the program in reaching capacity needed for expansion.

2. What goals, objectives and outcome measures would most effectively drive the BOC program forward? What strategies must be implemented in order to accomplish those goals?

At its November meeting, the BOC Advisory Committee agreed that the college had to establish goals for numbers of students. Strategies recommended by the group for producing qualified entry-level workers include the following:

- Internships must be a requirement for program completion. Internships will give even entry-level employees an element of job experience that will expose them not only to the hands-on application of their respective trade, but also to the work ethic expected of them when they enter the job market. All advisory

committee members expressed a desire to provide internship opportunities for NPC BOC students, and internship opportunities were part of the five-year plan described in the Show Low Bluff proposal.

- Articulation agreements with state universities will allow students to seek baccalaureate level degrees for career and salary advancement. There are no current articulation agreements with either Arizona State University Polytechnical Institute (ASU East) or Northern Arizona University. Leslie Collins, NPC Student Advisor, explained the difference between a Bachelor of Science and Bachelor of Applied Science degree. The BOC Advisory Committee felt the Bachelor of Applied Science would be the most appropriate degree with which to articulate, since it emphasizes application of trade-specific skills, rather than general studies. Strategies to accomplish articulation agreements include sending BOC Program Chair John Darst to meetings of the Arizona State Articulation Task Force and contacting ASU East and NAU for information on how to proceed in developing and implementing articulation agreements.

3. **If the program is to grow, what is the capacity for adding faculty? Is it sufficient?**
   Currently, the number of faculty and associate faculty will not support program expansion. Adding faculty depends upon the outcome of the partnership proposal with Show Low Bluff. If the proposal is accepted and the partnership allows for program expansion, increased enrollment will support additional faculty. BOC Advisory Committee members expressed an interest in becoming NPC Associate Faculty in their respective trades.
4. **NCCER – Is adoption of NCCER curriculum right for the college?**
   None of the employers on the advisory committee were familiar with NCCER curriculum, which may attest to the value of a student holding an NCCER certificate. Still, as Leslie Collins pointed out, from a curricular standpoint, NCCER curriculum provides a good guideline, even if it lacks "brand name recognition". John Darst explained that he has been tasked with adapting NCCER curriculum for all areas of the BOC program, and while it does provide a uniform set of guidelines, it must be augmented or modified to meet the needs of BOC students. It should not be an impediment to articulation agreements, and so it was generally felt to be beneficial, or at least not detrimental.
5. **Mandatory Placement: Should vocational students be required to earn minimum placement scores in reading, writing and math before enrolling in courses, or does this requirement deter potential enrollees?**
   This question was posed only because it was a prominent topic in the previous BOC program review draft. The author of that document strongly felt that mandatory placement testing deterred students from taking BOC courses or programs. Therefore, the question of placement testing was put to the BOC Advisory Committee at its November 2006 meeting. Mandatory placement testing is not applicable to BOC courses per se, only to students seeking degrees, because they must complete general education classes for which placement testing is required. In the case of general education courses, the

question of placement testing is non-negotiable. As Leslie Collins explained, what *can* be massaged is what general education course selections are used toward degrees. For example, an Associate of Applied Science in Construction Technology might require English 100, which emphasizes technical writing, instead of English 101, which emphasizes academic essays. One BOC Advisory Committee member reported that he actually found the placement testing process to be helpful, because it revealed areas he needed to refine and improve if he was to be successful in his chosen career. At a future advisory board meeting, the group would like to review BOC degree requirements and explore and discuss such options.

6. **Degrees and Certificates – What are the pros and cons of a *degree* in Construction Technology? Should degree programs be emphasized and are they indicators of program success?**
   The advisory committee strongly endorsed degrees, because they are important for career advancement. Still, they emphasized the need for on-the-job internships as requirements for degrees. As one member put it, "Hire for attitude – Advance for Skill". In other words, completion of a degree is indicative of the ability to follow through and complete a program, and such evidence should indicate commitment and work ethic to a prospective employer.

7. **What is the nature of employability of Degree and Certificate Completors locally and statewide?**
   As was aforementioned, there is tremendous unmet need both locally and statewide for both entry-level and skilled employees in the building trades. This is due to the massive population boom in the Western United States and the ongoing and escalating need for housing and related infrastructure.

8. **Should Plumbing and HVAC be added to specialization/proficiency areas?**
   By all means, Plumbing and HVAC should be included in areas of emphasis, and Certificates of Proficiency should be developed for each and placed in the catalog.

9. **Should BOC invite more opportunities for NAVIT students? How can the relationship between NAVIT and NPC BOC be mutually beneficial?**
   Expansion of opportunities for NAVIT students will depend upon the outcome of the partnership proposal with Show Low Bluff, but the advisory committee sees high schools as an excellent pool of potential employees, and sees the value of getting students into the BOC pipeline as early as possible.

   One committee member pointed out the value of allowing Welding (WLD) courses to count for elective credit toward some BOC degrees. As he pointed out, he holds an Associate Degree in BOC with an emphasis on Building Maintenance, and he uses welding often in his day-to-day work. Still, none of

the welding classes he took through NAVIT applied toward his BOC degree, even though he uses the skills he learned regularly.

V. Committee Recommendations

A. BOC Program Structure

Expand the NPC BOC program to accommodate larger numbers of students across the Construction Technology field. As one committee member pointed out, in other communities where she has lived, community colleges are the "go-to" places to find employees. There is certainly demand from the industry. NPC should meet the demand. Continue to pursue means of expanding the program, including the partnership with Show Low Bluff.

B. BOC Curriculum and Offerings

1. Make on-the-job internships a requirement for program completion. Seek internship opportunities from advisory committee members, who will not only provide them, but who will help identify additional opportunities through contacts within the Construction Technology community.

2. Provide short-term, open entry/open exit workshops to keep those in the field abreast of current technology. The BOC Advisory Committee reports that technology across the building trades is advancing at a pace never before seen, and local tradespeople are unable to keep up with the latest trends. The committee suggested construction trade shows as a resource for learning about new trends, and even for identifying associate faculty personnel to teach workshops on the new trends. They recommend sending BOC Program Chair John Darst to several trade shows each year to gather information. Mr. Darst can also work with Dean Peggy Belknap to create workshops to disseminate information.

3. Explore articulation agreements with state universities. Send John Darst to meetings of the State Articulation Task Force, and contact ASU East and NAU for information on how to initiate articulation agreements in Construction Technology.

4. Convene a meeting of the advisory committee to examine current degree requirements and make recommendations for possible modifications of required courses to produce better-qualified program completors.

5. Related to Item # 4 above, examine the feasibility of accepting Welding courses as electives for BOC, and perhaps for Automotive and Industrial Technology degrees as well.