Professional Qualifications Committee

California Architects Board

October 23, 2013
Sacramento and Various Locations

Edmund G. Brown Jr.
GOVERNOR

CALIFORNIA ARCHITECTS BOARD

PUBLIC PROTECTION THROUGH EXAMINATION, LICENSURE, AND REGULATION

NOTICE OF MEETING

PROFESSIONAL QUALIFICATIONS COMMITTEE

October 23, 2013
10:00 a.m. to 1:00 p.m.
2420 Del Paso Road, Suite 105
Sacramento, CA 95834

The California Architects Board will hold a Professional Qualifications (PQ) Committee meeting as noted above, and via telephone conference at the following locations:

Jon Alan Baker, Chair
Baker Nowicki Design Studio
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San Diego, CA 92101
(619) 795-2450

Pasqual Gutierrez, Vice Chair
HMC Architects
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(909) 989-9979

Raymond Cheng
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Los Angeles, CA 90048
(323) 866-7884

Allan Cooper
The Steynberg Gallery
1531 Monterey Street
San Luis Obispo, CA 93401
(805) 704-5725

Betsey Olenick Dougherty
Dougherty & Dougherty Architects
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(Continued on reverse side)

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AGENDA

A. Review and Approve the May 1, 2013 PQ Committee Summary Report

B. Discuss and Possible Action on the 2014 National Architectural Accrediting Board Conditions for Accreditation

C. Update and Possible Action on the 2013 Strategic Plan Objective to Present a Recommendation to the National Council of Architectural Registration Boards (NCARB) on Criteria for a "Broadly Experienced Design Professional" Pathway to Licensure

D. Update on the 2013 Strategic Plan Objective to Develop a Strategy to Expedite Reciprocity Licensure for Military Spouses and Domestic Partners

E. Report on the NCARB Proposed Changes to the Intern Development Program (IDP) Related to Employment Duration and IDP Entry Point

F. Report on the NCARB 2012 Practice Analysis

A quorum of Board members may be present during all or portions of the meeting, and if so, such members will only observe the PQ Committee meeting. Agenda items may not be addressed in the order noted above and the meeting will be adjourned upon completion of the agenda, which may be at a time earlier than that posted in this Notice.

The meeting is open to the public and accessible to the physically disabled. A person who needs a disability-related accomodation or modification in order to participate in the meeting may make a request by contacting Marccus Reinhardt at (916) 575-7212, emailing marccus.reinhardt@dca.ca.gov, or sending a written request to the California Architects Board, 2420 Del Paso Road, Suite 105, Sacramento, CA 95834. Providing your request at least five business days before the meeting will help to ensure availability of the requested accomodation.

The notice and agenda for this meeting and other meetings of the Board can be found on the Board's Web site: cab.ca.gov. For further information regarding this agenda, please contact Marccus Reinhardt at (916) 575-7212.

Agenda Item A

REVIEW AND APPROVE THE MAY 1, 2013 PQ COMMITTEE SUMMARY REPORT

The Committee is asked to review and approve the attached Summary Report for the May 1, 2013 Professional Qualifications Committee meeting.

Attachment:
May 1, 2013 Professional Qualifications Committee Summary Report

Edmund G. Brown Jr.
GOVERNOR

CALIFORNIA ARCHITECTS BOARD

PUBLIC PROTECTION THROUGH EXAMINATION, LICENSURE, AND REGULATION

SUMMARY REPORT

PROFESSIONAL QUALIFICATIONS COMMITTEE MEETING

May 1, 2013

Sacramento, CA

Committee Members Present
Jon Baker, Chair
Raymond Cheng
Allan Cooper (arrived at 10:55 a.m.)
Betsey Dougherty
Glenn Gall
Pasqual Gutierrez
Stephanie Silkwood
Barry Wasserman

Committee Members Absent
Gordon Carrier
Jeffrey Heller
Kirk Miller
Paul Neel
Alan Rudy

Guests
Bob Holmgren, Supervising Personnel Selection Consultant, Department of Consumer Affairs (DCA), Office of Professional Examination Services (OPES)
Raul Villanueva, Personnel Selection Consultant, DCA, OPES

Board Staff
Doug McCauley, Executive Officer
Vickie Mayer, Assistant Executive Officer
Marccus Reinhardt, Program Manager, Examination/Licensing Unit
Timothy Rodda, Examination/Licensing Analyst
Jeffrey Olguin, Continuing Education Program Analyst

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Committee Chair Jon Baker called the Professional Qualifications Committee (PQC) meeting to order at 10:05 a.m.

A. REVIEW AND APPROVE THE MAY 16, 2012 PQC SUMMARY REPORT

The PQC reviewed the May 16, 2012 meeting Summary Report.

Raymond Cheng made a motion to approve the May 16, 2012 PQC meeting Summary Report.

Betsey Dougherty seconded the motion.

The motion passed 7-0. (Allan Cooper not present at time of vote.)

*D. DISCUSS AND POSSIBLE ACTION ON 2013 STRATEGIC PLAN OBJECTIVE TO PRESENT A RECOMMENDATION TO THE NCARB ON CRITERIA FOR A "BROADLY EXPERIENCED INTERN" PATHWAY TO LICENSURE

Mr. Baker advised that at prior meetings, the Board had discussed the possibility of making a recommendation to the National Council of Architectural Registration Boards (NCARB) regarding a Broadly Experienced Intern pathway. Marccus Reinhardt then introduced Pasqual Gutierrez as the Committee member who initiated the discussion on the Broadly Experienced Intern pathway. Mr. Gutierrez explained there is currently a pathway for licensees to receive an NCARB Certificate without completing the Intern Development Program (IDP) called the Broadly Experienced Architect (BEA) program. Mr. Gutierrez said he is recommending a pathway be created for interns who have a wide array of experience, but are unable to document that experience through IDP because of the Six-Month Rule. He added the proposed framework as conceived, would require ten years of documented architectural experience and submission of a portfolio documenting 5,600 hours of evidence-based experience demonstrating fulfillment of the IDP Experience Categories and Areas. Doug McCauley noted the framework is similar to the Comprehensive Intern Development Program model formerly used by the Board.

Ms. Dougherty inquired if the intent was to circumvent the NCARB Six-Month Rule.
Mr. Gutierrez responded affirmatively and explained there is currently an exemption from the rule for licensees when documenting prior experience for IDP. He said no such exemption exists for candidates who want to document prior experience older than six months.

Mr. Baker indicated the proposed program is targeting those current and potential candidates who may have prior work experience that is currently unusable with the current IDP model.
Vickie Mayer added there are candidates previously exempt from the Board's IDP requirement who must now complete IDP because they lost eligibility and need to reapply with the Board. She added there are also current new candidates who have worked in the field for several years, but are unable to document that experience due to the Six-Month Rule. Ms. Dougherty and Mr. Baker stated that completion of IDP by these individuals may be viewed as a discouraging barrier. Mr. Baker opined that if the Board were to develop a recommendation to NCARB regarding this process, an NCARB approved alternative pathway may come faster.

Barry Wasserman inquired about the completion of IDP Experience Categories and Areas and how prior experience would be credited toward fulfillment. Mr. Gutierrez responded that candidates would demonstrate completion and competence through documentation in a portfolio of the work performed within the IDP Experience Categories and Areas. Mr. Baker added that the process could include statements from previous employers as well. Mr. Wasserman noted that documenting the hours of work experience through previous employers could be challenging, but providing evidence could be used as an alternative.

Ms. Dougherty noted the Board should create multiple scenarios for NCARB to consider regarding this alternative pathway. Mr. Gutierrez suggested that within the scenarios, candidates must demonstrate completion and competence in the IDP Experience Categories and Areas. Messrs. Baker and Wasserman agreed and added that the scenarios should not be viewed as a burden to discourage candidates.

Ms. Dougherty inquired if candidates could interpret the pathway as a method of circumventing IDP. Mr. McCauley responded that the program should be viewed as an alternative for those candidates who may have experience, and not as a method of circumventing IDP. He added that there are measures that may be taken to ensure this, such as requiring a minimum number of years experience before a candidate could enroll in the program. Mr. Baker reiterated the program should not create any additional barriers for candidates. He stated the goal should be to get a framework to NCARB for review. Ms. Dougherty suggested possibly working with other states to gather support for this program.

Ms. Mayer inquired how candidates could provide documented experience from prior employers who cannot be reached. Mr. Gutierrez responded that through an evidence based or portfolio submission, the prior employers may not need to be contacted directly.

Mr. Baker noted the task of creating a framework and program will require cooperation with other states and NCARB. Mr. Baker inquired if staff could develop a framework. Mr. McCauley affirmed that staff could develop an outline, submit it to the Board for approval and provide it to NCARB at the next annual meeting in June.

Betsey Dougherty made a motion to have staff develop a proposed framework of criteria for the Broadly Experienced Intern pathway to be considered by the Board and ultimately NCARB.

Raymond Cheng seconded the motion.

The motion passed 7-0. (Allan Cooper not present at time of vote.)

B. DISCUSS AND POSSIBLE ACTION ON 2013 STRATEGIC PLAN OBJECTIVE TO CONDUCT AN AUDIT OF THE NATIONAL COUNCIL OF ARCHITECTURAL REGISTRATION BOARDS (NCARB) ARCHITECT REGISTRATION EXAMINATION (ARE) AND THE CALIFORNIA SUPPLEMENTAL EXAMINATION (CSE) TEST SPECIFICATIONS TO DETERMINE APPROPRIATE CONTENT OF THE CSE

Mr. Reinhardt briefly introduced this agenda item. He explained that the Board has a Strategic Plan objective of reviewing the NCARB ARE which may be completed in conjunction with another

objective to conduct an Occupational Analysis (OA) for the ongoing development of the CSE.

Raul Villanueva from OPES presented this agenda item. He briefly explained OPES's mission and role in examination development, and noted that an OA is a fundamental component of developing a legally defensible examination. Mr. Villanueva added that the OA defines the basis, or content domain for an examination. He further explained an OA is typically conducted every five years, and identifies the critical tasks related to the practice; it defines the current practice of the profession.

Mr. Cooper inquired if frequency and criticality are addressed in the tasks of the OA.
Mr. Villanueva affirmed that frequency and criticality, as well as the other aspects of Bloom's Taxonomy, are used.

Mr. Villanueva continued explaining the process of conducting an OA, such as identifying changes in the profession, law, and emerging trends in practice. He noted the OA seeks input from stakeholders of the profession in order to develop an accurate picture of entry level practice.
Mr. Wasserman noted that it is critical to weigh responses accordingly so as not to skew results.
Mr. Villanueva agreed and added that the meaningfulness of the input is used to develop job content and structure. He proposed using focus groups to ensure the current practice of architecture is analyzed and entry-level practice is defined. Mr. Villanueva stated the OA will be conducted online, and review of the data will be ongoing.

Mr. Villanueva described the areas of responsibility for the OA:

- OPES will be conducting a quantitative analysis and prepare preliminary findings.
- Licensees would review the findings and explain the meaningfulness and criticality of each task through workshops as subject matter experts.
- The Board coordinates a broad spectrum of participation in workshops as well as identifies stakeholders and stakeholder groups.
- OPES will provide the technical oversight, conduct workshops, analyze the results and develop a report based upon the findings.

Glenn Gall noted that architecture does not have an entry level; once licensed, an architect can practice any aspect of the profession. Mr. Villanueva stated that the use of rating scales as part of the OA will define the expectation of what an entry level licensee will need to know.

Mr. Villanueva continued, stating the goal is to ensure the OA focuses on California specific content. He added that this will help to eliminate the overlap between the ARE and CSE, and will help define the entry level knowledge required for practice.

Mr. Villanueva explained the review of the ARE is required by Business and Professions Code section 139, and ensures it complies with psychometric and legal standards. He advised the review consists of three steps: 1) psychometric review of the ARE; 2) linkage of examination content with the CSE OA results; and 3) identification of content evaluated and not evaluated in the ARE.
Mr. Baker inquired if this process would duplicate the process of what NCARB has completed.
Mr. Villanueva responded that the study is conducted for instate requirements. He added that the OA forms the legal defensibility for the CSE.

Mr. Wasserman hoped that an outcome for the study would be a defense of the profession and why architecture practice requires licensure. Mr. Gall inquired when the last OA was completed. Mr. McCauley responded the last was completed in 2007, and stated that the new OA would not be completed until NCARB has completed its Practice Analysis. Mr. Gall noted that NCARB has a different focus on examination content. Mr. Baker stated he wanted to ensure that California specific items are adequately covered, without duplicating content sufficiently covered on the ARE.

Betsey Dougherty made a motion to recommend the Board enter into a contract with OPES to utilize their standard process of conducting a review of the ARE and proceed accordingly based upon the outcome.

Allan Cooper seconded the motion.

The motion passed 8-0.

Mr. Gall stated he was not clear on the definition of entry level qualification of the profession as part of the OA. Mr. Baker responded it was his interpretation that OPES must assess the profession and determine the level of knowledge of skills and abilities required for entry level practice. Mr. McCauley noted that the PQC could request clarification of the language as part of the OA. Mr. Gall stated the OA is a sample of daily work by practitioners, not a snapshot of entry level practice.

Glenn Gall made a motion to have OPES redefine the primary purpose of the OA as capturing architectural practice in California based on the critical tasks and knowledge related to current practice and not focus on entry level.

Raymond Cheng seconded the motion.

The motion passed 8-0.

C. DISCUSS AND POSSIBLE ACTION ON 2013 STRATEGIC PLAN OBJECTIVE TO CONDUCT AN OCCUPATIONAL ANALYSIS OF ARCHITECTURAL PRACTICE IN CALIFORNIA FOR ONGOING CSE DEVELOPMENT

Mr. Baker stated there is a concern relative to the concept of “entry level” and a belief that the OA should be broad in its assessment of the profession. He added that the test specifications and examination content would be the appropriate area to address entry level components.

Bob Holmgren responded that an OA is used to develop a test plan for a licensure examination. Through the licensure examination, the determination is made on what constitutes minimum acceptable competence. He added that the end result of the survey sent to licensees is to get a broad description of the practice, collect empirical data on tasks and then determine what should be incorporated in the test plan. Tasks that are identified as completed very frequently and very important will be included as entry level.

Mr. Cooper noted the difference between entry level and minimally competent in the profession, and proposed using minimally competent in lieu of entry level. Mr. Holmgren responded the goal

of an OA is to develop a test plan for minimal competence. He reiterated that the questionnaire that would be answered by the stakeholders has a rating scale for the items. Mr. Baker inquired how involved OPES will be with the decision on what items will be asked. Mr. Holmgren responded that subject matter experts will be the ones making all determinations regarding content and acceptable questions.

Ms. Dougherty inquired whether OPES will be using the NCARB Practice Analysis as part of the analysis. Mr. Holmgren responded that the NCARB Practice Analysis would be reviewed to ensure minimal overlap of content by the ARE. He added the OA survey will have broad questions that could be narrowed for the development of the CSE.

Mr. Gall stated that including only newly licensed licensees in developing the OA, certain knowledge may be missing because they are unaware of all aspects of the profession. Mr. Holmgren responded that the survey is distributed to all practitioners, and it is through their participation that an accurate detail of the profession is obtained. He added that it would be beneficial to have Board support in obtaining or convincing practitioners to participate.

E. DISCUSS AND POSSIBLE ACTION ON 2013 STRATEGIC PLAN OBJECTIVE TO COMMENT ON THE NATIONAL ARCHITECTURAL ACCREDITING BOARD (NAAB) ACCREDITATION STANDARDS

Mr. Cooper stated he endorses the work NCARB is advocating which is reflected in the meeting packet. He advised that it is important to include a metric against which IDP coordinators could be held. Ms. Dougherty inquired if there was a minimum standard for IDP coordinators. Mr. Cooper responded that there is not currently a standard that coordinators are held to, and he opined that is a problem. Mr. McCauley also noted that the detailed report provided by and effort put forth by NCARB is commendable. Mr. Cooper added that NCARB has identified a systemic problem that needs.

Allan Cooper made a motion to recommend to the Board it endorse the NCARB comments and position, and direct staff to draft a letter congratulating NCARB on the effort.

Betsey Dougherty seconded the motion.

The motion passed 8-0.

F. DISCUSS AND POSSIBLE ACTION ON 2013 STRATEGIC PLAN OBJECTIVE TO DEVELOP A STRATEGY TO EXPEDITE RECIPROCITY LICENSURE FOR MILITARY SPOUSES AND DOMESTIC PARTNERS

Mr. Reinhardt summarized Assembly Bill (AB) 1904 (Chapter 399, Statues of 2012) regarding the expedition of reciprocal licensure for individuals who are married or in a legal union with an active duty member. He noted that staff has taken measures to expedite the process for these candidates and included information available on the Board website. He next summarized AB 1588 (Chapter 752, Statutes of 2012) regarding the waiving of renewal requirements while the licensee is called to active duty.

Mr. Baker inquired how much time is saved by expediting the reciprocal candidates. Mr. Reinhardt responded that the time may be reduced by several weeks. Mr. Gutierrez asked for an explanation of the process. Mr. Reinhardt explained that when staff receives an application with documentation indicating their marital or union status with a member of the armed forces called to active duty, that candidate receives priority when reviewing and processing the application.

Mr. Gutierrez inquired about the renewal requirements that would be waived as part of the law. Ms. Mayer stated that the renewal fee is accrued, but the delinquency fee and continuing education requirement are not. Mr. Baker inquired why the renewal fee would continue to accrue. Ms. Mayer responded that staff would verify whether the renewal fee accrues and report the findings back.

Mr. McCauley stated there is currently a bill being discussed that would grant a provisional license to practice. He noted this would potentially require a waiver of the CSE. Mr. Baker inquired how these candidates would be handled should they wish to make the temporary licenses permanent. Mr. Cooper added that the bill would work more for professions that do not have a supplemental examination. Mr. Baker suggested the Board monitor the status of the bill.

Ms. Mayer stated that with respect to AB 1588, the Board may specify what requirements are waived for renewal, upon discharge. She added the Committee may recommend to the Board that staff pursue regulations what the Board determines necessary upon discharge from active duty.

Jon Baker made a motion to recommend to the Board staff pursue a regulatory amendment that would exempt active duty military licensees from the requirement to pay the accrued renewal fees excluding the current renewal cycle fee.

Pasqual Gutierrez seconded the motion.

The motion passed 8-0.

G. UPDATE ON PROPOSED REGULATIONS TO AMEND CALIFORNIA CODE OF REGULATIONS (CCR), TITLE 16, SECTION 121 (FORM OF EXAMINATION; RECIPROCITY) RELATIVE TO THE NCARB BROADLY EXPERIENCED FOREIGN ARCHITECT (BEFA) PROGRAM

Mr. Reinhardt provided the Committee with an update regarding the status of the pending regulatory proposal to amend CCR section 121. He explained that with the initially proposed language, candidates who were licensed in the United Kingdom would have been inadvertently excluded. He said at the March Board meeting, new language removing the exclusion of United Kingdom candidates was approved to move forward with the regulatory change. The public hearing for the proposed regulatory amendment is scheduled for May 9, 2013.

H. UPDATE ON PROPOSED REGULATIONS TO AMEND CCR, TITLE 16, SECTION 117 RELATIVE TO EXPERIENCE CREDIT FOR ACADEMIC INTERNSHIPS COMPLETED AS PART OF THE NCARB INTERN DEVELOPMENT PROGRAM

Mr. Reinhardt provided the Committee with an update regarding the status of the pending regulatory proposal to amend CCR section 117. He explained that the intent of the proposal is to align the Board's regulations with IDP changes pertaining to credit for academic internships. He stated that the modification to the proposal would align the Board's regulations with the November 2012 *IDP Guidelines* and that the public hearing for the proposed regulatory amendment was scheduled for May 9, 2013.

The meeting adjourned at 1:46 p.m.

**Agenda items were taken out of order to accommodate guest speakers. The order of business conducted herein follows the transaction of business.*

Agenda Item B

DISCUSS AND POSSIBLE ACTION ON THE 2014 NATIONAL ARCHITECTURAL ACCREDITING BOARD CONDITIONS FOR ACCREDITATION

The Board's 2013 Strategic Plan directs the Professional Qualifications (PQ) Committee to review and provide the Board with a recommendation for comments on the National Architectural Accrediting Board's (NAAB) Accreditation Standards.

At its May 1, 2013 meeting, the PQ Committee reviewed and discussed *NCARB's Contribution to NAAB 2013 Accreditation Review Conference* and recommended the Board send a letter (attached) commending National Council of Architectural Registration Boards (NCARB) for its efforts. The letter was subsequently approved by the Board and delivered to NCARB President, Ronald Blitch at the NCARB 2013 Annual Meeting held in June 2013.

In July 2013, NAAB hosted its 2013 Accreditation Review Validation Conference (ARC13). This conference was held over two days and involved discussion, deliberation, and problem solving over how to improve the process and program experience of individuals in NAAB accredited architecture programs.

Following ARC13, NAAB began developing the *2014 Conditions for Accreditation* (attached) and *A Guide to the 2014 Conditions for Accreditation and Preparation of Architecture Program Report* (attached). The NAAB *2014 Conditions for Accreditation* will include instructions for preparing for the Architecture Program Reports (APRs). Serving as both a self-study for the architecture program and as the principle source document for NAAB when conducting program visits, the APRs are utilized when conducting an evaluation of an educational institution. The APRs are comprehensive documents that show how a post-secondary program meets NAAB conditions for accreditation.

Several significant changes are proposed in the NAAB *2014 Conditions for Accreditation*. These changes include:

- Clarification of instructions;

- Ways of re-balancing commitment to continuous improvement and improving educational outcomes and curriculum;
- Five new perspectives relative to the practice;
- Removing the condition I.4 Policy Review;
- Eliminating redundancies in the Student Performance Criteria;
- Addressing student achievement for comprehensive or integrative design; and
- Changes to the Condition of Professional Degrees and Curriculum.

The PQ Committee is asked to review and provide the Board a recommendation for comments on the *2014 Conditions for Accreditation*. The deadline for comments to NAAB is December 1, 2013.

Attachments:

1. Letter of Support to NCARB
2. *2014 Conditions for Accreditation* – First Draft
3. *A Guide to the 2014 Conditions for Accreditation and Preparation of Architecture Program Report* – First Draft

CALIFORNIA ARCHITECTS BOARD
PUBLIC PROTECTION THROUGH EXAMINATION, LICENSURE, AND REGULATION

Edmund G. Brown Jr.
GOVERNOR

June 19, 2013

Mr. Ronald B. Blitch, FAIA, FACHA, NCARB, President/Chair of the Board
National Council of Architectural Registration Boards
1801 K Street, NW, Suite 700K
Washington, DC 20006

RE: NCARB's Comments to NAAB (*Conditions for Accreditation)*

Dear Mr. Blitch:

I am writing you on behalf of the California Architects Board to convey our support of NCARB's comments to the National Architectural Accrediting Board (NAAB) relative to *The Conditions for Accreditation*.

As you know, architectural education has been a long-standing concern of the Board. The Board has held three educator/practitioner forums on architectural education in recent years. One common theme has been that there is a disconnect between education and practice, as well as a lack on emphasis on critical health, safety, and welfare issues.

At its June meeting, the Board reviewed *NCARB's Contribution to the NAAB 2013 Accreditation Review Conference*. The Board believes that NCARB's use of its *2012 NCARB Practice Analysis of Architecture* as the basis for its comments is invaluable and will lead to accreditation standards that better support our efforts to protect the public health, safety, and welfare.

The Board commends NCARB for its quality work on this vital issue.

Sincerely,

SHERAN VOIGT
Board President

cc: Michael J. Armstrong, NCARB Chief Executive Officer
California Architects Board Members

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2014 Conditions for Accreditation

First Draft

The National Architectural Accrediting Board, Inc.

NAAB

August 29, 2013

First Draft

First Draft

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First Draft

ACCREDITATION

Accreditation is a voluntary, quality assurance process by which services and operations are evaluated by a third party against a set of standards established by the third-party with input and collaboration from peers within the field. In the U.S., accreditation of postsecondary institutions originated over a century ago. It is sought by colleges and universities and is conferred by non-governmental bodies. Today, voluntary accreditation is distinguished by five components, which also guide the NAAB's policies and procedures:

- It is provided through private agencies;
- It requires a significant degree of self-evaluation by the institution or program, the results of which are summarized in a report to the agency;
- A team conducts a visit;
- Recommendations or judgments about accreditation are made by expert and trained peers; and
- Institutions have the opportunity to respond to most steps in the process[1].

The U.S. model for accreditation is based on the values of independent decision-making by institutions, the ability of institutions to develop and deliver postsecondary education within the context of their mission and history, the core tenets of academic freedom, and the respect for diversity of thought, pedagogy, and methodology. These principles and practices have remained relatively stable over the past 70 years.

HISTORY

The first attempt to establish national standards in architecture education came with the founding of the Association of Collegiate Schools of Architecture (ACSA) in 1912 and its adoption two years later of "standard minima," which schools were required to meet to gain ACSA membership. While these standard minima were in place, ACSA membership was equivalent to accreditation.

In 1932, the ACSA abandoned the standard minima and in 1940, the ACSA, The American Institute of Architects (AIA), and the National Council of Architectural Registration Boards (NCARB) established the National Architectural Accrediting Board (NAAB)[2] and gave it authority to accredit schools of architecture nationally. The founding agreement of 1940 also announced the intention to create an integrated system of architectural education that would allow schools with varying resources and circumstances to develop according to their particular needs. This notion that the NAAB would "not to create conditions, nor to have conditions created, that will tend toward standardization of educational philosophies or practices," is considered the "prime directive" in the NAAB system today.

The foundation for the model for accreditation in architecture education that many know today was first outlined in a 1975 intercollateral report, *The Restructuring of the NAAB*. Today, the NAAB's accreditation system for professional degree programs requires a self-assessment by the accredited degree program, an evaluation of that assessment by the NAAB, and a site visit by an NAAB team of trained volunteers that concludes with a

[1] *The Handbook of Accreditation, Third Edition.* North Central Association of Colleges and Schools, Higher Learning Commission (2003).
[2] These four organizations, along with the American Institute of Architecture Students (AIAS) are referred to as the "collateral organizations" or "collaterals" within the architecture community.

First Draft

recommendation to the NAAB as to the term of accreditation. The decision regarding the term of accreditation is made by the NAAB directors.

On October 22, 2011, the NAAB directors approved a new statement of the NAAB's vision, mission, and values. Developed after several months of review and consideration, the document is a contemporary expression of the NAAB's founding principles. It guides the work of the NAAB in all its activities. The text of that statement follows.

From the 1940 Founding Agreement:

> "The … societies creating this accrediting board, here record their intent not to create conditions, nor to have conditions created, that will tend toward standardization of educational philosophies or practices, but rather to create and maintain conditions that will encourage the development of practices suited to the conditions which are special to the individual school. The accrediting board must be guided by this intent."

Since 1975, the *NAAB Conditions for Accreditation* have emphasized self-assessment and student performance as central elements of the NAAB model. The directors have maintained their commitment to both of these as core tenets of the NAAB's criteria and procedures.

Mission: The NAAB develops and maintains a system of accreditation in professional architecture education that is responsive to the needs of society and allows institutions with varying resources and circumstances to evolve according to their individual needs.

Vision: The NAAB aspires to be the leader in establishing educational quality assurance standards to enhance the value, relevance, and effectiveness of the architectural profession.

Values: The following principles serve as a guide and inspiration to the NAAB.

1. ***Shared Responsibility*.** The education of an architect is a responsibility shared by the academy and the profession in trust for the broader society and the public good.
2. ***Best Practices.*** The NAAB's accreditation processes are based on best practices in professional and specialized accreditation.
3. ***Program Accountability****.* Architecture degree programs are accountable for the learning of their students. Thus, accreditation by the NAAB is based both on educational outcomes and institutional commitment to continuous improvement.
4. ***Preparing Graduates for Practice.*** A NAAB-accredited degree prepares students to live and work in a diverse world: to think critically; to make informed decisions; to communicate effectively; to engage in life-long learning; and to exercise the unique knowledge and skills required to work and develop as professionals. Graduates are prepared for architectural internship, set on the pathway to examination and licensure, and prepared to engage in related fields.
5. ***Constant Conditions for Diverse Contexts*.** *The NAAB Conditions for Accreditation* are broadly defined and achievement-oriented so that programs may meet these standards within the framework of their mission and vision, allowing for initiative and innovation. This imposes conditions on both the NAAB and on architectural programs. The NAAB assumes the responsibility

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for undertaking a fair, thorough, and holistic evaluation process, relying essentially on the program's ability to demonstrate how within their institutional context they meet all evaluative criteria. The process relies on evaluation and judgment that, being rendered on the basis of qualitative factors, may defy precise substantiation.

6. ***Continuous Improvement through Regular Review.*** *The NAAB Conditions for Accreditation* are developed through an iterative process that acknowledges and values the contributions of educators, professionals in traditional and non-traditional practice, and students. The NAAB regularly convenes conversations on critical issues (e.g. studio culture) and challenges the other four collateral partners to acknowledge and respect the perspectives of the others.

While the NAAB stipulates the conditions and student performance criteria that must be met, it specifies neither the educational format nor the form of student work that may serve as evidence of having met these criteria. Programs are encouraged to develop unique learning and teaching strategies, and methods and materials to satisfy these criteria.

The NAAB encourages innovative methods for satisfying the criteria, provided the program has a formal evaluation process for assessing student achievement and documenting the results.

Specific areas and levels of excellence will vary among accredited degree programs as will approaches to meeting the conditions and reporting requirements. The positive aspects of a degree program in one area cannot override deficiencies in another.

NAAB ACCREDITATION DOCUMENTS

There are five documents referenced with accreditation.

1. 2014 NAAB Conditions for accreditation
2. NAAB Procedures for Accreditation
3. NAAB Guide to the 2014 Conditions for Accreditation and Preparation of Architecture Program Reports
4. Architecture Program Reports
5. Visiting Team Reports

The *2014 NAAB Conditions for Accreditation* define the standards that professional degree programs in architecture are expected to meet in order to ensure that students are prepared to move to the next steps in their careers including internship and licensure. This document was last revised in 2009; it will be revised again in 2019.

The *NAAB Procedures for Accreditation* outline the procedures that programs and visiting teams must follow in order to ensure a uniform accrediting process. This document was last revised in 2012; it will be revised again in 2015 and subsequently at two-year intervals.

The *2014 Conditions for Accreditation* apply to all programs seeking continued accreditation, candidacy, continuation of candidacy, or initial accreditation beginning April 1, 2015.

NAAB Guide to the 2014 Conditions for Accreditation and Preparation of Architecture Program Reports is a new document under development by the NAAB. The first iteration includes an introduction to and commentary on the preparation of the first draft of the *2014*

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Conditions. It will later be revised to include instructions for preparing Architecture Program Reports (APRs). In subsequent years, beginning in 2016, it will be revised annually based on surveys and evaluations of the visit process. This document is advisory and nonbinding on the NAAB.

An APR is a self-analytical, narrative report prepared by the program in advance of a visit. Instructions and required templates for these reports will be provided by the NAAB in the *Guide* described above.

A Visiting Team Report is prepared by a NAAB visiting team at the conclusion of each visit. In these reports the visiting team affirms that materials have been presented or reviewed in accordance with the *2014 Conditions* and the *Procedures.* Instructions and templates for preparing these reports are found in the *Procedures.*

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CONDITIONS FOR ACCREDITATION

PART ONE (I): INSTITUTIONAL SUPPORT AND COMMITMENT TO CONTINUOUS IMPROVEMENT

This part addresses the commitment of the institution, its faculty, staff, and students to the development and evolution of the program over time.

- **IDENTITY & SELF-ASSESSMENT**: The program must be defined and sustained through a robust network of policies, documents, and activities related to history, mission, culture, self-assessment, and future planning.
- **RESOURCES**: The program must have the human, physical, financial, and information resources necessary to support student learning in a professional degree program in architecture.

Programs demonstrate their compliance with Part One in two ways:

- A narrative report that briefly responds to each request to "demonstrate, describe, or document."
- A review of evidence and artifacts by the visiting team, as well as through interviews and observations conducted during the visit.

For instructions on how this material is to be presented in the APR and during the visit, see *NAAB Procedures for Accreditation* and the *NAAB Guide to the 2014 Conditions for Accreditation and Preparation of Architecture Program Reports.*

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CONDITIONS FOR ACCREDITATION

PART ONE (I): SECTION 1 – IDENTITY & SELF-ASSESSMENT

I.1.1 History and Mission: The program must describe its history, mission and culture and how that history, mission, and culture shape the program's pedagogy and development.

- Programs that exist within a larger educational institution must also describe the history and mission of the institution and how that shapes or influences the program.
- The program must also describe the relationship between the program, the administrative unit that supports it (e.g., school or college) and the institution. This includes an explanation of the program's benefits to the institutional setting, how the institution benefits from the program, any unique synergies, events, or activities occurring as a result.

I.1.2 Learning Culture: The program must demonstrate that it provides a positive and respectful learning environment that encourages optimism, respect, sharing, engagement, and innovation between and among the members of its faculty, student body, administration, and staff in all learning environments both traditional and non-traditional.

- The program must have adopted a written studio culture policy[3] that also includes a plan for its implementation, including dissemination to all members of the learning community, regular evaluation, and continuous improvement or revision. In addition to the matters identified above, the plan must address the values of time management, general health and well-being, work-life balance, and professional conduct.
- The program must describe the ways in which students and faculty are encouraged to learn both inside and outside the classroom through individual and collective learning opportunities that include, but are not limited to field trips, participation in professional societies and organizations, honor societies, and other program-specific or campus-wide activities.

I.1.3 Social Equity: The program must have a policy on diversity and inclusion that is communicated to current and prospective faculty, students, and staff and that is reflected in the distribution of the program's human, physical, and financial resources.

- The program must describe its plan for maintaining or increasing the diversity of its faculty, staff, and students as compared with the diversity of the faculty, staff, and students of the institution during the next two accreditation cycles.
- The program must document that institutional, college or program-level policies are in place to further Equal Employment Opportunity/Affirmative Action (EEO/AA), as well as any other diversity initiatives at the program, college or institutional-level.

[3] For additional information on the development and assessment of studio culture, see *Toward an Evolution of Studio Culture*, published by the American Institute of Architecture Students, 2008.

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I.1.4 the Five Perspectives: The program must describe how it is responsive to the following perspectives. Each program is expected to address these perspectives consistently and to further identify, as part of its long-range planning activities, how these perspectives will continue to be addressed in the future.

A. **Leadership and Collaboration**. The program must describe its culture for instilling, developing and promoting leadership and collaboration across diverse groups and stakeholders. This includes a description of how students are being prepared to: nurture a climate of civic engagement, including a commitment to professional and public service and leadership; live and work in a global world where diversity, distinctiveness, self-worth and dignity are nurtured and respected; understand diverse and collaborative roles and responsibilities of related disciplines; understand pressing environmental, social, and economic challenges and their impact on architects; and, emerge as leaders in the academic and professional setting.

B. **University Context**. The program must describe its active role within its academic context and university community. This includes how the program as a unit and/or individual faculty members participate in university-wide initiatives and the university's academic plan. This also includes how the program as a unit and/or individual faculty members develop multi-disciplinary relationships and leverage opportunities that are uniquely defined within the university and its local context in the surrounding community.

C. **Career Development**. The program must describe its approach for educating students on the breadth of professional opportunity and alternative career paths for architectural graduates in both traditional and non-traditional settings. For a traditional setting this includes how students are prepared for the transition to internship and licensure; with an understanding of the requirements for registration in the jurisdiction in which the program is located; and with the information needed to enroll in the Intern Development Program (IDP). For a non-traditional setting this includes students' understanding of alternative roles for architects in the building industry (e.g., developer, owners' representative, program manager, or civic leader).

D. **Stewardship of the Environment**. The program must describe its approach for developing young professionals who are prepared to both understand and take responsibility for stewardship of the environmental and natural resources that are often compromised by the act of building and settlement. This includes not only individual courses that develop an understanding of climate, geography and other natural characteristics and phenomena, but also the laws and practices governing architects and the built environment as well as the ethos of sustainable practices.

E. **Community and Social Responsibility**. The program must describe its approach to developing young professionals who are prepared to be active, engaged citizens able to understand what it means to be a responsible member of society and to act on that understanding. This includes the responsibility to act ethically, to communicate honestly and with integrity, to treat all persons with dignity and respect, and to nurture a commitment to professional and public service.

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I.1.5 Long-Range Planning: The program must demonstrate that it has identified multi-year objectives for continuous improvement. In addition, the program must demonstrate that data is collected routinely and from multiple sources to identify patterns and trends so as to inform its future planning and strategic decision-making.

I.1.6 Program Self-Assessment Procedures: The program must demonstrate that it regularly assesses the following:

- How well the program is progressing towards its mission and stated objectives.
- Progress against its defined multi-year objectives.
- Progress in addressing deficiencies and causes of concern identified at the time of the last visit.
- Identifies strengths, challenges and opportunities faced by the program while continuously improving learning opportunities.
- The program must also demonstrate that results of self-assessments are regularly used to advise and encourage changes and adjustments to promote student success.

I.1.7 Self-Assessment and Curricular Development: The program must demonstrate a well-reasoned process for curricular assessment and adjustments and must identify the roles and responsibilities of the personnel and committees involved in setting curricular agendas and initiatives including the curriculum committee, program coordinators, and department chairs or directors.

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PART ONE (I): SECTION 2 – RESOURCES

I.2.1 Human Resources & Human Resource Development:

The program must demonstrate that it has appropriate human resources to support student learning and achievement. This includes full and part-time instructional faculty, administrative leadership, and technical, administrative, and other support staff.

- The program must demonstrate that it balances the workloads of all faculty to support a tutorial exchange between the student and teacher that promotes student achievement
- The program must demonstrate that an IDP Educator Coordinator has been appointed, is trained in the issues of IDP, has regular communication with students, is fulfilling the requirements as outlined in the IDP Educator Coordinator position description and, regularly attends IDP Coordinator training and development programs.
- The program must demonstrate that faculty and staff have opportunities to pursue professional development that contributes to program improvement.
- The program must describe the support services available to students in the program, including but not limited to academic and personal advising, career guidance, and internship or job placement.

I.2.2 Physical Resources: If the program's pedagogy requires physical resources, then the program must demonstrate that it provides adequate physical resources that promote student learning and achievement consistent with that pedagogy.

Adequate physical resources include, but are not limited to the following:

- Space to support and encourage studio-based learning.
- Space to support and encourage didactic and interactive learning.
- Space to support and encourage the full range of faculty roles and responsibilities including preparation for teaching, research, mentoring, and student advising.

If online course delivery is employed, then the program must describe what changes, if any, this makes to space and physical resource requirements.

I.2.3 Financial Resources: The program must demonstrate that it has appropriate financial resources to support student learning and achievement.

I.2.4 Information Resources: The program must demonstrate that all students, faculty, and staff have convenient, equitable access to literature, information, visual, and digital resources that support professional education in the field of architecture.

Further, the program must demonstrate that all students, faculty, and staff have access to architecture librarians and visual resources professionals who provide information services that teach and develop the research, evaluative, and critical thinking skills necessary for professional practice and lifelong learning.

I.2.5 Administrative Structure & Governance:

- **Administrative Structure:** The program must describe its administrative structure within the context of the institution.

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- **Governance**: The program must describe the role of faculty, staff, and students in both program and institutional governance structures and the relationship of these structures to the governance structures of the academic unit and the institution.

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CONDITIONS FOR ACCREDITATION

PART TWO (II): EDUCATIONAL OUTCOMES AND CURRICULUM

This part has four sections that address the following:

- **STUDENT PERFORMANCE**. This section includes the Student Performance Criteria (SPC). Programs must demonstrate that graduates are learning at the level of achievement defined for each of the SPC listed in this part. Compliance will be evaluated through the review of student work
- **CURRICULAR FRAMEWORK**. This section addresses the program and institution relative to regional accreditation, degree nomenclature, credit hour requirements, general education and access to optional studies.
- **EVALUATION OF PREPARATORY EDUCATION**. The NAAB recognizes that students entering an accredited program from a preprofessional program and those entering an accredited program from a non-preprofessional degree program have different needs, aptitudes and knowledge bases. In this section, programs will be required to demonstrate the process by which incoming students are evaluated and to document that the SPC expected to have been met in educational experiences in non-accredited programs have indeed been met.
- **PUBLIC INFORMATION**. The NAAB expects accredited degree programs to provide information to the public regarding accreditation activities and the relationship between the program and the NAAB, admissions and advising, and career information, as well as accurate public information concerning the accredited and non-accredited architecture programs.

Programs demonstrate their compliance with Part Two in four ways:

- A narrative report that briefly responds to each request to “describe, document, or demonstrate.”
- A review of evidence and artifacts by the visiting team, as well as through interviews and observations conducted during the visit.
- A review of student work that demonstrates student achievement of the SPC at the required level of learning.
- A review of websites, links, and other materials.

For instructions on how this material is to be presented in the APR and during the visit, see *NAAB Procedures for Accreditation* and the *NAAB Guide to the 2014 Conditions for Accreditation and Preparation of Architecture Program Reports.*

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PART TWO (II): SECTION 1 – STUDENT PERFORMANCE -- EDUCATIONAL REALMS & STUDENT PERFORMANCE CRITERIA

The accredited degree program must demonstrate that each graduate possesses the knowledge and skills defined by the criteria below. The knowledge and skills defined here represent those required to move to the next stage in career development including internship.

The program must provide student work as evidence that its graduates have satisfied each criterion.

The criteria encompass two levels of accomplishment[4]:

- ***Understanding***—The capacity to classify, compare, summarize, explain and/or interpret information.
- ***Ability—***Proficiency in using specific information to accomplish a task, correctly selecting the appropriate information, and accurately applying it to the solution of a specific problem, while also distinguishing the effects of its implementation.

II.1.1 Student Performance Criteria (SPC): The NAAB establishes SPC to help accredited degree programs prepare students for the profession while encouraging educational practices suited to the individual degree program. The SPC are organized into realms to more easily understand the relationships between individual criteria.

Realm A: Critical Thinking and Representation: Graduates from NAAB-accredited programs must be able to build abstract relationships and understand the impact of ideas based on the research and analysis of multiple theoretical, social, political, economic, cultural and environmental contexts. This includes using a diverse range of media to think about and convey architectural ideas including writing, investigative skills, speaking, drawing and model making.

Student learning aspirations for this realm include:

- Being broadly educated.
- Valuing lifelong inquisitiveness.
- Communicating graphically in a range of media.
- Assessing evidence.
- Comprehending people, place, and context.
- Recognizing the disparate needs of client, community, and society.

A.1 Professional Communication Skills: *Ability* to write and speak effectively and use appropriate representational media with peers and with the general public.

A.2 Design Thinking Skills: *Ability to* raise clear and precise questions, use abstract ideas to interpret information, consider diverse points of view, reach well-reasoned conclusions, and test alternative outcomes against relevant criteria and standards.

[4] See also *Taxonomy for Learning, Teaching and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. L.W. Anderson & D.R. Krathwold, Eds. (New York; Longman 2001).

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A.3 Investigative Skills and Applied Research: *Ability to* gather, assess, record, and comparatively evaluate relevant information and performance in order to support conclusions related to a specific project or assignment.

A.4 Architectural Design Skills: *Ability to* effectively use basic formal, organizational and environmental principles and the capacity of each to inform two- and three-dimensional design.

A.5 Use of Precedents: *Ability* to examine and comprehend the fundamental principles present in relevant precedents and to make informed choices regarding the incorporation of such principles into architecture and urban design projects.

A.6 Historical Traditions and Global Culture: *Understanding* of parallel and divergent canons and traditions of architecture, landscape and urban design including examples of indigenous, vernacular, local, regional, national settings from the Eastern, Western, Northern, and Southern hemispheres in terms of their climatic, ecological, technological, socioeconomic, public health, and cultural factors.

A.7 Cultural Diversity*: Understanding* of the diverse needs, values, behavioral norms, physical abilities, and social and spatial patterns that characterize different cultures and individuals and the implication of this diversity on the societal roles and responsibilities of architects.

Realm B: Integrated Building Practices, Technical Skills and Knowledge: Graduates from NAAB-accredited programs must be able to comprehend the technical aspects of design, systems and materials, and be able to apply that comprehension to architectural solutions. Additionally the impact of such decisions on the environment must be well considered.

Student learning aspirations for this realm include:

- Creating building designs with well-integrated systems.
- Comprehending constructability.
- Integrating the principles of environmental stewardship.
- Conveying technical information accurately

B.1 Pre-Design: *Ability* to prepare a comprehensive program for an architectural project, which must include an assessment of client and user needs, an inventory of space requirements, an analysis of site conditions (including existing buildings), a review of the relevant laws and standards, including relevant sustainability requirements, and assessment of their implications for the project, and a definition of site selection and design assessment criteria.

B.2 Accessibility: *Ability* to design sites, facilities, and systems consistent with the Americans with Disabilities Act (ADA) standards or other appropriate jurisdictional requirements such as those of the American National Standards Institute (ANSI).

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B.3 Site Design: *Ability* to respond to site characteristics including zoning, soil, topography, vegetation, and watershed in the development of a project design.

B.4 Life Safety: *Ability* to apply the basic principles of life-safety systems with an emphasis on egress.

B.5 Technical Documentation: *Ability* to make technically clear drawings, write outline specifications, and prepare models illustrating and identifying the assembly of materials, systems, and components appropriate for a building design.

B.6 Environmental Systems: *Understanding* the principles of environmental systems' design, which must include active and passive heating and cooling, indoor air quality, solar orientation, daylighting and artificial illumination, and acoustics; and an understanding of performance assessment tools.

B.7 Structural Systems: *Understanding* of the basic principles of structural behavior in withstanding gravity and lateral forces and the evolution, range, and appropriate application of contemporary structural systems.

B.8 Building Envelope Systems and Assemblies: *Understanding* of the basic principles involved in the appropriate selection and application of building envelope systems and associated assemblies relative to fundamental performance, aesthetics, moisture transfer, durability, and energy and material resources.

B.9 Building Service Systems: *Understanding* of the basic principles and appropriate application and performance of building service systems such as plumbing, electrical, vertical transportation, security, and fire protection systems.

B.10 Financial Considerations: *Understanding* of the fundamentals of building costs, which must include project financing methods and feasibility, construction estimating, operational costs, and life-cycle costs.

Realm C: Professional Practice. Graduates from NAAB-accredited programs must understand business principles for the practice of architecture, including management, advocacy, and acting legally, ethically and critically for the good of the client, society and the public.

Student learning aspirations for this realm include:

- Comprehending the business of building.
- Collaborating and negotiating with clients and consultants in the design process.
- Discerning the diverse roles of architects and those in related disciplines.
- Understanding a professional code of ethics, as well as legal and professional responsibilities.

C.1 Stakeholder Roles In Architecture: *Understanding* of the relationship between the client, contractor, architect and other key stakeholders such as user groups and the community, in the design of the built environment,

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and the responsibilities of the architect to reconcile the needs of those stakeholders

C.2 Project Management: *Understanding* of the methods for selecting consultants and assembling teams, identifying work plans, project schedules and time requirements, and recommending project delivery methods.

C.3 Business of Architecture: *Understanding* of the basic principles of business within the architectural practice such as financial management and business planning, marketing, negotiation, risk management, human resources, practice typologies, firm culture, mediation and arbitration, and entrepreneurialism.

C.4 Non-traditional Forms of Practice: *Understanding* that the architect's capacity for collaboration, specialized architectural knowledge and business acumen can lead to diverse forms of practice and specialization.

C.5 Legal Responsibilities: *Understanding* the architect's responsibility to the public and the client as determined by registration law, building codes and regulations, professional service contracts, environmental regulation, and historic preservation and accessibility laws.

C.6 Professional Ethics: *Understanding* of the ethical issues involved in the formation of professional judgment regarding social, political and cultural issues in architectural design and practice; also includes an understanding of the role of the AIA Code of Ethics in defining professional conduct.

Realm D: Integrated Architectural Solutions: Graduates from NAAB-accredited programs must be able to synthesize a wide range of variables into an integrated design solution. This realm demonstrates the integrative thinking that shapes complex design and technical solutions.

Student learning aspirations in this realm include:

- Synthesizing variables from diverse and complex systems into an integrated architectural solution.
- Rationalizing environmental stewardship goals across multiple systems for an integrated solution.
- Evaluating options and reconciling the implications of design decisions across systems and scales.

D.1 Integrative Design: *Ability* to produce an architectural solution that demonstrates the ability to make design decisions about a single project while demonstrating broad integration and consideration of environmental stewardship, technical documentation, accessibility, site conditions, life safety, environmental systems, structural systems, and building envelope systems and assemblies.

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PART TWO (II): SECTION 2 – CURRICULAR FRAMEWORK

II.2.1 Regional Accreditation:

In order for a professional degree program in architecture to be accredited by the NAAB, the institution must meet one of the following criteria:

1. The institution offering the accredited degree program is or is part of an institution accredited by one of the following U.S. regional institutional accrediting agencies for higher education: the Southern Association of Colleges and Schools (SACS); the Middle States Association of Colleges and Schools (MSACS); the New England Association of Schools and Colleges (NEASC); the North Central Association of Colleges and Schools (NCACS); the Northwest Commission on Colleges and Universities (NWCCU); and the Western Association of Schools and Colleges (WASC);
2. Institutions that are not accredited by a U.S. regional accrediting agency, may request NAAB accreditation of a professional degree program in architecture only with explicit permission from all applicable national education authorities in that program's country or region. Any institution in this category that is interested in seeking NAAB accreditation of a professional degree program must contact the NAAB for additional information.

II.2.2 Professional Degrees and Curriculum: The NAAB accredits the following professional degree programs: the Bachelor of Architecture (B. Arch.), the Master of Architecture (M. Arch.), and the Doctor of Architecture (D. Arch.). The curricular requirements for awarding these degrees must include professional studies, general studies, and optional studies.

Institutions offering the degrees B. Arch., M. Arch., and/or D. Arch. are required to use these degree titles exclusively with NAAB-accredited professional degree programs.

Any institution that also uses the degree title B. Arch., M. Arch, or D. Arch. for a non-accredited post-professional degree program must initiate the appropriate institutional processes for changing the titles of such degree programs by June 30, 2018.

The number of credit hours for each degree is specified below. Every accredited program must conform to the following minimum credit hour requirements.

- **Bachelor of Architecture.** Accredited degree programs awarding the B. Arch. degree must require a minimum of 150 semester credit hours or the quarter-hour equivalent[5], in academic coursework in general studies, professional studies, and optional studies; all of which are delivered by the same institution.
- **Master of Architecture.** Accredited degree programs awarding the M. Arch. degree may take three forms:
    - Non-baccalaureate (NB): These are awarded by the institution after completing at least 168 semester credit hours, or the quarter hour equivalent, of which at least 30 are taken at the graduate level; all of which are delivered by the same institution. No baccalaureate degree is awarded

[5] Programs that operate on the quarter system must multiply these totals by 1.5 to identify the approximate minimum credit requirements for their programs.

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prior to completion of the NAAB-accredited program nor is one required for admission. Coursework must include general studies, professional studies, and optional studies.

- Preprofessional-plus: These are awarded by the institution after completing at least 168 semester credit hours, or the quarter hour equivalent, of which at least 30 are taken at the graduate level and require that students have earned a preprofessional degree[6] in architecture or a related field prior to admission. The graduate-level, academic coursework must include professional studies and optional studies.
- Nonpreprofessional degree-plus: These are awarded by the institution after completing at least 168 semester credit hours, or the quarter hour equivalent, of which at least 30 are taken at the graduate level and require that students have earned an undergraduate degree from a regionally accredited institution prior to admission. The graduate-level, academic coursework must include professional studies and optional studies.

- **Doctor of Architecture.** Accredited degree programs awarding the D. Arch. degree must require an undergraduate baccalaureate degree (minimum of 120 undergraduate semester credit hours or the undergraduate-level quarter-hour equivalent) for admission. Further, the D. Arch. must require a minimum of 90 graduate-level semester credit hours; or the graduate-level quarter-hour equivalent, in academic coursework in professional studies and optional studies.

General studies, professional studies, and optional studies are defined as follows:

- **General Studies.** Courses offered in the following subjects: communications, history, humanities, social sciences, natural sciences, foreign languages, and mathematics, either as an admission requirement or as part of the curriculum. Architectural courses cannot be used to meet the NAAB general studies requirement. These courses must be offered outside the academic unit that offers the NAAB-accredited degree and have no architectural content. In many cases, this requirement can be satisfied by the general education program of an institution's baccalaureate degree.
- **Professional Studies.** Courses with architectural content required of all students in the NAAB-accredited program. These are considered the core of a professional degree program. Student work from these courses is expected to satisfy the NAAB SPC (Condition II.1). The degree program has the flexibility to require additional professional studies courses to address its mission or institutional context. Further, the program may choose to provide co-curricular or extra-curricular learning opportunities to supplement or complement required coursework.
- **Optional Studies (Curricular Flexibility)**. All professional degree programs must provide sufficient flexibility in the curriculum in order to allow students to pursue their special interests either by taking additional courses offered in other academic units or

[6] Preprofessional architecture degree: The term refers to architecturally-focused four-year, undergraduate degrees that are not accredited by the NAAB. These degrees have such titles as B.S. in Architecture, B.S. in Architectural Studies, B.A. in Architecture, Bachelor of Environmental Design, Bachelor of Architectural Studies, etc. The amount of work in architecture in these programs may vary from institution to institution and may determine the length of time required to complete the NAAB-accredited program.

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departments, or courses offered within the department offering the accredited program, but outside the professional studies curriculum.

Table 1. Credit distribution for NAAB-accredited degrees

NOTE: This table lists semester-credit requirements. Programs that operate on the quarter system must multiply these totals by 1.5 to identify the minimum credit requirements for their programs.

Minimum requirements	**B. Arch.**	**M. Arch. (NB)**	**M. Arch. (Preprofessional plus)**	**M. Arch (Non-preprofessional plus)**	**D. Arch.**
General (non-architecture studies)	45 credits	45 credits	Defined by baccalaureate degree required for admission	Defined by baccalaureate degree required for admission	Defined by baccalaureate degree required for admission
Professional Studies [min.]	90-95 credits	103-113 credits	103-113 credits (incl. undergrad. study)	103-113 credits (incl. undergrad. study)	75-80 credits (graduate study **only**)
Optional Studies [min]	10-15 credits	10-15 credits	10-15 credits	10-15 credits	10-15 credits
Undergraduate credits [min]	150 credits	120-138 credits	120-138 credits	120-138 credits	120 credits
Graduate credits [min]	0 credits	30 credits	30 credits	30 credits	90 credits
Total credits [min]	150	168	168	168	210

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PART TWO (II): SECTION 3 – EVALUATION OF PREPARATORY EDUCATION

The program must demonstrate that it has a thorough and equitable process to evaluate the preparatory or preprofessional education of individuals admitted to the NAAB-accredited degree program.

- Programs must document their processes for evaluating a student's prior academic coursework related to NAAB Conditions when a student is admitted to the professional degree program
- In the event a program relies on the preparatory educational experience to ensure that admitted students have met certain SPC, the program must demonstrate it has established standards for ensuring these SPC are met and for determining whether any gaps exist.
- The program must demonstrate that the evaluation is clearly articulated in the admissions process, and that the process can be understood by a candidate prior to accepting the offer of admission. See also, Condition II.4.6.

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PART TWO (II): SECTION 4 – PUBLIC INFORMATION

The NAAB expects programs to be transparent and accountable in the information provided to students, faculty, and the general public. As a result, the following seven conditions require all NAAB-accredited programs to make certain information publicly available either online or on request.

II.4.1 Statement on NAAB-Accredited Degrees

All institutions offering a NAAB-accredited degree program or any candidacy program must include the *exact language* found in the *NAAB Conditions for Accreditation*, Appendix 1 in catalogs and promotional media.

II.4.2 Access to NAAB Conditions and Procedures

The program must make the following documents electronically available to all students, faculty and the public:

The 2014 NAAB Conditions for Accreditation

The Conditions for Accreditation in effect at the time of the last visit (2009 or 2004 depending on the date of the last visit)

The NAAB Procedures for Accreditation (edition currently in effect)

II.4.3 Access to Career Development Information

In order to assist students and others as they seek to develop an understanding of the larger context for architecture education and the career pathways available to graduates of accredited degree programs, the program must make the following resources available to all students, staff, faculty, and the public:

IDP Guidelines

Certification Guidelines

II.4.4 Public Access to APRs and VTRs

In order to promote transparency in the process of accreditation in architecture education, the program is required to make the following documents electronically available to the public:

All Interim Progress Reports (and narrative, Annual Reports submitted 2009-2012)

All NAAB responses to Interim Progress Reports (and NAAB Responses to narrative Annual Reports submitted 2009-2012)

The most recent decision letter from the NAAB

The most recent *APR*[7]

The final edition of the most recent *Visiting Team Report*, including attachments and addenda

II.4.5 ARE Pass Rates

NCARB publishes pass rates for each section of the Architect Registration Examination by

[7] This is understood to be the APR from the previous visit, not the APR for the visit currently in process.

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institution. This information is considered useful to prospective students as part of their planning for higher/post-secondary education. Therefore, programs are required to make this information available to current and prospective students and the public by linking their website to the results.

II.4.6. Admissions and Advising

The program must publicly document all policies and procedures that govern how applicants to the accredited program are evaluated for admission. These procedures must include first-time, first-year students as well as transfers within and outside the institution.

This documentation must include the following:

- Application forms and instructions
- Admissions requirements, admissions decisions procedures, including policies and processes for evaluation of transcripts and portfolios (where required), and decisions regarding remediation, and advanced standing
- Requirements and forms for applying for financial aid and scholarships
- Student diversity initiatives.

II.4.7 Student Financial Information

- The program must demonstrate that students have access to information and advice for making decisions regarding financial aid.
- The program must demonstrate that students have access to an initial estimate for all fees and materials required during the full course of study for completing the NAAB-accredited degree program.

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CONDITIONS FOR ACCREDITATION

PART THREE (III): – ANNUAL AND INTERIM REPORTS

III.1 Annual Statistical Reports: The program is required to submit annual statistical reports in the format required by the *NAAB Procedures*.

The program must certify that all statistical data it submits to NAAB has been verified by the institution and is consistent with institutional reports to national and regional agencies, including the Integrated Postsecondary Education Data System of the National Center for Education Statistics.

III.2 Interim Progress Reports. The program must submit interim progress reports to the NAAB (See Section 11, *NAAB Procedures for Accreditation,* 2012 Edition, Amended*).*

First Draft

LIST OF APPENDICES

Appendix 1 Statement on NAAB-Accredited Degrees -- Required Texts for Catalogs and Promotional Material

Appendix 2 Glossary

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Appendix 1: Required Text for Catalogs and Promotional Materials

The following statement must be included, in its entirety, in the catalogs and promotional materials of all accredited programs and candidate programs.

> "In the United States, most registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit professional degree programs in architecture offered by institutions with U.S. regional accreditation, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture, and the Doctor of Architecture. A program may be granted an eight-year, three-year, or two-year term of accreditation, depending on the extent of its conformance with established educational standards.
>
> "Doctor of Architecture and Master of Architecture degree programs may require a preprofessional undergraduate degree in architecture for admission. However, the preprofessional degree is not, by itself, recognized as an accredited degree."

This text is to be followed by the following information about each NAAB-accredited program:

[Name of university, name of academic unit] offers the following NAAB-accredited degree program(s) (If an institution offers more than one track for an M.Arch or D.Arch. based on the type of undergraduate/preparatory education required, please list all tracks separately):

[Name of degree] (Prerequisite + total number of credits required)

In addition, the program is required to publish the year of the next accreditation visit for each accredited program. A sample follows:

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SAMPLE TEXT FOR ACCREDITED PROGRAMS:

In the United States, most registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit professional degree programs in architecture offered by institutions with U.S. regional accreditation, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture, and the Doctor of Architecture. A program may be granted an eight-year, three-year, or two-year term of accreditation, depending on the extent of its conformance with established educational standards.

Doctor of Architecture and Master of Architecture degree programs may require a preprofessional undergraduate degree in architecture for admission. However, the preprofessional degree is not, by itself, recognized as an accredited degree.

Any University, College of Art and Design, Department of Architecture offers the following NAAB-accredited degree programs:

B. Arch. (150 undergraduate credits)

M. Arch. (preprofessional degree + 42 graduate credits)

M. Arch. (non-preprofessional degree + 63 credits)

Next accreditation visit for all programs: 2017

In addition to the previous text, all programs that have been granted candidacy status must include the following in its entirety:

> "The NAAB grants candidacy status to new programs that have developed viable plans for achieving initial accreditation. Candidacy status indicates that a program expects to achieve initial accreditation within six years of achieving candidacy, if its plan is properly implemented. In order to meet the education requirement set forth by the National Council of Architectural Registration Boards, an applicant for an NCARB Certificate must hold a professional degree in architecture from a program accredited by the NAAB; the degree must have been awarded not more than two years prior to initial accreditation."

This text is to be followed by the following information about each candidate program:

> [Name of university, name of academic unit] was granted candidacy status for the following professional degree program(s) in architecture:
>
> [Name of degree] (Prerequisite + total number of credits required) – Year candidacy was awarded, the year and purpose of the next visit and projected year of initial accreditation.

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A sample follows:

SAMPLE TEXT FOR CANDIDATE PROGRAMS

In the United States, most registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit professional degree programs in architecture offered by institutions with U.S. regional accreditation, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture, and the Doctor of Architecture. A program may be granted an eight-year, three-year, or two-year term of accreditation, depending on the extent of its conformance with established educational standards.

Doctor of Architecture and Master of Architecture degree programs may require a preprofessional undergraduate degree in architecture for admission. However, the preprofessional degree is not, by itself, recognized as an accredited degree.

The NAAB grants candidacy status to new programs that have developed viable plans for achieving initial accreditation. Candidacy status indicates that a program expects to achieve initial accreditation within six years of achieving candidacy, if its plan is properly implemented. In order to meet the education requirement set forth by the National Council of Architectural Registration Boards, an applicant for an NCARB Certificate must hold a professional degree in architecture from a program accredited by the NAAB; the degree must have been awarded not more than two years prior to initial accreditation. However, meeting the education requirement for the NCARB Certificate may not be equivalent to meeting the education requirement for registration in a specific jurisdiction. Please contact NCARB for more information.

Anyplace University, School of Architecture and Landscape Architecture was granted candidacy for the following professional degree program in architecture:

M. Arch. (preprofessional degree + 45 graduate credits) – 2014.

Next visit for continuation of candidacy: 2016

Projected year of initial accreditation: 2020

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Appendix 2. Glossary.

ACSA	Association of Collegiate Schools of Architecture
Access	The program must show that students, faculty or staff, have the ability to obtain or make use of something
AIA	The American Institute of Architects
AIAS	The American Institute of Architecture Students
APR	Architecture Program Report
APR-IC	Architecture Program Report for Initial Candidacy
APR-IA	Architecture Program Report for Initial Accreditation
ARE	Architect Registration Examination
Demonstrate	Illustrate and explain especially with many examples
Describe	The program must give an account of activity or set of processes in written form
Document	The program must convey evidence or proof through writing and then provide supporting materials or documentation of activity or policies
IDP	Intern Development Program
Must	Sets a minimum requirement; sets what is mandatory
NAAB	National Architectural Accrediting Board
NCARB	National Council of Architectural Registration Boards

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NVTM	Non-voting team member
Shall	Sets a minimum requirement; sets what is mandatory
VTR	Visiting Team Report
VTR-IC	Visiting Team Report for Initial Candidacy
VTR-IA	Visiting Team Report for Initial Accreditation

NOTE: This appendix will be continually developed and expanded during the review and approval process for the *2014 Conditions for Accreditation.*

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A Guide to the 2014 Conditions for Accreditation and Preparation of an Architecture Program Report

NAAB

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INTRODUCTION

In July 2013, the National Architectural Accrediting Board (NAAB) convened the 2013 Accreditation Review Conference (ARC13).

ARC13, which included two full days of discussion, deliberation, and creative-problem solving, produced over 50 pages of flip-chart sized notes and 300 images. These artifacts represent the distillation of over two years of study, analysis, and review by the NAAB, and other organizations in architecture.

Following the conference, NAAB began drafting the *2014 NAAB Conditions for Accreditation.* The first draft is now available for public comment at www.naab.org.

In addition, the NAAB directors agreed the 2014 Conditions should be accompanied by a companion document that addressed two matters:

1. Commentary by the writing team on the new areas or new text in the first draft.
2. Instructions to programs for writing the Architecture Program Report (APR)

The first iteration will include introductions and commentary on the preparation of the early drafts of the *2014 Conditions* and will later be revised to include instructions for preparing Architecture Program Reports (APRs).

It will be continually revised over the next eighteen months in order to serve as a set of guidelines for programs preparing for a NAAB visit using the *2014 Conditions*. In subsequent years (2016 and on) it will be revised annually based on surveys and evaluations of the visit process.

This document is not considered a part of *The Conditions for Accreditation*. It is advisory to and non-binding on the Board.

NAAB ACCREDITATION DOCUMENTS

The *2014 NAAB Conditions for Accreditation* define the standards that professional degree programs in architecture are expected to meet in order to ensure that students are prepared to move to the next steps in their careers including internship and licensure. This document was last revised in 2009; it will be revised again in 2019.

The *NAAB Procedures for Accreditation* outline the procedures that programs and visiting teams must follow in order to ensure a uniform accrediting process. This document was last revised in 2012; it will be revised again in 2015 and subsequently in two-year intervals.

The *2014 Conditions for Accreditation* apply to all programs seeking continued accreditation, candidacy, continuation of candidacy, or initial accreditation beginning April 1, 2015.

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BACKGROUND TO THE 2013 NAAB ACCREDITATION REVIEW CONFERENCE (ARC13)

What's Past is Prologue – The 2008 ARC

In 2008, the NAAB acknowledged that architecture education and practice had become more complex and therefore it was appropriate "to revise its accrediting process in response to the advice of its various constituencies."[1]

In their 2008 white papers and issue briefs, the NAAB's constituent partners were relatively consistent in much of the advice they offered. For example, nearly all the papers submitted by the collateral organizations, as well as those prepared by the NAAB's own task groups, included the following recommendations:

- Include a specific and comprehensive commitment to environmental sustainability in the Student Performance Criteria (SPC).
- Prepare graduates for global practice through cross-cultural and cross-curricular experiences in other disciplines.
- Prepare graduates who are able to practice ethically and professionally with an understanding of the centrality of the client to their work.
- Include a specific and measurable commitment to increasing the diversity of student and faculty populations in accredited programs relative to gender, race/ethnicity, age, religion, sexual orientation, and physical ability.
- Strengthen the connection between planning and self-assessment by programs and demonstrate a commitment to continuous improvement.

As the NAAB directors reviewed these outcomes, as well as the Board's own practices and procedures, several things became clear.

- The Board agreed that the *2004 Conditions for Accreditation* (13 conditions, including SPC), generally speaking, contained all the critical requirements and expectations for a professional degree in architecture. However, within several of conditions 1-12, expectations for student learning or achievement were embedded with expectations for institutional commitment or assessment.
- Next, as a matter of practice, the *Architecture Program Reports* (APRs), and the visits tended to treat all conditions as equal, and deserving of a "Met/Not-Met" designation, when, in reality, certain parts of the *2004 Conditions* could not be assessed in this way. Likewise all SPC were treated as equal when in practice some were "more equal than others." Thus, the NAAB Board agreed it was not only appropriate to revise the content of SPC to be relevant in light of current practice and professional concerns, but also to group both conditions and SPC in a way that reflected their relationships to one another and their relative importance overall.
- Finally, the Board agreed that it was time to implement processes for internal and external assessment and review of the NAAB itself both in terms of the

[1] *1998 Conditions and Procedures for Professional Degree Programs in Architecture*. National Architectural Accrediting Board. p. 3

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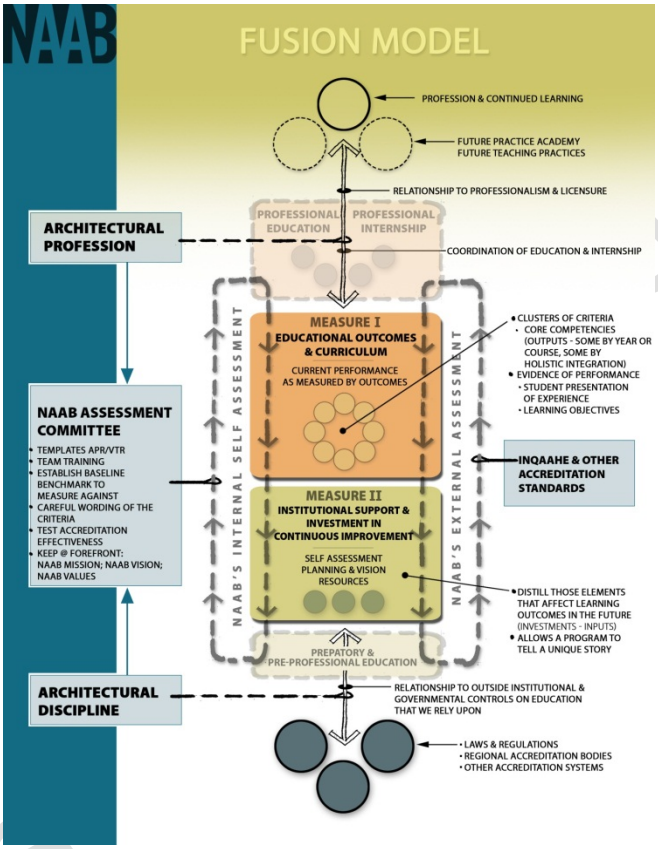
effectiveness of its procedures and its compliance with best practices as defined by independent organizations. Today, this effort is led by the NAAB's Assessment and Evaluation Committee.

In developing the model that drove development of the *2009 Conditions,* the Board was able to address all of these matters:

The result of the process in 2008 was described as the Fusion Model:



The *2009 Conditions for Accreditation*, while based initially on the 2008 Fusion Model, were ultimately a combination of input from collateral organizations, individual comments, and the findings of the 2008 Architectural Review Conference (ARC).

In many regards, the basic purposes of the *1998* and *2004 Conditions for Accreditation* were sustained in the *2009 Conditions for Accreditation.* Likewise, the central attributes of voluntary accreditation remained and the core elements of the NAAB's process persisted:

- Programs are required to document their compliance with the conditions through a comprehensive, self-analytical report.
- A team visits the program to confirm the results of the report and to document additional compliance through the review of student work, institutional policies, interviews, and other records.
- The final decision is made by the NAAB directors.

In addition to *The NAAB 2009 Conditions for Accreditation,* the 2008 process also gave the NAAB the opportunity for the following:

- Major procedural review and overhaul (continuous since 2008).
- Significant revisions to team training protocols (continuous since 2009).
- Investment in technology for visit management (initiated in 2010).
- The Assessment and Evaluation Committee (established in 2009).
    - Internal evaluation (visit practices, board self-evaluation).
    - ARC13 preparation
        - NAAB Study of Accredited Architectural Education
        - NAAB-commissioned studies
        - NAAB director reviews
    - External evaluation of NAAB processes (Canberra Accord).

2010-2013: A Process for Preparing

Beginning in 2010, the NAAB's Assessment and Evaluation (A&E) Committee focused on preparation for ARC13. In addition to setting the timeline for preparation, the committee also oversaw the completion of *The NAAB Study of Accredited Architectural Education*. This study represented one of the first NAAB-directed efforts to prepare a baseline of information and analysis for ARC13. The purpose of the study was to set a foundation against which the NAAB could evaluate the proposals and recommendations of other organizations and individuals.

The NAAB retained McKinley Advisors to conduct the study and to complete the final report. McKinley is a DC-based consulting firm specializing in research, consulting and outsourced services for associations and other non-profits.

The study began in August 2010 with interviews of the NAAB directors. The second stage of research consisted of eight focus groups conducted at various meetings of the collateral organizations during late 2010 and early 2011.

The final stage consisted of an electronic survey designed to capture feedback on the changing field of architecture, the future of accredited architecture education, and the impact of past changes to the NAAB *Conditions for Accreditation* on architecture education. The survey was developed based on the findings collected during the prior stages; it combined quantitative questions with open-ended, essay-style queries to provide a comprehensive look at architecture education.

The final report was released on May 1, 2012 and can be downloaded from www.naab.org.

The A&E Committee also identified additional areas of study:

- Analyzing data collected in the NAAB's Annual Report Submission System (ARS) to identify trends in enrollment, graduation rates, finances, and faculty.
- Analyzing the following trends in higher education: funding models, collaboration with community colleges, online education, student learning assessment, and changes in faculty work life.

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- Considering the implications for the use of co-curricular activity to meet certain SPC.
- Reviewing the objectives for the SPC for comprehensive design.
- Considering the effect of changes in access to higher education on demographic diversity in architecture programs.
- Studying how other specialized accrediting agencies or organizations in higher education define and assess collaboration.

Concurrent with the NAAB's effort, the American Institute of Architects (AIA), the National Council of Architectural Registration Boards (NCARB), the Association of Collegiate Schools of Architecture (ACSA), and the American Institute of Architecture Students (AIAS) began their own efforts to analyze the issues and to prepare white papers in advance of the conference. All materials: white papers, letters, proposals, and recommendations from all sources were due to the NAAB on January 31, 2013.

On that date, the NAAB had in its library of materials: four organizational position statements, five NAAB-commissioned reviews, four NAAB-director reviews; and six additional contributions from other organizations and individuals. This represented the largest collection of material ever assembled for an ARC.

The ARC13 Task Force

On September 30, 2012, the NAAB named the 2013 ARC Task Force. These nine individuals, seven directors, the immediate past president, and the executive director were responsible for analyzing and synthesizing material sent to the NAAB, as well as leading the conference itself.

The task force completed its work in June 2013. This included developing a framework paper that identified the following:

- Areas of common ground.
- Areas that would be addressed in the first draft of the next edition of *The Conditions.*
- Areas that would be discussed at ARC13.
- Procedural matters that would be addressed during the next revision of *The Procedures*, scheduled for 2015.

The task force also developed the agenda for the conference itself. Both documents were released along with a list of preconference reading on June 15 are available on the NAAB website.

Analysis and Synthesis

First and foremost, both the quantity and the quality of the submissions from collateral organizations, related professional organizations, and interested individuals far exceeded that of the materials submitted in 2008. The NAAB had a vastly broader and better researched library of proposals, commentary, and recommendations from which to work in preparation for the 2013 ARC and subsequent development of the *2014 Conditions*.

Overall, with limited exceptions, the papers contributed for the 2013 conference affirmed that the 2008 model should stand as is. Nevertheless, the NAAB committed itself to

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approaching ARC13 and the development of the *2014 Conditions* with the following in mind:

- The NAAB will make its choices in the best interests of accreditation while keeping its vision, mission, and values in the forefront. The scope of the NAAB's decision-making cannot be constrained by real or imagined concerns over what constitutes "too much or too little change."
- As a global leader in accreditation in architecture education, it is incumbent upon the NAAB to be open to the understanding that others in the field both at home and abroad have alternative ideas about architecture education; the NAAB must embrace and engage new ideas rather than avoid them.
- The NAAB is willing to consider a review of the balance between institutional commitment to continuous improvement (Part I) and educational outcomes and curriculum (Part II) with a view toward shifting the time and attention of visiting teams toward Part II.

New/Emerging Issues That Must be Addressed in The *2014 Conditions*

Working from the materials submitted in January, the task force identified a number of significant issues that are, in many instances, related to trends affecting post-secondary education in the U.S. While only tangentially relevant to the particulars of the NAAB's system, understanding them and being responsive is critical to the NAAB's continued relevance within institutions and specialized accreditation.

- Calls to increase the rigor of the accreditation process without increasing expense (time, people, space, and money).
- Understanding the implications of shifting demographics in education. There is a large population of first-generation college students (e.g., non-English speakers), many of whom are differently-prepared for postsecondary education than their legacy classmates. With their gradual movement into post-secondary and higher education come related expectations within professional programs for teaching or developing basic skills.
- Looking at the role of community colleges in preparing students for preprofessional and professional education, particularly those individuals less-well-prepared for traditional college and university settings.
- Acknowledging the increasing use of online and distance learning delivery models, which in turn call for online and distance learning achievement/assessment models.
- There is an increasing call for colleges and universities to demonstrate the civic engagement of students in professional degree programs.
- The SPC must balance conventional and emerging visualization skills, while still using drawing as method of learning and communication.
- Calls to increase the quality of building sciences education (broadly-defined).
- Defining student learning outcomes that go beyond general education and apply directly to professional competencies (e.g., communication skills, collaborative ability and, investigative skills).

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- Calls from programs and team members to be explicit about the expectations for student achievement in comprehensive design.
- Colleges and universities are being asked to provide more public information on student debt.

THE 2013 ACCREDITATION REVIEW CONFERENCE (ARC13)

The conference took place July 18-19 at the Snowbird Resort in Utah. It was by-invitation-only and was be attended by delegations from the AIA, AIAS, ACSA, NCARB, the Canadian Architectural Certification Board-*Conseil canadien de certification en architecture* (CACB-CCCA), and the National Organization for Minority Architects, as well as the NAAB directors and directors-elect. In total, 44 people participated.

The agenda was designed to provide participants with multiple opportunities to interact with one another, to discuss and evaluate the SPC, to consider new forms of evidence of student achievement, and to consider procedural issues.

ARC13 generated nearly 50 flip-chart-sized pages of notes and graphics and over 300 images. These materials were used by the writing team to support their early conclusions and proposed language.

As the NAAB directors considered the outcomes of ARC13 during their meeting, which immediately followed the conference, they reached the following conclusions:

- The five perspectives (I.1.3.A-E) must be revised in order to
    - Remove the language that binds the perspectives to one of the five organizations in architecture.
    - Address values and core principles held in common throughout the profession and the academy relative to practice and discipline of architecture.
    - Delete both implicit and explicit student learning outcomes; those that should be preserved are moved to II.1, SPC.
- Simplify the conditions and eliminate redundancies.
- Establish a stand-alone realm for learning on comprehensive or integrative design.
- Use clear, common, unambiguous language.
- Reframe the conditions on resources (I.2), especially financial resources (I.2.4) in order to link them to student achievement or student development.
- Make bold recommendations in the first draft.
- Develop a companion document that includes advice and commentary from the NAAB, instructions to programs for preparing Architecture Program Reports, and a glossary.

As a result of the last three years' efforts and in keeping with the outcomes of ARC13, the *Conditions* have been revised. These revisions are significant in some areas, but not in others.

Further, the NAAB has identified a number of procedural changes that may streamline the process of accreditation, while still maintaining a commitment to both the NAAB's "prime

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directive" to avoid creating conditions that lead to uniformity of architecture education, and the core tenets of accreditation. These changes will be made in the next edition of the *Procedures for Accreditation*, scheduled for completion in early 2015.

The first draft of the *2014 Conditions for Accreditation* is now available for a 90-day public comment period through late November 2013. A second draft will be available in mid-February 2014, with final approval scheduled for July 2014. The first visits to be conducted using the *2014 Conditions* will take place in 2016.

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SIGNIFICANT DIFFERENCES BETWEEN THE 2009 CONDITIONS AND THE FIRST DRAFT OF THE 2014 CONDITIONS FOR ACCREDITATION

The *2014 NAAB Conditions for Accreditation – First Draft* represents the NAAB's first, best effort to synthesize the outcomes of ARC13. In doing so, the Board has agreed to propose its most dramatic changes in this draft. While a number of these revisions are modest, there are several that are significant. They are highlighted here:

- The first noticeable difference is the absence of instructions and the phase "The APR must include…" followed by a long list of documents, tables following each condition. The NAAB felt strongly that this type of material should be captured in an advisory document that could be revised annually based on best practices, surveys and visit evaluations. The Board also felt strongly that many of these instructions had calcified over time and were losing relevance in the process. By removing them, the NAAB believed programs would be given greater flexibility to respond to each condition within its own context.
- Wherever possible, the NAAB clarified whether programs "must" or "should" provide information, documentation, or other materials in support of its self-evaluation.
- Next, the NAAB carefully considered ways to re-balance institutional commitment to continuous improvement (Part I) and educational outcomes and curriculum (Part II) with a view toward shifting the time and attention of visiting teams toward Part II. To that end, the NAAB is in the process of changing the format for the Architecture Program Report (APR), instructions to teams regarding review of materials that support a program's responses to the requirements of Part I, and the format both for the visit and the Visiting Team Report (VTR). This is expected to redistribute the visit workload so that more verification and review takes place in advance of the visit, while onsite work can focus on student learning and progress since the previous visit.
- The NAAB is proposing five new perspectives. These are intended to address values and core principles held in common throughout the profession and the academy relative to practice and discipline of architecture rather than to describe the viewpoint of each collateral organization. SPC have been culled out of these five statements and either applied to specific SPC in Condition II.1 or deleted as redundant. The five "new" perspectives are:
    - Leadership and Collaboration
    - University Context
    - Career Development
    - Stewardship of the Environment
    - Community and Social Responsibility
- Condition I.3, Institutional and Program Characteristics, has been eliminated. All the material requested under Conditions I.3.1 and I.3.3 has been moved to the instructions for providing supplemental material in the APR This material will no longer be assessed as part of a visit. Instead it will be used to inform the team's review and affirmation of Condition I.2.1 Human Resources and Human Resource Development. Condition I.3.2 has been moved to a new Part III regarding the submission of annual statistical reports and interim progress reports.

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- Condition I.4 Policy Review, has been eliminated. All the material requested under this condition has been moved to the instructions for providing supplemental material in the APR. This material will no longer be assessed as part of a visit. Instead it will be used to inform the team's review of Part I.
- The NAAB is proposing to reduce the number of SPC to 24. This has been achieved by eliminating redundancies and combining SPC where appropriate. Where SPC expressed a value or core principle, they were edited into the new perspectives, as appropriate, and then deleted from II.1.
- The NAAB is proposing a fourth realm, Realm D, to address student achievement for comprehensive or integrative design. This recommendation was clearly supported by ARC13 participants.
- The NAAB has made major changes to the Condition on Professional Degrees and Curriculum (II.2.2). These are intended to accomplish several things:
    - First, to clarify what courses and content meet the definition for general studies.
    - Second, to remove the burden of remediating general studies requirements for students admitted to M. Arch. or D. Arch. programs that require an undergraduate degree for admission.
    - Finally, the NAAB has made the titles B. Arch., M. Arch. and D. Arch. exclusive to the NAAB-accredited degree.
- The first draft moves the conditions on curriculum development (II.2.3) to Part I, Section 1. It now follows the condition on program self-assessment (I.1.5).
- The first draft has added two new sections to Public Information (II.4). These are
    - II.4.6 Admissions and Advising
    - II.4.7 Student Financial Information

  These changes were made in response to repeated calls for creating public information requirements that supported Condition II.3, Evaluation of Preparatory Education, as well as the position of the AIAS, that students had insufficient access to information regarding the financial implications of financial aid decisions and course and materials fees.

Overall, the NAAB believes this first draft represents a significant change for the better in terms of creating a succinct, unambiguous statement about what the profession, the academy, and students believe is required to (a) support a professional education in architecture and (b) produce graduates that are prepared to move forward with the next steps in their careers.

The NAAB welcomes your comments on the first draft at forum@naab.org through December 1, 2013.

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INSTRUCTIONS FOR PREPARING THE ARCHITECTURE PROGRAM REPORT

This section will provide information and instructions for preparing Architecture Program Reports in response to the *NAAB 2014 Conditions for Accreditation.*

This section will include definitions, and specifications for the content in each section of the APR.

UNDER DEVELOPMENT

This section will be completed along with the development of the final, approved edition of the 2014 Conditions for Accreditation, and will also be accompanied by a new edition of the *Team Member Handbook*, which will include corresponding instructions to visiting teams.

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History of Accreditation in Architecture Education

The first step leading to architectural accreditation was taken in Illinois where the first legislation regulating the practice of architecture was enacted in 1897. Following that enactment, in 1898 the Illinois Board of Examiners and Regulators of Architects gave its first examination. By 1902 they had established a rule restricting the examination to graduates of the state's approved 4-year architecture curriculum. In 1903, the board expanded this policy to include graduates from Cornell, Columbia, and Harvard Universities, the Massachusetts Institute of Technology, and the University of Pennsylvania. That action demonstrated the need for national standards of architectural education.

In 1972, the membership of the NAAB Board of Directors was expanded to include one student representative nominated by "the Association of Student Chapters/ AIA[2]" and one graduate student nominated by schools accredited by the NAAB. In 1999, this representation was further refined to be two individuals nominated by the American Institute of Architecture Students.

In that report, the collateral organizations identified two over-arching goals for the NAAB:

- Advancement of all phases of architectural education, with a view toward the promotion of public welfare.
- Provide guidance, encourage improvement and innovation in the architecture system process, program experience, and product with a view toward serving the public interest and meeting societal needs.

And three objectives for the accreditation process:

- To hold a school accountable to its own stated objectives to the student, the profession, the institution, and the public community.
- To improve educational programs in schools of architecture by continuing a systematic review and assessment of education programs and resources through the self-evaluation process.
- To identify to prospective students, the public community, the profession, educational institutions, governmental agencies and state registration boards and to grant public recognition to those architecture education programs which meet and maintain established qualifications.

Finally, the report identified 13 policies; of which many remain central to the process. Among the thirteen, the following four relate to the continuous review and evaluation of the *Conditions for Accreditation.* The NAAB will:

- Accredit professional degree programs in architecture rather than institutions, colleges, departments, or schools.
- Accredit only the first professional degree program in architecture.

[2] The Association of Students Chapters/AIA was later renamed The American Institute of Architecture Students (AIAS).

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- Avoid rigid standards of curriculum content as a basis for accreditation in order to prevent standardization of programs and support well-planned experimentation.
- Establish and maintain procedures for reviewing and evaluating programs and informing schools of their accreditation status and for appeals by schools.

The NAAB

The directors of the NAAB bring varied insight and concerns to the accreditation process and provide a broad and inclusive view of architecture. In addition to two nonarchitects, one with a background in academia and the other a generalist who together represent the public interest, the directors include individuals nominated by the four organizations that serve the profession of architecture:

- The American Institute of Architects. Since 1857, the AIA has represented the professional interests of America's architects. AIA numbers more than 83,000 licensed architects, emerging professionals, and allied partners who, in design, express their commitment to excellence and livability in our nation's buildings and communities.
- The American Institute of Architecture Students. Founded in 1956, the AIAS serves architecture and design students throughout North America by promoting and complementing architectural education and by representing the concerns of students to the profession and the public.
- The Association of Collegiate Schools of Architecture. The mission of ACSA, founded in 1912, is to advance architectural education through support of member schools, their faculties, and their students.
- The National Council of Architectural Registration Boards. Founded in 1919, the NCARB today provides assistance in protecting the public's health, safety, and welfare to 55 boards regulating architecture in the 50 states, 4 territories, and District of Columbia.

First Draft Edition

Agenda Item C

UPDATE AND POSSIBLE ACTION ON THE 2013 STRATEGIC PLAN OBJECTIVE TO PRESENT A RECOMMENDATION TO THE NATIONAL COUNCIL OF ARCHITECTURAL REGISTRATION BOARDS (NCARB) ON CRITERIA FOR A "BROADLY EXPERIENCED DESIGN PROFESSIONAL" PATHWAY TO LICENSURE

At the Board's 2011 Strategic Planning session held on December 8, 2011 there was discussion regarding the feasibility of establishing an alternate methodology for satisfying the requirements of the NCARB Intern Development Program (IDP). As initially envisioned by the Board, the Broadly Experienced Intern (BEI) pathway would allow a candidate with ten or more years of experience to submit a portfolio of their work for a comprehensive evaluation by NCARB. The evaluation would assess whether the candidate has met the training requirements of IDP through their demonstrated practical work experience. The objective was assigned to the Professional Qualifications (PQ) Committee in the Board's 2012 Strategic Plan for further discussion and a recommendation for a potential course of action.

Based on the PQ Committee's recommendation relative to this matter at its May 16, 2012 meeting, the Board's 2013 Strategic Plan included a directive for the PQ Committee to present NCARB with a recommendation for the criteria related to the BEI pathway to licensure. At its May 1, 2013 meeting, the PQ Committee discussed the adverse impact the current IDP Six-Month Rule is having on experienced candidates who have not initiated the licensing process, as well as those who have become inactive and are reapplying. The Committee recommended to the Board that staff develop a framework of the BEI pathway criteria for consideration at the June 13, 2013 Board meeting. The PQ Committee Vice Chair suggested the concept be appropriately renamed the "Broadly Experienced Design Professional" (BEDP) pathway to more accurately reflect a description of the individuals to whom the pathway would apply.

The Board, at its June 13, 2013 meeting, approved the framework and directed the staff who attended the NCARB 2013 Annual Meeting to present the framework to the NCARB President, Ronald Blitch. Executive Officer, Doug McCauley made the presentation to Mr. Blitch (attached).

NCARB previously had considered the possibility of developing an alternate methodology for completing the IDP, and received approval from its Board of Directors to commence outlining a

program. On September 6-7, 2013, a new Licensure Task Force was launched by NCARB and led by now Past President Ronald Blitch. The Task Force consists of representatives from the four architectural collateral organizations, educators, recently licensed architects, and Member Board Members. The Task Force is charged with analyzing each component of the licensure process as a basis for exploring potential additional pathways that lead to licensure, including determining where there may be overlap and opportunities for efficiencies to be realized.

At the meeting, the PQ Committee will be provided with additional information regarding the Task Force.

The Committee is asked to consider the additional information and determine whether further action is necessary.

Attachment:
Letter to NCARB Regarding the Broadly Experienced Design Professional Pathway with Proposed Framework

Edmund G. Brown Jr.
GOVERNOR

CALIFORNIA ARCHITECTS BOARD

PUBLIC PROTECTION THROUGH EXAMINATION, LICENSURE, AND REGULATION

June 19, 2013

Mr. Ronald B. Blitch, FAIA, FACHA, NCARB, President/Chair of the Board
National Council of Architectural Registration Boards
1801 K Street, NW, Suite 700K
Washington, DC 20006

RE: Broadly Experienced Design Professional

Dear Mr. Blitch:

The California Architects Board has a long history of promoting multiple pathways to licensure and understands NCARB's interest in considering new methodologies. I am writing to introduce to you the framework for an alternate pathway for completing the Intern Development Program.

The "Broadly Experienced Design Professional" pathway, as envisioned by the Board, would afford experienced individuals an opportunity to become licensed architects.

The Board, at its June 13, 2013 meeting, approved a framework (attached) which I am sharing with you for consideration. We would be pleased to meet with you to answer any questions you may have.

Sincerely,

DOUGLAS R. McCAULEY
Executive Officer

Attachment

cc: Michael J. Armstrong, NCARB Chief Executive Officer
California Architects Board Members

2420 Del Paso Road,
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Sacramento,
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BROADLY EXPERIENCED DESIGN PROFESSIONAL PROPOSED FRAMEWORK

The Broadly Experienced Design Professional (BEDP) pathway, as originally conceived by the California Architects Board, establishes an alternate methodology for satisfying the requirements of the National Council of Architectural Registration Boards (NCARB) Intern Development Program (IDP). The BEDP pathway would afford a candidate with ten or more years of architectural design experience an opportunity to submit a portfolio of their work (extending longer than six months, notwithstanding NCARB's "six month rule"). The portfolio should demonstrate accomplishment of the IDP criteria requirements for a comprehensive evaluation by NCARB, similar to what is done for foreign architects attempting NCARB Certification through the Broadly Experienced Foreign Architect program. The evaluation would assess whether the candidate has met the training requirements for each Experience Category and Experience Area as set forth in the *IDP Guidelines* through their practical work experience. Upon successful demonstration to NCARB the candidate has met the requirements, NCARB would note fulfillment of IDP.

Agenda Item D

UPDATE ON THE 2013 STRATEGIC PLAN OBJECTIVE TO DEVELOP A STRATEGY TO EXPEDITE RECIPROCITY LICENSURE FOR MILITARY SPOUSES AND DOMESTIC PARTNERS

The Board's 2013 Strategic Plan directs the Professional Qualifications (PQ) Committee to develop a strategy for expediting reciprocal licensure for military spouses and domestic partners.

In September 2012, Governor Edmund G. Brown, Jr. signed into law Assembly Bills (AB) 1588 and 1904 (attached), which respectively added sections 114.3 and 115.5 to the Business and Professions Code. Section 114.3 requires the Board to waive the renewal requirements for military licensees who are called to active duty, provided certain conditions (specified in the law) are met. Section 115.5 requires the Board to expedite the reciprocal licensure process for a spouse or domestic partner of an active duty military member assigned to a duty station in California, provided satisfactory evidence is supplied to the Board.

At its May 1, 2013 meeting, the PQ Committee voted to recommend that the Board pursue a regulatory amendment that would exempt military licensees called to active duty from paying the accrued renewal fees, excluding the current renewal cycle fee.

Subsequently, staff conducted its research into developing a regulatory amendment in accordance with the Committee's recommendation. The research showed that language within section 114.3, specifically "…shall waive the renewal fee, continuing education requirements, and other renewal requirements as determined by the Board…," already waives the renewal obligations and accrued renewal fees. Therefore, at the advice of legal counsel, a regulatory amendment is not necessary.

Attachments:
1. AB 1588 (Chapter 752, Statutes of 2012)
2. AB 1904 (Chapter 399, Statutes of 2012)

Assembly Bill No. 1588

CHAPTER 742

An act to add Section 114.3 to the Business and Professions Code, relating to professions and vocations.

[Approved by Governor September 29, 2012. Filed with Secretary of State September 29, 2012.]

LEGISLATIVE COUNSEL'S DIGEST

AB 1588, Atkins. Professions and vocations: reservist licensees: fees and continuing education.

Existing law provides for the regulation of various professions and vocations by boards within the Department of Consumer Affairs and for the licensure or registration of individuals in that regard. Existing law authorizes any licensee whose license expired while he or she was on active duty as a member of the California National Guard or the United States Armed Forces to reinstate his or her license without examination or penalty if certain requirements are met.

This bill would require the boards described above, with certain exceptions, to waive the renewal fees, continuing education requirements, and other renewal requirements as determined by the board, if any are applicable, of any licensee or registrant who is called to active duty as a member of the United States Armed Forces or the California National Guard if certain requirements are met. The bill would, except as specified, prohibit a licensee or registrant from engaging in any activities requiring a license while a waiver is in effect. The bill would require a licensee or registrant to meet certain renewal requirements within a specified time period after being discharged from active duty service prior to engaging in any activity requiring a license. The bill would require a licensee or registrant to notify the board of his or her discharge from active duty within a specified time period.

The people of the State of California do enact as follows:

SECTION 1. Section 114.3 is added to the Business and Professions Code, to read:

114.3. (a) Notwithstanding any other provision of law, every board, as defined in Section 22, within the department shall waive the renewal fees, continuing education requirements, and other renewal requirements as determined by the board, if any are applicable, for any licensee or registrant called to active duty as a member of the United States Armed Forces or the California National Guard if all of the following requirements are met:

(1) The licensee or registrant possessed a current and valid license with the board at the time he or she was called to active duty.

(2) The renewal requirements are waived only for the period during which the licensee or registrant is on active duty service.

(3) Written documentation that substantiates the licensee or registrant's active duty service is provided to the board.

(b) (1) Except as specified in paragraph (2), the licensee or registrant shall not engage in any activities requiring a license during the period that the waivers provided by this section are in effect.

(2) If the licensee or registrant will provide services for which he or she is licensed while on active duty, the board shall convert the license status to military active and no private practice of any type shall be permitted.

(c) In order to engage in any activities for which he or she is licensed once discharged from active duty, the licensee or registrant shall meet all necessary renewal requirements as determined by the board within six months from the licensee's or registrant's date of discharge from active duty service.

(d) After a licensee or registrant receives notice of his or her discharge date, the licensee or registrant shall notify the board of his or her discharge from active duty within 60 days of receiving his or her notice of discharge.

(e) A board may adopt regulations to carry out the provisions of this section.

(f) This section shall not apply to any board that has a similar license renewal waiver process statutorily authorized for that board.

O

Assembly Bill No. 1904

CHAPTER 399

An act to add Section 115.5 to the Business and Professions Code, relating to professions and vocations.

[Approved by Governor September 20, 2012. Filed with Secretary of State September 20, 2012.]

LEGISLATIVE COUNSEL'S DIGEST

AB 1904, Block. Professions and vocations: military spouses: expedited licensure.

Existing law provides for the licensure and regulation of various professions and vocations by boards within the Department of Consumer Affairs. Existing law provides for the issuance of reciprocal licenses in certain fields where the applicant, among other requirements, has a license to practice within that field in another jurisdiction, as specified. Existing law authorizes a licensee to reinstate an expired license without examination or penalty if, among other requirements, the license expired while the licensee was on active duty as a member of the California National Guard or the United States Armed Forces.

This bill would require a board within the department to expedite the licensure process for an applicant who holds a license in the same profession or vocation in another jurisdiction and is married to, or in a legal union with, an active duty member of the Armed Forces of the United States who is assigned to a duty station in California under official active duty military orders.

The people of the State of California do enact as follows:

SECTION 1. Section 115.5 is added to the Business and Professions Code, to read:

115.5. (a) A board within the department shall expedite the licensure process for an applicant who meets both of the following requirements:

(1) Supplies evidence satisfactory to the board that the applicant is married to, or in a domestic partnership or other legal union with, an active duty member of the Armed Forces of the United States who is assigned to a duty station in this state under official active duty military orders.

(2) Holds a current license in another state, district, or territory of the United States in the profession or vocation for which he or she seeks a license from the board.

(b) A board may adopt regulations necessary to administer this section.

O

Agenda Item E

REPORT ON THE NCARB PROPOSED CHANGES TO THE INTERN DEVELOPMENT PROGRAM (IDP) RELATED TO EMPLOYMENT DURATION AND IDP ENTRY POINT

On May 2, 2013, the National Council of Architectural Registration Boards (NCARB) released a notice to Member Boards seeking comments on two proposed changes to the IDP, relative to employment duration and program eligibility. These proposed changes are consistent with IDP discussions the Board has had since before it adopted IDP in 2005. NCARB provided a 90-day period during which Member Boards may submit comments for review.

Currently, interns are required to be employed for a minimum of 15 hours per week for eight consecutive weeks to earn IDP experience credit. The first proposed change eliminates the minimum employment duration requirement and allows interns to earn IDP experience credit for valid work through the project work performed relative to an experience area. This would include periods of work performed over winter and spring breaks, while in school, and projects of limited scope with completion time in weeks.

The other proposed change related to the IDP eligibility date and modifies the entry point for participation in the IDP to when an intern receives a U.S. high school diploma or equivalent. Currently, interns must be enrolled in a degree program accredited by the National Architectural Accreditation Board (NAAB) or the Canadian Architectural Certification Board (CACB), enrolled in a pre-professional degree program at a school that offers a NAAB/CACB accredited degree program, or be employed in Experience Setting A after first obtaining a U.S. high school diploma, General Education Degree (GED) equivalent, or comparable foreign degree.

The attached notice further explains the rationale relative to each change. The Board was asked to provide comments to NCARB regarding the proposed changes to IDP. At its June 13, 2013 meeting, the Board considered the changes and was strongly supportive. The Board's comments regarding the changes were furnished for NCARB's consideration shortly afterwards.

At its September 19-21, 2013 Board of Directors Meeting, NCARB approved both changes to IDP based on the feedback it received during the comment period. NCARB staff is presently

updating the *IDP Guidelines* to reflect the changes and plans for the release of the updated *IDP Guidelines* within the next few months.

Attachment:
NCARB Notice to Member Board Members and Member Board Executives

NCARB
National Council of Architectural Registration Boards 1801 K Street NW, Suite 700K Washington, DC 20006 202/783-6500 202/783-0290 FAX

2 May 2013

Dear NCARB Member Board Members and Member Board Executives:

The National Council of Architectural Registration Boards (NCARB) is currently seeking Member Board comments on two proposed changes to the Intern Development Program. These changes specifically relate to the employment duration and eligibility requirements. Detailed descriptions of the proposed changes are attached and are also posted on the Registration Board Section of the NCARB website.

Following this initial notice of the proposed changes there will be a 90-day period for your Board to review and submit comments. Please take the opportunity to review the proposed changes and provide your feedback. **The NCARB Board of Directors would like to hear from all Member Boards before they vote on the proposed changes**. To that end, please use the following questions as a guide when crafting your response:

- Does your Board agree, disagree, or have no position on the proposed changes?
- If your Board disagrees, what are your concerns?
- Does your Board need more time to address the proposed changes? If so, when do you expect to be able to provide us feedback?

All comments, including "no comments", should be sent to the following address: idp-comments@ncarb.org with a copy to khillegas@ncarb.org by 5:00 P.M. on Friday, August 2, 2013.

NCARB
National Council of Architectural Registration Boards 1801 K Street NW, Suite 700K Washington, DC 20006 202/783-6500 202/783-0290 FAX

Proposed Changed to IDP Duration Requirement

WHAT IS THE PROPOSED CHANGE?

This proposed change will allow interns to earn IDP credit for valid work experience in short employment periods. Currently interns, in most experience settings, must be employed a minimum of 15 hours per week for eight consecutive weeks.

WHY SHOULD THIS CHANGE BE IMPLEMENTED?

Interns will be able to earn IDP experience credit for valid work though the project work relative to an experience area. This includes periods of work performed over winter and spring breaks while in school, and projects of limited scope with completion time in weeks.

The NCARB Board of Directors approved the following revisions to modify the IDP "Employment Requirements" for Member Board comment:

Modify the IDP Guidelines, November 2012, page 9, Employment Requirements, Paragraph 1 as follows:

> *"To earn experience in setting A, O, "Design and Construction Related Employment" within setting S, and some scenarios in "Construction Work" within setting S, you must be employed.* ~~*at least 15 hours per week for a minimum period of eight consecutive weeks.*~~
>
> - *Unpaid internships are not eligible to earn experience hours with the exception of the approved community-based design center/collaborative as defined in experience setting S.*
> - *No experience may be earned outside of the U.S. or Canada, except at an organization engaged in the practice of architecture, an approved Community-Based Design Center/Collaborative as defined in experience setting S, or through Leadership and Service defined in experience setting S.*
> - *To earn experience in Teaching or Research as defined in experience setting S, you must be employed by the institution.* ~~*; however, there is no minimum period of consecutive employment."*~~

Rationale:

The IDP experience requirements today are based on the performance of tasks, and the development of the knowledge and skills necessary to competently perform those tasks independently. As the IDP has developed over time, the integrated role of the IDP Supervisor has increasingly become recognized as the evaluator of intern progress. Supervisors determine what is valid and appropriate experience in all facets of the program. Therefore, they should hold the responsibility to ultimately determine whether or not the length of an experience is meaningful enough to qualify to meet the IDP requirement. The program rules inherently provide the guidance necessary to keep interns on track and provide an appropriate framework for what tasks must be completed.

NCARB
National Council of Architectural Registration Boards 1801 K Street NW, Suite 700K Washington, DC 20006 202/783-6500 202/783-0290 FAX

In today's typical firm, changes in project delivery methods have altered the traditional development path. Many projects – from concept through construction documents – may take less than eight weeks to complete. In looking at defined IDP experience areas, for example 'Programming' and 'Bidding and Contract Negotiation,' these tasks on an average project may be successfully completed in a couple of weeks. A firm may be hired for only limited services such as schematic design, with a separate contract to follow at a later date (and perhaps to a different firm) for the construction documents.

Numerous practices today rely on contract labor to complete projects in their offices. Interns may be brought in to assist with projects only for specific phases. In some cases, interns have been working full time, but are accumulating that time between several firms. In these cases the interns are not meeting the duration requirements of IDP so they earn no credit for their work. While limited in time, this is all valid experience.

Many practices rely on interns returning to work during school breaks. Typically these are interns who worked in the firm over the summer, and return at the holiday breaks to work for two or three weeks. These interns receive no experience credit for their two to three week effort though it is a continuation of their intern training.

By recommending the minimum duration requirements for employment be discontinued, the committee is not suggesting that a fragmented internship is acceptable to the IDP process. Historically, there has been a strong sentiment that it is important to immerse an intern into the culture of a firm. We acknowledge that firm culture is of importance; however the nature of practice has changed rather dramatically in recent years.

The hourly requirements of each IDP experience area, the associated tasks of each experience area, and the experience setting in which hours must be accrued identify the critical criteria for an intern to complete. It is these program requirements that form the elements of IDP created to ensure valuable learning experiences, not the length of time an intern spends at a particular employment.

NCARB
National Council of Architectural Registration Boards 1801 K Street NW, Suite 700K Washington, DC 20006 202/783-6500 202/783-0290 FAX

Eligibility Date

WHAT IS THE PROPOSED CHANGE?
This proposed change will modify the point of eligibility to participate in the IDP as the receipt of a U.S. high school diploma, or equivalent.

Currently interns must be enrolled in a degree program accredited by the National Architectural Accreditation Board (NAAB) or the Canadian Architectural Certification Board (CACB), enrolled in a pre-professional degree program at a school that offers a NAAB/CACB accredited degree program, or be employed in experience setting A after obtaining a U.S. high school diploma, General Education Degree (GED) equivalent, or comparable foreign degree.

WHY SHOULD THIS CHANGE BE IMPLEMENTED?
Interns will be able to earn IDP credit for valid work and supplemental experience meeting the requirements of the program.

The NCARB Board of Directors approved the following revisions to modify the IDP "Eligibility Requirements:"

Modify the IDP Guidelines, November 2012, page 9, Eligibility Requirements as follows:

> ~~*"Your 'IDP eligibility date' is the date after which you are able to earn IDP experience.*~~ *Qualifying experience can be earned only after obtaining a high school diploma (or equivalent).* ~~*on or after your IDP eligibility date. Once this date has been established, it is set for all experience earned on or after that date.*~~
>
> ~~*You can earn IDP experience once you have successfully established one of the following:*~~
> ~~*1. Enrollment in a NAAB/CACB-accredited degree program*~~
> ~~*2. Enrollment in a pre-professional architecture degree program at a school that offers a NAAB/CACB-accredited degree program.*~~
> ~~*3. Employment in experience setting A after obtaining a U.S. high school diploma, General Education Degree (GED) equivalent, or comparable foreign degree."*~~

Rationale:
The existing requirement to begin participation in the Intern Development Program (IDP) is that interns meet one of three IDP eligibility dates:

1) Enrollment in a NAAB/CACB-accredited degree program.
2) Enrollment in a pre-professional architecture degree program.
3) Employment in Experience Setting A after obtaining a high school diploma.

NCARB
National Council of Architectural Registration Boards 1801 K Street NW, Suite 700K Washington, DC 20006 202/783-6500 202/783-0290 FAX

These requirements were established by the Board of Directors in FY10. The philosophy behind these requirements was to simply require a "commitment to the practice of architecture". Today, the Internship Committee believes that establishing an NCARB Record is a commitment to the practice of architecture in and of itself, as the sole purpose of doing so is to document one's qualifications to practice architecture.

It is not an education threshold in one's career that ensures the IDP is of any particular quality for an intern. The hourly requirements of each IDP experience area, the associated tasks of each experience area, and the experience setting in which hours are accrued determine what is most important for an intern to experience. It is these elements of the IDP that create and ensure valuable learning experiences. The program requirements themselves ensure the degree of quality.

The determination of the point where work experience meets the requirements of the IDP is effectively accomplished by the IDP Supervisor, who works directly with the intern and evaluates his/her performance in all areas of internship, accepts the work submitted. As NCARB continues to align the requirements of the Intern Development Program with current practice, it has become evident that NCARB cannot effectively determine whether or not an intern's experience is meaningful by applying arbitrary eligibility thresholds.

The current IDP eligibility date process requires interns to document their IDP eligibility date through a third party with hard copy forms, in addition to other administrative duties such as establishing an NCARB record, documenting IDP hours, transmitting their record for an authorization to test, and various procedures directly with state boards. The removal of IDP eligibility dates is an opportunity to streamline the process for interns and alleviate confusion that many times occurs due to the substantial paperwork involved in simply progressing through the process of licensure.

A minimum of a high school diploma is proposed because it is believed that most experiences before high school graduation would be geared more toward simply experiencing what it's like to work for an architect as an exploratory career exercise, rather than actually contributing as a substantial member of the design team. The committee members believe individuals who do maintain employment prior to high school graduation and contribute as substantial members of the design team would be minimal.

Agenda Item F

REPORT ON THE NCARB 2012 PRACTICE ANALYSIS

In April 2012, the National Council of Architectural Registration Boards (NCARB) began its recent and most comprehensive Practice Analysis of Architecture. The *2012 Practice Analysis of Architecture* survey was distributed to more than 80,000 architects, interns, and educators across the country and more than 7,800 responses were included in the final data analysis. The Practice Analysis of Architecture is conducted by NCARB every five to seven years, as its findings are significant to the profession and help determine the knowledge and skills that are necessary in order to practice architecture independently and protect the public's health, safety, and welfare.

Practice analyses are typically used to update specifications for professional licensure examinations; however, NCARB planned the expanded *2012 Practice Analysis of Architecture* deliberately and methodically to not only drive future updates and modifications to the Architect Registration Examination (ARE), but to also inform the Intern Development Program (IDP), guide NCARB's response to the 2013 National Architectural Accrediting Board Accreditation Review Conference, and guide NCARB's future continuing education policies. The study included multiple surveys designed to engage architects in the evaluation of tasks and knowledge/skills required of an independent practitioner and yielded a great deal of data for review and analysis. Practitioners' responses were supplemented with those from interns and educators to allow for deeper analysis and broader application of findings. Additionally, findings will be used to inform important discussions within the profession related to the path to licensure.

In March 2013, NCARB released the first in a series of 2012 Practice Analysis-related reports, the *Education Report*. Subsequently, the *Internship Report* was released in April 2013, and the *Examination Report*, *Continuing Education Report*, and a final report were released in June 2013. Of particular interest to the Board is the *Examination Report* (attached), which encompasses extensive data collected from the study's three examination-specific surveys, and NCARB's subsequent actions with regard to the ARE. It should be noted that the Board's 2013 Strategic Plan includes an objective to review the ARE test specification and conduct an occupational analysis (OA) of architectural practice in California during the 2013/2014 fiscal

year. The results of both will be used for the ongoing development of the California Supplemental Examination (CSE).

As noted in the *Examination Report*, the *2012 Practice Analysis of Architecture* has already had a meaningful influence on the immediate future of the ARE as a guide for refreshing the existing examination item bank. Additionally, in early 2013, the NCARB Test Specification Task Force, a committee of subject-matter experts, comprehensively reviewed the current test specification. The goal of the Task Force was to identify potential short-term updates to the test specification based on the findings of the *2012 Practice Analysis of Architecture* without modifying the overall structure of the ARE. A short-term update to the current ARE test specification will also be used to complete a full review of the item bank in preparation for examination forms scheduled to be released in July 2014.

The report also indicates that tasks identified in the *2012 Practice Analysis of Architecture* were recently used in a study to evaluate current and potential examination item types that could be incorporated into the ARE. Each item type was evaluated based on its ability to appropriately assess each of the 110 tasks identified in the Practice Analysis. The findings of the study confirmed that current ARE item types adequately cover all tasks identified. The study also identified potential new item types that could be incorporated into the ARE to either complement or replace current item types. The findings of the item type study were also used to evaluate options and inform decisions regarding the future structure of the ARE.

In addition to the short-term uses of the Practice Analysis, survey results will also inform future versions of the ARE. As noted in the report, this data will help determine the specific content areas to be included within a new divisional structure of the ARE, known as ARE 5.0. Survey results will also help inform the weightings of content areas within each division. It is also noted that a supplement to the *Examination Report*, further identifying the long-term application of the Practice Analysis data, will be released in early 2014 following further research and analysis by various NCARB committees and task forces.

In July and September 2013, the Test Specification Task Force met again to begin shaping ARE 5.0. Task Force members recommended content areas and assessment objectives for the proposed divisions; aligned assessment objectives to the knowledge, skills and tasks identified in the *2012 Practice Analysis of Architecture*; and weighted the importance of each content area and assessment objective. The Task Force is charged with determining the Test Specification for ARE 5.0, which determines the knowledge and skills that will be measured in each division and will direct all further development of the ARE. Task Force recommendations are being presented to NCARB's Examination Committee in October 2013 before being considered by the NCARB Board of Directors this winter. Once the content areas are approved, work will begin on mapping the current ARE to the new divisions and developing a transition plan in the spring. ARE 5.0 is expected to launch in late 2016.

<u>Attachment:</u>
2012 NCARB Practice Analysis of Architecture: Examination Report

NCARB

2012 NCARB Practice Analysis of Architecture: **EXAMINATION REPORT**

CONTRIBUTORS

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2012 NCARB Practice Analysis of Architecture: Examination Report

By the National Council of Architectural Registration Boards

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FOREWORD

The *2012 NCARB Practice Analysis of Architecture* is unique in many ways compared to previous practice analyses of the profession. This significant and greatly expanded study was planned deliberately and methodically to:

DRIVE the test specification of the Architect Registration Examination® (ARE®),

INFORM the future of the Intern Development Program (IDP), and

GUIDE *NCARB's Contribution to the 2013 NAAB Accreditation Review Conference (ARC)*, as well as future continuing education policies.

The survey yielded a great deal of data for review and analysis by four NCARB committees: Education, Internship, Examination, and Continuing Education, as well as the Council's Board of Directors. The findings will be used to shape our programs and policies over the coming years and inform important discussions within the profession related to the path to licensure.

This *Examination Report* is the third in a series of Practice Analysis-related reports that NCARB is publishing in 2013. The previously released reports focused on education and internship. The remaining report will share data and findings for continuing education. The complete *2012 NCARB Practice Analysis of Architecture*, which will include the full set of published reports, will be released in late June 2013.

The NCARB Practice Analysis of Architecture is an important example of the many ways the Council is reaching out and soliciting feedback from across the profession as we collectively consider and shape the future of practice. For example, the prestigious NCARB Award is supporting innovation in education; our newly inaugurated Intern Think Tank is giving interns a greater voice in the future of the IDP; our ARE research efforts are informed by ongoing feedback from architect volunteers and our Member Boards as we prepare for the next generation of the examination; and our efforts to increase collaboration with the architectural collaterals is helping drive positive change in the profession.

The Council extends its thanks and gratitude to those involved in the development of the Practice Analysis as well as to every individual who took the time to complete the survey. Your support of the profession throughout this important endeavor is greatly valued and appreciated.

Michael J. Armstrong
Chief Executive Officer
National Council of Architectural Registration Boards

EXECUTIVE SUMMARY

PURPOSE

A practice analysis is conducted with practitioners of a profession in order to define the knowledge/skills they must possess and the tasks they must be able to perform at the time of licensure. These studies are carefully designed according to strict standards and are used to ensure that the body of knowledge necessary to practice reflects the current state of the profession and the needs of practitioners. Practice analyses are not limited to the profession of architecture; they are conducted on behalf of a wide variety of professions, occupations, and vocations, and they play an important role in licensure and certification programs all over the world. Through its long history and experience, NCARB has determined that surveying every five to seven years most appropriately responds to the needs of the architecture profession.

Findings from practice analyses are typically used to update specifications for professional licensure exams, such as the Architect Registration Examination® (ARE®); however, the scope of the *2012 NCARB Practice Analysis of Architecture* was intentionally expanded to gather additional information to strategically support the Council's equally important education, internship, and continuing education initiatives. This comprehensive study included multiple surveys designed to engage architects—the most appropriate representatives of the profession—in the evaluation of tasks and knowledge/skills required of an independent practitioner. Practitioners' responses were supplemented with those from interns and educators to allow for deeper analysis and broader application of findings.

THE EXAMINATION SURVEY

This *Examination Report* encompasses extensive data collected from the three examination-specific surveys:

EXAMINATION A Survey
Architects were asked to indicate how frequently they performed a specific task in the past year and to rate the level of importance of the competent performance of the task by a recently licensed architect practicing independently.

EXAMINATION B Survey
In this survey, architects were presented with two similar, but distinct questions. The first question is very common in practice analyses and asks when each knowledge/skill was acquired. The second question asked the same respondents to identify when each knowledge/skill should be acquired.

EXAMINATION C Survey
In the third survey, architects were asked to rate the importance of each knowledge/skill to a recently licensed architect practicing independently and at what level they typically use the knowledge/skill when performing their job.

KEY FINDINGS

The data resulting from the Examination Survey of the *2012 NCARB Practice Analysis of Architecture* represents the views of a broad sample of architects. The Examination Committee and the Test Specification Task Force, consisting of NCARB Member Board Members, recently licensed architects, and other subject-matter experts will continue to analyze the data in support of the current ARE. Findings will also drive the research and development of new testing innovations and item types to be introduced in future versions of the examination.

- **Level of Importance** – The survey indicates that 129 of the 132 knowledge/skills and 106 of the 110 tasks were rated as "*important*" or greater by architects who completed the survey. Three of these K/S and tasks were rated as "*critically important*" and are directly related to the protection of the public health, safety, and welfare—building code analysis, the impact of building codes on building design, and compliance with laws and regulations governing the practice of architecture.

- **Point of Knowledge/Skill Acquisition** – When comparing level of importance with point of acquisition, 15 knowledge/skills were identified as "*important*" or greater and also identified as being acquired after licensure by more than 50 percent of architects completing the survey. These 15 knowledge/skills primarily deal with practice and project management issues and are vital to competent practice; therefore, their acquisition should be better supported during education and internship.

- **Level of Knowledge/Skill Use** – Architects were asked to rate the level at which they use each knowledge/skill. "*Apply*" was the most frequently selected response at 42.5 percent. "*Evaluate*" and "*Understand*" were evenly split at 26.0 percent and 25.7 percent, respectively. Only 5.8 percent of architects indicated they did not use the knowledge/skill in their job. This data will be used to support item writers in the creation of more relevant items/questions for the examination.

- **Frequency of Task Performance** – Over 70 percent of the tasks included in the survey were indicated by architects as being performed in the past year. Most tasks were rated as being performed "*quarterly*" (20.4 percent) or "*monthly*" (19.0 percent). This data will be used to refine the content and distribution of items included in the ARE. Ten tasks rated "*important*" or greater were identified as "*not performed*" in the past year by more than 50 percent of architects. Additional analysis by various NCARB committees is warranted to better understand the nature of those tasks.

- **Subgroup Analysis** – Respondent characteristics such as years of licensed practice and firm size had minimal influence on responses; however, a couple of differences are worth noting. More experienced practitioners tended to report a slightly higher level of ability than those recently licensed, underscoring the important role continuing education plays after licensure. Additionally, architects working in smaller firms rated their typical level of knowledge/skill use at "*evaluate*" more frequently than those working in medium and larger firms, reinforcing that the small-firm practitioner is typically responsible for performing a broader range of tasks in their daily work.

CONCLUSION

The ARE plays a critical role in assessing the knowledge, skills, and abilities to provide the various services required for the independent practice of architecture. The exam is required by all 54 U.S. jurisdictions and helps ensure that NCARB's Member Boards and licensed practitioners can meet their obligation to protect the public health, safety, and welfare. Further analysis and application of Practice Analysis data will help ensure the ARE remains psychometrically justifiable, legally defensible, and relevant to current practice.

USE AND APPLICATION

The *2012 NCARB Practice Analysis of Architecture* will inform interim updates to the current version of the ARE as well as serve as a foundation for the development of future versions of the examination. The findings will also have a significant impact on the Council's exploration of alternative pathways to licensure that further blend the three traditional components of education, internship, and examination.

SHORT-TERM USE

The 2012 Practice Analysis has already had a meaningful influence on the immediate future of the ARE as a guide for refreshing the existing exam item databank. The survey's ongoing impact will be seen throughout its application over the next few years, as the Council continues to explore new means and methods for examination development and delivery.

Refinement of ARE Test Specification

The ARE Test Specification is the document that outlines the content areas of the ARE as well as the overall requirements to assemble multiple versions (forms) for each division of the exam. The current test specification is based on the findings of the *2007 Practice Analysis of Architecture.* The Test Specification Task Force, a specially-formed committee of subject-matter experts, comprehensively reviewed the current test specification during early 2013. The committee's goal was to identify potential short-term updates to the test specification based on the findings of the *2012 Practice Analysis* without modifying the overall structure of the ARE. Committee members attempted to align the knowledge, skill, and task statements of the *2012 Practice Analysis* to the current test specification and as a result, identified 11 knowledge/skill (K/S) statements that were not in alignment. It was determined that although these 11 K/S are not assessed by the current examination, they are covered in the education and/or internship components of the path to licensure. The committee also aligned the task statements to the knowledge/skill statements to allow for better refinement of each content area within the examination. The result was the identification of four task statements that did not align with any of the K/S statements. Each of these tasks related to the use of various drawing methodologies including hand drawing, computer-aided design (CAD), and building information modeling (BIM).

This short-term update to the current ARE test specification will also be used to complete a full review of the item databank in preparation for exam forms scheduled to be released in July 2014. More detailed information on the slightly updated version of the ARE will be released in early 2014, well in advance of its launch.

Item Type Analysis

The tasks identified in the 2012 Practice Analysis were recently used in a Research & Development Subcommittee study to evaluate current and potential examination item types that could be incorporated into the ARE. Each item type was evaluated based on its ability to appropriately assess each of the 110 tasks identified in the Practice Analysis. The findings of the study confirmed that current ARE item types adequately cover all tasks identified. The study also identified potential new item types that could be incorporated into the ARE to either complement or replace current item types. The findings of the item type study were also used to evaluate options and inform decisions regarding the future structure of the ARE.

CURRENT ARE ITEM TYPES

Single-select Multiple Choice
A candidate must choose the one correct answer from a list of possible options (typically out of four options).

Multi-select Multiple Choice (Check-all-that-apply)
A candidate must choose the multiple correct answers from a list of possible options (typically two to four correct out of six options).

Constructed Response – Numeric (Quantitative Fill-In-The-Blank)
A candidate is presented a question asking him/her to identify a correct numerical response. The candidate must determine and then enter the correct number.

Figural Response (Vignette)
A candidate is presented a problem statement (program requirements, code requirements, etc.) along with a base drawing. Using the CAD toolset available, the candidate must create a solution that is responsive to the various aspects of the problem statement.

LONG-TERM APPLICATION

In addition to the short-term uses of the *2012 Practice Analysis* data, survey results will also inform future versions of the ARE.

Numerous subject-matter experts—including experienced architects, recently licensed architects, educators, and testing consultants—will reference the Practice Analysis data to help determine the specific content areas to be included within a new divisional structure to be proposed for the next version of the ARE, known as ARE 5.0. Additionally, survey results will help inform the weightings of content areas within each division. For example, if a particular content area received a high mean importance and/or frequency rating, that content area will likely be weighted more heavily within a particular division. While each division's content areas and weightings are ultimately determined by the subject-matter experts, the survey data serves as the empirical evidence to inform and validate their decisions.

It is important to note that the Practice Analysis findings inform *what* should be assessed in the ARE; however, they do not determine *how* it is to be assessed. NCARB relies on the informed judgment of subject-matter experts, consultants, and other specialists in the testing industry to assist in designing the most appropriate testing methodology. For example, subject-matter experts, informed by the Practice Analysis data, will determine the composition and cognitive complexity of each division's content areas. These experts will also determine the practical feasibility of an assessment within the given constraints of the examination's domain. It is possible that some K/S or tasks that received high ratings by survey respondents may not be appropriate for assessment in the ARE and therefore should be incorporated in greater depth in the education and/or internship components of the path to licensure.

Computer-based testing in general, and specifically the convenience of year-round administration, requires a deep and robust database of items/questions from which to draw upon to create each division of the exam. The survey responses regarding the cognitive level of use of each K/S will be used to support item writers in the creation of more relevant items to populate this database.

Finally, a supplement to this *Examination Report*, further identifying the long-term application of the Practice Analysis data, will be released in early 2014 following further research and analysis by various NCARB committees and task forces.

EXAMINATION SURVEY

Each examination (ARE) survey was designed to gather information from licensed architects, who reviewed the K/S and task statements and indicated:

- Importance of the K/S and task to independent practice for recently licensed architects;
- Frequency of task performance in the past year;
- Level at which they typically use the K/S in their job; and
- When each K/S was acquired and when it should be acquired.

A total of 2,695 ARE surveys were included in the data analysis. The number of survey responses for each ARE survey included in the final data analysis ranged from 60 percent to 74 percent, based on the 90 percent completion rule (participants who responded to at least 90 percent of the items in the survey were included).

ARE SURVEY	RESPONSES RECEIVED	RESPONSES INCLUDED IN DATA ANALYSIS	PERCENTAGE INCLUDED IN DATA ANALYSIS
ARE A	1,169	865	74%
ARE B	1,429	1,008	71%
ARE C	1,376	822	60%

The chart below summarizes the survey population and the research questions related to the task and knowledge/skill (K/S) statements, as well as the various rating scales for the examination surveys. The chart also references the related Examination (ARE) Data Tables.

SURVEY	SURVEY POPULATION	STATEMENT TYPE	RESEARCH QUESTIONS AND RATING SCALES	DATA TABLE
ARE A	All licensed architects	Task	How frequently have you performed the task during the past year? • Not performed or does not apply • Yearly • Quarterly • Monthly • Weekly • Daily	D2
			How important is competent performance of the task by a recently licensed architect practicing independently? • Of little or no importance • Somewhat important • Important • Very important • Critically important	D3

SURVEY	SURVEY POPULATION	STATEMENT TYPE	RESEARCH QUESTIONS AND RATING SCALES	DATA TABLE
ARE B	All licensed architects	Knowledge/ Skill	When did you acquire the knowledge/skill? • Not acquired • By completion of accredited architecture degree program • During internship • After licensure	D8
			When should the knowledge/skill be acquired? • Not relevant, does not apply • By completion of accredited architecture degree program • During internship • After licensure	D9
ARE C	All licensed architects	Knowledge/ Skill	How important is the knowledge/skill to a recently licensed architect practicing independently? • Of little or no importance • Somewhat important • Important • Very important • Critically important	D6
			At what level do you typically use the knowledge/skill in your job? • Do not use knowledge/skill • Understand: General understanding; no specific details are used on the job • Apply: Application of general principles, procedures, skills to typical job scenarios • Evaluate: Use of knowledge/skill to evaluate and refine solutions for job scenarios or designs	D7
			Indicate why you do not use the knowledge/skill. (Select all that apply.) • Not used in my practice • Not allowed by my jurisdiction • Not recommended by my legal counsel or insurance carrier • Provided by consultant(s) • Lack of experience • Other	D10

NCARB'S KEY FINDINGS

No single licensure examination, or combination of examinations, can comprehensively test for all of the knowledge, skills, and tasks of a profession. Therefore, methods for defining and prioritizing the content are important steps in the examination development and validation process. NCARB relies on the Practice Analysis to help prioritize the practice-related knowledge, skills, and tasks of the profession that should be demonstrated competently prior to licensure.

The identification and prioritization of test content is based on several factors:

- Level of Importance
- Point of Acquisition
- Frequency of Performance
- Level of Use

As noted earlier, Practice Analysis findings will inform *what* should be measured by the ARE, not *how* it should be tested. The key findings on the following pages offer valuable insights that both validate current examination content and drive development of content for a future version of the ARE.

LEVEL OF IMPORTANCE

One of the most frequently asked questions when conducting a Practice Analysis of any profession relates to the level of importance of a knowledge/skill or task in relation to the recently licensed, independent practitioner.

IMPORTANT KNOWLEDGE/SKILLS (K/S)

Architects completing the ARE Survey were asked to rate "*How important is the knowledge/skill to a recently licensed architect practicing independently?*" The data indicates that 129 of 132 K/S were rated "*important*" or greater (an importance rating of 1.5 or above). Of these, 11 K/S were rated 3.0 or greater and include:

ARE K/S #	KNOWLEDGE/SKILL STATEMENT	IMPORTANCE RATING 0 1 2 3 4
20	Building codes and their impact on building design.	3.53
1	Oral, written, and visual presentation techniques to communicate project information.	3.40
102	Appropriate documentation level required for construction documents.	3.37
15	Designing facility layout and site plan that responds to site constraints.	3.24
3	Method for project controls, e.g., scope of services, budget, billing, compensation.	3.18
19	Protocols and procedures for conducting a code analysis.	3.17
122	Design decisions and their impact on constructability.	3.16
71	Relationship between constructability and aesthetics.	3.06
62	Functional requirements for thermal and moisture control systems.	3.04
110	Methods for production of construction documentation and drawings.	3.02
10	Factors involved in selection of building systems and components.	3.02

0 = Of little or no importance 1 = Somewhat important 2 = Important 3 = Very important 4 = Critically important

The three lowest rated K/S were:

ARE K/S #	KNOWLEDGE/SKILL STATEMENT	IMPORTANCE RATING 0 1 2 3 4
49	Methods and strategies for evidence-based design (EBD).	1.35
27	Producing physical scale models.	1.28
130	Factors involved in conducting architectural practice in international markets.	0.97

0 = Of little or no importance 1 = Somewhat important 2 = Important 3 = Very important 4 = Critically important

IMPORTANT TASKS

Architects rated 106 of the 110 tasks surveyed as "*important*" or greater (an importance rating of 1.5 or greater) when asked a similar question, "*How important is competent performance of the task by a recently licensed architect practicing independently?*" Twelve tasks were rated 3.0 or greater and include:

ARE TASK #	TASK STATEMENT	IMPORTANCE RATING 0 1 2 3 4
25	Perform building code analysis.	3.55
107	Comply with laws and regulations governing the practice of architecture.	3.50
106	Adhere to ethical standards and codes of professional conduct.	3.46
96	Develop and maintain effective and productive relationships with clients.	3.33
26	Communicate design ideas to the client graphically.	3.25
1	Gather information about client's vision, goals, budget, and schedule to validate project scope and program.	3.25
67	Coordinate design work of consultants.	3.21
5	Determine impact of applicable zoning and development ordinances to determine project constraints.	3.20
2	Prepare design alternatives for client review.	3.08
7	Determine scope of services.	3.05
39	Prepare code analysis documentation.	3.05
60	Respond to contractor Requests for Information (RFI).	3.00
0 = Of little or no importance 1 = Somewhat important 2 = Important 3 = Very important 4 = Critically important		

The four lowest rated tasks were:

ARE TASK #	TASK STATEMENT	IMPORTANCE RATING 0 1 2 3 4
49	Design landscape elements for site.	1.46
53	Prepare life cycle cost analysis.	1.36
16	Assess socio-cultural context of the proposed site.	1.33
87	Establish procedures for building commissioning.	1.32
0 = Of little or no importance 1 = Somewhat important 2 = Important 3 = Very important 4 = Critically important		

POINT OF KNOWLEDGE/SKILL ACQUISITION

A second, common question asked when conducting a practice analysis is "*When did you acquire the knowledge/skill?*" For our purposes, the *2012 NCARB Practice Analysis of Architecture* asked the question in order to determine if the K/S was acquired by completion of an accredited architecture degree program, during internship, or after licensure. Ideally, if a K/S is rated as important for the competent practice of architecture, it stands to reason that it should be acquired prior to licensure.

As a point of comparison, architects completing the 2012 survey were also asked a slightly different version of that question, "*When should the knowledge/skill be acquired?*" The response to the second question across all K/S statements was predominantly "*before completion of the accredited degree program.*" The scatter plot below contrasts the "*did*" vs. "*should*" responses to the two questions. With only one exception, every K/S had a higher rating for "*was acquired after licensure*" than "*should be acquired after licensure.*" **These responses, as illustrated by the dots falling below the diagonal line, both reinforce the importance of acquiring the K/S prior to licensure and highlight a knowledge gap, as architects acquired the K/S later than they believe is necessary.**

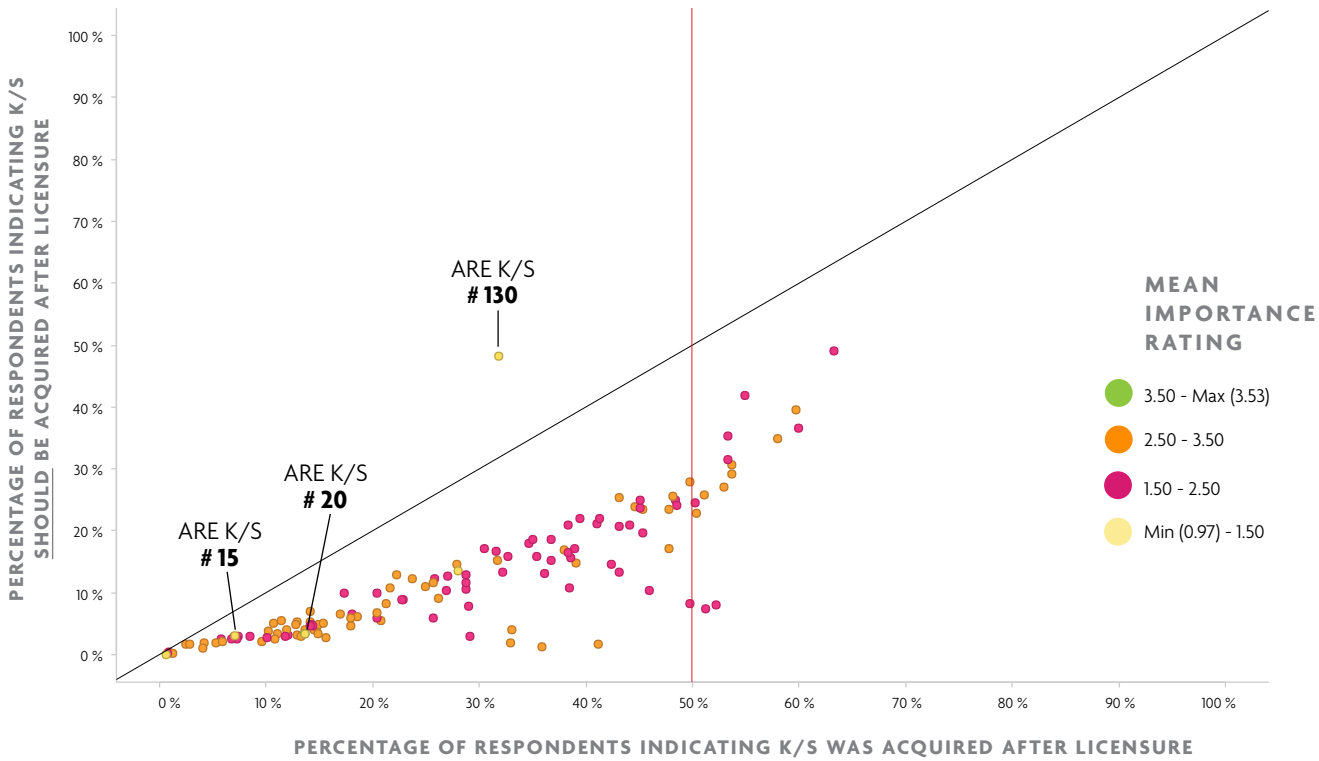
Each dot on this scatter plot represents a specific K/S, with position on the x-axis determined by the percentage of responses from architects who indicated that the K/S *"was acquired after licensure."*

The y-axis represents the percentage of responses from architects who indicated that the same K/S *"should be acquired after licensure."*

The diagonal line represents perfect agreement among responses to the two questions. If architects reported a K/S as being *"acquired after licensure"* to the same degree as they indicated it *"should be acquired after licensure,"* it will appear on or close to this line.

The dots that fall to the right of the vertical dashed line are the K/S that were identified by more than 50 percent of architects completing the survey as being *"acquired after licensure."*

K/S WAS ACQUIRED AFTER LICENSURE VS. K/S SHOULD BE ACQUIRED AFTER LICENSURE



For example, ARE K/S #20 "*Knowledge of Building codes and their impact on building design*" had the highest mean importance rating, and while 13.7 percent of architects indicated they acquired the K/S after licensure, only 3.4 percent indicated it should be acquired after licensure. For ARE K/S #15 "*Skill in designing facility layout and site plan that responds to site constraints,*" 6.9 percent of architects said they acquired it after licensure, with only 3.0 percent saying it should be acquired after licensure. The single exception was ARE K/S #130 "*Knowledge of factors involved in conducting architectural practice in international markets,*" for which a higher percentage of architects (48.1 percent) indicated it should be acquired after licensure than their actual experience (31.8 percent). This result is not surprising as this knowledge was rated as the least important of all K/S and primarily impacts only those architects pursuing work internationally.

IMPORTANCE VS. ACQUISITION

Comparing level of importance and point of acquisition readily identifies several K/S that were rated as "*important*" (or greater) and that were acquired after licensure—an imbalance that is less than ideal.

The scatter plot presented earlier illustrates that 15 K/S were identified by more than 50 percent of architects completing the survey as being acquired after licensure (represented by the dots that fall to the right of the vertical, dashed line, in the lower right quadrant of the scatter plot). These 15 K/S (listed in the table below) also were rated as "*important*" or greater by respondents. It is encouraging to note, however, that none of these K/S were rated as "*critical*" (3.5 or greater).

ARE K/S #	KNOWLEDGE/SKILL STATEMENT	ALL LICENSED ARCHITECTS	
		ACQUIRED "*AFTER LICENSURE*"	IMPORTANCE RATING 0 1 2 3 4
132	Financial planning methods to manage revenues, staffing, and overhead expenses.	63.3%	2.49
86	Business development strategies.	59.9%	2.47
87	Relationship between staffing capabilities and hours, and internal project budget to meet established milestones and profitability.	59.7%	2.60
88	Purposes and types of professional liability insurance related to architectural practice.	58.0%	2.53
123	Methods to manage human resources.	54.9%	1.95
6	Client and project characteristics that influence contract agreements.	53.7%	2.96
101	Procedures for processing requests for additional services.	53.7%	2.55
126	Purposes of and legal implications for different types of business entities.	53.3%	1.96
131	Methods and procedures for risk management.	53.3%	2.40
37	Strategies for anticipating, managing, and preventing disputes and conflicts.	53.0%	2.56
97	Sustainability strategies and/or rating systems.	52.2%	2.20
98	Sustainability considerations related to building materials and construction processes.	51.2%	2.27
82	Fee structures, their attributes and implications for schedule, scope, and profit.	51.1%	2.68
100	Methods to identify scope changes that may require additional services.	50.4%	2.77
77	Processes and procedures for building commissioning.	50.3%	1.66

0 = Of little or no importance 1 = Somewhat important 2 = Important 3 = Very important 4 = Critically important

Most of the 15 K/S are related to practice and project management issues, which aligns with findings from the Education-related survey of the Practice Analysis that indicated a need for more focus in these areas. Future committees responsible for the development of various NCARB programs will be charged with determining the best way to support the introduction and acquisition of these important K/S during education and/or internship.

IMPACT ON THE TEST SPECIFICATION

As explained in the Use and Application section of this report, the results of the Practice Analysis drive the development and refinement of the test specification for the ARE. Eleven K/S included in the survey are not covered in the current test specification.

ARE K/S #	KNOWLEDGE/SKILL STATEMENT	IMPORTANCE RATING 0 1 2 3 4
25	Using software to produce two-dimensional (2-D) drawings.	2.98
30	Computer aided design and drafting (CADD) software for producing two-dimensional (2-D) drawings.	2.96
106	Principles of computer-assisted design and drafting (CADD) software and its uses in communicating design ideas.	2.75
26	Using software to produce three-dimensional (3-D) models of building design.	2.37
22	Producing hand drawings of design ideas.	2.31
24	Producing two-dimensional (2-D) drawings using hand methods.	2.00
31	Factors involved in selecting computer-based design technologies.	1.99
28	Use of building information modeling (BIM) to develop and manage databases of building and construction information.	1.96
105	Building information modeling (BIM) and its impact on planning, financial management, and construction documentation.	1.82
27	Producing physical scale models.	1.28
130	Factors involved in conducting architectural practice in international markets.	0.97

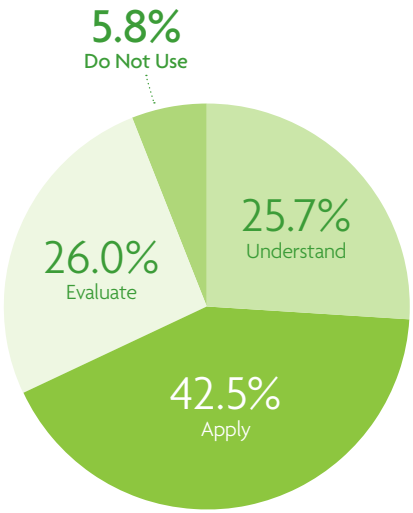
0 = Of little or no importance 1 = Somewhat important 2 = Important 3 = Very important 4 = Critically important

Even though the ARE does not assess these skills, many were rated as "*important*" (mean importance rating of 1.5 or greater) to competent practice. NCARB committees will continue to analyze this data to determine its impact on future versions of the examination. The majority of these K/S are technology based and require early introduction and continuous learning over the course of an architect's career. Therefore, education, internship, and continuing education all share the responsibility in the early introduction of and training in the use of these important tools. Software vendors and their educational resources also play a supporting role in the process.

LEVEL OF KNOWLEDGE/SKILL USE

The Practice Analysis survey also asked architects "*At what level do you typically use the knowledge/skill in your job?*" Based on the mean average rating across all K/S, the most frequently self-reported level of knowledge/skill use by architects was "*apply.*"

LEVEL OF K/S USE: MEAN RESPONSE FOR ALL ITEMS



LEVEL OF USE AND IMPORTANCE

When factoring importance ratings into data analysis, 129 of the 132 K/S surveyed were rated as "*important*" or greater, and 98 of these were indicated as used at the "*apply*" level by respondents.

COUNT OF K/S ITEMS IN LEVEL OF USE AND IMPORTANCE CATEGORIES

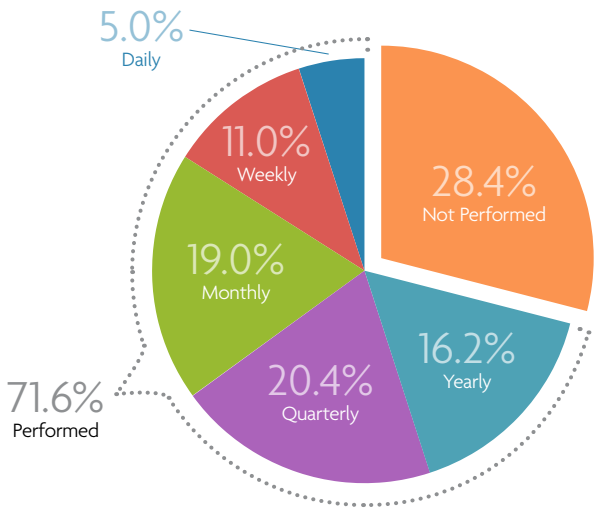
MODAL LEVEL CATEGORY	OF LITTLE OR NO IMPORTANCE	SOMEWHAT IMPORTANT	IMPORTANT	VERY IMPORTANT	CRITICALLY IMPORTANT
Do Not Use	0	2	0	0	0
Understand	0	1	22	1	0
Apply	0	0	41	57	0
Evaluate	0	0	0	**4**	**1**
Multiple Values	0	0	2	1	0

In the table above, the single K/S categorized as "*evaluate*" and "*critically important*" is ARE K/S #20 "*Knowledge of building codes and their impact on building design.*" The other four K/S categorized as "*evaluate*" and rated "*very important*" are: ARE K/S #1 "*Knowledge of oral, written, and visual presentation techniques to communicate project information;*" ARE K/S #15 "*Skill in designing facility layout and site plan that responds to site constraints;*" ARE K/S #71 "*Knowledge of relationship between constructability and aesthetics;*" and ARE K/S #122 "*Knowledge of design decisions and their impact on constructability.*"

FREQUENCY OF TASK PERFORMANCE

For the first time in the history of architecture practice analyses, architects were asked "*How frequently have you performed the task during the past year*?" As identified in the pie chart below, 28.4 percent of responses indicated the task was "*not performed or does not apply*," while 71.6 percent of responses indicated the task was "*performed*" in the past year. When examining the mean response rates in greater detail, the largest number of responses indicated that tasks were performed "*quarterly*" or "*monthly*" at nearly the same rate.

FREQUENCY OF PERFORMANCE



The table below identifies the eight tasks that were rated as "*performed*" by more than 90 percent of respondents. The two most frequently performed tasks, by a significant margin, were ARE Task #106 "*Adhere to ethical standards and codes of professional conduct*" and ARE Task #107 "*Comply with laws and regulations governing the practice of architecture*." The nature of these two tasks is clearly related to the architect's responsibility to protect the public health, safety, and welfare.

ARE TASK #	TASK STATEMENT	FREQUENCY OF PERFORMANCE					PERCENT "PERFORMED"	PERCENT "NOT PERFORMED"
		YEARLY	QUARTERLY	MONTHLY	WEEKLY	DAILY		
106	Adhere to ethical standards and codes of professional conduct.	6.9%	5.2%	5.9%	6.5%	70.8%	95.3%	4.7%
107	Comply with laws and regulations governing the practice of architecture.	8.2%	4.7%	6.4%	6.1%	69.1%	94.6%	5.4%
26	Communicate design ideas to the client graphically.	5.3%	16.0%	27.1%	33.1%	10.6%	92.0%	8.0%
25	Perform building code analysis.	8.2%	21.8%	32.1%	20.3%	9.2%	91.8%	8.2%
67	Coordinate design work of consultants.	5.1%	16.3%	23.7%	32.3%	13.4%	90.8%	9.2%
2	Prepare design alternatives for client review.	4.6%	20.2%	34.5%	25.0%	6.4%	90.6%	9.4%
96	Develop and maintain effective and productive relationships with clients.	5.3%	9.8%	18.4%	25.2%	31.8%	90.5%	9.5%
51	Select materials, finishes and systems based on technical properties and aesthetic requirements.	7.1%	22.2%	29.6%	22.4%	9.1%	90.4%	9.6%

A closer examination of the tasks that were rated by the largest number of architects as performed "*yearly,*" identified in the table below, reveals a few interesting findings. In many instances, these tasks have an even higher rating for "*not performed*" when compared to "*yearly*" performance. These annually performed tasks all relate to practice management issues that are more likely performed by the senior partners or principals of a firm, or by architects practicing in smaller firms where they may be required to assume broader responsibilities than they would in larger firms.

ARE TASK #	TASK STATEMENT	FREQUENCY OF PERFORMANCE					PERCENT "PERFORMED"	PERCENT "NOT PERFORMED"
		YEARLY	QUARTERLY	MONTHLY	WEEKLY	DAILY		
95	Develop business plan for firm.	41.0%	6.2%	2.4%	0.9%	0.1%	50.8%	49.2%
103	Understand firm's legal structure to comply with jurisdictional rules and regulations.	40.7%	11.0%	4.3%	2.0%	1.4%	59.3%	40.7%
94	Determine billing rates.	39.8%	14.0%	7.4%	3.0%	0.6%	64.7%	35.3%
92	Secure insurance policies related to general, automobile, workers' compensation, and professional liability.	39.8%	6.6%	2.9%	0.5%	0.1%	49.8%	50.2%
56	Determine specific insurance requirements to meet contract or business needs.	29.7%	11.9%	5.8%	1.2%	0.3%	48.9%	51.1%
93	Develop strategies to control risk and manage liability.	29.2%	19.1%	11.0%	3.0%	2.9%	65.2%	34.8%

FREQUENCY AND IMPORTANCE

The chart below categorizes the tasks by frequency of performance and level of importance. This comparison will be helpful in refining the content distribution of future versions of the ARE test specification. For example, if two statements are equally rated on the importance scale, and it is not feasible to measure both, it is logical to prioritize the one that is performed more frequently in practice.

COUNT OF TASKS IN FREQUENCY AND IMPORTANCE CATEGORIES

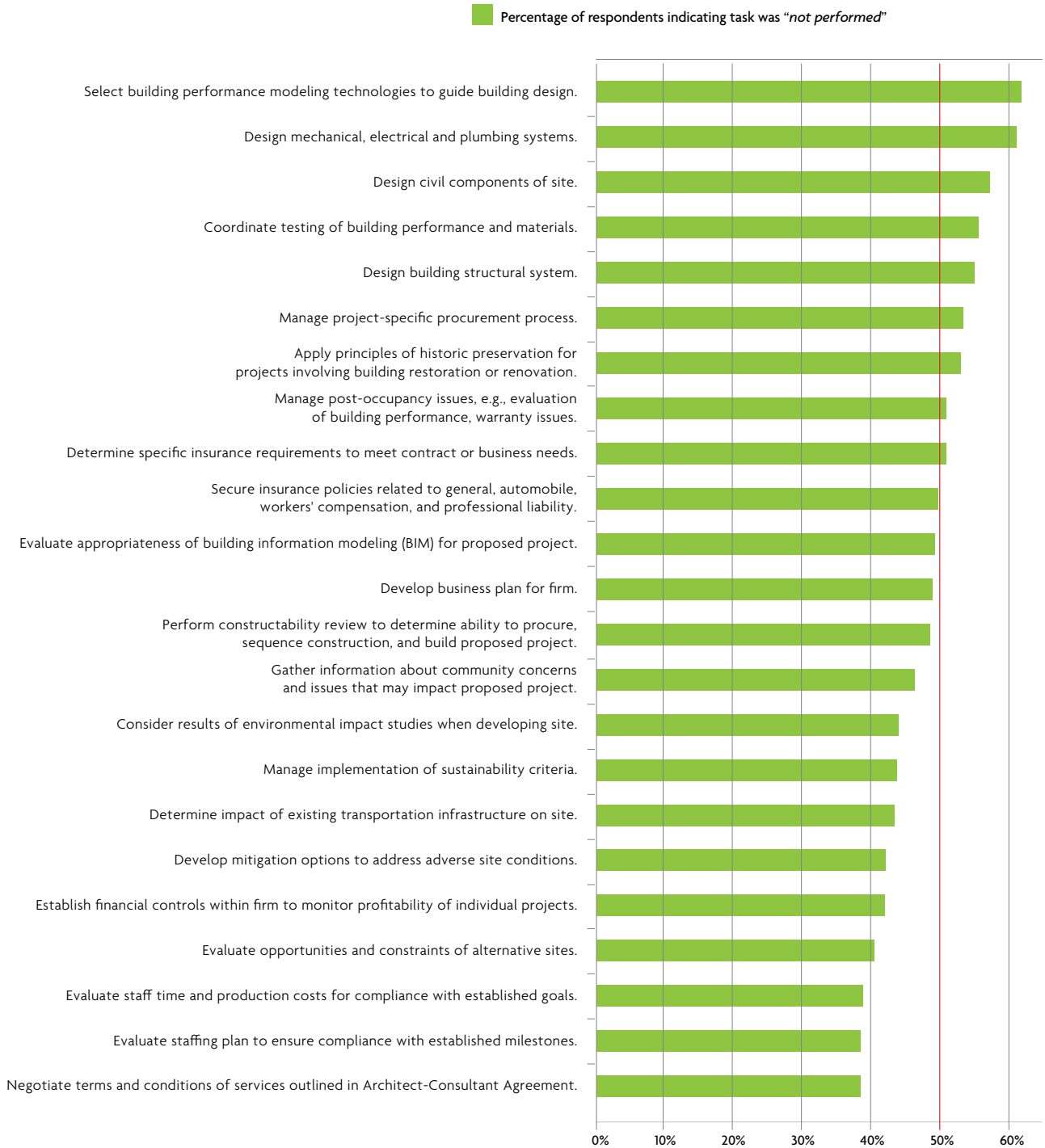
MODAL FREQUENCY CATEGORY	OF LITTLE OR NO IMPORTANCE	SOMEWHAT IMPORTANT	IMPORTANT	VERY IMPORTANT	CRITICALLY IMPORTANT
Multiple Values	0	0	2	0	0
Performed Daily	0	0	0	2	**1**
Performed Weekly	0	0	0	10	0
Performed Monthly	0	0	2	21	**1**
Performed Quarterly	0	0	8	11	0
Performed Yearly	0	0	2	0	0
Not Performed	0	4	**42**	**4**	0

The two tasks identified below were rated "*critically important,*" with one performed daily and the other performed monthly. Once again, it is not surprising that these frequently performed and "*critically important*" tasks are directly tied to public health, safety, and welfare.

ARE TASK #	TASK STATEMENT	FREQUENCY OF PERFORMANCE		IMPORTANCE RATING 0 1 2 3 4
107	Comply with laws and regulations governing the practice of architecture.	Daily	69.1%	3.50
25	Perform building code analysis.	Monthly	32.1%	3.55
0 = Of little or no importance 1 = Somewhat important 2 = Important 3 = Very important 4 = Critically important				

Looking more closely at the frequency vs. importance data, the following 46 tasks were identified as "*not performed*" during the past year yet were also rated as "*very important*" or "*important*."

TASKS IDENTIFIED AS "*IMPORTANT*" OR "*VERY IMPORTANT*" AND ALSO IDENTIFIED AS "*NOT PERFORMED*"



CONTINUED

TASKS IDENTIFIED AS "*IMPORTANT*" OR "*VERY IMPORTANT*" AND ALSO IDENTIFIED AS "*NOT PERFORMED*" (CONT.)

Ten of these 46 tasks were identified as "*not performed*" by 50 percent or more of respondents, as noted in the table below. ARE Task #48 "*Design mechanical, electrical, and plumbing systems*," ARE Task #47 "*Design civil components of site*," and ARE Task #46 "*Design building structural system*" received a high percentage of responses indicating the tasks were "*not performed*." This may be because most architects rely on consultants to "*design*" these significant building systems, with the architect performing important review and critical coordination efforts. Those tasks related to practice management issues such as ARE Task #56 "*Determine specific insurance requirements to meet contract or business needs*" and ARE Task #92 "*Secure insurance policies related to general, automobile, workers' compensation, and professional liability*" may have received a higher percentage of "*not performed*" responses because these annual responsibilities are often only carried out by select principals in the firm and therefore not performed by the majority of staff architects.

ARE TASK #	TASK STATEMENT	PERCENT "NOT PERFORMED"
52	Select building performance modeling technologies to guide building design.	62.2%
48	Design mechanical, electrical, and plumbing systems.	61.5%
47	Design civil components of site.	57.7%
80	Coordinate testing of building performance and materials.	56.0%
46	Design building structural system.	55.5%
86	Manage project-specific procurement process.	53.8%
65	Apply principles of historic preservation for projects involving building restoration or renovation.	53.4%
88	Manage post-occupancy issues, e.g., evaluation of building performance, warranty issues.	51.2%
56	Determine specific insurance requirements to meet contract or business needs.	51.1%
92	Secure insurance policies related to general, automobile, workers' compensation, and professional liability.	50.2%

Regardless of interpretation, these results warrant further research by NCARB's committees to better understand why so many important K/S received a high percentage of "*not performed*" survey responses.

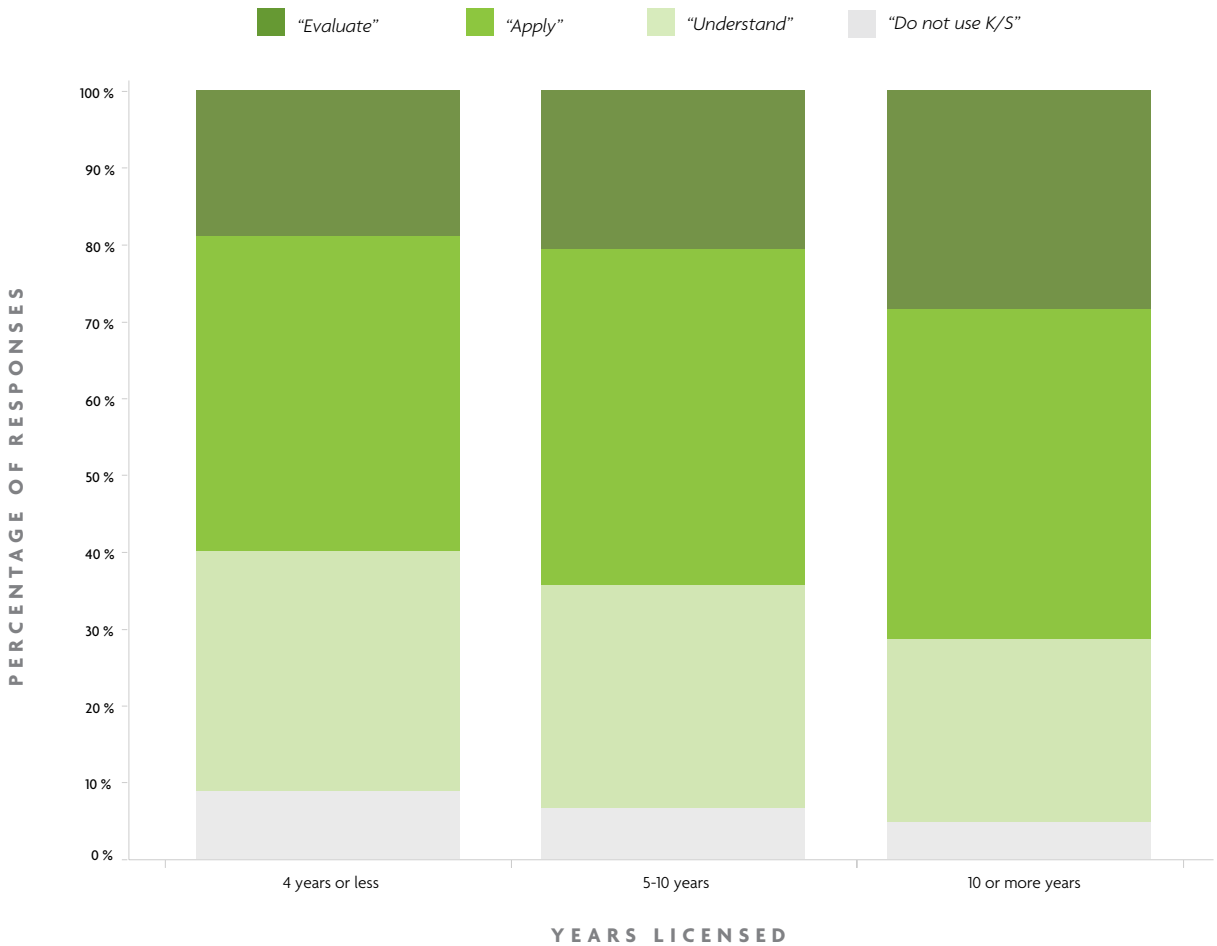
SUBGROUP ANALYSIS

There is little variation in responses when analyzing the data for level of K/S use across two distinct subgroups–years of experience and firm size, although a few differences are worth noting.

KNOWLEDGE/SKILL USE VS. YEARS OF EXPERIENCE

The chart below illustrates responses regarding the level of K/S use ("*understand*," "*apply*," or "*evaluate*") broken down by years licensed. The largest percentage of responses indicating K/S use at the "*understand*" level (31.2 percent) was from architects licensed less than four years. Responses from mid-range practitioners, those licensed five to 10 years, indicated K/S use at the "*apply*" level at the highest rate (43.6 percent). And responses from those licensed more than 10 years indicated the highest K/S use at the "*evaluate*" level (28.3 percent).

LEVEL OF K/S USE, BY YEARS LICENSED

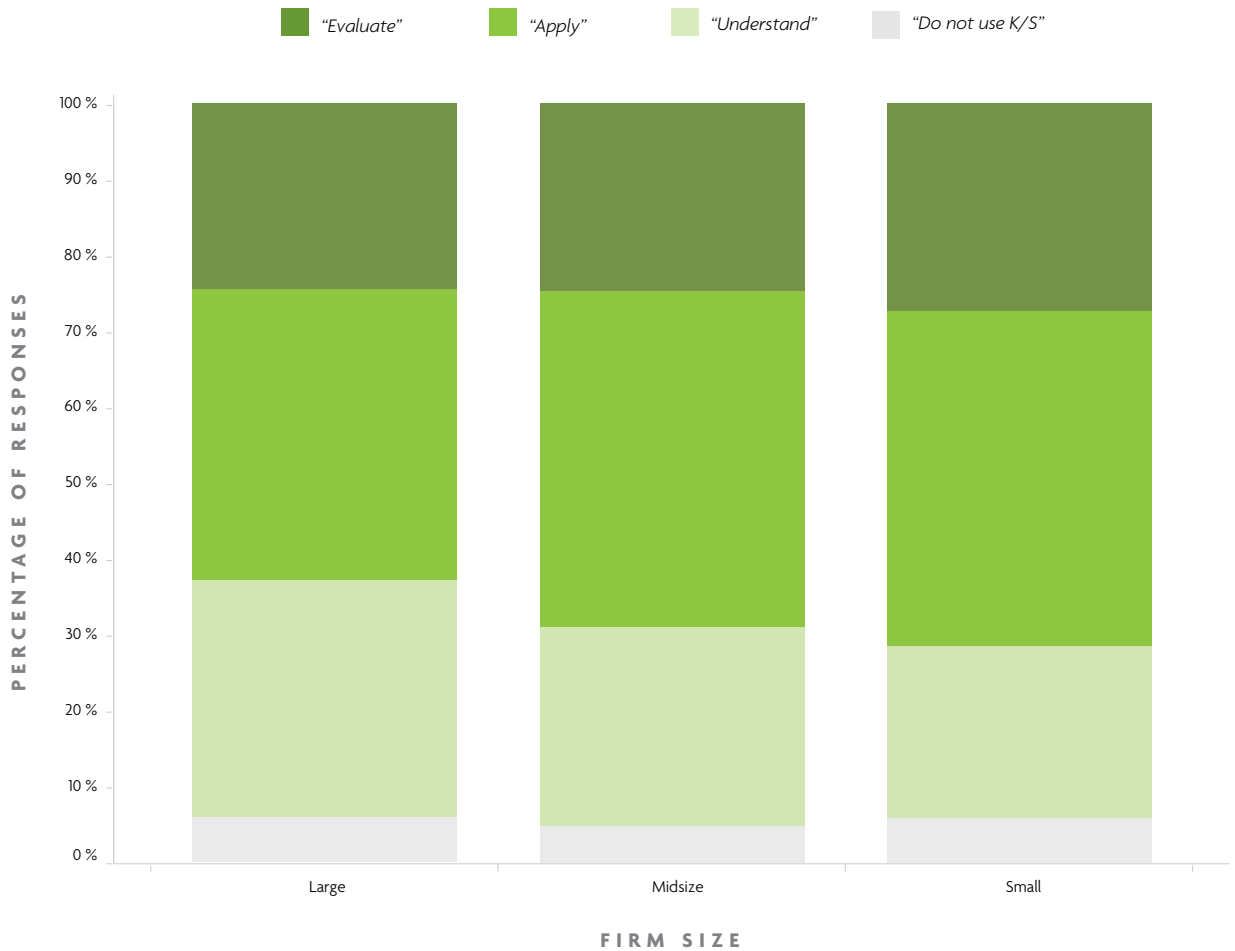


These results are not surprising and clearly indicate that more experienced practitioners tend to have a higher level of ability than more recently licensed architects. Comparing experience across the progression of ability reinforces the need for life-long learning and the value of continuing education to an architect's development over the course of a career.

KNOWLEDGE/SKILL USE VS. SIZE OF FIRM

A second comparison, which looks at level of performance by firm size, also illustrates limited variation in responses. Interestingly, architects practicing in smaller firms (fewer than 10 architects) reported using the K/S at the *"evaluate"* level at a slightly higher rate (27.3 percent) than those in medium (24.6 percent) and large firms (24.5 percent).

LEVEL OF K/S USE, BY FIRM SIZE



While this certainly does not reflect a lesser ability of architects working in larger firms, it does reinforce that architects in smaller practices are typically responsible for performing a broader range of tasks in their daily work. Architects practicing in larger firms may also be more likely to focus on areas of special expertise rather than areas of general practice.

EXAMINATION SURVEY RESULTS

ARE TASK RATINGS

A total of 865 licensed architects responded to the Examination (ARE) task survey and indicated the frequency at which each ARE task was performed and the importance for competent performance by a recently licensed architect practicing independently.

TASK FREQUENCY

Participants rated the frequency with which they perform each of the tasks listed in the ARE A survey by selecting one of the following scale points: "*not performed or does not apply*," "*yearly*," "*quarterly*," "*monthly*," "*weekly*," or "*daily*."

For some of the analyses, task frequency categories higher than "*not performed*" were aggregated (with equal weighting to each category) to derive an overall "*performed*" category.

Data Table D2 lists the percent of architects who rated each task at each level of task frequency. For example, with ARE Task #1 "*Gather information about client's vision, goals, budget, and schedule to validate project scope and program*," 89.6 percent of the architects indicated they perform the task at least once "*yearly*." Specifically, 9.5 percent of the architects indicated "*daily*," 19.5 percent indicated "*weekly*," 28.9 percent indicated "*monthly*," 22.1 percent indicated "*quarterly*," and 9.6 percent indicated "*yearly*."

The chart below displays the distribution of task ratings with respect to the percentage of architects who indicated they performed each of the tasks. For example, 34 tasks were rated as performed by 80 to 90 percent of the responding architects; eight tasks were rated as performed by 90 percent or more of responding architects.

DISTRIBUTION OF ARE TASK RATINGS: PERCENT OF LICENSED ARCHITECTS WHO PERFORM EACH TASK

TASK IMPORTANCE

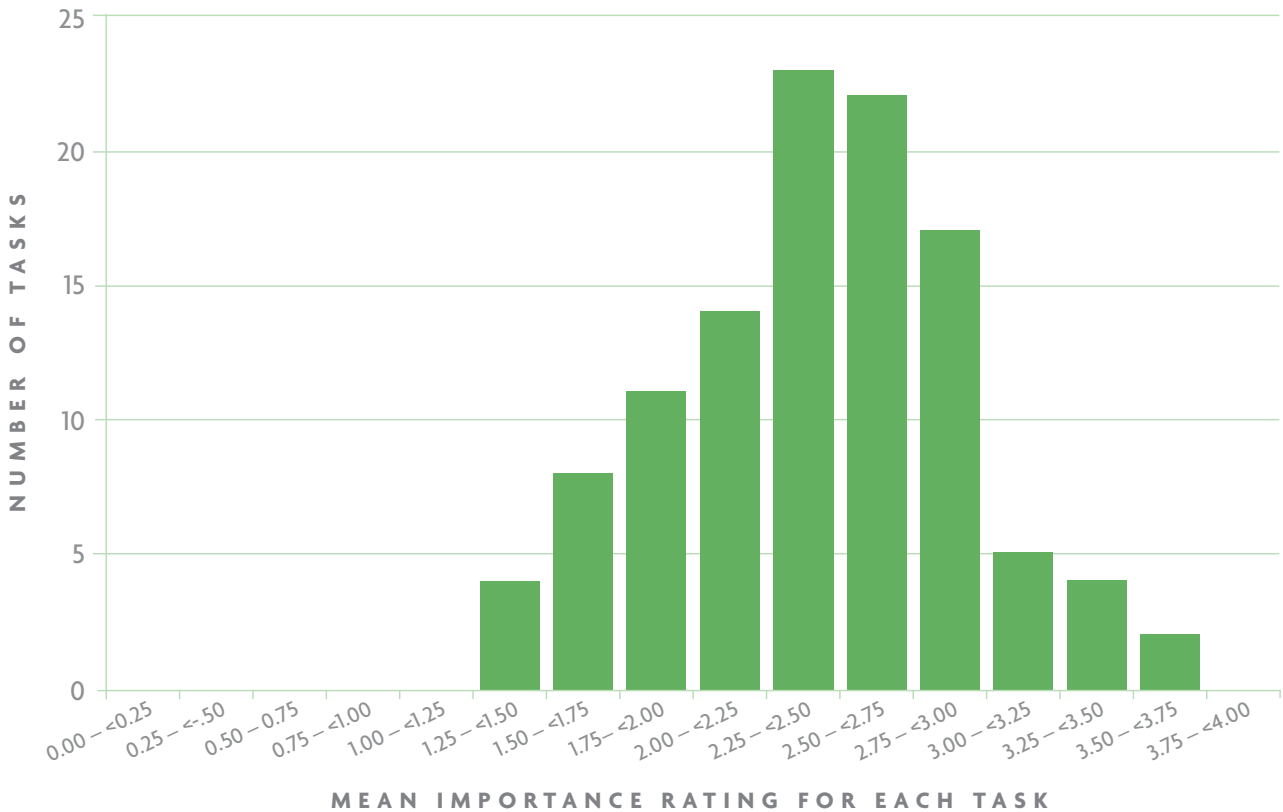
Participants rated the importance of the tasks listed in the ARE A survey by selecting one of the following scale points: "*of little or no importance*," "*somewhat important*," "*important*," "*very important*," or "*critically important*."

Data Table D3 lists the percent of architects who rated each task for each level of task importance. The column labeled "*Percent Imp.*" represents the aggregate percent of ratings of "*important*," "*very important*," and "*critically important*." The mean importance rating is also reported in the column labeled "*Mean Imp.*" and the standard deviation of the importance ratings is reported in the column labeled "*SD Imp.*"

For example, with ARE Task #1 "*Gather information about client's vision, goals, budget, and schedule to validate project scope and program*," 51.3 percent of the architects rated the task as "*critically important*" and 29.6 percent rated the task as "*very important*." The mean importance rating was 3.25 and the standard deviation was 0.94.

The chart below displays the distribution of task mean importance ratings. In this figure, each interval includes the lower bound value, e.g., the interval of 3.50 to 3.75 includes the value 3.50 and excludes the upper bound value. The only exception is with the interval of 3.75 to 4.00, which includes both 3.75 and 4.00. For example, five tasks had a mean importance rating between 3.00 and 3.24.

DISTRIBUTION OF ARE TASK RATINGS: MEAN IMPORTANCE FOR LICENSED ARCHITECTS



TASKS RECOMMENDED FOR ARE CONTENT OUTLINE

The practice analysis ratings were analyzed to identify the ARE tasks that are recommended for consideration to be represented in the content outline and test specification. Tasks were initially recommended for inclusion in the examination if they met each of the following criteria[1] :

1. Mean task importance ≥ 1.5 (between "*somewhat important*" and "*important*")[2], and
2. Percent performed task ≥ 50 percent of architects.

Data Table D4 lists mean importance ratings and percent performed values for each task. As seen in Data Table D4, 87.3 percent of the ARE tasks met both of the above criteria.

The table below displays a cross tabulation of mean task importance with percent performed for 110 ARE tasks that met the above criteria for recommended inclusion. The results indicate that 60.9 percent of the ARE tasks had a mean importance greater than or equal to 2.00 as well as a percent performed of greater than or equal to 66.7 percent. Moreover, 7.3 percent of ARE tasks had a mean importance greater than or equal to 1.50, but less than 2.00, and a percent performed greater than or equal to 50.0 percent but less than 66.7 percent.

		PERCENT PERFORMED TASK				
		<33.0%	33.0% –< 50.0%	50.0% –< 66.7%	>66.7%	ROW SUBTOTAL
MEAN IMPORTANCE	<1.40	1.8%	0.9%	0.0%	0.0%	2.7%
	1.40 –< 1.50	0.0%	0.0%	0.9%	0.0%	0.9%
	1.50 –< 2.00	0.0%	9.1%	7.3%	0.9%	17.3%
	≥ 2.00	0.0%	0.0%	18.2%	60.9%	79.1%
COLUMN SUBTOTAL		1.8%	10.0%	26.4%	61.8%	

Note: The shaded cells represent the percent of ARE tasks that met the criteria for recommended inclusion (mean importance of 1.5 or greater and a percent performed task of 50 percent or greater).

[1] Initial recommended criteria for task inclusion are subject to committee review and modification during the test specification development process.

[2] A mean task importance of 1.5 corresponds to the lower limit of a rating of "*important*" in the present study; this is equivalent to the cut point on mean task importance that was utilized in the *2007 Practice Analysis of Architecture*.

ARE KNOWLEDGE/SKILLS

KNOWLEDGE/SKILL IMPORTANCE RATINGS

A total of 822 licensed architects responded to the Examination (ARE) knowledge/skill (K/S) survey and indicated the importance of each K/S for competent performance by a recently licensed architect practicing independently.

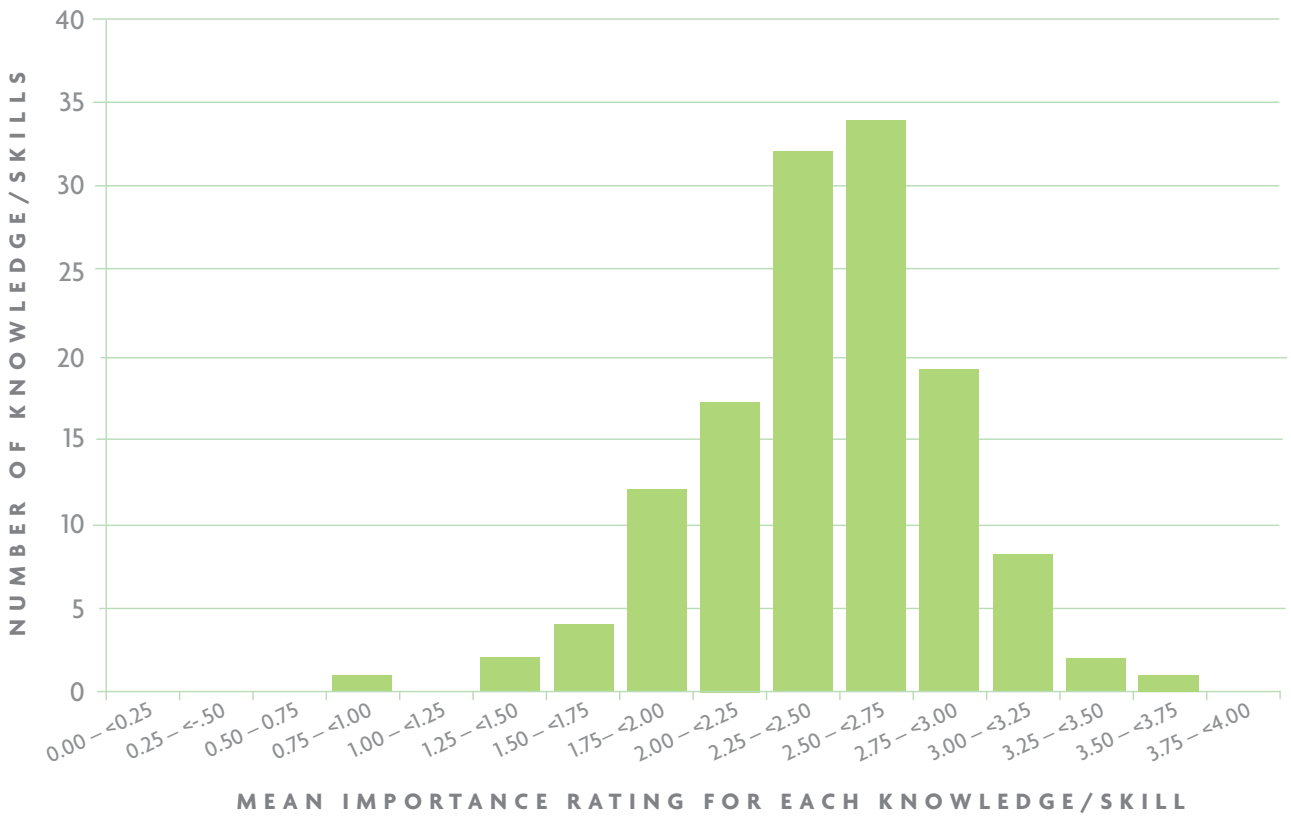
Participants rated the importance of the K/S listed in the ARE C survey by selecting one of the following scale points: "*of little or no importance*," "*somewhat important*," "*important*," "*very important*," or "*critically important*."

Data Table D6 lists the percent of architects who rated each K/S at each level on the importance rating scale. In Data Table D6, the column labeled "*Percent Imp.*" represents the aggregate percent of ratings of "*important*," "*very important*," and "*critically important*." The mean importance rating is also reported in the column labeled "*Mean Imp.*" and the standard deviation of the importance ratings is reported in the column labeled "*SD Imp.*"

For example, with ARE K/S #1 "*Knowledge of oral, written, and visual presentation techniques to communicate project information*," 54.3 percent of the architects rated the K/S as "*critically important*," and 34.1 percent rated the K/S as "*very important*." The mean importance rating was 3.40 and the standard deviation was 0.75.

The chart below displays the distribution of K/S importance ratings. For example, eight K/S items had a mean importance rating between 3.00 and 3.24.

DISTRIBUTION OF ARE K/S RATINGS: MEAN IMPORTANCE FOR LICENSED ARCHITECTS



COGNITIVE LEVELS FOR ARE KNOWLEDGE/SKILLS

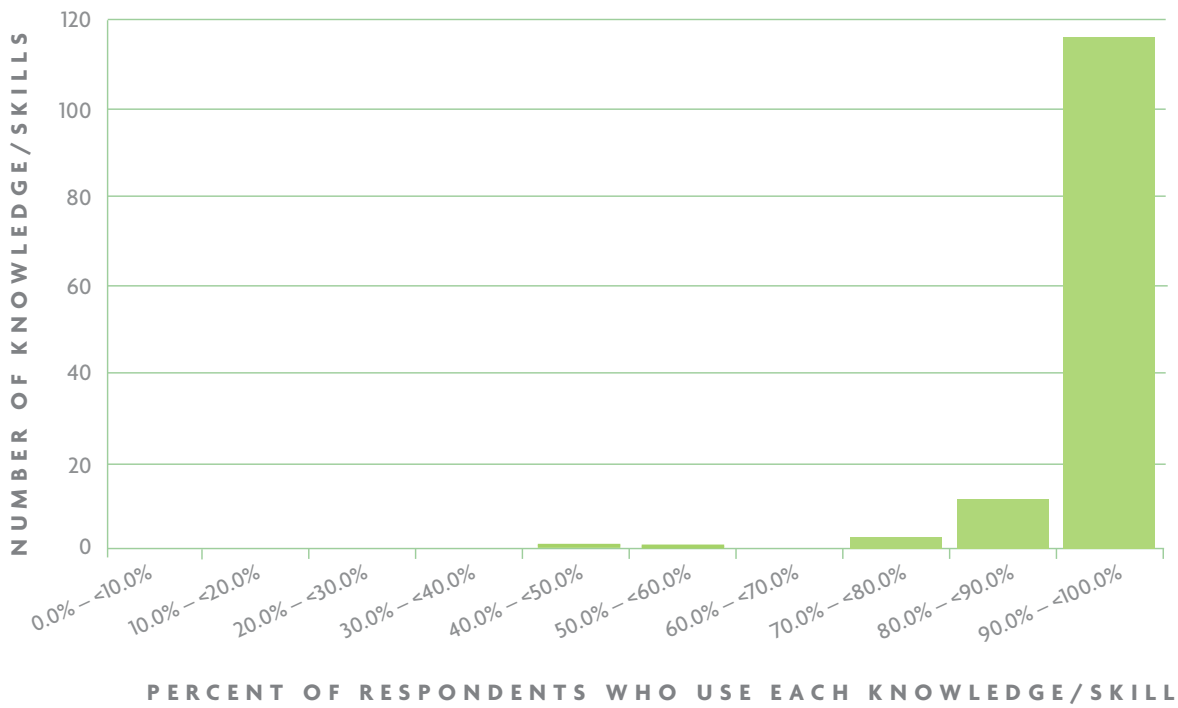
The same group of 822 licensed architects indicated the cognitive level at which they use each of the K/S by selecting one of the following scale categories: "*understand*," "*apply*," "*evaluate*," or "*do not use*."

Data Table D7 lists the percent of architects who indicated the cognitive level for each K/S. The column "*Percent Used*," contains the percent of architects who used the K/S, calculated as the combined percent of ratings of the three cognitive levels.

For example, for ARE K/S #1 "*Knowledge of oral, written, and visual presentation techniques to communicate project information*," 50.6 percent of the architects indicated a cognitive level of "*evaluate*," 45.3 percent indicated "*apply*," 3.6 percent indicated "*understand*," and 0.5 percent indicated "*do not use*." Accordingly, 99.5 percent of architects indicated that they used the task at one of the three cognitive levels.

The chart below displays the distribution of K/S ratings with respect to the percentage of responding architects who indicated they use the K/S. As seen in the figure, the vast majority of the K/S were reportedly used by 90 percent or more architects. (Accordingly, there were very few responses to the follow-up question regarding why a K/S was not used.)

DISTRIBUTION OF ARE K/S RATINGS: PERCENT OF LICENSED ARCHITECTS WHO USE EACH K/S



REASONS WHY ARE KNOWLEDGE/SKILLS WERE NOT USED BY LICENSED ARCHITECTS

The responding architects who indicated they did not use a K/S were asked to indicate why they did not use that K/S by choosing among six reasons. Data Table D10 summarizes the percentage of respondents indicating each reason, as well as the mean, minimum (min) and maximum (max) percentage indicating each reason across the K/S. For example, with ARE K/S #1 "*Knowledge of oral, written, and visual presentation techniques to communicate project information*," all respondents cited "*other*" and were given the chance to type in a reason. None of the following reasons were indicated for not using ARE K/S #1: "*not used in practice*," "*not allowed by jurisdiction*," "*not recommended by legal counsel or insurance carrier*," "*provided by consultant(s)*," or "*lack of experience*."

Data Table D10 also reports the mean percent of ratings across all K/S statements for each of six reasons why they were not used (see bottom section of the table). Of the reasons cited, the most common was "not used in practice" (25.9 percent of ratings), followed by "*lack of experience*" (10.0 percent), and "*provided by consultant(s)*" (9.9 percent). Of all reasons selected, "*not allowed by jurisdiction*" and "*not recommended by legal counsel or insurance carrier*" were the least commonly observed (0.1 percent and 0.5 percent, respectively).

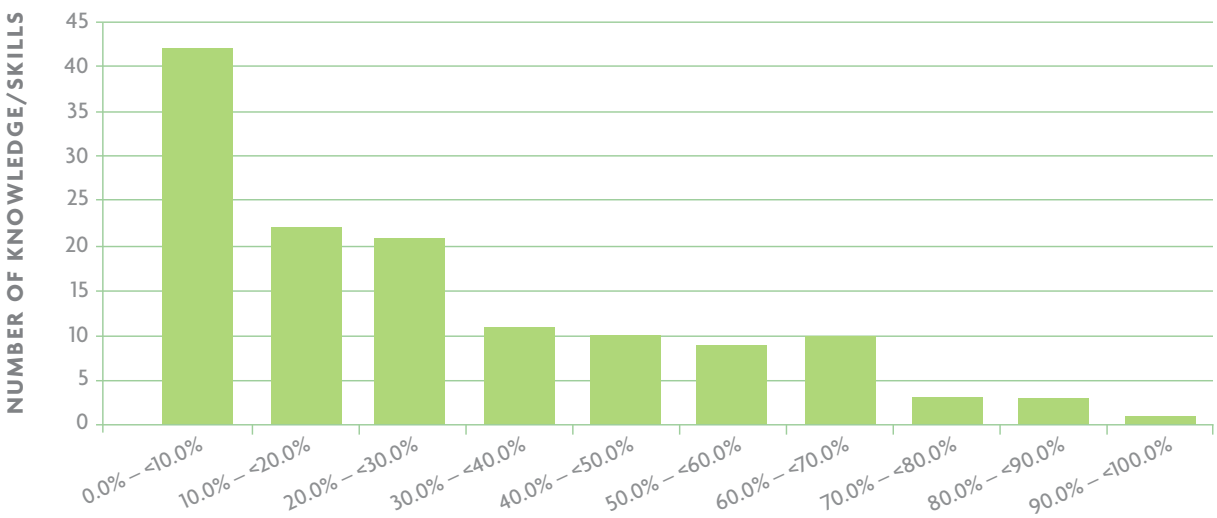
WHEN KNOWLEDGE/SKILLS WERE ACQUIRED

A total of 1,008 licensed architects responded to the ARE B survey and indicated when they acquired each K/S by choosing one of the following categories: "*not acquired*," "*by completion of accredited architecture degree program*," "*during internship*," or "*after licensure*."

Data Table D8 lists the percent of architects who indicated when each K/S was acquired. For example, with ARE K/S #1 "*Knowledge of oral, written, and visual presentation techniques to communicate project information*," 60.4 percent of the architects indicated they acquired the task "*by completion of accredited architecture degree program,*" 26.5 percent indicated "*during internship*," 12.9 percent indicated "*after licensure*," and 0.2 percent indicated "*not acquired*."

The chart below displays the distribution of K/S with respect to the percentage of architects who indicated each K/S was acquired "*by completion of accredited architecture degree program*." For example, one K/S was rated by 90 percent or more architects as being acquired "*by completion of accredited architecture degree program*." Three K/S were rated by 80 to 90 percent of architects as being acquired "*by completion of the degree program*."

DISTRIBUTION OF ARE RATINGS: PERCENT OF LICENSED ARCHITECTS WHO INDICATED K/S IS ACQUIRED "BY COMPLETION OF ACCREDITED ARCHITECTURE DEGREE PROGRAM"



PERCENT OF RESPONDENTS WHO FIRST ACQUIRED EACH KNOWLEDGE/SKILL BY COMPLETION OF ACCREDITED ARCH. DEGREE PROGRAM

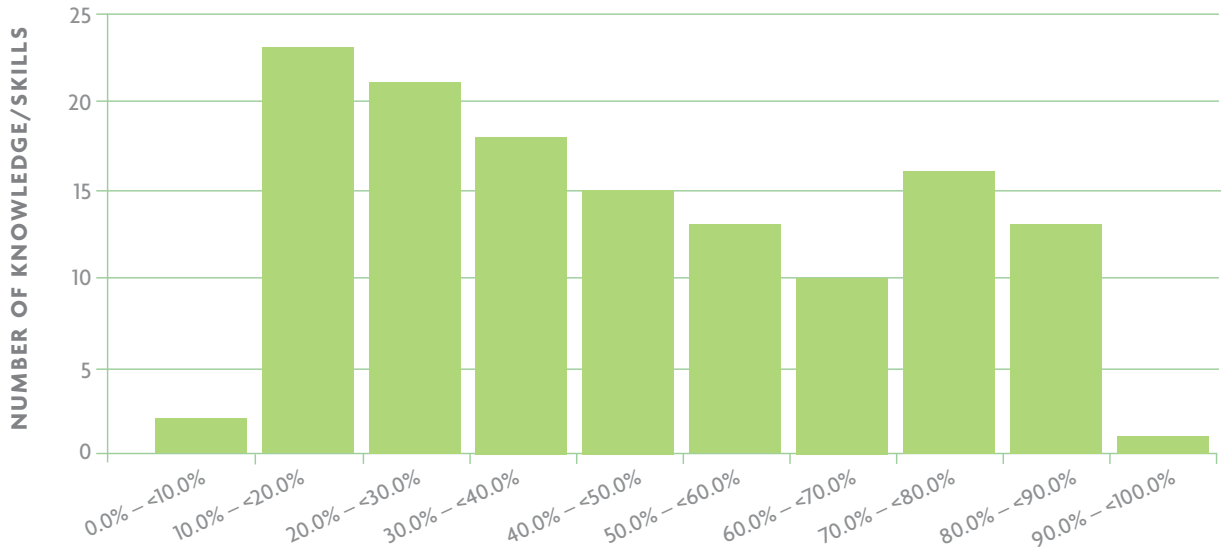
WHEN KNOWLEDGE/SKILLS SHOULD BE ACQUIRED

The same group of 1,008 licensed architects indicated when each K/S should be acquired by selecting one of the following scale values: "*not relevant*," "*by completion of accredited architecture degree program*," "*during internship*," or "*after licensure*."

Data Table D9 lists the percent of licensed architects who rated each K/S. For example, with ARE K/S #1 "*Knowledge of oral, written, and visual presentation techniques to communicate project information*," 70.5 percent of the architects indicated that the K/S should be acquired "*by completion of accredited architecture degree program*," 25.6 percent selected "*during internship*," 3.1 percent indicated "*after licensure*," and 0.8 percent indicated "*not relevant*."

The chart below displays the distribution of K/S with respect to the percentage of architects who indicated each K/S should be acquired "*by completion of accredited architecture degree program*." For example, one K/S was rated by 90 percent or more of the architects as something that should be acquired by completion of their degree program. Additionally, 13 K/S were rated by 80 to 90 percent of responding architects as something that should be acquired by completion of their degree program.

DISTRIBUTION OF K/S RATINGS: MEAN PERCENT OF LICENSED ARCHITECTS INDICATING THE K/S SHOULD BE ACQUIRED BY COMPLETION OF ACCREDITED ARCHITECTURE DEGREE PROGRAM



PERCENT OF RESPONDENTS INDICATING K/S SHOULD BE ACQUIRED BY COMPLETION OF ACCREDITED ARCH. DEGREE PROGRAM

KNOWLEDGE/SKILLS RECOMMENDED FOR ARE CONTENT OUTLINE

Knowledge/skills are recommended for possible inclusion in the ARE if the K/S has a mean importance rating greater than or equal to 1.50. The table below displays the percent of K/S statements within four intervals on the importance scale.

PERCENTAGE BREAKDOWN OF ARE K/S MEAN IMPORTANCE RATINGS

	Mean Knowledge/Skill Importance*			
	<1.40	1.40-1.49	1.50-1.99	>=2.00
Percent of Knowledge/Skill Statements	2.3%	0.0%	12.1%	85.6%

*Importance scale: 0 = of little or no importance; 1 = somewhat important; 2 = important; 3 = very important; or 4 = critically important

QUALITATIVE FINDINGS

Three open-ended questions were included at the end of each Practice Analysis survey.

> *"How do you expect your job in the field of architecture to change over the next few years?"*
> *"What tasks will be performed and what knowledge/skills will be needed to meet changing job demands?"*
> *"If you could change the field of architecture, what is the most important change you would make?"*

Nearly 6,000 survey participants provided qualitative feedback, with many similarities emerging from their responses. The summary below represents the comments and suggestions received from those respondents completing the examination survey.

CHANGES OVER THE NEXT FEW YEARS AND MEETING CHANGING JOB DEMANDS

A total of 2,072 licensed architects who completed the Examination (ARE) survey replied to the questions "*How do you expect your job in the field of architecture to change over the next few years*?" and "*What tasks will be performed and what knowledge/skills will be needed to meet changing job demands*?"

Respondents focused on knowledge and skills architects need and shared thoughts on the future trends of architecture. They addressed topics such as technology and business development. Some mentioned a future increase in the use of BIM and suggested that all architects should learn BIM. Respondents also stated that there will be a trend toward more 3-D drawings (and fewer 2-D drawings), along with the elimination of paper drawings and other documents in favor of electronic documentation.

Respondents also noted several other trends within the profession: they expect to see an increase in outsourcing, life cycle costing, LEED, energy efficiency, and other sustainable design practices.

Some of the knowledge or skills identified as being necessary to thrive in the field of architecture included business skills (business development, management, marketing, communication, and people skills), programming and computer skills (including BIM), keeping current with codes and new materials, and greater collaboration with contractors and coordination with other design professionals.

Respondents also mentioned several challenges they envision, including the architect's increased level of risk in a project and improving public perception about an architect's role throughout the project.

MOST IMPORTANT CHANGES TO MAKE

A total of 2,055 licensed architects responded to the question "I*f you could change the field of architecture, what is the most important change you would make*?" The comments received were similar to the themes that appear in the *NCARB 2012 Focus Group Report*, which will be released in late June 2013 as part of the complete *2012 NCARB Practice Analysis of Architecture* publication, and have been grouped into six major categories:

1. Changing role of the architect
2. Adapting to changing demands
3. Impact of technology on the profession
4. Knowledge and/or skills needed now and in the future
5. Professional practice, accreditation, and licensure
6. NCARB opportunities

Changing Role of the Architect
Respondents suggested that training should adopt a holistic approach and emphasize the practice of architecture rather than architectural style, building type, and narrowly focused specializations. Other respondents suggested offering graduates the option of pursuing general practice or specialty fields as is done in the field of medicine, law, and engineering. Some indicated that architects should act as a "master architect/master builder" and assume a leadership role in the project management/construction management process and reclaim control of the final outcome rather than imposing a design-build process that subordinates the architect to the contractor. Many of the respondents identified the need for architects to educate the public with respect to the skills and responsibilities involved in projects in order to better understand the basis of cost estimates for services.

Adapting to Changing Demands
An overwhelming majority of respondents indicated that educational curricula should include more hands-on experience in the field so that graduates can apply their knowledge and experience to actual construction situations. Some respondents commented that flexible work options should be available to accommodate work-life balance. Opinions were mixed with respect to integration of new standards for energy efficiency, sustainability, LEED, and other green technologies into design. Respondents seemed to be evenly split regarding what should drive the design of buildings—either the fundamentals of good design or the new standards for green technologies.

Impact of Technology on the Profession
The majority of architects recognized BIM, CAD, and other technologies as tools that facilitate workflow; however, they cautioned that these tools should be used to supplement, not replace, an architect's design expertise and understanding of design fundamentals.

Knowledge and/or Skills Needed Now and in the Future
Respondents cited a number of knowledge and skills that are valuable when performing day to day activities such as the understanding of conceptual design, construction sequencing, constructability, building performance, working knowledge of building construction, specification writing and code review, and communication skills.

Professional Practice, Accreditation, and Licensure
Several respondents commented that uniform codes, encompassing IBC, LEED, ASTM, ANSI, and OSHA should be created to simplify compliance. Such codes would assist in standardizing the code review process. A few respondents indicated that architects should approve plans for all residential and commercial buildings.

NCARB Opportunities
The majority of the comments related to future opportunities for NCARB addressed internship and the IDP. Some suggested extending the program to five years. Some suggested using the IDP as a sole pathway to licensure. Others suggested that the IDP should be integrated with the educational curriculum, thus extending the years spent in undergraduate curriculum.

EXAMINATION DATA TABLES

The chart below summarizes the survey population and the research questions related to the task and knowledge/skill (K/S) statements, as well as the various rating scales for the examination surveys. The chart also references the related Examination (ARE) Data Tables.

SURVEY	SURVEY POPULATION	STATEMENT TYPE	RESEARCH QUESTIONS AND RATING SCALES	DATA TABLE
ARE A	All licensed architects	Task	How frequently have you performed the task during the past year? • Not performed or does not apply • Yearly • Quarterly • Monthly • Weekly • Daily	D2
			How important is competent performance of the task by a recently licensed architect practicing independently? • Of little or no importance • Somewhat important • Important • Very important • Critically important	D3

SURVEY	SURVEY POPULATION	STATEMENT TYPE	RESEARCH QUESTIONS AND RATING SCALES	DATA TABLE
ARE B	All licensed architects	Knowledge/ Skill	When did you acquire the knowledge/skill? • Not acquired • By completion of accredited architecture degree program • During internship • After licensure	D8
			When should the knowledge/skill be acquired? • Not relevant, does not apply • By completion of accredited architecture degree program • During internship • After licensure	D9
ARE C	All licensed architects	Knowledge/ Skill	How important is the knowledge/skill to a recently licensed architect practicing independently? • Of little or no importance • Somewhat important • Important • Very important • Critically important	D6
			At what level do you typically use the knowledge/skill in your job? • Do not use knowledge/skill • Understand: General understanding; no specific details are used on the job • Apply: Application of general principles, procedures, skills to typical job scenarios • Evaluate: Use of knowledge/skill to evaluate and refine solutions for job scenarios or designs	D7
			Indicate why you do not use the knowledge/skill. (Select all that apply.) • Not used in my practice • Not allowed by my jurisdiction • Not recommended by my legal counsel or insurance carrier • Provided by consultant(s) • Lack of experience • Other	D10

Data Table D1. List of All ARE Task Statements

TASK #	TASK STATEMENT
1	Gather information about client's vision, goals, budget, and schedule to validate project scope and program.
2	Prepare design alternatives for client review.
3	Establish methods for Architect-Client communication based on project scope of work.
4	Assist client in determining delivery method for construction of project.
5	Determine impact of applicable zoning and development ordinances to determine project constraints.
6	Define roles and responsibilities of team members.
7	Determine scope of services.
8	Determine design fees.
9	Determine project schedule.
10	Evaluate results of feasibility studies to determine project's financial viability.
11	Evaluate results of feasibility studies to determine project's technical viability.
12	Determine impact of existing utilities infrastructure on site.
13	Determine impact of existing transportation infrastructure on site.
14	Assess environmental impact of design decisions.
15	Determine impact of environmental, zoning and other regulations on site.
16	Assess socio-cultural context of the proposed site.
17	Define requirements for site survey based on established project scope.
18	Analyze existing site conditions to determine impact on facility layout.
19	Consider recommendations from geotechnical studies when establishing design parameters.
20	Develop sustainability goals based on existing site environmental conditions.
21	Establish sustainability goals affecting building performance.
22	Consider results of environmental impact studies when developing site.
23	Develop mitigation options to address adverse site conditions.
24	Review legal documents related to site to determine project constraints.
25	Perform building code analysis.
26	Communicate design ideas to the client graphically.
27	Communicate design ideas to the client using hand drawings.
28	Communicate design ideas to client with two-dimensional (2-D) computer aided design software.

TASK #	TASK STATEMENT
29	Communicate design ideas to client with three-dimensional (3-D) computer aided design software.
30	Determine design parameters for building systems.
31	Prepare submittals for regulatory approval.
32	Evaluate opportunities and constraints of alternative sites.
33	Gather information about community concerns and issues that may impact proposed project.
34	Assist Owner in preparing building program including list of spaces and their characteristics.
35	Establish project design goals.
36	Prepare site analysis diagrams to document existing conditions, features, infrastructure, and regulatory requirements.
37	Prepare diagrams illustrating spatial relationships and functional adjacencies.
38	Submit schedule of Architect's services to Owner for each phase.
39	Prepare code analysis documentation.
40	Select technologies to develop and produce design and construction documentation.
41	Coordinate documentation of design team members.
42	Manage project close-out procedures and documentation.
43	Perform quality control reviews throughout the documentation process.
44	Prepare Cost of Work estimates.
45	Update Cost of Work estimates.
46	Design building structural system.
47	Design civil components of site.
48	Design mechanical, electrical and plumbing systems.
49	Design landscape elements for site.
50	Oversee design integration of building components and systems.
51	Select materials, finishes and systems based on technical properties and aesthetic requirements.
52	Select building performance modeling technologies to guide building design.
53	Prepare life cycle cost analysis.
54	Perform constructability review to determine ability to procure, sequence construction, and build proposed project.
55	Prepare final procurement and contract documents.
56	Determine specific insurance requirements to meet contract or business needs.

CONTINUED

Data Table D1. List of All ARE Task Statements

TASK #	TASK STATEMENT
57	Review results from field reports, third-party inspections, and other test results for conformance with contract documents.
58	Manage modifications to the construction contract.
59	Assist Owner in preparing Owner-Contractor Agreement.
60	Respond to Contractor Requests for Information.
61	Prepare proposals for services in response to client requirements.
62	Prepare Owner-Architect agreement.
63	Prepare Architect-Consultant agreement.
64	Negotiate terms and conditions outlined in Owner-Architect Agreement.
65	Apply principles of historic preservation for projects involving building restoration or renovation.
66	Collaborate with stakeholders during design process to maintain design intent and comply with Owner requirements.
67	Coordinate design work of consultants.
68	Select furniture, fixtures and equipment that meet client's design requirements and needs.
69	Negotiate terms and conditions of services outlined in Architect-Consultant Agreement.
70	Establish financial controls within firm to monitor profitability of individual projects.
71	Prepare staffing plan to meet project goals.
72	Establish procedures for documenting project decisions.
73	Monitor project schedule to maintain compliance with established milestones.
74	Evaluate staffing plan to ensure compliance with established milestones.
75	Manage client expectations to align with established milestones and final decision points.
76	Assist client in selecting contractors.
77	Manage implementation of sustainability criteria.
78	Identify changes in project scope that require additional services.
79	Assist Owner in obtaining necessary permits and approvals.
80	Coordinate testing of building performance and materials.
81	Review Application and Certificate for Payment.
82	Review shop drawings and submittals during construction for conformance with design intent.
83	Complete field reports to document field observations from site visit.
84	Manage information exchange during construction.

TASK #	TASK STATEMENT
85	Resolve conflicts that may arise during design and construction process.
86	Manage project-specific procurement process.
87	Establish procedures for building commissioning.
88	Manage post-occupancy issues, e.g., evaluation of building performance, warranty issues.
89	Select design team consultants.
90	Conduct periodic progress meetings with design and project team.
91	Participate in pre-construction, pre-installation and regular progress meetings with design team.
92	Secure insurance policies related to general, automobile, workers' compensation, and professional liability.
93	Develop strategies to control risk and manage liability.
94	Determine billing rates.
95	Develop business plan for firm.
96	Develop and maintain effective and productive relationships with clients.
97	Develop procedures for responding to changes in project scope.
98	Develop procedures for responding to contractor requests (Requests for Information).
99	Develop strategies for responding to Owner requests for proposal (Requests for Proposal, Requests for Qualifications).
100	Review local, state, and federal codes for changes that may impact design and construction.
101	Make staff assignments based on knowledge and skill of staff members.
102	Evaluate staff time and production costs for compliance with established goals.
103	Understand firm's legal structure to comply with jurisdictional rules and regulations.
104	Understand implications of evolving sustainable design strategies and technologies.
105	Understand implications of project delivery methods.
106	Adhere to ethical standards and codes of professional conduct.
107	Comply with laws and regulations governing the practice of architecture.
108	Evaluate appropriateness of building information modeling (BIM) for proposed project.
109	Understand implications of policies and procedures to ensure supervision of design work by architect in responsible charge/control.
110	Monitor performance of design team consultants.

Data Table D2. Percentage Distribution of Task Frequency Ratings

Survey Population: All Licensed Architects

TASK STATEMENT	NOT PERFORMED	Performed					PERCENT PERFORMED	TOTAL N
		YEARLY	QUARTERLY	MONTHLY	WEEKLY	DAILY		
1. Gather information about client's vision, goals, budget, and schedule to validate project scope and program.	10.4%	9.6%	22.1%	28.9%	19.5%	9.5%	89.6%	865
2. Prepare design alternatives for client review.	9.4%	4.6%	20.2%	34.5%	25.0%	6.4%	90.6%	865
3. Establish methods for Architect-Client communication based on project scope of work.	13.3%	8.8%	23.7%	25.0%	21.6%	7.6%	86.7%	865
4. Assist client in determining delivery method for construction of project.	20.9%	17.7%	30.5%	21.0%	8.3%	1.5%	79.1%	865
5. Determine impact of applicable zoning and development ordinances to determine project constraints.	12.7%	14.6%	27.7%	29.0%	12.6%	3.4%	87.3%	865
6. Define roles and responsibilities of team members.	17.5%	10.2%	24.3%	24.3%	16.2%	7.6%	82.5%	865
7. Determine scope of services.	12.8%	7.2%	25.0%	34.0%	17.1%	3.9%	87.2%	865
8. Determine design fees.	20.2%	9.6%	22.1%	28.3%	16.5%	3.2%	79.8%	865
9. Determine project schedule.	11.8%	8.3%	26.4%	32.6%	16.8%	4.2%	88.2%	865
10. Evaluate results of feasibility studies to determine project's financial viability.	38.5%	18.7%	22.8%	14.6%	4.7%	0.7%	61.5%	865
11. Evaluate results of feasibility studies to determine project's technical viability.	32.1%	17.5%	26.0%	16.8%	6.5%	1.2%	67.9%	865
12. Determine impact of existing utilities infrastructure on site.	17.9%	21.0%	31.9%	22.2%	6.4%	0.6%	82.1%	865
13. Determine impact of existing transportation infrastructure on site.	43.6%	23.1%	21.5%	9.6%	2.1%	0.1%	56.4%	865
14. Assess environmental impact of design decisions.	25.2%	19.7%	26.8%	18.6%	7.9%	1.8%	74.8%	865
15. Determine impact of environmental, zoning and other regulations on site.	15.1%	16.9%	29.2%	25.8%	11.0%	2.0%	84.9%	865
16. Assess socio-cultural context of the proposed site.	59.5%	18.2%	13.8%	6.9%	1.5%	0.1%	40.5%	865
17. Define requirements for site survey based on established project scope.	22.0%	25.3%	30.8%	16.9%	4.4%	0.7%	78.0%	865
18. Analyze existing site conditions to determine impact on facility layout.	12.3%	18.5%	34.9%	23.4%	8.4%	2.5%	87.7%	865
19. Consider recommendations from geotechnical studies when establishing design parameters.	22.0%	26.7%	30.4%	17.2%	3.7%	0.0%	78.0%	865
20. Develop sustainability goals based on existing site environmental conditions.	35.6%	23.5%	25.1%	12.7%	2.4%	0.7%	64.4%	865
21. Establish sustainability goals affecting building performance.	29.5%	22.1%	26.8%	15.6%	5.0%	1.0%	70.5%	865
22. Consider results of environmental impact studies when developing site.	44.3%	25.7%	19.1%	8.7%	2.3%	0.0%	55.7%	865
23. Develop mitigation options to address adverse site conditions.	42.3%	28.6%	16.9%	8.4%	3.2%	0.6%	57.7%	865
24. Review legal documents related to site to determine project constraints.	33.5%	25.4%	22.1%	13.5%	4.5%	0.9%	66.5%	865
25. Perform building code analysis.	8.2%	8.2%	21.8%	32.1%	20.3%	9.2%	91.8%	865
26. Communicate design ideas to the client graphically.	8.0%	5.3%	16.0%	27.1%	33.1%	10.6%	92.0%	865
27. Communicate design ideas to the client using hand drawings.	17.6%	11.0%	20.8%	24.2%	21.4%	5.1%	82.4%	865
28. Communicate design ideas to client with two-dimensional (2-D) computer aided design software.	18.4%	3.5%	12.9%	23.0%	29.7%	12.5%	81.6%	865
29. Communicate design ideas to client with three-dimensional (3-D) computer aided design software.	31.6%	10.6%	20.0%	20.9%	12.4%	4.5%	68.4%	865

Total N = number of respondents

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Data Table D2. Percentage Distribution of Task Frequency Ratings

Survey Population: All Licensed Architects

TASK STATEMENT	NOT PERFORMED	Performed					PERCENT PERFORMED	TOTAL N
		YEARLY	QUARTERLY	MONTHLY	WEEKLY	DAILY		
30. Determine design parameters for building systems.	16.6%	13.6%	30.4%	24.9%	11.0%	3.5%	83.4%	865
31. Prepare submittals for regulatory approval.	15.8%	14.9%	33.3%	25.1%	8.8%	2.1%	84.2%	865
32. Evaluate opportunities and constraints of alternative sites.	40.8%	27.3%	19.9%	9.0%	2.4%	0.6%	59.2%	865
33. Gather information about community concerns and issues that may impact proposed project.	46.6%	28.7%	17.2%	5.5%	1.8%	0.1%	53.4%	865
34. Assist Owner in preparing building program including list of spaces and their characteristics.	18.5%	23.4%	31.0%	19.1%	6.7%	1.4%	81.5%	865
35. Establish project design goals.	13.5%	17.2%	31.0%	24.0%	11.0%	3.2%	86.5%	865
36. Prepare site analysis diagrams to document existing conditions, features, infrastructure, and regulatory requirements.	27.1%	23.7%	29.7%	14.7%	3.9%	0.9%	72.9%	865
37. Prepare diagrams illustrating spatial relationships and functional adjacencies.	22.9%	21.3%	27.7%	17.1%	9.0%	2.0%	77.1%	865
38. Submit schedule of Architect's services to Owner for each phase.	34.1%	12.6%	27.1%	21.7%	4.0%	0.5%	65.9%	865
39. Prepare code analysis documentation.	13.5%	16.3%	27.7%	28.7%	10.2%	3.6%	86.5%	865
40. Select technologies to develop and produce design and construction documentation.	31.2%	27.1%	16.9%	13.6%	7.3%	3.9%	68.8%	865
41. Coordinate documentation of design team members.	14.1%	5.7%	16.9%	19.3%	27.6%	16.4%	85.9%	865
42. Manage project close-out procedures and documentation.	21.8%	27.3%	30.8%	14.3%	5.0%	0.8%	78.2%	865
43. Perform quality control reviews throughout the documentation process.	17.0%	7.5%	20.9%	27.3%	19.4%	7.9%	83.0%	865
44. Prepare Cost of Work estimates.	33.5%	14.1%	27.5%	19.2%	4.4%	1.3%	66.5%	865
45. Update Cost of Work estimates.	36.4%	13.2%	25.1%	20.5%	4.2%	0.7%	63.6%	865
46. Design building structural system.	55.5%	12.4%	16.5%	11.0%	4.2%	0.5%	44.5%	865
47. Design civil components of site.	57.7%	15.7%	15.8%	7.6%	2.8%	0.3%	42.3%	865
48. Design mechanical, electrical and plumbing systems.	61.5%	10.4%	15.3%	8.7%	3.1%	1.0%	38.5%	865
49. Design landscape elements for site.	46.9%	24.9%	18.6%	7.1%	2.0%	0.6%	53.1%	865
50. Oversee design integration of building components and systems.	14.3%	9.2%	23.7%	25.3%	16.4%	11.0%	85.7%	865
51. Select materials, finishes and systems based on technical properties and aesthetic requirements.	9.6%	7.1%	22.2%	29.6%	22.4%	9.1%	90.4%	865
52. Select building performance modeling technologies to guide building design.	62.2%	14.1%	13.6%	7.3%	1.6%	1.2%	37.8%	865
53. Prepare life cycle cost analysis.	69.7%	17.3%	8.3%	3.4%	1.2%	0.1%	30.3%	865
54. Perform constructability review to determine ability to procure, sequence construction, and build proposed project.	48.8%	17.0%	17.3%	10.6%	4.7%	1.5%	51.2%	865
55. Prepare final procurement and contract documents.	20.8%	13.6%	21.4%	23.4%	11.8%	9.0%	79.2%	865
56. Determine specific insurance requirements to meet contract or business needs.	51.1%	29.7%	11.9%	5.8%	1.2%	0.3%	48.9%	865
57. Review results from field reports, third-party inspections, and other test results for conformance with contract documents.	19.4%	15.5%	22.8%	25.1%	13.4%	3.8%	80.6%	865
58. Manage modifications to the construction contract.	25.3%	12.1%	19.4%	25.4%	13.2%	4.5%	74.7%	865

Total N = number of respondents

CONTINUED

Data Table D2. Percentage Distribution of Task Frequency Ratings

Survey Population: All Licensed Architects

TASK STATEMENT	NOT PERFORMED	Performed					PERCENT PERFORMED	TOTAL N
		YEARLY	QUARTERLY	MONTHLY	WEEKLY	DAILY		
59. Assist Owner in preparing Owner-Contractor Agreement.	38.6%	20.2%	26.5%	12.6%	1.8%	0.2%	61.4%	865
60. Respond to Contractor Requests for Information.	10.1%	4.2%	12.1%	23.2%	33.8%	16.6%	89.9%	865
61. Prepare proposals for services in response to client requirements.	19.3%	9.8%	23.1%	29.6%	15.3%	2.9%	80.7%	865
62. Prepare Owner-Architect agreement.	28.2%	17.1%	25.0%	23.5%	5.4%	0.8%	71.8%	865
63. Prepare Architect-Consultant agreement.	34.7%	18.2%	23.1%	19.9%	3.9%	0.2%	65.3%	865
64. Negotiate terms and conditions outlined in Owner-Architect Agreement.	34.7%	17.6%	25.0%	17.2%	5.0%	0.6%	65.3%	865
65. Apply principles of historic preservation for projects involving building restoration or renovation.	53.4%	24.0%	12.1%	6.2%	2.8%	1.4%	46.6%	865
66. Collaborate with stakeholders during design process to maintain design intent and comply with Owner requirements.	26.4%	12.6%	22.1%	23.5%	12.9%	2.5%	73.6%	865
67. Coordinate design work of consultants.	9.2%	5.1%	16.3%	23.7%	32.3%	13.4%	90.8%	865
68. Select furniture, fixtures and equipment that meet client's design requirements and needs.	36.2%	18.4%	20.3%	15.5%	7.9%	1.7%	63.8%	865
69. Negotiate terms and conditions of services outlined in Architect-Consultant Agreement.	38.7%	17.8%	23.1%	16.3%	3.1%	0.9%	61.3%	865
70. Establish financial controls within firm to monitor profitability of individual projects.	42.2%	12.1%	15.3%	18.0%	9.2%	3.1%	57.8%	865
71. Prepare staffing plan to meet project goals.	36.8%	10.9%	13.1%	18.8%	17.8%	2.7%	63.2%	865
72. Establish procedures for documenting project decisions.	24.0%	19.3%	19.8%	19.5%	11.8%	5.5%	76.0%	865
73. Monitor project schedule to maintain compliance with established milestones.	13.6%	7.2%	15.6%	25.2%	33.5%	4.9%	86.4%	865
74. Evaluate staffing plan to ensure compliance with established milestones.	38.7%	7.1%	10.8%	20.9%	20.1%	2.4%	61.3%	865
75. Manage client expectations to align with established milestones and final decision points.	18.2%	8.2%	17.0%	28.3%	22.7%	5.7%	81.8%	865
76. Assist client in selecting contractors.	23.6%	21.0%	33.1%	18.6%	3.2%	0.5%	76.4%	865
77. Manage implementation of sustainability criteria.	44.0%	14.9%	21.2%	14.3%	4.0%	1.5%	56.0%	865
78. Identify changes in project scope that require additional services.	13.4%	10.9%	25.1%	32.6%	14.3%	3.7%	86.6%	865
79. Assist Owner in obtaining necessary permits and approvals.	17.1%	14.9%	30.9%	25.7%	8.7%	2.7%	82.9%	864
80. Coordinate testing of building performance and materials.	56.0%	17.2%	16.0%	8.3%	1.8%	0.7%	44.0%	865
81. Review Application and Certificate for Payment.	24.5%	8.4%	12.5%	49.7%	4.5%	0.3%	75.5%	865
82. Review shop drawings and submittals during construction for conformance with design intent.	13.2%	6.9%	16.0%	28.2%	29.5%	6.2%	86.8%	865
83. Complete field reports to document field observations from site visit.	19.9%	8.0%	14.5%	30.2%	26.1%	1.4%	80.1%	865
84. Manage information exchange during construction.	17.9%	4.0%	12.3%	19.5%	27.2%	19.1%	82.1%	865
85. Resolve conflicts that may arise during design and construction process.	11.8%	9.8%	16.4%	23.5%	24.4%	14.1%	88.2%	865
86. Manage project-specific procurement process.	53.8%	10.8%	15.1%	13.3%	6.2%	0.8%	46.2%	865
87. Establish procedures for building commissioning.	69.6%	14.0%	11.9%	3.5%	1.0%	0.0%	30.4%	865

Total N = number of respondents

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Data Table D2. Percentage Distribution of Task Frequency Ratings

Survey Population: All Licensed Architects

TASK STATEMENT	NOT PERFORMED	Performed					PERCENT PERFORMED	TOTAL N
		YEARLY	QUARTERLY	MONTHLY	WEEKLY	DAILY		
88. Manage post-occupancy issues, e.g., evaluation of building performance, warranty issues.	51.2%	27.7%	14.0%	5.0%	1.7%	0.3%	48.8%	865
89. Select design team consultants.	21.8%	18.2%	30.6%	24.0%	4.3%	1.0%	78.2%	865
90. Conduct periodic progress meetings with design and project team.	11.4%	5.3%	14.9%	35.5%	31.7%	1.2%	88.6%	865
91. Participate in pre-construction, pre-installation and regular progress meetings with design team.	16.0%	8.1%	20.0%	34.0%	20.6%	1.4%	84.0%	865
92. Secure insurance policies related to general, automobile, workers' compensation, and professional liability.	50.2%	39.8%	6.6%	2.9%	0.5%	0.1%	49.8%	865
93. Develop strategies to control risk and manage liability.	34.8%	29.2%	19.1%	11.0%	3.0%	2.9%	65.2%	865
94. Determine billing rates.	35.3%	39.8%	14.0%	7.4%	3.0%	0.6%	64.7%	865
95. Develop business plan for firm.	49.2%	41.0%	6.2%	2.4%	0.9%	0.1%	50.8%	865
96. Develop and maintain effective and productive relationships with clients.	9.5%	5.3%	9.8%	18.4%	25.2%	31.8%	90.5%	865
97. Develop procedures for responding to changes in project scope.	21.5%	20.8%	21.0%	22.8%	11.1%	2.8%	78.5%	865
98. Develop procedures for responding to contractor requests (Requests for Information).	23.6%	24.4%	18.0%	13.8%	13.6%	6.6%	76.4%	865
99. Develop strategies for responding to Owner requests for proposal (Requests for Proposal, Requests for Qualifications).	28.0%	23.2%	23.4%	15.1%	8.6%	1.7%	72.0%	865
100. Review local, state, and federal codes for changes that may impact design and construction.	11.0%	26.5%	28.4%	22.0%	8.0%	4.2%	89.0%	865
101. Make staff assignments based on knowledge and skill of staff members.	36.8%	6.7%	12.8%	19.7%	18.8%	5.2%	63.2%	865
102. Evaluate staff time and production costs for compliance with established goals.	39.1%	7.9%	13.4%	24.0%	14.1%	1.5%	60.9%	865
103. Understand firm's legal structure to comply with jurisdictional rules and regulations.	40.7%	40.7%	11.0%	4.3%	2.0%	1.4%	59.3%	865
104. Understand implications of evolving sustainable design strategies and technologies.	26.7%	24.3%	25.3%	17.3%	4.3%	2.1%	73.3%	865
105. Understand implications of project delivery methods.	21.5%	25.5%	27.4%	18.5%	5.4%	1.6%	78.5%	865
106. Adhere to ethical standards and codes of professional conduct.	4.7%	6.9%	5.2%	5.9%	6.5%	70.8%	95.3%	865
107. Comply with laws and regulations governing the practice of architecture.	5.4%	8.2%	4.7%	6.4%	6.1%	69.1%	94.6%	865
108. Evaluate appropriateness of building information modeling (BIM) for proposed project.	49.5%	10.9%	19.9%	12.3%	5.1%	2.4%	50.5%	865
109. Understand implications of policies and procedures to ensure supervision of design work by architect in responsible charge/control.	26.1%	13.1%	11.4%	14.5%	13.6%	21.3%	73.9%	865
110. Monitor performance of design team consultants.	11.0%	5.8%	11.9%	31.1%	33.1%	7.2%	89.0%	865
MEAN	28.4%	16.2%	20.4%	19.0%	11.0%	5.0%	71.6%	865
MIN	4.7%	3.5%	4.7%	2.4%	0.5%	0.0%	30.3%	864
MAX	69.7%	41.0%	34.9%	49.7%	33.8%	70.8%	95.3%	865

Total N = number of respondents

Data Table D3. Percentage Distribution of Task Importance Ratings

Survey Population: All Licensed Architects

TASK STATEMENT	Task Importance					MEAN IMP.	SD IMP	PERCENT IMP.	TOTAL N
	0	1	2	3	4				
	OF LITTLE OR NO IMP.	SOMEWHAT IMP.	IMP.	VERY IMP.	CRITICALLY IMP.				
1. Gather information about client's vision, goals, budget, and schedule to validate project scope and program.	1.3%	4.6%	13.2%	29.6%	51.3%	3.25	0.94	94.1%	865
2. Prepare design alternatives for client review.	0.2%	3.7%	19.3%	41.6%	35.1%	3.08	0.84	96.1%	865
3. Establish methods for Architect-Client communication based on project scope of work.	2.9%	8.4%	27.2%	34.5%	27.1%	2.74	1.04	88.7%	865
4. Assist client in determining delivery method for construction of project.	3.1%	15.6%	37.2%	30.8%	13.3%	2.35	1.00	81.3%	865
5. Determine impact of applicable zoning and development ordinances to determine project constraints.	1.0%	3.9%	16.5%	31.0%	47.5%	3.20	0.92	95.0%	865
6. Define roles and responsibilities of team members.	4.5%	15.1%	32.1%	33.1%	15.1%	2.39	1.06	80.3%	865
7. Determine scope of services.	1.7%	5.2%	17.8%	36.8%	38.5%	3.05	0.96	93.1%	865
8. Determine design fees.	3.2%	6.1%	18.3%	34.7%	37.7%	2.97	1.05	90.6%	865
9. Determine project schedule.	1.7%	7.6%	28.7%	41.0%	20.9%	2.72	0.94	90.6%	865
10. Evaluate results of feasibility studies to determine project's financial viability.	7.6%	26.2%	30.2%	22.9%	13.1%	2.08	1.15	66.1%	865
11. Evaluate results of feasibility studies to determine project's technical viability.	5.1%	16.6%	32.9%	29.8%	15.5%	2.34	1.08	78.3%	865
12. Determine impact of existing utilities infrastructure on site.	3.5%	15.3%	34.3%	32.5%	14.5%	2.39	1.02	81.3%	865
13. Determine impact of existing transportation infrastructure on site.	14.6%	32.4%	34.5%	14.3%	4.3%	1.61	1.04	53.1%	865
14. Assess environmental impact of design decisions.	6.8%	16.1%	35.6%	31.0%	10.5%	2.22	1.06	77.1%	865
15. Determine impact of environmental, zoning and other regulations on site.	2.3%	8.3%	25.8%	35.8%	27.7%	2.78	1.02	89.4%	865
16. Assess socio-cultural context of the proposed site.	23.9%	35.1%	27.4%	10.6%	2.9%	1.33	1.04	40.9%	865
17. Define requirements for site survey based on established project scope.	3.1%	18.3%	35.7%	29.7%	13.2%	2.32	1.02	78.6%	865
18. Analyze existing site conditions to determine impact on facility layout.	1.2%	6.1%	22.8%	42.4%	27.5%	2.89	0.92	92.7%	865
19. Consider recommendations from geotechnical studies when establishing design parameters.	3.9%	11.7%	31.0%	32.0%	21.4%	2.55	1.07	84.4%	865
20. Develop sustainability goals based on existing site environmental conditions.	8.7%	23.0%	36.3%	25.3%	6.7%	1.98	1.05	68.3%	865
21. Establish sustainability goals affecting building performance.	7.2%	20.9%	32.3%	30.6%	9.0%	2.13	1.07	71.9%	865
22. Consider results of environmental impact studies when developing site.	6.9%	20.2%	38.3%	25.3%	9.2%	2.10	1.05	72.8%	865
23. Develop mitigation options to address adverse site conditions.	7.9%	23.9%	33.8%	24.9%	9.6%	2.04	1.09	68.2%	865
24. Review legal documents related to site to determine project constraints.	5.9%	15.5%	28.9%	31.4%	18.3%	2.41	1.13	78.6%	865
25. Perform building code analysis.	0.3%	0.9%	7.5%	26.0%	65.2%	3.55	0.70	98.7%	865
26. Communicate design ideas to the client graphically.	0.7%	1.4%	11.1%	45.7%	41.2%	3.25	0.76	97.9%	865
27. Communicate design ideas to the client using hand drawings.	7.4%	15.8%	26.2%	33.8%	16.8%	2.37	1.15	76.8%	865
28. Communicate design ideas to client with two-dimensional (2-D) computer aided design software.	3.9%	8.0%	26.0%	39.7%	22.4%	2.69	1.03	88.1%	865
29. Communicate design ideas to client with three-dimensional (3-D) computer aided design software.	6.6%	16.3%	29.1%	33.4%	14.6%	2.33	1.11	77.1%	865

Total N = number of respondents

CONTINUED

Data Table D3. Percentage Distribution of Task Importance Ratings

Survey Population: All Licensed Architects

TASK STATEMENT	Task Importance					MEAN IMP.	SD IMP	PERCENT IMP.	TOTAL N
	0	1	2	3	4				
	OF LITTLE OR NO IMP.	SOMEWHAT IMP.	IMP.	VERY IMP.	CRITICALLY IMP.				
30. Determine design parameters for building systems.	1.8%	7.7%	35.4%	37.9%	17.1%	2.61	0.92	90.4%	865
31. Prepare submittals for regulatory approval.	2.2%	6.9%	20.9%	37.0%	32.9%	2.92	1.00	90.9%	865
32. Evaluate opportunities and constraints of alternative sites.	8.4%	21.3%	38.4%	25.9%	6.0%	2.00	1.03	70.3%	865
33. Gather information about community concerns and issues that may impact proposed project.	9.1%	31.0%	34.6%	19.0%	6.4%	1.82	1.04	59.9%	865
34. Assist Owner in preparing building program including list of spaces and their characteristics.	1.5%	6.1%	25.7%	40.1%	26.6%	2.84	0.94	92.4%	865
35. Establish project design goals.	1.7%	4.5%	29.7%	38.6%	25.4%	2.82	0.92	93.8%	865
36. Prepare site analysis diagrams to document existing conditions, features, infrastructure, and regulatory requirements.	3.4%	12.8%	32.6%	34.6%	16.6%	2.48	1.02	83.8%	865
37. Prepare diagrams illustrating spatial relationships and functional adjacencies.	3.9%	12.0%	30.2%	37.0%	16.9%	2.51	1.03	84.0%	865
38. Submit schedule of Architect's services to Owner for each phase.	5.3%	16.6%	29.8%	33.6%	14.6%	2.35	1.08	78.0%	865
39. Prepare code analysis documentation.	1.8%	4.6%	18.4%	37.0%	38.2%	3.05	0.96	93.5%	865
40. Select technologies to develop and produce design and construction documentation.	8.8%	20.7%	33.3%	26.7%	10.5%	2.09	1.11	70.5%	865
41. Coordinate documentation of design team members.	2.2%	5.7%	20.6%	36.1%	35.5%	2.97	0.99	92.1%	865
42. Manage project close-out procedures and documentation.	3.0%	14.3%	32.9%	36.3%	13.4%	2.43	0.99	82.7%	865
43. Perform quality control reviews throughout the documentation process.	2.9%	8.1%	23.0%	36.6%	29.4%	2.82	1.04	89.0%	865
44. Prepare Cost of Work estimates.	7.7%	18.7%	33.8%	28.8%	11.0%	2.17	1.09	73.5%	865
45. Update Cost of Work estimates.	9.2%	21.7%	34.3%	25.8%	8.9%	2.03	1.10	69.0%	865
46. Design building structural system.	13.6%	23.7%	26.7%	22.4%	13.5%	1.98	1.24	62.7%	865
47. Design civil components of site.	17.6%	29.4%	29.9%	17.1%	6.0%	1.65	1.13	53.1%	865
48. Design mechanical, electrical and plumbing systems.	17.7%	31.1%	25.7%	17.6%	8.0%	1.67	1.19	51.2%	865
49. Design landscape elements for site.	15.7%	38.7%	32.1%	10.5%	2.9%	1.46	0.97	45.5%	865
50. Oversee design integration of building components and systems.	2.3%	4.7%	23.0%	37.2%	32.7%	2.93	0.98	92.9%	865
51. Select materials, finishes and systems based on technical properties and aesthetic requirements.	1.0%	4.3%	24.6%	46.5%	23.6%	2.87	0.86	94.7%	865
52. Select building performance modeling technologies to guide building design.	18.3%	31.8%	33.2%	13.1%	3.7%	1.52	1.05	49.9%	865
53. Prepare life cycle cost analysis.	20.0%	38.8%	28.1%	11.1%	2.0%	1.36	0.99	41.2%	865
54. Perform constructability review to determine ability to procure, sequence construction, and build proposed project.	13.8%	30.2%	30.1%	18.4%	7.6%	1.76	1.13	56.1%	865
55. Prepare final procurement and contract documents.	3.1%	7.2%	22.7%	32.6%	34.5%	2.88	1.06	89.7%	865
56. Determine specific insurance requirements to meet contract or business needs.	15.1%	26.4%	31.3%	17.9%	9.2%	1.80	1.17	58.5%	865
57. Review results from field reports, third-party inspections, and other test results for conformance with contract documents.	2.8%	15.5%	34.2%	33.3%	14.2%	2.41	1.00	81.7%	865
58. Manage modifications to the construction contract.	3.0%	14.0%	29.6%	36.1%	17.3%	2.51	1.03	83.0%	865
59. Assist Owner in preparing Owner-Contractor Agreement.	7.6%	19.4%	35.4%	25.8%	11.8%	2.15	1.10	72.9%	865

Total N = number of respondents

CONTINUED

Data Table D3. Percentage Distribution of Task Importance Ratings

Survey Population: All Licensed Architects

TASK STATEMENT	Task Importance					MEAN IMP.	SD IMP	PERCENT IMP.	TOTAL N
	0	1	2	3	4				
	OF LITTLE OR NO IMP.	SOMEWHAT IMP.	IMP.	VERY IMP.	CRITICALLY IMP.				
60. Respond to Contractor Requests for Information.	0.9%	3.4%	20.1%	46.5%	29.1%	3.00	0.84	95.7%	865
61. Prepare proposals for services in response to client requirements.	2.7%	7.5%	28.8%	39.2%	21.8%	2.70	0.98	89.8%	865
62. Prepare Owner-Architect agreement.	3.1%	5.2%	21.3%	33.2%	37.2%	2.96	1.04	91.7%	865
63. Prepare Architect-Consultant agreement.	5.3%	9.6%	27.9%	34.8%	22.4%	2.59	1.10	85.1%	865
64. Negotiate terms and conditions outlined in Owner-Architect Agreement.	4.2%	9.7%	26.2%	33.8%	26.1%	2.68	1.09	86.1%	865
65. Apply principles of historic preservation for projects involving building restoration or renovation.	10.2%	24.7%	35.7%	23.7%	5.7%	1.90	1.05	65.1%	865
66. Collaborate with stakeholders during design process to maintain design intent and comply with Owner requirements.	5.1%	13.3%	29.1%	35.3%	17.2%	2.46	1.08	81.6%	865
67. Coordinate design work of consultants.	0.8%	2.0%	14.1%	42.1%	41.0%	3.21	0.81	97.2%	865
68. Select furniture, fixtures and equipment that meet client's design requirements and needs.	11.4%	24.7%	35.1%	22.9%	5.8%	1.87	1.07	63.8%	865
69. Negotiate terms and conditions of services outlined in Architect-Consultant Agreement.	5.5%	15.6%	33.4%	30.2%	15.3%	2.34	1.08	78.8%	865
70.Establish financial controls within firm to monitor profitability of individual projects.	7.3%	14.1%	29.1%	27.2%	22.3%	2.43	1.19	78.6%	865
71. Prepare staffing plan to meet project goals.	8.8%	14.3%	30.4%	30.8%	15.7%	2.30	1.16	76.9%	865
72. Establish procedures for documenting project decisions.	5.8%	14.2%	29.4%	31.8%	18.8%	2.44	1.12	80.0%	865
73. Monitor project schedule to maintain compliance with established milestones.	2.5%	9.4%	32.0%	39.3%	16.8%	2.58	0.96	88.1%	865
74. Evaluate staffing plan to ensure compliance with established milestones.	9.1%	17.7%	34.2%	27.9%	11.1%	2.14	1.12	73.2%	865
75. Manage client expectations to align with established milestones and final decision points.	4.2%	8.8%	30.6%	35.3%	21.2%	2.60	1.04	87.1%	865
76. Assist client in selecting contractors.	3.6%	19.1%	36.3%	31.4%	9.6%	2.24	0.99	77.3%	865
77. Manage implementation of sustainability criteria.	13.2%	24.5%	36.4%	20.6%	5.3%	1.80	1.07	62.3%	865
78. Identify changes in project scope that require additional services.	1.5%	7.2%	33.3%	39.2%	18.8%	2.67	0.91	91.3%	865
79. Assist Owner in obtaining necessary permits and approvals.	1.7%	11.0%	28.0%	36.3%	22.9%	2.68	1.00	87.3%	864
80. Coordinate testing of building performance and materials.	16.8%	31.1%	34.0%	13.9%	4.3%	1.58	1.06	52.1%	865
81. Review Application and Certificate for Payment.	3.2%	10.9%	31.7%	37.9%	16.3%	2.53	0.99	85.9%	865
82. Review shop drawings and submittals during construction for conformance with design intent.	1.2%	4.7%	20.7%	43.6%	29.8%	2.96	0.89	94.1%	865
83. Complete field reports to document field observations from site visit.	1.5%	9.4%	33.6%	39.1%	16.4%	2.60	0.92	89.1%	865
84. Manage information exchange during construction.	2.1%	8.3%	32.3%	36.6%	20.7%	2.66	0.97	89.6%	865
85. Resolve conflicts that may arise during design and construction process.	0.9%	3.9%	22.3%	40.7%	32.1%	2.99	0.89	95.1%	865
86. Manage project-specific procurement process.	19.2%	28.8%	34.5%	13.4%	4.2%	1.55	1.07	52.0%	865
87. Establish procedures for building commissioning.	24.0%	34.8%	28.9%	9.7%	2.5%	1.32	1.02	41.2%	865
88. Manage post-occupancy issues, e.g., evaluation of building performance, warranty issues.	15.0%	35.4%	32.3%	12.9%	4.4%	1.56	1.03	49.6%	865

Total N = number of respondents

CONTINUED

Data Table D3. Percentage Distribution of Task Importance Ratings

Survey Population: All Licensed Architects

TASK STATEMENT	Task Importance					MEAN IMP.	SD IMP	PERCENT IMP.	TOTAL N
	0	1	2	3	4				
	OF LITTLE OR NO IMP.	SOMEWHAT IMP.	IMP.	VERY IMP.	CRITICALLY IMP.				
89. Select design team consultants.	2.8%	9.9%	29.0%	38.6%	19.7%	2.62	1.00	87.3%	865
90. Conduct periodic progress meetings with design and project team.	1.3%	6.2%	32.8%	41.4%	18.3%	2.69	0.88	92.5%	865
91. Participate in pre-construction, pre-installation and regular progress meetings with design team.	2.0%	9.9%	37.9%	35.7%	14.5%	2.51	0.93	88.1%	865
92. Secure insurance policies related to general, automobile, workers' compensation, and professional liability.	15.7%	23.9%	30.2%	17.7%	12.5%	1.87	1.24	60.3%	865
93. Develop strategies to control risk and manage liability.	6.8%	16.6%	31.0%	27.4%	18.2%	2.33	1.15	76.5%	865
94. Determine billing rates.	5.9%	12.6%	31.6%	33.1%	16.9%	2.42	1.09	81.5%	865
95. Develop business plan for firm.	9.2%	15.6%	28.6%	29.9%	16.6%	2.29	1.19	75.1%	865
96. Develop and maintain effective and productive relationships with clients.	1.2%	2.1%	12.4%	31.6%	52.8%	3.33	0.86	96.8%	865
97. Develop procedures for responding to changes in project scope.	2.1%	10.8%	36.4%	36.3%	14.5%	2.50	0.94	87.2%	865
98. Develop procedures for responding to contractor requests (Requests for Information).	3.2%	11.9%	35.8%	33.2%	15.8%	2.46	1.00	84.9%	865
99. Develop strategies for responding to Owner requests for proposal (Requests for Proposal, Requests for Qualifications).	4.3%	12.9%	34.2%	32.5%	16.1%	2.43	1.04	82.8%	865
100. Review local, state, and federal codes for changes that may impact design and construction.	1.5%	6.6%	26.6%	33.9%	31.4%	2.87	0.98	91.9%	865
101. Make staff assignments based on knowledge and skill of staff members.	7.7%	10.8%	32.1%	34.5%	14.9%	2.38	1.10	81.5%	865
102. Evaluate staff time and production costs for compliance with established goals.	8.3%	15.1%	35.3%	29.0%	12.3%	2.22	1.10	76.5%	865
103. Understand firm's legal structure to comply with jurisdictional rules and regulations.	9.2%	18.7%	33.4%	22.2%	16.4%	2.18	1.19	72.0%	865
104. Understand implications of evolving sustainable design strategies and technologies.	10.6%	21.6%	37.6%	24.4%	5.8%	1.93	1.06	67.7%	865
105. Understand implications of project delivery methods.	4.6%	19.0%	37.1%	30.8%	8.6%	2.20	0.99	76.4%	865
106. Adhere to ethical standards and codes of professional conduct.	0.9%	2.4%	9.6%	23.9%	63.1%	3.46	0.84	96.6%	865
107. Comply with laws and regulations governing the practice of architecture.	1.2%	1.7%	10.1%	19.8%	67.3%	3.50	0.83	97.1%	865
108. Evaluate appropriateness of building information modeling (BIM) for proposed project.	16.0%	26.4%	34.7%	17.9%	5.1%	1.70	1.09	57.7%	865
109. Understand implications of policies and procedures to ensure supervision of design work by architect in responsible charge/control.	4.7%	10.2%	28.8%	28.4%	27.9%	2.65	1.13	85.1%	865
110. Monitor performance of design team consultants.	1.4%	4.6%	28.6%	47.4%	18.0%	2.76	0.85	94.0%	865
MEAN	6.2%	14.8%	29.0%	30.5%	19.5%	2.42	1.02	79.0%	865
MIN	0.2%	0.9%	7.5%	9.7%	2.0%	1.32	0.70	40.9%	864
MAX	24.0%	38.8%	38.4%	47.4%	67.3%	3.55	1.24	98.7%	865

Total N = number of respondents

Data Table D4. Summary Statistics of Task Importance and Task Frequency Ratings

Survey Population: All Licensed Architects

TASK STATEMENT	MEAN IMP.	SD IMP.	PERCENT PERFORMED	TOTAL N
1. Gather information about client's vision, goals, budget, and schedule to validate project scope and program.	3.25	0.94	89.6%	865
2. Prepare design alternatives for client review.	3.08	0.84	90.6%	865
3. Establish methods for Architect-Client communication based on project scope of work.	2.74	1.04	86.7%	865
4. Assist client in determining delivery method for construction of project.	2.35	1.00	79.1%	865
5. Determine impact of applicable zoning and development ordinances to determine project constraints.	3.20	0.92	87.3%	865
6. Define roles and responsibilities of team members.	2.39	1.06	82.5%	865
7. Determine scope of services.	3.05	0.96	87.2%	865
8. Determine design fees.	2.97	1.05	79.8%	865
9. Determine project schedule.	2.72	0.94	88.2%	865
10. Evaluate results of feasibility studies to determine project's financial viability.	2.08	1.15	61.5%	865
11. Evaluate results of feasibility studies to determine project's technical viability.	2.34	1.08	67.9%	865
12. Determine impact of existing utilities infrastructure on site.	2.39	1.02	82.1%	865
13. Determine impact of existing transportation infrastructure on site.	1.61	1.04	56.4%	865
14. Assess environmental impact of design decisions.	2.22	1.06	74.8%	865
15. Determine impact of environmental, zoning and other regulations on site.	2.78	1.02	84.9%	865
16. Assess socio-cultural context of the proposed site.	1.33	1.04	40.5%	865
17. Define requirements for site survey based on established project scope.	2.32	1.02	78.0%	865
18. Analyze existing site conditions to determine impact on facility layout.	2.89	0.92	87.7%	865
19. Consider recommendations from geotechnical studies when establishing design parameters.	2.55	1.07	78.0%	865
20. Develop sustainability goals based on existing site environmental conditions.	1.98	1.05	64.4%	865
21. Establish sustainability goals affecting building performance.	2.13	1.07	70.5%	865
22. Consider results of environmental impact studies when developing site.	2.10	1.05	55.7%	865
23. Develop mitigation options to address adverse site conditions.	2.04	1.09	57.7%	865
24. Review legal documents related to site to determine project constraints.	2.41	1.13	66.5%	865
25. Perform building code analysis.	3.55	0.70	91.8%	865
26. Communicate design ideas to the client graphically.	3.25	0.76	92.0%	865
27. Communicate design ideas to the client using hand drawings.	2.37	1.15	82.4%	865
28. Communicate design ideas to client with two-dimensional (2-D) computer aided design software.	2.69	1.03	81.6%	865
29. Communicate design ideas to client with three-dimensional (3-D) computer aided design software.	2.33	1.11	68.4%	865
30. Determine design parameters for building systems.	2.61	0.92	83.4%	865
31. Prepare submittals for regulatory approval.	2.92	1.00	84.2%	865
32. Evaluate opportunities and constraints of alternative sites.	2.00	1.03	59.2%	865
33. Gather information about community concerns and issues that may impact proposed project.	1.82	1.04	53.4%	865
34. Assist Owner in preparing building program including list of spaces and their characteristics.	2.84	0.94	81.5%	865
35. Establish project design goals.	2.82	0.92	86.5%	865
36. Prepare site analysis diagrams to document existing conditions, features, infrastructure, and regulatory requirements.	2.48	1.02	72.9%	865
37. Prepare diagrams illustrating spatial relationships and functional adjacencies.	2.51	1.03	77.1%	865
38. Submit schedule of Architect's services to Owner for each phase.	2.35	1.08	65.9%	865

Total N = number of respondents

CONTINUED

Data Table D4. Summary Statistics of Task Importance and Task Frequency Ratings

Survey Population: All Licensed Architects

TASK STATEMENT	MEAN IMP.	SD IMP.	PERCENT PERFORMED	TOTAL N
39. Prepare code analysis documentation.	3.05	0.96	86.5%	865
40. Select technologies to develop and produce design and construction documentation.	2.09	1.11	68.8%	865
41. Coordinate documentation of design team members.	2.97	0.99	85.9%	865
42. Manage project close-out procedures and documentation.	2.43	0.99	78.2%	865
43. Perform quality control reviews throughout the documentation process.	2.82	1.04	83.0%	865
44. Prepare Cost of Work estimates.	2.17	1.09	66.5%	865
45. Update Cost of Work estimates.	2.03	1.10	63.6%	865
46. Design building structural system.	1.98	1.24	44.5%	865
47. Design civil components of site.	1.65	1.13	42.3%	865
48. Design mechanical, electrical and plumbing systems.	1.67	1.19	38.5%	865
49. Design landscape elements for site.	1.46	0.97	53.1%	865
50. Oversee design integration of building components and systems.	2.93	0.98	85.7%	865
51. Select materials, finishes and systems based on technical properties and aesthetic requirements.	2.87	0.86	90.4%	865
52. Select building performance modeling technologies to guide building design.	1.52	1.05	37.8%	865
53. Prepare life cycle cost analysis.	1.36	0.99	30.3%	865
54. Perform constructability review to determine ability to procure, sequence construction, and build proposed project.	1.76	1.13	51.2%	865
55. Prepare final procurement and contract documents.	2.88	1.06	79.2%	865
56. Determine specific insurance requirements to meet contract or business needs.	1.80	1.17	48.9%	865
57. Review results from field reports, third-party inspections, and other test results for conformance with contract documents.	2.41	1.00	80.6%	865
58. Manage modifications to the construction contract.	2.51	1.03	74.7%	865
59. Assist Owner in preparing Owner-Contractor Agreement.	2.15	1.10	61.4%	865
60. Respond to Contractor Requests for Information.	3.00	0.84	89.9%	865
61. Prepare proposals for services in response to client requirements.	2.70	0.98	80.7%	865
62. Prepare Owner-Architect agreement.	2.96	1.04	71.8%	865
63. Prepare Architect-Consultant agreement.	2.59	1.10	65.3%	865
64. Negotiate terms and conditions outlined in Owner-Architect Agreement.	2.68	1.09	65.3%	865
65. Apply principles of historic preservation for projects involving building restoration or renovation.	1.90	1.05	46.6%	865
66. Collaborate with stakeholders during design process to maintain design intent and comply with Owner requirements.	2.46	1.08	73.6%	865
67. Coordinate design work of consultants.	3.21	0.81	90.8%	865
68. Select furniture, fixtures and equipment that meet client's design requirements and needs.	1.87	1.07	63.8%	865
69. Negotiate terms and conditions of services outlined in Architect-Consultant Agreement.	2.34	1.08	61.3%	865
70. Establish financial controls within firm to monitor profitability of individual projects.	2.43	1.19	57.8%	865
71. Prepare staffing plan to meet project goals.	2.30	1.16	63.2%	865
72. Establish procedures for documenting project decisions.	2.44	1.12	76.0%	865
73. Monitor project schedule to maintain compliance with established milestones.	2.58	0.96	86.4%	865
74. Evaluate staffing plan to ensure compliance with established milestones.	2.14	1.12	61.3%	865
75. Manage client expectations to align with established milestones and final decision points.	2.60	1.04	81.8%	865
76. Assist client in selecting contractors.	2.24	0.99	76.4%	865

Total N = number of respondents

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Data Table D4. Summary Statistics of Task Importance and Task Frequency Ratings

Survey Population: All Licensed Architects

TASK STATEMENT	MEAN IMP.	SD IMP.	PERCENT PERFORMED	TOTAL N
77. Manage implementation of sustainability criteria.	1.80	1.07	56.0%	865
78. Identify changes in project scope that require additional services.	2.67	0.91	86.6%	865
79. Assist Owner in obtaining necessary permits and approvals.	2.68	1.00	82.9%	864
80. Coordinate testing of building performance and materials.	1.58	1.06	44.0%	865
81. Review Application and Certificate for Payment.	2.53	0.99	75.5%	865
82. Review shop drawings and submittals during construction for conformance with design intent.	2.96	0.89	86.8%	865
83. Complete field reports to document field observations from site visit.	2.60	0.92	80.1%	865
84. Manage information exchange during construction.	2.66	0.97	82.1%	865
85. Resolve conflicts that may arise during design and construction process.	2.99	0.89	88.2%	865
86. Manage project-specific procurement process.	1.55	1.07	46.2%	865
87. Establish procedures for building commissioning.	1.32	1.02	30.4%	865
88. Manage post-occupancy issues, e.g., evaluation of building performance, warranty issues.	1.56	1.03	48.8%	865
89. Select design team consultants.	2.62	1.00	78.2%	865
90. Conduct periodic progress meetings with design and project team.	2.69	0.88	88.6%	865
91. Participate in pre-construction, pre-installation and regular progress meetings with design team.	2.51	0.93	84.0%	865
92. Secure insurance policies related to general, automobile, workers' compensation, and professional liability.	1.87	1.24	49.8%	865
93. Develop strategies to control risk and manage liability.	2.33	1.15	65.2%	865
94. Determine billing rates.	2.42	1.09	64.7%	865
95. Develop business plan for firm.	2.29	1.19	50.8%	865
96. Develop and maintain effective and productive relationships with clients.	3.33	0.86	90.5%	865
97. Develop procedures for responding to changes in project scope.	2.50	0.94	78.5%	865
98. Develop procedures for responding to contractor requests (Requests for Information).	2.46	1.00	76.4%	865
99. Develop strategies for responding to Owner requests for proposal (Requests for Proposal, Requests for Qualifications).	2.43	1.04	72.0%	865
100. Review local, state, and federal codes for changes that may impact design and construction.	2.87	0.98	89.0%	865
101. Make staff assignments based on knowledge and skill of staff members.	2.38	1.10	63.2%	865
102. Evaluate staff time and production costs for compliance with established goals.	2.22	1.10	60.9%	865
103. Understand firm's legal structure to comply with jurisdictional rules and regulations.	2.18	1.19	59.3%	865
104. Understand implications of evolving sustainable design strategies and technologies.	1.93	1.06	73.3%	865
105. Understand implications of project delivery methods.	2.20	0.99	78.5%	865
106. Adhere to ethical standards and codes of professional conduct.	3.46	0.84	95.3%	865
107. Comply with laws and regulations governing the practice of architecture.	3.50	0.83	94.6%	865
108. Evaluate appropriateness of building information modeling (BIM) for proposed project.	1.70	1.09	50.5%	865
109. Understand implications of policies and procedures to ensure supervision of design work by architect in responsible charge/control.	2.65	1.13	73.9%	865
110. Monitor performance of design team consultants.	2.76	0.85	89.0%	865
MEAN	2.42	1.02	71.6%	865
MIN	1.32	0.70	30.3%	864
MAX	3.55	1.24	95.3%	865

Total N = number of respondents

Data Table D5. List of all ARE Survey Knowledge/Skill Statements

K/S #	KNOWLEDGE/SKILL STATEMENT
1	Knowledge of oral, written, and visual presentation techniques to communicate project information.
2	Knowledge of master plans and their impact on building design.
3	Knowledge of method for project controls, e.g., scope of services, budget, billing, compensation.
4	Knowledge of factors that affect selection of project consultants.
5	Knowledge of strategies for delegating and monitoring task assignments, accountability and deadlines for project team.
6	Knowledge of client and project characteristics that influence contract agreements.
7	Knowledge of types of contracts and their designated use.
8	Knowledge of standard forms of architectural service agreements for Owner-Architect, Architect-Consultant and Owner-Contractor.
9	Knowledge of effects of specific findings from feasibility studies on building design.
10	Knowledge of factors involved in selection of building systems and components.
11	Knowledge of effect of environmental factors on site development.
12	Knowledge of environmental policies and regulations and their implications for proposed construction.
13	Knowledge of processes involved in conducting a survey of existing conditions.
14	Knowledge of effects of specific findings from environmental impact studies on building design.
15	Skill in designing facility layout and site plan that responds to site constraints.
16	Knowledge of methods required to mitigate adverse site conditions.
17	Knowledge of elements of and processes for conducting a site analysis.
18	Knowledge of codes of professional conduct related to architectural practice.
19	Knowledge of protocols and procedures for conducting a code analysis.
20	Knowledge of building codes and their impact on building design.
21	Knowledge of land use codes and ordinances that govern land use decisions.
22	Skill in producing hand drawings of design ideas.
23	Knowledge of standards for graphic symbols and units of measurement in technical drawings.
24	Skill in producing two-dimensional (2-D) drawings using hand methods.
25	Skill in using software to produce two-dimensional (2-D) drawings.
26	Skill in using software to produce three-dimensional (3-D) models of building design.

K/S #	KNOWLEDGE/SKILL STATEMENT
27	Skill in producing physical scale models.
28	Skill in use of building information modeling (BIM) to develop and manage databases of building and construction information.
29	Knowledge of protocols and procedures for obtaining community input for proposed design.
30	Knowledge of computer aided design and drafting software for producing two-dimensional (2-D) drawings.
31	Knowledge of factors involved in selecting computer based design technologies.
32	Knowledge of engineering properties of soils and their effect on building foundations and building design.
33	Knowledge of factors to be considered in adaptive reuse of existing buildings.
34	Knowledge of building technologies which provide solutions for comfort, life safety and energy efficiency.
35	Knowledge of effect of thermal envelope in design of building systems.
36	Knowledge of principles of integrated project design.
37	Knowledge of strategies for anticipating, managing and preventing disputes and conflicts.
38	Knowledge of engineering principles and their application to design and construction.
39	Knowledge of properties of concrete products, materials, assemblies and their impact on building design and construction.
40	Knowledge of properties of stone and masonry products, materials, assemblies and their impact on building design and construction.
41	Knowledge of properties of metal products, materials, assemblies and their impact on building design and construction.
42	Knowledge of properties of wood and wood products, materials, assemblies and their impact on building design and construction.
43	Knowledge of properties of glass products, materials, assemblies and their impact on building design and construction.
44	Knowledge of means and methods for building construction.
45	Knowledge of benefits and limitations of "fast track" or other forms of construction delivery methods.
46	Knowledge of methods and techniques for estimating construction costs.
47	Knowledge of structural load and load conditions that affect building design.
48	Knowledge of energy codes that impact construction.
49	Knowledge of methods and strategies for evidence based design (EBD).
50	Knowledge of impact of design on human behavior.
51	Knowledge of functional requirements of heating, ventilation and air conditioning (HVAC) systems.

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Data Table D5. List of all ARE Survey Knowledge/Skill Statements

K/S #	KNOWLEDGE/SKILL STATEMENT
52	Knowledge of functional requirements of plumbing systems.
53	Knowledge of functional requirements of electrical systems.
54	Knowledge of functional requirements of special systems.
55	Knowledge of functional requirements of conveying systems.
56	Knowledge of functional requirements of structural systems.
57	Knowledge of functional requirements of roofing systems.
58	Knowledge of functional requirements of fire suppression systems.
59	Knowledge of functional requirements of communications systems.
60	Knowledge of functional requirements of electronic safety and security systems.
61	Knowledge of functional requirements of door and window systems.
62	Knowledge of functional requirements for thermal and moisture control systems.
63	Knowledge of hazardous materials mitigation at building site.
64	Knowledge of principles of building operation and function.
65	Knowledge of content and format of specifications.
66	Knowledge of principles of interior design and their influences on building design.
67	Knowledge of principles of landscape design and their influences on building design.
68	Knowledge of site design principles and practices.
69	Knowledge of techniques for architectural programming to identify functional and operational requirements of scope of work.
70	Knowledge of procedures to develop project scheduling, phasing and deliverables for various building types.
71	Knowledge of relationship between constructability and aesthetics.
72	Knowledge of accepted standards for building materials and methods of construction, e.g., ASTM, ANSI.
73	Knowledge of methods to perform a life cycle cost analysis.
74	Knowledge of principles of value analysis and value engineering processes.
75	Knowledge of procedures and protocols of permit approval process.
76	Knowledge of principles of historic preservation.
77	Knowledge of processes and procedures for building commissioning.
78	Knowledge of design factors to consider in selecting furniture, fixtures and equipment (FFE).
79	Knowledge of methods and tools for space planning.

K/S #	KNOWLEDGE/SKILL STATEMENT
80	Knowledge of different project delivery methods and their impacts on project schedule, costs and project goals.
81	Knowledge of factors that impact construction management services.
82	Knowledge of fee structures, their attributes and implications for schedule, scope and profit.
83	Knowledge of consultant agreements and fee structures.
84	Knowledge of different building and construction types and their implications for design and construction schedules.
85	Knowledge of scheduling methods to establish project timeframes based on standard sequences of architectural services in each phase.
86	Knowledge of business development strategies.
87	Knowledge of relationship between staffing capabilities and hours, and internal project budget to meet established milestones and profitability.
88	Knowledge of purposes and types of professional liability insurance related to architectural practice.
89	Knowledge of format and protocols for efficient meeting management and information distribution.
90	Knowledge of strategies to assess project progress and verify its alignment with project schedule.
91	Knowledge of ways to translate project goals into specific tasks and measureable design criteria.
92	Knowledge of effective communication techniques to educate client with respect to roles and responsibilities of all parties.
93	Knowledge of formats and protocols to produce and distribute field reports to document construction progress.
94	Knowledge of site requirements for a specific building type and scope to determine client's site needs.
95	Knowledge of site analysis techniques to determine project parameters affecting design.
96	Knowledge of methods to prioritize or objectively evaluate design options based on project goals.
97	Knowledge of sustainability strategies and/or rating systems.
98	Knowledge of sustainability considerations related to building materials and construction processes.
99	Knowledge of techniques to integrate renewable energy systems into building design.
100	Knowledge of methods to identify scope changes that may require additional services.
101	Knowledge of procedures for processing requests for additional services.
102	Knowledge of appropriate documentation level required for construction documents.
103	Knowledge of close-out document requirements and protocols.

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Data Table D5. List of all ARE Survey Knowledge/Skill Statements

K/S #	KNOWLEDGE/SKILL STATEMENT
104	Knowledge of construction document technologies and their standards and applications.
105	Knowledge of building information modeling (BIM) and its impact on planning, financial management and construction documentation.
106	Knowledge of principles of computer assisted design and drafting (CADD) software and its uses in communicating design ideas.
107	Knowledge of American Institute of Architects (AIA) guidelines for contract agreements.
108	Knowledge of techniques to integrate model contract forms and documents.
109	Knowledge of benefits and limitations of software for construction documentation.
110	Knowledge of methods for production of construction documentation and drawings.
111	Knowledge of standard methods for production of design development documentation.
112	Knowledge of standard methods for production of site plan documentation.
113	Knowledge of circumstances warranting further actions based on field reports, third party inspections and test results.
114	Knowledge of materials testing processes and protocols to be performed during the construction process.
115	Knowledge of building systems testing processes and protocols to be performed during the construction process.
116	Knowledge of formats and protocols to process shop drawings and submittals to ensure they meet design intent.
117	Knowledge of protocols for responding to Requests for Information (RFI).

K/S #	KNOWLEDGE/SKILL STATEMENT
118	Knowledge of roles, responsibilities and authorities of project team members during construction.
119	Knowledge of conflict resolution techniques and their applications throughout project.
120	Knowledge of bidding processes and protocols for different project delivery methods and their applications.
121	Knowledge of requirements for post-occupancy evaluation.
122	Knowledge of design decisions and their impact on constructability.
123	Knowledge of methods to manage human resources.
124	Knowledge of state board guidelines for licensing and professional practice.
125	Knowledge of principles of universal design.
126	Knowledge of purposes of and legal implications for different types of business entities.
127	Knowledge of innovative and evolving technologies and their impact on architectural practice.
128	Knowledge of ethical standards relevant to architectural practice.
129	Knowledge of methods to facilitate information management in building design and construction.
130	Knowledge of factors involved in conducting architectural practice in international markets.
131	Knowledge of methods and procedures for risk management.
132	Knowledge of financial planning methods to manage revenues, staffing, and overhead expenses.

Data Table D6. Percentage Distribution of Knowledge/Skill Importance Ratings

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	Knowledge/Skill Importance					MEAN IMP.	SD IMP.	PERCENT IMP.	TOTAL N
	0	1	2	3	4				
	OF LITTLE OR NO IMP.	SOMEWHAT IMP.	IMP.	VERY IMP.	CRITICALLY IMP.				
1. Knowledge of oral, written, and visual presentation techniques to communicate project information.	0.1%	Imp.	9.6%	34.1%	54.3%	3.40	0.75	97.9%	822
2. Knowledge of master plans and their impact on building design.	1.3%	10.7%	28.2%	37.1%	22.6%	2.69	0.98	88.0%	822
3. Knowledge of method for project controls, e.g., scope of services, budget, billing, compensation.	0.6%	4.0%	16.8%	34.1%	44.5%	3.18	0.89	95.4%	822
4. Knowledge of factors that affect selection of project consultants.	1.0%	7.9%	30.2%	40.4%	20.6%	2.72	0.91	91.1%	822
5. Knowledge of strategies for delegating and monitoring task assignments, accountability and deadlines for project team.	1.1%	8.8%	26.9%	42.6%	20.7%	2.73	0.92	90.1%	822
6. Knowledge of client and project characteristics that influence contract agreements.	1.1%	6.4%	22.1%	36.1%	34.2%	2.96	0.96	92.5%	822
7. Knowledge of types of contracts and their designated use.	1.0%	10.1%	28.0%	36.1%	24.8%	2.74	0.98	88.9%	822
8. Knowledge of standard forms of architectural service agreements for Owner-Architect, Architect-Consultant and Owner-Contractor.	1.1%	9.5%	27.3%	38.7%	23.5%	2.74	0.96	89.4%	822
9. Knowledge of effects of specific findings from feasibility studies on building design.	2.2%	12.5%	35.8%	34.7%	14.8%	2.47	0.96	85.3%	822
10. Knowledge of factors involved in selection of building systems and components.	0.1%	3.4%	21.2%	45.3%	30.0%	3.02	0.81	96.5%	822
11. Knowledge of effect of environmental factors on site development.	1.0%	5.2%	30.7%	44.3%	18.9%	2.75	0.85	93.8%	822
12. Knowledge of environmental policies and regulations and their implications for proposed construction.	1.6%	9.7%	33.1%	35.3%	20.3%	2.63	0.96	88.7%	822
13. Knowledge of processes involved in conducting a survey of existing conditions.	0.9%	7.2%	32.2%	35.9%	23.8%	2.75	0.93	92.0%	822
14. Knowledge of effects of specific findings from environmental impact studies on building design.	2.9%	12.3%	39.5%	30.8%	14.5%	2.42	0.98	84.8%	822
15. Skill in designing facility layout and site plan that responds to site constraints.	0.2%	2.1%	13.7%	41.1%	42.8%	3.24	0.78	97.7%	822
16. Knowledge of methods required to mitigate adverse site conditions.	0.5%	9.2%	38.8%	36.4%	15.1%	2.56	0.87	90.3%	822
17. Knowledge of elements of and processes for conducting a site analysis.	0.7%	9.2%	38.0%	37.7%	14.4%	2.56	0.87	90.0%	822
18. Knowledge of codes of professional conduct related to architectural practice.	0.4%	7.1%	23.7%	34.8%	34.1%	2.95	0.94	92.6%	822
19. Knowledge of protocols and procedures for conducting a code analysis.	0.2%	3.5%	17.0%	37.5%	41.7%	3.17	0.85	96.2%	822
20. Knowledge of building codes and their impact on building design.	0.0%	0.7%	7.5%	29.9%	61.8%	3.53	0.67	99.3%	822
21. Knowledge of land use codes and ordinances that govern land use decisions.	0.6%	7.8%	26.8%	35.2%	29.7%	2.86	0.95	91.6%	822
22. Skill in producing hand drawings of design ideas.	3.4%	19.2%	34.7%	28.8%	13.9%	2.31	1.04	77.4%	822
23. Knowledge of standards for graphic symbols and units of measurement in technical drawings.	0.2%	7.5%	25.3%	41.6%	25.3%	2.84	0.90	92.2%	822
24. Skill in producing two-dimensional (2-D) drawings using hand methods.	11.8%	22.6%	31.3%	22.3%	12.0%	2.00	1.19	65.6%	822
25. Skill in using software to produce two-dimensional (2-D) drawings.	0.9%	3.6%	22.1%	43.2%	30.2%	2.98	0.86	95.5%	822

Total N = number of respondents

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Data Table D6. Percentage Distribution of Knowledge/Skill Importance Ratings

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	Knowledge/Skill Importance					MEAN IMP.	SD IMP.	PERCENT IMP.	TOTAL N
	0	1	2	3	4				
	OF LITTLE OR NO IMP.	SOMEWHAT IMP.	IMP.	VERY IMP.	CRITICALLY IMP.				
26. Skill in using software to produce three-dimensional (3-D) models of building design.	3.2%	17.5%	31.4%	34.8%	13.1%	2.37	1.02	79.3%	822
27. Skill in producing physical scale models.	22.4%	40.1%	26.8%	8.5%	2.2%	1.28	0.98	37.5%	822
28. Skill in use of building information modeling (BIM) to develop and manage databases of building and construction information.	10.8%	24.3%	32.2%	23.6%	9.0%	1.96	1.13	64.8%	822
29. Knowledge of protocols and procedures for obtaining community input for proposed design.	4.7%	26.2%	38.7%	23.0%	7.4%	2.02	0.99	69.1%	822
30. Knowledge of computer aided design and drafting software for producing two-dimensional (2-D) drawings.	1.1%	6.0%	21.4%	38.9%	32.6%	2.96	0.94	92.9%	822
31. Knowledge of factors involved in selecting computer based design technologies.	4.9%	26.4%	39.2%	23.7%	5.8%	1.99	0.96	68.7%	822
32. Knowledge of engineering properties of soils and their effect on building foundations and building design.	1.7%	21.4%	38.6%	26.3%	12.0%	2.26	0.98	76.9%	822
33. Knowledge of factors to be considered in adaptive reuse of existing buildings.	1.3%	15.1%	39.2%	33.7%	10.7%	2.37	0.91	83.6%	822
34. Knowledge of building technologies which provide solutions for comfort, life safety and energy efficiency.	0.1%	3.6%	23.8%	43.9%	28.5%	2.97	0.82	96.2%	822
35. Knowledge of effect of thermal envelope in design of building systems.	0.2%	4.1%	25.4%	45.7%	24.5%	2.90	0.82	95.6%	822
36. Knowledge of principles of integrated project design.	5.2%	19.5%	38.3%	26.6%	10.3%	2.17	1.03	75.3%	822
37. Knowledge of strategies for anticipating, managing and preventing disputes and conflicts.	2.1%	11.7%	32.6%	35.3%	18.4%	2.56	0.99	86.3%	822
38. Knowledge of engineering principles and their application to design and construction.	0.0%	6.0%	35.5%	39.4%	19.1%	2.72	0.84	94.0%	822
39. Knowledge of properties of concrete products, materials, assemblies and their impact on building design and construction.	0.2%	11.9%	42.8%	34.1%	10.9%	2.44	0.85	87.8%	822
40. Knowledge of properties of stone and masonry products, materials, assemblies and their impact on building design and construction.	0.0%	11.9%	43.1%	33.9%	11.1%	2.44	0.84	88.1%	822
41. Knowledge of properties of metal products, materials, assemblies and their impact on building design and construction.	0.1%	9.5%	42.7%	36.1%	11.6%	2.50	0.82	90.4%	822
42. Knowledge of properties of wood and wood products, materials, assemblies and their impact on building design and construction.	0.1%	7.9%	40.5%	38.3%	13.1%	2.56	0.82	92.0%	822
43. Knowledge of properties of glass products, materials, assemblies and their impact on building design and construction.	0.1%	9.6%	43.6%	35.2%	11.6%	2.48	0.83	90.3%	822
44. Knowledge of means and methods for building construction.	0.6%	8.3%	25.7%	39.8%	25.7%	2.82	0.93	91.1%	822
45. Knowledge of benefits and limitations of "fast track" or other forms of construction delivery methods.	3.6%	22.5%	43.3%	24.2%	6.3%	2.07	0.93	73.8%	822
46. Knowledge of methods and techniques for estimating construction costs.	1.5%	22.6%	39.2%	27.6%	9.1%	2.20	0.94	75.9%	822
47. Knowledge of structural load and load conditions that affect building design.	0.5%	12.8%	35.4%	33.5%	17.9%	2.55	0.94	86.7%	822

Total N = number of respondents

CONTINUED

Data Table D6. Percentage Distribution of Knowledge/Skill Importance Ratings

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	Knowledge/Skill Importance					MEAN IMP.	SD IMP.	PERCENT IMP.	TOTAL N
	0	1	2	3	4				
	OF LITTLE OR NO IMP.	SOMEWHAT IMP.	IMP.	VERY IMP.	CRITICALLY IMP.				
48. Knowledge of energy codes that impact construction.	0.7%	8.2%	32.7%	39.9%	18.5%	2.67	0.89	91.1%	822
49. Knowledge of methods and strategies for evidence based design (EBD).	23.5%	32.5%	32.0%	9.6%	2.4%	1.35	1.02	44.0%	822
50. Knowledge of impact of design on human behavior.	2.3%	17.6%	35.3%	30.5%	14.2%	2.37	1.00	80.0%	822
51. Knowledge of functional requirements of heating, ventilation and air conditioning (HVAC) systems.	0.4%	9.0%	41.6%	37.7%	11.3%	2.51	0.82	90.6%	822
52. Knowledge of functional requirements of plumbing systems.	1.5%	12.3%	48.1%	29.4%	8.8%	2.32	0.85	86.2%	821
53. Knowledge of functional requirements of electrical systems.	1.2%	13.3%	48.5%	28.7%	8.3%	2.30	0.84	85.5%	822
54. Knowledge of functional requirements of special systems.	3.5%	24.6%	49.8%	18.4%	3.8%	1.94	0.85	71.9%	822
55. Knowledge of functional requirements of conveying systems.	8.2%	29.1%	42.0%	17.3%	3.5%	1.79	0.94	62.8%	822
56. Knowledge of functional requirements of structural systems.	0.2%	5.0%	29.0%	44.3%	21.5%	2.82	0.83	94.8%	822
57. Knowledge of functional requirements of roofing systems.	0.1%	3.5%	29.8%	43.2%	23.4%	2.86	0.82	96.4%	822
58. Knowledge of functional requirements of fire suppression systems.	1.6%	16.4%	41.8%	30.5%	9.6%	2.30	0.91	82.0%	822
59. Knowledge of functional requirements of communications systems.	6.2%	32.2%	42.8%	15.5%	3.3%	1.77	0.90	61.6%	822
60. Knowledge of functional requirements of electronic safety and security systems.	6.2%	33.6%	40.3%	16.5%	3.4%	1.77	0.91	60.2%	822
61. Knowledge of functional requirements of door and window systems.	0.2%	5.2%	33.3%	45.1%	16.1%	2.72	0.80	94.5%	822
62. Knowledge of functional requirements for thermal and moisture control systems.	0.1%	3.2%	22.7%	40.9%	33.1%	3.04	0.83	96.7%	822
63. Knowledge of hazardous materials mitigation at building site.	7.1%	29.4%	38.0%	19.6%	6.0%	1.88	1.00	63.5%	822
64. Knowledge of principles of building operation and function.	1.8%	15.5%	37.3%	30.3%	15.1%	2.41	0.98	82.7%	822
65. Knowledge of content and format of specifications.	0.2%	8.8%	33.9%	38.7%	18.4%	2.66	0.88	91.0%	822
66. Knowledge of principles of interior design and their influences on building design.	2.3%	16.3%	42.6%	31.3%	7.5%	2.25	0.90	81.4%	822
67. Knowledge of principles of landscape design and their influences on building design.	2.2%	24.2%	45.5%	24.0%	4.1%	2.04	0.86	73.6%	822
68. Knowledge of site design principles and practices.	0.2%	7.5%	32.4%	43.6%	16.3%	2.68	0.84	92.2%	822
69. Knowledge of techniques for architectural programming to identify functional and operational requirements of scope of work.	0.6%	7.2%	23.7%	40.5%	28.0%	2.88	0.92	92.2%	822
70. Knowledge of procedures to develop project scheduling, phasing and deliverables for various building types.	2.1%	15.5%	36.7%	33.8%	11.9%	2.38	0.95	82.5%	822
71. Knowledge of relationship between constructability and aesthetics.	0.5%	3.4%	18.6%	44.4%	33.1%	3.06	0.83	96.1%	822
72. Knowledge of accepted standards for building materials and methods of construction, e.g., ASTM, ANSI.	1.8%	21.3%	37.7%	29.7%	9.5%	2.24	0.95	76.9%	822
73. Knowledge of methods to perform a life cycle cost analysis.	6.4%	37.8%	38.9%	12.8%	4.0%	1.70	0.91	55.7%	822
74. Knowledge of principles of value analysis and value engineering processes.	2.4%	20.7%	46.0%	25.1%	5.8%	2.11	0.88	76.9%	822
75. Knowledge of procedures and protocols of permit approval process.	0.6%	9.4%	34.3%	36.9%	18.9%	2.64	0.91	90.0%	822
76. Knowledge of principles of historic preservation.	5.7%	34.7%	36.9%	18.1%	4.6%	1.81	0.95	59.6%	822
77. Knowledge of processes and procedures for building commissioning.	7.3%	38.0%	38.9%	12.8%	3.0%	1.66	0.90	54.7%	822

Total N = number of respondents

CONTINUED

Data Table D6. Percentage Distribution of Knowledge/Skill Importance Ratings

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	Knowledge/Skill Importance					MEAN IMP.	SD IMP.	PERCENT IMP.	TOTAL N
	0	1	2	3	4				
	OF LITTLE OR NO IMP.	SOMEWHAT IMP.	IMP.	VERY IMP.	CRITICALLY IMP.				
78. Knowledge of design factors to consider in selecting furniture, fixtures and equipment (FFE).	7.9%	40.8%	35.2%	13.3%	2.9%	1.63	0.91	51.3%	822
79. Knowledge of methods and tools for space planning.	1.7%	14.1%	37.2%	33.6%	13.4%	2.43	0.95	84.2%	822
80. Knowledge of different project delivery methods and their impacts on project schedule, costs and project goals.	2.8%	18.6%	40.4%	27.7%	10.5%	2.24	0.97	78.6%	822
81. Knowledge of factors that impact construction management services.	6.2%	29.3%	39.7%	20.2%	4.6%	1.88	0.96	64.5%	822
82. Knowledge of fee structures, their attributes and implications for schedule, scope and profit.	1.8%	12.0%	27.6%	33.8%	24.7%	2.68	1.03	86.1%	822
83. Knowledge of consultant agreements and fee structures.	2.1%	10.6%	31.0%	35.2%	21.2%	2.63	1.00	87.3%	822
84. Knowledge of different building and construction types and their implications for design and construction schedules.	0.4%	6.6%	28.7%	43.8%	20.6%	2.78	0.86	93.1%	822
85. Knowledge of scheduling methods to establish project timeframes based on standard sequences of architectural services in each phase.	2.3%	15.7%	36.0%	32.4%	13.6%	2.39	0.98	82.0%	822
86. Knowledge of business development strategies.	2.8%	17.3%	32.0%	25.5%	22.4%	2.47	1.10	79.9%	822
87. Knowledge of relationship between staffing capabilities and hours, and internal project budget to meet established milestones and profitability.	3.9%	13.9%	25.4%	31.8%	25.1%	2.60	1.12	82.2%	822
88. Knowledge of purposes and types of professional liability insurance related to architectural practice.	2.4%	12.7%	33.7%	31.9%	19.3%	2.53	1.02	84.9%	822
89. Knowledge of format and protocols for efficient meeting management and information distribution.	3.6%	19.2%	37.6%	30.0%	9.5%	2.23	0.98	77.1%	822
90. Knowledge of strategies to assess project progress and verify its alignment with project schedule.	2.3%	13.6%	40.6%	30.7%	12.8%	2.38	0.95	84.1%	822
91. Knowledge of ways to translate project goals into specific tasks and measureable design criteria.	2.6%	13.5%	36.5%	32.8%	14.6%	2.43	0.98	83.9%	822
92. Knowledge of effective communication techniques to educate client with respect to roles and responsibilities of all parties.	1.1%	6.1%	26.2%	37.6%	29.1%	2.87	0.94	92.8%	822
93. Knowledge of formats and protocols to produce and distribute field reports to document construction progress.	2.9%	14.7%	39.9%	32.7%	9.7%	2.32	0.94	82.4%	822
94. Knowledge of site requirements for a specific building type and scope to determine client's site needs.	0.5%	9.0%	33.1%	38.8%	18.6%	2.66	0.90	90.5%	822
95. Knowledge of site analysis techniques to determine project parameters affecting design.	1.2%	8.4%	34.2%	38.0%	18.2%	2.64	0.92	90.4%	822
96. Knowledge of methods to prioritize or objectively evaluate design options based on project goals.	1.5%	6.4%	30.9%	40.0%	21.2%	2.73	0.92	92.1%	822
97. Knowledge of sustainability strategies and/or rating systems.	2.6%	18.7%	42.5%	28.2%	8.0%	2.20	0.92	78.7%	822
98. Knowledge of sustainability considerations related to building materials and construction processes.	1.3%	18.4%	39.9%	32.2%	8.2%	2.27	0.90	80.3%	822
99. Knowledge of techniques to integrate renewable energy systems into building design.	3.5%	25.5%	41.2%	24.1%	5.6%	2.03	0.93	70.9%	822
100. Knowledge of methods to identify scope changes that may require additional services.	0.9%	7.1%	28.8%	40.9%	22.4%	2.77	0.90	92.1%	822
101. Knowledge of procedures for processing requests for additional services.	1.1%	12.3%	34.8%	34.4%	17.4%	2.55	0.95	86.6%	822

Total N = number of respondents

CONTINUED

Data Table D6. Percentage Distribution of Knowledge/Skill Importance Ratings

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	Knowledge/Skill Importance					MEAN IMP.	SD IMP.	PERCENT IMP.	TOTAL N
	0	1	2	3	4				
	OF LITTLE OR NO IMP.	SOMEWHAT IMP.	IMP.	VERY IMP.	CRITICALLY IMP.				
102. Knowledge of appropriate documentation level required for construction documents.	0.0%	1.0%	11.7%	36.6%	50.7%	3.37	0.73	99.0%	822
103. Knowledge of close-out document requirements and protocols.	1.6%	11.9%	37.2%	36.5%	12.8%	2.47	0.92	86.5%	822
104. Knowledge of construction document technologies and their standards and applications.	0.7%	7.7%	34.1%	37.8%	19.7%	2.68	0.90	91.6%	822
105. Knowledge of building information modeling (BIM) and its impact on planning, financial management and construction documentation.	10.5%	28.5%	34.8%	20.9%	5.4%	1.82	1.05	61.1%	822
106. Knowledge of principles of computer assisted design and drafting (CADD) software and its uses in communicating design ideas.	1.2%	7.2%	28.2%	41.7%	21.7%	2.75	0.91	91.6%	822
107. Knowledge of American Institute of Architects (AIA) guidelines for contract agreements.	2.6%	16.4%	39.1%	31.0%	10.9%	2.31	0.96	81.0%	822
108. Knowledge of techniques to integrate model contract forms and documents.	4.0%	20.4%	41.5%	24.8%	9.2%	2.15	0.98	75.5%	822
109. Knowledge of benefits and limitations of software for construction documentation.	2.8%	16.1%	38.3%	31.1%	11.7%	2.33	0.97	81.1%	822
110. Knowledge of methods for production of construction documentation and drawings.	0.1%	4.4%	22.6%	39.2%	33.7%	3.02	0.87	95.5%	822
111. Knowledge of standard methods for production of design development documentation.	0.5%	7.3%	33.3%	38.2%	20.7%	2.71	0.89	92.2%	822
112. Knowledge of standard methods for production of site plan documentation.	1.0%	13.9%	39.5%	32.6%	13.0%	2.43	0.92	85.2%	822
113. Knowledge of circumstances warranting further actions based on field reports, third party inspections and test results.	0.6%	10.3%	34.2%	35.3%	19.6%	2.63	0.93	89.1%	822
114. Knowledge of materials testing processes and protocols to be performed during the construction process.	2.2%	21.2%	42.0%	27.3%	7.4%	2.17	0.92	76.6%	822
115. Knowledge of building systems testing processes and protocols to be performed during the construction process.	1.7%	24.5%	43.3%	24.1%	6.4%	2.09	0.90	73.8%	822
116. Knowledge of formats and protocols to process shop drawings and submittals to ensure they meet design intent.	0.2%	6.7%	30.3%	40.9%	21.9%	2.77	0.87	93.1%	822
117. Knowledge of protocols for responding to Requests for Information (RFI).	1.3%	8.2%	32.1%	39.7%	18.7%	2.66	0.92	90.5%	822
118. Knowledge of roles, responsibilities and authorities of project team members during construction.	0.4%	5.1%	31.1%	38.4%	24.9%	2.82	0.88	94.5%	822
119. Knowledge of conflict resolution techniques and their applications throughout project.	1.5%	11.2%	35.5%	35.3%	16.5%	2.54	0.94	87.3%	822
120. Knowledge of bidding processes and protocols for different project delivery methods and their applications.	1.3%	11.9%	39.7%	35.4%	11.7%	2.44	0.89	86.7%	822
121. Knowledge of requirements for post-occupancy evaluation.	7.7%	34.7%	38.6%	16.3%	2.8%	1.72	0.92	57.7%	822
122. Knowledge of design decisions and their impact on constructability.	0.1%	2.2%	16.8%	43.1%	37.8%	3.16	0.79	97.7%	822
123. Knowledge of methods to manage human resources.	7.2%	25.5%	39.1%	21.4%	6.8%	1.95	1.01	67.3%	822
124. Knowledge of state board guidelines for licensing and professional practice.	2.7%	13.5%	30.4%	30.0%	23.4%	2.58	1.07	83.8%	822
125. Knowledge of principles of universal design.	6.9%	19.0%	33.5%	30.2%	10.5%	2.18	1.07	74.1%	822
126. Knowledge of purposes of and legal implications for different types of business entities.	6.6%	28.2%	37.7%	18.0%	9.5%	1.96	1.05	65.2%	822

Total N = number of respondents

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Data Table D6. Percentage Distribution of Knowledge/Skill Importance Ratings

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	Knowledge/Skill Importance					MEAN IMP.	SD IMP.	PERCENT IMP.	TOTAL N
	0	1	2	3	4				
	OF LITTLE OR NO IMP.	SOMEWHAT IMP.	IMP.	VERY IMP.	CRITICALLY IMP.				
127. Knowledge of innovative and evolving technologies and their impact on architectural practice.	1.2%	17.8%	43.2%	29.8%	8.0%	2.26	0.88	81.0%	822
128. Knowledge of ethical standards relevant to architectural practice.	0.6%	5.2%	22.9%	39.1%	32.2%	2.97	0.90	94.2%	822
129. Knowledge of methods to facilitate information management in building design and construction.	2.3%	20.9%	43.3%	26.2%	7.3%	2.15	0.91	76.8%	822
130. Knowledge of factors involved in conducting architectural practice in international markets.	38.2%	37.3%	16.7%	5.2%	2.6%	0.97	0.99	24.5%	822
131. Knowledge of methods and procedures for risk management.	3.5%	14.7%	34.8%	32.5%	14.5%	2.40	1.02	81.8%	822
132. Knowledge of financial planning methods to manage revenues, staffing, and overhead expenses.	3.4%	14.4%	32.4%	30.0%	19.8%	2.49	1.07	82.2%	822
MEAN	2.8%	14.5%	33.5%	32.2%	17.1%	2.46	0.92	82.7%	822
MIN	0.0%	0.7%	7.5%	5.2%	2.2%	0.97	0.67	24.5%	821
MAX	38.2%	40.8%	49.8%	45.7%	61.8%	3.53	1.19	99.3%	822

Total N = number of respondents

Data Table D7. Percentage Distribution of Ratings for Level At Which Knowledge/Skills Were Used

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	DO NOT USE	Level at Which Used			PERCENT USED	TOTAL N
		UNDERSTAND	APPLY	EVALUATE		
1. Knowledge of oral, written, and visual presentation techniques to communicate project information.	0.5%	3.6%	45.3%	50.6%	99.5%	822
2. Knowledge of master plans and their impact on building design.	3.8%	18.2%	40.6%	37.3%	96.2%	822
3. Knowledge of method for project controls, e.g., scope of services, budget, billing, compensation.	1.6%	14.6%	45.4%	38.4%	98.4%	822
4. Knowledge of factors that affect selection of project consultants.	3.0%	16.1%	44.3%	36.6%	97.0%	822
5. Knowledge of strategies for delegating and monitoring task assignments, accountability and deadlines for project team.	2.9%	11.1%	53.8%	32.2%	97.1%	822
6. Knowledge of client and project characteristics that influence contract agreements.	2.8%	20.2%	41.6%	35.4%	97.2%	822
7. Knowledge of types of contracts and their designated use.	4.0%	22.7%	44.4%	28.8%	96.0%	822
8. Knowledge of standard forms of architectural service agreements for Owner-Architect, Architect-Consultant and Owner-Contractor.	5.1%	22.6%	47.1%	25.2%	94.9%	822
9. Knowledge of effects of specific findings from feasibility studies on building design.	5.8%	23.6%	43.2%	27.4%	94.2%	822
10. Knowledge of factors involved in selection of building systems and components.	1.2%	11.4%	43.7%	43.7%	98.8%	822
11. Knowledge of effect of environmental factors on site development.	1.9%	19.8%	45.3%	33.0%	98.1%	822
12. Knowledge of environmental policies and regulations and their implications for proposed construction.	3.4%	26.4%	40.8%	29.4%	96.6%	822
13. Knowledge of processes involved in conducting a survey of existing conditions.	1.6%	13.0%	47.9%	37.5%	98.4%	822
14. Knowledge of effects of specific findings from environmental impact studies on building design.	7.5%	29.2%	38.3%	24.9%	92.5%	822
15. Skill in designing facility layout and site plan that responds to site constraints.	2.1%	10.1%	41.1%	46.7%	97.9%	822
16. Knowledge of methods required to mitigate adverse site conditions.	3.9%	26.4%	42.0%	27.7%	96.1%	822
17. Knowledge of elements of and processes for conducting a site analysis.	2.8%	25.4%	43.9%	27.9%	97.2%	822
18. Knowledge of codes of professional conduct related to architectural practice.	1.1%	19.6%	49.1%	30.2%	98.9%	822
19. Knowledge of protocols and procedures for conducting a code analysis.	1.2%	9.7%	44.8%	44.3%	98.8%	822
20. Knowledge of building codes and their impact on building design.	0.6%	4.3%	39.1%	56.1%	99.4%	822
21. Knowledge of land use codes and ordinances that govern land use decisions.	2.7%	20.7%	41.5%	35.2%	97.3%	822
22. Skill in producing hand drawings of design ideas.	3.0%	14.8%	55.2%	26.9%	97.0%	822
23. Knowledge of standards for graphic symbols and units of measurement in technical drawings.	0.9%	10.1%	59.2%	29.8%	99.1%	822
24. Skill in producing two-dimensional (2-D) drawings using hand methods.	8.2%	21.9%	46.6%	23.4%	91.8%	822
25. Skill in using software to produce two-dimensional (2-D) drawings.	5.6%	12.8%	49.6%	32.0%	94.4%	822
26. Skill in using software to produce three-dimensional (3-D) models of building design.	14.4%	28.2%	35.3%	22.1%	85.6%	822
27. Skill in producing physical scale models.	23.5%	42.1%	23.8%	10.6%	76.5%	822
28. Skill in use of building information modeling (BIM) to develop and manage databases of building and construction information.	27.4%	35.2%	24.1%	13.4%	72.6%	822
29. Knowledge of protocols and procedures for obtaining community input for proposed design.	10.3%	35.0%	34.2%	20.4%	89.7%	822
30. Knowledge of computer aided design and drafting software for producing two-dimensional (2-D) drawings.	6.4%	16.3%	45.6%	31.6%	93.6%	822
31. Knowledge of factors involved in selecting computer based design technologies.	10.1%	39.8%	29.4%	20.7%	89.9%	822
32. Knowledge of engineering properties of soils and their effect on building foundations and building design.	7.5%	34.8%	33.8%	23.8%	92.5%	822
33. Knowledge of factors to be considered in adaptive reuse of existing buildings.	3.6%	25.8%	41.2%	29.3%	96.4%	822
34. Knowledge of building technologies which provide solutions for comfort, life safety and energy efficiency.	1.6%	12.5%	47.7%	38.2%	98.4%	822

Total N = number of respondents

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Data Table D7. Percentage Distribution of Ratings for Level At Which Knowledge/Skills Were Used

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	DO NOT USE	Level at Which Used			PERCENT USED	TOTAL N
		UNDERSTAND	APPLY	EVALUATE		
35. Knowledge of effect of thermal envelope in design of building systems.	2.3%	14.7%	44.5%	38.4%	97.7%	822
36. Knowledge of principles of integrated project design.	10.0%	35.9%	35.9%	18.2%	90.0%	822
37. Knowledge of strategies for anticipating, managing and preventing disputes and conflicts.	2.9%	26.3%	44.9%	25.9%	97.1%	822
38. Knowledge of engineering principles and their application to design and construction.	2.1%	21.7%	44.5%	31.8%	97.9%	822
39. Knowledge of properties of concrete products, materials, assemblies and their impact on building design and construction.	1.9%	23.7%	51.0%	23.4%	98.1%	822
40. Knowledge of properties of stone and masonry products, materials, assemblies and their impact on building design and construction.	1.3%	20.0%	52.4%	26.3%	98.7%	822
41. Knowledge of properties of metal products, materials, assemblies and their impact on building design and construction.	1.5%	18.4%	52.6%	27.6%	98.5%	822
42. Knowledge of properties of wood and wood products, materials, assemblies and their impact on building design and construction.	1.0%	15.8%	53.0%	30.2%	99.0%	822
43. Knowledge of properties of glass products, materials, assemblies and their impact on building design and construction.	1.2%	18.4%	52.3%	28.1%	98.8%	822
44. Knowledge of means and methods for building construction.	1.2%	18.2%	44.9%	35.6%	98.8%	822
45. Knowledge of benefits and limitations of "fast track" or other forms of construction delivery methods.	5.8%	38.2%	36.9%	19.1%	94.2%	822
46. Knowledge of methods and techniques for estimating construction costs.	7.3%	33.5%	36.6%	22.6%	92.7%	822
47. Knowledge of structural load and load conditions that affect building design.	4.1%	29.9%	39.4%	26.5%	95.9%	822
48. Knowledge of energy codes that impact construction.	3.8%	22.7%	44.6%	28.8%	96.2%	822
49. Knowledge of methods and strategies for evidence based design (EBD).	40.6%	38.2%	13.1%	8.0%	59.4%	822
50. Knowledge of impact of design on human behavior.	5.2%	30.2%	40.0%	24.6%	94.8%	822
51. Knowledge of functional requirements of heating, ventilation and air conditioning (HVAC) systems.	3.9%	26.6%	45.1%	24.3%	96.1%	822
52. Knowledge of functional requirements of plumbing systems.	3.8%	30.1%	45.2%	21.0%	96.2%	821
53. Knowledge of functional requirements of electrical systems.	4.1%	31.3%	45.4%	19.2%	95.9%	822
54. Knowledge of functional requirements of special systems.	7.1%	42.9%	33.2%	16.8%	92.9%	822
55. Knowledge of functional requirements of conveying systems.	9.7%	36.9%	36.9%	16.5%	90.3%	822
56. Knowledge of functional requirements of structural systems.	2.9%	18.6%	45.6%	32.8%	97.1%	822
57. Knowledge of functional requirements of roofing systems.	1.5%	10.8%	48.3%	39.4%	98.5%	822
58. Knowledge of functional requirements of fire suppression systems.	5.4%	35.2%	39.8%	19.7%	94.6%	822
59. Knowledge of functional requirements of communications systems.	8.6%	45.6%	31.5%	14.2%	91.4%	822
60. Knowledge of functional requirements of electronic safety and security systems.	9.4%	46.1%	30.5%	14.0%	90.6%	822
61. Knowledge of functional requirements of door and window systems.	1.0%	12.5%	50.1%	36.4%	99.0%	822
62. Knowledge of functional requirements for thermal and moisture control systems.	1.6%	10.2%	48.1%	40.1%	98.4%	822
63. Knowledge of hazardous materials mitigation at building site.	13.4%	46.7%	25.8%	14.1%	86.6%	822
64. Knowledge of principles of building operation and function.	3.3%	29.8%	40.8%	26.2%	96.7%	822
65. Knowledge of content and format of specifications.	2.1%	15.6%	54.3%	28.1%	97.9%	822
66. Knowledge of principles of interior design and their influences on building design.	3.3%	21.8%	49.3%	25.7%	96.7%	822
67. Knowledge of principles of landscape design and their influences on building design.	5.7%	34.9%	39.9%	19.5%	94.3%	822
68. Knowledge of site design principles and practices.	1.9%	17.6%	45.9%	34.5%	98.1%	822

Total N = number of respondents

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Data Table D7. Percentage Distribution of Ratings for Level At Which Knowledge/Skills Were Used

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	DO NOT USE	Level at Which Used			PERCENT USED	TOTAL N
		UNDERSTAND	APPLY	EVALUATE		
69. Knowledge of techniques for architectural programming to identify functional and operational requirements of scope of work.	2.6%	16.7%	42.7%	38.1%	97.4%	822
70. Knowledge of procedures to develop project scheduling, phasing and deliverables for various building types.	4.6%	27.7%	43.9%	23.7%	95.4%	822
71. Knowledge of relationship between constructability and aesthetics.	1.0%	10.3%	41.5%	47.2%	99.0%	822
72. Knowledge of accepted standards for building materials and methods of construction, e.g., ASTM, ANSI.	2.4%	30.2%	45.6%	21.8%	97.6%	822
73. Knowledge of methods to perform a life cycle cost analysis.	17.9%	49.8%	20.1%	12.3%	82.1%	822
74. Knowledge of principles of value analysis and value engineering processes.	6.0%	31.3%	40.3%	22.5%	94.0%	822
75. Knowledge of procedures and protocols of permit approval process.	2.2%	17.5%	51.2%	29.1%	97.8%	822
76. Knowledge of principles of historic preservation.	12.2%	40.1%	30.9%	16.8%	87.8%	822
77. Knowledge of processes and procedures for building commissioning.	19.7%	48.3%	24.6%	7.4%	80.3%	822
78. Knowledge of design factors to consider in selecting furniture, fixtures and equipment (FFE).	9.9%	42.5%	32.4%	15.3%	90.1%	822
79. Knowledge of methods and tools for space planning.	3.5%	22.9%	47.1%	26.5%	96.5%	822
80. Knowledge of different project delivery methods and their impacts on project schedule, costs and project goals.	5.7%	31.1%	39.5%	23.6%	94.3%	822
81. Knowledge of factors that impact construction management services.	8.2%	44.9%	30.5%	16.4%	91.8%	822
82. Knowledge of fee structures, their attributes and implications for schedule, scope and profit.	4.6%	25.5%	40.3%	29.6%	95.4%	822
83. Knowledge of consultant agreements and fee structures.	3.6%	24.5%	42.8%	29.1%	96.4%	822
84. Knowledge of different building and construction types and their implications for design and construction schedules.	1.5%	19.5%	45.0%	34.1%	98.5%	822
85. Knowledge of scheduling methods to establish project timeframes based on standard sequences of architectural services in each phase.	5.2%	27.5%	45.4%	21.9%	94.8%	822
86. Knowledge of business development strategies.	10.0%	35.2%	34.9%	20.0%	90.0%	822
87. Knowledge of relationship between staffing capabilities and hours, and internal project budget to meet established milestones and profitability.	8.6%	26.3%	40.6%	24.5%	91.4%	821
88. Knowledge of purposes and types of professional liability insurance related to architectural practice.	10.0%	37.0%	32.2%	20.8%	90.0%	822
89. Knowledge of format and protocols for efficient meeting management and information distribution.	3.0%	24.0%	54.6%	18.4%	97.0%	822
90. Knowledge of strategies to assess project progress and verify its alignment with project schedule.	3.8%	25.1%	50.9%	20.3%	96.2%	822
91. Knowledge of ways to translate project goals into specific tasks and measureable design criteria.	3.9%	23.2%	50.5%	22.4%	96.1%	822
92. Knowledge of effective communication techniques to educate client with respect to roles and responsibilities of all parties.	1.2%	18.1%	52.1%	28.6%	98.8%	822
93. Knowledge of formats and protocols to produce and distribute field reports to document construction progress.	3.8%	20.4%	58.0%	17.8%	96.2%	822
94. Knowledge of site requirements for a specific building type and scope to determine client's site needs.	3.5%	22.5%	42.1%	31.9%	96.5%	822
95. Knowledge of site analysis techniques to determine project parameters affecting design.	3.5%	22.4%	43.4%	30.7%	96.5%	822
96. Knowledge of methods to prioritize or objectively evaluate design options based on project goals.	2.2%	17.0%	46.5%	34.3%	97.8%	822
97. Knowledge of sustainability strategies and/or rating systems.	6.1%	32.1%	39.5%	22.3%	93.9%	822
98. Knowledge of sustainability considerations related to building materials and construction processes.	3.5%	29.2%	42.5%	24.8%	96.5%	822
99. Knowledge of techniques to integrate renewable energy systems into building design.	8.3%	40.1%	33.5%	18.1%	91.7%	822
100. Knowledge of methods to identify scope changes that may require additional services.	1.2%	17.8%	49.6%	31.4%	98.8%	822

Total N = number of respondents

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Data Table D7. Percentage Distribution of Ratings for Level At Which Knowledge/Skills Were Used

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	DO NOT USE	Level at Which Used			PERCENT USED	TOTAL N
		UNDERSTAND	APPLY	EVALUATE		
101. Knowledge of procedures for processing requests for additional services.	2.4%	23.0%	49.0%	25.5%	97.6%	822
102. Knowledge of appropriate documentation level required for construction documents.	0.9%	4.3%	48.2%	46.7%	99.1%	822
103. Knowledge of close-out document requirements and protocols.	3.4%	19.3%	57.7%	19.6%	96.6%	822
104. Knowledge of construction document technologies and their standards and applications.	1.1%	16.9%	54.9%	27.1%	98.9%	822
105. Knowledge of building information modeling (BIM) and its impact on planning, financial management and construction documentation.	27.1%	37.6%	24.0%	11.3%	72.9%	822
106. Knowledge of principles of computer assisted design and drafting (CADD) software and its uses in communicating design ideas.	5.0%	17.0%	49.4%	28.6%	95.0%	822
107. Knowledge of American Institute of Architects (AIA) guidelines for contract agreements.	5.0%	32.2%	44.2%	18.6%	95.0%	822
108. Knowledge of techniques to integrate model contract forms and documents.	9.7%	34.3%	39.4%	16.5%	90.3%	822
109. Knowledge of benefits and limitations of software for construction documentation.	5.5%	33.0%	39.9%	21.7%	94.5%	822
110. Knowledge of methods for production of construction documentation and drawings.	1.8%	12.2%	50.2%	35.8%	98.2%	822
111. Knowledge of standard methods for production of design development documentation.	1.8%	13.9%	55.0%	29.3%	98.2%	822
112. Knowledge of standard methods for production of site plan documentation.	4.3%	22.6%	49.8%	23.4%	95.7%	822
113. Knowledge of circumstances warranting further actions based on field reports, third party inspections and test results.	3.2%	22.5%	47.7%	26.6%	96.8%	822
115. Knowledge of building systems testing processes and protocols to be performed during the construction process.	5.4%	40.6%	38.9%	15.1%	94.6%	822
116. Knowledge of formats and protocols to process shop drawings and submittals to ensure they meet design intent.	1.5%	12.7%	58.0%	27.9%	98.5%	822
117. Knowledge of protocols for responding to Requests for Information (RFI).	2.8%	13.4%	57.7%	26.2%	97.2%	822
118. Knowledge of roles, responsibilities and authorities of project team members during construction.	1.3%	15.1%	54.7%	28.8%	98.7%	822
119. Knowledge of conflict resolution techniques and their applications throughout project.	2.4%	26.6%	49.3%	21.7%	97.6%	822
120. Knowledge of bidding processes and protocols for different project delivery methods and their applications.	3.4%	26.5%	49.6%	20.4%	96.6%	822
121. Knowledge of requirements for post-occupancy evaluation.	13.1%	47.0%	28.3%	11.6%	86.9%	822
122. Knowledge of design decisions and their impact on constructability.	0.9%	8.6%	42.9%	47.6%	99.1%	822
123. Knowledge of methods to manage human resources.	10.9%	39.5%	34.2%	15.3%	89.1%	822
124. Knowledge of state board guidelines for licensing and professional practice.	2.3%	33.0%	47.2%	17.5%	97.7%	822
125. Knowledge of principles of universal design.	10.2%	32.1%	38.3%	19.3%	89.8%	822
126. Knowledge of purposes of and legal implications for different types of business entities.	9.5%	51.6%	26.2%	12.8%	90.5%	822
127. Knowledge of innovative and evolving technologies and their impact on architectural practice.	2.3%	42.0%	34.4%	21.3%	97.7%	822
128. Knowledge of ethical standards relevant to architectural practice.	0.9%	19.7%	52.4%	27.0%	99.1%	822
129. Knowledge of methods to facilitate information management in building design and construction.	4.9%	36.9%	42.3%	15.9%	95.1%	822
130. Knowledge of factors involved in conducting architectural practice in international markets.	51.1%	32.4%	9.1%	7.4%	48.9%	822
131. Knowledge of methods and procedures for risk management.	6.2%	34.1%	39.1%	20.7%	93.8%	822
132. Knowledge of financial planning methods to manage revenues, staffing, and overhead expenses.	10.5%	34.5%	35.9%	19.1%	89.5%	822
MEAN	5.8%	25.7%	42.5%	26.0%	94.2%	822
MIN	0.5%	3.6%	9.1%	7.4%	48.9%	821
MAX	51.1%	51.6%	59.2%	56.1%	99.5%	822

Total N = number of respondents

Data Table D8. Percentage Distribution of Ratings for When Knowledge/Skills Were Acquired

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	When Acquired				TOTAL N
	NOT ACQUIRED	BY COMPLETION OF ACCREDITED ARCH. DEGREE PROGRAM	DURING INTERNSHIP	AFTER LICENSURE	
1. Knowledge of oral, written, and visual presentation techniques to communicate project information.	0.2%	60.4%	26.5%	12.9%	1,008
2. Knowledge of master plans and their impact on building design.	1.9%	42.1%	35.3%	20.7%	1,008
3. Knowledge of method for project controls, e.g., scope of services, budget, billing, compensation.	1.8%	6.8%	43.6%	47.8%	1,008
4. Knowledge of factors that affect selection of project consultants.	2.6%	3.2%	48.9%	45.3%	1,008
5. Knowledge of strategies for delegating and monitoring task assignments, accountability and deadlines for project team.	1.8%	6.5%	48.5%	43.2%	1,008
6. Knowledge of client and project characteristics that influence contract agreements.	3.2%	5.9%	37.3%	53.7%	1,008
7. Knowledge of types of contracts and their designated use.	1.9%	23.1%	37.0%	38.0%	1,008
8. Knowledge of standard forms of architectural service agreements for Owner-Architect, Architect-Consultant and Owner-Contractor.	1.1%	27.7%	39.6%	31.6%	1,008
9. Knowledge of effects of specific findings from feasibility studies on building design.	5.5%	14.8%	47.1%	32.6%	1,008
10. Knowledge of factors involved in selection of building systems and components.	0.5%	41.2%	45.4%	12.9%	1,008
11. Knowledge of effect of environmental factors on site development.	1.4%	58.0%	26.1%	14.5%	1,008
12. Knowledge of environmental policies and regulations and their implications for proposed construction.	3.4%	13.2%	44.3%	39.1%	1,008
13. Knowledge of processes involved in conducting a survey of existing conditions.	1.1%	24.2%	60.5%	14.2%	1,008
14. Knowledge of effects of specific findings from environmental impact studies on building design.	7.6%	14.5%	38.9%	39.0%	1,008
15. Skill in designing facility layout and site plan that responds to site constraints.	0.0%	67.9%	25.2%	6.9%	1,008
16. Knowledge of methods required to mitigate adverse site conditions.	2.9%	26.9%	42.4%	27.9%	1,008
17. Knowledge of elements of and processes for conducting a site analysis.	1.4%	55.7%	30.2%	12.8%	1,008
18. Knowledge of codes of professional conduct related to architectural practice.	0.3%	40.0%	44.9%	14.8%	1,008
19. Knowledge of protocols and procedures for conducting a code analysis.	0.8%	15.9%	65.4%	18.0%	1,008
20. Knowledge of building codes and their impact on building design.	0.0%	26.4%	59.9%	13.7%	1,008
21. Knowledge of land use codes and ordinances that govern land use decisions.	1.9%	17.3%	56.0%	24.9%	1,008
22. Skill in producing hand drawings of design ideas.	2.2%	88.8%	8.1%	0.9%	1,008
23. Knowledge of standards for graphic symbols and units of measurement in technical drawings.	0.1%	68.9%	29.7%	1.3%	1,008
24. Skill in producing two-dimensional (2-D) drawings using hand methods.	0.8%	89.6%	8.9%	0.7%	1,008
25. Skill in using software to produce two-dimensional (2-D) drawings.	13.0%	33.5%	20.5%	32.9%	1,008
26. Skill in using software to produce three-dimensional (3-D) models of building design.	35.1%	23.1%	12.7%	29.1%	1,008
27. Skill in producing physical scale models.	2.8%	91.0%	5.7%	0.6%	1,008
28. Skill in use of building information modeling (BIM) to develop and manage databases of building and construction information.	54.1%	4.4%	12.6%	29.0%	1,008
29. Knowledge of protocols and procedures for obtaining community input for proposed design.	10.1%	17.3%	38.0%	34.6%	1,008
30. Knowledge of computer aided design and drafting software for producing two-dimensional (2-D) drawings.	14.5%	28.3%	21.3%	35.9%	1,008
31. Knowledge of factors involved in selecting computer based design technologies.	20.6%	13.4%	22.8%	43.2%	1,008
32. Knowledge of engineering properties of soils and their effect on building foundations and building design.	3.4%	43.2%	35.4%	18.1%	1,008
33. Knowledge of factors to be considered in adaptive reuse of existing buildings.	4.4%	27.3%	41.5%	26.9%	1,008

Total N = number of respondents

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Data Table D8. Percentage Distribution of Ratings for When Knowledge/Skills Were Acquired

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	When Acquired				TOTAL N
	NOT ACQUIRED	BY COMPLETION OF ACCREDITED ARCH. DEGREE PROGRAM	DURING INTERNSHIP	AFTER LICENSURE	
34. Knowledge of building technologies which provide solutions for comfort, life safety and energy efficiency.	0.8%	49.0%	35.3%	14.9%	1,008
35. Knowledge of effect of thermal envelope in design of building systems.	1.6%	58.8%	24.0%	15.6%	1,008
36. Knowledge of principles of integrated project design.	12.0%	23.3%	26.2%	38.5%	1,008
37. Knowledge of strategies for anticipating, managing and preventing disputes and conflicts.	4.7%	8.1%	34.2%	53.0%	1,008
38. Knowledge of engineering principles and their application to design and construction.	0.5%	71.8%	23.5%	4.2%	1,008
39. Knowledge of properties of concrete products, materials, assemblies and their impact on building design and construction.	1.2%	69.7%	23.3%	5.8%	1,008
40. Knowledge of properties of stone and masonry products, materials, assemblies and their impact on building design and construction.	1.2%	61.5%	30.0%	7.3%	1,008
41. Knowledge of properties of metal products, materials, assemblies and their impact on building design and construction.	1.2%	63.2%	28.4%	7.2%	1,008
42. Knowledge of properties of wood and wood products, materials, assemblies and their impact on building design and construction.	0.8%	68.5%	25.5%	5.3%	1,008
43. Knowledge of properties of glass products, materials, assemblies and their impact on building design and construction.	1.6%	51.2%	35.2%	12.0%	1,008
44. Knowledge of means and methods for building construction.	1.4%	45.0%	42.9%	10.7%	1,008
45. Knowledge of benefits and limitations of "fast track" or other forms of construction delivery methods.	2.7%	17.4%	44.5%	35.4%	1,008
46. Knowledge of methods and techniques for estimating construction costs.	5.4%	16.6%	45.9%	32.1%	1,008
47. Knowledge of structural load and load conditions that affect building design.	1.0%	81.2%	15.4%	2.5%	1,008
48. Knowledge of energy codes that impact construction.	2.8%	24.4%	39.8%	33.0%	1,008
49. Knowledge of methods and strategies for evidence based design (EBD).	51.8%	7.6%	12.6%	28.0%	1,008
50. Knowledge of impact of design on human behavior.	5.9%	68.6%	11.3%	14.3%	1,008
51. Knowledge of functional requirements of heating, ventilation and air conditioning (HVAC) systems.	0.8%	67.4%	26.0%	5.9%	1,008
52. Knowledge of functional requirements of plumbing systems.	1.5%	61.5%	30.3%	6.7%	1,008
53. Knowledge of functional requirements of electrical systems.	1.8%	57.9%	31.7%	8.5%	1,008
54. Knowledge of functional requirements of special systems.	6.0%	31.0%	42.8%	20.3%	1,008
55. Knowledge of functional requirements of conveying systems.	7.1%	30.5%	45.0%	17.4%	1,008
56. Knowledge of functional requirements of structural systems.	0.7%	76.6%	19.9%	2.8%	1,008
57. Knowledge of functional requirements of roofing systems.	0.8%	41.0%	47.2%	11.0%	1,008
58. Knowledge of functional requirements of fire suppression systems.	1.8%	26.8%	51.0%	20.4%	1,008
59. Knowledge of functional requirements of communications systems.	6.1%	16.8%	48.4%	28.8%	1,008
60. Knowledge of functional requirements of electronic safety and security systems.	8.6%	11.5%	43.2%	36.7%	1,008
61. Knowledge of functional requirements of door and window systems.	0.4%	39.4%	50.0%	10.2%	1,008
62. Knowledge of functional requirements for thermal and moisture control systems.	0.9%	44.2%	41.6%	13.3%	1,008
63. Knowledge of hazardous materials mitigation at building site.	11.0%	6.3%	37.3%	45.3%	1,008
64. Knowledge of principles of building operation and function.	4.1%	36.0%	34.1%	25.8%	1,008
65. Knowledge of content and format of specifications.	1.0%	25.7%	58.4%	14.9%	1,008

Total N = number of respondents

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Data Table D8. Percentage Distribution of Ratings for When Knowledge/Skills Were Acquired

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	When Acquired				TOTAL N
	NOT ACQUIRED	BY COMPLETION OF ACCREDITED ARCH. DEGREE PROGRAM	DURING INTERNSHIP	AFTER LICENSURE	
66. Knowledge of principles of interior design and their influences on building design.	5.1%	49.7%	30.9%	14.4%	1,008
67. Knowledge of principles of landscape design and their influences on building design.	4.7%	55.3%	26.0%	14.1%	1,008
68. Knowledge of site design principles and practices.	0.7%	75.9%	19.3%	4.1%	1,008
69. Knowledge of techniques for architectural programming to identify functional and operational requirements of scope of work.	1.7%	56.4%	30.0%	11.9%	1,008
70. Knowledge of procedures to develop project scheduling, phasing and deliverables for various building types.	3.4%	8.8%	51.0%	36.7%	1,007
71. Knowledge of relationship between constructability and aesthetics.	1.2%	40.7%	39.6%	18.6%	1,008
72. Knowledge of accepted standards for building materials and methods of construction, e.g., ASTM, ANSI.	1.6%	25.4%	50.2%	22.8%	1,008
73. Knowledge of methods to perform a life cycle cost analysis.	21.1%	12.2%	25.6%	41.1%	1,008
74. Knowledge of principles of value analysis and value engineering processes.	6.2%	7.2%	43.5%	43.2%	1,008
75. Knowledge of procedures and protocols of permit approval process.	0.8%	4.6%	68.9%	25.7%	1,008
76. Knowledge of principles of historic preservation.	13.0%	31.8%	28.1%	27.1%	1,008
77. Knowledge of processes and procedures for building commissioning.	20.1%	3.8%	25.8%	50.3%	1,008
78. Knowledge of design factors to consider in selecting furniture, fixtures and equipment (FFE).	10.8%	13.5%	44.1%	31.5%	1,008
79. Knowledge of methods and tools for space planning.	1.7%	57.7%	28.8%	11.8%	1,008
80. Knowledge of different project delivery methods and their impacts on project schedule, costs and project goals.	3.2%	15.3%	43.0%	38.6%	1,008
81. Knowledge of factors that impact construction management services.	7.7%	8.1%	35.7%	48.4%	1,008
82. Knowledge of fee structures, their attributes and implications for schedule, scope and profit.	5.3%	7.5%	36.1%	51.1%	1,008
83. Knowledge of consultant agreements and fee structures.	4.1%	7.0%	39.1%	49.8%	1,008
84. Knowledge of different building and construction types and their implications for design and construction schedules.	2.0%	29.7%	44.6%	23.7%	1,008
85. Knowledge of scheduling methods to establish project timeframes based on standard sequences of architectural services in each phase.	5.1%	7.1%	49.5%	38.3%	1,008
86. Knowledge of business development strategies.	12.2%	3.9%	24.0%	59.9%	1,008
87. Knowledge of relationship between staffing capabilities and hours, and internal project budget to meet established milestones and profitability.	9.4%	1.8%	29.1%	59.7%	1,008
88. Knowledge of purposes and types of professional liability insurance related to architectural practice.	8.4%	9.2%	24.3%	58.0%	1,008
89. Knowledge of format and protocols for efficient meeting management and information distribution.	5.6%	3.9%	46.4%	44.1%	1,008
90. Knowledge of strategies to assess project progress and verify its alignment with project schedule.	4.9%	2.6%	44.0%	48.5%	1,008
91. Knowledge of ways to translate project goals into specific tasks and measureable design criteria.	6.9%	12.3%	39.5%	41.3%	1,008
92. Knowledge of effective communication techniques to educate client with respect to roles and responsibilities of all parties.	3.7%	7.0%	41.5%	47.8%	1,008
93. Knowledge of formats and protocols to produce and distribute field reports to document construction progress.	2.6%	3.4%	65.3%	28.8%	1,008
94. Knowledge of site requirements for a specific building type and scope to determine client's site needs.	2.4%	27.4%	48.0%	22.2%	1,008
95. Knowledge of site analysis techniques to determine project parameters affecting design.	2.3%	52.1%	31.5%	14.1%	1,008

Total N = number of respondents

CONTINUED

Data Table D8. Percentage Distribution of Ratings for When Knowledge/Skills Were Acquired

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	When Acquired				TOTAL N
	NOT ACQUIRED	BY COMPLETION OF ACCREDITED ARCH. DEGREE PROGRAM	DURING INTERNSHIP	AFTER LICENSURE	
96. Knowledge of methods to prioritize or objectively evaluate design options based on project goals.	3.2%	35.9%	39.3%	21.6%	1,008
97. Knowledge of sustainability strategies and/or rating systems.	10.9%	16.1%	20.8%	52.2%	1,008
98. Knowledge of sustainability considerations related to building materials and construction processes.	7.0%	19.2%	22.5%	51.2%	1,008
99. Knowledge of techniques to integrate renewable energy systems into building design.	9.2%	22.2%	18.8%	49.7%	1,008
100. Knowledge of methods to identify scope changes that may require additional services.	1.4%	3.0%	45.2%	50.4%	1,008
101. Knowledge of procedures for processing requests for additional services.	4.0%	2.3%	40.1%	53.7%	1,008
102. Knowledge of appropriate documentation level required for construction documents.	0.3%	9.8%	71.9%	18.0%	1,008
103. Knowledge of close-out document requirements and protocols.	5.1%	3.7%	53.0%	38.3%	1,008
104. Knowledge of construction document technologies and their standards and applications.	2.9%	14.6%	62.2%	20.3%	1,008
105. Knowledge of building information modeling (BIM) and its impact on planning, financial management and construction documentation.	42.4%	3.1%	12.2%	42.4%	1,008
106. Knowledge of principles of computer assisted design and drafting (CADD) software and its uses in communicating design ideas.	11.2%	23.0%	24.6%	41.2%	1,008
107. Knowledge of American Institute of Architects (AIA) guidelines for contract agreements.	1.7%	31.9%	43.7%	22.7%	1,008
108. Knowledge of techniques to integrate model contract forms and documents.	10.4%	11.6%	38.6%	39.4%	1,008
109. Knowledge of benefits and limitations of software for construction documentation.	11.1%	6.6%	36.3%	45.9%	1,008
110. Knowledge of methods for production of construction documentation and drawings.	0.5%	23.7%	65.0%	10.8%	1,008
111. Knowledge of standard methods for production of design development documentation.	0.3%	26.2%	64.0%	9.5%	1,008
112. Knowledge of standard methods for production of site plan documentation.	1.4%	27.6%	61.0%	10.0%	1,008
113. Knowledge of circumstances warranting further actions based on field reports, third party inspections and test results.	2.3%	2.5%	50.6%	44.6%	1,008
114. Knowledge of materials testing processes and protocols to be performed during the construction process.	4.3%	13.3%	52.0%	30.5%	1,008
115. Knowledge of building systems testing processes and protocols to be performed during the construction process.	5.9%	8.5%	50.6%	35.0%	1,008
116. Knowledge of formats and protocols to process shop drawings and submittals to ensure they meet design intent.	0.5%	3.1%	79.5%	17.0%	1,008
117. Knowledge of protocols for responding to Requests for Information (RFI).	2.0%	2.7%	69.1%	26.2%	1,008
118. Knowledge of roles, responsibilities and authorities of project team members during construction.	0.8%	9.5%	68.5%	21.2%	1,008
119. Knowledge of conflict resolution techniques and their applications throughout project.	5.8%	6.2%	40.0%	48.1%	1,008
120. Knowledge of bidding processes and protocols for different project delivery methods and their applications.	1.8%	8.9%	60.5%	28.8%	1,008
121. Knowledge of requirements for post-occupancy evaluation.	15.7%	6.4%	32.8%	45.0%	1,008
122. Knowledge of design decisions and their impact on constructability.	0.2%	33.5%	50.9%	15.4%	1,008
123. Knowledge of methods to manage human resources.	14.7%	3.5%	27.0%	54.9%	1,008
124. Knowledge of state board guidelines for licensing and professional practice.	0.4%	21.9%	66.3%	11.4%	1,008
125. Knowledge of principles of universal design.	17.2%	34.2%	22.9%	25.7%	1,008
126. Knowledge of purposes of and legal implications for different types of business entities.	11.9%	13.9%	20.9%	53.3%	1,008

Total N = number of respondents

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Data Table D8. Percentage Distribution of Ratings for When Knowledge/Skills Were Acquired

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	When Acquired				TOTAL N
	NOT ACQUIRED	BY COMPLETION OF ACCREDITED ARCH. DEGREE PROGRAM	DURING INTERNSHIP	AFTER LICENSURE	
127. Knowledge of innovative and evolving technologies and their impact on architectural practice.	3.2%	19.7%	31.9%	45.1%	1,008
128. Knowledge of ethical standards relevant to architectural practice.	0.6%	47.9%	37.8%	13.7%	1,008
129. Knowledge of methods to facilitate information management in building design and construction.	10.1%	8.3%	45.4%	36.1%	1,008
130. Knowledge of factors involved in conducting architectural practice in international markets.	57.4%	1.3%	9.4%	31.8%	1,008
131. Knowledge of methods and procedures for risk management.	14.0%	5.6%	27.2%	53.3%	1,008
132. Knowledge of financial planning methods to manage revenues, staffing, and overhead expenses.	16.6%	2.5%	17.7%	63.3%	1,008
MEAN	6.3%	27.7%	37.9%	28.1%	1,008
MIN	0.0%	1.3%	5.7%	0.6%	1,007
MAX	57.4%	91.0%	79.5%	63.3%	1,008

Total N = number of respondents

Data Table D9. Percentage Distribution of Ratings for When Knowledge/Skills Should be Acquired

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	When Should Be Acquired				TOTAL N
	NOT RELEVANT	BY COMPLETION OF ACCREDITED ARCH. DEGREE PROGRAM	DURING INTERNSHIP	AFTER LICENSURE	
1. Knowledge of oral, written, and visual presentation techniques to communicate project information.	0.8%	70.5%	25.6%	3.1%	1,008
2. Knowledge of master plans and their impact on building design.	1.1%	60.5%	32.8%	5.6%	1,008
3. Knowledge of method for project controls, e.g., scope of services, budget, billing, compensation.	0.5%	23.9%	58.5%	17.1%	1,008
4. Knowledge of factors that affect selection of project consultants.	0.8%	11.8%	64.0%	23.4%	1,008
5. Knowledge of strategies for delegating and monitoring task assignments, accountability and deadlines for project team.	0.6%	13.2%	60.8%	25.4%	1,008
6. Knowledge of client and project characteristics that influence contract agreements.	0.9%	14.5%	54.1%	30.6%	1,008
7. Knowledge of types of contracts and their designated use.	0.4%	37.7%	44.9%	17.0%	1,008
8. Knowledge of standard forms of architectural service agreements for Owner-Architect, Architect-Consultant and Owner-Contractor.	0.3%	39.9%	44.5%	15.3%	1,008
9. Knowledge of effects of specific findings from feasibility studies on building design.	2.3%	28.2%	53.7%	15.9%	1,008
10. Knowledge of factors involved in selection of building systems and components.	0.3%	58.0%	36.4%	5.3%	1,008
11. Knowledge of effect of environmental factors on site development.	0.4%	73.8%	21.7%	4.1%	1,008
12. Knowledge of environmental policies and regulations and their implications for proposed construction.	0.8%	31.9%	52.5%	14.8%	1,008
13. Knowledge of processes involved in conducting a survey of existing conditions.	0.8%	35.5%	58.4%	5.3%	1,008
14. Knowledge of effects of specific findings from environmental impact studies on building design.	2.1%	31.1%	49.7%	17.2%	1,008
15. Skill in designing facility layout and site plan that responds to site constraints.	0.2%	77.5%	19.3%	3.0%	1,008
16. Knowledge of methods required to mitigate adverse site conditions.	0.8%	41.7%	42.9%	14.7%	1,008
17. Knowledge of elements of and processes for conducting a site analysis.	0.5%	68.3%	26.4%	4.9%	1,008
18. Knowledge of codes of professional conduct related to architectural practice.	0.1%	56.7%	38.7%	4.5%	1,008
19. Knowledge of protocols and procedures for conducting a code analysis.	0.3%	42.8%	52.3%	4.7%	1,008
20. Knowledge of building codes and their impact on building design.	0.1%	55.5%	41.1%	3.4%	1,008
21. Knowledge of land use codes and ordinances that govern land use decisions.	0.6%	39.6%	48.8%	11.0%	1,008
22. Skill in producing hand drawings of design ideas.	3.2%	92.7%	3.8%	0.4%	1,008
23. Knowledge of standards for graphic symbols and units of measurement in technical drawings.	0.2%	81.2%	18.4%	0.3%	1,008
24. Skill in producing two-dimensional (2-D) drawings using hand methods.	7.2%	88.3%	4.3%	0.2%	1,008
25. Skill in using software to produce two-dimensional (2-D) drawings.	2.4%	85.6%	10.0%	2.0%	1,008
26. Skill in using software to produce three-dimensional (3-D) models of building design.	2.9%	82.2%	11.9%	3.0%	1,008
27. Skill in producing physical scale models.	7.2%	89.0%	3.8%	0.0%	1,008
28. Skill in use of building information modeling (BIM) to develop and manage databases of building and construction information.	6.4%	44.2%	41.6%	7.7%	1,008
29. Knowledge of protocols and procedures for obtaining community input for proposed design.	2.3%	25.0%	54.8%	18.0%	1,008
30. Knowledge of computer aided design and drafting software for producing two-dimensional (2-D) drawings.	1.4%	86.6%	10.8%	1.2%	1,008
31. Knowledge of factors involved in selecting computer based design technologies.	7.0%	45.7%	33.9%	13.3%	1,008
32. Knowledge of engineering properties of soils and their effect on building foundations and building design.	2.0%	59.3%	32.2%	6.4%	1,008

Total N = number of respondents

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Data Table D9. Percentage Distribution of Ratings for When Knowledge/Skills Should be Acquired

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	When Should Be Acquired				TOTAL N
	NOT RELEVANT	BY COMPLETION OF ACCREDITED ARCH. DEGREE PROGRAM	DURING INTERNSHIP	AFTER LICENSURE	
33. Knowledge of factors to be considered in adaptive reuse of existing buildings.	1.1%	48.4%	40.2%	10.3%	1,008
34. Knowledge of building technologies which provide solutions for comfort, life safety and energy efficiency.	0.2%	70.0%	26.3%	3.5%	1,008
35. Knowledge of effect of thermal envelope in design of building systems.	0.2%	80.3%	16.8%	2.8%	1,008
36. Knowledge of principles of integrated project design.	2.8%	47.7%	38.7%	10.8%	1,008
37. Knowledge of strategies for anticipating, managing and preventing disputes and conflicts.	1.3%	18.8%	52.9%	27.0%	1,008
38. Knowledge of engineering principles and their application to design and construction.	0.2%	81.8%	16.0%	2.0%	1,008
39. Knowledge of properties of concrete products, materials, assemblies and their impact on building design and construction.	0.3%	77.6%	19.6%	2.5%	1,008
40. Knowledge of properties of stone and masonry products, materials, assemblies and their impact on building design and construction.	0.3%	74.9%	21.8%	3.0%	1,008
41. Knowledge of properties of metal products, materials, assemblies and their impact on building design and construction.	0.3%	75.7%	21.4%	2.6%	1,008
42. Knowledge of properties of wood and wood products, materials, assemblies and their impact on building design and construction.	0.2%	77.5%	20.3%	2.0%	1,008
43. Knowledge of properties of glass products, materials, assemblies and their impact on building design and construction.	0.1%	72.8%	24.0%	3.1%	1,008
44. Knowledge of means and methods for building construction.	1.2%	57.3%	36.4%	5.1%	1,008
45. Knowledge of benefits and limitations of "fast track" or other forms of construction delivery methods.	1.6%	32.2%	50.3%	15.9%	1,008
46. Knowledge of methods and techniques for estimating construction costs.	1.7%	36.8%	48.2%	13.3%	1,008
47. Knowledge of structural load and load conditions that affect building design.	1.1%	85.5%	11.6%	1.8%	1,008
48. Knowledge of energy codes that impact construction.	0.5%	59.8%	35.7%	4.0%	1,008
49. Knowledge of methods and strategies for evidence based design (EBD).	20.0%	32.7%	33.6%	13.6%	1,008
50. Knowledge of impact of design on human behavior.	2.6%	83.6%	9.0%	4.8%	1,008
51. Knowledge of functional requirements of heating, ventilation and air conditioning (HVAC) systems.	0.4%	79.2%	18.3%	2.2%	1,008
52. Knowledge of functional requirements of plumbing systems.	1.0%	74.9%	21.5%	2.6%	1,008
53. Knowledge of functional requirements of electrical systems.	1.1%	73.1%	22.8%	3.0%	1,008
54. Knowledge of functional requirements of special systems.	3.8%	46.9%	39.4%	9.9%	1,008
55. Knowledge of functional requirements of conveying systems.	3.6%	47.2%	39.3%	9.9%	1,008
56. Knowledge of functional requirements of structural systems.	0.8%	83.3%	14.3%	1.6%	1,008
57. Knowledge of functional requirements of roofing systems.	0.2%	62.5%	33.8%	3.5%	1,008
58. Knowledge of functional requirements of fire suppression systems.	0.8%	51.0%	42.4%	5.9%	1,008
59. Knowledge of functional requirements of communications systems.	4.2%	38.0%	47.2%	10.6%	1,008
60. Knowledge of functional requirements of electronic safety and security systems.	4.7%	30.0%	50.1%	15.3%	1,008
61. Knowledge of functional requirements of door and window systems.	0.2%	55.6%	40.5%	3.8%	1,008
62. Knowledge of functional requirements for thermal and moisture control systems.	0.2%	65.2%	31.6%	3.0%	1,008
63. Knowledge of hazardous materials mitigation at building site.	5.6%	23.9%	50.8%	19.7%	1,008

Total N = number of respondents

CONTINUED

Data Table D9. Percentage Distribution of Ratings for When Knowledge/Skills Should be Acquired

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	When Should Be Acquired				TOTAL N
	NOT RELEVANT	BY COMPLETION OF ACCREDITED ARCH. DEGREE PROGRAM	DURING INTERNSHIP	AFTER LICENSURE	
64. Knowledge of principles of building operation and function.	2.7%	50.5%	34.5%	12.3%	1,008
65. Knowledge of content and format of specifications.	0.5%	48.8%	45.9%	4.8%	1,008
66. Knowledge of principles of interior design and their influences on building design.	2.9%	70.0%	22.4%	4.7%	1,008
67. Knowledge of principles of landscape design and their influences on building design.	2.3%	74.3%	18.8%	4.6%	1,008
68. Knowledge of site design principles and practices.	0.2%	87.7%	11.0%	1.1%	1,008
69. Knowledge of techniques for architectural programming to identify functional and operational requirements of scope of work.	0.7%	72.0%	23.3%	4.0%	1,008
70. Knowledge of procedures to develop project scheduling, phasing and deliverables for various building types.	1.3%	21.6%	58.5%	18.6%	1,008
71. Knowledge of relationship between constructability and aesthetics.	0.8%	64.1%	29.0%	6.2%	1,008
72. Knowledge of accepted standards for building materials and methods of construction, e.g., ASTM, ANSI.	0.8%	43.6%	46.7%	8.9%	1,008
73. Knowledge of methods to perform a life cycle cost analysis.	4.2%	34.1%	40.5%	21.2%	1,008
74. Knowledge of principles of value analysis and value engineering processes.	2.7%	24.0%	52.6%	20.7%	1,008
75. Knowledge of procedures and protocols of permit approval process.	0.3%	13.4%	74.7%	11.6%	1,008
76. Knowledge of principles of historic preservation.	5.1%	51.7%	30.7%	12.6%	1,008
77. Knowledge of processes and procedures for building commissioning.	6.2%	18.4%	51.0%	24.5%	1,008
78. Knowledge of design factors to consider in selecting furniture, fixtures and equipment (FFE).	8.4%	24.6%	50.2%	16.8%	1,008
79. Knowledge of methods and tools for space planning.	1.2%	74.8%	21.1%	2.9%	1,008
80. Knowledge of different project delivery methods and their impacts on project schedule, costs and project goals.	1.4%	34.2%	48.8%	15.6%	1,008
81. Knowledge of factors that impact construction management services.	3.0%	21.3%	50.8%	24.9%	1,008
82. Knowledge of fee structures, their attributes and implications for schedule, scope and profit.	0.7%	22.1%	51.3%	25.9%	1,008
83. Knowledge of consultant agreements and fee structures.	0.7%	18.6%	52.8%	28.0%	1,008
84. Knowledge of different building and construction types and their implications for design and construction schedules.	0.2%	47.5%	40.1%	12.2%	1,008
85. Knowledge of scheduling methods to establish project timeframes based on standard sequences of architectural services in each phase.	1.1%	19.6%	58.3%	20.9%	1,008
86. Knowledge of business development strategies.	2.4%	24.0%	37.1%	36.5%	1,008
87. Knowledge of relationship between staffing capabilities and hours, and internal project budget to meet established milestones and profitability.	2.1%	12.6%	45.8%	39.5%	1,008
88. Knowledge of purposes and types of professional liability insurance related to architectural practice.	1.3%	24.1%	39.7%	34.9%	1,008
89. Knowledge of format and protocols for efficient meeting management and information distribution.	2.6%	16.5%	60.0%	20.9%	1,008
90. Knowledge of strategies to assess project progress and verify its alignment with project schedule.	1.1%	11.1%	63.8%	24.0%	1,008
91. Knowledge of ways to translate project goals into specific tasks and measureable design criteria.	2.0%	21.9%	54.2%	21.9%	1,008
92. Knowledge of effective communication techniques to educate client with respect to roles and responsibilities of all parties.	0.6%	20.4%	55.5%	23.5%	1,008
93. Knowledge of formats and protocols to produce and distribute field reports to document construction progress.	1.1%	11.7%	75.6%	11.6%	1,008

Total N = number of respondents

CONTINUED

Data Table D9. Percentage Distribution of Ratings for When Knowledge/Skills Should be Acquired

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	When Should Be Acquired				TOTAL N
	NOT RELEVANT	BY COMPLETION OF ACCREDITED ARCH. DEGREE PROGRAM	DURING INTERNSHIP	AFTER LICENSURE	
94. Knowledge of site requirements for a specific building type and scope to determine client's site needs.	0.7%	39.2%	47.3%	12.8%	1,008
95. Knowledge of site analysis techniques to determine project parameters affecting design.	0.4%	64.2%	28.4%	7.0%	1,008
96. Knowledge of methods to prioritize or objectively evaluate design options based on project goals.	0.8%	51.0%	37.4%	10.8%	1,008
97. Knowledge of sustainability strategies and/or rating systems.	3.3%	57.6%	31.0%	8.1%	1,008
98. Knowledge of sustainability considerations related to building materials and construction processes.	2.2%	60.2%	30.3%	7.3%	1,008
99. Knowledge of techniques to integrate renewable energy systems into building design.	2.4%	64.3%	25.1%	8.2%	1,008
100. Knowledge of methods to identify scope changes that may require additional services.	0.4%	10.0%	66.8%	22.8%	1,008
101. Knowledge of procedures for processing requests for additional services.	0.7%	9.6%	60.4%	29.3%	1,008
102. Knowledge of appropriate documentation level required for construction documents.	0.2%	23.7%	70.2%	5.9%	1,008
103. Knowledge of close-out document requirements and protocols.	0.9%	12.3%	70.2%	16.6%	1,008
104. Knowledge of construction document technologies and their standards and applications.	1.4%	31.0%	60.8%	6.8%	1,008
105. Knowledge of building information modeling (BIM) and its impact on planning, financial management and construction documentation.	6.3%	34.6%	44.4%	14.7%	1,008
106. Knowledge of principles of computer assisted design and drafting (CADD) software and its uses in communicating design ideas.	2.0%	80.2%	16.1%	1.8%	1,008
107. Knowledge of American Institute of Architects (AIA) guidelines for contract agreements.	1.8%	43.7%	45.7%	8.8%	1,008
108. Knowledge of techniques to integrate model contract forms and documents.	2.9%	22.4%	52.8%	21.9%	1,008
109. Knowledge of benefits and limitations of software for construction documentation.	2.2%	32.8%	54.6%	10.4%	1,008
110. Knowledge of methods for production of construction documentation and drawings.	0.4%	44.0%	53.1%	2.5%	1,008
111. Knowledge of standard methods for production of design development documentation.	0.7%	43.4%	53.9%	2.1%	1,008
112. Knowledge of standard methods for production of site plan documentation.	1.0%	44.6%	51.7%	2.7%	1,008
113. Knowledge of circumstances warranting further actions based on field reports, third party inspections and test results.	0.5%	9.1%	66.6%	23.8%	1,008
114. Knowledge of materials testing processes and protocols to be performed during the construction process.	0.9%	22.1%	59.8%	17.2%	1,008
115. Knowledge of building systems testing processes and protocols to be performed during the construction process.	1.7%	18.8%	61.0%	18.6%	1,008
116. Knowledge of formats and protocols to process shop drawings and submittals to ensure they meet design intent.	0.2%	11.7%	81.5%	6.5%	1,008
117. Knowledge of protocols for responding to Requests for Information (RFI).	0.6%	10.7%	79.7%	9.0%	1,008
118. Knowledge of roles, responsibilities and authorities of project team members during construction.	0.2%	23.6%	68.0%	8.2%	1,008
119. Knowledge of conflict resolution techniques and their applications throughout project.	1.5%	18.7%	54.3%	25.6%	1,008
120. Knowledge of bidding processes and protocols for different project delivery methods and their applications.	0.8%	22.7%	63.7%	12.8%	1,008
121. Knowledge of requirements for post-occupancy evaluation.	4.9%	15.2%	56.3%	23.6%	1,008
122. Knowledge of design decisions and their impact on constructability.	0.3%	55.5%	39.1%	5.2%	1,008
123. Knowledge of methods to manage human resources.	6.1%	10.9%	41.3%	41.8%	1,008
124. Knowledge of state board guidelines for licensing and professional practice.	0.3%	37.6%	56.5%	5.6%	1,008

Total N = number of respondents

CONTINUED

ARE B

Data Table D9. Percentage Distribution of Ratings for When Knowledge/Skills Should be Acquired

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	When Should Be Acquired				TOTAL N
	NOT RELEVANT	BY COMPLETION OF ACCREDITED ARCH. DEGREE PROGRAM	DURING INTERNSHIP	AFTER LICENSURE	
125. Knowledge of principles of universal design.	9.2%	65.1%	19.7%	6.0%	1,008
126. Knowledge of purposes of and legal implications for different types of business entities.	6.0%	28.4%	30.5%	35.2%	1,008
127. Knowledge of innovative and evolving technologies and their impact on architectural practice.	1.6%	36.7%	36.7%	25.0%	1,008
128. Knowledge of ethical standards relevant to architectural practice.	0.4%	67.3%	28.4%	4.0%	1,008
129. Knowledge of methods to facilitate information management in building design and construction.	3.7%	26.0%	57.1%	13.2%	1,008
130. Knowledge of factors involved in conducting architectural practice in international markets.	19.3%	10.6%	21.9%	48.1%	1,008
131. Knowledge of methods and procedures for risk management.	3.8%	19.3%	45.3%	31.5%	1,008
132. Knowledge of financial planning methods to manage revenues, staffing, and overhead expenses.	3.0%	15.7%	32.2%	49.1%	1,008
MEAN	2.1%	44.8%	40.7%	12.4%	1,008
MIN	0.1%	9.1%	3.8%	0.0%	1,008
MAX	20.0%	92.7%	81.5%	49.1%	1,008

Total N = number of respondents

Data Table D10. Percentage Distribution of Ratings for Reason(s) a Knowledge/Skill Was Not Used

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	Reason(s) Not Used						N – TOTAL REASONS NOT USED[1] OTHER	N – INDIVIDUALS NOT USED[2]
	NOT USED IN PRACTICE	NOT ALLOWED BY JURIS.	NOT REC. BY LEGAL COUNSEL OR INSURANCE CARRIER	PROVIDED BY CONSULTANT(S)	LACK OF EXP.	OTHER		
1. Knowledge of oral, written, and visual presentation techniques to communicate project information.	0	0	0	0	0	5	5	4
2. Knowledge of master plans and their impact on building design.	20	0	0	2	3	7	32	31
3. Knowledge of method for project controls, e.g., scope of services, budget, billing, compensation.	3	0	0	0	5	5	13	13
4. Knowledge of factors that affect selection of project consultants.	7	1	1	0	8	12	29	25
5. Knowledge of strategies for delegating and monitoring task assignments, accountability and deadlines for project team.	18	0	0	1	2	5	26	24
6. Knowledge of client and project characteristics that influence contract agreements.	3	0	0	0	11	11	25	23
7. Knowledge of types of contracts and their designated use.	10	0	0	1	7	16	34	33
8. Knowledge of standard forms of architectural service agreements for Owner-Architect, Architect-Consultant and Owner-Contractor.	18	0	0	0	6	18	42	42
9. Knowledge of effects of specific findings from feasibility studies on building design.	33	0	0	6	8	4	51	48
10. Knowledge of factors involved in selection of building systems and components.	4	0	0	2	0	4	10	10
11. Knowledge of effect of environmental factors on site development.	8	0	0	2	1	5	16	16
12. Knowledge of environmental policies and regulations and their implications for proposed construction.	11	0	0	9	3	7	30	28
13. Knowledge of processes involved in conducting a survey of existing conditions.	5	0	0	4	1	3	13	13
14. Knowledge of effects of specific findings from environmental impact studies on building design.	39	0	2	12	6	6	65	62
15. Skill in designing facility layout and site plan that responds to site constraints.	13	0	0	1	0	3	17	17
16. Knowledge of methods required to mitigate adverse site conditions.	14	0	2	10	7	2	35	32
17. Knowledge of elements of and processes for conducting a site analysis.	9	0	0	11	2	3	25	23
18. Knowledge of codes of professional conduct related to architectural practice.	4	0	0	0	1	5	10	9
19. Knowledge of protocols and procedures for conducting a code analysis.	4	0	0	3	1	3	11	10

CONTINUED

[1] This column is a sum of all the reasons participants did not use a knowledge or skill. Respondents were allowed to select as many of the reasons not used as applicable; therefore the reason a knowledge was not used may exceed the number of participants who do not use a particular knowledge or skill.

[2] This column represents the number of individuals who indicated that they do not use the knowledge or skill.

Data Table D10. Percentage Distribution of Ratings for Reason(s) a Knowledge/Skill Was Not Used

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	Reason(s) Not Used						N – TOTAL REASONS NOT USED[1] OTHER	N – INDIVIDUALS NOT USED[2]
	NOT USED IN PRACTICE	NOT ALLOWED BY JURIS.	NOT REC. BY LEGAL COUNSEL OR INSURANCE CARRIER	PROVIDED BY CONSULTANT(S)	LACK OF EXP.	OTHER		
20. Knowledge of building codes and their impact on building design.	2	0	0	1	0	2	5	5
21. Knowledge of land use codes and ordinances that govern land use decisions.	13	0	0	4	3	4	24	22
22. Skill in producing hand drawings of design ideas.	15	0	0	4	3	7	29	25
23. Knowledge of standards for graphic symbols and units of measurement in technical drawings.	4	0	0	2	0	3	9	7
24. Skill in producing two-dimensional (2-D) drawings using hand methods.	50	0	0	4	2	15	71	67
25. Skill in using software to produce two-dimensional (2-D) drawings.	19	0	0	8	13	12	52	46
26. Skill in using software to produce three-dimensional (3-D) models of building design.	49	0	0	14	60	20	143	118
27. Skill in producing physical scale models.	145	0	1	31	10	30	217	193
28. Skill in use of building information modeling (BIM) to develop and manage databases of building and construction information.	150	0	2	9	87	27	275	225
29. Knowledge of protocols and procedures for obtaining community input for proposed design.	59	1	1	6	9	15	91	85
30. Knowledge of computer aided design and drafting software for producing two-dimensional (2-D) drawings.	24	0	0	12	13	9	58	53
31. Knowledge of factors involved in selecting computer based design technologies.	36	0	0	12	23	22	93	83
32. Knowledge of engineering properties of soils and their effect on building foundations and building design.	12	0	3	48	1	4	68	62
33. Knowledge of factors to be considered in adaptive reuse of existing buildings.	22	0	0	2	3	3	30	30
34. Knowledge of building technologies which provide solutions for comfort, life safety and energy efficiency.	5	0	0	6	0	2	13	13
35. Knowledge of effect of thermal envelope in design of building systems.	8	0	0	7	2	3	20	19
36. Knowledge of principles of integrated project design.	56	0	0	3	17	14	90	82
37. Knowledge of strategies for anticipating, managing and preventing disputes and conflicts.	12	0	1	4	6	4	27	24
38. Knowledge of engineering principles and their application to design and construction.	4	0	0	12	0	2	18	17
39. Knowledge of properties of concrete products, materials, assemblies and their impact on building design and construction.	5	0	0	10	0	2	17	16

CONTINUED

[1] This column is a sum of all the reasons participants did not use a knowledge or skill. Respondents were allowed to select as many of the reasons not used as applicable; therefore the reason a knowledge was not used may exceed the number of participants who do not use a particular knowledge or skill.

[2] This column represents the number of individuals who indicated that they do not use the knowledge or skill.

ARE C

Data Table D10. Percentage Distribution of Ratings for Reason(s) a Knowledge/Skill Was Not Used

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	Reason(s) Not Used						N – TOTAL REASONS NOT USED[1] OTHER	N – INDIVIDUALS NOT USED[2]
	NOT USED IN PRACTICE	NOT ALLOWED BY JURIS.	NOT REC. BY LEGAL COUNSEL OR INSURANCE CARRIER	PROVIDED BY CONSULTANT(S)	LACK OF EXP.	OTHER		
40. Knowledge of properties of stone and masonry products, materials, assemblies and their impact on building design and construction.	4	0	0	5	0	3	12	11
41. Knowledge of properties of metal products, materials, assemblies and their impact on building design and construction.	5	0	0	6	0	2	13	12
42. Knowledge of properties of wood and wood products, materials, assemblies and their impact on building design and construction.	4	0	0	2	0	2	8	8
43. Knowledge of properties of glass products, materials, assemblies and their impact on building design and construction.	5	0	0	3	0	2	10	10
44. Knowledge of means and methods for building construction.	4	1	2	2	1	2	12	10
45. Knowledge of benefits and limitations of "fast track" or other forms of construction delivery methods.	40	0	1	1	7	6	55	48
46. Knowledge of methods and techniques for estimating construction costs.	20	0	3	29	15	5	72	60
47. Knowledge of structural load and load conditions that affect building design.	9	0	0	25	0	3	37	34
48. Knowledge of energy codes that impact construction.	10	0	0	15	4	3	32	31
49. Knowledge of methods and strategies for evidence based design (EBD).	205	0	0	12	117	41	375	334
50. Knowledge of impact of design on human behavior.	29	0	0	4	11	4	48	43
51. Knowledge of functional requirements of heating, ventilation and air conditioning (HVAC) systems.	6	0	0	25	1	2	34	32
52. Knowledge of functional requirements of plumbing systems.	6	0	0	23	2	3	34	31
53. Knowledge of functional requirements of electrical systems.	7	0	0	25	2	4	38	34
54. Knowledge of functional requirements of special systems.	13	0	0	35	3	10	61	58
55. Knowledge of functional requirements of conveying systems.	54	0	0	21	3	4	82	80
56. Knowledge of functional requirements of structural systems.	3	0	0	19	0	2	24	24
57. Knowledge of functional requirements of roofing systems.	6	0	0	5	0	3	14	12
58. Knowledge of functional requirements of fire suppression systems.	10	1	0	30	3	6	50	44
59. Knowledge of functional requirements of communications systems.	26	0	0	40	4	5	75	71
60. Knowledge of functional requirements of electronic safety and security systems.	23	0	0	52	4	3	82	77

CONTINUED

[1] This column is a sum of all the reasons participants did not use a knowledge or skill. Respondents were allowed to select as many of the reasons not used as applicable; therefore the reason a knowledge was not used may exceed the number of participants who do not use a particular knowledge or skill.

[2] This column represents the number of individuals who indicated that they do not use the knowledge or skill.

Data Table D10. Percentage Distribution of Ratings for Reason(s) a Knowledge/Skill Was Not Used

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	Reason(s) Not Used						N – TOTAL REASONS NOT USED[1] OTHER	N – INDIVIDUALS NOT USED[2]
	NOT USED IN PRACTICE	NOT ALLOWED BY JURIS.	NOT REC. BY LEGAL COUNSEL OR INSURANCE CARRIER	PROVIDED BY CONSULTANT(S)	LACK OF EXP.	OTHER		
61. Knowledge of functional requirements of door and window systems.	4	0	0	2	0	2	8	8
62. Knowledge of functional requirements for thermal and moisture control systems.	7	0	0	4	0	2	13	13
63. Knowledge of hazardous materials mitigation at building site.	43	2	23	49	15	8	140	110
64. Knowledge of principles of building operation and function.	15	0	0	5	3	4	27	27
65. Knowledge of content and format of specifications.	9	0	0	4	2	3	18	17
66. Knowledge of principles of interior design and their influences on building design.	14	0	1	11	3	2	31	27
67. Knowledge of principles of landscape design and their influences on building design.	14	0	0	33	2	3	52	47
68. Knowledge of site design principles and practices.	8	0	0	7	0	2	17	16
69. Knowledge of techniques for architectural programming to identify functional and operational requirements of scope of work.	12	0	0	3	2	4	21	21
70. Knowledge of procedures to develop project scheduling, phasing and deliverables for various building types.	16	0	0	10	13	7	46	38
71. Knowledge of relationship between constructability and aesthetics.	4	0	0	3	0	2	9	8
72. Knowledge of accepted standards for building materials and methods of construction, e.g., ASTM, ANSI.	10	0	0	2	6	2	20	20
73. Knowledge of methods to perform a life cycle cost analysis.	83	0	1	40	45	7	176	147
74. Knowledge of principles of value analysis and value engineering processes.	26	0	1	14	11	4	56	49
75. Knowledge of procedures and protocols of permit approval process.	7	0	0	6	2	4	19	18
76. Knowledge of principles of historic preservation.	75	0	0	11	14	4	104	100
77. Knowledge of processes and procedures for building commissioning.	88	0	0	59	33	8	188	162
78. Knowledge of design factors to consider in selecting furniture, fixtures and equipment (FFE).	43	0	0	38	12	4	97	81
79. Knowledge of methods and tools for space planning.	14	0	0	7	5	5	31	29
80. Knowledge of different project delivery methods and their impacts on project schedule, costs and project goals.	30	0	0	10	9	7	56	47
81. Knowledge of factors that impact construction management services.	37	0	2	16	11	10	76	67
82. Knowledge of fee structures, their attributes and implications for schedule, scope and profit.	16	0	0	3	10	11	40	38
83. Knowledge of consultant agreements and fee structures.	8	0	0	1	13	10	32	30

CONTINUED

[1] This column is a sum of all the reasons participants did not use a knowledge or skill. Respondents were allowed to select as many of the reasons not used as applicable; therefore the reason a knowledge was not used may exceed the number of participants who do not use a particular knowledge or skill.

[2] This column represents the number of individuals who indicated that they do not use the knowledge or skill.

Data Table D10. Percentage Distribution of Ratings for Reason(s) a Knowledge/Skill Was Not Used

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	Reason(s) Not Used						N – TOTAL REASONS NOT USED[1] OTHER	N – INDIVIDUALS NOT USED[2]
	NOT USED IN PRACTICE	NOT ALLOWED BY JURIS.	NOT REC. BY LEGAL COUNSEL OR INSURANCE CARRIER	PROVIDED BY CONSULTANT(S)	LACK OF EXP.	OTHER		
84. Knowledge of different building and construction types and their implications for design and construction schedules.	6	0	0	2	2	3	13	12
85. Knowledge of scheduling methods to establish project timeframes based on standard sequences of architectural services in each phase.	22	0	0	9	11	7	49	43
86. Knowledge of business development strategies.	34	0	0	6	33	17	90	82
87. Knowledge of relationship between staffing capabilities and hours, and internal project budget to meet established milestones and profitability.	37	0	0	8	21	13	79	71
88. Knowledge of purposes and types of professional liability insurance related to architectural practice.	23	0	2	14	33	15	87	82
89. Knowledge of format and protocols for efficient meeting management and information distribution.	17	0	0	1	5	4	27	25
90. Knowledge of strategies to assess project progress and verify its alignment with project schedule.	17	0	0	5	6	6	34	31
91. Knowledge of ways to translate project goals into specific tasks and measureable design criteria.	21	0	0	1	5	5	32	32
92. Knowledge of effective communication techniques to educate client with respect to roles and responsibilities of all parties.	4	0	0	1	2	3	10	10
93. Knowledge of formats and protocols to produce and distribute field reports to document construction progress.	19	0	0	6	3	3	31	31
94. Knowledge of site requirements for a specific building type and scope to determine client's site needs.	13	0	0	11	3	3	30	29
95. Knowledge of site analysis techniques to determine project parameters affecting design.	14	0	0	11	4	4	33	29
96. Knowledge of methods to prioritize or objectively evaluate design options based on project goals.	9	0	0	3	3	5	20	19
97. Knowledge of sustainability strategies and/or rating systems.	34	0	0	7	13	6	60	49
98. Knowledge of sustainability considerations related to building materials and construction processes.	19	0	0	4	8	2	33	29
99. Knowledge of techniques to integrate renewable energy systems into building design.	40	0	1	18	19	7	85	68
100. Knowledge of methods to identify scope changes that may require additional services.	3	0	0	1	3	3	10	10
101. Knowledge of procedures for processing requests for additional services.	4	0	0	3	9	5	21	20
102. Knowledge of appropriate documentation level required for construction documents.	3	0	0	1	0	3	7	7
103. Knowledge of close-out document requirements and protocols.	14	0	0	3	5	9	31	29

CONTINUED

[1] This column is a sum of all the reasons participants did not use a knowledge or skill. Respondents were allowed to select as many of the reasons not used as applicable; therefore the reason a knowledge was not used may exceed the number of participants who do not use a particular knowledge or skill.

[2] This column represents the number of individuals who indicated that they do not use the knowledge or skill.

Data Table D10. Percentage Distribution of Ratings for Reason(s) a Knowledge/Skill Was Not Used

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	Reason(s) Not Used						N – TOTAL REASONS NOT USED[1] OTHER	N – INDIVIDUALS NOT USED[2]
	NOT USED IN PRACTICE	NOT ALLOWED BY JURIS.	NOT REC. BY LEGAL COUNSEL OR INSURANCE CARRIER	PROVIDED BY CONSULTANT(S)	LACK OF EXP.	OTHER		
104. Knowledge of construction document technologies and their standards and applications.	3	0	0	3	0	3	9	9
105. Knowledge of building information modeling (BIM) and its impact on planning, financial management and construction documentation.	160	0	2	12	82	22	278	223
106. Knowledge of principles of computer assisted design and drafting (CADD) software and its uses in communicating design ideas.	21	0	0	11	10	7	49	41
107. Knowledge of American Institute of Architects (AIA) guidelines for contract agreements.	26	2	1	3	4	8	44	40
108. Knowledge of techniques to integrate model contract forms and documents.	39	1	3	4	28	9	84	80
109. Knowledge of benefits and limitations of software for construction documentation.	23	0	0	10	12	5	50	45
110. Knowledge of methods for production of construction documentation and drawings.	8	0	0	5	0	2	15	15
111. Knowledge of standard methods for production of design development documentation.	7	0	0	4	0	5	16	14
112. Knowledge of standard methods for production of site plan documentation.	9	0	0	23	1	5	38	35
113. Knowledge of circumstances warranting further actions based on field reports, third party inspections and test results.	12	0	1	6	6	2	27	26
114. Knowledge of materials testing processes and protocols to be performed during the construction process.	17	0	1	22	10	3	53	48
115. Knowledge of building systems testing processes and protocols to be performed during the construction process.	14	0	0	24	10	3	51	44
116. Knowledge of formats and protocols to process shop drawings and submittals to ensure they meet design intent.	6	0	0	3	0	4	13	13
117. Knowledge of protocols for responding to Requests for Information (RFI).	17	0	0	2	3	4	26	23
118. Knowledge of roles, responsibilities and authorities of project team members during construction.	7	0	0	1	1	3	12	11
119. Knowledge of conflict resolution techniques and their applications throughout project.	6	0	0	1	12	2	21	20
120. Knowledge of bidding processes and protocols for different project delivery methods and their applications.	15	0	0	5	7	5	32	27
121. Knowledge of requirements for post-occupancy evaluation.	80	0	0	11	23	11	125	108
122. Knowledge of design decisions and their impact on constructability.	2	0	0	3	0	4	9	9

[1] This column is a sum of all the reasons participants did not use a knowledge or skill. Respondents were allowed to select as many of the reasons not used as applicable; therefore the reason a knowledge was not used may exceed the number of participants who do not use a particular knowledge or skill.

[2] This column represents the number of individuals who indicated that they do not use the knowledge or skill.

CONTINUED

ARE C

Data Table D10. Percentage Distribution of Ratings for Reason(s) a Knowledge/Skill Was Not Used

Survey Population: All Licensed Architects

KNOWLEDGE/SKILL STATEMENT	Reason(s) Not Used						N – TOTAL REASONS NOT USED[1] OTHER	N – INDIVIDUALS NOT USED[2]
	NOT USED IN PRACTICE	NOT ALLOWED BY JURIS.	NOT REC. BY LEGAL COUNSEL OR INSURANCE CARRIER	PROVIDED BY CONSULTANT(S)	LACK OF EXP.	OTHER		
123. Knowledge of methods to manage human resources.	51	0	0	5	19	21	96	90
124. Knowledge of state board guidelines for licensing and professional practice.	7	0	0	3	1	8	19	18
125. Knowledge of principles of universal design.	53	1	0	6	20	14	94	84
126. Knowledge of purposes of and legal implications for different types of business entities.	34	0	0	8	30	12	84	78
127. Knowledge of innovative and evolving technologies and their impact on architectural practice.	8	0	0	5	3	4	20	18
128. Knowledge of ethical standards relevant to architectural practice.	4	0	0	0	1	2	7	7
129. Knowledge of methods to facilitate information management in building design and construction.	25	0	0	6	9	5	45	41
130. Knowledge of factors involved in conducting architectural practice in international markets.	369	2	4	5	72	17	469	419
131. Knowledge of methods and procedures for risk management.	27	0	0	6	18	6	57	51
132. Knowledge of financial planning methods to manage revenues, staffing, and overhead expenses.	27	0	0	12	34	17	90	86
MEAN	25.87	0.09	0.47	9.88	9.97	6.74	53.02	-
MIN	0	0	0	0	0	2	5	-
MAX	369	2	23	59	117	41	469	-

[1] This column is a sum of all the reasons participants did not use a knowledge or skill. Respondents were allowed to select as many of the reasons not used as applicable; therefore the reason a knowledge was not used may exceed the number of participants who do not use a particular knowledge or skill.

[2] This column represents the number of individuals who indicated that they do not use the knowledge or skill.

APPENDICES

APPENDIX A: **OVERALL SURVEY DEVELOPMENT**

The primary goal of previous NCARB practice analysis studies was to gather data for purposes of maintaining a current and valid ARE test specification. The Council expanded the scope of the 2012 study so that all Council programs could directly benefit from the Practice Analysis findings. As a result, the survey design, data collection, data analysis, and application processes were significantly revamped.

As in the past, the *2012 NCARB Practice Analysis of Architecture* was designed to be consistent with the Standards for Educational and Psychological Testing (1999) set forth by the American Educational Research Association, the American Psychological Association, and the National Council on Measurement in Education (the Standards). The Standards serve as the universally recognized benchmark for design, construction, standard setting/cut score, test administration, score reporting, and test scoring of all examinations, including those related to education, personnel selection, licensure, and certification. The three key Standards that served as foundational references for NCARB's 2012 Practice Analysis are:

Standard 14.8 "Evidence of validity based on test content requires a thorough and explicit definition of the content domain of interest." (p. 160)

Standard 14.10 "When evidence of validity based on test content is presented, the rationale for defining and describing a specific job content domain in a particular way (e.g., in terms of tasks to be performed or knowledge, skills, abilities, and other personal characteristics) should be stated clearly." (p. 160)

Standard 14.14 "The content domain to be covered by a credentialing test should be defined clearly and justified in terms of the importance of content for credential-worthy performance in an occupation or profession. A rationale should be provided to support a claim that the knowledge or skills being assessed are required for credential-worthy performance in an occupation and are consistent with the purpose for which the licensing or certification program was instituted." (p. 161)

SURVEY DESIGN

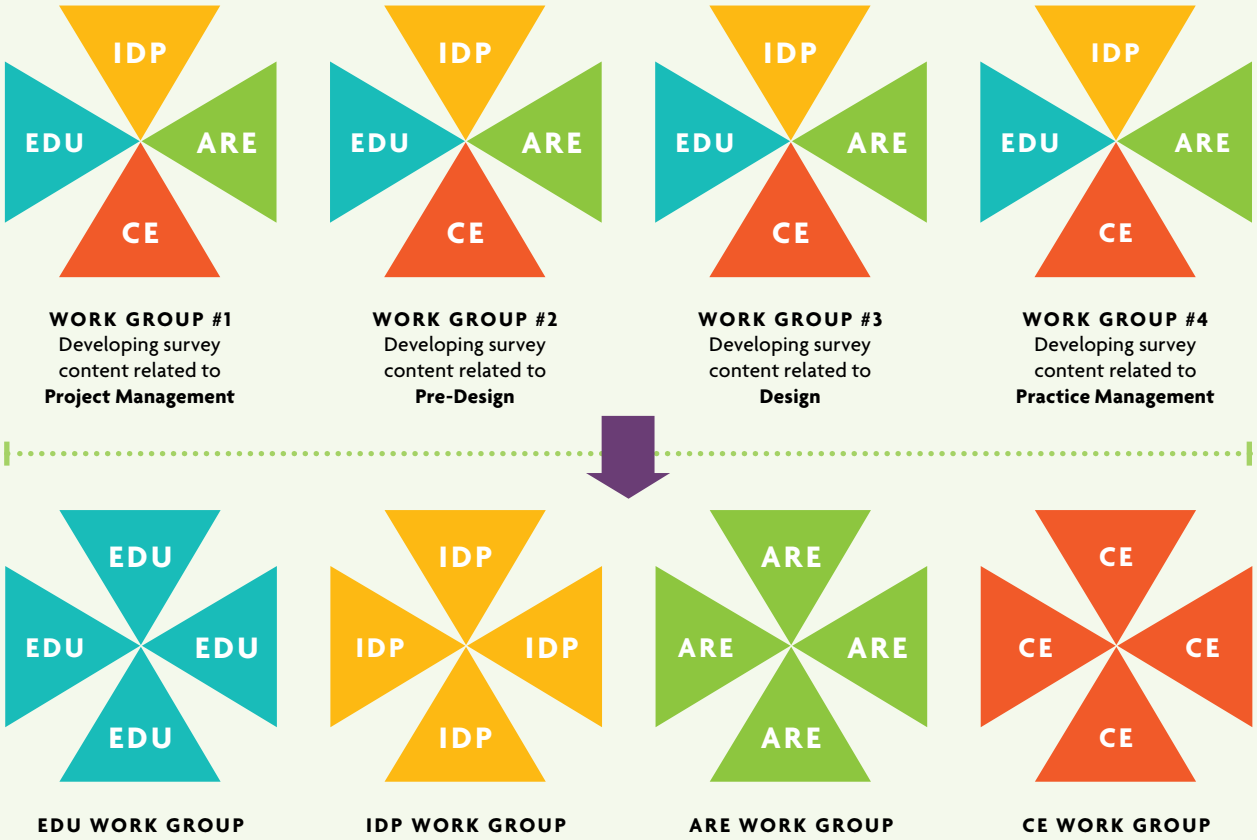
The 2012 Practice Analysis was designed under the guidance and review of the Practice Analysis Steering Committee (PASC), which served as the oversight body responsible for planning and implementing the new multi-disciplinary approach. The 11-member PASC included representatives from NCARB's Education Committee, Internship Committee, Examination Committee, Continuing Education Committee, Board of Directors, and staff. Additionally, for the first time, the PASC included leaders from the ACSA, AIA, AIAS, and the NAAB, in order to gain their input and foster support of the survey and its findings.

A larger working group, the Practice Analysis Task Force (PATF), consisting of over 40 architects and subject-matter experts from across NCARB's Member Boards, was convened to assemble a comprehensive list of tasks and knowledge/skills (K/S) representing the competencies necessary to practice architecture. Those competencies were categorized into four main program areas of interest—education (EDU), internship (IDP), examination (ARE), and continuing education (CE)—and combined with extensive ratings scales to serve as the Practice Analysis survey.

The PATF was separated into four work groups in order to gain diverse perspectives on the types of tasks and K/S that architects utilize. Each work group consisted of eight subject-matter experts (SMEs) representing the Education, Internship, Examination, and Continuing Education Committees. An NCARB staff member managed the process, with discussions facilitated by the survey consultant, PSI Services, LLC. Each group was charged with developing task and K/S statements for one of four domains: pre-design, design, project management, and practice management.

After the initial list of task and K/S statements was developed, facilitators compared the new list of statements to the statements from the 2007 practice analysis. The work groups reviewed the comparative data and incorporated appropriate revisions.

Next, the four multi-program work groups were re-organized into four program-specific work groups as illustrated below. Multiple webinars were scheduled in order for the EDU, IDP, ARE, and CE work groups to review the lists of task and K/S statements and ensure the statements holistically represented the needs of each specific program area.



With the comprehensive lists of tasks and K/S compiled, the work of the task force was returned to the steering committee. The PASC then finalized the list of task and K/S statements, reviewed the multiple ratings scales, and finalized the background information questions. The chart to the right indicates the total number of task and K/S statements identified for each of the four program area surveys.

The four program surveys were then subdivided into a total of 11 separate surveys in order to decrease the amount of time required to complete the survey and to help ensure that a sufficient number of responses would be obtained. A master sampling plan was developed to direct each of the segmented surveys to the appropriate target audience and to allow for the best response rates possible.

PROGRAM AREA	SURVEY	STATEMENT TYPE	NUMBER OF STATEMENTS
Education	**EDU**	Task	104
		Knowledge/Skill	122
Internship	**IDP**	Task	136
Examination	**ARE**	Task	110
		Knowledge/Skill	132
Continuing Education	**CE**	Knowledge/Skill	127

PROGRAM AREA	NUMBER OF SURVEYS
Education (EDU)	4
Internship (IDP)	3
Examination (ARE)	3
Continuing Education (CE)	1

New rating scales were also introduced in the 2012 Practice Analysis. These scales were developed to answer various research questions pertinent to NCARB's four key program areas, and went beyond the traditional importance and acquisition scales typically used in a practice analysis.

Pilot Survey

Prior to releasing the main survey, a pilot survey was launched to gather feedback regarding the comprehensive nature of the task and K/S statements as well as the functionality and design of the survey. A total of 1,338 e-mail invitations was sent and 218 individuals participated. Several refinements to the surveys, the background information questions (BIQs), and the survey instructions were made based on the pilot survey results.

Supplemental Studies

In addition to the main survey, three supplemental studies were conducted in order to support the Practice Analysis: a multi-faceted focus group study, a survey of students, and a crosswalk study.

Nine focus groups were conducted with individuals who regularly work with architects. These groups participated through surveys, individual telephone interviews, and facilitated web conferences to identify their perception regarding current issues, challenges, and future opportunities for the Council. The focus group participants included:

- Clients of architects
- Civil/geotechnical consultants and landscape architects
- Structural, mechanical, and electrical engineers
- Interior designers and other specialty consultants
- General contractors and construction managers
- Senior building officials
- CAD technology delivery groups and product manufacturers
- Liability carriers, lending institutions, and attorneys
- Futurists and visionaries

Students attending the December 2011 AIAS Forum were invited to take part in a modified practice analysis survey to further inform the development of the final survey. These surveys were developed using the same task and K/S statements along with slightly different rating scales. The primary focus of the student survey was to provide supplemental information in support of the Council's education and internship programs; the survey data also helped inform the development of the Practice Analysis survey.

The Crosswalk Study compared the tasks and K/S identified in NCARB's *2007 Practice Analysis of Architecture* with those identified for the 2012 Practice Analysis Survey prior to its national administration. Approximately half of the tasks and K/S in the 2012 Practice Analysis Survey were found to be aligned with the tasks and K/S included in the 2007 survey.

DATA COLLECTION

The best source for identifying the requisite body of knowledge for any profession is practitioners themselves. Active practitioners serve as the most reliable resource to establish the current trends of practice and identify the future needs of the profession. Three groups of architects were the primary contributors of the data collected for the *2012 NCARB Practice Analysis of Architecture*:

- architects licensed in the past year (who completed the IDP in the past two years),
- architects who have been licensed between two and 10 years, and
- architects licensed more than 10 years.

Another group of architects—those who recently served as IDP supervisors and/or mentors—were specifically identified to participate in the Internship (IDP) survey to better inform the future of the IDP.

NCARB also engaged other important constituencies in order to gain as much insight as possible. Educators were once again invited to participate in the Practice Analysis survey. A select group of interns was also invited to complete the survey—those who completed the IDP within the past year and those who completed the IDP within the past two years but not the ARE. Even though educators and interns represented a small part of the overall survey sample, the important input they provided will be used to guide and inform the Council's education and internship perspectives.

In order to reach as many practitioners, educators, and interns as possible, a substantial e-mail database was compiled from various NCARB, ACSA, AIA, and AIA component databases. Two separate e-mail campaigns were conducted and a supplemental open link to the survey was placed on NCARB's website to promote participation. Several additional communications were issued to describe the study and its importance to the profession. NCARB's Member Boards, each collateral organization, and the AIA's components were successfully encouraged to disseminate the information as well.

The survey was launched on 2 April 2012 and closed on 6 May 2012. Reminder e-mails were sent on a weekly basis to encourage completion of the survey. As an incentive to participate, 100 respondents who completed the survey were randomly selected to receive a $50 gift card.

Collectively, NCARB drew upon a wide spectrum of those engaged with the practice of architecture—both directly and indirectly—to ensure that the data collected will have both an immediate and long-term impact on the Council's education, internship, examination, and continuing education programs and policies.

DATA ANALYSIS

Complete files that included both the background information question (BIQ) response data and the task and K/S statement data were compiled for each of the surveys and extensively examined for quality control purposes prior to data analysis. New matrix sampling technologies were employed to improve the representativeness of survey results. By using matrix-sampling methods, the size of the samples better represents the population at large.

Participants who responded to at least 90 percent of the items in the survey were included in the final analysis; however, if a participant completed the same survey twice, their second response was not included. Duplicate responses by the same participants were detected by a repeating BIQ ID number. Also, anomalies in a participant's response patterns were identified and their responses to the open-ended questions were examined. In a small number of cases, respondents' data was excluded for the following possible reasons: based on response patterns and comments stating that respondents had randomly selected any answer; that they did not belong to the particular survey population; or that they had been mistakenly routed to the wrong survey.

APPENDIX B: **OVERALL RESPONSE RATE AND STATISTICS**

SURVEY RESPONSE RATE

A total of 15,620 surveys were returned (21.0 percent) from the 74,387 surveys that were successfully delivered via e-mail plus those submitted through a link on NCARB's website. These responses were screened to ensure that the respondents met the study criteria with respect to population segment and experience level, as well as survey completeness. After applying rigorous quality control standards, a total of 7,867 surveys were retained in the final analysis sample, comprising a 10.6 percent response rate. NCARB's Practice Analysis consultant, PSI Services LLC, indicates that the data resulting from the survey sample provides a substantive basis for summarizing professional practice through its representativeness, precision, and breadth of information.

Representativeness of the Sample

Overall, the analysis sample represents a wide range of experience levels, employment settings, organization sizes, and geographic regions, thereby supporting the validity of the survey data. It reflects a diverse and representative sample of architects, interns, and educators.

Precision of the Survey Statistics

The survey sample size is sufficiently large to support the calculation of summary descriptive statistics, such as the mean rating and percentage of respondents choosing a rating scale category. Overall, there is a good degree of precision in the statistics for their intended use. In most cases of interest where the number of respondents exceeds 100, the Standard Error (SE) of the task and K/S ratings is less than 5 percent. The EDU, IDP, ARE, and CE survey sub-samples ranged from 147 to 1,152; therefore, the precision of the statistics was higher (i.e., SE was lower).

Breadth of Information

The breadth of the information provided by the survey participants is unprecedented for a survey yielding information germane to architecture education, training, and assessment. **The respondents used a total of 24 rating scales to provide information regarding the task and K/S statements, generating over 21 million quality-screened data points for analysis.**

Details regarding the derivation of the final analysis sample are summarized below.

- Survey invitations delivered: Of the 82,985 survey invitations sent, 74,387 were successfully delivered to a valid e-mail address.
- Surveys submitted: A total of 15,620 surveys (21.0 percent) were submitted, including those completed through a survey link on NCARB's website.
- Surveys qualified: A total of 2,543 respondents were disqualified from taking the survey because they were not licensed and had participated in the IDP more than two years ago. As a result, 13,077 (17.6 percent) qualified surveys were retained for further quality screening.
- Surveys qualified for analysis: Surveys were retained for analysis if respondents completed 90 percent or more of the survey items. A total of 7,867 (10.6 percent) surveys met this criterion.

Comprised of multiple questions, these surveys yielded over 21 million data points. The table to the right identifies combined response rates for the surveys in each of the four program areas.

PROGRAM AREA	RESPONSES RECEIVED	RESPONSES INCLUDED IN DATA ANALYSIS	PERCENTAGE INCLUDED IN DATA ANALYSIS
Education (EDU)	2,935	2,015	69%
Internship (IDP)	3,438	2,302	67%
Examination (ARE)	3,974	2,695	68%
Continuing Education (CE)	1,232	855	69%

RESPONDENT DEMOGRAPHICS

Nineteen (19) background information questions (BIQs) delivered at the beginning of each survey were designed to collect demographic information about the respondents. Responses to the BIQs were also used to direct the respondent to the most appropriate survey as identified by the master sampling plan. The sampling plan was developed to decrease the amount of time required to complete the survey and to help ensure that a sufficient number of responses would be obtained.

Profile

The profile of the typical survey respondent is an individual who:

- Received a Bachelor of Architecture degree (B. Arch) in the United States
- Has been licensed for more than 20 years in the United States or Canada
- Is a white male
- Works full-time as a principal in an equity position
- Has not served as an IDP supervisor/mentor

Optional demographic questions included gender, age, and ethnicity.

GENDER	
Male	80%
Female	20%

AGE	
20-29	4%
30-39	19%
40-49	19%
50-59	28%
60-69	23%
70+	7%

Over 83 percent of the respondents described themselves as "white."

SELF-REPORTED ETHNICITY	NUMBER OF RESPONSES (N)	PERCENT
White	6,015	83.93%
Black or African American	117	1.63%
American Indian or Alaskan Native	8	0.11%
Asian Indian	38	0.53%
Japanese	42	0.59%
Native Hawaiian	4	0.06%
Chinese	116	1.62%
Korean	37	0.52%
Guamanian or Chamorro	4	0.06%
Filipino	26	0.36%
Vietnamese	5	0.07%
Samoan	0	0.00%
Other Asian	29	0.40%
Other Pacific Islander	0	0.00%
Other race	163	2.27%
Multiple Selected	120	1.67%
None Selected	443	6.18%
TOTAL	7,167	100.00%

Approximately 95 percent of the respondents who responded to the ethnicity question indicated that they were not of Hispanic, Latino, or Spanish origin.

HISPANIC, LATINO, OR SPANISH ORIGIN	NUMBER OF RESPONSES (N)	PERCENT
No, not of Hispanic, Latino, or Spanish origin	6,408	94.65%
Yes, Mexican, Mexican American, Chicano	90	1.33%
Yes, Puerto Rican	52	0.77%
Yes, Cuban	65	0.96%
Yes, another Hispanic, Latino, or Spanish origin	155	2.29%
TOTAL	6,770	100.00%

Additional data points regarding the overall Practice Analysis survey respondents include:

EDUCATION

96% educated in the United States

47% completed a B. Arch

71% graduated from a NAAB-accredited program (B. Arch, M. Arch, or D. Arch)

INTERNSHIP

50% completed IDP

41% served as an IDP supervisor and/or mentor

LICENSURE

92% are currently licensed in a U.S. or Canadian jurisdiction

21% of respondents have been licensed 2-10 years

14% of respondents have been licensed 11-19 years

56% of respondents have been licensed 20 or more years

82% are employed full time

63% work in an architecture firm

39% serve as a principal in an equity position

31% serve as project architects + project managers

Job and Firm Type

The survey respondents included practitioners from a wide range of professional settings, including:

- Architecture firms
- Architecture/engineering firms
- University/academic institutions
- Government/public sectors
- Construction and Design/build firms
- Specialty consulting firms

Organizational sizes ranged from sole practitioner to more than 100 employees. The respondents ranged in experience (two-thirds were licensed for more than 10 years while nearly 10 percent had been licensed for a year or less) and included a variety of job titles such as:

- Principal
- Project architect
- Design architect
- Production architect
- Project manager
- Facilities manager/owner's representative
- Intern
- Educator

Regional Representation

The sample of respondents represented all geographic regions in the United States, with a small percentage received from Canada and other international locations.

NCARB REGION OR INTERNATIONAL LOCATION	PERCENT
REGION 1: NEW ENGLAND Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont	6%
REGION 2: MIDDLE-ATLANTIC Delaware, District of Columbia, Maryland, New Jersey, New York, Pennsylvania, Virginia, West Virginia	20%
REGION 3: SOUTHERN Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, Puerto Rico, South Carolina, Tennessee, Texas, U.S. Virgin Islands	24%
REGION 4: MID-CENTRAL Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, Ohio, Wisconsin	18%
REGION 5: CENTRAL STATES Kansas, Montana, Nebraska, North Dakota, Oklahoma, South Dakota, Wyoming	4%
REGION 6: WESTERN Alaska, Arizona, California, Colorado, Guam, Hawaii, Idaho, Nevada, New Mexico, Oregon, Utah, Washington	26%
Canada	1%
Other International	1%
TOTAL	100%

APPENDIX C: **GLOSSARY**

ACSA

The Association of Collegiate Schools of Architecture is a nonprofit, membership association comprised of over 250 member schools for all accredited programs in the United States and government-sanctioned schools in Canada. The ACSA provides a forum for leading edge ideas and issues that affect the architectural profession.

AIA

The American Institute of Architects is a leading professional membership association for licensed architects, emerging professionals, and allied partners. The AIA maintains a number of programs, initiatives, and resources, including continuing education experiences and standard contract documents.

AIAS

The American Institute of Architect Students is an independent, nonprofit student-run organization whose mission is to promote excellence in architectural education, training and practice, and advance the art and science of architecture.

BIM

Building Information Modeling, or BIM, is a process that entails generation and management of digital representations of the physical and functional characteristics of a building or facility. BIM provides a database resource and virtual three-dimensional (3-D) model for making decisions about a building throughout its life cycle. Information can be tracked for the cost management, construction management, project management, and facility operation purposes.

BRANCHING

The term branching, or conditional skip logic, refers to dynamic system logic in online survey software that permits the respondent to be directed to a question based on his/her responses to a previous question. In this survey, respondents were asked, "to what extent is the task covered in architecture education?" If they answered "*yes*", they were asked, "to what extent do students perform the task by completion of their architecture program?" If they answered "*no*", they were asked, "why is the task not covered in your architecture program?"

COMPETENCY

The term competency refers to the set of behaviors identified in the practice analysis through interviews and focus groups of subject-matter experts. See practice analysis.

CONTENT VALIDITY

The term content validity refers to the extent to which a measure represents what it is intended to measure. In order to produce valid survey content or test questions, psychometricians will collaborate with persons in the profession who understand the nuances and technical aspects of the subject matter. Here, the practice analysis was based on a content validation approach whereby persons with technical subject-matter knowledge were consulted in the design and implementation of the survey instrument.

CORRELATION

A series of statistical measures that describes the relationship, positive or negative, between two variables on a continuum. For example, if there is a strong positive correlation between years of experience and number of hours worked per week (0.80), one could conclude that people who have many years of experience tend to work more hours per week. If the correlation were negative, one could conclude that people with many years of experience tend to work fewer hours per week.

CRITERION

This term refers to a standard on which a judgment or decision is based. For example, the numeric of a mean importance rating for a knowledge/skill statement must equal or exceed 1.5 to be included in the content outline.

CROSSWALK

A crosswalk analysis involves mapping elements of one source with another source according to standards, semantic equivalents, or conceptual equivalents. Typically, the concepts and attributes in one source are compared side by side with similar concepts and attributes of another source to identify similarities and differences across time periods. Here, a crosswalk analysis was conducted to compare tasks and knowledge/skills from the 2007 and the 2012 practice analyses to identify similarities and differences between them.

DEFENSIBILITY

A research study, particularly a practice analysis, can be considered legally defensible if the methodology for the study abided by specific standards, procedures, and guidelines. Here, the practice analysis relied on a content validation approach cited in the Standards for Educational and Psychological Testing whereby the survey content was developed in collaboration with many subject-matter experts and validated by responses of thousands of subject-matter experts. Generally speaking, if the methodology was performed correctly, the study can withstand legal scrutiny.

DESCRIPTIVE STATISTICS

Statistics that summarize the main features of a dataset in order to understand its properties. Descriptive statistics can be summarized in tables or graphical displays such as graphs and charts). Examples of descriptive statistics include overall sample size (N), percent/proportion of subjects for different variables, measures of central tendency (mean, median, mode), and measures of spread (range, quartiles, variance, standard deviation).

DISTRIBUTION

In statistics, a distribution can represent discrete categories of variables or continuous variables, e.g., frequency of use. For example, a histogram might illustrate how many respondents answered "*yes*" and "*no*" to the question ("Is this concept important?") vs. how many respondents answered yearly, quarterly, monthly, weekly, daily to a question ("how frequently have you performed this task?").

EBD

Evidence-based design is a process that emphasizes the importance of using data to make decisions about the design process. Typically, existing research literature is reviewed to identify significant findings and recommendations; data is gathered from multiple sources, e.g., site visits, surveys and subject-matter experts, predicting outcomes of design decisions, and tracking positive outcomes for design implementation. For example, the design of healthcare facilities may be based on data from environmental psychologists, clinicians, administration, and evidence-based tools and methods.

FFE

This term refers to movable furniture, fixtures, and equipment that have no permanent connection to a building structure.

FOCUS GROUP

A qualitative technique that uses a representative group of subject-matter experts to provide information and/or critically evaluate the merits of a work product. In the present study, face-to-face and webinar focus groups were used to ensure that the content of the practice analysis surveys (e.g., task and knowledge/skill statements) were comprehensive and related to the current practice of architecture. The focus groups also elicited information regarding recent developments in the profession and future trends.

FREQUENCY DISTRIBUTION

This term refers to an arrangement of values taken from a sample. For example, the number of cases could be arranged along a continuum according to a rating scale, e.g., 1-of never, 2-rarely, 3-sometimes, 4-often, and 5-constantly. So the distribution might show there were 20 respondents with a rating of 1, 40 respondents with a rating of 2, and so on.

FREQUENCY RATING

Frequency ratings on survey instruments typically assign numeric ratings to scale points along a continuum. For example, the scale points could be: 1-of little or minor importance, 2-somewhat important, 3-important, 4-very important, and 5-critically important.

HSW

This term refers to health, safety, and welfare guidelines. Examples of health guidelines include those for accessibility, energy efficiency, mechanical, plumbing, and electrical systems. Examples of safety guidelines include codes, regulations, provision of fire-rated egress enclosures, and correct rise-to-run proportions for stairs. Examples of welfare include adaptive reuse, environmental issues, and building design and materials.

IBC

This term refers to International Building Codes, which are model building codes developed by the International Code Council.

IMPORTANCE RATING

Importance ratings on survey instruments typically assign numeric ratings to scale points along a continuum. Here, the following scale points could be: 1-of little or minor importance, 2-somewhat important, 3-important, 4-very important, and 5-critically important.

INFERENTIAL STATISTICS

Statistics based on probability theory that allow the use of samples to make generalization, estimates, predictions of decisions about the populations from which they are drawn. For example, if there were 100 randomly selected cases, inferential statistics could be used to determine the probability that those cases would occur according to specific limits, e.g., 95 percent, 99 percent.

IPD

Integrated Project Delivery (IPD) refers to the process used in construction projects and is typically conceptualized in terms of eight main phases: conceptualization, criteria design, detailed design, implementation documents phase, agency review, buyout, construction, closeout, and facilities management. The IPD process involves contractual arrangements between the owner, contractor, and design professionals such as architects.

KNOWLEDGE

Job knowledge is a measurable, organized body of information related to specific aspects of a job. Examples of job knowledge include principles, protocols, procedures, systems, methods, procedures, techniques, standards, codes, and laws that apply to specific job tasks.

LEED

The Leadership in Energy and Environmental Design, or LEED, is a set of rating systems developed by the U. S. Green Building Council as a framework for identifying and implementing practical and measurable solutions for design, construction, operation, and sustainability of high-performance buildings, homes, and neighborhoods.

MAPPING (SEE CROSSWALK)

MATRIX SAMPLING

The term matrix sampling refers to specific procedures that are employed to improve the representativeness of survey results. So, instead of obtaining a random sample from a population of prospective respondents, a researcher may select a subset of cases from different strata, e.g., interns with two years of experience, or architects licensed in the past year who completed the IDP in the past two years. By using matrix sampling methods, the size of the samples will better represent the population at large.

MEAN

A type of descriptive statistic commonly known as the average. It is calculated by summing the values of a variable and dividing by the number of cases. For example, if the sum of ratings from 5 individuals is 20, then the mean is 20 divided by 5, or 4.

MEDIAN

A type of descriptive statistic commonly known as a midpoint of a dataset. After the data is rank ordered, the median is calculated by the formula (n +1)/2. For example, if there are 60 values, the midpoint of the dataset is (60 + 1) divided by 2, or 30.5.

N

N refers to the size of the sample, or number of cases in a sample. For example, if N = 171, there are 171 cases that were used in the calculation of statistics for that sample.

NAAB

The National Architectural Accrediting Board (NAAB) is the sole agency authorized to accredit U. S. professional degree programs in architecture. The curriculum of a NAAB-accredited program includes general studies, professional studies, and electives. The intent is to provide students with a range of skills that enables them to solve architectural design problems and understand the historical, socio-cultural, and environmental context of architecture.

NCARB

The National Council of Architectural Registration Boards' membership is comprised of the architectural registration boards of all 50 states, the District of Columbia, Guam, Puerto Rico, and the U.S. Virgin Islands. These boards formed NCARB in order to provide a common approach to protecting the public health, safety, and welfare. NCARB leads the regulation of the practice of architecture through the development and application of standards for licensure and credentialing of architects. These range from the Intern Development Program (IDP) and Architectural Registration Examination® (ARE®) to certification for the purposes of reciprocal licensing and record keeping.

PASC

A steering committee appointed by NCARB to carry out strategic planning and assist in the implementation of the practice analysis.

PATF

A task force appointed by NCARB to provide the majority of subject-matter expertise in survey task and knowledge/skill development for the practice analysis.

PRACTICE ANALYSIS

A practice analysis defines professional practice in terms of the actual tasks that practitioners must be able to perform safely and competently at the time of licensure or certification. The process is an essential step in validating test programs so that they comply with professional testing standards such as the Standards for Educational and Psychological Testing. The Standards are the universally recognized benchmark for design, construction, standard setting/cut score, test administration, score reporting, and test score for all examinations.

REVIT

A type of Building Information Modeling software that allows the user to draft 3-D and two-dimensional (2-D) elements. The 3-D elements are represented as physical building components such as doors and walls. The Revit environment allows the user to render realistic images of buildings and rooms.

ROUTING

The term routing refers to dynamic system logic in online survey software that permits respondents to complete a specific set of questions. Here, if a respondent was a licensed architect, he/she could be directed to ARE, IDP, EDU, or CE surveys.

SAMPLE PARAMETERS

(See discussion of stratified random sampling under "Sampling plan")

SAMPLING PLAN

This term refers to the approach taken to ensure adequate representation from all of the populations of interest. If a researcher wanted to obtain survey responses, he/she could identify strata/parameters of interest (stratified random sampling), e.g., geographic region or years of experience, which he/she would target to obtain representative data from different populations, and select a percentage of names of prospective respondents that is equal to that population's occurrence in a large population. For example, a specific state represents 15 percent of the total population of licensed architects; the researcher would select 15 percent of the individuals from that state to solicit survey responses. A simpler, but less effective, procedure is random sampling. Random sampling assumes that all individuals in the population are equal, and a specific number of cases are selected from the pool of individuals without regard for any strata of interest.

SKILL

A job skill is a specific, observable, measurable competence required to perform one or more job tasks. Examples of job skills include skill in using software to produce 3-D models and skill in producing freehand sketches.

SME

Subject-matter experts are individuals who possess technical knowledge of their field. When tests are developed, the process is typically facilitated by persons knowledgeable in the design of tests (psychometricians), who work with SMEs who understand the technical content of the test questions.

STAKEHOLDERS

The term stakeholder refers to persons, groups, or organizations with an interest in a project. For example, the results of the practice analysis will affect stakeholders such as students, educators, and licensed architects.

STANDARDS FOR EDUCATIONAL AND PSYCHOLOGICAL TESTING ("STANDARDS")

The Standards for Educational and Psychological Testing were developed jointly by the American Educational Research Association, the American Psychological Association, and the National Council for Measurement in Education. The Standards are the universally recognized benchmark for design, construction, standard setting/cut score, test administration, score reporting, and test score for all examinations, including those related to education, personnel selection, licensure, and certification.

TASK

A job task is a stand-alone unit of work with a definite beginning and end, which results in a product or service. For example, a job task is "perform building code analysis."

TAXONOMY

The term taxonomy refers to the development of categories to classify objects, properties, or relationships. For example, Bloom and Depth of Knowledge taxonomies have identified different levels of cognitive processing such as recall, comprehension/understanding, application, analysis, and synthesis/evaluation.

TEST

The term test, or examination, can be used broadly and refer to any measurement procedure including surveys, tests, and structured interviews.

VALIDITY

The term validity refers to the degree to which evidence supports the interpretation of test score or proposed use of tests. If a test is valid and includes questions with technically correct subject-matter, one can make inferences about the test taker's scores.

VALIDITY EVIDENCE

There are three types of validity evidence from which conclusions may be drawn. In content validity, the issue is representativeness ("does the content to be measured represent the intended body of knowledge?"). In criterion related validity, one can infer from a test score how an examinee will perform on some external criterion ("how well does performance on a test predict future performance?"). In construct validity, one can classify individuals based on test scores according to a theoretical trait (how well do test scores assess a theoretical concept of interest?). For example, if a student scores well on a test, one could infer that students had verbal reasoning.