



NCARB Comments on the
NAAB 2009 Conditions for Accreditation, Public Comment Edition

May 22, 2009

NCARB Mission

The National Council of Architectural Registration Boards (NCARB) is committed to protecting the health, safety, and welfare of the public through effective regulation and exemplary service.

Core Values

NCARB believes in

- Integrity
- Service
- Accountability

NCARB is a nonprofit corporation comprising the legally constituted architectural registration boards of the 50 states, the District of Columbia, Guam, Puerto Rico, and the U.S. Virgin Islands as its members.

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Executive Summary

The following provides an overview of NCARB's recommendations regarding the revision of NAAB's *2009 Conditions for Accreditation, Public Comment Edition (2009 Draft Conditions)*. At the outset, we must tell you that, on the whole, NAAB has tried to address our concerns and for that we applaud you. Some of NAAB's proposed changes though cause us pause; others confuse; and a few downright trouble us. This document presents all of those concerns and provides detailed rationales for the recommended revisions.

Criteria for Issue Spotting

The following criteria were used by NCARB to guide its review process and to develop recommendations for revising the *2009 Draft Conditions*:

- Will the proposed language adversely impact the Profession's capacity to serve as leaders and mentors in the world of design and construction? These concerns, being the most important, are highlighted in yellow in the Detailed Comments section for the language as written, as NCARB reads it, adversely affects the underpinnings of the Profession and its capacity to protect the health, welfare and safety of clients and society and even to lead. NAAB cannot mean what we infer. Given the intense and effective collaboration we have enjoyed with NAAB and the other collaterals to date, we fully expect that discussions with NAAB should clarify, if not change, the content.
- Will the proposed language make students less capable of participating successfully in IDP? A careful study of NCARB's 2007 Practice Analysis of Architecture (2007 Practice Analysis) shows that some knowledge and skills are missing in graduates. IDP, as we know it now, fills some of those gaps, but some of those gaps would be filled more easily if the 2009 Draft Conditions put the Academy on notice that those items need to be taught for their graduates to be able to effectively address the health, safety, and welfare parameters of tasks assigned them during internship.

Areas of Concern to NCARB

There are four major areas of serious concern to NCARB where we are seeking revisions to the *2009 Draft Conditions* as addressed in the Detailed Comments section of this document.

- **The Definitions of Achievement Levels**
In NCARB's view, the new definitions for achievement levels, those of "Understanding" and "Ability", are inadequate in that their respective wording seems to lower the standards for education as compared to the definitions in the *2004 Conditions for Accreditation (2004 Conditions)*. We therefore have recommended alternative wording for NAAB's consideration (see page 7) based on Bloom's *Taxonomy of Educational Objectives*. Our hope is that it will assist you in developing appropriate educational outcomes.

- **The Application of the Definitions of Achievement Levels to the SPC**
NCARB struggled mightily with what should be required at the “Understanding” level and what should be required at the “Ability” level. Ever mindful that architecture education cannot and should not be required to produce mini-MBAs and mini-lawyers, and that no school can teach “everything,” NCARB asked itself, what should a graduating student *be able* to do? What should a graduating student genuinely and only understand? Based on the *2007 Practice Analysis* and NCARB’s sense of logic, recommendations are provided for changing the level of achievement for specific SPC, when indicated.
- **The Recommended Revisions to the SPC**
All recommendations for SPC revisions presented in the Detailed Comments section of this document link directly to the *2007 Practice Analysis*¹ and emanate from it.² This linkage stems from our commitment to analysis based solely on valid empirically derived information. To help NAAB understand our thinking, we have included as an appendix the relationship (linkage) between the SPC and the knowledge/skills (KS) from the *2007 Practice Analysis*. As you will see, that linkage surfaced two new conditions for NAAB consideration—one on interiors, the other on construction.

Additionally, NCARB recommends the renaming of SPC A.2 from Design Thinking Skills to Critical Thinking Skills. NCARB is very concerned as, after much research and analysis, it has concluded that the change is fundamental and adverse to the understandings and abilities required of the Profession by architects and the Public and clients they serve.

- **The Role of the Intern Development Program (IDP) Education Coordinator**
NCARB recommends that the IDP Education Coordinator be required to do more than just answer questions when asked about IDP. Rather it recommends that the Coordinator role be a proactive one, both requiring the Coordinator to keep up to date and provide IDP information and direction on a regular basis to all architectural students as well as faculty and, as appropriate, staff.

A full explanation of the logic behind these recommendations follows.

¹ The purpose, design, conduct, and results of the *2007 Practice Analysis* are described fully in a report published by NCARB and posted on its web site (www.ncarb.org). A précis is attached. The results of the study reflect the input of a representative sample of over 9,800 licensed architects in validating task and knowledge/skills that are important to the work performed by recently licensed architects practicing independently.

² A very few suggestions, mostly concerning the realms, do not; they are relayed solely in the spirit of collaboration.

Detailed Comments

The Definitions of Achievement

Definitions of Achievement: One of the issues concerning NCARB is NAAB's redefining "Understanding" and "Ability" in ways it found most troubling. The terms seem to be watered down—*perhaps in* response to those ARC participants who wanted to bring awareness *back, perhaps* unwittingly, perhaps for reasons that eluded the entire NCARB Board.

Collectively, these changes undermine the Profession's future's ability to serve by lowering the standards for education. NAAB cannot mean to have done that so it is truly important that NAAB revisit these definitions. No concern of NCARB is more important than this, as a student who knows without being able to see implications truly does not know enough to participate in IDP—to serve as a draftsman perhaps, but not as an intern architect.

While the 2004 definition of "Understanding" basically applauded architect-as-parrot, NCARB is even more troubled by the *2009 Draft Conditions'* definition that seems to be:

- confusing -- knowing without necessarily being able to see implications
- inconsistent -- comprehension without understanding application
- inappropriate -- information without needing to place it in context (this is, after all, for college and graduate schools)
- and incapable of being consistently or objectively measured by anyone in a school or on a visiting team

To help NAAB understand the issue and its implications for the Profession, as NCARB interpreted the changes, here is how NAAB defined these terms in the *2004 Conditions*:

- Understanding -- The capacity to correctly paraphrase or summarize information
- Ability -- The capacity to correctly apply (principles, learning etc.)

"Understanding" and "Ability" are defined in the *2009 Draft Conditions* as follows:

- Understanding -- means the assimilation and comprehension of information without necessarily being able to see its full application. This includes the knowledge or familiarity with a particular subject, skill, or aspect of the student performance criteria
- Ability -- means the skill in using specific information to accomplish the task, in correctly selecting the appropriate information, and in accurately applying it to the solution of a specific problem. This includes a student's capacity or competence in a particular subject, skill, or aspect of the student performance criteria

The definition of "Ability" is better, but the second sentence undoes the first, giving everyone a way out. That cannot be NAAB's intent.

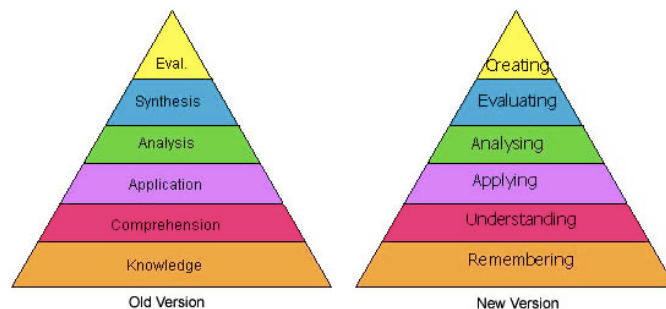
It may be that reliance on an outside, third party, unaffiliated definition will help NAAB and NCARB resolve this issue. That is what NAAB did in 1998 and earlier when it relied on Bloom's *Taxonomy of Educational Objectives (Taxonomy)*. The *Taxonomy* has been used for years by educators, psychologists, psychometricians and credentialing professionals and others, as the accepted standard applied to cognitive (or knowing) levels.

Anderson and Krathwohl's revised taxonomy that builds on Bloom's work is presented below,³

Bloom's *Taxonomy* (or classification) shown below is titled "Old Version." The taxonomy is a "multi-tiered model of classifying thinking according to six cognitive levels of complexity. Throughout the years, the levels have often been depicted as a stairway, leading many teachers to encourage their students to "climb to a higher (level of) thought." The lowest three levels are: knowledge, comprehension, and application. The highest three levels are: analysis, synthesis, and evaluation. The taxonomy is hierarchical; each level is subsumed by the higher levels.

Bloom's *Taxonomy* (first published in the 1956) "...has stood the test of time. Due to its long history and popularity, it has been condensed, expanded, and reinterpreted in a variety of ways. Research findings have led to the discovery of a veritable smorgasbord of interpretations and applications falling on a continuum ranging from tight overviews to expanded explanations. Nonetheless, one recent revision (designed by one of the co-editors of the original taxonomy along with a former Bloom student) merits particular attention" based on its relevance and clarity.

As shown below, the Anderson and Krathwohl taxonomy is titled "New Version" (also known as the Revised Bloom's *Taxonomy*, RBT). With Anderson and Krathwohl leading the initiative, the new version (published in 2001) is the product of a collaboration among cognitive psychologists, curriculum theorists and instructional researchers, and testing and assessment specialists whose intent was to add "relevance for 21st century students and teachers."



³ ANDERSON, L W, & KRATHWOHL D R (eds.) *Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. (New York: Longman 2001).

The new definitions are⁴:

- **Remembering:** Retrieving, recognizing, and recalling relevant knowledge from long-term memory.
- **Understanding:** Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.
- **Applying:** Carrying out or using a procedure through executing, or implementing.
- **Analyzing:** Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing.
- **Evaluating:** Making judgments based on criteria and standards through checking and critiquing.
- **Creating:** Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing.

If NAAB agrees with the approach of third party reliance on experts, NCARB recommends the following definitions to NAAB:

Understanding: The capacity to classify, compare, summarize, explain, and/or interpret information.

With that change, then “Ability”, as currently defined by NAAB, could stay, minus the second sentence, that is,

Ability -- Skill in using specific information to accomplish the task, in correctly selecting the appropriate information, and in accurately applying it to the solution of a specific problem.

Both of these new definitions should be more measurable than that which NAAB is proposing.⁵ Both these definitions should do much to ensure that the Profession’s future is receiving schooling worth having. It is important that NAAB know that NCARB evolved its recommended definition of “Understanding” from the revised Bloom’s *Taxonomy*. Its recommended definition for “Ability”, however, flows directly from what NAAB developed for the *2009 Draft Conditions*. It may be that NAAB will choose to rely more heavily on Bloom’s *Taxonomy* for both definitions. It may even be that, once NAAB reviews and struggles with the revised Bloom’s *Taxonomy*, it will decide to aim the Academy even higher. We assume that NCARB and students would in this competitive age applaud the higher heights. Clients and the Public most certainly would.

⁴ ANDERSON, L W, & KRATHWOHL D R (eds.) *Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom’s Taxonomy of Educational Objectives*. (New York: Longman 2001). (Also see the following referenced article for the full text of the informational summary on the RBT provided above and, in particular, page 2 of 9: Forehand, M. [Bloom’s taxonomy: Original and revised](#) in M. Orey, Ed., *Emerging perspectives on learning, teaching, and technology*, retrieved March 29, 2009, from <http://projects.coe.uga.edu/epltt/>, University of Georgia, Department of Educational Psychology and Instructional Technology. This particular document is referred to because of its clear and succinct description of the history and recent work on the topic of educational taxonomies.

⁵ If NAAB chooses to rely more heavily on Bloom’s taxonomy for both definitions, it might consider defining Ability as “the capacity to carry out or use appropriately information, a process, or a procedure through executing, or implementing.”

The Application of the Achievement Levels to the SPC

NCARB struggled mightily with what should be required at the “Understanding” level and what should be required at the “Ability” level. Ever mindful that architecture education cannot and should not be required to produce mini-MBAs and mini-lawyers, and that no school can teach “everything,” NCARB asked itself, what should a graduating student *be able* to do? Usually the *2007 Practice Analysis* provided the answer. (Précis charts are attached as an Appendix.)

The stress on “Ability” was the result of reality. Most teachers grade on their assessment of their students’ ability to apply the learning they gave them. Most students want to be able to apply that learning in work before and upon graduation. Most employers want their new hires to be able to contribute to their firms. The power to “do” is *the* value of today, and, yes, tomorrow.

What made this struggle all the more difficult was NAAB’s requirement that students *be able* to produce a comprehensive design, yet only *understand* the many issues that need to inform that design. NCARB reasoned that no one could produce a comprehensive design with mere “Understanding” of certain SPC, but that seems to be NAAB’s intent. Moreover, NCARB is concerned that the failure to meet the Comprehensive Design criterion would necessitate a plethora of “Not Mets” elsewhere.⁶ There is a disconnect here that needs to be addressed with NAAB and resolved by NAAB. NCARB would suggest that “Ability” be the norm in most SPC situations as that is where most teachers are or should be targeting their efforts.

The Definitions/Scope of the *Conditions*.

What follows is NCARB’s tweaking of the *2009 Draft Conditions* with suggested changes in **red bold font** and explanations for those changes labeled appropriately. Our goal is NAAB buy-in to the concepts presented, not necessarily to the precise words proposed. Again, all changes spring from the *2007 Practice Analysis* and are considered essential for prerequisites for effective student participation in IDP.

⁶ NAAB has many of the following SPC at the *Understanding* level which is inconsistent with the *Ability* required of *Comprehensive Design*: A2—Critical Thinking; A3—Visual Communication Skills; A4—Technical Documentation; A5—Investigative Skills; A8—Ordering System Skills; B1—Pre-Design; B2—Accessibility; B3—Sustainable Design; B4—Site Design; B5—Life Safety; B7—Financial Considerations; B8—Structural Systems; B9—Environmental Systems Integration; B10—Building Envelope Systems; and, B11—Building Service Integration. Moreover, it is confused by NAAB’s decision to put only Sustainability at the Ability level, as important as Sustainability is, given the importance of everything else that graduating architects-to-be need to be able to do.

Realm A: Critical Thinking and Representation:

Architects must have the ability to build abstract relationships and understand the impact of ideas based on research and analysis of multiple theoretical, social, political economic, cultural and environmental contexts. This ability includes facility in the wider range of media used to think about architecture, including writing, investigative skills, speaking, drawing, and model making.

Student's learning aspirations will include:

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

NCARB Comment: NAAB has created Realms to induce an SPC context for both the teacher and the student. NCARB sees merit in this approach. As the Realms though will not be the basis for Visiting Team Assessment, NCARB thought NAAB may want to edit them to make their purpose clear. NCARB is not committed to the language suggested and merely suggests it as a way of strengthening realm context.⁷

A.1. Communication Skills: *Ability to read, write, speak and listen effectively.*

A.2. Critical 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 them against relevant criteria and standards.*

NCARB Comment: In the 2004 Conditions NAAB required schools to provide evidence that they taught students critical thinking skills and accordingly their students had the ability "to raise clear and precise questions, use abstract ideas to interpret information, consider diverse points of view, reach well-reasoned conclusions, and test them against relevant criteria and standards." Now NAAB is proposing that schools strive to teach Design Thinking Skills.

The goal of the newly-defined condition is the same: to enable students "to raise clear and precise questions, use abstract ideas to interpret information, consider diverse points of view, reach well-reasoned conclusions, and test them against relevant criteria and standards." The change of title though impacts the context, and thus the meaning, of the definition. NCARB has concluded that the change is fundamental and adverse to the Profession that architects and their clients need to have.

⁷ There are very few changes in this document that are not tied directly to the Practice Analysis. All such changes are NOT bolded, such as the ones made here. NCARB sends these few forward gently and in the spirit of continuous improvement for NAAB's consideration (or not).

Some background is necessary to see the implications of so seemingly small a change. In the last few years, “right-brained” people (for lack of a better term), most particularly the Harvard Business School and its many counterparts, have come to realize what “left-brained” architects have long known—the power of good design to solve critical problems in special and unique ways. Accordingly, these schools are encouraging their students to pick up “design thinking skills” to expand their fluidity and utility to business, their future clients, and to society. They figure that their students, already grounded in the world of business, would be even more wanted if they had an appreciation of and an ability to use, if not “do,” design.⁸

At the Accreditation Review Conference (ARC) including Design Thinking for many became important. The reasoning of some of those in the camp that wanted its infusion was that the new business school thrust was “competition”—for students, for resources, and for cachet. Other supporters viewed it as much appreciated reinforcement for continuing to teach that which “we have always been teaching.” Still others viewed it as a way to increase their students’ attractiveness and utility to the world at large.

There were a few that viewed it as a step backward. NCARBites, by and large, were in that group, and interestingly enough, their reasons for non-support shared the same goals as many of those who found the change in terminology enticing. They feared the inclusion would *decrease* students’ attractiveness and utility to the world at large.

NCARB has revisited all sides of this issue and comes down strongly on the side of those that see adverse consequences in this change. Ever mindful of the *2007 Practice Analysis*, NCARB noted that one of the key architect inabilities that limits architect capacity to protect the clients and the public’s health, safety, and welfare is the lack of knowledge about business and client concerns that revolve around money, construction, and building impacts. For NCARB, the fact that business schools have discovered “design” underscored the need for design schools to discover “business.” That evolution, when successful, would best produce architects savvy in meeting client and society needs through design.

Moreover, NCARB was concerned that many in the Academy would interpret Critical Design Thinking as a demand that students think more deeply about their *projects* with achieving internally defined project excellence as the goal. This orientation would only serve to increase the “architect as ancillary.” Clients want more than Design. They want Design that serves a non-design problem critical to them. Critical Thinking underscores the outward nature of problem identification and assessment in crucial ways that Critical Design Thinking undercuts. Other professions, such as law,

⁸ See for example, [Design Thinking](http://hbr.harvardbusiness.org/2008/06/design-thinking/ar/pr) by Tim Brown at <http://hbr.harvardbusiness.org/2008/06/design-thinking/ar/pr>.

business, and medicine, have increased their clinic courses to encourage their students early in the curriculum to think critically about people and their non-expertise-specific needs in solving problems, as that forms a mind-set that increases student utility to themselves, their clients, and the public. NAAB should want to encourage this, too. NAAB may even want to consider moving Critical Thinking to Realm C: Leadership and Practice, as it is the quality of critical thinking that will strengthen both.

A.3. Visual Communication Skills: *Ability to use appropriate representational media such as traditional graphic and digital technology skills to convey essential formal elements at each stage of the programming and design process.*

A.4. Technical Documentation: *Ability to **write outline specifications and** make technically clear drawings and models illustrating the assembly of materials, systems, and components appropriate for a building design.*

NCARB Comment: Writing outline specifications was a 2004 SPC and to the best of NCARB's knowledge, no one at the ARC suggested the requirement be discarded. Moreover, specifying is an important component of both the design process and the documentation of it. The *2007 Practice Analysis* confirms that most architects learn this during IDP. NCARB simply wants the Academy to provide foundation knowledge to students first, so that they have a theory and informational context supporting that skill.

A.5. Investigative Skills: *Ability to gather, assess record, apply, and comparatively evaluate relevant information within architectural coursework and design processes.*

A.6. Fundamental Design Skills: *Ability to effectively use basic architectural and environmental principles in design.*

A.7. Use of Precedents: *Ability to examine and comprehend the fundamental principles present in relevant precedents and to make choices regarding the incorporation of such principles into architecture and urban design projects.*

A.8. Ordering Systems Skills: *Understanding the fundamentals of both natural and formal ordering systems and the capacity of each to inform two- and three-dimensional design.*

A.9. Historical Traditions and Global Culture: *Understanding of the parallel and divergent canons and traditions of architecture, landscape, and urban design in the world (including indigenous and vernacular examples) in terms of their climatic, ecological, technological, socioeconomic, public health, and cultural factors.*

A.10. Cultural Diversity: *Understanding* of the diverse needs, values, behavioral norms, physical ability, 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

Architects are called to understand the technical aspects of design, systems and materials, and be able to apply that understanding in their services. Additionally, they must know their role in the implementation of design, and their impact on the environment.

- Creating building designs with well-integrated systems.
- Comprehending constructability.
- Incorporating life safety systems.
- Integrating accessibility.
- Applying principles of sustainable design.

B.1. Pre-Design: *Ability* to prepare a comprehensive program for an architectural project, such as by providing an assessment of client and user needs, an evaluation of project financing and funding, an inventory of space and equipment requirements, an analysis of existing building and site conditions including hazardous conditions and materials, a review of the relevant laws and standards and assessment of their implications for the project, and a definition of site selection and design assessment criteria and a consideration of project delivery methods.

NCARB Comment: NCARB linked the revised SPC to the 2007 Practice Analysis findings and discovered that some knowledge and skills that could be learned in school, but tested poorly as being taught in schools, and remain overlooked or underplayed in the proposed SPC. The 2007 Practice Analysis suggests that items in **Bold** need to be included.

B.2. Accessibility: *Ability* to design sites, facilities, and systems in accordance with universal design principles to accommodate all individuals regardless of limitations.

NCARB Comment: While NCARB has heard that some on the NAAB Board view Universal Design Principles as less broad than the language it is now promulgating, NCARB viewed the new language as less broad than Universal Design and also unresponsive to the full gambit of the demands of health, safety, and welfare.

B.3. Sustainable Design: Understanding of the principles of sustainable design to produce projects that conserve natural and built resources provide healthy environments for occupants/users and reduce the impacts of building construction and operations on future generations.

NCARB Comment: Having academic programs that produce students able to achieve sustainable design was and is an NCARB priority. Nonetheless, NCARB changed this language from “Ability” to “Understanding” solely for consistency’s sake: NAAB has Sustainable Design, unlike so many others needed for a comprehensive design project, at the Ability level. Most others are at the “Understanding” level. NCARB would prefer that those SPC, like this one, be tied to the “Ability” level. It has highlighted the inconsistency using one of its own priorities—Sustainable Design—solely to bring it to NAAB’s attention.

B.4. Site Design: *Ability* to respond to site characteristics, including proper contour manipulation in the development of a project design including regional impact considerations.

NCARB Comment: Nowhere in the proposed SPC are regional impact considerations included. Issues, such as seismic, water, climate, transportation, economy, and labor, impact the development of project design. Students need to know how to think critically about them.

B.5. Life Safety: *Ability* to apply the basic principles of life-safety systems with an emphasis on egress.

B.6. Comprehensive Design: *Ability* to produce a comprehensive architectural project that reflects the understanding of and integrates the following SPC: A2; A3; A4; A5; A8; B1; B2; B3; B4; B5; B7; B8; B9; B10; and B11.

NCARB Comment: NCARB reasoned that no one could produce a comprehensive design with mere “Understanding” of certain SPC⁹, but that seems to be NAAB’s intent. Moreover, NCARB is concerned that the failure to meet the Comprehensive Design criterion would necessitate a plethora of “Not Mets” elsewhere. There is a disconnect here that needs to be addressed with NAAB and resolved by NAAB. NCARB would suggest that “Ability” be the norm in most SPC situations as that is where most teachers are or should be targeting their efforts.

⁹ It is worth repeating. NAAB has many of the following SPC at the *Understanding* level which is inconsistent with the *Ability* required of *Comprehensive Design*: A2—Critical Thinking; A3—Visual Communication Skills; A4—Technical Documentation; A5—Investigative Skills; A8—Ordering System Skills; B1—Pre-Design; B2—Accessibility; B3—Sustainable Design; B4—Site Design; B5—Life Safety; B7—Financial Considerations; B8—Structural Systems; B9—Environmental Systems Integration; B10—Building Envelope Systems; and, B11—Building Service Integration.

B.7. Financial Considerations: *Understanding* of the fundamentals of building costs, **project funding and financing**, financial feasibility, **operational costs**, and construction estimating with an emphasis on life-cycle cost accounting, **management of project budget, and the needs of the client.**

NCARB Comment: Nothing annoys clients more than a project out of financial control, yet the *2007 Practice Analysis* shows that most architects do not pick up that skill until they begin practicing. NCARB strongly recommends that these understandings be taught early in an architect's career to help students form the mindset and way of thinking expected of them by their future clients. Additionally, NCARB asks NAAB to consider whether this SPC should be revised to require the "Ability to apply the principles of....", as it reconsiders when "Ability" versus "Understanding" should be required of programs.

B.8. Structural Systems: *Understanding* of basic principles of structural behavior in withstanding gravity and lateral forces and the evolution, range, and appropriate application of contemporary structural systems.

B.9. Environmental Systems Integration: *Understanding* of the principles of active and passive environmental systems, such as embodied energy, energy efficiency, indoor air quality, bioclimatic design, solar geometry, passive heating and cooling, day-lighting, carbon-neutral design, as well as the application of appropriate performance assessment tools.

B.10. Building Envelope Systems: *Understanding* of the basic principles involved in the appropriate application of building envelope systems and associated assemblies relative to fundamental performance, aesthetics, durability, and energy and material resources.

B.11. Building Service Systems Integration: *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.12. Building Materials and Assemblies Integration: *Understanding* of the basic principles utilized in the appropriate selection of **interior and exterior** construction materials, products, components, and assemblies, based on their inherent characteristics and performance, including their environmental impact and reuse **as well as the mitigation of hazardous materials encountered in existing buildings, facilities, products and assemblies.**

NCARB Comment: As noted earlier in comments for B.3 Sustainable Design, the SPC level ("Understanding" versus "Ability") should be consistent with other SPC. The mitigation of hazardous materials encountered in existing buildings, facilities, products and assemblies is critical to public

health, safety and welfare and of equal importance with other design issues including sustainability. Further the selection of construction materials for both interiors and exteriors is important to note.

B.13. Interiors: Understanding the basic design principles associated with life safety including fire-rated assemblies, lighting, space planning, acoustics and the appropriate selection of interior materials and finishes and furnishings, fixtures and equipment.

NCARB Comment: Nowhere do the SPC address interior spaces and the life safety concerns associated with them. NCARB recommends that NCARB explore with NAAB either incorporating Interiors explicitly under other SPC or creating an SPC for Interiors alone.

Realm C: Leadership and Practice

Architects need to have the ability to manage, advocate, and act legally, ethically and critically for the good of the client, society and the public. This includes their having collaborative, business, and leadership skills.

Students learning aspirations will include:

- Knowing societal and professional responsibilities.
- Collaborating and negotiating with clients and consultants in the design process.
- Comprehending the business of architecture and building.
- Integrating community service into the practice of architecture.

NCARB Comment: While changing realm language is of limited concern to NCARB, in this realm including the client is critical, as leaving the client out undermines the credibility of the architect both as Leader and as Practitioner. NCARB assumes the absence is merely an oversight.

C.1. Collaboration: *Ability* to work in collaboration with others and in multi-disciplinary teams to successfully complete design projects, including the ability to mentor and teach others.

NCARB Comment: In light of NAAB's expansion of the Learning Culture, it seems only proper that NAAB require that mentoring be taught and learned. The fact that it is not confounds NCARB. Whether the "mentoree" is a client, a consultant, an employee, or a government agent, the *2007 Practice Analysis* makes clear that having mentoring skills is a critical component both of Leadership and Practice. There is no better place and no better time to teach those skills than in a school setting where the skills can be practiced daily without concern of adverse consequences to clients and business.

C.2. Human Behavior: *Understanding* of the relationship between human behavior, the natural environment and the design of the built environment.

C.3 Research: *Understanding* of the role of research in evidence-based design in areas such as human behavior and building sciences.

C.4. Client Role in Architecture: *Understanding* of the responsibility of the architect to elicit, understand, and reconcile the needs of the client, owner, user groups, and the public and community domains.

C.5. Practice Management: *Understanding* of how to obtain commissions and negotiate contracts, manage personnel and select consultants, recommend project delivery methods, and forms of service contracts.

C.6. Architectural Practice & Project Management: **Ability to apply** the basic principles and legal aspects of practice organization through such means as financial management, business planning, time and project management, risk **management**, mediation, arbitration, and litigation, as well as an understanding of trends that affect practice.

NCARB Comment: Solid risk management knowledge and skills are a prerequisite for the architect to protect the public's health, safety, and welfare. For reasons unclear to NCARB though, NAAB chose not to change "risk mitigation" to "risk management" as recommended by NCARB in September 2008. As mitigating risk is but one available risk management strategy, and a passive one at best, there seemed then, and still, to be no reason to limit student education to just that one strategy, especially if acquiring leadership skills is also an education goal.

Moreover, as risk is inherent to architecture, it is self-defeating to have the future of architecture taught fewer options to manage it. Simply put, one of the reasons architects are retained is because of their risk management skills. Reducing the architect's utility to themselves, their clients, and the public cannot be NAAB's intent.

Further, while NCARB has assiduously avoided making any non-Practice Analysis-based comments in this document, it cannot help itself here, as in our society people who take on reasonable risks and manage them reasonably are the ones sought after and rewarded. People who run from risk are not. The next generation of architects has to be comfortable stepping up to bat, else they will not have the value-added information clients look for.

In that vein, NCARB would also urge NAAB to reconsider the "Understanding" requirement. The *2007 Practice Analysis' Point of Acquisition* data show that the issues in this SPC tend not to be

addressed in architectural education. This may be an unintended consequence of schools' tendency to offer only one mandatory ProPractice course. Regardless, the need for upgraded program performance is clearly indicated.

C.7. Leadership: Ability to apply the techniques and skills that enable architects to work collaboratively in the building design and construction process and on environmental, social, and aesthetic issues in their communities.

NCARB comment: NCARB would again urge NAAB to reconsider the "Understanding" requirement. The *2007 Practice Analysis'* Point of Acquisition data show that the issues in this SPC tend not to be addressed in architectural education. This may be an unintended consequence of schools' tendency to offer only one mandatory ProPractice course. Regardless, the need for upgraded program performance is clearly indicated.

C.8. Legal Responsibilities: Understanding of the architect's responsibility to the client and the public as determined by registration law, employment law, professional service contracts, building codes and regulations, zoning and subdivision ordinances, environmental regulation, historic preservation laws, and accessibility laws.

NCARB Comment: While no one wants to make mini-lawyers out of architects, the *2007 Practice Analysis* results suggest that students need to be introduced to more areas of law than that being proposed by NAAB.

C.9. Ethics and Professional Judgment: *Understanding* of the personal and professional ethical issues involved in the formation of professional judgment regarding social, political and cultural issues in architectural design and practice.

NCARB Comment: The recommended SPC revision emphasizes that ethical issues can be personal and/or professional.

C.10. Project Delivery: Understanding of constructability, permitting and approval processes, construction sequencing, construction procurement, project records management, substitutions, shop drawing review, change order process, site observation, contractor application for payment and construction conflict resolution.

NCARB Comment: In no SPC does NAAB require architecture students to learn about construction. Yet "construction administration services (CCA)" is a "basic service" of architects. Architects routinely include their provision in their contracts, knowing full well that it is those services that protect the integrity of the design, guard their client best, and help ensure the

profitability of their practice by decreasing the likelihood of claims. Hence, NCARB found NAAB's silence on this issue confusing at best, especially as the *2007 Practice Analysis* calls for greater construction knowledge conveyance both in school and during IDP.

While it is not the purpose of this document to explore the ambivalence of many in the Profession about CCA services, architects cannot protect the public's health, safety and welfare without a solid grounding in constructability issues. Nor can architects exercise the leadership role expected of them in the revised conditions without that knowledge. For those architects untaught in the ways of construction, maintaining a non-leader-like silence at the Integrated Project Delivery table would be wiser than manifesting ignorance. Architects of the future require more. NAAB should require more.

NCARB is not seeking a new course, though such courses would be welcomed. Nor is it seeking a lengthening of the curriculum. Schools can meet this new SPC creatively through work placement programs in contractors' offices, in banks, in developer firms, on construction sites, and elsewhere. Regardless of the route each school takes, in time, this Student Performance Criterion must be met for the Profession to fulfill its health, safety, and welfare responsibilities.

The Intern Development Program (IDP)

NCARB is aware of how much NAAB has done to address NCARB's IDP concerns and is pleased with the progress made. While NCARB will always believe that schools should be required to facilitate IDP enrollment at the student's earliest eligibility and that NAAB should mandate that requirement, NCARB understands that that will not happen this year. There is still room though for improvement in the *2009 Draft Conditions*.

In the section on Human Resources, NAAB states, "An accredited degree program must demonstrate that an IDP Education Coordinator has been appointed within each accredited degree program, trained in the issues of IDP, and is active in supporting students who have questions about IDP and internship." NCARB strongly urges NAAB require that the IDP Coordinator do more. Building on the proposed NAAB language, it offers the following language for Board consideration:

An accredited degree program must demonstrate that an IDP Education Coordinator has been appointed within each accredited degree program, trained in the issues of IDP, and is active in supporting students who have questions about IDP and internship as well as seeking out and educating all other students in an accredited degree program about IDP and internship. Additionally, the IDP Education Coordinator should help students enroll in IDP, when the need for such help is indicated.

Conclusion

In summary, NCARB respectfully requests that NAAB consider the following:

- **The Definitions of Achievement Levels:** NCARB recommends that “Understanding” and “Ability” be redefined to ensure that educational outcomes are easily and clearly communicated and reliably measured. The recommended definitions are: “**Understanding.**” The capacity to classify, compare, summarize, explain, and/or interpret information and “**Ability.**” Skill in using specific information to accomplish the task, in correctly selecting the appropriate information, and in accurately applying it to the solution of a specific problem.
- **The Application of the Definitions of Achievement Levels to the SPC:** NCARB recommends that the assignment of “Ability” and “Understanding” to SPC achievement levels be re-thought in light of the appropriate requirement that students be *able* to produce a comprehensive project.
- **The Recommended Revisions to the SPC:** There are knowledge/skills identified as important in NCARB’s *2007 Practice Analysis* that are not covered in the SPC, but should be added. Further, the SPC “Design Thinking Skills” should be recast as “Critical Thinking Skills”. This revision would prevent potential confusion that “design thinking” refers to project excellence as a goal rather than the broader, more inclusive “critical thinking skills” that would be applied to all areas of an architect’s work.
- **The Role of the Intern Development Program (IDP) Education Coordinator:** The role of the Coordinator should be cast as a proactive one. Successful performance in the Coordinator role requires keeping up to date on IDP requirements and regularly reaching out to students as well as faculty and staff to ensure that information is clearly communicated and questions answered.

NAAB is calling for collateral responses by June first. NCARB hopes NAAB will find this analysis useful and stands ready to answer questions as they arise. Regardless of the decisions NAAB reaches, NCARB would request a debriefing so that we understand NAAB’s decisions and can incorporate its decisions into our own.

Reading the 2009 Conditions for Accreditation Student Performance Criteria (SPC) and the 2007 Practice Analysis of Architecture Knowledge/Skills (KS) Linking Study

March 2009

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The 2009 Conditions for Accreditation Student Performance Criteria (SPC) and the 2007 Practice Analysis of Architecture Knowledge/Skills (KS) Linking Study chart documents the results of linking the SPC of the 2009 Draft Conditions with the KS from the 2007 Practice Analysis.

- The first three columns list domains and KSs from the 2007 Practice Analysis of Architecture.
- The figures in the column labeled "Importance mean"¹ are from the 2007 Practice Analysis of Architecture survey. (Means at or above 2.50 are deemed important based on a five-point rating scale of 0 to 4. Any means of less than 2.50 are shaded.)
- The columns labeled "Time of Acquisition/Frequency Percentage" show distributions for the point of acquisition ratings² from the 2007 Practice Analysis of Architecture survey.
- The columns under "Student Performance Criteria (SPC)" record the results of the linking between the SPC and the KS. Cells shaded and marked with an "X" indicate a match.

Example:

SPC A.3. Visual Communication Skills: Ability to use appropriate representational media, such as traditional graphic and digital technology skills, to convey essential formal elements at each stage of the programming and design process.

Knowledge/Skill		Importance Mean	Point of Acquisition (Percent)			SPC & KS match	
			Not acquired	By completion of first professional architectural degree	During internship	After licensure	A.3 Visual Communication Skills
Domain 5: General KS	1. freehand drawing and design sketching	3.17	2%	89%	8%	1%	X
	2. manual drafting	2.45	7%	83%	9%	1%	X
	3. Computer Aided Design and Drafting (CADD)	3.53	1%	79%	19%	2%	X
	5. 3D modeling	2.86	3%	70%	23%	3%	X
	7. current software applications	3.02	2%	41%	47%	10%	X
	16. graphic communication	3.41	1%	86%	12%	1%	X
	17. spatial visualization and modeling	3.42	1%	84%	13%	2%	X
	20. designing and delivering presentations	3.41	0%	55%	35%	9%	X

¹ Survey Importance Rating Scale: How important is competent performance of the knowledge/skill for a recently licensed architect practicing independently? Response choices: 0=Of no importance; 1=Of little importance; 2=Of moderate importance; 3=Important; and, 4=Very important.

² Survey Point of Acquisition Rating Scale: At what point is the knowledge/skill acquired? Response choices: 0=Not acquired; 1=By completion of first professional architectural degree; 2=During internship; and, 3=After licensure.

